

Wilcox & Barton INC.

CIVIL • ENVIRONMENTAL • GEOTECHNICAL

STORMWATER MANAGEMENT PLAN for

**County Road Apartments
268 County Road
New London, NH 03257**

Prepared for:

Twin Pines Housing Trust
266 Holiday Drive, suite 20
White River Junction, VT 05001

Prepared by:

Wilcox & Barton, Inc.
2 Capital Plaza, Suite 305
Concord, New Hampshire 03301
Contact: Erin Lambert, PE, (603) 369-4190 x527

***Preliminary Stormwater
Management Plan
Report to be updated with
Alteration of Terrain
Permit Application Submission***

Wilcox & Barton, Inc. Project No.: TWIN0001

October 4, 2022

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1.0 NHDES ALTERATION OF TERRAIN APPLICATION

To be completed with Alteration of Terrain Permit Application submission.

2.0 PROJECT NARRATIVE

2.1 Project Description

The project consists of constructing four multi-family apartment buildings providing 60 units in total (7,320 square feet per building) with a community center building, maintenance and storage garage, associated parking areas, stormwater management systems, landscaped areas, community garden area, and access way. The community center building is proposed to be in the historic barn structure and the maintenance/storage garage will utilize the existing garage structure, which are both located on Lot 17. Work involved includes paving; landscaping; and the installation of stormwater management systems. Currently, one of the project parcels is partially developed as farmland (Lot 15); while the other project parcel is developed for residential use (Lot 17). The project parcels have a total area of 41.69 acres (1,816,018 square feet). A proposed lot line adjustment is concurrently submitted and will add 6.06 acres to Lot 17 (limits at the Town zoning district line), where the project area will be located. Construction activities are expected to disturb approximately 273,475 square feet of land and add 110,675 square feet of new impervious cover to the project property. The proposed stormwater management system consists of one detention pond, two treatment swales, five building drip edges, two bioretention systems, one detention/filtration system, and one porous patio area, which provide water quality treatment, quantity reduction, and rate control to pre-development levels.

2.2 Site Soils

On-site soils consist of Marlow fine sandy loam within the project area, which is hydrologic soil group C. There are poorly drained soils associated with the wetland located in the central southern portion of the project parcel, which conveys on-site drainage off the site. The Marlow soils located on-site, and in the report, have an infiltration rate measured at 0.6-2.0 inches/hour. The site soils were modeled with an infiltration rate of 0.3 inches/hour, after a factor of safety of 2 was applied to the maximum infiltration rate of 0.6 inches/hour. The Site-Specific Soil Report (with more soil information) shall be completed with the Alteration of Terrain permit application. Refer to the NRCS soil report for more information.

2.3 Pre-Development Watershed

The pre-development watershed consists of the entire project area, which includes the portion of the parcels with an extent to the central southern wetland area on-site. The existing lots are developed for farmland and residential use. Wetlands are present on the property parcel, with wooded areas surrounding the wetland up to the farmland area to the north. The parcel slopes in two general directions: to the south and east. The parcel topography slopes in the eastern direction down to the northeastern parcel boundary line, which generally discharges flow towards County Road in two different directions: to the north towards an existing catch basin, and to the south to a roadway ditch line. The remaining portions of the project property slopes in the southern direction down to the wetlands located on the project parcel. The wetland ultimately discharges flow towards the southern parcel boundary line. As a result, the pre-

development watershed has been directed to three points of interest (POI). POI #1 includes the project area, which drains to the northeastern property boundary line and to the existing catch basin located at County Road. POI #2 includes the remaining portion of the parcel which drains to the east to the eastern property boundary line and ultimately to the roadway ditch line alongside County Road. POI #3 includes the remaining portion of the project area which drains to the on-site wetland to the south. See the pre-development stormwater plan for sub-watershed boundaries and POI locations.

2.4 Post-Development Watershed

The post-development watershed consists of the same area as the pre-development watershed. Post-development cover will consist of parking, driveways, sidewalks, building footprints, pavilion, patios, landscaped areas, and naturally vegetated areas. Construction of the project will not change the locations of the POI(s), though the drainage areas to each will change.

The project proposes stormwater management systems that will treat stormwater runoff to remove pollutants and detain peak flows to levels below the pre-development watershed conditions. To the maximum extent feasible, all runoff from the new impervious areas will be collected in the one detention pond, two treatment swales, five building drip edges, two bioretention systems, one detention/filtration system, and one porous patio area. Pre-treatment for the treatment swales is provided through either the storage capacity in the detention basin or a deep sump catch basin. Pre-treatment for the bioretention systems is provided through sediment forebays. Pre-treatment for the filtration system is provided through the storage capacity in the subsurface detention system. Pre-treatment for the building drip edges is not needed due to the inflow area being roof runoff.

POI #1: The POI#1 post-development watershed will include the entirety of the northern portion of the project area including: one apartment building, one parking lot area and driveway access, a portion of the existing garage building, the affiliated stormwater systems, and the existing grass and woodland areas. The stormwater treatment practices in POI #1 will include two building drip edges, one bioretention system, and the detention/filtration system on-site to adequately handle the runoff from the driveway, pavement, and building areas. All treatment systems effectively direct runoff to the northeastern property boundary line to the existing catch basin at County Road, which is where POI#1 is located and where the existing runoff is directed to.

POI #2: The POI#2 post-development watershed will include the eastern portion of the project area where the existing structures are located including: the historic barn building, a portion of the existing garage structure, existing gravel driveway area and proposed expanded gravel driveway area, the affiliated stormwater system, and the existing grass and woodland areas. The stormwater treatment practice in POI #2 includes the pervious patio area on-site to adequately handle the runoff from the proposed impervious patio area. All treatment systems effectively direct runoff to the eastern property boundary line to the existing ditch line along County Road, which is where POI#2 is located and where the existing runoff is directed to.

POI #3: The POI#3 post-development watershed will include the remaining portion of the project area to the wetland area on-site including: three apartment buildings, two parking lot

areas and driveway circulation, the affiliated stormwater systems, and the existing grass and woodland areas. The stormwater treatment practices in POI #3 will include three building drip edges, one bioretention system, one detention basin, and two treatment swales on-site to adequately handle the runoff from the driveway circulation, pavement, and building areas. All treatment systems effectively direct runoff to the southern wetland area and ultimately to the southern property boundary line, which is where POI#3 is located and where the existing runoff is directed to.

The detention/filtration system is sized to treat the water quality volume – WQV through the cartridges and includes a bypass to confirm that the system does not overtop during the 50-year storm event. The subsurface detention system and detention ponds are sized to contain the runoff from the 100-year storm event without overtopping the top of the system or berm of the pond storage area. The bioretention systems and building drip edges are sized to contain the runoff from the 100-year storm event without overtopping the berm of the pond storage area. The detention basin is designed with an overflow spillway, which discharges to the wetlands along the southern portion of the property. Because site soils vary throughout the site, the drainage systems reflect the estimated seasonal high-water table in the area of the respective system.

2.5 Schedule

Construction is planned to commence in Spring 2023 following all applicable state and local permits.

2.6 Points of Interest

There are three points of interest in the hydraulic model. Please see the pre-development and post-development watershed section for descriptions of the points of interest.

2.7 Erosion Sediment Control/Site Stabilization

The methods to be used to control sediment migration and erosion of the site include use of tracking control pads, temporary sedimentation basins, silt fence, check dams, landscaping, hydro-seeding, erosion control matting, and stone inlet protection at catch basins in accordance with best management practices.

The contractor will be responsible for all temporary erosion and sediment control measures during construction, while the property owner will be ultimately responsible for maintaining all permanent erosion and sediment control measures as may be required.

2.8 Water Quality

During construction activities, silt fence, stone inlet protection at catch basins, erosion control matting, and temporary seeding and mulching will maintain the quality of storm water leaving the site. Runoff from disturbed areas shall be directed to depressions to infiltrate into the

groundwater and allow for settling of sediment/pollutants. After construction is completed and the site is stabilized, stormwater quality will be maintained by detention, conveyance, and filtration through the required filter media. Pretreatment is provided in the sediment forebays, a deep sump catch basin, and detention storage capacity before entering the respective treatment systems.

2.9 Summary of Results

POI		Peak Discharge				
		2-yr		10-yr	25-yr	50-yr
		Peak Q	Discharged Volume	Peak Q	Peak Q	Peak Q
#1	Pre	1.98 cfs	0.20 ac-ft	3.96 cfs	5.57 cfs	7.11 cfs
	Post	1.83 cfs	0.273 ac-ft	3.67 cfs	4.99 cfs	6.94 cfs
#2	Pre	1.60 cfs	0.128 ac-ft	2.96 cfs	4.07 cfs	5.12 cfs
	Post	0.65 cfs	0.050 ac-ft	1.20 cfs	1.65 cfs	2.09 cfs
#3	Pre	12.94 cfs	1.30 ac-ft	27.89 cfs	40.56 cfs	52.79 cfs
	Post	10.43 cfs	1.17 ac-ft	23.10 cfs	33.84 cfs	44.04 cfs

2.10 Conclusions

The preceding table and following calculations indicate that the post-development peak flow rates of the property will be attenuated to a value below the pre-development peak flow in the 2-year, 10-year, 25-year, 50-year storm events. Stormwater is collected in the proposed detention, conveyance, and filtration systems and treated by means of detention and filtration through the required filter media, prior to entering the groundwater table.

The proposed design meets the Env-Wq 1507.05 Channel Protection Requirement for peak flow rates. The 2-year, 24-hour post-development peak flow rates at all points of interest are less than the 2-year, 24-hour pre-development peak flow rates and the discharged volume has not increased over the pre-development volume by more than 0.1 acre-feet. The only increase in discharged volume occurs at POI#1 where the pre and post-development peak flow rates are both less than 2 cfs. No increase in the 2-year discharged volume occurs at POI #2 and POI#3

Calculations are included for the 2-year, 10-year, 25-year, and 50-year events.

3.0 WEB GIS INFORMATION

- 3.1 USGS Location Map
- 3.2 NHDES Screening Layers Map

To be completed with Alteration of Terrain Permit Application submission.

4.0 NH NATURAL HERITAGE BUREAU REVIEW



New Hampshire Natural Heritage Bureau NHB DataCheck Results Letter

To: Kate Fournier, SRW Environmental Consulting
143 Rochester Hill Road

Rochester, NH 03867

From: NH Natural Heritage Bureau

Date: 7/28/2022 (valid until 7/28/2023)

Re: Review by NH Natural Heritage Bureau of request submitted 7/12/2022

Permits: GRANT APP - HUD

NHB ID: NHB22-2363

Applicant: Kate Fournier

Location: New London
268 County Road

Project

Description: Entire site may be developed for new construction of affordable housing, drive, parking lot, and landscaping. Existing residence may be demolished.

The NH Natural Heritage database has been checked by staff of the NH Natural Heritage Bureau and/or the NH Nongame and Endangered Species Program for records of rare species and exemplary natural communities near the area mapped below. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government.

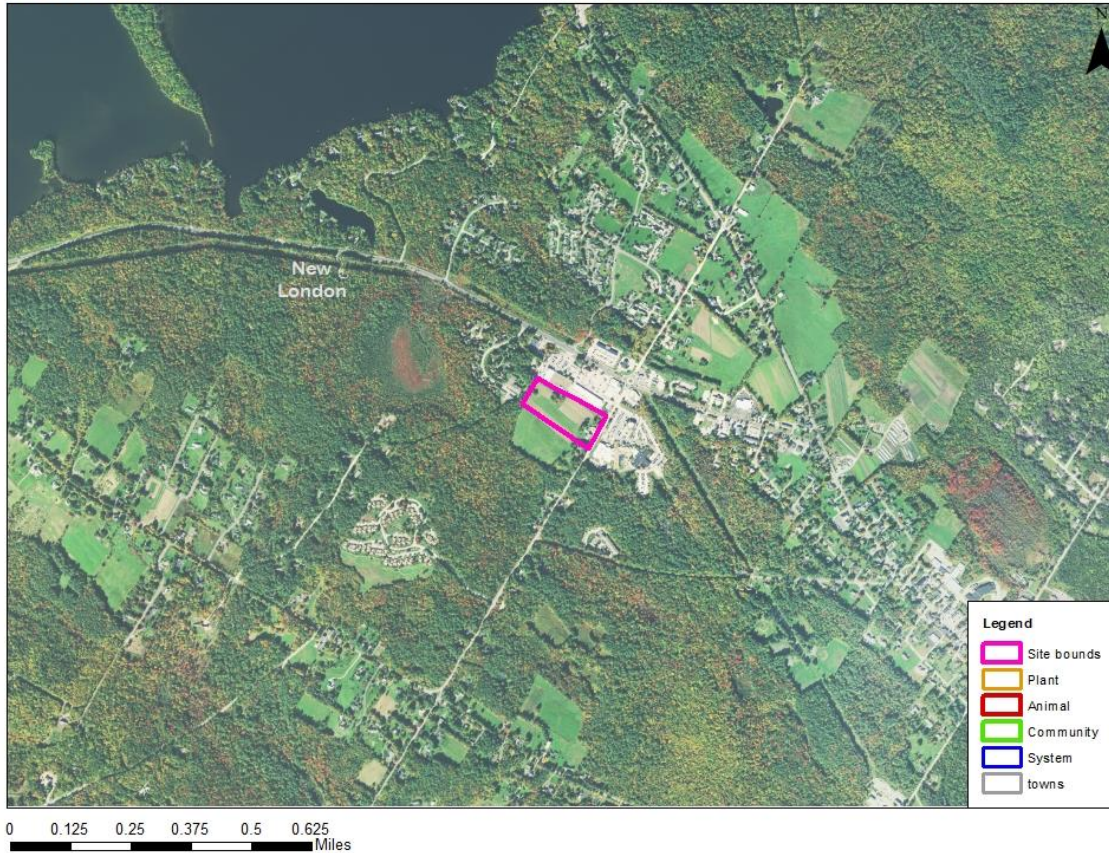
It was determined that, although there was a NHB record (e.g., rare wildlife, plant, and/or natural community) present in the vicinity, we do not expect that it will be impacted by the proposed project. This determination was made based on the project information submitted via the NHB Datacheck Tool on 7/12/2022 10:32:01 AM, and cannot be used for any other project.

Based on the information submitted, no further consultation with the NH Fish and Game Department pursuant to Fis 1004 is required.

New Hampshire Natural Heritage Bureau NHB DataCheck Results Letter

MAP OF PROJECT BOUNDARIES FOR: **NHB22-2363**

NHB22-2363



5.0 NRCS SOIL INFORMATION



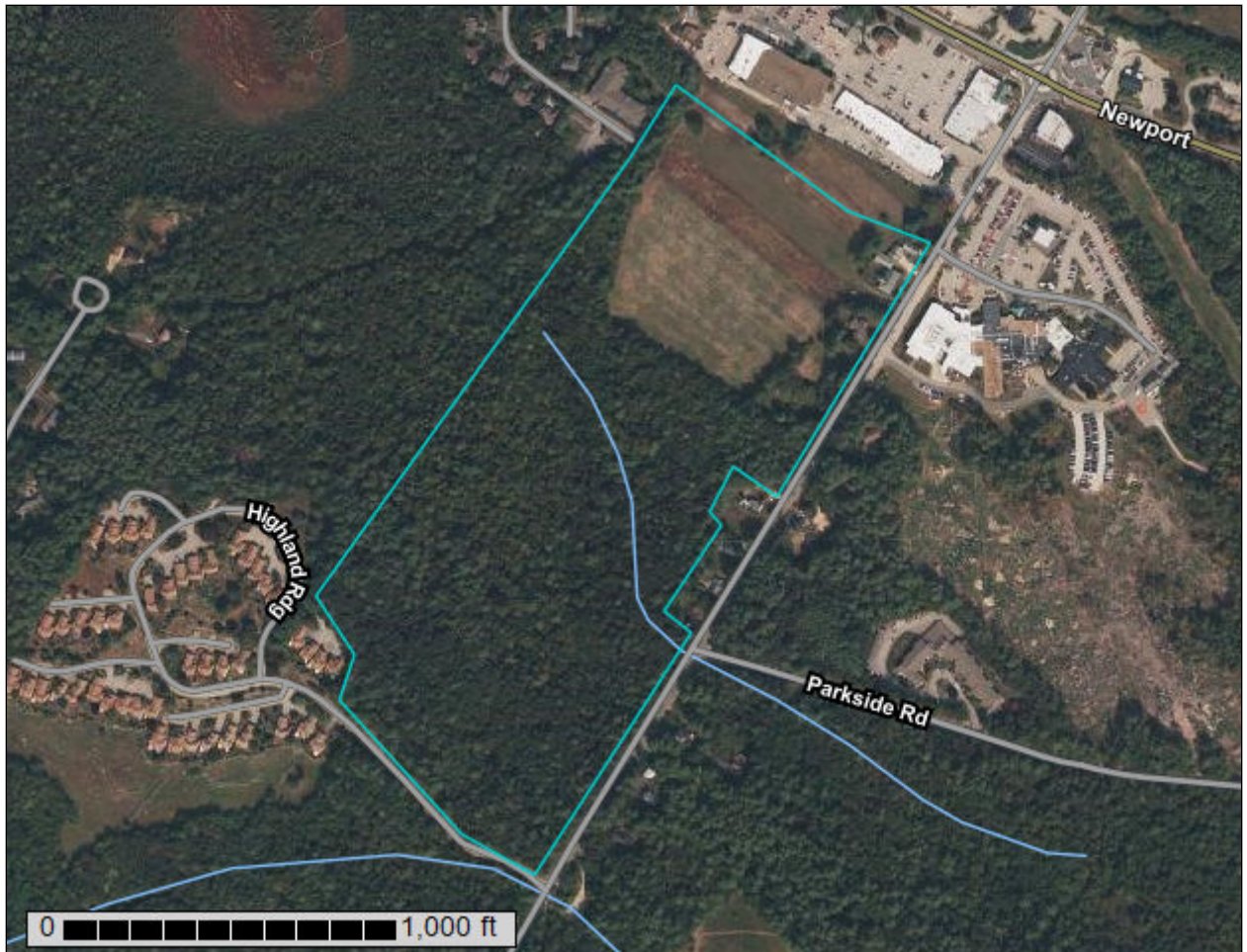
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

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

Custom Soil Resource Report for Merrimack and Belknap Counties, New Hampshire



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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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

Custom Soil Resource Report

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

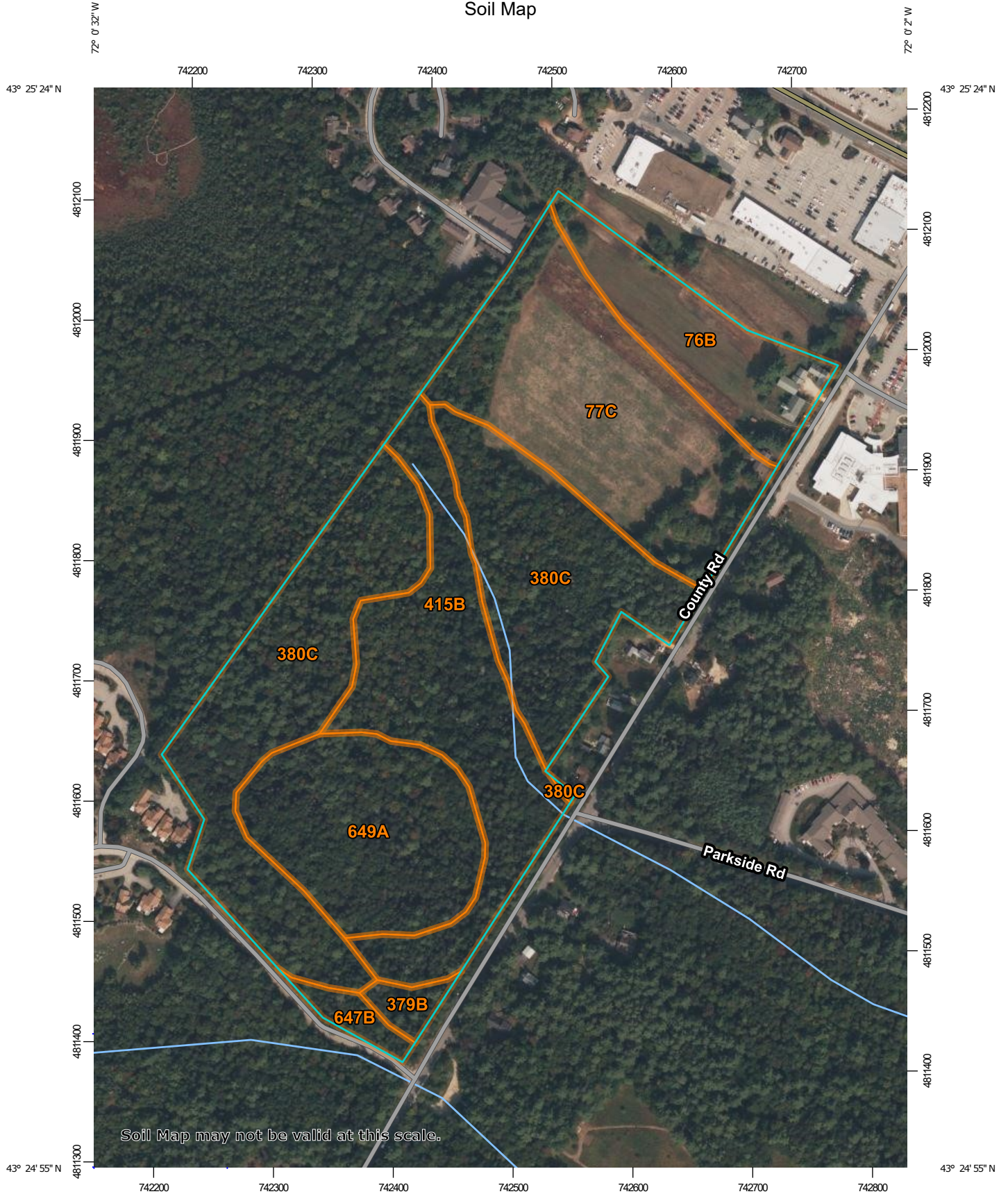
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

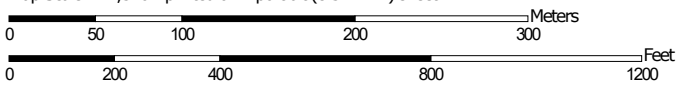
Soil Map

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: 1:4,370 if printed on A portrait (8.5" x 11") sheet.




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


MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)




















Soils







 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

Water Features

 Streams and Canals

Transportation

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

Background

 Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Merrimack and Belknap Counties, New Hampshire
 Survey Area Data: Version 27, Aug 31, 2021

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

Date(s) aerial images were photographed: May 27, 2020—Sep 16, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
76B	Marlow fine sandy loam, 3 to 8 percent slopes	4.1	9.1%
77C	Marlow fine sandy loam, 8 to 15 percent slopes, very stony	9.7	21.2%
379B	Peru fine sandy loam, 0 to 8 percent slopes, very stony	0.6	1.2%
380C	Tunbridge-Lyman-Becket complex, 8 to 15 percent slopes, very stony	15.8	34.6%
415B	Moosilauke fine sandy loam, 3 to 8 percent slopes, very stony	8.4	18.3%
647B	Pillsbury fine sandy loam, 0 to 8 percent slopes, very stony	0.6	1.4%
649A	Peacham mucky peat, 0 to 8 percent slopes, very stony	6.6	14.3%
Totals for Area of Interest		45.7	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

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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.

Merrimack and Belknap Counties, New Hampshire

76B—Marlow fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2ty5f
Elevation: 590 to 1,710 feet
Mean annual precipitation: 31 to 95 inches
Mean annual air temperature: 27 to 52 degrees F
Frost-free period: 90 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Marlow and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Marlow

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountainbase, interfluve, nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite

Typical profile

Ap - 0 to 4 inches: fine sandy loam
E - 4 to 6 inches: fine sandy loam
Bs1 - 6 to 10 inches: fine sandy loam
Bs2 - 10 to 15 inches: fine sandy loam
Bs3 - 15 to 20 inches: fine sandy loam
BC - 20 to 24 inches: fine sandy loam
Cd - 24 to 65 inches: fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F144BY501ME - Loamy Slope (Northern Hardwoods)

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Hydric soil rating: No

Minor Components

Peru

Percent of map unit: 7 percent

Landform: Mountains, hills

Landform position (two-dimensional): Backslope, footslope

Landform position (three-dimensional): Mountainbase, interfluve, nose slope, side slope

Microfeatures of landform position: Closed depressions, closed depressions

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: No

Pillsbury

Percent of map unit: 3 percent

Landform: Mountains, hills

Landform position (two-dimensional): Footslope, toeslope

Landform position (three-dimensional): Mountainbase, interfluve, nose slope, side slope

Microfeatures of landform position: Closed depressions, closed depressions

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Monadnock

Percent of map unit: 3 percent

Landform: Mountains, hills

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Mountainbase, interfluve, nose slope, side slope

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Tunbridge

Percent of map unit: 2 percent

Landform: Mountains, hills

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Mountainbase, interfluve, nose slope, side slope

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

77C—Marlow fine sandy loam, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2ty5p

Elevation: 520 to 1,900 feet

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Mean annual precipitation: 31 to 95 inches
Mean annual air temperature: 27 to 55 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Farmland of local importance

Map Unit Composition

Marlow, very stony, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Marlow, Very Stony

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite

Typical profile

O_i - 0 to 2 inches: slightly decomposed plant material
A - 2 to 5 inches: fine sandy loam
E - 5 to 8 inches: fine sandy loam
B_{s1} - 8 to 15 inches: fine sandy loam
B_{s2} - 15 to 19 inches: fine sandy loam
BC - 19 to 33 inches: gravelly fine sandy loam
Cd - 33 to 65 inches: fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.1 percent
Depth to restrictive feature: 20 to 41 inches to densic material
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (K_{sat}): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: F144BY501ME - Loamy Slope (Northern Hardwoods)
Hydric soil rating: No

Minor Components

Peru, very stony

Percent of map unit: 6 percent
Landform: Mountains, hills
Landform position (two-dimensional): Backslope, footslope

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Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, nose slope, side slope

Microfeatures of landform position: Open depressions, open depressions, closed depressions, closed depressions

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: No

Berkshire, very stony

Percent of map unit: 4 percent

Landform: Mountains, hills

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, nose slope, side slope

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Tunbridge, very stony

Percent of map unit: 3 percent

Landform: Hills, mountains

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, nose slope, side slope

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Pillsbury, very stony

Percent of map unit: 2 percent

Landform: Mountains, hills

Landform position (two-dimensional): Footslope, toeslope

Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, nose slope, side slope

Microfeatures of landform position: Open depressions, open depressions, closed depressions, closed depressions

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

379B—Peru fine sandy loam, 0 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2ty63

Elevation: 160 to 1,840 feet

Mean annual precipitation: 31 to 95 inches

Mean annual air temperature: 27 to 52 degrees F

Frost-free period: 90 to 160 days

Farmland classification: Farmland of local importance

Map Unit Composition

Peru, very stony, and similar soils: 88 percent

Minor components: 12 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peru, Very Stony

Setting

Landform: Mountains, hills

Landform position (two-dimensional): Backslope, footslope

Landform position (three-dimensional): Mountainbase, interfluve

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material

A - 1 to 5 inches: fine sandy loam

E - 5 to 6 inches: fine sandy loam

Bs1 - 6 to 7 inches: fine sandy loam

Bs2 - 7 to 13 inches: fine sandy loam

Bs3 - 13 to 18 inches: fine sandy loam

BC - 18 to 21 inches: fine sandy loam

Cd1 - 21 to 37 inches: fine sandy loam

Cd2 - 37 to 65 inches: fine sandy loam

Properties and qualities

Slope: 0 to 8 percent

Surface area covered with cobbles, stones or boulders: 1.1 percent

Depth to restrictive feature: 21 to 43 inches to densic material

Drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)

Depth to water table: About 17 to 34 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

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: C/D

Ecological site: F144BY501ME - Loamy Slope (Northern Hardwoods)

Hydric soil rating: No

Minor Components

Marlow, very stony

Percent of map unit: 5 percent

Landform: Mountains, hills

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Mountainbase, interfluve

Down-slope shape: Convex

Across-slope shape: Convex

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Hydric soil rating: No

Pillsbury, very stony

Percent of map unit: 4 percent

Landform: Mountains, hills

Landform position (two-dimensional): Footslope, toeslope

Landform position (three-dimensional): Mountainbase, interfluve

Microfeatures of landform position: Closed depressions, closed depressions

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Lyman, very stony

Percent of map unit: 2 percent

Landform: Mountains, hills

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Mountainbase, interfluve

Microfeatures of landform position: Rises, rises

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Colonel, very stony

Percent of map unit: 1 percent

Landform: Mountains, hills

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Mountainbase, interfluve

Microfeatures of landform position: Closed depressions, closed depressions

Down-slope shape: Linear, concave

Across-slope shape: Concave

Hydric soil rating: No

380C—Tunbridge-Lyman-Becket complex, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2xk0m

Elevation: 390 to 1,510 feet

Mean annual precipitation: 36 to 65 inches

Mean annual air temperature: 36 to 52 degrees F

Frost-free period: 90 to 160 days

Farmland classification: Farmland of local importance

Map Unit Composition

Tunbridge, very stony, and similar soils: 35 percent

Lyman, very stony, and similar soils: 25 percent

Becket, very stony, and similar soils: 25 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tunbridge, Very Stony

Setting

Landform: Mountains, hills

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, nose slope, side slope, crest

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Loamy supraglacial till derived from granite and gneiss and/or mica schist and/or phyllite

Typical profile

Oe - 0 to 3 inches: moderately decomposed plant material

Oa - 3 to 5 inches: highly decomposed plant material

E - 5 to 8 inches: fine sandy loam

Bhs - 8 to 11 inches: fine sandy loam

Bs - 11 to 26 inches: fine sandy loam

BC - 26 to 28 inches: fine sandy loam

R - 28 to 38 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent

Surface area covered with cobbles, stones or boulders: 1.1 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 14.03 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: C

Hydric soil rating: No

Description of Becket, Very Stony

Setting

Landform: Hills, mountains

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, nose slope, side slope, crest

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Loamy lodgment till derived from granite and gneiss and/or schist over sandy lodgment till derived from granite and gneiss and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material

E - 2 to 4 inches: fine sandy loam

Bhs - 4 to 5 inches: fine sandy loam

Bs1 - 5 to 7 inches: fine sandy loam

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Bs2 - 7 to 14 inches: fine sandy loam
Bs3 - 14 to 24 inches: gravelly sandy loam
BC - 24 to 33 inches: gravelly sandy loam
Cd - 33 to 65 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.1 percent
Depth to restrictive feature: 21 to 43 inches to densic material
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

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

Description of Lyman, Very Stony

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, nose slope, side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy supraglacial till derived from granite and gneiss and/or mica schist and/or phyllite

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loam
E - 3 to 5 inches: fine sandy loam
Bhs - 5 to 7 inches: loam
Bs1 - 7 to 11 inches: loam
Bs2 - 11 to 18 inches: channery loam
R - 18 to 28 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.5 percent
Depth to restrictive feature: 11 to 24 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

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

Minor Components

Monadnock, very stony

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, nose slope, side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Skerry, very stony

Percent of map unit: 4 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, nose slope, side slope, crest
Microfeatures of landform position: Closed depressions, closed depressions, open depressions, open depressions
Down-slope shape: Convex, concave
Across-slope shape: Linear, concave
Hydric soil rating: No

Searsport, very stony

Percent of map unit: 3 percent
Landform: Mountains, hills
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, nose slope, side slope, crest
Microfeatures of landform position: Open depressions, open depressions, closed depressions, closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Moosilauke, very stony

Percent of map unit: 3 percent
Landform: Mountains, hills
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, nose slope, side slope, crest
Microfeatures of landform position: Open depressions, open depressions, closed depressions, closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

415B—Moosilauke fine sandy loam, 3 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 21xtt
Elevation: 250 to 2,940 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 90 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Moosilauke

Setting

Landform: Drainageways
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Glacial drift

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
H1 - 2 to 4 inches: fine sandy loam
H2 - 4 to 10 inches: fine sandy loam
H3 - 10 to 65 inches: fine sand

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A/D
Ecological site: F144BY303ME - Acidic Swamp

Hydric soil rating: Yes

Minor Components

Chocorua

Percent of map unit: 5 percent

Landform: Bogs

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Pillsbury

Percent of map unit: 5 percent

Landform: Ground moraines

Down-slope shape: Linear

Across-slope shape: Convex

Hydric soil rating: Yes

Peacham

Percent of map unit: 5 percent

Landform: Depressions

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Metacomet

Percent of map unit: 3 percent

Landform: Hillslopes

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

Skerry

Percent of map unit: 3 percent

Landform: Hillslopes

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

Searsport

Percent of map unit: 2 percent

Landform: Outwash terraces

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Meadowsedge

Percent of map unit: 2 percent

Landform: Bogs

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

647B—Pillsbury fine sandy loam, 0 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2ty6x
Elevation: 360 to 2,070 feet
Mean annual precipitation: 31 to 95 inches
Mean annual air temperature: 27 to 52 degrees F
Frost-free period: 90 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Pillsbury, very stony, and similar soils: 79 percent
Minor components: 21 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pillsbury, Very Stony

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Mountainbase, interflue, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy lodgment till derived from gneiss and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from granite

Typical profile

Oe - 0 to 1 inches: mucky peat
A - 1 to 6 inches: fine sandy loam
Bg1 - 6 to 13 inches: cobbly fine sandy loam
Bg2 - 13 to 23 inches: cobbly fine sandy loam
Cd - 23 to 65 inches: cobbly fine sandy loam

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.1 percent
Depth to restrictive feature: 21 to 43 inches to densic material
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D

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Ecological site: F144BY305ME - Wet Loamy Flat
Hydric soil rating: Yes

Minor Components

Peru, very stony

Percent of map unit: 9 percent
Landform: Mountains, hills
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainbase, interfluve, base slope
Microfeatures of landform position: Rises, rises
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Peacham, very stony

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Mountainbase, interfluve, base slope
Microfeatures of landform position: Closed depressions, closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Wonsqueak

Percent of map unit: 4 percent
Landform: Hills, mountains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Mountainbase, interfluve, base slope
Microfeatures of landform position: Closed depressions, closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Lyman, very stony

Percent of map unit: 3 percent
Landform: Mountains, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountainbase, interfluve, base slope
Microfeatures of landform position: Rises, rises
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

649A—Peacham mucky peat, 0 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2ty6t
Elevation: 430 to 1,970 feet
Mean annual precipitation: 31 to 95 inches

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Mean annual air temperature: 27 to 52 degrees F

Frost-free period: 70 to 135 days

Farmland classification: Not prime farmland

Map Unit Composition

Peacham, very stony, and similar soils: 78 percent

Minor components: 22 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peacham, Very Stony

Setting

Landform: Mountains, hills

Landform position (two-dimensional): Footslope, toeslope

Landform position (three-dimensional): Mountainbase, interfluvium, base slope

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Organic material over loamy lodgment till derived from schist and/or loamy lodgment till derived from granite and gneiss and/or loamy lodgment till derived from phyllite

Typical profile

Oe - 0 to 2 inches: mucky peat

Oa - 2 to 10 inches: muck

Bg - 10 to 15 inches: fine sandy loam

Cdg1 - 15 to 31 inches: fine sandy loam

Cdg2 - 31 to 65 inches: sandy loam

Properties and qualities

Slope: 0 to 8 percent

Surface area covered with cobbles, stones or boulders: 1.1 percent

Depth to restrictive feature: 12 to 35 inches to densic material

Drainage class: Very poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)

Depth to water table: About 0 inches

Frequency of flooding: None

Frequency of ponding: Frequent

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D

Ecological site: F144BY301ME - Loamy Till Swamp

Hydric soil rating: Yes

Minor Components

Cabot, very stony

Percent of map unit: 11 percent

Landform: Mountains, hills

Landform position (two-dimensional): Footslope, toeslope

Landform position (three-dimensional): Mountainbase, interfluvium, base slope

Microfeatures of landform position: Rises, rises

Down-slope shape: Concave, convex

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Across-slope shape: Concave, convex
Hydric soil rating: Yes

Wonsqueak

Percent of map unit: 8 percent
Landform: Mountains, hills
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Mountainbase, interfluve, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Bucksport

Percent of map unit: 2 percent
Landform: Mountains, hills
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Mountainbase, interfluve, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Searsport

Percent of map unit: 1 percent
Landform: Mountains, hills
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Mountainbase, interfluve, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

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

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

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

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

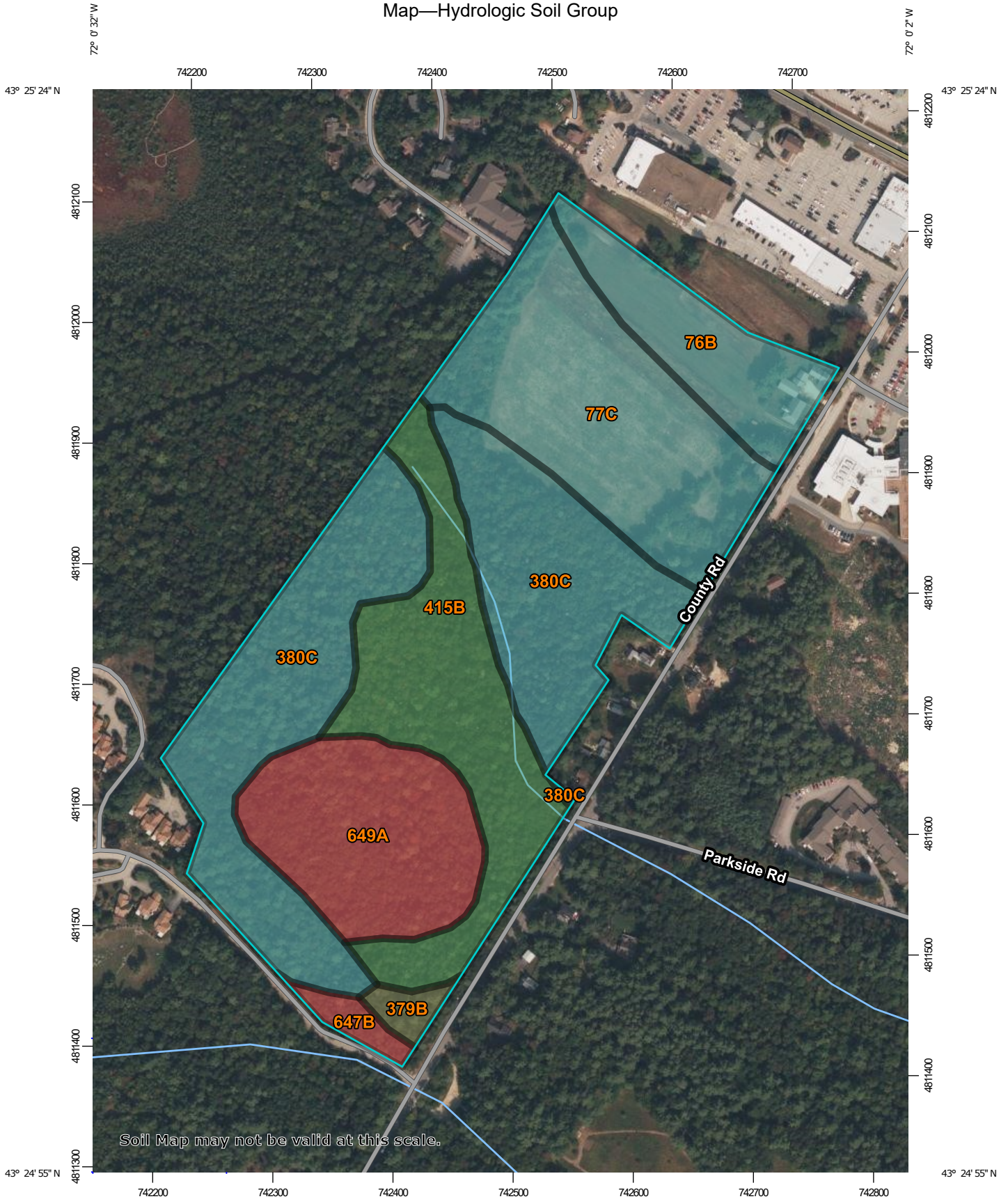
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Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water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

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

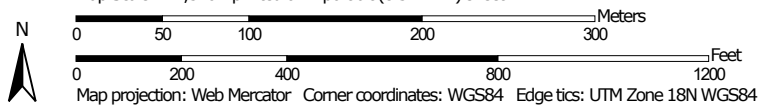
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

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Map—Hydrologic Soil Group




Soil Map may not be valid at this scale.

Map Scale: 1:4,370 if printed on A portrait (8.5" x 11") sheet.











MAP LEGEND









Area of Interest (AOI)
 Area of Interest (AOI)

Soils





Soil Rating Polygons

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


Soil Rating Lines

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






Soil Rating Points

-  A
-  A/D
-  B
-  B/D


Water Features

-  Streams and Canals





Transportation

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

Background

-  Aerial Photography

Soils

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

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Merrimack and Belknap Counties, New Hampshire
 Survey Area Data: Version 27, Aug 31, 2021

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

Date(s) aerial images were photographed: May 27, 2020—Sep 16, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
76B	Marlow fine sandy loam, 3 to 8 percent slopes	C	4.1	9.1%
77C	Marlow fine sandy loam, 8 to 15 percent slopes, very stony	C	9.7	21.2%
379B	Peru fine sandy loam, 0 to 8 percent slopes, very stony	C/D	0.6	1.2%
380C	Tunbridge-Lyman-Becket complex, 8 to 15 percent slopes, very stony	C	15.8	34.6%
415B	Moosilauke fine sandy loam, 3 to 8 percent slopes, very stony	A/D	8.4	18.3%
647B	Pillsbury fine sandy loam, 0 to 8 percent slopes, very stony	D	0.6	1.4%
649A	Peacham mucky peat, 0 to 8 percent slopes, very stony	D	6.6	14.3%
Totals for Area of Interest			45.7	100.0%

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

References

- American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.
- American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.
- Federal Register. July 13, 1994. Changes in hydric soils of the United States.
- Federal Register. September 18, 2002. Hydric soils of the United States.
- Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.
- National Research Council. 1995. Wetlands: Characteristics and boundaries.
- Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262
- Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577
- Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580
- Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.
- United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.
- United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374
- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

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

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

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

6.0 AERIAL SITE PHOTOGRAPH

To be completed with Alteration of Terrain Permit Application submission.

7.0 SITE PHOTOGRAPHS

To be completed with Alteration of Terrain Permit Application submission.

8.0 SITE DESIGN CRITERIA

- 8.1 Groundwater recharge volume calculations
- 8.2 BMP calculation worksheets

To be completed with Alteration of Terrain Permit Application submission.

9.0 HYDRAULIC CALCULATIONS

- 9.1 Extreme Precipitations
- 9.2 Pre-Development Stormwater Plan – SW.1
- 9.3 Post-Development Stormwater Plan – SW.2
- 9.4 Pre-development Conditions
 - 9.4.1 Drainage Diagram
 - 9.4.2 Area Listing
 - 9.4.3 Soil Listing
 - 9.4.4 2-yr Node Listing
 - 9.4.5 10-yr Node Listing
 - 9.4.6 25-yr Node Listing
 - 9.4.7 50-yr Node Listing
 - 9.4.8 10-yr Storm Full Summary
- 9.5 Post-Development Conditions
 - 9.5.1 Drainage Diagram
 - 9.5.2 Area Listing
 - 9.5.3 Soil Listing
 - 9.5.4 2-yr Node Listing
 - 9.5.5 10-yr Node Listing
 - 9.5.6 25-yr Node Listing
 - 9.5.7 50-yr Node Listing
 - 9.5.8 10-yr Storm Full Summary

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Smoothing	Yes
State	New Hampshire
Location	
Longitude	72.002 degrees West
Latitude	43.420 degrees North
Elevation	0 feet
Date/Time	Wed, 21 Sep 2022 11:30:12 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.82	1.02	1yr	0.71	0.94	1.18	1.46	1.81	2.24	2.54	1yr	1.98	2.44	2.83	3.49	4.03	1yr
2yr	0.31	0.48	0.59	0.78	0.99	1.23	2yr	0.85	1.12	1.42	1.75	2.15	2.63	2.98	2yr	2.33	2.86	3.33	3.97	4.56	2yr
5yr	0.37	0.57	0.72	0.97	1.24	1.56	5yr	1.07	1.42	1.79	2.20	2.68	3.25	3.73	5yr	2.88	3.59	4.16	4.89	5.56	5yr
10yr	0.42	0.66	0.83	1.13	1.47	1.86	10yr	1.27	1.69	2.14	2.63	3.18	3.82	4.42	10yr	3.38	4.25	4.92	5.73	6.45	10yr
25yr	0.50	0.79	1.01	1.39	1.84	2.34	25yr	1.59	2.14	2.70	3.31	3.98	4.73	5.54	25yr	4.19	5.33	6.16	7.07	7.87	25yr
50yr	0.57	0.91	1.17	1.63	2.19	2.80	50yr	1.89	2.56	3.23	3.94	4.71	5.57	6.57	50yr	4.93	6.32	7.30	8.28	9.14	50yr
100yr	0.64	1.04	1.35	1.91	2.60	3.35	100yr	2.25	3.07	3.87	4.70	5.59	6.55	7.81	100yr	5.80	7.51	8.65	9.71	10.63	100yr
200yr	0.74	1.21	1.57	2.25	3.10	3.99	200yr	2.67	3.68	4.61	5.59	6.62	7.71	9.27	200yr	6.82	8.92	10.26	11.40	12.36	200yr
500yr	0.90	1.47	1.92	2.78	3.90	5.05	500yr	3.36	4.67	5.83	7.03	8.28	9.57	11.65	500yr	8.47	11.20	12.86	14.09	15.09	500yr

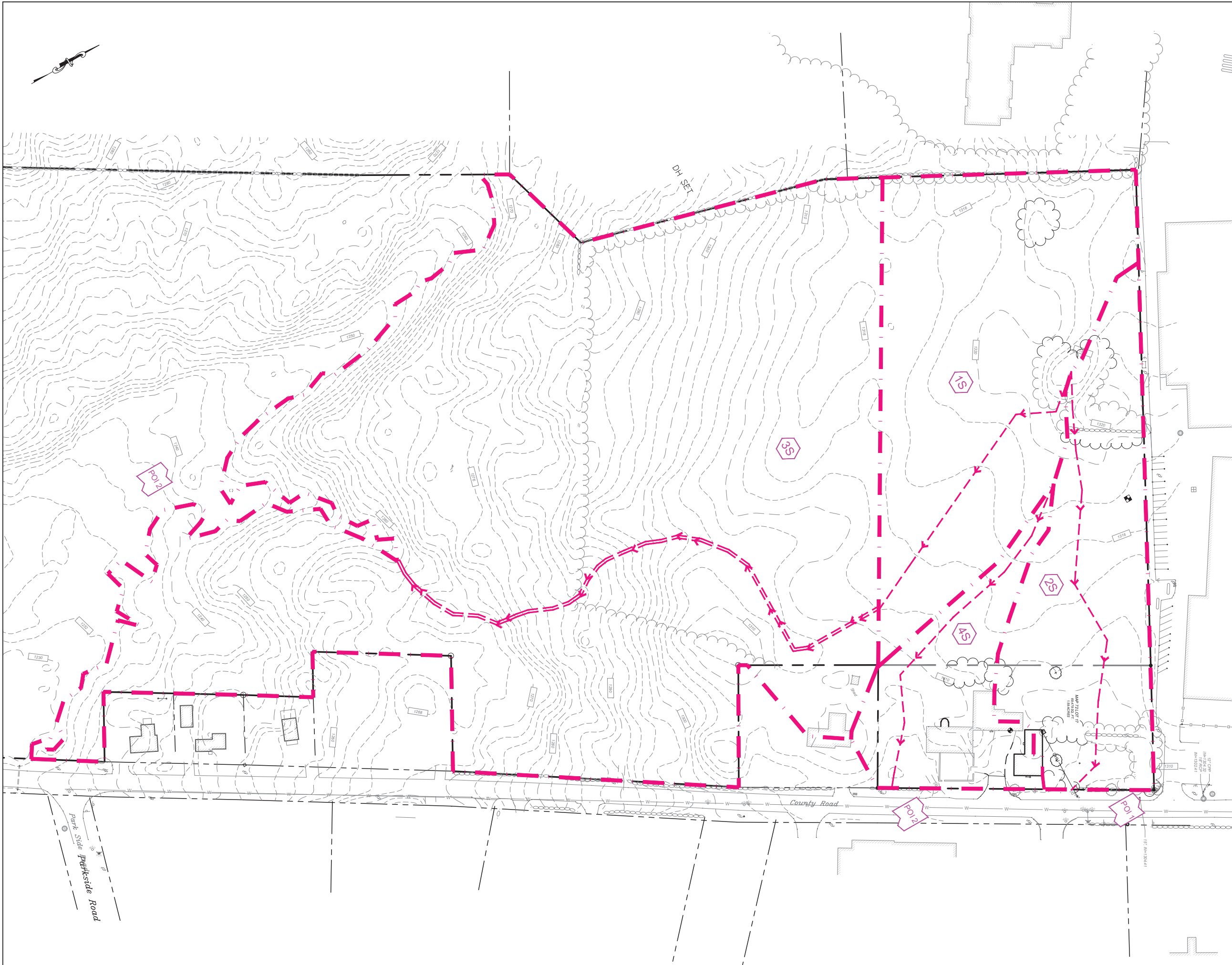
Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.21	0.32	0.39	0.52	0.64	0.81	1yr	0.56	0.79	0.95	1.27	1.65	1.94	2.27	1yr	1.71	2.18	2.53	2.99	3.28	1yr
2yr	0.30	0.46	0.57	0.77	0.95	1.12	2yr	0.82	1.09	1.29	1.67	2.15	2.54	2.87	2yr	2.25	2.76	3.21	3.85	4.42	2yr
5yr	0.34	0.53	0.65	0.89	1.14	1.33	5yr	0.98	1.30	1.52	1.96	2.47	3.00	3.38	5yr	2.66	3.25	3.77	4.49	5.09	5yr
10yr	0.37	0.57	0.71	0.99	1.28	1.49	10yr	1.11	1.45	1.71	2.20	2.74	3.40	3.83	10yr	3.01	3.68	4.23	5.00	5.67	10yr
25yr	0.41	0.63	0.78	1.12	1.47	1.69	25yr	1.27	1.65	2.00	2.53	3.15	3.99	4.51	25yr	3.53	4.33	4.93	5.78	6.51	25yr
50yr	0.44	0.66	0.83	1.19	1.60	1.84	50yr	1.38	1.80	2.25	2.82	3.48	4.52	5.09	50yr	4.00	4.90	5.53	6.38	7.22	50yr
100yr	0.45	0.69	0.86	1.24	1.71	2.00	100yr	1.47	1.96	2.54	3.23	3.87	5.12	5.74	100yr	4.53	5.52	6.17	7.02	7.98	100yr
200yr	0.47	0.70	0.89	1.29	1.80	2.16	200yr	1.55	2.12	2.86	3.62	4.30	5.82	6.46	200yr	5.15	6.21	6.87	7.72	8.82	200yr
500yr	0.49	0.73	0.94	1.36	1.93	2.35	500yr	1.67	2.30	3.34	4.22	4.93	6.92	7.57	500yr	6.12	7.28	7.88	8.69	10.01	500yr

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.45	0.55	0.74	0.91	1.08	1yr	0.79	1.06	1.21	1.58	1.94	2.49	2.85	1yr	2.20	2.74	3.20	3.82	4.44	1yr
2yr	0.34	0.53	0.65	0.88	1.09	1.24	2yr	0.94	1.21	1.39	1.80	2.29	2.75	3.11	2yr	2.43	2.99	3.49	4.15	4.73	2yr
5yr	0.40	0.62	0.77	1.06	1.35	1.58	5yr	1.17	1.55	1.80	2.28	2.89	3.52	4.10	5yr	3.12	3.94	4.59	5.31	6.02	5yr
10yr	0.48	0.74	0.92	1.29	1.67	1.96	10yr	1.44	1.91	2.22	2.72	3.42	4.27	5.08	10yr	3.78	4.88	5.64	6.44	7.26	10yr
25yr	0.62	0.95	1.18	1.68	2.21	2.61	25yr	1.91	2.55	2.93	3.50	4.36	5.49	6.73	25yr	4.86	6.47	7.49	8.34	9.29	25yr
50yr	0.75	1.14	1.42	2.04	2.75	3.25	50yr	2.37	3.18	3.61	4.23	5.25	6.65	8.33	50yr	5.89	8.01	9.29	10.18	11.24	50yr
100yr	0.92	1.38	1.73	2.51	3.44	4.07	100yr	2.97	3.98	4.46	5.30	6.32	8.07	10.33	100yr	7.14	9.93	11.51	12.46	13.57	100yr
200yr	1.11	1.68	2.12	3.08	4.29	5.10	200yr	3.70	4.99	5.52	6.43	8.03	9.79	12.81	200yr	8.66	12.32	14.26	15.27	16.43	200yr
500yr	1.46	2.17	2.79	4.05	5.76	6.90	500yr	4.97	6.75	7.32	8.34	10.37	12.62	17.08	500yr	11.17	16.43	19.01	20.04	21.18	500yr





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TWIN PINES HOUSING TRUST
 268 COUNTY ROAD
 NEW LONDON, NH 03257

SITE

COUNTY ROAD APARTMENTS
 268 COUNTY ROAD
 NEW LONDON, NH 03257
 MBLU: 72/17 & 72/15

DRAWING TITLE

PRE-DEVELOPMENT STORMWATER PLAN

SCALE	DATE		
1" = 60'	10/04/2022		
DRAFTED BY	CHECKED BY	PROJECT MGR	PROJECT NO.
CDM	ERL	ERL	TWIN0001

SHEET NO.
SW1
 01 OF 03

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SITE

COUNTY ROAD APARTMENTS

**268 COUNTY ROAD
 NEW LONDON, NH 03257**

MBLU: 72/17 & 72/15

DRAWING TITLE

**POST-DEVELOPMENT
 STORMWATER PLAN**

SCALE

1" = 60'

DATE

10/04/2022

DRAFTED BY

CDM

CHECKED BY

ERL

PROJECT MGR

ERL

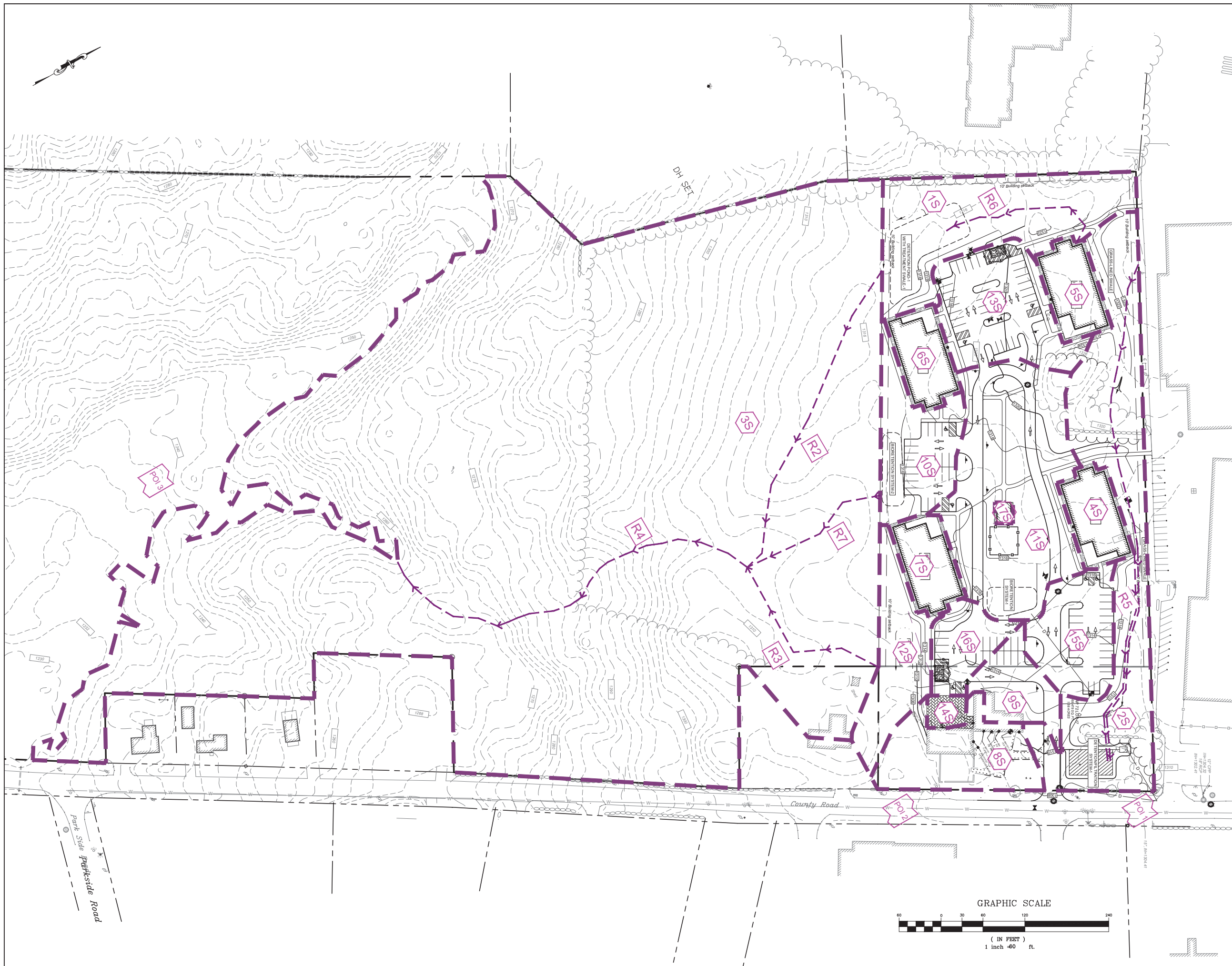
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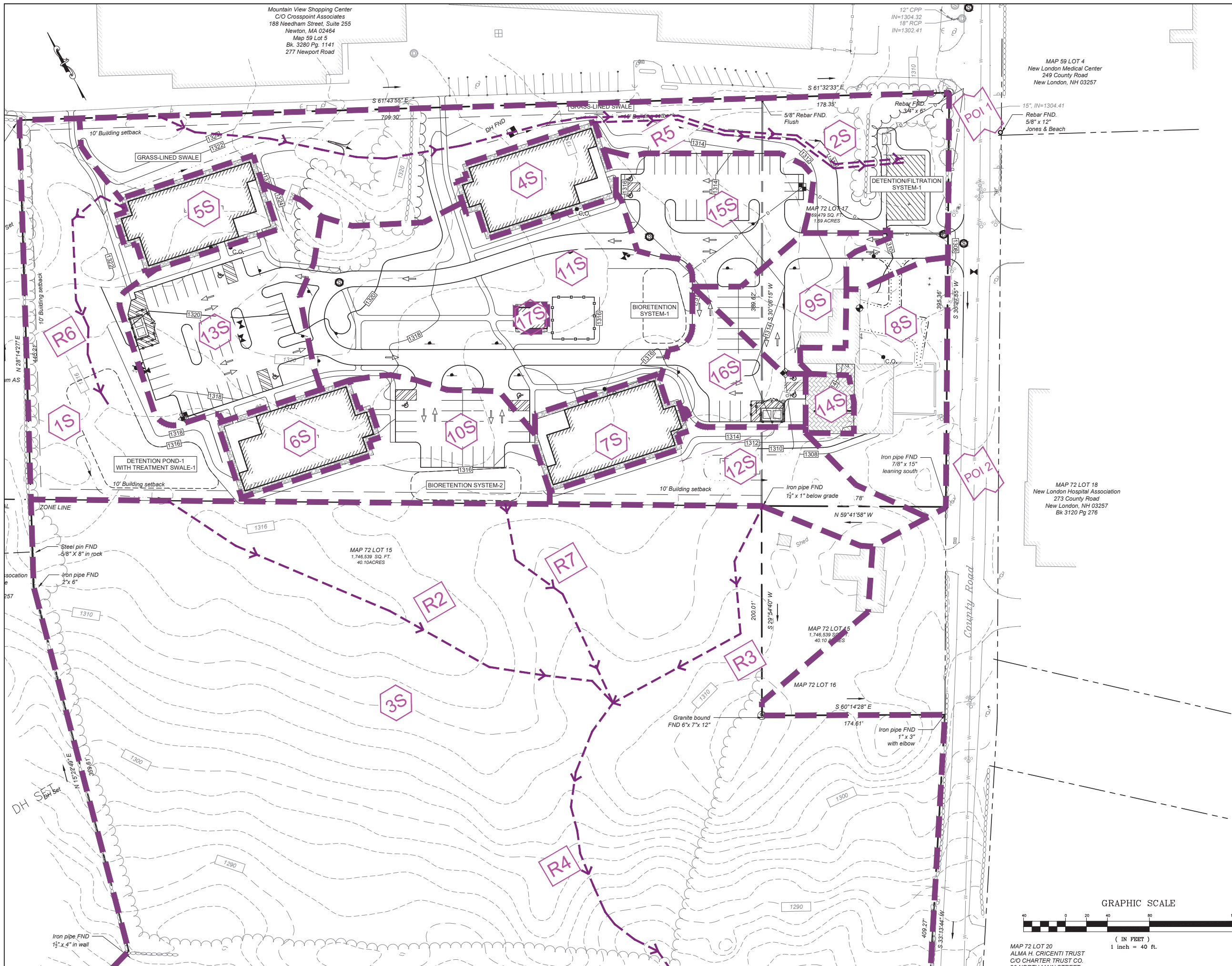
TWIN0001

SHEET NO.

SW2

02 OF 03





Mountain View Shopping Center
 C/O Crosspoint Associates
 188 Needham Street, Suite 255
 Newton, MA 02464
 Map 59 Lot 5
 Bk. 3280 Pg. 1141
 277 Newport Road

MAP 59 LOT 4
 New London Medical Center
 249 County Road
 New London, NH 03257

MAP 72 LOT 18
 New London Hospital Association
 273 County Road
 New London, NH 03257
 Bk 3120 Pg 276

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 CONCORD, NH 03301
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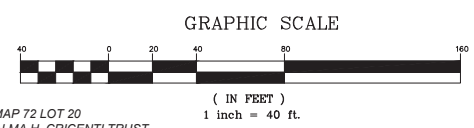
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 NEW LONDON, NH 03257
 MBLU: 72/17 & 72/15

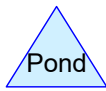
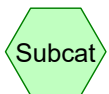
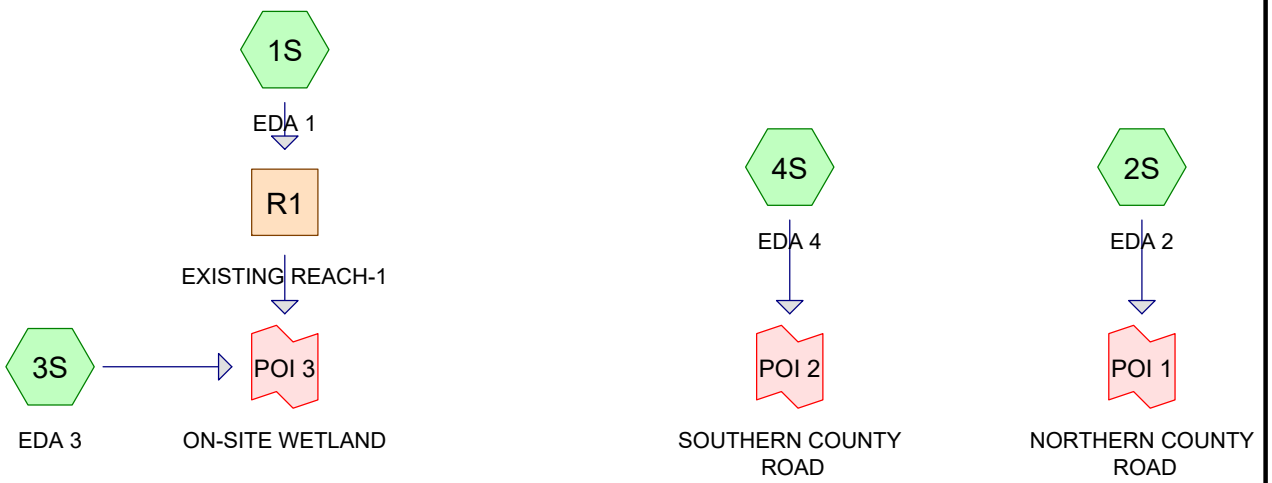
DRAWING TITLE
POST-DEVELOPMENT STORMWATER DETAILS

SCALE	DATE		
1" = 40'	10/04/2022		
DRAFTED BY	CHECKED BY	PROJECT MGR	PROJECT NO.
CDM	ERL	ERL	TWIN0001

SHEET NO.
SW3
 03 OF 03



MAP 72 LOT 20
 ALMA H. CRICENTI TRUST
 C/O CHARTER TRUST CO.
 20 NORTH MAIN STREET



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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
29,246	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S, 4S)
9,000	98	EXISTING BUILDING (2S, 3S, 4S)
1,939	85	EXISTING GRAVEL (4S)
472	98	EXISTING PAVEMENT (4S)
535,418	82	Row crops, SR + CR, Good, HSG C (1S, 2S, 3S, 4S)
422,191	70	Woods, Good, HSG C (1S, 2S, 3S, 4S)
998,266	77	TOTAL AREA

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
986,855	HSG C	1S, 2S, 3S, 4S
0	HSG D	
11,411	Other	2S, 3S, 4S
998,266		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
0	0	29,246	0	0	29,246	>75% Grass cover, Good
0	0	0	0	9,000	9,000	EXISTING BUILDING
0	0	0	0	1,939	1,939	EXISTING GRAVEL
0	0	0	0	472	472	EXISTING PAVEMENT
0	0	535,418	0	0	535,418	Row crops, SR + CR, Good
0	0	422,191	0	0	422,191	Woods, Good
0	0	986,855	0	11,411	998,266	TOTAL AREA

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Type III 24-hr 2-yr Rainfall=2.63"

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Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: EDA 1

Runoff Area=173,575 sf 0.00% Impervious Runoff Depth=1.06"
Flow Length=459' Tc=13.0 min CN=WQ Runoff=3.82 cfs 15,321 cf

Subcatchment 2S: EDA 2

Runoff Area=106,101 sf 0.98% Impervious Runoff Depth=0.98"
Flow Length=626' Tc=15.6 min CN=WQ Runoff=1.98 cfs 8,695 cf

Subcatchment 3S: EDA 3

Runoff Area=661,165 sf 0.22% Impervious Runoff Depth=0.75"
Flow Length=862' Tc=13.5 min CN=WQ Runoff=9.36 cfs 41,279 cf

Subcatchment 4S: EDA 4

Runoff Area=57,425 sf 12.19% Impervious Runoff Depth=1.16"
Flow Length=519' Slope=0.0300 '/ Tc=7.5 min CN=WQ Runoff=1.60 cfs 5,555 cf

Reach R1: EXISTING REACH-1

Avg. Flow Depth=0.12' Max Vel=3.50 fps Inflow=3.82 cfs 15,321 cf
n=0.025 L=864.0' S=0.0602 '/ Capacity=11.92 cfs Outflow=3.62 cfs 15,321 cf

Link POI 1: NORTHERN COUNTY ROAD

Inflow=1.98 cfs 8,695 cf
Primary=1.98 cfs 8,695 cf

Link POI 2: SOUTHERN COUNTY ROAD

Inflow=1.60 cfs 5,555 cf
Primary=1.60 cfs 5,555 cf

Link POI 3: ON-SITE WETLAND

Inflow=12.94 cfs 56,599 cf
Primary=12.94 cfs 56,599 cf

Total Runoff Area = 998,266 sf Runoff Volume = 70,850 cf Average Runoff Depth = 0.85"
99.05% Pervious = 988,794 sf 0.95% Impervious = 9,472 sf

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Type III 24-hr 10-yr Rainfall=3.82"

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Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: EDA 1 Runoff Area=173,575 sf 0.00% Impervious Runoff Depth=2.00"
Flow Length=459' Tc=13.0 min CN=WQ Runoff=7.36 cfs 28,915 cf

Subcatchment 2S: EDA 2 Runoff Area=106,101 sf 0.98% Impervious Runoff Depth=1.89"
Flow Length=626' Tc=15.6 min CN=WQ Runoff=3.96 cfs 16,677 cf

Subcatchment 3S: EDA 3 Runoff Area=661,165 sf 0.22% Impervious Runoff Depth=1.55"
Flow Length=862' Tc=13.5 min CN=WQ Runoff=20.82 cfs 85,188 cf

Subcatchment 4S: EDA 4 Runoff Area=57,425 sf 12.19% Impervious Runoff Depth=2.10"
Flow Length=519' Slope=0.0300 '/' Tc=7.5 min CN=WQ Runoff=2.96 cfs 10,069 cf

Reach R1: EXISTING REACH-1 Avg. Flow Depth=0.18' Max Vel=4.50 fps Inflow=7.36 cfs 28,915 cf
n=0.025 L=864.0' S=0.0602 '/' Capacity=11.92 cfs Outflow=7.15 cfs 28,915 cf

Link POI 1: NORTHERN COUNTY ROAD Inflow=3.96 cfs 16,677 cf
Primary=3.96 cfs 16,677 cf

Link POI 2: SOUTHERN COUNTY ROAD Inflow=2.96 cfs 10,069 cf
Primary=2.96 cfs 10,069 cf

Link POI 3: ON-SITE WETLAND Inflow=27.89 cfs 114,103 cf
Primary=27.89 cfs 114,103 cf

Total Runoff Area = 998,266 sf Runoff Volume = 140,849 cf Average Runoff Depth = 1.69"
99.05% Pervious = 988,794 sf 0.95% Impervious = 9,472 sf

Summary for Subcatchment 1S: EDA 1

Runoff = 7.36 cfs @ 12.18 hrs, Volume= 28,915 cf, Depth= 2.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=3.82"

Area (sf)	CN	Description
7,404	70	Woods, Good, HSG C
161,665	82	Row crops, SR + CR, Good, HSG C
4,506	74	>75% Grass cover, Good, HSG C
173,575		Weighted Average
173,575		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0600	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.76"
4.4	409	0.0300	1.56		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
13.0	459	Total			

Summary for Subcatchment 2S: EDA 2

Runoff = 3.96 cfs @ 12.22 hrs, Volume= 16,677 cf, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=3.82"

Area (sf)	CN	Description
15,102	70	Woods, Good, HSG C
79,174	82	Row crops, SR + CR, Good, HSG C
10,787	74	>75% Grass cover, Good, HSG C
* 1,038	98	EXISTING BUILDING
* 0	85	EXISTING GRAVEL
* 0	98	EXISTING PAVEMENT
106,101		Weighted Average
105,063		99.02% Pervious Area
1,038		0.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0600	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.76"
5.0	470	0.0300	1.56		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
2.0	106	0.0300	0.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
15.6	626	Total			

Summary for Subcatchment 3S: EDA 3

Runoff = 20.82 cfs @ 12.20 hrs, Volume= 85,188 cf, Depth= 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=3.82"

Area (sf)	CN	Description
397,606	70	Woods, Good, HSG C
259,089	82	Row crops, SR + CR, Good, HSG C
3,036	74	>75% Grass cover, Good, HSG C
* 1,434	98	EXISTING BUILDING
* 0	85	EXISTING GRAVEL
* 0	98	EXISTING PAVEMENT
661,165		Weighted Average
659,731		99.78% Pervious Area
1,434		0.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0300	0.15		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.76"
4.6	527	0.0450	1.91		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
3.2	285	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
13.5	862	Total			

Summary for Subcatchment 4S: EDA 4

Runoff = 2.96 cfs @ 12.11 hrs, Volume= 10,069 cf, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=3.82"

Area (sf)	CN	Description
2,079	70	Woods, Good, HSG C
35,490	82	Row crops, SR + CR, Good, HSG C
10,917	74	>75% Grass cover, Good, HSG C
* 6,528	98	EXISTING BUILDING
* 1,939	85	EXISTING GRAVEL
* 472	98	EXISTING PAVEMENT
57,425		Weighted Average
50,425		87.81% Pervious Area
7,000		12.19% Impervious Area

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Type III 24-hr 10-yr Rainfall=3.82"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	50	0.0300	0.34		Sheet Flow, Cultivated: Residue<=20% n= 0.060 P2= 2.76"
5.0	469	0.0300	1.56		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
7.5	519	Total			

Summary for Reach R1: EXISTING REACH-1

Inflow Area = 173,575 sf, 0.00% Impervious, Inflow Depth = 2.00" for 10-yr event
 Inflow = 7.36 cfs @ 12.18 hrs, Volume= 28,915 cf
 Outflow = 7.15 cfs @ 12.22 hrs, Volume= 28,915 cf, Atten= 3%, Lag= 2.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Max. Velocity= 4.50 fps, Min. Travel Time= 3.2 min
 Avg. Velocity = 1.06 fps, Avg. Travel Time= 13.5 min

Peak Storage= 1,367 cf @ 12.22 hrs
 Average Depth at Peak Storage= 0.18'
 Bank-Full Depth= 0.25' Flow Area= 2.2 sf, Capacity= 11.92 cfs

8.00' x 0.25' deep channel, n= 0.025 Earth, clean & winding
 Side Slope Z-value= 3.0 ' Top Width= 9.50'
 Length= 864.0' Slope= 0.0602 '
 Inlet Invert= 1,312.00', Outlet Invert= 1,260.00'



Summary for Link POI 1: NORTHERN COUNTY ROAD

Inflow Area = 106,101 sf, 0.98% Impervious, Inflow Depth = 1.89" for 10-yr event
 Inflow = 3.96 cfs @ 12.22 hrs, Volume= 16,677 cf
 Primary = 3.96 cfs @ 12.22 hrs, Volume= 16,677 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link POI 2: SOUTHERN COUNTY ROAD

Inflow Area = 57,425 sf, 12.19% Impervious, Inflow Depth = 2.10" for 10-yr event
 Inflow = 2.96 cfs @ 12.11 hrs, Volume= 10,069 cf
 Primary = 2.96 cfs @ 12.11 hrs, Volume= 10,069 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link POI 3: ON-SITE WETLAND

Inflow Area = 834,740 sf, 0.17% Impervious, Inflow Depth = 1.64" for 10-yr event
Inflow = 27.89 cfs @ 12.20 hrs, Volume= 114,103 cf
Primary = 27.89 cfs @ 12.20 hrs, Volume= 114,103 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

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Type III 24-hr 25-yr Rainfall=4.73"

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Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: EDA 1

Runoff Area=173,575 sf 0.00% Impervious Runoff Depth=2.78"
Flow Length=459' Tc=13.0 min CN=WQ Runoff=10.23 cfs 40,186 cf

Subcatchment 2S: EDA 2

Runoff Area=106,101 sf 0.98% Impervious Runoff Depth=2.64"
Flow Length=626' Tc=15.6 min CN=WQ Runoff=5.57 cfs 23,365 cf

Subcatchment 3S: EDA 3

Runoff Area=661,165 sf 0.22% Impervious Runoff Depth=2.24"
Flow Length=862' Tc=13.5 min CN=WQ Runoff=30.63 cfs 123,287 cf

Subcatchment 4S: EDA 4

Runoff Area=57,425 sf 12.19% Impervious Runoff Depth=2.88"
Flow Length=519' Slope=0.0300 '/' Tc=7.5 min CN=WQ Runoff=4.07 cfs 13,796 cf

Reach R1: EXISTING REACH-1

Avg. Flow Depth=0.23' Max Vel=5.10 fps Inflow=10.23 cfs 40,186 cf
n=0.025 L=864.0' S=0.0602 '/' Capacity=11.92 cfs Outflow=10.02 cfs 40,186 cf

Link POI 1: NORTHERN COUNTY ROAD

Inflow=5.57 cfs 23,365 cf
Primary=5.57 cfs 23,365 cf

Link POI 2: SOUTHERN COUNTY ROAD

Inflow=4.07 cfs 13,796 cf
Primary=4.07 cfs 13,796 cf

Link POI 3: ON-SITE WETLAND

Inflow=40.56 cfs 163,473 cf
Primary=40.56 cfs 163,473 cf

Total Runoff Area = 998,266 sf Runoff Volume = 200,634 cf Average Runoff Depth = 2.41"
99.05% Pervious = 988,794 sf 0.95% Impervious = 9,472 sf

Summary for Subcatchment 1S: EDA 1

Runoff = 10.23 cfs @ 12.18 hrs, Volume= 40,186 cf, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=4.73"

Area (sf)	CN	Description
7,404	70	Woods, Good, HSG C
161,665	82	Row crops, SR + CR, Good, HSG C
4,506	74	>75% Grass cover, Good, HSG C
173,575		Weighted Average
173,575		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0600	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.76"
4.4	409	0.0300	1.56		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
13.0	459	Total			

Summary for Subcatchment 2S: EDA 2

Runoff = 5.57 cfs @ 12.22 hrs, Volume= 23,365 cf, Depth= 2.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=4.73"

Area (sf)	CN	Description
15,102	70	Woods, Good, HSG C
79,174	82	Row crops, SR + CR, Good, HSG C
10,787	74	>75% Grass cover, Good, HSG C
* 1,038	98	EXISTING BUILDING
* 0	85	EXISTING GRAVEL
* 0	98	EXISTING PAVEMENT
106,101		Weighted Average
105,063		99.02% Pervious Area
1,038		0.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0600	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.76"
5.0	470	0.0300	1.56		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
2.0	106	0.0300	0.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
15.6	626	Total			

Summary for Subcatchment 3S: EDA 3

Runoff = 30.63 cfs @ 12.19 hrs, Volume= 123,287 cf, Depth= 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=4.73"

Area (sf)	CN	Description
397,606	70	Woods, Good, HSG C
259,089	82	Row crops, SR + CR, Good, HSG C
3,036	74	>75% Grass cover, Good, HSG C
* 1,434	98	EXISTING BUILDING
* 0	85	EXISTING GRAVEL
* 0	98	EXISTING PAVEMENT
661,165		Weighted Average
659,731		99.78% Pervious Area
1,434		0.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0300	0.15		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.76"
4.6	527	0.0450	1.91		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
3.2	285	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
13.5	862	Total			

Summary for Subcatchment 4S: EDA 4

Runoff = 4.07 cfs @ 12.11 hrs, Volume= 13,796 cf, Depth= 2.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=4.73"

Area (sf)	CN	Description
2,079	70	Woods, Good, HSG C
35,490	82	Row crops, SR + CR, Good, HSG C
10,917	74	>75% Grass cover, Good, HSG C
* 6,528	98	EXISTING BUILDING
* 1,939	85	EXISTING GRAVEL
* 472	98	EXISTING PAVEMENT
57,425		Weighted Average
50,425		87.81% Pervious Area
7,000		12.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	50	0.0300	0.34		Sheet Flow, Cultivated: Residue<=20% n= 0.060 P2= 2.76"
5.0	469	0.0300	1.56		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
7.5	519	Total			

Summary for Reach R1: EXISTING REACH-1

Inflow Area = 173,575 sf, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
 Inflow = 10.23 cfs @ 12.18 hrs, Volume= 40,186 cf
 Outflow = 10.02 cfs @ 12.21 hrs, Volume= 40,186 cf, Atten= 2%, Lag= 2.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Max. Velocity= 5.10 fps, Min. Travel Time= 2.8 min
 Avg. Velocity = 1.18 fps, Avg. Travel Time= 12.2 min

Peak Storage= 1,692 cf @ 12.21 hrs
 Average Depth at Peak Storage= 0.23'
 Bank-Full Depth= 0.25' Flow Area= 2.2 sf, Capacity= 11.92 cfs

8.00' x 0.25' deep channel, n= 0.025 Earth, clean & winding
 Side Slope Z-value= 3.0 '/' Top Width= 9.50'
 Length= 864.0' Slope= 0.0602 '/'
 Inlet Invert= 1,312.00', Outlet Invert= 1,260.00'



Summary for Link POI 1: NORTHERN COUNTY ROAD

Inflow Area = 106,101 sf, 0.98% Impervious, Inflow Depth = 2.64" for 25-yr event
 Inflow = 5.57 cfs @ 12.22 hrs, Volume= 23,365 cf
 Primary = 5.57 cfs @ 12.22 hrs, Volume= 23,365 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link POI 2: SOUTHERN COUNTY ROAD

Inflow Area = 57,425 sf, 12.19% Impervious, Inflow Depth = 2.88" for 25-yr event
 Inflow = 4.07 cfs @ 12.11 hrs, Volume= 13,796 cf
 Primary = 4.07 cfs @ 12.11 hrs, Volume= 13,796 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link POI 3: ON-SITE WETLAND

Inflow Area = 834,740 sf, 0.17% Impervious, Inflow Depth = 2.35" for 25-yr event
Inflow = 40.56 cfs @ 12.20 hrs, Volume= 163,473 cf
Primary = 40.56 cfs @ 12.20 hrs, Volume= 163,473 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

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Type III 24-hr 50-yr Rainfall=5.57"

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Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: EDA 1

Runoff Area=173,575 sf 0.00% Impervious Runoff Depth=3.53"
Flow Length=459' Tc=13.0 min CN=WQ Runoff=12.95 cfs 50,997 cf

Subcatchment 2S: EDA 2

Runoff Area=106,101 sf 0.98% Impervious Runoff Depth=3.37"
Flow Length=626' Tc=15.6 min CN=WQ Runoff=7.11 cfs 29,818 cf

Subcatchment 3S: EDA 3

Runoff Area=661,165 sf 0.22% Impervious Runoff Depth=2.92"
Flow Length=862' Tc=13.5 min CN=WQ Runoff=40.17 cfs 160,724 cf

Subcatchment 4S: EDA 4

Runoff Area=57,425 sf 12.19% Impervious Runoff Depth=3.63"
Flow Length=519' Slope=0.0300 '/' Tc=7.5 min CN=WQ Runoff=5.12 cfs 17,368 cf

Reach R1: EXISTING REACH-1

Avg. Flow Depth=0.26' Max Vel=5.57 fps Inflow=12.95 cfs 50,997 cf
n=0.025 L=864.0' S=0.0602 '/' Capacity=11.92 cfs Outflow=12.72 cfs 50,997 cf

Link POI 1: NORTHERN COUNTY ROAD

Inflow=7.11 cfs 29,818 cf
Primary=7.11 cfs 29,818 cf

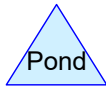
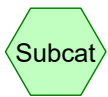
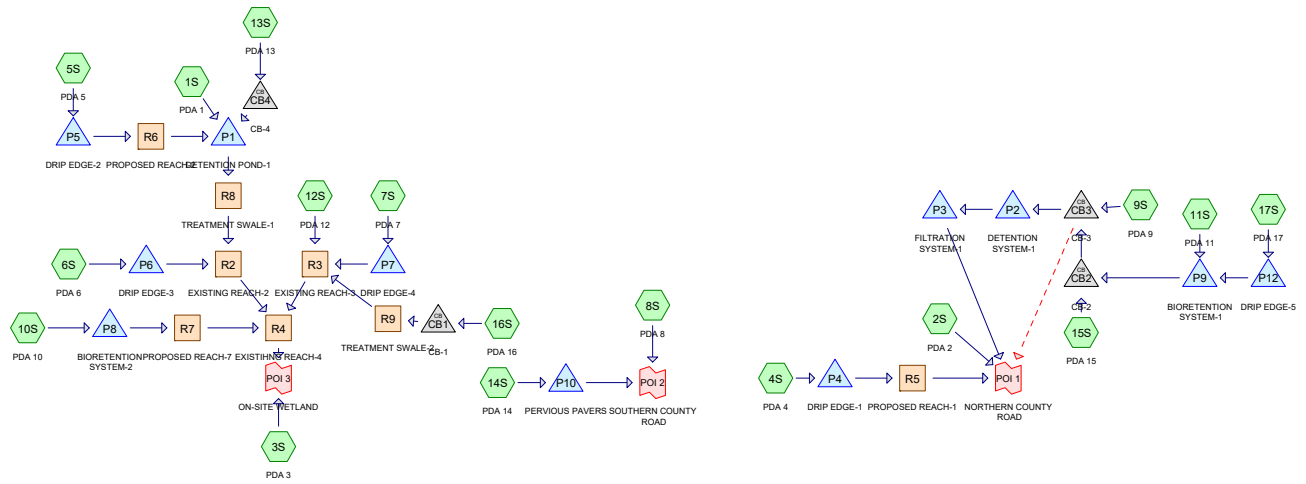
Link POI 2: SOUTHERN COUNTY ROAD

Inflow=5.12 cfs 17,368 cf
Primary=5.12 cfs 17,368 cf

Link POI 3: ON-SITE WETLAND

Inflow=52.79 cfs 211,722 cf
Primary=52.79 cfs 211,722 cf

Total Runoff Area = 998,266 sf Runoff Volume = 258,908 cf Average Runoff Depth = 3.11"
99.05% Pervious = 988,794 sf 0.95% Impervious = 9,472 sf



Routing Diagram for Post-development_TWIN0001
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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
147,670	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S)
6,751	98	EXISTING BUILDING (3S, 8S, 9S)
1,939	85	EXISTING GRAVEL (8S)
29,276	98	PROPOSED BUILDING (4S, 5S, 6S, 7S)
4,081	98	PROPOSED DECK (4S, 5S, 6S, 7S, 13S)
8,797	85	PROPOSED GRAVEL (2S, 4S, 5S, 6S, 7S, 8S, 17S)
2,054	98	PROPOSED PATIO (14S)
67,633	98	PROPOSED PAVEMENT (2S, 9S, 10S, 11S, 13S, 15S, 16S)
600	98	PROPOSED PAVILION (17S)
9,755	98	PROPOSED SIDEWALK (1S, 2S, 4S, 5S, 6S, 7S, 10S, 11S, 13S, 14S, 15S, 16S)
303,603	82	Row crops, SR + CR, Good, HSG C (1S, 2S, 3S, 8S)
416,107	70	Woods, Good, HSG C (1S, 2S, 3S, 8S, 11S, 13S)
998,266	78	TOTAL AREA

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
867,380	HSG C	1S, 2S, 3S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S
0	HSG D	
130,886	Other	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 13S, 14S, 15S, 16S, 17S
998,266		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
0	0	147,670	0	0	147,670	>75% Grass cover, Good
0	0	0	0	6,751	6,751	EXISTING BUILDING
0	0	0	0	1,939	1,939	EXISTING GRAVEL
0	0	0	0	29,276	29,276	PROPOSED BUILDING
0	0	0	0	4,081	4,081	PROPOSED DECK
0	0	0	0	8,797	8,797	PROPOSED GRAVEL
0	0	0	0	2,054	2,054	PROPOSED PATIO
0	0	0	0	67,633	67,633	PROPOSED PAVEMENT
0	0	0	0	600	600	PROPOSED PAVILION
0	0	0	0	9,755	9,755	PROPOSED SIDEWALK
0	0	303,603	0	0	303,603	Row crops, SR + CR, Good
0	0	416,107	0	0	416,107	Woods, Good
0	0	867,380	0	130,886	998,266	TOTAL AREA

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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	CB1	1,310.20	1,309.91	58.0	0.0050	0.012	12.0	0.0	0.0
2	CB2	1,307.00	1,306.22	92.0	0.0085	0.120	18.0	0.0	0.0
3	CB3	1,306.12	1,306.00	12.0	0.0100	0.012	18.0	0.0	0.0
4	CB4	1,313.75	1,313.65	20.0	0.0050	0.012	15.0	0.0	0.0
5	P1	1,313.50	1,312.63	20.0	0.0435	0.012	12.0	0.0	0.0
6	P2	1,305.00	1,304.75	10.0	0.0250	0.120	12.0	0.0	0.0
7	P3	1,304.00	1,303.43	94.0	0.0061	0.012	12.0	0.0	0.0
8	P8	1,314.40	1,314.30	20.0	0.0050	0.012	6.0	0.0	0.0
9	P9	1,313.33	1,308.00	143.0	0.0373	0.012	12.0	0.0	0.0

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Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: PDA 1	Runoff Area=41,912 sf 2.14% Impervious Runoff Depth=0.93" Flow Length=250' Slope=0.0200 '/' Tc=9.5 min CN=WQ Runoff=0.87 cfs 3,238 cf
Subcatchment 2S: PDA 2	Runoff Area=64,545 sf 3.49% Impervious Runoff Depth=0.82" Flow Length=731' Tc=12.0 min CN=WQ Runoff=1.05 cfs 4,416 cf
Subcatchment 3S: PDA 3	Runoff Area=661,165 sf 0.22% Impervious Runoff Depth=0.75" Flow Length=862' Tc=13.5 min CN=WQ Runoff=9.36 cfs 41,279 cf
Subcatchment 4S: PDA 4	Runoff Area=10,240 sf 80.46% Impervious Runoff Depth=2.18" Tc=5.0 min CN=WQ Runoff=0.55 cfs 1,862 cf
Subcatchment 5S: PDA 5	Runoff Area=10,224 sf 80.54% Impervious Runoff Depth=2.18" Tc=5.0 min CN=WQ Runoff=0.55 cfs 1,860 cf
Subcatchment 6S: PDA 6	Runoff Area=10,224 sf 80.54% Impervious Runoff Depth=2.18" Tc=5.0 min CN=WQ Runoff=0.55 cfs 1,860 cf
Subcatchment 7S: PDA 7	Runoff Area=10,090 sf 81.07% Impervious Runoff Depth=2.19" Tc=5.0 min CN=WQ Runoff=0.55 cfs 1,840 cf
Subcatchment 8S: PDA 8	Runoff Area=22,375 sf 18.18% Impervious Runoff Depth=1.16" Tc=5.0 min CN=WQ Runoff=0.65 cfs 2,168 cf
Subcatchment 9S: PDA 9	Runoff Area=11,694 sf 62.62% Impervious Runoff Depth=1.76" Tc=5.0 min CN=WQ Runoff=0.50 cfs 1,713 cf
Subcatchment 10S: PDA 10	Runoff Area=20,610 sf 40.66% Impervious Runoff Depth=1.38" Tc=5.0 min CN=WQ Runoff=0.69 cfs 2,372 cf
Subcatchment 11S: PDA 11	Runoff Area=55,597 sf 31.85% Impervious Runoff Depth=1.22" Tc=5.0 min CN=WQ Runoff=1.64 cfs 5,668 cf
Subcatchment 12S: PDA 12	Runoff Area=19,190 sf 0.00% Impervious Runoff Depth=0.68" Tc=5.0 min CN=WQ Runoff=0.32 cfs 1,092 cf
Subcatchment 13S: PDA 13	Runoff Area=27,614 sf 69.55% Impervious Runoff Depth=1.87" Tc=5.0 min CN=WQ Runoff=1.25 cfs 4,296 cf
Subcatchment 14S: PDA 14	Runoff Area=2,517 sf 91.42% Impervious Runoff Depth=2.25" Tc=5.0 min CN=WQ Runoff=0.14 cfs 472 cf
Subcatchment 15S: PDA 15	Runoff Area=18,813 sf 77.80% Impervious Runoff Depth=2.02" Tc=5.0 min CN=WQ Runoff=0.93 cfs 3,165 cf
Subcatchment 16S: PDA 16	Runoff Area=10,676 sf 79.24% Impervious Runoff Depth=2.04" Tc=5.0 min CN=WQ Runoff=0.53 cfs 1,818 cf

Subcatchment 17S: PDA 17	Runoff Area=780 sf 76.92% Impervious Runoff Depth=2.14" Tc=0.0 min CN=WQ Runoff=0.05 cfs 139 cf
Reach R2: EXISTING REACH-2	Avg. Flow Depth=0.05' Max Vel=1.01 fps Inflow=0.40 cfs 5,509 cf n=0.025 L=474.0' S=0.0169 '/ Capacity=6.31 cfs Outflow=0.40 cfs 5,502 cf
Reach R3: EXISTING REACH-3	Avg. Flow Depth=0.09' Max Vel=1.00 fps Inflow=0.83 cfs 2,910 cf n=0.025 L=268.0' S=0.0075 '/ Capacity=4.20 cfs Outflow=0.74 cfs 2,910 cf
Reach R4: EXISTING REACH-4	Avg. Flow Depth=0.05' Max Vel=2.40 fps Inflow=1.13 cfs 9,889 cf n=0.025 L=587.0' S=0.0818 '/ Capacity=13.89 cfs Outflow=1.07 cfs 9,885 cf
Reach R5: PROPOSED REACH-1	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0 cf n=0.025 L=308.0' S=0.0292 '/ Capacity=6.30 cfs Outflow=0.00 cfs 0 cf
Reach R6: PROPOSED REACH-2	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0 cf n=0.025 L=250.0' S=0.0260 '/ Capacity=5.94 cfs Outflow=0.00 cfs 0 cf
Reach R7: PROPOSED REACH-7	Avg. Flow Depth=0.04' Max Vel=1.19 fps Inflow=0.43 cfs 1,477 cf n=0.025 L=224.0' S=0.0268 '/ Capacity=7.95 cfs Outflow=0.42 cfs 1,477 cf
Reach R8: TREATMENT SWALE-1	Avg. Flow Depth=0.08' Max Vel=0.63 fps Inflow=0.40 cfs 5,512 cf n=0.030 L=130.0' S=0.0050 '/ Capacity=9.41 cfs Outflow=0.40 cfs 5,509 cf
Reach R9: TREATMENT SWALE-2	Avg. Flow Depth=0.09' Max Vel=0.69 fps Inflow=0.53 cfs 1,818 cf n=0.030 L=100.0' S=0.0050 '/ Capacity=9.41 cfs Outflow=0.51 cfs 1,818 cf
Pond CB1: CB-1	Peak Elev=1,310.62' Inflow=0.53 cfs 1,818 cf 12.0" Round Culvert n=0.012 L=58.0' S=0.0050 '/ Outflow=0.53 cfs 1,818 cf
Pond CB2: CB-2	Peak Elev=1,309.47' Inflow=1.56 cfs 7,020 cf 18.0" Round Culvert n=0.120 L=92.0' S=0.0085 '/ Outflow=1.56 cfs 7,020 cf
Pond CB3: CB-3	Peak Elev=1,306.69' Inflow=2.04 cfs 8,733 cf Primary=1.27 cfs 7,600 cf Secondary=0.77 cfs 1,133 cf Outflow=2.04 cfs 8,733 cf
Pond CB4: CB-4	Peak Elev=1,314.39' Inflow=1.25 cfs 4,296 cf 15.0" Round Culvert n=0.012 L=20.0' S=0.0050 '/ Outflow=1.25 cfs 4,296 cf
Pond P1: DETENTION POND-1	Peak Elev=1,313.93' Storage=3,766 cf Inflow=1.99 cfs 7,534 cf Outflow=0.40 cfs 5,512 cf
Pond P10: PERVIOUS PAVERS	Peak Elev=1,310.19' Storage=154 cf Inflow=0.14 cfs 472 cf Discarded=0.01 cfs 473 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 473 cf
Pond P12: DRIP EDGE-5	Peak Elev=1,315.03' Storage=74 cf Inflow=0.05 cfs 139 cf Discarded=0.00 cfs 139 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 139 cf
Pond P2: DETENTION SYSTEM-1	Peak Elev=1,306.24' Storage=3,249 cf Inflow=1.27 cfs 7,600 cf Outflow=0.93 cfs 6,407 cf
Pond P3: FILTRATION SYSTEM-1	Peak Elev=1,306.79' Storage=290 cf Inflow=0.93 cfs 6,407 cf Outflow=0.37 cfs 6,361 cf

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Pond P4: DRIP EDGE-1 Peak Elev=1,316.10' Storage=990 cf Inflow=0.55 cfs 1,862 cf
Discarded=0.02 cfs 1,862 cf Primary=0.00 cfs 0 cf Outflow=0.02 cfs 1,862 cf

Pond P5: DRIP EDGE-2 Peak Elev=1,321.10' Storage=988 cf Inflow=0.55 cfs 1,860 cf
Discarded=0.02 cfs 1,861 cf Primary=0.00 cfs 0 cf Outflow=0.02 cfs 1,861 cf

Pond P6: DRIP EDGE-3 Peak Elev=1,316.60' Storage=988 cf Inflow=0.55 cfs 1,860 cf
Discarded=0.02 cfs 1,861 cf Primary=0.00 cfs 0 cf Outflow=0.02 cfs 1,861 cf

Pond P7: DRIP EDGE-4 Peak Elev=1,316.58' Storage=975 cf Inflow=0.55 cfs 1,840 cf
Discarded=0.02 cfs 1,841 cf Primary=0.00 cfs 0 cf Outflow=0.02 cfs 1,841 cf

Pond P8: BIORETENTION SYSTEM-2 Peak Elev=1,314.95' Storage=536 cf Inflow=0.69 cfs 2,372 cf
Discarded=0.01 cfs 896 cf Primary=0.43 cfs 1,477 cf Outflow=0.44 cfs 2,373 cf

Pond P9: BIORETENTION SYSTEM-1 Peak Elev=1,314.30' Storage=1,941 cf Inflow=1.64 cfs 5,668 cf
Discarded=0.01 cfs 974 cf Primary=0.80 cfs 3,855 cf Outflow=0.82 cfs 4,829 cf

Link POI 1: NORTHERN COUNTY ROAD Inflow=1.83 cfs 11,910 cf
Primary=1.83 cfs 11,910 cf

Link POI 2: SOUTHERN COUNTY ROAD Inflow=0.65 cfs 2,168 cf
Primary=0.65 cfs 2,168 cf

Link POI 3: ON-SITE WETLAND Inflow=10.43 cfs 51,163 cf
Primary=10.43 cfs 51,163 cf

Total Runoff Area = 998,266 sf Runoff Volume = 79,258 cf Average Runoff Depth = 0.95"
87.96% Pervious = 878,116 sf 12.04% Impervious = 120,150 sf

Post-development_TWIN0001

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Type III 24-hr 10-yr Rainfall=3.82"

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Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: PDA 1	Runoff Area=41,912 sf 2.14% Impervious Runoff Depth=1.80" Flow Length=250' Slope=0.0200 '/' Tc=9.5 min CN=WQ Runoff=1.75 cfs 6,304 cf
Subcatchment 2S: PDA 2	Runoff Area=64,545 sf 3.49% Impervious Runoff Depth=1.65" Flow Length=731' Tc=12.0 min CN=WQ Runoff=2.26 cfs 8,857 cf
Subcatchment 3S: PDA 3	Runoff Area=661,165 sf 0.22% Impervious Runoff Depth=1.55" Flow Length=862' Tc=13.5 min CN=WQ Runoff=20.82 cfs 85,188 cf
Subcatchment 4S: PDA 4	Runoff Area=10,240 sf 80.46% Impervious Runoff Depth=3.33" Tc=5.0 min CN=WQ Runoff=0.83 cfs 2,845 cf
Subcatchment 5S: PDA 5	Runoff Area=10,224 sf 80.54% Impervious Runoff Depth=3.33" Tc=5.0 min CN=WQ Runoff=0.83 cfs 2,841 cf
Subcatchment 6S: PDA 6	Runoff Area=10,224 sf 80.54% Impervious Runoff Depth=3.33" Tc=5.0 min CN=WQ Runoff=0.83 cfs 2,841 cf
Subcatchment 7S: PDA 7	Runoff Area=10,090 sf 81.07% Impervious Runoff Depth=3.34" Tc=5.0 min CN=WQ Runoff=0.82 cfs 2,810 cf
Subcatchment 8S: PDA 8	Runoff Area=22,375 sf 18.18% Impervious Runoff Depth=2.09" Tc=5.0 min CN=WQ Runoff=1.20 cfs 3,891 cf
Subcatchment 9S: PDA 9	Runoff Area=11,694 sf 62.62% Impervious Runoff Depth=2.79" Tc=5.0 min CN=WQ Runoff=0.80 cfs 2,722 cf
Subcatchment 10S: PDA 10	Runoff Area=20,610 sf 40.66% Impervious Runoff Depth=2.33" Tc=5.0 min CN=WQ Runoff=1.18 cfs 3,998 cf
Subcatchment 11S: PDA 11	Runoff Area=55,597 sf 31.85% Impervious Runoff Depth=2.13" Tc=5.0 min CN=WQ Runoff=2.95 cfs 9,873 cf
Subcatchment 12S: PDA 12	Runoff Area=19,190 sf 0.00% Impervious Runoff Depth=1.47" Tc=5.0 min CN=WQ Runoff=0.74 cfs 2,344 cf
Subcatchment 13S: PDA 13	Runoff Area=27,614 sf 69.55% Impervious Runoff Depth=2.92" Tc=5.0 min CN=WQ Runoff=1.96 cfs 6,729 cf
Subcatchment 14S: PDA 14	Runoff Area=2,517 sf 91.42% Impervious Runoff Depth=3.40" Tc=5.0 min CN=WQ Runoff=0.21 cfs 714 cf
Subcatchment 15S: PDA 15	Runoff Area=18,813 sf 77.80% Impervious Runoff Depth=3.11" Tc=5.0 min CN=WQ Runoff=1.42 cfs 4,883 cf
Subcatchment 16S: PDA 16	Runoff Area=10,676 sf 79.24% Impervious Runoff Depth=3.15" Tc=5.0 min CN=WQ Runoff=0.81 cfs 2,798 cf

Subcatchment 17S: PDA 17	Runoff Area=780 sf 76.92% Impervious Runoff Depth=3.29" Tc=0.0 min CN=WQ Runoff=0.07 cfs 214 cf
Reach R2: EXISTING REACH-2	Avg. Flow Depth=0.07' Max Vel=1.32 fps Inflow=0.79 cfs 11,003 cf n=0.025 L=474.0' S=0.0169 '/' Capacity=6.31 cfs Outflow=0.78 cfs 10,995 cf
Reach R3: EXISTING REACH-3	Avg. Flow Depth=0.13' Max Vel=1.27 fps Inflow=1.53 cfs 5,142 cf n=0.025 L=268.0' S=0.0075 '/' Capacity=4.20 cfs Outflow=1.39 cfs 5,142 cf
Reach R4: EXISTING REACH-4	Avg. Flow Depth=0.09' Max Vel=3.23 fps Inflow=2.34 cfs 19,156 cf n=0.025 L=587.0' S=0.0818 '/' Capacity=13.89 cfs Outflow=2.28 cfs 19,151 cf
Reach R5: PROPOSED REACH-1	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0 cf n=0.025 L=308.0' S=0.0292 '/' Capacity=6.30 cfs Outflow=0.00 cfs 0 cf
Reach R6: PROPOSED REACH-2	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0 cf n=0.025 L=250.0' S=0.0260 '/' Capacity=5.94 cfs Outflow=0.00 cfs 0 cf
Reach R7: PROPOSED REACH-7	Avg. Flow Depth=0.06' Max Vel=1.45 fps Inflow=0.70 cfs 3,019 cf n=0.025 L=224.0' S=0.0268 '/' Capacity=7.95 cfs Outflow=0.70 cfs 3,019 cf
Reach R8: TREATMENT SWALE-1	Avg. Flow Depth=0.12' Max Vel=0.81 fps Inflow=0.79 cfs 11,005 cf n=0.030 L=130.0' S=0.0050 '/' Capacity=9.41 cfs Outflow=0.79 cfs 11,003 cf
Reach R9: TREATMENT SWALE-2	Avg. Flow Depth=0.12' Max Vel=0.81 fps Inflow=0.81 cfs 2,798 cf n=0.030 L=100.0' S=0.0050 '/' Capacity=9.41 cfs Outflow=0.79 cfs 2,798 cf
Pond CB1: CB-1	Peak Elev=1,310.73' Inflow=0.81 cfs 2,798 cf 12.0" Round Culvert n=0.012 L=58.0' S=0.0050 '/' Outflow=0.81 cfs 2,798 cf
Pond CB2: CB-2	Peak Elev=1,312.12' Inflow=2.47 cfs 12,458 cf 18.0" Round Culvert n=0.120 L=92.0' S=0.0085 '/' Outflow=2.47 cfs 12,458 cf
Pond CB3: CB-3	Peak Elev=1,306.83' Inflow=3.26 cfs 15,180 cf Primary=1.87 cfs 10,515 cf Secondary=1.39 cfs 4,665 cf Outflow=3.26 cfs 15,180 cf
Pond CB4: CB-4	Peak Elev=1,314.58' Inflow=1.96 cfs 6,729 cf 15.0" Round Culvert n=0.012 L=20.0' S=0.0050 '/' Outflow=1.96 cfs 6,729 cf
Pond P1: DETENTION POND-1	Peak Elev=1,314.44' Storage=6,167 cf Inflow=3.52 cfs 13,033 cf Outflow=0.79 cfs 11,005 cf
Pond P10: PERVIOUS PAVERS	Peak Elev=1,310.33' Storage=273 cf Inflow=0.21 cfs 714 cf Discarded=0.01 cfs 715 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 715 cf
Pond P12: DRIP EDGE-5	Peak Elev=1,315.79' Storage=129 cf Inflow=0.07 cfs 214 cf Discarded=0.00 cfs 177 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 177 cf
Pond P2: DETENTION SYSTEM-1	Peak Elev=1,306.79' Storage=4,188 cf Inflow=1.87 cfs 10,515 cf Outflow=0.92 cfs 9,318 cf
Pond P3: FILTRATION SYSTEM-1	Peak Elev=1,307.25' Storage=330 cf Inflow=0.92 cfs 9,318 cf Outflow=0.40 cfs 9,272 cf

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Pond P4: DRIP EDGE-1

Peak Elev=1,316.87' Storage=1,685 cf Inflow=0.83 cfs 2,845 cf
Discarded=0.03 cfs 2,473 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 2,473 cf

Pond P5: DRIP EDGE-2

Peak Elev=1,321.87' Storage=1,683 cf Inflow=0.83 cfs 2,841 cf
Discarded=0.03 cfs 2,471 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 2,471 cf

Pond P6: DRIP EDGE-3

Peak Elev=1,317.37' Storage=1,683 cf Inflow=0.83 cfs 2,841 cf
Discarded=0.03 cfs 2,471 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 2,471 cf

Pond P7: DRIP EDGE-4

Peak Elev=1,317.34' Storage=1,659 cf Inflow=0.82 cfs 2,810 cf
Discarded=0.03 cfs 2,457 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 2,457 cf

Pond P8: BIORETENTION SYSTEM-2

Peak Elev=1,315.37' Storage=784 cf Inflow=1.18 cfs 3,998 cf
Discarded=0.01 cfs 979 cf Primary=0.70 cfs 3,019 cf Outflow=0.71 cfs 3,998 cf

Pond P9: BIORETENTION SYSTEM-1

Peak Elev=1,315.11' Storage=2,752 cf Inflow=2.95 cfs 9,873 cf
Discarded=0.47 cfs 1,459 cf Primary=1.17 cfs 7,575 cf Outflow=1.64 cfs 9,033 cf

Link POI 1: NORTHERN COUNTY ROAD

Inflow=3.67 cfs 22,794 cf
Primary=3.67 cfs 22,794 cf

Link POI 2: SOUTHERN COUNTY ROAD

Inflow=1.20 cfs 3,891 cf
Primary=1.20 cfs 3,891 cf

Link POI 3: ON-SITE WETLAND

Inflow=23.10 cfs 104,339 cf
Primary=23.10 cfs 104,339 cf

Total Runoff Area = 998,266 sf Runoff Volume = 149,850 cf Average Runoff Depth = 1.80"
87.96% Pervious = 878,116 sf 12.04% Impervious = 120,150 sf

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Type III 24-hr 10-yr Rainfall=3.82"

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Summary for Subcatchment 1S: PDA 1

Runoff = 1.75 cfs @ 12.14 hrs, Volume= 6,304 cf, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=3.82"

Area (sf)	CN	Description
1,628	70	Woods, Good, HSG C
21,802	82	Row crops, SR + CR, Good, HSG C
17,587	74	>75% Grass cover, Good, HSG C
* 895	98	PROPOSED SIDEWALK
41,912		Weighted Average
41,017		97.86% Pervious Area
895		2.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 2.76"
3.4	200	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
9.5	250	Total			

Summary for Subcatchment 2S: PDA 2

Runoff = 2.26 cfs @ 12.17 hrs, Volume= 8,857 cf, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=3.82"

Area (sf)	CN	Description
12,394	70	Woods, Good, HSG C
16,837	82	Row crops, SR + CR, Good, HSG C
32,790	74	>75% Grass cover, Good, HSG C
* 0	98	EXISTING BUILDING
* 0	85	EXISTING GRAVEL
* 1,775	98	PROPOSED PAVEMENT
* 477	98	PROPOSED SIDEWALK
* 272	85	PROPOSED GRAVEL
64,545		Weighted Average
62,293		96.51% Pervious Area
2,252		3.49% Impervious Area

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Type III 24-hr 10-yr Rainfall=3.82"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.0200	0.29		Sheet Flow, Cultivated: Residue<=20% n= 0.060 P2= 2.76"
1.5	160	0.0380	1.75		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
0.7	54	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.9	467	0.0260	1.13		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
12.0	731	Total			

Summary for Subcatchment 3S: PDA 3

Runoff = 20.82 cfs @ 12.20 hrs, Volume= 85,188 cf, Depth= 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=3.82"

Area (sf)	CN	Description
397,606	70	Woods, Good, HSG C
259,089	82	Row crops, SR + CR, Good, HSG C
3,036	74	>75% Grass cover, Good, HSG C
* 1,434	98	EXISTING BUILDING
* 0	85	EXISTING GRAVEL
* 0	98	EXISTING PAVEMENT
661,165		Weighted Average
659,731		99.78% Pervious Area
1,434		0.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0300	0.15		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.76"
4.6	527	0.0450	1.91		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
3.2	285	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
13.5	862	Total			

Summary for Subcatchment 4S: PDA 4

Runoff = 0.83 cfs @ 12.07 hrs, Volume= 2,845 cf, Depth= 3.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=3.82"

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Type III 24-hr 10-yr Rainfall=3.82"

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	Area (sf)	CN	Description
*	7,319	98	PROPOSED BUILDING
*	2,001	85	PROPOSED GRAVEL
*	95	98	PROPOSED SIDEWALK
*	825	98	PROPOSED DECK
	10,240		Weighted Average
	2,001		19.54% Pervious Area
	8,239		80.46% Impervious Area

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

Summary for Subcatchment 5S: PDA 5

Runoff = 0.83 cfs @ 12.07 hrs, Volume= 2,841 cf, Depth= 3.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=3.82"

	Area (sf)	CN	Description
*	7,319	98	PROPOSED BUILDING
*	1,990	85	PROPOSED GRAVEL
*	90	98	PROPOSED SIDEWALK
*	825	98	PROPOSED DECK
	10,224		Weighted Average
	1,990		19.46% Pervious Area
	8,234		80.54% Impervious Area

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

Summary for Subcatchment 6S: PDA 6

Runoff = 0.83 cfs @ 12.07 hrs, Volume= 2,841 cf, Depth= 3.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=3.82"

	Area (sf)	CN	Description
*	7,319	98	PROPOSED BUILDING
*	1,990	85	PROPOSED GRAVEL
*	90	98	PROPOSED SIDEWALK
*	825	98	PROPOSED DECK
	10,224		Weighted Average
	1,990		19.46% Pervious Area
	8,234		80.54% Impervious Area

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Type III 24-hr 10-yr Rainfall=3.82"

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

Summary for Subcatchment 7S: PDA 7

Runoff = 0.82 cfs @ 12.07 hrs, Volume= 2,810 cf, Depth= 3.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=3.82"

Area (sf)	CN	Description
* 7,319	98	PROPOSED BUILDING
* 1,910	85	PROPOSED GRAVEL
* 80	98	PROPOSED SIDEWALK
* 781	98	PROPOSED DECK
10,090		Weighted Average
1,910		18.93% Pervious Area
8,180		81.07% Impervious Area

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

Summary for Subcatchment 8S: PDA 8

Runoff = 1.20 cfs @ 12.08 hrs, Volume= 3,891 cf, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=3.82"

Area (sf)	CN	Description
590	70	Woods, Good, HSG C
5,875	82	Row crops, SR + CR, Good, HSG C
9,449	74	>75% Grass cover, Good, HSG C
* 4,068	98	EXISTING BUILDING
* 1,939	85	EXISTING GRAVEL
* 0	98	EXISTING PAVEMENT
* 454	85	PROPOSED GRAVEL
22,375		Weighted Average
18,307		81.82% Pervious Area
4,068		18.18% Impervious Area

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

Summary for Subcatchment 9S: PDA 9

Runoff = 0.80 cfs @ 12.07 hrs, Volume= 2,722 cf, Depth= 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=3.82"

	Area (sf)	CN	Description
*	1,249	98	EXISTING BUILDING
*	6,074	98	PROPOSED PAVEMENT
	0	70	Woods, Good, HSG C
	4,371	74	>75% Grass cover, Good, HSG C
	11,694		Weighted Average
	4,371		37.38% Pervious Area
	7,323		62.62% Impervious Area

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

Summary for Subcatchment 10S: PDA 10

Runoff = 1.18 cfs @ 12.08 hrs, Volume= 3,998 cf, Depth= 2.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=3.82"

	Area (sf)	CN	Description
*	471	98	PROPOSED SIDEWALK
*	7,909	98	PROPOSED PAVEMENT
	12,230	74	>75% Grass cover, Good, HSG C
	20,610		Weighted Average
	12,230		59.34% Pervious Area
	8,380		40.66% Impervious Area

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

Summary for Subcatchment 11S: PDA 11

Runoff = 2.95 cfs @ 12.08 hrs, Volume= 9,873 cf, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=3.82"

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Type III 24-hr 10-yr Rainfall=3.82"

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Area (sf)	CN	Description
2,165	70	Woods, Good, HSG C
* 4,346	98	PROPOSED SIDEWALK
* 13,363	98	PROPOSED PAVEMENT
35,723	74	>75% Grass cover, Good, HSG C
55,597		Weighted Average
37,888		68.15% Pervious Area
17,709		31.85% Impervious Area

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

Summary for Subcatchment 12S: PDA 12

Runoff = 0.74 cfs @ 12.08 hrs, Volume= 2,344 cf, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=3.82"

Area (sf)	CN	Description
19,190	74	>75% Grass cover, Good, HSG C
* 0	98	PROPOSED SIDEWALK
* 0	98	PROPOSED PAVEMENT
19,190		Weighted Average
19,190		100.00% Pervious Area

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

Summary for Subcatchment 13S: PDA 13

Runoff = 1.96 cfs @ 12.07 hrs, Volume= 6,729 cf, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=3.82"

Area (sf)	CN	Description
* 16,525	98	PROPOSED PAVEMENT
* 1,855	98	PROPOSED SIDEWALK
1,724	70	Woods, Good, HSG C
6,685	74	>75% Grass cover, Good, HSG C
* 825	98	PROPOSED DECK
27,614		Weighted Average
8,409		30.45% Pervious Area
19,205		69.55% Impervious Area

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

Summary for Subcatchment 14S: PDA 14

Runoff = 0.21 cfs @ 12.07 hrs, Volume= 714 cf, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=3.82"

Area (sf)	CN	Description
* 2,054	98	PROPOSED PATIO
* 247	98	PROPOSED SIDEWALK
216	74	>75% Grass cover, Good, HSG C
2,517		Weighted Average
216		8.58% Pervious Area
2,301		91.42% Impervious Area

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

Summary for Subcatchment 15S: PDA 15

Runoff = 1.42 cfs @ 12.07 hrs, Volume= 4,883 cf, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=3.82"

Area (sf)	CN	Description
* 14,383	98	PROPOSED PAVEMENT
* 253	98	PROPOSED SIDEWALK
4,177	74	>75% Grass cover, Good, HSG C
18,813		Weighted Average
4,177		22.20% Pervious Area
14,636		77.80% Impervious Area

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

Summary for Subcatchment 16S: PDA 16

Runoff = 0.81 cfs @ 12.07 hrs, Volume= 2,798 cf, Depth= 3.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=3.82"

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Type III 24-hr 10-yr Rainfall=3.82"

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	Area (sf)	CN	Description
*	7,604	98	PROPOSED PAVEMENT
*	856	98	PROPOSED SIDEWALK
	2,216	74	>75% Grass cover, Good, HSG C
	10,676		Weighted Average
	2,216		20.76% Pervious Area
	8,460		79.24% Impervious Area

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

Summary for Subcatchment 17S: PDA 17

Runoff = 0.07 cfs @ 12.00 hrs, Volume= 214 cf, Depth= 3.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=3.82"

	Area (sf)	CN	Description
*	600	98	PROPOSED PAVILION
*	180	85	PROPOSED GRAVEL
	780		Weighted Average
	180		23.08% Pervious Area
	600		76.92% Impervious Area

Summary for Reach R2: EXISTING REACH-2

Inflow Area = 89,974 sf, 40.64% Impervious, Inflow Depth > 1.47" for 10-yr event
Inflow = 0.79 cfs @ 12.59 hrs, Volume= 11,003 cf
Outflow = 0.78 cfs @ 12.67 hrs, Volume= 10,995 cf, Atten= 0%, Lag= 4.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.32 fps, Min. Travel Time= 6.0 min
Avg. Velocity = 0.49 fps, Avg. Travel Time= 16.1 min

Peak Storage= 282 cf @ 12.67 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 0.25' Flow Area= 2.2 sf, Capacity= 6.31 cfs

8.00' x 0.25' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.0 ' Top Width= 9.50'
Length= 474.0' Slope= 0.0169 '
Inlet Invert= 1,316.00', Outlet Invert= 1,308.00'



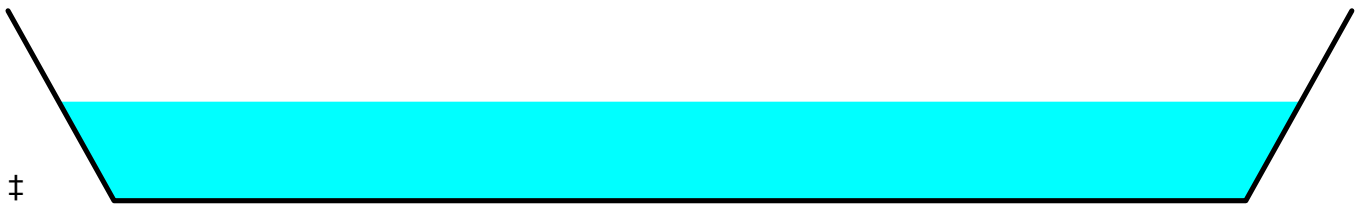
Summary for Reach R3: EXISTING REACH-3

Inflow Area = 39,956 sf, 41.65% Impervious, Inflow Depth = 1.54" for 10-yr event
Inflow = 1.53 cfs @ 12.09 hrs, Volume= 5,142 cf
Outflow = 1.39 cfs @ 12.13 hrs, Volume= 5,142 cf, Atten= 9%, Lag= 2.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.27 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 0.27 fps, Avg. Travel Time= 16.8 min

Peak Storage= 293 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 0.25' Flow Area= 2.2 sf, Capacity= 4.20 cfs

8.00' x 0.25' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.0 '/' Top Width= 9.50'
Length= 268.0' Slope= 0.0075 '/'
Inlet Invert= 1,310.00', Outlet Invert= 1,308.00'



Summary for Reach R4: EXISTING REACH-4

Inflow Area = 150,540 sf, 40.91% Impervious, Inflow Depth > 1.53" for 10-yr event
Inflow = 2.34 cfs @ 12.16 hrs, Volume= 19,156 cf
Outflow = 2.28 cfs @ 12.21 hrs, Volume= 19,151 cf, Atten= 3%, Lag= 2.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.23 fps, Min. Travel Time= 3.0 min
Avg. Velocity = 0.80 fps, Avg. Travel Time= 12.2 min

Peak Storage= 415 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 0.25' Flow Area= 2.2 sf, Capacity= 13.89 cfs

8.00' x 0.25' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.0 '/' Top Width= 9.50'
Length= 587.0' Slope= 0.0818 '/'
Inlet Invert= 1,308.00', Outlet Invert= 1,260.00'



Summary for Reach R5: PROPOSED REACH-1

Inflow Area = 10,240 sf, 80.46% Impervious, Inflow Depth = 0.00" for 10-yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.25' Flow Area= 1.7 sf, Capacity= 6.30 cfs

6.00' x 0.25' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.0 '/' Top Width= 7.50'
Length= 308.0' Slope= 0.0292 '/'
Inlet Invert= 1,317.00', Outlet Invert= 1,308.00'



Summary for Reach R6: PROPOSED REACH-2

Inflow Area = 10,224 sf, 80.54% Impervious, Inflow Depth = 0.00" for 10-yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.25' Flow Area= 1.7 sf, Capacity= 5.94 cfs

6.00' x 0.25' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.0 '/' Top Width= 7.50'
Length= 250.0' Slope= 0.0260 '/'
Inlet Invert= 1,322.50', Outlet Invert= 1,316.00'



Summary for Reach R7: PROPOSED REACH-7

Inflow Area = 20,610 sf, 40.66% Impervious, Inflow Depth = 1.76" for 10-yr event
Inflow = 0.70 cfs @ 12.19 hrs, Volume= 3,019 cf
Outflow = 0.70 cfs @ 12.22 hrs, Volume= 3,019 cf, Atten= 0%, Lag= 1.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.45 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 0.40 fps, Avg. Travel Time= 9.2 min

Peak Storage= 108 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 0.25' Flow Area= 2.2 sf, Capacity= 7.95 cfs

8.00' x 0.25' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.0 '/' Top Width= 9.50'
Length= 224.0' Slope= 0.0268 '/'
Inlet Invert= 1,314.00', Outlet Invert= 1,308.00'



Summary for Reach R8: TREATMENT SWALE-1

Inflow Area = 79,750 sf, 35.53% Impervious, Inflow Depth > 1.66" for 10-yr event
Inflow = 0.79 cfs @ 12.56 hrs, Volume= 11,005 cf
Outflow = 0.79 cfs @ 12.59 hrs, Volume= 11,003 cf, Atten= 0%, Lag= 1.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.81 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 0.30 fps, Avg. Travel Time= 7.2 min

Peak Storage= 126 cf @ 12.59 hrs
Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 0.50' Flow Area= 4.8 sf, Capacity= 9.41 cfs

8.00' x 0.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 130.0' Slope= 0.0050 '/'
Inlet Invert= 313.40', Outlet Invert= 312.75'



Summary for Reach R9: TREATMENT SWALE-2

Inflow Area = 10,676 sf, 79.24% Impervious, Inflow Depth = 3.15" for 10-yr event
 Inflow = 0.81 cfs @ 12.07 hrs, Volume= 2,798 cf
 Outflow = 0.79 cfs @ 12.10 hrs, Volume= 2,798 cf, Atten= 3%, Lag= 1.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.81 fps, Min. Travel Time= 2.1 min
 Avg. Velocity = 0.19 fps, Avg. Travel Time= 8.7 min

Peak Storage= 97 cf @ 12.10 hrs
 Average Depth at Peak Storage= 0.12'
 Bank-Full Depth= 0.50' Flow Area= 4.8 sf, Capacity= 9.41 cfs

8.00' x 0.50' deep channel, n= 0.030 Earth, grassed & winding
 Side Slope Z-value= 3.0 '/' Top Width= 11.00'
 Length= 100.0' Slope= 0.0050 '/'
 Inlet Invert= 1,309.90', Outlet Invert= 1,309.40'



Summary for Pond CB1: CB-1

Inflow Area = 10,676 sf, 79.24% Impervious, Inflow Depth = 3.15" for 10-yr event
 Inflow = 0.81 cfs @ 12.07 hrs, Volume= 2,798 cf
 Outflow = 0.81 cfs @ 12.07 hrs, Volume= 2,798 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.81 cfs @ 12.07 hrs, Volume= 2,798 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,310.73' @ 12.07 hrs
 Flood Elev= 1,313.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,310.20'	12.0" Round Culvert L= 58.0' Ke= 0.500 Inlet / Outlet Invert= 1,310.20' / 1,309.91' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.78 cfs @ 12.07 hrs HW=1,310.72' TW=1,310.01' (Dynamic Tailwater)
 1=Culvert (Barrel Controls 0.78 cfs @ 2.79 fps)

Summary for Pond CB2: CB-2

Inflow Area = 75,190 sf, 43.82% Impervious, Inflow Depth = 1.99" for 10-yr event
 Inflow = 2.47 cfs @ 12.09 hrs, Volume= 12,458 cf
 Outflow = 2.47 cfs @ 12.09 hrs, Volume= 12,458 cf, Atten= 0%, Lag= 0.0 min
 Primary = 2.47 cfs @ 12.09 hrs, Volume= 12,458 cf

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 1,312.12' @ 12.09 hrs

Flood Elev= 1,312.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,307.00'	18.0" Round Culvert L= 92.0' Ke= 0.500 Inlet / Outlet Invert= 1,307.00' / 1,306.22' S= 0.0085 '/' Cc= 0.900 n= 0.120, Flow Area= 1.77 sf

Primary OutFlow Max=2.44 cfs @ 12.09 hrs HW=1,312.00' TW=1,306.83' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 2.44 cfs @ 1.38 fps)**Summary for Pond CB3: CB-3**

Inflow Area = 86,884 sf, 46.35% Impervious, Inflow Depth = 2.10" for 10-yr event
 Inflow = 3.26 cfs @ 12.09 hrs, Volume= 15,180 cf
 Outflow = 3.26 cfs @ 12.09 hrs, Volume= 15,180 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.87 cfs @ 12.09 hrs, Volume= 10,515 cf
 Secondary = 1.39 cfs @ 12.09 hrs, Volume= 4,665 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 1,306.83' @ 12.08 hrs

Flood Elev= 1,310.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,306.12'	18.0" Round Culvert L= 12.0' Ke= 0.500 Inlet / Outlet Invert= 1,306.12' / 1,306.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	1,306.40'	1.5' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=1.84 cfs @ 12.09 hrs HW=1,306.83' TW=1,306.06' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 1.84 cfs @ 3.29 fps)**Secondary OutFlow** Max=1.35 cfs @ 12.09 hrs HW=1,306.83' TW=0.00' (Dynamic Tailwater)↑**2=Sharp-Crested Rectangular Weir** (Weir Controls 1.35 cfs @ 2.25 fps)**Summary for Pond CB4: CB-4**

Inflow Area = 27,614 sf, 69.55% Impervious, Inflow Depth = 2.92" for 10-yr event
 Inflow = 1.96 cfs @ 12.07 hrs, Volume= 6,729 cf
 Outflow = 1.96 cfs @ 12.07 hrs, Volume= 6,729 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.96 cfs @ 12.07 hrs, Volume= 6,729 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 1,314.58' @ 12.07 hrs

Flood Elev= 1,318.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,313.75'	15.0" Round Culvert L= 20.0' Ke= 0.500

Inlet / Outlet Invert= 1,313.75' / 1,313.65' S= 0.0050 '/' Cc= 0.900
 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.89 cfs @ 12.07 hrs HW=1,314.56' TW=1,313.98' (Dynamic Tailwater)

1=Culvert (Barrel Controls 1.89 cfs @ 3.19 fps)

Summary for Pond P1: DETENTION POND-1

Inflow Area = 79,750 sf, 35.53% Impervious, Inflow Depth = 1.96" for 10-yr event
 Inflow = 3.52 cfs @ 12.10 hrs, Volume= 13,033 cf
 Outflow = 0.79 cfs @ 12.56 hrs, Volume= 11,005 cf, Atten= 78%, Lag= 27.8 min
 Primary = 0.79 cfs @ 12.56 hrs, Volume= 11,005 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,314.44' @ 12.56 hrs Surf.Area= 4,971 sf Storage= 6,167 cf
 Flood Elev= 1,316.00' Surf.Area= 6,550 sf Storage= 15,150 cf

Plug-Flow detention time= 202.9 min calculated for 11,005 cf (84% of inflow)
 Center-of-Mass det. time= 135.0 min (935.7 - 800.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,313.00'	15,150 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,313.00	3,625	0	0
1,314.00	4,525	4,075	4,075
1,316.00	6,550	11,075	15,150

Device	Routing	Invert	Outlet Devices
#1	Primary	1,313.50'	12.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 1,313.50' / 1,312.63' S= 0.0435 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	1,315.00'	6.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	1,313.50'	6.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.79 cfs @ 12.56 hrs HW=1,314.44' TW=313.52' (Dynamic Tailwater)

1=Culvert (Passes 0.79 cfs of 2.53 cfs potential flow)

2=Orifice/Grate (Controls 0.00 cfs)

3=Orifice/Grate (Orifice Controls 0.79 cfs @ 4.00 fps)

Summary for Pond P10: PERVIOUS PAVERS

Inflow Area = 2,517 sf, 91.42% Impervious, Inflow Depth = 3.40" for 10-yr event
 Inflow = 0.21 cfs @ 12.07 hrs, Volume= 714 cf
 Outflow = 0.01 cfs @ 13.28 hrs, Volume= 715 cf, Atten= 93%, Lag= 72.6 min
 Discarded = 0.01 cfs @ 13.28 hrs, Volume= 715 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

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Peak Elev= 1,310.33' @ 13.28 hrs Surf.Area= 2,050 sf Storage= 273 cf
 Flood Elev= 1,312.00' Surf.Area= 2,050 sf Storage= 1,640 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 141.5 min (897.0 - 755.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,310.00'	1,640 cf	Custom Stage Data (Conic) Listed below (Recalc) 4,100 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,310.00	2,050	0	0	2,050
1,312.00	2,050	4,100	4,100	2,371

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,310.00'	0.300 in/hr Exfiltration over Wetted area
#2	Primary	1,312.00'	40.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.01 cfs @ 13.28 hrs HW=1,310.33' (Free Discharge)
 ↖1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,310.00' TW=0.00' (Dynamic Tailwater)
 ↖2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond P12: DRIP EDGE-5

Inflow Area = 780 sf, 76.92% Impervious, Inflow Depth = 3.29" for 10-yr event
 Inflow = 0.07 cfs @ 12.00 hrs, Volume= 214 cf
 Outflow = 0.00 cfs @ 15.86 hrs, Volume= 177 cf, Atten= 97%, Lag= 231.5 min
 Discarded = 0.00 cfs @ 15.86 hrs, Volume= 177 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,315.79' @ 15.86 hrs Surf.Area= 180 sf Storage= 129 cf
 Flood Elev= 1,316.00' Surf.Area= 180 sf Storage= 144 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 489.0 min (1,246.8 - 757.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,314.00'	144 cf	Custom Stage Data (Conic) Listed below (Recalc) 360 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,314.00	180	0	0	180
1,316.00	180	360	360	275

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,314.00'	0.300 in/hr Exfiltration over Wetted area
#2	Primary	1,315.90'	20.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 15.86 hrs HW=1,315.79' (Free Discharge)

↳ **1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,314.00' TW=1,312.00' (Dynamic Tailwater)

↳ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond P2: DETENTION SYSTEM-1

Inflow Area = 86,884 sf, 46.35% Impervious, Inflow Depth = 1.45" for 10-yr event
 Inflow = 1.87 cfs @ 12.09 hrs, Volume= 10,515 cf
 Outflow = 0.92 cfs @ 12.61 hrs, Volume= 9,318 cf, Atten= 51%, Lag= 31.7 min
 Primary = 0.92 cfs @ 12.61 hrs, Volume= 9,318 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,306.79' @ 12.56 hrs Surf.Area= 2,263 sf Storage= 4,188 cf
 Flood Elev= 1,308.00' Surf.Area= 2,263 sf Storage= 5,657 cf

Plug-Flow detention time= 198.3 min calculated for 9,305 cf (88% of inflow)
 Center-of-Mass det. time= 142.5 min (967.1 - 824.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	1,304.00'	2,264 cf	36.50'W x 62.00'L x 4.00'H Field A 9,052 cf Overall - 3,393 cf Embedded = 5,659 cf x 40.0% Voids
#2A	1,304.50'	3,393 cf	CMP Round 36 x 24 Inside #1 Effective Size= 36.0"W x 36.0"H => 7.07 sf x 20.00'L = 141.4 cf Overall Size= 36.0"W x 36.0"H x 20.00'L 24 Chambers in 8 Rows
		5,657 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	1,305.00'	12.0" Round Culvert L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 1,305.00' / 1,304.75' S= 0.0250 ' / Cc= 0.900 n= 0.120, Flow Area= 0.79 sf
#2	Device 1	1,305.00'	8.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	1,307.00'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 0.5' Crest Height

Primary OutFlow Max=0.39 cfs @ 12.61 hrs HW=1,306.74' TW=1,306.63' (Dynamic Tailwater)

↳ **1=Culvert** (Outlet Controls 0.39 cfs @ 0.50 fps)

↳ **2=Orifice/Grate** (Passes 0.39 cfs of 0.56 cfs potential flow)

↳ **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond P3: FILTRATION SYSTEM-1

Inflow Area = 86,884 sf, 46.35% Impervious, Inflow Depth > 1.29" for 10-yr event
 Inflow = 0.92 cfs @ 12.61 hrs, Volume= 9,318 cf
 Outflow = 0.40 cfs @ 12.67 hrs, Volume= 9,272 cf, Atten= 57%, Lag= 3.2 min
 Primary = 0.40 cfs @ 12.67 hrs, Volume= 9,272 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,307.25' @ 12.67 hrs Surf.Area= 88 sf Storage= 330 cf
 Flood Elev= 1,309.50' Surf.Area= 88 sf Storage= 528 cf

Plug-Flow detention time= 14.0 min calculated for 9,259 cf (99% of inflow)
 Center-of-Mass det. time= 9.6 min (976.7 - 967.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,303.50'	528 cf	8.00'W x 11.00'L x 6.00'H Prisma

Device	Routing	Invert	Outlet Devices (Turned on 1 times)
#1	Device 2	1,303.50'	Tube/Siphon/Float Valve X 14.00 0.772" Diameter, C= 0.600, 0.263" Trickle Diameter Starts@1,305.00' Breaks@1,303.87'
#2	Primary	1,304.00'	12.0" Round Culvert L= 94.0' Ke= 0.500 Inlet / Outlet Invert= 1,304.00' / 1,303.43' S= 0.0061 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.39 cfs @ 12.67 hrs HW=1,307.15' TW=0.00' (Dynamic Tailwater)
 ↑ **2=Culvert** (Passes 0.39 cfs of 5.18 cfs potential flow)
 ↑ **1=Tube/Siphon/Float Valve** (Orifice Controls 0.39 cfs @ 8.54 fps)

Summary for Pond P4: DRIP EDGE-1

Inflow Area = 10,240 sf, 80.46% Impervious, Inflow Depth = 3.33" for 10-yr event
 Inflow = 0.83 cfs @ 12.07 hrs, Volume= 2,845 cf
 Outflow = 0.03 cfs @ 15.62 hrs, Volume= 2,473 cf, Atten= 97%, Lag= 213.0 min
 Discarded = 0.03 cfs @ 15.62 hrs, Volume= 2,473 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,316.87' @ 15.62 hrs Surf.Area= 2,250 sf Storage= 1,685 cf
 Flood Elev= 1,317.50' Surf.Area= 2,250 sf Storage= 2,250 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 482.7 min (1,243.4 - 760.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,315.00'	2,250 cf	5.00'W x 450.00'L x 2.50'H Prisma 5,625 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,315.00'	0.300 in/hr Exfiltration over Wetted area
#2	Primary	1,317.49'	450.0' long x 1.0' breadth Broad-Crested Rectangular Weir

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
 2.50 3.00
 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31
 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 15.62 hrs HW=1,316.87' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,315.00' TW=1,317.00' (Dynamic Tailwater)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond P5: DRIP EDGE-2

Inflow Area = 10,224 sf, 80.54% Impervious, Inflow Depth = 3.33" for 10-yr event
 Inflow = 0.83 cfs @ 12.07 hrs, Volume= 2,841 cf
 Outflow = 0.03 cfs @ 15.62 hrs, Volume= 2,471 cf, Atten= 97%, Lag= 212.8 min
 Discarded = 0.03 cfs @ 15.62 hrs, Volume= 2,471 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,321.87' @ 15.62 hrs Surf.Area= 2,250 sf Storage= 1,683 cf
 Flood Elev= 1,322.50' Surf.Area= 2,250 sf Storage= 2,250 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 482.6 min (1,243.4 - 760.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,320.00'	2,250 cf	5.00'W x 450.00'L x 2.50'H Prismatic 5,625 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,320.00'	0.300 in/hr Exfiltration over Wetted area
#2	Primary	1,322.49'	450.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 15.62 hrs HW=1,321.87' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,320.00' TW=1,322.50' (Dynamic Tailwater)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond P6: DRIP EDGE-3

Inflow Area = 10,224 sf, 80.54% Impervious, Inflow Depth = 3.33" for 10-yr event
 Inflow = 0.83 cfs @ 12.07 hrs, Volume= 2,841 cf
 Outflow = 0.03 cfs @ 15.62 hrs, Volume= 2,471 cf, Atten= 97%, Lag= 212.8 min
 Discarded = 0.03 cfs @ 15.62 hrs, Volume= 2,471 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Discarded OutFlow Max=0.03 cfs @ 15.60 hrs HW=1,317.34' (Free Discharge)

↳1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,315.50' TW=1,310.00' (Dynamic Tailwater)

↳2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond P8: BIORETENTION SYSTEM-2

Inflow Area = 20,610 sf, 40.66% Impervious, Inflow Depth = 2.33" for 10-yr event
 Inflow = 1.18 cfs @ 12.08 hrs, Volume= 3,998 cf
 Outflow = 0.71 cfs @ 12.19 hrs, Volume= 3,998 cf, Atten= 40%, Lag= 6.8 min
 Discarded = 0.01 cfs @ 7.70 hrs, Volume= 979 cf
 Primary = 0.70 cfs @ 12.19 hrs, Volume= 3,019 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,315.37' @ 12.19 hrs Surf.Area= 1,500 sf Storage= 784 cf
 Flood Elev= 1,316.00' Surf.Area= 3,300 sf Storage= 1,594 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 70.2 min (859.0 - 788.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,315.58'	683 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2	1,314.08'	892 cf	15.00'W x 100.00'L x 1.50'H Prismatic 2,250 cf Overall - 20 cf Embedded = 2,230 cf x 40.0% Voids
#3	1,314.40'	20 cf	6.0" Round Pipe Storage Inside #2 L= 100.0'
		1,594 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,315.58	1,450	0	0
1,316.00	1,800	683	683

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,314.08'	10.000 in/hr Exfiltration over Surface area from 1,314.08' - 1,315.58' Excluded Surface area = 1,500 sf
#2	Discarded	1,314.08'	0.300 in/hr Exfiltration over Surface area from 1,313.08' - 1,314.08' Excluded Surface area = 0 sf
#3	Primary	1,314.40'	6.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 1,314.40' / 1,314.30' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Discarded OutFlow Max=0.01 cfs @ 7.70 hrs HW=1,314.10' (Free Discharge)

↳1=Exfiltration (Exfiltration Controls 0.00 cfs)

↳2=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.70 cfs @ 12.19 hrs HW=1,315.36' TW=1,314.06' (Dynamic Tailwater)

↳3=Culvert (Barrel Controls 0.70 cfs @ 3.57 fps)

Summary for Pond P9: BIORETENTION SYSTEM-1

Inflow Area = 56,377 sf, 32.48% Impervious, Inflow Depth = 2.10" for 10-yr event
 Inflow = 2.95 cfs @ 12.08 hrs, Volume= 9,873 cf
 Outflow = 1.64 cfs @ 12.20 hrs, Volume= 9,033 cf, Atten= 44%, Lag= 7.4 min
 Discarded = 0.47 cfs @ 12.15 hrs, Volume= 1,459 cf
 Primary = 1.17 cfs @ 12.21 hrs, Volume= 7,575 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,315.11' @ 12.21 hrs Surf.Area= 6,212 sf Storage= 2,752 cf
 Flood Elev= 1,316.00' Surf.Area= 6,700 sf Storage= 4,753 cf

Plug-Flow detention time= 126.0 min calculated for 9,033 cf (91% of inflow)
 Center-of-Mass det. time= 81.7 min (879.7 - 798.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,315.00'	2,225 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2	1,313.00'	1,675 cf	30.00'W x 70.00'L x 2.00'H Prismatic 4,200 cf Overall - 14 cf Embedded = 4,186 cf x 40.0% Voids
#3	1,313.33'	14 cf	6.0" Round Pipe Storage Inside #2 L= 70.0'
#4	1,312.00'	840 cf	30.00'W x 70.00'L x 1.00'H Prismatic 2,100 cf Overall x 40.0% Voids
		4,753 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,315.00	1,950	0	0
1,316.00	2,500	2,225	2,225

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,313.00'	10.000 in/hr Exfiltration over Surface area from 1,313.00' - 1,315.00' Excluded Surface area = 4,200 sf
#2	Discarded	1,312.00'	0.300 in/hr Exfiltration over Surface area from 1,312.00' - 1,313.00' Excluded Surface area = 2,100 sf
#3	Primary	1,313.33'	12.0" Round Culvert L= 143.0' Ke= 0.500 Inlet / Outlet Invert= 1,313.33' / 1,308.00' S= 0.0373 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#4	Device 3	1,313.33'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.47 cfs @ 12.15 hrs HW=1,315.09' (Free Discharge)

- ↑ 1=Exfiltration (Exfiltration Controls 0.45 cfs)
- ↑ 2=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.17 cfs @ 12.21 hrs HW=1,315.11' TW=1,310.28' (Dynamic Tailwater)

- ↑ 3=Culvert (Passes 1.17 cfs of 4.28 cfs potential flow)
- ↑ 4=Orifice/Grate (Orifice Controls 1.17 cfs @ 5.96 fps)

Summary for Link POI 1: NORTHERN COUNTY ROAD

Inflow Area = 161,669 sf, 31.40% Impervious, Inflow Depth > 1.69" for 10-yr event
Inflow = 3.67 cfs @ 12.14 hrs, Volume= 22,794 cf
Primary = 3.67 cfs @ 12.14 hrs, Volume= 22,794 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link POI 2: SOUTHERN COUNTY ROAD

Inflow Area = 24,892 sf, 25.59% Impervious, Inflow Depth = 1.88" for 10-yr event
Inflow = 1.20 cfs @ 12.08 hrs, Volume= 3,891 cf
Primary = 1.20 cfs @ 12.08 hrs, Volume= 3,891 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link POI 3: ON-SITE WETLAND

Inflow Area = 811,705 sf, 7.76% Impervious, Inflow Depth > 1.54" for 10-yr event
Inflow = 23.10 cfs @ 12.20 hrs, Volume= 104,339 cf
Primary = 23.10 cfs @ 12.20 hrs, Volume= 104,339 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: PDA 1	Runoff Area=41,912 sf 2.14% Impervious Runoff Depth=2.55" Flow Length=250' Slope=0.0200 '/' Tc=9.5 min CN=WQ Runoff=2.49 cfs 8,894 cf
Subcatchment 2S: PDA 2	Runoff Area=64,545 sf 3.49% Impervious Runoff Depth=2.36" Flow Length=731' Tc=12.0 min CN=WQ Runoff=3.28 cfs 12,673 cf
Subcatchment 3S: PDA 3	Runoff Area=661,165 sf 0.22% Impervious Runoff Depth=2.24" Flow Length=862' Tc=13.5 min CN=WQ Runoff=30.63 cfs 123,287 cf
Subcatchment 4S: PDA 4	Runoff Area=10,240 sf 80.46% Impervious Runoff Depth=4.23" Tc=5.0 min CN=WQ Runoff=1.05 cfs 3,605 cf
Subcatchment 5S: PDA 5	Runoff Area=10,224 sf 80.54% Impervious Runoff Depth=4.23" Tc=5.0 min CN=WQ Runoff=1.05 cfs 3,601 cf
Subcatchment 6S: PDA 6	Runoff Area=10,224 sf 80.54% Impervious Runoff Depth=4.23" Tc=5.0 min CN=WQ Runoff=1.05 cfs 3,601 cf
Subcatchment 7S: PDA 7	Runoff Area=10,090 sf 81.07% Impervious Runoff Depth=4.23" Tc=5.0 min CN=WQ Runoff=1.03 cfs 3,560 cf
Subcatchment 8S: PDA 8	Runoff Area=22,375 sf 18.18% Impervious Runoff Depth=2.85" Tc=5.0 min CN=WQ Runoff=1.65 cfs 5,319 cf
Subcatchment 9S: PDA 9	Runoff Area=11,694 sf 62.62% Impervious Runoff Depth=3.62" Tc=5.0 min CN=WQ Runoff=1.03 cfs 3,526 cf
Subcatchment 10S: PDA 10	Runoff Area=20,610 sf 40.66% Impervious Runoff Depth=3.10" Tc=5.0 min CN=WQ Runoff=1.60 cfs 5,330 cf
Subcatchment 11S: PDA 11	Runoff Area=55,597 sf 31.85% Impervious Runoff Depth=2.88" Tc=5.0 min CN=WQ Runoff=4.03 cfs 13,366 cf
Subcatchment 12S: PDA 12	Runoff Area=19,190 sf 0.00% Impervious Runoff Depth=2.15" Tc=5.0 min CN=WQ Runoff=1.11 cfs 3,440 cf
Subcatchment 13S: PDA 13	Runoff Area=27,614 sf 69.55% Impervious Runoff Depth=3.76" Tc=5.0 min CN=WQ Runoff=2.52 cfs 8,654 cf
Subcatchment 14S: PDA 14	Runoff Area=2,517 sf 91.42% Impervious Runoff Depth=4.29" Tc=5.0 min CN=WQ Runoff=0.26 cfs 900 cf
Subcatchment 15S: PDA 15	Runoff Area=18,813 sf 77.80% Impervious Runoff Depth=3.97" Tc=5.0 min CN=WQ Runoff=1.80 cfs 6,229 cf
Subcatchment 16S: PDA 16	Runoff Area=10,676 sf 79.24% Impervious Runoff Depth=4.01" Tc=5.0 min CN=WQ Runoff=1.03 cfs 3,565 cf

Subcatchment 17S: PDA 17	Runoff Area=780 sf 76.92% Impervious Runoff Depth=4.18" Tc=0.0 min CN=WQ Runoff=0.09 cfs 271 cf
Reach R2: EXISTING REACH-2	Avg. Flow Depth=0.08' Max Vel=1.44 fps Inflow=0.99 cfs 15,515 cf n=0.025 L=474.0' S=0.0169 '/' Capacity=6.31 cfs Outflow=0.98 cfs 15,507 cf
Reach R3: EXISTING REACH-3	Avg. Flow Depth=0.16' Max Vel=1.44 fps Inflow=2.10 cfs 7,005 cf n=0.025 L=268.0' S=0.0075 '/' Capacity=4.20 cfs Outflow=1.97 cfs 7,005 cf
Reach R4: EXISTING REACH-4	Avg. Flow Depth=0.11' Max Vel=3.68 fps Inflow=3.32 cfs 26,701 cf n=0.025 L=587.0' S=0.0818 '/' Capacity=13.89 cfs Outflow=3.27 cfs 26,696 cf
Reach R5: PROPOSED REACH-1	Avg. Flow Depth=0.00' Max Vel=0.19 fps Inflow=0.00 cfs 0 cf n=0.025 L=308.0' S=0.0292 '/' Capacity=6.30 cfs Outflow=0.00 cfs 0 cf
Reach R6: PROPOSED REACH-2	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0 cf n=0.025 L=250.0' S=0.0260 '/' Capacity=5.94 cfs Outflow=0.00 cfs 0 cf
Reach R7: PROPOSED REACH-7	Avg. Flow Depth=0.07' Max Vel=1.55 fps Inflow=0.84 cfs 4,189 cf n=0.025 L=224.0' S=0.0268 '/' Capacity=7.95 cfs Outflow=0.83 cfs 4,189 cf
Reach R8: TREATMENT SWALE-1	Avg. Flow Depth=0.13' Max Vel=0.88 fps Inflow=0.99 cfs 15,518 cf n=0.030 L=130.0' S=0.0050 '/' Capacity=9.41 cfs Outflow=0.99 cfs 15,515 cf
Reach R9: TREATMENT SWALE-2	Avg. Flow Depth=0.13' Max Vel=0.89 fps Inflow=1.03 cfs 3,565 cf n=0.030 L=100.0' S=0.0050 '/' Capacity=9.41 cfs Outflow=1.01 cfs 3,565 cf
Pond CB1: CB-1	Peak Elev=1,310.80' Inflow=1.03 cfs 3,565 cf 12.0" Round Culvert n=0.012 L=58.0' S=0.0050 '/' Outflow=1.03 cfs 3,565 cf
Pond CB2: CB-2	Peak Elev=1,314.02' Inflow=2.97 cfs 16,636 cf 18.0" Round Culvert n=0.120 L=92.0' S=0.0085 '/' Outflow=2.97 cfs 16,636 cf
Pond CB3: CB-3	Peak Elev=1,306.96' Inflow=4.00 cfs 20,161 cf Primary=2.23 cfs 12,399 cf Secondary=2.03 cfs 7,762 cf Outflow=4.00 cfs 20,161 cf
Pond CB4: CB-4	Peak Elev=1,314.84' Inflow=2.52 cfs 8,654 cf 15.0" Round Culvert n=0.012 L=20.0' S=0.0050 '/' Outflow=2.52 cfs 8,654 cf
Pond P1: DETENTION POND-1	Peak Elev=1,314.84' Storage=8,231 cf Inflow=4.76 cfs 17,548 cf Outflow=0.99 cfs 15,518 cf
Pond P10: PERVIOUS PAVERS	Peak Elev=1,310.46' Storage=379 cf Inflow=0.26 cfs 900 cf Discarded=0.01 cfs 902 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 902 cf
Pond P12: DRIP EDGE-5	Peak Elev=1,315.90' Storage=137 cf Inflow=0.09 cfs 271 cf Discarded=0.00 cfs 187 cf Primary=0.02 cfs 38 cf Outflow=0.02 cfs 224 cf
Pond P2: DETENTION SYSTEM-1	Peak Elev=1,306.96' Storage=4,464 cf Inflow=2.23 cfs 12,399 cf Outflow=0.94 cfs 11,201 cf
Pond P3: FILTRATION SYSTEM-1	Peak Elev=1,307.32' Storage=336 cf Inflow=0.94 cfs 11,201 cf Outflow=0.40 cfs 11,155 cf

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Pond P4: DRIP EDGE-1 Peak Elev=1,317.49' Storage=2,241 cf Inflow=1.05 cfs 3,605 cf
Discarded=0.03 cfs 2,837 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 2,837 cf

Pond P5: DRIP EDGE-2 Peak Elev=1,322.49' Storage=2,238 cf Inflow=1.05 cfs 3,601 cf
Discarded=0.03 cfs 2,835 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 2,835 cf

Pond P6: DRIP EDGE-3 Peak Elev=1,317.99' Storage=2,238 cf Inflow=1.05 cfs 3,601 cf
Discarded=0.03 cfs 2,835 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 2,835 cf

Pond P7: DRIP EDGE-4 Peak Elev=1,317.95' Storage=2,207 cf Inflow=1.03 cfs 3,560 cf
Discarded=0.03 cfs 2,816 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 2,816 cf

Pond P8: BIORETENTION SYSTEM-2 Peak Elev=1,315.61' Storage=956 cf Inflow=1.60 cfs 5,330 cf
Discarded=0.39 cfs 1,141 cf Primary=0.84 cfs 4,189 cf Outflow=1.23 cfs 5,331 cf

Pond P9: BIORETENTION SYSTEM-1 Peak Elev=1,315.48' Storage=3,534 cf Inflow=4.03 cfs 13,404 cf
Discarded=0.47 cfs 2,159 cf Primary=1.30 cfs 10,406 cf Outflow=1.77 cfs 12,565 cf

Link POI 1: NORTHERN COUNTY ROAD Inflow=4.99 cfs 31,590 cf
Primary=4.99 cfs 31,590 cf

Link POI 2: SOUTHERN COUNTY ROAD Inflow=1.65 cfs 5,319 cf
Primary=1.65 cfs 5,319 cf

Link POI 3: ON-SITE WETLAND Inflow=33.84 cfs 149,983 cf
Primary=33.84 cfs 149,983 cf

Total Runoff Area = 998,266 sf Runoff Volume = 209,821 cf Average Runoff Depth = 2.52"
87.96% Pervious = 878,116 sf 12.04% Impervious = 120,150 sf

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Type III 24-hr 25-yr Rainfall=4.73"

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Summary for Subcatchment 1S: PDA 1

Runoff = 2.49 cfs @ 12.14 hrs, Volume= 8,894 cf, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=4.73"

Area (sf)	CN	Description
1,628	70	Woods, Good, HSG C
21,802	82	Row crops, SR + CR, Good, HSG C
17,587	74	>75% Grass cover, Good, HSG C
* 895	98	PROPOSED SIDEWALK
41,912		Weighted Average
41,017		97.86% Pervious Area
895		2.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 2.76"
3.4	200	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
9.5	250	Total			

Summary for Subcatchment 2S: PDA 2

Runoff = 3.28 cfs @ 12.17 hrs, Volume= 12,673 cf, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=4.73"

Area (sf)	CN	Description
12,394	70	Woods, Good, HSG C
16,837	82	Row crops, SR + CR, Good, HSG C
32,790	74	>75% Grass cover, Good, HSG C
* 0	98	EXISTING BUILDING
* 0	85	EXISTING GRAVEL
* 1,775	98	PROPOSED PAVEMENT
* 477	98	PROPOSED SIDEWALK
* 272	85	PROPOSED GRAVEL
64,545		Weighted Average
62,293		96.51% Pervious Area
2,252		3.49% Impervious Area

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Type III 24-hr 25-yr Rainfall=4.73"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.0200	0.29		Sheet Flow, Cultivated: Residue<=20% n= 0.060 P2= 2.76"
1.5	160	0.0380	1.75		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
0.7	54	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.9	467	0.0260	1.13		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
12.0	731	Total			

Summary for Subcatchment 3S: PDA 3

Runoff = 30.63 cfs @ 12.19 hrs, Volume= 123,287 cf, Depth= 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=4.73"

Area (sf)	CN	Description
397,606	70	Woods, Good, HSG C
259,089	82	Row crops, SR + CR, Good, HSG C
3,036	74	>75% Grass cover, Good, HSG C
* 1,434	98	EXISTING BUILDING
* 0	85	EXISTING GRAVEL
* 0	98	EXISTING PAVEMENT
661,165		Weighted Average
659,731		99.78% Pervious Area
1,434		0.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0300	0.15		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.76"
4.6	527	0.0450	1.91		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
3.2	285	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
13.5	862	Total			

Summary for Subcatchment 4S: PDA 4

Runoff = 1.05 cfs @ 12.07 hrs, Volume= 3,605 cf, Depth= 4.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=4.73"

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Type III 24-hr 25-yr Rainfall=4.73"

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	Area (sf)	CN	Description
*	7,319	98	PROPOSED BUILDING
*	2,001	85	PROPOSED GRAVEL
*	95	98	PROPOSED SIDEWALK
*	825	98	PROPOSED DECK
	10,240		Weighted Average
	2,001		19.54% Pervious Area
	8,239		80.46% Impervious Area

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

Summary for Subcatchment 5S: PDA 5

Runoff = 1.05 cfs @ 12.07 hrs, Volume= 3,601 cf, Depth= 4.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=4.73"

	Area (sf)	CN	Description
*	7,319	98	PROPOSED BUILDING
*	1,990	85	PROPOSED GRAVEL
*	90	98	PROPOSED SIDEWALK
*	825	98	PROPOSED DECK
	10,224		Weighted Average
	1,990		19.46% Pervious Area
	8,234		80.54% Impervious Area

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

Summary for Subcatchment 6S: PDA 6

Runoff = 1.05 cfs @ 12.07 hrs, Volume= 3,601 cf, Depth= 4.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=4.73"

	Area (sf)	CN	Description
*	7,319	98	PROPOSED BUILDING
*	1,990	85	PROPOSED GRAVEL
*	90	98	PROPOSED SIDEWALK
*	825	98	PROPOSED DECK
	10,224		Weighted Average
	1,990		19.46% Pervious Area
	8,234		80.54% Impervious Area

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Type III 24-hr 25-yr Rainfall=4.73"

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

Summary for Subcatchment 7S: PDA 7

Runoff = 1.03 cfs @ 12.07 hrs, Volume= 3,560 cf, Depth= 4.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=4.73"

Area (sf)	CN	Description
* 7,319	98	PROPOSED BUILDING
* 1,910	85	PROPOSED GRAVEL
* 80	98	PROPOSED SIDEWALK
* 781	98	PROPOSED DECK
10,090		Weighted Average
1,910		18.93% Pervious Area
8,180		81.07% Impervious Area

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

Summary for Subcatchment 8S: PDA 8

Runoff = 1.65 cfs @ 12.08 hrs, Volume= 5,319 cf, Depth= 2.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=4.73"

Area (sf)	CN	Description
590	70	Woods, Good, HSG C
5,875	82	Row crops, SR + CR, Good, HSG C
9,449	74	>75% Grass cover, Good, HSG C
* 4,068	98	EXISTING BUILDING
* 1,939	85	EXISTING GRAVEL
* 0	98	EXISTING PAVEMENT
* 454	85	PROPOSED GRAVEL
22,375		Weighted Average
18,307		81.82% Pervious Area
4,068		18.18% Impervious Area

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

Summary for Subcatchment 9S: PDA 9

Runoff = 1.03 cfs @ 12.07 hrs, Volume= 3,526 cf, Depth= 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=4.73"

Area (sf)	CN	Description
* 1,249	98	EXISTING BUILDING
* 6,074	98	PROPOSED PAVEMENT
0	70	Woods, Good, HSG C
4,371	74	>75% Grass cover, Good, HSG C
11,694		Weighted Average
4,371		37.38% Pervious Area
7,323		62.62% Impervious Area

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

Summary for Subcatchment 10S: PDA 10

Runoff = 1.60 cfs @ 12.07 hrs, Volume= 5,330 cf, Depth= 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=4.73"

Area (sf)	CN	Description
* 471	98	PROPOSED SIDEWALK
* 7,909	98	PROPOSED PAVEMENT
12,230	74	>75% Grass cover, Good, HSG C
20,610		Weighted Average
12,230		59.34% Pervious Area
8,380		40.66% Impervious Area

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

Summary for Subcatchment 11S: PDA 11

Runoff = 4.03 cfs @ 12.08 hrs, Volume= 13,366 cf, Depth= 2.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=4.73"

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Type III 24-hr 25-yr Rainfall=4.73"

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Area (sf)	CN	Description
2,165	70	Woods, Good, HSG C
* 4,346	98	PROPOSED SIDEWALK
* 13,363	98	PROPOSED PAVEMENT
35,723	74	>75% Grass cover, Good, HSG C
55,597		Weighted Average
37,888		68.15% Pervious Area
17,709		31.85% Impervious Area

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

Summary for Subcatchment 12S: PDA 12

Runoff = 1.11 cfs @ 12.08 hrs, Volume= 3,440 cf, Depth= 2.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=4.73"

Area (sf)	CN	Description
19,190	74	>75% Grass cover, Good, HSG C
* 0	98	PROPOSED SIDEWALK
* 0	98	PROPOSED PAVEMENT
19,190		Weighted Average
19,190		100.00% Pervious Area

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

Summary for Subcatchment 13S: PDA 13

Runoff = 2.52 cfs @ 12.07 hrs, Volume= 8,654 cf, Depth= 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=4.73"

Area (sf)	CN	Description
* 16,525	98	PROPOSED PAVEMENT
* 1,855	98	PROPOSED SIDEWALK
1,724	70	Woods, Good, HSG C
6,685	74	>75% Grass cover, Good, HSG C
* 825	98	PROPOSED DECK
27,614		Weighted Average
8,409		30.45% Pervious Area
19,205		69.55% Impervious Area

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

Summary for Subcatchment 14S: PDA 14

Runoff = 0.26 cfs @ 12.07 hrs, Volume= 900 cf, Depth= 4.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=4.73"

Area (sf)	CN	Description
* 2,054	98	PROPOSED PATIO
* 247	98	PROPOSED SIDEWALK
216	74	>75% Grass cover, Good, HSG C
2,517		Weighted Average
216		8.58% Pervious Area
2,301		91.42% Impervious Area

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

Summary for Subcatchment 15S: PDA 15

Runoff = 1.80 cfs @ 12.07 hrs, Volume= 6,229 cf, Depth= 3.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=4.73"

Area (sf)	CN	Description
* 14,383	98	PROPOSED PAVEMENT
* 253	98	PROPOSED SIDEWALK
4,177	74	>75% Grass cover, Good, HSG C
18,813		Weighted Average
4,177		22.20% Pervious Area
14,636		77.80% Impervious Area

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

Summary for Subcatchment 16S: PDA 16

Runoff = 1.03 cfs @ 12.07 hrs, Volume= 3,565 cf, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=4.73"

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Type III 24-hr 25-yr Rainfall=4.73"

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	Area (sf)	CN	Description
*	7,604	98	PROPOSED PAVEMENT
*	856	98	PROPOSED SIDEWALK
	2,216	74	>75% Grass cover, Good, HSG C
	10,676		Weighted Average
	2,216		20.76% Pervious Area
	8,460		79.24% Impervious Area

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

Summary for Subcatchment 17S: PDA 17

Runoff = 0.09 cfs @ 12.00 hrs, Volume= 271 cf, Depth= 4.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=4.73"

	Area (sf)	CN	Description
*	600	98	PROPOSED PAVILION
*	180	85	PROPOSED GRAVEL
	780		Weighted Average
	180		23.08% Pervious Area
	600		76.92% Impervious Area

Summary for Reach R2: EXISTING REACH-2

Inflow Area = 89,974 sf, 40.64% Impervious, Inflow Depth > 2.07" for 25-yr event
Inflow = 0.99 cfs @ 12.61 hrs, Volume= 15,515 cf
Outflow = 0.98 cfs @ 12.67 hrs, Volume= 15,507 cf, Atten= 0%, Lag= 3.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.44 fps, Min. Travel Time= 5.5 min
Avg. Velocity = 0.55 fps, Avg. Travel Time= 14.5 min

Peak Storage= 325 cf @ 12.67 hrs
Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 0.25' Flow Area= 2.2 sf, Capacity= 6.31 cfs

8.00' x 0.25' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.0 ' / ' Top Width= 9.50'
Length= 474.0' Slope= 0.0169 ' / '
Inlet Invert= 1,316.00', Outlet Invert= 1,308.00'



Summary for Reach R3: EXISTING REACH-3

Inflow Area = 39,956 sf, 41.65% Impervious, Inflow Depth = 2.10" for 25-yr event
Inflow = 2.10 cfs @ 12.09 hrs, Volume= 7,005 cf
Outflow = 1.97 cfs @ 12.12 hrs, Volume= 7,005 cf, Atten= 6%, Lag= 1.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.44 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 0.29 fps, Avg. Travel Time= 15.1 min

Peak Storage= 363 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 0.25' Flow Area= 2.2 sf, Capacity= 4.20 cfs

8.00' x 0.25' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.0 '/' Top Width= 9.50'
Length= 268.0' Slope= 0.0075 '/'
Inlet Invert= 1,310.00', Outlet Invert= 1,308.00'



Summary for Reach R4: EXISTING REACH-4

Inflow Area = 150,540 sf, 40.91% Impervious, Inflow Depth > 2.13" for 25-yr event
Inflow = 3.32 cfs @ 12.14 hrs, Volume= 26,701 cf
Outflow = 3.27 cfs @ 12.17 hrs, Volume= 26,696 cf, Atten= 2%, Lag= 1.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.68 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 0.89 fps, Avg. Travel Time= 11.0 min

Peak Storage= 518 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 0.25' Flow Area= 2.2 sf, Capacity= 13.89 cfs

8.00' x 0.25' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.0 '/' Top Width= 9.50'
Length= 587.0' Slope= 0.0818 '/'
Inlet Invert= 1,308.00', Outlet Invert= 1,260.00'



Summary for Reach R5: PROPOSED REACH-1

Inflow Area = 10,240 sf, 80.46% Impervious, Inflow Depth = 0.00" for 25-yr event
Inflow = 0.00 cfs @ 15.80 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 15.88 hrs, Volume= 0 cf, Atten= 89%, Lag= 4.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.19 fps, Min. Travel Time= 27.5 min
Avg. Velocity = 0.19 fps, Avg. Travel Time= 27.5 min

Peak Storage= 0 cf @ 15.88 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.25' Flow Area= 1.7 sf, Capacity= 6.30 cfs

6.00' x 0.25' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.0 '/' Top Width= 7.50'
Length= 308.0' Slope= 0.0292 '/'
Inlet Invert= 1,317.00', Outlet Invert= 1,308.00'



Summary for Reach R6: PROPOSED REACH-2

Inflow Area = 10,224 sf, 80.54% Impervious, Inflow Depth = 0.00" for 25-yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.25' Flow Area= 1.7 sf, Capacity= 5.94 cfs

6.00' x 0.25' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.0 '/' Top Width= 7.50'
Length= 250.0' Slope= 0.0260 '/'
Inlet Invert= 1,322.50', Outlet Invert= 1,316.00'



Summary for Reach R7: PROPOSED REACH-7

Inflow Area = 20,610 sf, 40.66% Impervious, Inflow Depth = 2.44" for 25-yr event
Inflow = 0.84 cfs @ 12.16 hrs, Volume= 4,189 cf
Outflow = 0.83 cfs @ 12.19 hrs, Volume= 4,189 cf, Atten= 1%, Lag= 1.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.55 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 0.46 fps, Avg. Travel Time= 8.1 min

Peak Storage= 120 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 0.25' Flow Area= 2.2 sf, Capacity= 7.95 cfs

8.00' x 0.25' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.0 '/' Top Width= 9.50'
Length= 224.0' Slope= 0.0268 '/'
Inlet Invert= 1,314.00', Outlet Invert= 1,308.00'



Summary for Reach R8: TREATMENT SWALE-1

Inflow Area = 79,750 sf, 35.53% Impervious, Inflow Depth > 2.33" for 25-yr event
Inflow = 0.99 cfs @ 12.58 hrs, Volume= 15,518 cf
Outflow = 0.99 cfs @ 12.61 hrs, Volume= 15,515 cf, Atten= 0%, Lag= 1.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.88 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 0.34 fps, Avg. Travel Time= 6.4 min

Peak Storage= 145 cf @ 12.61 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 0.50' Flow Area= 4.8 sf, Capacity= 9.41 cfs

8.00' x 0.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 130.0' Slope= 0.0050 '/'
Inlet Invert= 313.40', Outlet Invert= 312.75'



Summary for Reach R9: TREATMENT SWALE-2

Inflow Area = 10,676 sf, 79.24% Impervious, Inflow Depth = 4.01" for 25-yr event
 Inflow = 1.03 cfs @ 12.07 hrs, Volume= 3,565 cf
 Outflow = 1.01 cfs @ 12.10 hrs, Volume= 3,565 cf, Atten= 3%, Lag= 1.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.89 fps, Min. Travel Time= 1.9 min
 Avg. Velocity = 0.21 fps, Avg. Travel Time= 8.0 min

Peak Storage= 113 cf @ 12.10 hrs
 Average Depth at Peak Storage= 0.13'
 Bank-Full Depth= 0.50' Flow Area= 4.8 sf, Capacity= 9.41 cfs

8.00' x 0.50' deep channel, n= 0.030 Earth, grassed & winding
 Side Slope Z-value= 3.0 '/' Top Width= 11.00'
 Length= 100.0' Slope= 0.0050 '/'
 Inlet Invert= 1,309.90', Outlet Invert= 1,309.40'



Summary for Pond CB1: CB-1

Inflow Area = 10,676 sf, 79.24% Impervious, Inflow Depth = 4.01" for 25-yr event
 Inflow = 1.03 cfs @ 12.07 hrs, Volume= 3,565 cf
 Outflow = 1.03 cfs @ 12.07 hrs, Volume= 3,565 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.03 cfs @ 12.07 hrs, Volume= 3,565 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,310.80' @ 12.07 hrs
 Flood Elev= 1,313.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,310.20'	12.0" Round Culvert L= 58.0' Ke= 0.500 Inlet / Outlet Invert= 1,310.20' / 1,309.91' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.99 cfs @ 12.07 hrs HW=1,310.79' TW=1,310.03' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 0.99 cfs @ 2.96 fps)

Summary for Pond CB2: CB-2

Inflow Area = 75,190 sf, 43.82% Impervious, Inflow Depth = 2.65" for 25-yr event
 Inflow = 2.97 cfs @ 12.07 hrs, Volume= 16,636 cf
 Outflow = 2.97 cfs @ 12.07 hrs, Volume= 16,636 cf, Atten= 0%, Lag= 0.0 min
 Primary = 2.97 cfs @ 12.07 hrs, Volume= 16,636 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 1,314.02' @ 12.07 hrs

Flood Elev= 1,312.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,307.00'	18.0" Round Culvert L= 92.0' Ke= 0.500 Inlet / Outlet Invert= 1,307.00' / 1,306.22' S= 0.0085 '/' Cc= 0.900 n= 0.120, Flow Area= 1.77 sf

Primary OutFlow Max=2.88 cfs @ 12.07 hrs HW=1,313.71' TW=1,306.90' (Dynamic Tailwater)

↑**1=Culvert** (Barrel Controls 2.88 cfs @ 1.63 fps)

Summary for Pond CB3: CB-3

Inflow Area = 86,884 sf, 46.35% Impervious, Inflow Depth = 2.78" for 25-yr event
 Inflow = 4.00 cfs @ 12.07 hrs, Volume= 20,161 cf
 Outflow = 4.00 cfs @ 12.07 hrs, Volume= 20,161 cf, Atten= 0%, Lag= 0.0 min
 Primary = 2.23 cfs @ 12.07 hrs, Volume= 12,399 cf
 Secondary = 2.03 cfs @ 12.41 hrs, Volume= 7,762 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 1,306.96' @ 12.41 hrs

Flood Elev= 1,310.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,306.12'	18.0" Round Culvert L= 12.0' Ke= 0.500 Inlet / Outlet Invert= 1,306.12' / 1,306.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	1,306.40'	1.5' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=2.17 cfs @ 12.07 hrs HW=1,306.90' TW=1,306.42' (Dynamic Tailwater)

↑**1=Culvert** (Barrel Controls 2.17 cfs @ 3.42 fps)

Secondary OutFlow Max=2.02 cfs @ 12.41 hrs HW=1,306.96' TW=0.00' (Dynamic Tailwater)

↑**2=Sharp-Crested Rectangular Weir** (Weir Controls 2.02 cfs @ 2.61 fps)

Summary for Pond CB4: CB-4

Inflow Area = 27,614 sf, 69.55% Impervious, Inflow Depth = 3.76" for 25-yr event
 Inflow = 2.52 cfs @ 12.07 hrs, Volume= 8,654 cf
 Outflow = 2.52 cfs @ 12.07 hrs, Volume= 8,654 cf, Atten= 0%, Lag= 0.0 min
 Primary = 2.52 cfs @ 12.07 hrs, Volume= 8,654 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 1,314.84' @ 12.62 hrs

Flood Elev= 1,318.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,313.75'	15.0" Round Culvert L= 20.0' Ke= 0.500

Inlet / Outlet Invert= 1,313.75' / 1,313.65' S= 0.0050 '/' Cc= 0.900
 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.43 cfs @ 12.07 hrs HW=1,314.69' TW=1,314.24' (Dynamic Tailwater)

1=Culvert (Barrel Controls 2.43 cfs @ 3.40 fps)

Summary for Pond P1: DETENTION POND-1

Inflow Area = 79,750 sf, 35.53% Impervious, Inflow Depth = 2.64" for 25-yr event
 Inflow = 4.76 cfs @ 12.10 hrs, Volume= 17,548 cf
 Outflow = 0.99 cfs @ 12.58 hrs, Volume= 15,518 cf, Atten= 79%, Lag= 28.6 min
 Primary = 0.99 cfs @ 12.58 hrs, Volume= 15,518 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,314.84' @ 12.58 hrs Surf.Area= 5,375 sf Storage= 8,231 cf
 Flood Elev= 1,316.00' Surf.Area= 6,550 sf Storage= 15,150 cf

Plug-Flow detention time= 184.4 min calculated for 15,496 cf (88% of inflow)
 Center-of-Mass det. time= 130.5 min (926.7 - 796.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,313.00'	15,150 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,313.00	3,625	0	0
1,314.00	4,525	4,075	4,075
1,316.00	6,550	11,075	15,150

Device	Routing	Invert	Outlet Devices
#1	Primary	1,313.50'	12.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 1,313.50' / 1,312.63' S= 0.0435 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	1,315.00'	6.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	1,313.50'	6.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.99 cfs @ 12.58 hrs HW=1,314.84' TW=313.53' (Dynamic Tailwater)

1=Culvert (Passes 0.99 cfs of 3.46 cfs potential flow)

2=Orifice/Grate (Controls 0.00 cfs)

3=Orifice/Grate (Orifice Controls 0.99 cfs @ 5.02 fps)

Summary for Pond P10: PERVIOUS PAVERS

Inflow Area = 2,517 sf, 91.42% Impervious, Inflow Depth = 4.29" for 25-yr event
 Inflow = 0.26 cfs @ 12.07 hrs, Volume= 900 cf
 Outflow = 0.01 cfs @ 13.83 hrs, Volume= 902 cf, Atten= 94%, Lag= 105.4 min
 Discarded = 0.01 cfs @ 13.83 hrs, Volume= 902 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

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Type III 24-hr 25-yr Rainfall=4.73"

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Peak Elev= 1,310.46' @ 13.83 hrs Surf.Area= 2,050 sf Storage= 379 cf
 Flood Elev= 1,312.00' Surf.Area= 2,050 sf Storage= 1,640 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 206.6 min (958.6 - 751.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,310.00'	1,640 cf	Custom Stage Data (Conic) Listed below (Recalc) 4,100 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,310.00	2,050	0	0	2,050
1,312.00	2,050	4,100	4,100	2,371

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,310.00'	0.300 in/hr Exfiltration over Wetted area
#2	Primary	1,312.00'	40.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.01 cfs @ 13.83 hrs HW=1,310.46' (Free Discharge)
 ↖1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,310.00' TW=0.00' (Dynamic Tailwater)
 ↖2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond P12: DRIP EDGE-5

Inflow Area = 780 sf, 76.92% Impervious, Inflow Depth = 4.18" for 25-yr event
 Inflow = 0.09 cfs @ 12.00 hrs, Volume= 271 cf
 Outflow = 0.02 cfs @ 12.41 hrs, Volume= 224 cf, Atten= 79%, Lag= 24.8 min
 Discarded = 0.00 cfs @ 12.40 hrs, Volume= 187 cf
 Primary = 0.02 cfs @ 12.41 hrs, Volume= 38 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,315.90' @ 12.40 hrs Surf.Area= 180 sf Storage= 137 cf
 Flood Elev= 1,316.00' Surf.Area= 180 sf Storage= 144 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 403.7 min (1,157.5 - 753.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,314.00'	144 cf	Custom Stage Data (Conic) Listed below (Recalc) 360 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,314.00	180	0	0	180
1,316.00	180	360	360	275

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,314.00'	0.300 in/hr Exfiltration over Wetted area
#2	Primary	1,315.90'	20.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 12.40 hrs HW=1,315.90' (Free Discharge)

↳ **1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.01 cfs @ 12.41 hrs HW=1,315.90' TW=1,315.42' (Dynamic Tailwater)

↳ **2=Broad-Crested Rectangular Weir** (Weir Controls 0.01 cfs @ 0.17 fps)

Summary for Pond P2: DETENTION SYSTEM-1

Inflow Area = 86,884 sf, 46.35% Impervious, Inflow Depth = 1.71" for 25-yr event
 Inflow = 2.23 cfs @ 12.07 hrs, Volume= 12,399 cf
 Outflow = 0.94 cfs @ 12.61 hrs, Volume= 11,201 cf, Atten= 58%, Lag= 32.4 min
 Primary = 0.94 cfs @ 12.61 hrs, Volume= 11,201 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,306.96' @ 12.36 hrs Surf.Area= 2,263 sf Storage= 4,464 cf
 Flood Elev= 1,308.00' Surf.Area= 2,263 sf Storage= 5,657 cf

Plug-Flow detention time= 192.8 min calculated for 11,201 cf (90% of inflow)
 Center-of-Mass det. time= 141.6 min (971.9 - 830.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	1,304.00'	2,264 cf	36.50'W x 62.00'L x 4.00'H Field A 9,052 cf Overall - 3,393 cf Embedded = 5,659 cf x 40.0% Voids
#2A	1,304.50'	3,393 cf	CMP Round 36 x 24 Inside #1 Effective Size= 36.0"W x 36.0"H => 7.07 sf x 20.00'L = 141.4 cf Overall Size= 36.0"W x 36.0"H x 20.00'L 24 Chambers in 8 Rows
		5,657 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	1,305.00'	12.0" Round Culvert L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 1,305.00' / 1,304.75' S= 0.0250 ' / Cc= 0.900 n= 0.120, Flow Area= 0.79 sf
#2	Device 1	1,305.00'	8.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	1,307.00'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 0.5' Crest Height

Primary OutFlow Max=0.41 cfs @ 12.61 hrs HW=1,306.81' TW=1,306.69' (Dynamic Tailwater)

↳ **1=Culvert** (Outlet Controls 0.41 cfs @ 0.52 fps)

↳ **2=Orifice/Grate** (Passes 0.41 cfs of 0.58 cfs potential flow)

↳ **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond P3: FILTRATION SYSTEM-1

Inflow Area = 86,884 sf, 46.35% Impervious, Inflow Depth > 1.55" for 25-yr event
 Inflow = 0.94 cfs @ 12.61 hrs, Volume= 11,201 cf
 Outflow = 0.40 cfs @ 12.67 hrs, Volume= 11,155 cf, Atten= 57%, Lag= 3.2 min
 Primary = 0.40 cfs @ 12.67 hrs, Volume= 11,155 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,307.32' @ 12.67 hrs Surf.Area= 88 sf Storage= 336 cf
 Flood Elev= 1,309.50' Surf.Area= 88 sf Storage= 528 cf

Plug-Flow detention time= 13.8 min calculated for 11,155 cf (100% of inflow)
 Center-of-Mass det. time= 9.8 min (981.7 - 971.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,303.50'	528 cf	8.00'W x 11.00'L x 6.00'H Prisma

Device	Routing	Invert	Outlet Devices (Turned on 1 times)
#1	Device 2	1,303.50'	Tube/Siphon/Float Valve X 14.00 0.772" Diameter, C= 0.600, 0.263" Trickle Diameter Starts@1,305.00' Breaks@1,303.87'
#2	Primary	1,304.00'	12.0" Round Culvert L= 94.0' Ke= 0.500 Inlet / Outlet Invert= 1,304.00' / 1,303.43' S= 0.0061 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.39 cfs @ 12.67 hrs HW=1,307.22' TW=0.00' (Dynamic Tailwater)
 ↑ **2=Culvert** (Passes 0.39 cfs of 5.25 cfs potential flow)
 ↑ **1=Tube/Siphon/Float Valve** (Orifice Controls 0.39 cfs @ 8.64 fps)

Summary for Pond P4: DRIP EDGE-1

Inflow Area = 10,240 sf, 80.46% Impervious, Inflow Depth = 4.23" for 25-yr event
 Inflow = 1.05 cfs @ 12.07 hrs, Volume= 3,605 cf
 Outflow = 0.03 cfs @ 15.80 hrs, Volume= 2,837 cf, Atten= 97%, Lag= 223.9 min
 Discarded = 0.03 cfs @ 15.81 hrs, Volume= 2,837 cf
 Primary = 0.00 cfs @ 15.80 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,317.49' @ 15.81 hrs Surf.Area= 2,250 sf Storage= 2,241 cf
 Flood Elev= 1,317.50' Surf.Area= 2,250 sf Storage= 2,250 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 485.2 min (1,242.0 - 756.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,315.00'	2,250 cf	5.00'W x 450.00'L x 2.50'H Prisma 5,625 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,315.00'	0.300 in/hr Exfiltration over Wetted area
#2	Primary	1,317.49'	450.0' long x 1.0' breadth Broad-Crested Rectangular Weir

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
 2.50 3.00
 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31
 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 15.81 hrs HW=1,317.49' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 15.80 hrs HW=1,317.49' TW=1,317.00' (Dynamic Tailwater)

↑2=Broad-Crested Rectangular Weir (Weir Controls 0.00 cfs @ 0.03 fps)

Summary for Pond P5: DRIP EDGE-2

Inflow Area = 10,224 sf, 80.54% Impervious, Inflow Depth = 4.23" for 25-yr event
 Inflow = 1.05 cfs @ 12.07 hrs, Volume= 3,601 cf
 Outflow = 0.03 cfs @ 15.85 hrs, Volume= 2,835 cf, Atten= 97%, Lag= 226.8 min
 Discarded = 0.03 cfs @ 15.85 hrs, Volume= 2,835 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,322.49' @ 15.85 hrs Surf.Area= 2,250 sf Storage= 2,238 cf
 Flood Elev= 1,322.50' Surf.Area= 2,250 sf Storage= 2,250 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 485.2 min (1,242.0 - 756.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,320.00'	2,250 cf	5.00'W x 450.00'L x 2.50'H Prismatic 5,625 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,320.00'	0.300 in/hr Exfiltration over Wetted area
#2	Primary	1,322.49'	450.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 15.85 hrs HW=1,322.49' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,320.00' TW=1,322.50' (Dynamic Tailwater)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond P6: DRIP EDGE-3

Inflow Area = 10,224 sf, 80.54% Impervious, Inflow Depth = 4.23" for 25-yr event
 Inflow = 1.05 cfs @ 12.07 hrs, Volume= 3,601 cf
 Outflow = 0.03 cfs @ 15.85 hrs, Volume= 2,835 cf, Atten= 97%, Lag= 226.8 min
 Discarded = 0.03 cfs @ 15.85 hrs, Volume= 2,835 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

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Type III 24-hr 25-yr Rainfall=4.73"

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,317.99' @ 15.85 hrs Surf.Area= 2,250 sf Storage= 2,238 cf
Flood Elev= 1,318.00' Surf.Area= 2,250 sf Storage= 2,250 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 485.2 min (1,242.0 - 756.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,315.50'	2,250 cf	5.00'W x 450.00'L x 2.50'H Prismaoid 5,625 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,315.50'	0.300 in/hr Exfiltration over Wetted area
#2	Primary	1,317.99'	450.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 15.85 hrs HW=1,317.99' (Free Discharge)
↑1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,315.50' TW=1,316.00' (Dynamic Tailwater)
↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond P7: DRIP EDGE-4

Inflow Area = 10,090 sf, 81.07% Impervious, Inflow Depth = 4.23" for 25-yr event
 Inflow = 1.03 cfs @ 12.07 hrs, Volume= 3,560 cf
 Outflow = 0.03 cfs @ 15.84 hrs, Volume= 2,816 cf, Atten= 97%, Lag= 225.9 min
 Discarded = 0.03 cfs @ 15.84 hrs, Volume= 2,816 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 1,317.95' @ 15.84 hrs Surf.Area= 2,250 sf Storage= 2,207 cf
Flood Elev= 1,318.00' Surf.Area= 2,250 sf Storage= 2,250 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 484.8 min (1,241.3 - 756.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,315.50'	2,250 cf	5.00'W x 450.00'L x 2.50'H Prismaoid 5,625 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,315.50'	0.300 in/hr Exfiltration over Wetted area
#2	Primary	1,317.99'	450.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 15.84 hrs HW=1,317.95' (Free Discharge)

↳1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,315.50' TW=1,310.00' (Dynamic Tailwater)

↳2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond P8: BIORETENTION SYSTEM-2

Inflow Area = 20,610 sf, 40.66% Impervious, Inflow Depth = 3.10" for 25-yr event
 Inflow = 1.60 cfs @ 12.07 hrs, Volume= 5,330 cf
 Outflow = 1.23 cfs @ 12.17 hrs, Volume= 5,331 cf, Atten= 23%, Lag= 5.9 min
 Discarded = 0.39 cfs @ 12.18 hrs, Volume= 1,141 cf
 Primary = 0.84 cfs @ 12.16 hrs, Volume= 4,189 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,315.61' @ 12.16 hrs Surf.Area= 2,975 sf Storage= 956 cf
 Flood Elev= 1,316.00' Surf.Area= 3,300 sf Storage= 1,594 cf

Plug-Flow detention time= 58.4 min calculated for 5,323 cf (100% of inflow)
 Center-of-Mass det. time= 58.9 min (844.4 - 785.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,315.58'	683 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2	1,314.08'	892 cf	15.00'W x 100.00'L x 1.50'H Prismatic 2,250 cf Overall - 20 cf Embedded = 2,230 cf x 40.0% Voids
#3	1,314.40'	20 cf	6.0" Round Pipe Storage Inside #2 L= 100.0'
		1,594 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,315.58	1,450	0	0
1,316.00	1,800	683	683

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,314.08'	10.000 in/hr Exfiltration over Surface area from 1,314.08' - 1,315.58' Excluded Surface area = 1,500 sf
#2	Discarded	1,314.08'	0.300 in/hr Exfiltration over Surface area from 1,313.08' - 1,314.08' Excluded Surface area = 0 sf
#3	Primary	1,314.40'	6.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 1,314.40' / 1,314.30' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Discarded OutFlow Max=0.35 cfs @ 12.18 hrs HW=1,315.60' (Free Discharge)

↳1=Exfiltration (Exfiltration Controls 0.34 cfs)

↳2=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.84 cfs @ 12.16 hrs HW=1,315.60' TW=1,314.07' (Dynamic Tailwater)

↳3=Culvert (Barrel Controls 0.84 cfs @ 4.26 fps)

Summary for Pond P9: BIORETENTION SYSTEM-1

Inflow Area = 56,377 sf, 32.48% Impervious, Inflow Depth = 2.85" for 25-yr event
 Inflow = 4.03 cfs @ 12.08 hrs, Volume= 13,404 cf
 Outflow = 1.77 cfs @ 12.27 hrs, Volume= 12,565 cf, Atten= 56%, Lag= 11.9 min
 Discarded = 0.47 cfs @ 12.05 hrs, Volume= 2,159 cf
 Primary = 1.30 cfs @ 12.27 hrs, Volume= 10,406 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,315.48' @ 12.27 hrs Surf.Area= 6,416 sf Storage= 3,534 cf
 Flood Elev= 1,316.00' Surf.Area= 6,700 sf Storage= 4,753 cf

Plug-Flow detention time= 103.2 min calculated for 12,565 cf (94% of inflow)
 Center-of-Mass det. time= 68.8 min (863.1 - 794.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,315.00'	2,225 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2	1,313.00'	1,675 cf	30.00'W x 70.00'L x 2.00'H Prismatic 4,200 cf Overall - 14 cf Embedded = 4,186 cf x 40.0% Voids
#3	1,313.33'	14 cf	6.0" Round Pipe Storage Inside #2 L= 70.0'
#4	1,312.00'	840 cf	30.00'W x 70.00'L x 1.00'H Prismatic 2,100 cf Overall x 40.0% Voids
		4,753 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,315.00	1,950	0	0
1,316.00	2,500	2,225	2,225

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,313.00'	10.000 in/hr Exfiltration over Surface area from 1,313.00' - 1,315.00' Excluded Surface area = 4,200 sf
#2	Discarded	1,312.00'	0.300 in/hr Exfiltration over Surface area from 1,312.00' - 1,313.00' Excluded Surface area = 2,100 sf
#3	Primary	1,313.33'	12.0" Round Culvert L= 143.0' Ke= 0.500 Inlet / Outlet Invert= 1,313.33' / 1,308.00' S= 0.0373 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#4	Device 3	1,313.33'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.47 cfs @ 12.05 hrs HW=1,315.04' (Free Discharge)

- ↑ 1=Exfiltration (Exfiltration Controls 0.45 cfs)
- ↑ 2=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.30 cfs @ 12.27 hrs HW=1,315.48' TW=1,310.72' (Dynamic Tailwater)

- ↑ 3=Culvert (Passes 1.30 cfs of 4.86 cfs potential flow)
- ↑ 4=Orifice/Grate (Orifice Controls 1.30 cfs @ 6.64 fps)

Summary for Link POI 1: NORTHERN COUNTY ROAD

Inflow Area = 161,669 sf, 31.40% Impervious, Inflow Depth > 2.34" for 25-yr event
Inflow = 4.99 cfs @ 12.17 hrs, Volume= 31,590 cf
Primary = 4.99 cfs @ 12.17 hrs, Volume= 31,590 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link POI 2: SOUTHERN COUNTY ROAD

Inflow Area = 24,892 sf, 25.59% Impervious, Inflow Depth = 2.56" for 25-yr event
Inflow = 1.65 cfs @ 12.08 hrs, Volume= 5,319 cf
Primary = 1.65 cfs @ 12.08 hrs, Volume= 5,319 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link POI 3: ON-SITE WETLAND

Inflow Area = 811,705 sf, 7.76% Impervious, Inflow Depth = 2.22" for 25-yr event
Inflow = 33.84 cfs @ 12.19 hrs, Volume= 149,983 cf
Primary = 33.84 cfs @ 12.19 hrs, Volume= 149,983 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

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Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: PDA 1	Runoff Area=41,912 sf 2.14% Impervious Runoff Depth=3.27" Flow Length=250' Slope=0.0200 '/ Tc=9.5 min CN=WQ Runoff=3.19 cfs 11,404 cf
Subcatchment 2S: PDA 2	Runoff Area=64,545 sf 3.49% Impervious Runoff Depth=3.05" Flow Length=731' Tc=12.0 min CN=WQ Runoff=4.27 cfs 16,405 cf
Subcatchment 3S: PDA 3	Runoff Area=661,165 sf 0.22% Impervious Runoff Depth=2.92" Flow Length=862' Tc=13.5 min CN=WQ Runoff=40.17 cfs 160,724 cf
Subcatchment 4S: PDA 4	Runoff Area=10,240 sf 80.46% Impervious Runoff Depth=5.05" Tc=5.0 min CN=WQ Runoff=1.25 cfs 4,311 cf
Subcatchment 5S: PDA 5	Runoff Area=10,224 sf 80.54% Impervious Runoff Depth=5.05" Tc=5.0 min CN=WQ Runoff=1.24 cfs 4,305 cf
Subcatchment 6S: PDA 6	Runoff Area=10,224 sf 80.54% Impervious Runoff Depth=5.05" Tc=5.0 min CN=WQ Runoff=1.24 cfs 4,305 cf
Subcatchment 7S: PDA 7	Runoff Area=10,090 sf 81.07% Impervious Runoff Depth=5.06" Tc=5.0 min CN=WQ Runoff=1.23 cfs 4,255 cf
Subcatchment 8S: PDA 8	Runoff Area=22,375 sf 18.18% Impervious Runoff Depth=3.59" Tc=5.0 min CN=WQ Runoff=2.09 cfs 6,692 cf
Subcatchment 9S: PDA 9	Runoff Area=11,694 sf 62.62% Impervious Runoff Depth=4.40" Tc=5.0 min CN=WQ Runoff=1.26 cfs 4,284 cf
Subcatchment 10S: PDA 10	Runoff Area=20,610 sf 40.66% Impervious Runoff Depth=3.85" Tc=5.0 min CN=WQ Runoff=1.99 cfs 6,605 cf
Subcatchment 11S: PDA 11	Runoff Area=55,597 sf 31.85% Impervious Runoff Depth=3.61" Tc=5.0 min CN=WQ Runoff=5.10 cfs 16,730 cf
Subcatchment 12S: PDA 12	Runoff Area=19,190 sf 0.00% Impervious Runoff Depth=2.83" Tc=5.0 min CN=WQ Runoff=1.46 cfs 4,520 cf
Subcatchment 13S: PDA 13	Runoff Area=27,614 sf 69.55% Impervious Runoff Depth=4.55" Tc=5.0 min CN=WQ Runoff=3.04 cfs 10,463 cf
Subcatchment 14S: PDA 14	Runoff Area=2,517 sf 91.42% Impervious Runoff Depth=5.12" Tc=5.0 min CN=WQ Runoff=0.31 cfs 1,073 cf
Subcatchment 15S: PDA 15	Runoff Area=18,813 sf 77.80% Impervious Runoff Depth=4.78" Tc=5.0 min CN=WQ Runoff=2.16 cfs 7,488 cf
Subcatchment 16S: PDA 16	Runoff Area=10,676 sf 79.24% Impervious Runoff Depth=4.81" Tc=5.0 min CN=WQ Runoff=1.23 cfs 4,281 cf

Subcatchment 17S: PDA 17	Runoff Area=780 sf 76.92% Impervious Runoff Depth=5.00" Tc=0.0 min CN=WQ Runoff=0.11 cfs 325 cf
Reach R2: EXISTING REACH-2	Avg. Flow Depth=0.10' Max Vel=1.64 fps Inflow=1.62 cfs 20,937 cf n=0.025 L=474.0' S=0.0169 '/' Capacity=6.31 cfs Outflow=1.39 cfs 20,928 cf
Reach R3: EXISTING REACH-3	Avg. Flow Depth=0.18' Max Vel=1.58 fps Inflow=2.66 cfs 9,317 cf n=0.025 L=268.0' S=0.0075 '/' Capacity=4.20 cfs Outflow=2.51 cfs 9,317 cf
Reach R4: EXISTING REACH-4	Avg. Flow Depth=0.12' Max Vel=4.00 fps Inflow=4.06 cfs 35,441 cf n=0.025 L=587.0' S=0.0818 '/' Capacity=13.89 cfs Outflow=4.01 cfs 35,436 cf
Reach R5: PROPOSED REACH-1	Avg. Flow Depth=0.03' Max Vel=0.91 fps Inflow=0.39 cfs 562 cf n=0.025 L=308.0' S=0.0292 '/' Capacity=6.30 cfs Outflow=0.16 cfs 562 cf
Reach R6: PROPOSED REACH-2	Avg. Flow Depth=0.03' Max Vel=0.89 fps Inflow=0.39 cfs 547 cf n=0.025 L=250.0' S=0.0260 '/' Capacity=5.94 cfs Outflow=0.16 cfs 547 cf
Reach R7: PROPOSED REACH-7	Avg. Flow Depth=0.07' Max Vel=1.60 fps Inflow=0.90 cfs 5,196 cf n=0.025 L=224.0' S=0.0268 '/' Capacity=7.95 cfs Outflow=0.90 cfs 5,196 cf
Reach R8: TREATMENT SWALE-1	Avg. Flow Depth=0.15' Max Vel=0.96 fps Inflow=1.24 cfs 20,383 cf n=0.030 L=130.0' S=0.0050 '/' Capacity=9.41 cfs Outflow=1.24 cfs 20,380 cf
Reach R9: TREATMENT SWALE-2	Avg. Flow Depth=0.15' Max Vel=0.95 fps Inflow=1.23 cfs 4,281 cf n=0.030 L=100.0' S=0.0050 '/' Capacity=9.41 cfs Outflow=1.21 cfs 4,281 cf
Pond CB1: CB-1	Peak Elev=1,310.87' Inflow=1.23 cfs 4,281 cf 12.0" Round Culvert n=0.012 L=58.0' S=0.0050 '/' Outflow=1.23 cfs 4,281 cf
Pond CB2: CB-2	Peak Elev=1,315.73' Inflow=3.34 cfs 20,698 cf 18.0" Round Culvert n=0.120 L=92.0' S=0.0085 '/' Outflow=3.34 cfs 20,698 cf
Pond CB3: CB-3	Peak Elev=1,307.10' Inflow=4.54 cfs 24,982 cf Primary=2.50 cfs 13,990 cf Secondary=2.82 cfs 10,992 cf Outflow=4.54 cfs 24,982 cf
Pond CB4: CB-4	Peak Elev=1,315.19' Inflow=3.04 cfs 10,463 cf 15.0" Round Culvert n=0.012 L=20.0' S=0.0050 '/' Outflow=3.04 cfs 10,463 cf
Pond P1: DETENTION POND-1	Peak Elev=1,315.19' Storage=10,178 cf Inflow=5.93 cfs 22,415 cf Outflow=1.24 cfs 20,383 cf
Pond P10: PERVIOUS PAVERS	Peak Elev=1,310.59' Storage=485 cf Inflow=0.31 cfs 1,073 cf Discarded=0.01 cfs 1,075 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 1,075 cf
Pond P12: DRIP EDGE-5	Peak Elev=1,315.98' Storage=143 cf Inflow=0.11 cfs 325 cf Discarded=0.00 cfs 191 cf Primary=0.08 cfs 83 cf Outflow=0.08 cfs 274 cf
Pond P2: DETENTION SYSTEM-1	Peak Elev=1,307.10' Storage=4,683 cf Inflow=2.50 cfs 13,990 cf Outflow=0.88 cfs 12,791 cf
Pond P3: FILTRATION SYSTEM-1	Peak Elev=1,307.35' Storage=339 cf Inflow=0.88 cfs 12,791 cf Outflow=0.40 cfs 12,745 cf

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Pond P4: DRIP EDGE-1 Peak Elev=1,317.49' Storage=2,245 cf Inflow=1.25 cfs 4,311 cf
Discarded=0.03 cfs 2,927 cf Primary=0.39 cfs 562 cf Outflow=0.43 cfs 3,489 cf

Pond P5: DRIP EDGE-2 Peak Elev=1,322.53' Storage=2,250 cf Inflow=1.24 cfs 4,305 cf
Discarded=0.03 cfs 2,931 cf Primary=0.39 cfs 547 cf Outflow=0.43 cfs 3,478 cf

Pond P6: DRIP EDGE-3 Peak Elev=1,317.99' Storage=2,245 cf Inflow=1.24 cfs 4,305 cf
Discarded=0.03 cfs 2,926 cf Primary=0.42 cfs 557 cf Outflow=0.45 cfs 3,484 cf

Pond P7: DRIP EDGE-4 Peak Elev=1,317.99' Storage=2,244 cf Inflow=1.23 cfs 4,255 cf
Discarded=0.03 cfs 2,922 cf Primary=0.22 cfs 515 cf Outflow=0.25 cfs 3,438 cf

Pond P8: BIORETENTION SYSTEM-2 Peak Elev=1,315.73' Storage=1,133 cf Inflow=1.99 cfs 6,605 cf
Discarded=0.35 cfs 1,409 cf Primary=0.90 cfs 5,196 cf Outflow=1.24 cfs 6,606 cf

Pond P9: BIORETENTION SYSTEM-1 Peak Elev=1,315.98' Storage=4,709 cf Inflow=5.10 cfs 16,812 cf
Discarded=0.47 cfs 2,762 cf Primary=1.47 cfs 13,211 cf Outflow=1.93 cfs 15,972 cf

Link POI 1: NORTHERN COUNTY ROAD Inflow=6.94 cfs 40,704 cf
Primary=6.94 cfs 40,704 cf

Link POI 2: SOUTHERN COUNTY ROAD Inflow=2.09 cfs 6,692 cf
Primary=2.09 cfs 6,692 cf

Link POI 3: ON-SITE WETLAND Inflow=44.04 cfs 196,160 cf
Primary=44.04 cfs 196,160 cf

Total Runoff Area = 998,266 sf Runoff Volume = 268,171 cf Average Runoff Depth = 3.22"
87.96% Pervious = 878,116 sf 12.04% Impervious = 120,150 sf

10.0 RIPRAP APRON STABILITY CONTROL CALCULATIONS

To be completed with Alteration of Terrain Permit Application submission.

11.0 SITE SPECIFIC SOIL REPORT

To be completed following preliminary site plan application.

12.0 INSPECTION AND MAINTENANCE MANUAL

To be completed with Alteration of Terrain Permit Application submission.