Stormwater Management Report

894 Hopmeadow Redevelopment

Simsbury, Connecticut

June 10, 2022

Prepared for

894 Hopmeadow Street, LLC

146 Hopmeadow Street

Weatogue, Connecticut 06089

Loureiro

Engineering • Construction • EH&S • Energy
Waste • Facility Services • Laboratory

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An Employee-Owned Company

Comm. No. 71JR9.01

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1. INTRODUCTION

1.1 Background

This Stormwater Management Plan has been prepared by Loureiro Engineering Associates, Inc. (LEA) at the request of 894 Hopmeadow Street LLC in support of the redevelopment of 894 Hopmeadow Street (St) in Simsbury, Connecticut (hereinafter referred to as the "Site"). The redevelopment includes the demolition of the current commercial site and development of a mixed use residential building with first floor commercial store front and a subsurface parking level. The redevelopment will include the construction of a new drive access that connects to Iron Horse Boulevard (Blvd) to the rear of the property and the enhancement of a low functioning wetland area adjacent to Iron Horse Blvd. An Existing Drainage Areas plan is attached as Drawing 1.

1.2 Physical Setting

The Site is located on the parcel identified as Town of Simsbury Tax Map H09 Block 22 Lot 004A with an area of approximately 1.23 acres (ac). The Site is bounded by Hopmeadow St. to the east and Iron Horse Blvd. to the west. The Site is adjoined by properties to the north and south by properties own by Simsbury Town Shops and Vincent Funeral Home, respectively. Site location is depicted on the United States Geological Survey (USGS) map included as Appendix A.

1.3 Existing Site Features

1.3.1 Topography & Geology

The site has a significant topographic drop across the site from west to east. The site has a downgradient drop of approximately 25 feet over a total distance of approximately 300 feet. Most of the site slopes from east to west with the exception of the eastern most side of the site that slopes towards to Hopmeadow St. to the east. Portions of the adjoining properties slope towards the site, resulting in surface runoff flowing from the rear of those sites into the on-site wetlands.

The Natural Resource Conservation Service (NRCS) Soil Survey for the State of Connecticut identified the soils within the site as mainly Hinckley loamy sand (Map Unit 38C) and Tisbury silt loam (Map Unit 702A) within the wetland area. Hinckley soil is classified as Hydrologic Soil Group (HSG) A and Tisbury soil is classified as HSG C. Group A soils are generally extremely well drained with fast rates of water infiltration while Group C generally have moderate to slow infiltration rates. Appendix B includes the NRCS soil map for the site.

With the redevelopment including a new building and infiltration of stormwater, geotechnical borings were performed throughout the site along with permeability tests. Clarence Welti Associates, Inc (Welti) completed the borings on November 1, 2018 and the permeability tests November 6, 2018. Eight borings were performed at various locations to a maximum depth of 61.5 feet showing a general soil profile of topsoil from 5 to 12 inches depth or asphalt from 2 to 3 inches over processed aggregate from 6 to 8 inches, fill from 3 to 4 feet consisting of loose medium sand, some silt and trace of roots, fine to coarse sand from 18 to 36 feet with little silt and a trace of gravel, and silt and fine sand from 36 to 61.5+ feet with a trace of clay and thin strata of fine to medium sand. Water table was observed about 25 feet below grade on the western side of the site and between 11 and 12 feet on the eastern end of the site outside of the flagged wetland area. Three permeability tests were performed on site, yielding an average permeability of 40 feet/day. The full Welti report and boring logs are attached as Appendix F.

1.3.2 Flood Plain & Surface Water Bodies

The sites flood conditions are established by Federal Emergency Management Agency's (FEMA) national Flood Insurance Program Flood Insurance Rate Map (FIRM) Panel 09003C0193F (effective September 26, 2008). The site is located in a Zone X, corresponding to an area of minimal flood hazard as defined by less than 0.2% annual chance for flooding (500-year flood elevation).

As previously mentioned, the rear of the site includes a wetland along Iron Horse Blvd. that receives surface runoff from the site and from the rear of the neighboring properties. The wetland was delineated and flagged in October 1996 and again reviewed in August 2021. Over 600 feet south of the property, past Iron Horse Blvd., are wetland and marsh areas that border the Farmington River.

1.4 **Existing Stormwater Management**

1.4.1 Existing Subcatchment Characteristics

The drainage of the site consists of three subcatchment areas, excluding the wetland area. The three subcatchment areas include small portions of the adjacent properties that convey runoff towards the rear of the site (See Drawing 1). The site is approximately 14% impervious including the existing structures, walks, parking area and driveway.

1.4.2 Existing Stormwater System

The site has no existing stormwater management structures or designed systems on site. Stormwater is conveyed via surface runoff to Hopmeadow Street, where it is collected in the roadway system, and to the rear wetland. The majority of the site conveys to the wetland area where it infiltrates over time. The wetland also sees runoff from the rear of the neighboring properties as previously stated. The northern property includes a discharge pipe from their rear parking into the wetland. The inlet of the pipe receives overflow runoff from Iron Horse Blvd. The wetland is about 4 to 5 feet lower than Iron Horse Blvd, which likely prevents major overflow into the roadway during most storms creating significant standing water.

The site is distributed into two points of compliance (POC). POC 1 is flow off the site to Hopmeadow and to the abutting property to the north. POC 2 is the flow to the wetland. With most of the site consisting of sandy soil, some runoff does infiltrate throughout the site.

2. NEW DEVELOPMENT

2.1 Overview

The new redevelopment of the site consists of the construction of a mixed use residential and retail building with subsurface parking. The building's shape leaves a small portion of the subsurface parking exposed on the north and south sides. The redevelopment will include an access drive that connects Hopmeadow St. to Iron Horse Blvd. and a pedestrian ramp on the north side to allow access on the side of the building, rear of the building, and parking level. The building will include first floor commercial and a loading dock in the rear for deliveries. The front of the site will include an outdoor patio area for patron seating. The site is located along two different zones within the Simsbury Center zones. Hopmeadow St. is along the SC-1 zone and Iron Horse Blvd. is along the SC-4 zone.

The redevelopment is in close proximity to the onsite wetland and will impact a portion of the wetland due to the drive crossing. The anticipated impact will be less than 5,000 SF and the remaining area will be enhanced to a higher functioning wetland. Restoration will include vegetation within and around the wetland to improve the natural habitat for wildlife and aesthetics for the residents and visitors. The site will be tied into existing infrastructure on Hopmeadow and Iron Horse to facilitate the redevelopment. In addition to the site redevelopment, a new left-hand turn lane will be included on Iron Horse for traffic flow into the site from the rear. The n~~N~~ew site is depicted on the New Drainage Area plan (Drawing 2).

2.2 New Subcatchment Areas

The redeveloped site includes fourteen (14) subcatchment areas for analysis purposes, totaling the full site and portions of the adjacent properties that convey stormwater into the wetland area. The overall area for the new subcatchment areas does increase. The increase analyzed area is due to wetland area, POC 2, reduction due to the new development. The subcatchment areas are depicted on Drawing 2 and in the post-construction HydroCAD model included in Appendix C. The redevelopment creates a significant increase in impervious area, from 14 ~~percent (~~%~~)~~ to approximately 68%. The increase in impervious coverage results in a need for stormwater peak-flow attenuation, water quality volume treatment and groundwater recharge.

2.3 New Stormwater Management System

The new stormwater management system consists of a series of catch basins and pipe conveyances which collects stormwater runoff from the site. The stormwater runoff from the site will be retained

and infiltrated via two 5-foot Retain-It subsurface infiltration systems. The systems will be placed beneath the access drive, the first system retaining the western half of the building roof and the second system will retain the eastern half of the building roof, parking area, access drive and majority of the pedestrian ramp. A small portion of rear seating area and pedestrian ramp will be conveyed to a dry well for infiltration. The onsite systems will discharge to the rear wetland. Two areas of the covered parking will be exposed directly to rainfall. These areas will be conveyed to the exterior stormwater management system.

The retention systems will be designed to retain and treat the Water Quality Volume (WQV) for the site as well as meet Town of Simsbury standards for recharge volume for the site's zone. Stormwater from the interior parking will be conveyed through a water quality unit to provide sediment removal and oil/water separation for the associated parking areas.

3. STORMWATER MANAGEMENT EVALUATION

3.1 Stormwater Runoff Calculations

3.1.1 Design Criteria & Methodology

The post-development stormwater runoff analysis was based on the 2-, 10-, 25-, and 100-year 24-hour design storm events. For the SC-1 and SC-4 zones, the Town requires zero increase in runoff from the site into any of the receiving drainage facilities for storms up to the 100-year storm. The increase in runoff resulting from the new site improvements will necessitate on-site attenuation to meet the zero increase criteria. Since our site mostly discharges into the rear wetland, the site was designed with no increase in runoff for the 100-year storm as well.

Site specific point precipitation frequency estimates used to generate peak stormwater flow were obtained from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 10 Version 3: Precipitation-Frequency Atlas of the United States, Northeastern States (rev. 2015). Precipitation-frequency estimates are based upon frequency analysis of partial duration series with a 90% confidence interval of data largely from the National Centers for Environmental Information (NCEI).

The methods described in Urban Hydrology for Small Watersheds, 2nd Edition, (Technical Release Number 55 [TR-55]) from the Natural Resources Conservation Service formerly the Soil Conservation Service – [SCS], 1986) were used to calculate stormwater peak-flow generated from pre- and post-construction conditions. These methods, which are incorporated into the HydroCAD computer software program, use well documented procedures to calculate stormwater runoff volume, peak-flow rate of discharge, hydrographs and storage volumes required for floodwater reservoirs in small watersheds. The method uses the SCS Runoff Curve Number method to estimate runoff volume, calculates times of concentration, produces tabular hydrographs and estimates basin storage capacity.

3.1.2 Curve Numbers

The curve numbers (CN) values utilized for the analysis of the existing and new conditions included:

Existing:

- Open space lawn/grassed area, CN = 49 (Fair grass cover, HSG A)
- Lawn/grasses area new existing development, CN=68 (Poor grass cover, HSG A)

- Brush/shrub areas, CN = 35 (Fair condition, HSG A)
- Brush/shrub areas, CN = 35 (Good condition, HSG A)
- Impervious areas (Pavement, roofs, etc), CN = 98

New:

- Lawn/grassed area, CN = 39 (Good grass cover, HSG A)
- Brush/shrub/treed area, CN = 30 (HSG A)
- Impervious areas (Pavement, roofs, etc), CN = 98

The weighted CN of the site increased from 57 to 78 due to the increase in developed area.

3.2 Existing and New Peak-Flow Comparison

With the use of subsurface retention and attenuation to the POCs the following table includes the existing vs new peak-flow comparison

Table 1 – Peak-Flow Comparison, Cubic Feet Per Second (CFS)

	2-Year Event		10-Year Event		25-Year Event		100-Year Event	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
POC 1	0.08	0.07	0.36	0.2	0.58	0.27	0.96	0.4
POC 2	0.05	0.05	0.56	0.3	1.08	0.95	2.03	1.8
Total	0.13	0.12	0.92	0.5	1.66	1.22	2.99	2.2

The table shows zero increase or a decreases to each POC over all storms and an overall decrease in discharge from the site. POC 2 is the discharge to the wetland area. The reduction in peak-flow for POC 1 to Hopmeadow ranges from 0.01 to 0.56 CFS. The reduction in peak-flow to POC 2 ranges from 0 to 0.23 CFS. The reduction to POC was limited to avoid a significant reduction in stormwater to the wetland area.

3.3 Water Quality Volume and Groundwater Recharge

The methods described in the 2004 Connecticut Stormwater Quality Manual were utilized to calculate the Water Quality Volume (WQV) and Water Quality Flow (WQF) of the redevelopment. The WQV for the site is equivalent to the runoff generated with the first one-inch of rainfall. The site is approximately 53,773 sf or about 1.23 acres and approximately 68% impervious, resulting in a WQV of 2,966 cubic feet (cf). WQV and WQF calculations for the entire site is located in Appendix D. The subsurface retention is designed to infiltration the WQV and required volume to meet the Simsbury groundwater recharge volume for the SC-1 or SC-4 zones. The total retention area for all systems is approximately 7,020 cf. Per the regulations, the recharge volume is 75% of the total calculated volume. The calculated volume is of the Effective Impervious

Area – Volume (EIA-V) multiplied by 0.6 inches, for HSG A. The total impervious area is approximately 36,426 sf. 75% of 0.6 inches over the EIA-V is approximately 1,366 cf.

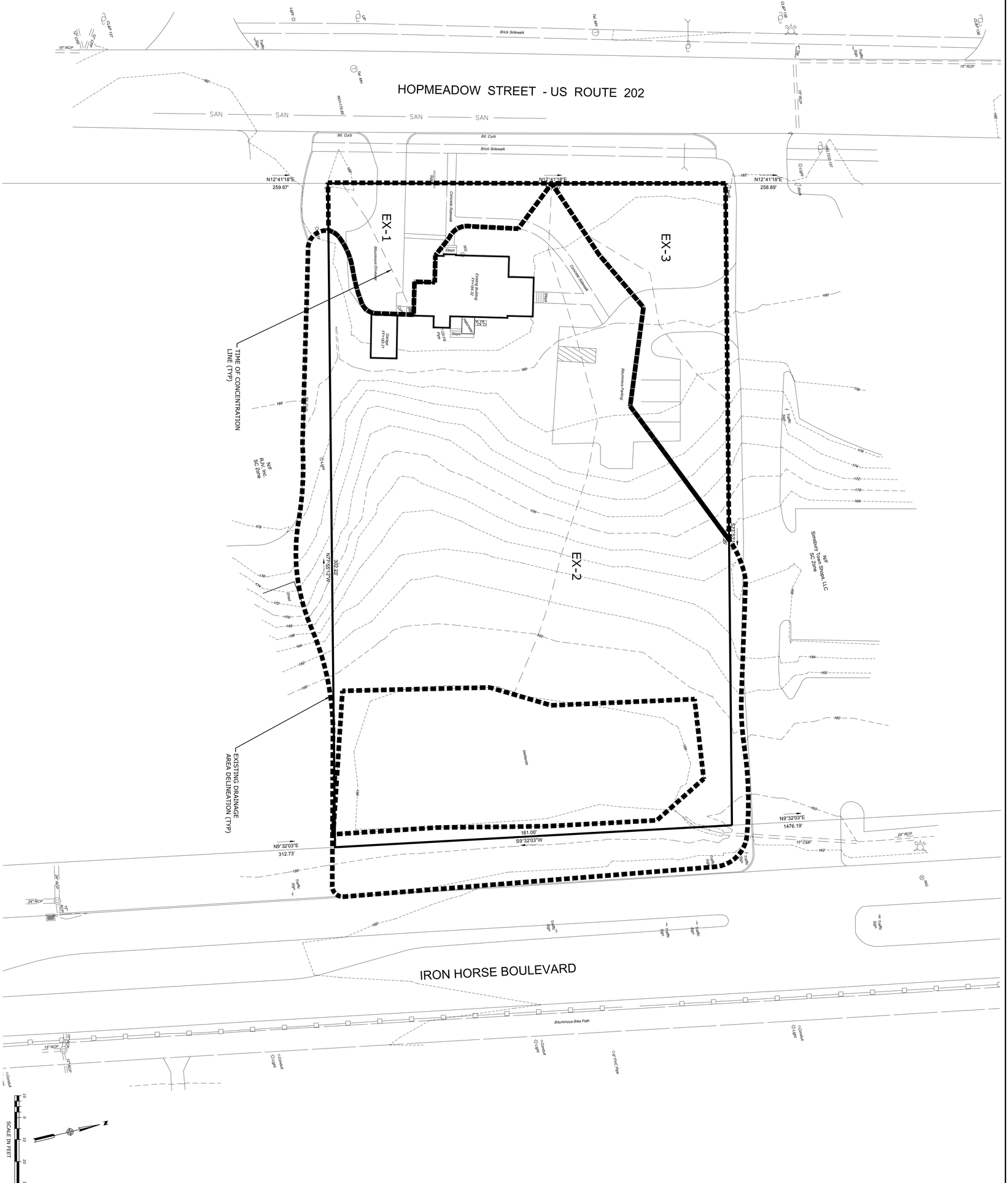
3.4 Stormwater System Maintenance Program

To help facilitate the function and longevity of the stormwater management system, a maintenance program and inspection checklist will be developed for the site. The maintenance includes outlines for periodic inspections, scheduled cleanings, and details on identifying signs of failures in the system. A full checklist of system features shall be completed to provide a log of inspections, cleanings, repairs, and any important information regarding the system. The program will be implemented after installation. The program, checklist, and past inspection/maintenance logs should be retained by current, future owners, and necessary facility personnel. The maintenance program and checklist are included as Appendix E.

4. CONCLUSION

The new redevelopment includes the development of a new mixed-use building and associated parking. The site includes the installation of a completely new stormwater system which provided attenuation of all stormwater events, reducing peak-flows into the existing resource area and offsite systems. The subsurface retention system and drywell includes sufficient storage and will treat the full WQV through treatment system rows and infiltration. The parking areas are treated utilized a hydrodynamic separator prior to discharge. Overall, the stormwater management system provides quantitative and qualitative improvements in stormwater for the site which will positively impact the receiving facilities off site and within the wetland area.

DRAWINGS



SHEET NO. 1 OF SHEETS 2	DRAWING 1	**EXISTING DRAINAGE AREAS PLAN**	SCALE 1" = 20'	Loureiro Engineering • Construction • EH&S • Energy Water • Facility Services • Laboratory **Loureiro Engineering Associates, Inc.** 100 Northwest Drive • Plainville, Connecticut 06062 Phone: 860-747-6181 • Fax: 860-747-8822 An Employee Owned Company • www.Loureiro.com 	STAMP	REV.	DESCRIPTION OF REVISION	DATE	APPR.
		894 HOPMEADOW REDEVELOPMENT 894 HOPMEADOW STREET, SIMSBURY, CT PREPARED FOR **894 HOPMEADOW STREET, LLC**	COMM. NO. 71JR9.01 DRAWN BY APH — DATE 6/8/2022 APPROVED BY TRW — DATE 6/8/2022						

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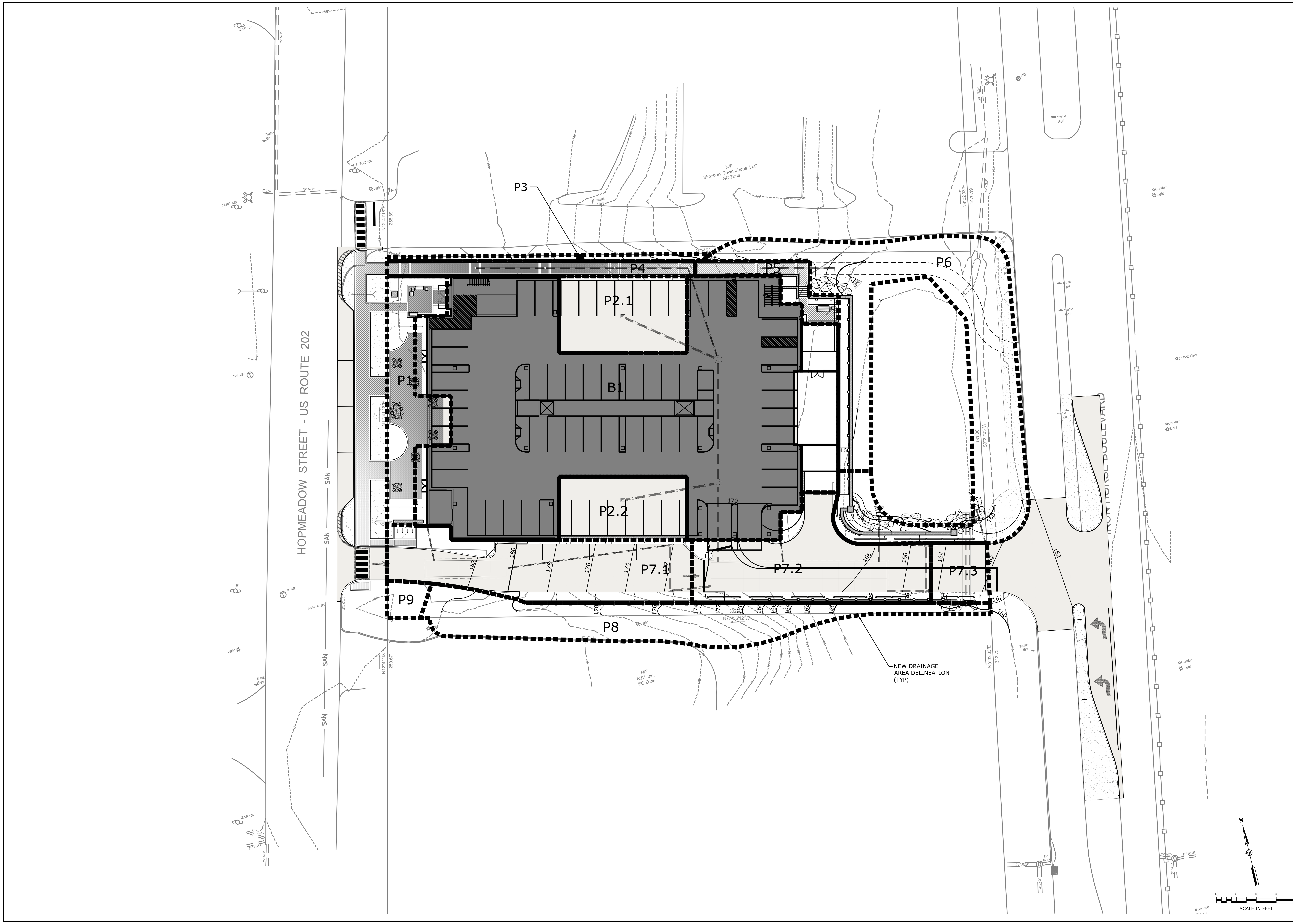

NEW DRAINAGE AREA PLAN

894 HOPMEADOW REDEVELOPMENT
894 HOPMEADOW STREET, SIMSBURY, CT

PREPARED FOR:
894 HOPMEADOW STREET, LLC

SCALE	1" = 20'
COMM. NO.	71JR9.01
DRAWN BY	APH
DATE	6/8/2022
APPROVED BY	TRW
DATE	6/8/2022
DRAWING	2
SHEET NO.	2
NO. OF SHEETS	2

REV.	DESCRIPTION OF REVISION	DATE	APPR.

STAMP

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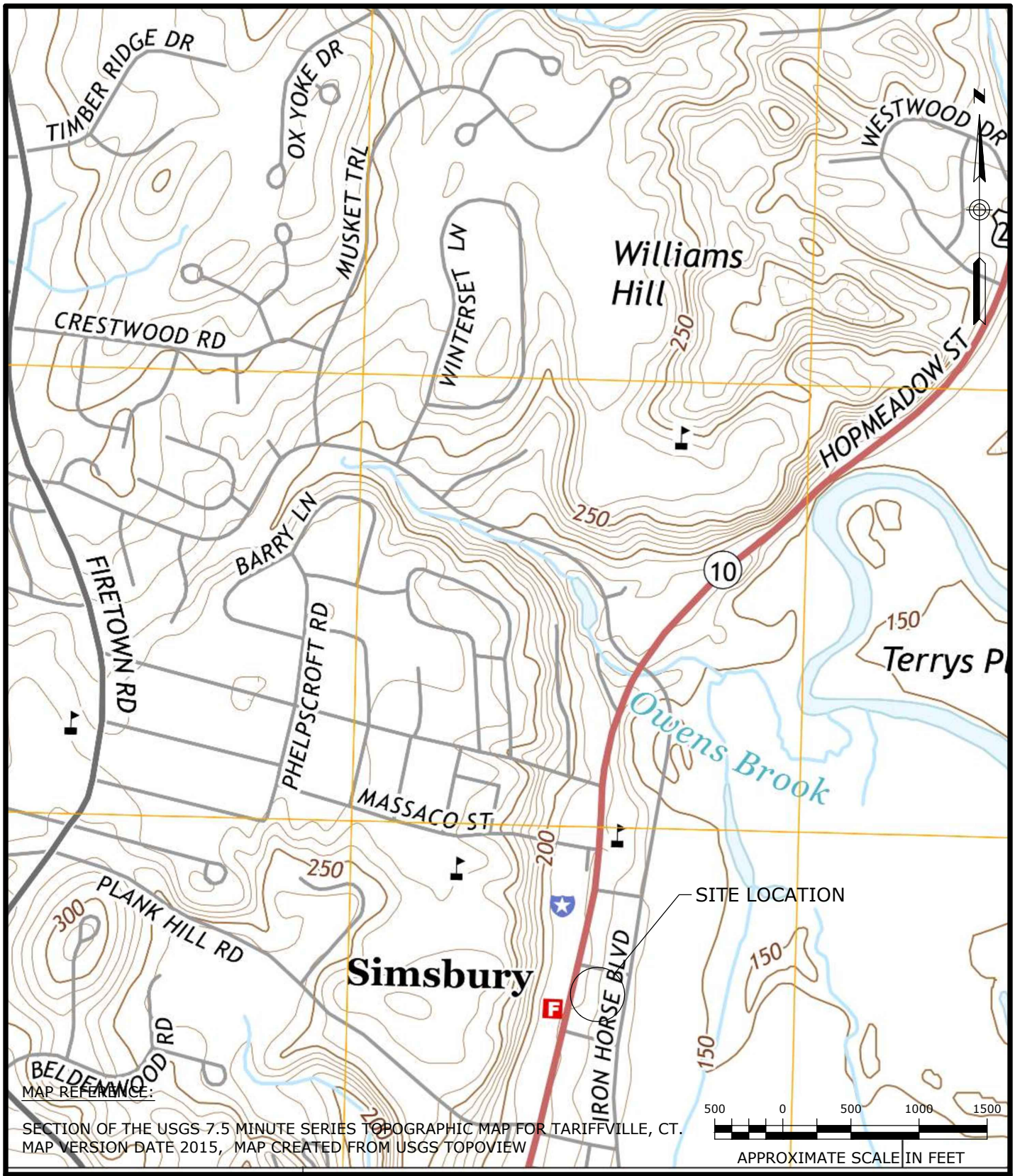
APPENDIX A

USGS Site Location Map



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USGS MAP

894 HOPMEADOW REDEVELOPMENT
894 HOPMEADOW STREET, SIMSBURY, CT
PREPARED FOR:
894 HOPMEADOW STREET, LLC

SCALE
1" = 1000'±

COMM. NO.
71JR9.01

DATE
6/7/2022

1

APPENDIX B

Natural Resources Conservation Service – Web Soil Survey

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for State of Connecticut

February 4, 2020

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

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

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

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

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

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

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

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

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

Soil Map

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

Custom Soil Resource Report
Soil Map

Map Scale: 1:920 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 40 80 160 240

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 1:12,000.

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: State of Connecticut
Survey Area Data: Version 19, Sep 13, 2019

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

Date(s) aerial images were photographed: Aug 27, 2016—Oct 30, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
38C	Hinckley loamy sand, 3 to 15 percent slopes	1.3	34.2%
306	Udorthents-Urban land complex	1.8	47.8%
702A	Tisbury silt loam, 0 to 3 percent slopes	0.7	18.0%
Totals for Area of Interest		**3.9**	**100.0%**

Map Unit Descriptions

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

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

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

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The

delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

State of Connecticut

38C—Hinckley loamy sand, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2svmb
Elevation: 0 to 1,290 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Hinckley

Setting

Landform: Eskers, outwash terraces, kames, kame terraces, outwash plains, moraines, outwash deltas
Landform position (two-dimensional): Footslope, toeslope, shoulder, backslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, riser, tread
Down-slope shape: Convex, concave, linear
Across-slope shape: Concave, linear, convex
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

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

Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 5 percent
Landform: Moraines, outwash terraces, eskers, kames, kame terraces, outwash plains, outwash deltas
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, riser, tread
Down-slope shape: Convex, linear, concave
Across-slope shape: Linear, convex, concave
Hydric soil rating: No

Merrimac

Percent of map unit: 5 percent
Landform: Outwash terraces, kames, moraines, outwash plains, eskers
Landform position (two-dimensional): Backslope, footslope, shoulder, toeslope, summit
Landform position (three-dimensional): Side slope, crest, head slope, nose slope, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Agawam

Percent of map unit: 3 percent
Landform: Eskers, outwash terraces, kames, kame terraces, outwash plains, moraines, outwash deltas
Landform position (two-dimensional): Shoulder, backslope, toeslope, summit, footslope
Landform position (three-dimensional): Crest, head slope, nose slope, side slope, riser, tread
Down-slope shape: Linear, convex, concave
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Sudbury

Percent of map unit: 2 percent
Landform: Outwash deltas, outwash terraces, kame terraces, outwash plains, moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Linear, concave
Across-slope shape: Concave, linear
Hydric soil rating: No

306—Udorthents-Urban land complex

Map Unit Setting

National map unit symbol: 9lmg
Elevation: 0 to 2,000 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 120 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 50 percent
Urban land: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Drift

Typical profile

A - 0 to 5 inches: loam
C1 - 5 to 21 inches: gravelly loam
C2 - 21 to 80 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 1.98 in/hr)
Depth to water table: About 54 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.8 inches)

Interpretive groups

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

Description of Urban Land

Typical profile

H - 0 to 6 inches: material

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Unnamed, undisturbed soils

Percent of map unit: 8 percent
Hydric soil rating: No

Udorthents, wet substratum

Percent of map unit: 5 percent
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent
Hydric soil rating: No

702A—Tisbury silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2y07g
Elevation: 0 to 1,260 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Tisbury

Setting

Landform: Outwash plains, deltas, valley trains, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-silty eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite, schist, and/or gneiss

Typical profile

Ap - 0 to 8 inches: silt loam
Bw1 - 8 to 18 inches: silt loam

Bw2 - 18 to 26 inches: silt loam
2C - 26 to 65 inches: extremely gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 24 to 36 inches to strongly contrasting textural stratification
Natural drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

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

Minor Components

Merrimac

Percent of map unit: 5 percent
Landform: Eskers, outwash terraces, kames, moraines, outwash plains
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Side slope, crest, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Agawam

Percent of map unit: 5 percent
Landform: Kame terraces, outwash terraces, kames, moraines, outwash plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope, crest, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Ninigret

Percent of map unit: 3 percent
Landform: Kames, moraines, outwash plains, kame terraces, outwash terraces
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Convex, linear
Across-slope shape: Convex, concave
Hydric soil rating: No

Raypol

Percent of map unit: 2 percent
Landform: Drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave

Hydric soil rating: Yes

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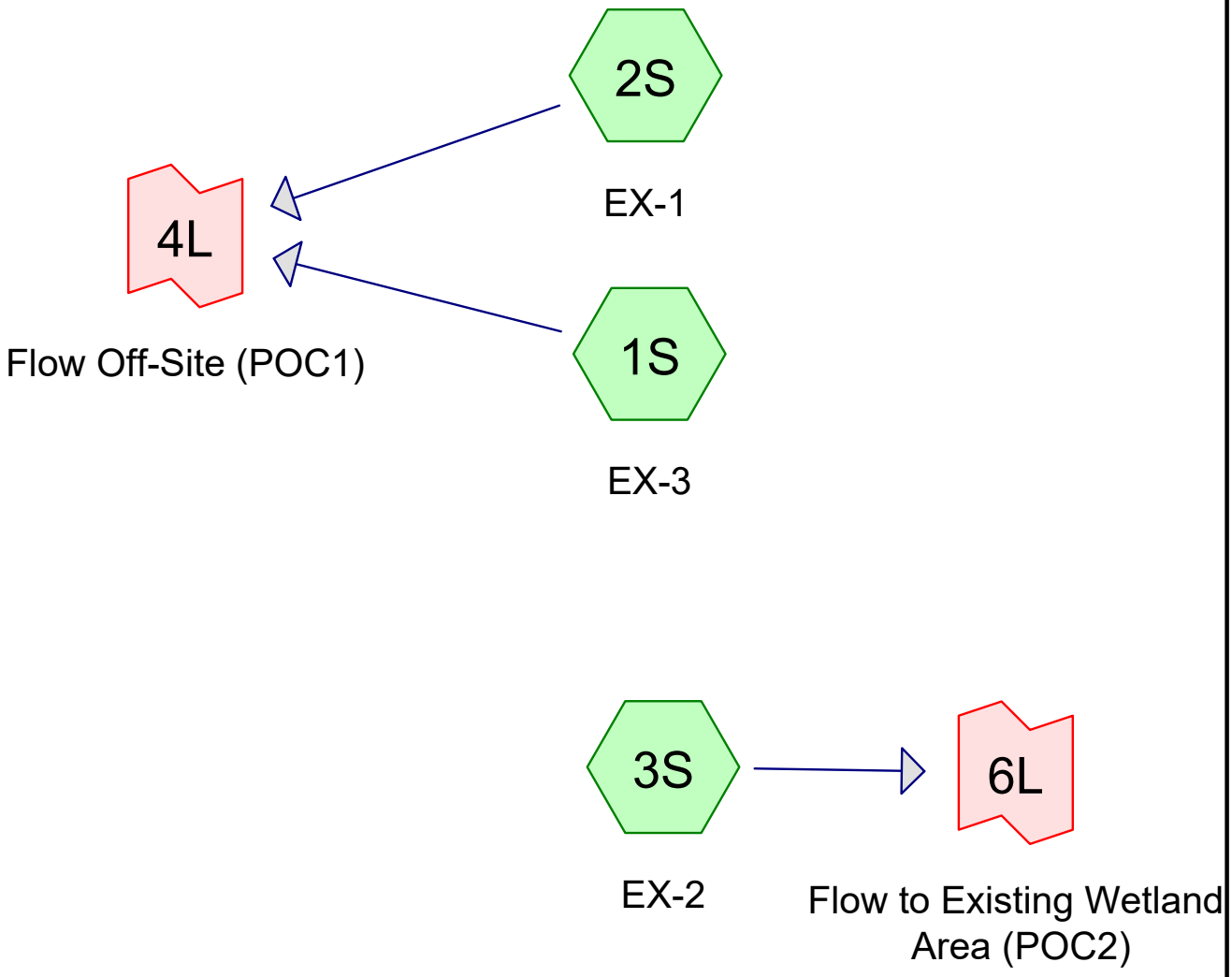
APPENDIX C

HydroCAD Reports



Subcat Reach Pond Link

Routing Diagram for 894 Hopmeadow-Existing Conditions
Prepared by Loureiro Engineering Assoc, Inc, Printed 6/10/2022

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Type III 24-hr		Default	24.00	1	3.30	2
2	10-yr	Type III 24-hr		Default	24.00	1	5.32	2
3	25-yr	Type III 24-hr		Default	24.00	1	6.58	2
4	100-yr	Type III 24-hr		Default	24.00	1	8.51	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.783	49	50-75% Grass cover, Fair, HSG A (1S, 2S, 3S)
0.119	68	<50% Grass cover, Poor, HSG A (3S)
0.003	35	Brush, Fair, HSG A (2S)
0.098	30	Brush, Good, HSG A (3S)
0.134	98	Unconnected pavement, HSG A (1S, 2S, 3S)
0.039	98	Unconnected roofs, HSG A (3S)
1.176	**57**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.176	HSG A	1S, 2S, 3S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
1.176		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.783	0.000	0.000	0.000	0.000	0.783	50-75% Grass cover, Fair	1S, 2S, 3S
0.119	0.000	0.000	0.000	0.000	0.119	<50% Grass cover, Poor	3S
0.003	0.000	0.000	0.000	0.000	0.003	Brush, Fair	2S
0.098	0.000	0.000	0.000	0.000	0.098	Brush, Good	3S
0.134	0.000	0.000	0.000	0.000	0.134	Unconnected pavement	1S, 2S, 3S
0.039	0.000	0.000	0.000	0.000	0.039	Unconnected roofs	3S
1.176	**0.000**	**0.000**	**0.000**	**0.000**	**1.176**	**TOTAL AREA**	

Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: EX-3 Runoff Area=6,577 sf 25.15% Impervious Runoff Depth=0.28"
Flow Length=135' Tc=7.0 min UI Adjusted CN=55 Runoff=0.02 cfs 0.004 af

Subcatchment 2S: EX-1 Runoff Area=3,327 sf 42.98% Impervious Runoff Depth=0.89"
Tc=5.0 min CN=70 Runoff=0.07 cfs 0.006 af

Subcatchment 3S: EX-2 Runoff Area=41,314 sf 10.80% Impervious Runoff Depth=0.20"
Flow Length=217' Tc=18.6 min UI Adjusted CN=52 Runoff=0.05 cfs 0.016 af

Link 4L: Flow Off-Site (POC1) Inflow=0.08 cfs 0.009 af
Primary=0.08 cfs 0.009 af

Link 6L: Flow to Existing Wetland Area (POC2) Inflow=0.05 cfs 0.016 af
Primary=0.05 cfs 0.016 af

Total Runoff Area = 1.176 ac Runoff Volume = 0.025 af Average Runoff Depth = 0.25"
85.27% Pervious = 1.003 ac 14.73% Impervious = 0.173 ac

Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: EX-3 Runoff Area=6,577 sf 25.15% Impervious Runoff Depth=1.14"
Flow Length=135' Tc=7.0 min UI Adjusted CN=55 Runoff=0.16 cfs 0.014 af

Subcatchment 2S: EX-1 Runoff Area=3,327 sf 42.98% Impervious Runoff Depth=2.28"
Tc=5.0 min CN=70 Runoff=0.21 cfs 0.014 af

Subcatchment 3S: EX-2 Runoff Area=41,314 sf 10.80% Impervious Runoff Depth=0.95"
Flow Length=217' Tc=18.6 min UI Adjusted CN=52 Runoff=0.56 cfs 0.075 af

Link 4L: Flow Off-Site (POC1) Inflow=0.36 cfs 0.029 af
Primary=0.36 cfs 0.029 af

Link 6L: Flow to Existing Wetland Area (POC2) Inflow=0.56 cfs 0.075 af
Primary=0.56 cfs 0.075 af

Total Runoff Area = 1.176 ac Runoff Volume = 0.104 af Average Runoff Depth = 1.06"
85.27% Pervious = 1.003 ac 14.73% Impervious = 0.173 ac

Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: EX-3 Runoff Area=6,577 sf 25.15% Impervious Runoff Depth=1.86"
Flow Length=135' Tc=7.0 min UI Adjusted CN=55 Runoff=0.29 cfs 0.023 af

Subcatchment 2S: EX-1 Runoff Area=3,327 sf 42.98% Impervious Runoff Depth=3.27"
Tc=5.0 min CN=70 Runoff=0.30 cfs 0.021 af

Subcatchment 3S: EX-2 Runoff Area=41,314 sf 10.80% Impervious Runoff Depth=1.60"
Flow Length=217' Tc=18.6 min UI Adjusted CN=52 Runoff=1.08 cfs 0.127 af

Link 4L: Flow Off-Site (POC1) Inflow=0.58 cfs 0.044 af
Primary=0.58 cfs 0.044 af

Link 6L: Flow to Existing Wetland Area (POC2) Inflow=1.08 cfs 0.127 af
Primary=1.08 cfs 0.127 af

Total Runoff Area = 1.176 ac Runoff Volume = 0.171 af Average Runoff Depth = 1.75"
85.27% Pervious = 1.003 ac 14.73% Impervious = 0.173 ac

Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: EX-3 Runoff Area=6,577 sf 25.15% Impervious Runoff Depth=3.14"
Flow Length=135' Tc=7.0 min UI Adjusted CN=55 Runoff=0.52 cfs 0.039 af

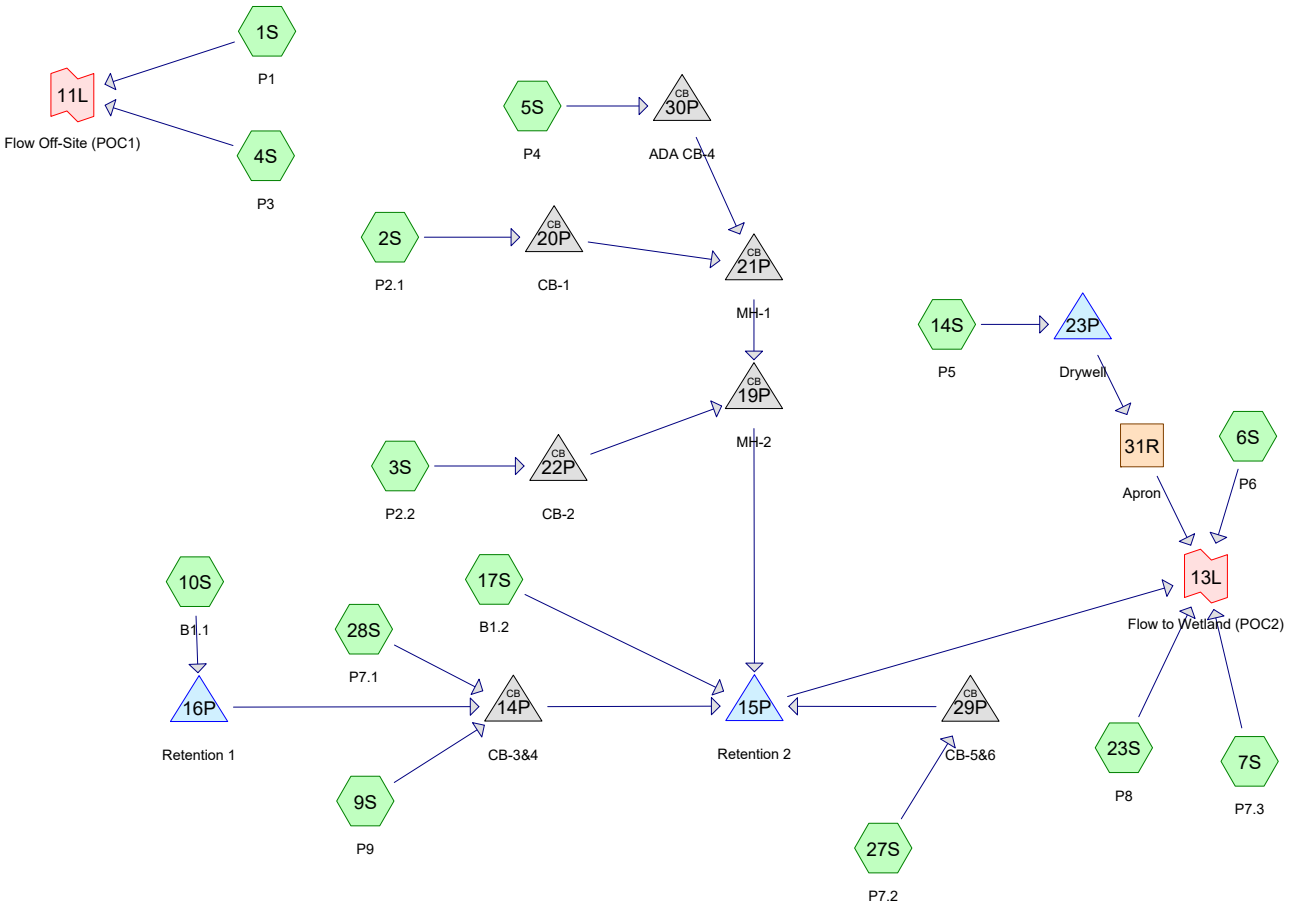
Subcatchment 2S: EX-1 Runoff Area=3,327 sf 42.98% Impervious Runoff Depth=4.91"
Tc=5.0 min CN=70 Runoff=0.46 cfs 0.031 af

Subcatchment 3S: EX-2 Runoff Area=41,314 sf 10.80% Impervious Runoff Depth=2.79"
Flow Length=217' Tc=18.6 min UI Adjusted CN=52 Runoff=2.03 cfs 0.221 af

Link 4L: Flow Off-Site (POC1) Inflow=0.96 cfs 0.071 af
Primary=0.96 cfs 0.071 af

Link 6L: Flow to Existing Wetland Area (POC2) Inflow=2.03 cfs 0.221 af
Primary=2.03 cfs 0.221 af

Total Runoff Area = 1.176 ac Runoff Volume = 0.292 af Average Runoff Depth = 2.98"
85.27% Pervious = 1.003 ac 14.73% Impervious = 0.173 ac



Subcat Reach Pond Link

Routing Diagram for 894 Hopmeadow-Proposed Conditions
Prepared by Loureiro Engineering Assoc, Inc, Printed 6/10/2022

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Type III 24-hr		Default	24.00	1	3.30	2
2	10-yr	Type III 24-hr		Default	24.00	1	5.32	2
3	25-yr	Type III 24-hr		Default	24.00	1	6.58	2
4	100-yr	Type III 24-hr		Default	24.00	1	8.51	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.222	39	>75% Grass cover, Good, HSG A (1S, 6S, 7S, 23S, 27S, 28S)
0.172	30	Brush, Good, HSG A (1S, 4S, 6S, 9S, 14S, 23S, 27S, 28S)
0.282	98	Paved parking, HSG A (2S, 3S, 7S, 27S, 28S)
0.073	98	Unconnected pavement, HSG A (1S, 5S, 6S, 14S)
0.481	98	Unconnected roofs, HSG A (10S, 17S)
1.231	**78**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.231	HSG A	1S, 2S, 3S, 4S, 5S, 6S, 7S, 9S, 10S, 14S, 17S, 23S, 27S, 28S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
1.231		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.222	0.000	0.000	0.000	0.000	0.222	>75% Grass cover, Good	1S, 6S, 7S, 23S, 27S, 28S
0.172	0.000	0.000	0.000	0.000	0.172	Brush, Good	1S, 4S, 6S, 9S, 14S, 23S, 27S, 28S
0.282	0.000	0.000	0.000	0.000	0.282	Paved parking	2S, 3S, 7S, 27S, 28S
0.073	0.000	0.000	0.000	0.000	0.073	Unconnected pavement	1S, 5S, 6S, 14S
0.481	0.000	0.000	0.000	0.000	0.481	Unconnected roofs	10S, 17S
1.231	**0.000**	**0.000**	**0.000**	**0.000**	**1.231**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	14P	164.50	163.50	20.0	0.0500	0.012	0.0	12.0	0.0
2	15P	161.66	161.00	26.9	0.0245	0.012	0.0	8.0	0.0
3	16P	176.04	169.00	88.0	0.0800	0.012	0.0	8.0	0.0
4	19P	163.95	163.31	38.0	0.0168	0.012	0.0	12.0	0.0
5	20P	165.98	165.00	49.0	0.0200	0.012	0.0	12.0	0.0
6	21P	165.00	163.95	58.0	0.0181	0.012	0.0	12.0	0.0
7	22P	164.80	163.95	45.0	0.0189	0.012	0.0	12.0	0.0
8	23P	161.33	161.13	4.0	0.0500	0.012	0.0	8.0	0.0
9	29P	162.40	162.16	18.7	0.0128	0.012	0.0	12.0	0.0
10	30P	167.27	165.00	45.5	0.0499	0.012	0.0	8.0	0.0

Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: P1 Runoff Area=2,515 sf 59.88% Impervious Runoff Depth=1.05"
Tc=5.0 min CN=73 Runoff=0.07 cfs 0.005 af

Subcatchment 2S: P2.1 Runoff Area=2,464 sf 100.00% Impervious Runoff Depth=3.07"
Tc=5.0 min CN=98 Runoff=0.19 cfs 0.014 af

Subcatchment 3S: P2.2 Runoff Area=2,027 sf 100.00% Impervious Runoff Depth=3.07"
Tc=5.0 min CN=98 Runoff=0.15 cfs 0.012 af

Subcatchment 4S: P3 Runoff Area=467 sf 0.00% Impervious Runoff Depth=0.00"
Tc=5.0 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment 5S: P4 Runoff Area=1,031 sf 100.00% Impervious Runoff Depth=3.07"
Tc=5.0 min CN=98 Runoff=0.08 cfs 0.006 af

Subcatchment 6S: P6 Runoff Area=8,755 sf 0.29% Impervious Runoff Depth=0.00"
Tc=5.0 min CN=35 Runoff=0.00 cfs 0.000 af

Subcatchment 7S: P7.3 Runoff Area=861 sf 83.28% Impervious Runoff Depth=2.09"
Tc=5.0 min CN=88 Runoff=0.05 cfs 0.003 af

Subcatchment 9S: P9 Runoff Area=356 sf 0.00% Impervious Runoff Depth=0.00"
Tc=5.0 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment 10S: B1.1 Runoff Area=10,475 sf 100.00% Impervious Runoff Depth=3.07"
Tc=5.0 min CN=98 Runoff=0.80 cfs 0.061 af

Subcatchment 14S: P5 Runoff Area=746 sf 83.38% Impervious Runoff Depth=2.00"
Tc=5.0 min CN=87 Runoff=0.04 cfs 0.003 af

Subcatchment 17S: B1.2 Runoff Area=10,475 sf 100.00% Impervious Runoff Depth=3.07"
Tc=5.0 min CN=98 Runoff=0.80 cfs 0.061 af

Subcatchment 23S: P8 Runoff Area=4,423 sf 0.00% Impervious Runoff Depth=0.00"
Tc=5.0 min CN=36 Runoff=0.00 cfs 0.000 af

Subcatchment 27S: P7.2 Runoff Area=4,330 sf 80.90% Impervious Runoff Depth=1.92"
Tc=5.0 min CN=86 Runoff=0.23 cfs 0.016 af

Subcatchment 28S: P7.1 Runoff Area=4,682 sf 76.53% Impervious Runoff Depth=1.69"
Tc=5.0 min CN=83 Runoff=0.22 cfs 0.015 af

Reach 31R: Apron Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.069 L=6.0' S=0.0050 '/' Capacity=2.12 cfs Outflow=0.00 cfs 0.000 af

Pond 14P: CB-3&4 Peak Elev=164.73' Inflow=0.22 cfs 0.016 af
12.0" Round Culvert n=0.012 L=20.0' S=0.0500 '/' Outflow=0.22 cfs 0.016 af

Pond 15P: Retention 2 Peak Elev=160.05' Storage=1,763 cf Inflow=1.67 cfs 0.126 af
Discarded=0.19 cfs 0.126 af Primary=0.00 cfs 0.000 af Outflow=0.19 cfs 0.126 af

Pond 16P: Retention 1 Peak Elev=176.12' Storage=1,057 cf Inflow=0.80 cfs 0.061 af
Discarded=0.05 cfs 0.060 af Primary=0.02 cfs 0.001 af Outflow=0.07 cfs 0.061 af

Pond 19P: MH-2 Peak Elev=164.27' Inflow=0.42 cfs 0.032 af
12.0" Round Culvert n=0.012 L=38.0' S=0.0168 '/' Outflow=0.42 cfs 0.032 af

Pond 20P: CB-1 Peak Elev=166.19' Inflow=0.19 cfs 0.014 af
12.0" Round Culvert n=0.012 L=49.0' S=0.0200 '/' Outflow=0.19 cfs 0.014 af

Pond 21P: MH-1 Peak Elev=165.25' Inflow=0.27 cfs 0.021 af
12.0" Round Culvert n=0.012 L=58.0' S=0.0181 '/' Outflow=0.27 cfs 0.021 af

Pond 22P: CB-2 Peak Elev=164.99' Inflow=0.15 cfs 0.012 af
12.0" Round Culvert n=0.012 L=45.0' S=0.0189 '/' Outflow=0.15 cfs 0.012 af

Pond 23P: Drywell Peak Elev=159.79' Storage=40 cf Inflow=0.04 cfs 0.003 af
Discarded=0.01 cfs 0.003 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.003 af

Pond 29P: CB-5&6 Peak Elev=162.63' Inflow=0.23 cfs 0.016 af
12.0" Round Culvert n=0.012 L=18.7' S=0.0128 '/' Outflow=0.23 cfs 0.016 af

Pond 30P: ADA CB-4 Peak Elev=167.42' Inflow=0.08 cfs 0.006 af
8.0" Round Culvert n=0.012 L=45.5' S=0.0499 '/' Outflow=0.08 cfs 0.006 af

Link 11L: Flow Off-Site (POC1) Inflow=0.07 cfs 0.005 af
Primary=0.07 cfs 0.005 af

Link 13L: Flow to Wetland (POC2) Inflow=0.05 cfs 0.003 af
Primary=0.05 cfs 0.003 af

Total Runoff Area = 1.231 ac Runoff Volume = 0.198 af Average Runoff Depth = 1.93"
32.05% Pervious = 0.394 ac 67.95% Impervious = 0.836 ac

Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: P1 Runoff Area=2,515 sf 59.88% Impervious Runoff Depth=2.53"
Tc=5.0 min CN=73 Runoff=0.18 cfs 0.012 af

Subcatchment 2S: P2.1 Runoff Area=2,464 sf 100.00% Impervious Runoff Depth=5.08"
Tc=5.0 min CN=98 Runoff=0.31 cfs 0.024 af

Subcatchment 3S: P2.2 Runoff Area=2,027 sf 100.00% Impervious Runoff Depth=5.08"
Tc=5.0 min CN=98 Runoff=0.25 cfs 0.020 af

Subcatchment 4S: P3 Runoff Area=467 sf 0.00% Impervious Runoff Depth=0.02"
Tc=5.0 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment 5S: P4 Runoff Area=1,031 sf 100.00% Impervious Runoff Depth=5.08"
Tc=5.0 min CN=98 Runoff=0.13 cfs 0.010 af

Subcatchment 6S: P6 Runoff Area=8,755 sf 0.29% Impervious Runoff Depth=0.13"
Tc=5.0 min CN=35 Runoff=0.00 cfs 0.002 af

Subcatchment 7S: P7.3 Runoff Area=861 sf 83.28% Impervious Runoff Depth=3.97"
Tc=5.0 min CN=88 Runoff=0.09 cfs 0.007 af

Subcatchment 9S: P9 Runoff Area=356 sf 0.00% Impervious Runoff Depth=0.02"
Tc=5.0 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment 10S: B1.1 Runoff Area=10,475 sf 100.00% Impervious Runoff Depth=5.08"
Tc=5.0 min CN=98 Runoff=1.30 cfs 0.102 af

Subcatchment 14S: P5 Runoff Area=746 sf 83.38% Impervious Runoff Depth=3.87"
Tc=5.0 min CN=87 Runoff=0.08 cfs 0.006 af

Subcatchment 17S: B1.2 Runoff Area=10,475 sf 100.00% Impervious Runoff Depth=5.08"
Tc=5.0 min CN=98 Runoff=1.30 cfs 0.102 af

Subcatchment 23S: P8 Runoff Area=4,423 sf 0.00% Impervious Runoff Depth=0.16"
Tc=5.0 min CN=36 Runoff=0.00 cfs 0.001 af

Subcatchment 27S: P7.2 Runoff Area=4,330 sf 80.90% Impervious Runoff Depth=3.77"
Tc=5.0 min CN=86 Runoff=0.45 cfs 0.031 af

Subcatchment 28S: P7.1 Runoff Area=4,682 sf 76.53% Impervious Runoff Depth=3.47"
Tc=5.0 min CN=83 Runoff=0.45 cfs 0.031 af

Reach 31R: Apron Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.069 L=6.0' S=0.0050 '/' Capacity=2.12 cfs Outflow=0.00 cfs 0.000 af

Pond 14P: CB-3&4 Peak Elev=165.01' Inflow=0.97 cfs 0.058 af
12.0" Round Culvert n=0.012 L=20.0' S=0.0500 '/' Outflow=0.97 cfs 0.058 af

Pond 15P: Retention 2 Peak Elev=162.01' Storage=4,326 cf Inflow=3.15 cfs 0.245 af
Discarded=0.19 cfs 0.224 af Primary=0.29 cfs 0.021 af Outflow=0.48 cfs 0.245 af

Pond 16P: Retention 1 Peak Elev=176.79' Storage=1,262 cf Inflow=1.30 cfs 0.102 af
Discarded=0.05 cfs 0.075 af Primary=0.67 cfs 0.027 af Outflow=0.71 cfs 0.102 af

Pond 19P: MH-2 Peak Elev=164.37' Inflow=0.68 cfs 0.054 af
12.0" Round Culvert n=0.012 L=38.0' S=0.0168 '/' Outflow=0.68 cfs 0.054 af

Pond 20P: CB-1 Peak Elev=166.25' Inflow=0.31 cfs 0.024 af
12.0" Round Culvert n=0.012 L=49.0' S=0.0200 '/' Outflow=0.31 cfs 0.024 af

Pond 21P: MH-1 Peak Elev=165.33' Inflow=0.43 cfs 0.034 af
12.0" Round Culvert n=0.012 L=58.0' S=0.0181 '/' Outflow=0.43 cfs 0.034 af

Pond 22P: CB-2 Peak Elev=165.04' Inflow=0.25 cfs 0.020 af
12.0" Round Culvert n=0.012 L=45.0' S=0.0189 '/' Outflow=0.25 cfs 0.020 af

Pond 23P: Drywell Peak Elev=160.95' Storage=98 cf Inflow=0.08 cfs 0.006 af
Discarded=0.01 cfs 0.006 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.006 af

Pond 29P: CB-5&6 Peak Elev=162.74' Inflow=0.45 cfs 0.031 af
12.0" Round Culvert n=0.012 L=18.7' S=0.0128 '/' Outflow=0.45 cfs 0.031 af

Pond 30P: ADA CB-4 Peak Elev=167.46' Inflow=0.13 cfs 0.010 af
8.0" Round Culvert n=0.012 L=45.5' S=0.0499 '/' Outflow=0.13 cfs 0.010 af

Link 11L: Flow Off-Site (POC1) Inflow=0.18 cfs 0.012 af
Primary=0.18 cfs 0.012 af

Link 13L: Flow to Wetland (POC2) Inflow=0.30 cfs 0.031 af
Primary=0.30 cfs 0.031 af

Total Runoff Area = 1.231 ac Runoff Volume = 0.347 af Average Runoff Depth = 3.39"
32.05% Pervious = 0.394 ac 67.95% Impervious = 0.836 ac

Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: P1 Runoff Area=2,515 sf 59.88% Impervious Runoff Depth=3.58"
Tc=5.0 min CN=73 Runoff=0.25 cfs 0.017 af

Subcatchment 2S: P2.1 Runoff Area=2,464 sf 100.00% Impervious Runoff Depth=6.34"
Tc=5.0 min CN=98 Runoff=0.38 cfs 0.030 af

Subcatchment 3S: P2.2 Runoff Area=2,027 sf 100.00% Impervious Runoff Depth=6.34"
Tc=5.0 min CN=98 Runoff=0.31 cfs 0.025 af

Subcatchment 4S: P3 Runoff Area=467 sf 0.00% Impervious Runoff Depth=0.15"
Tc=5.0 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment 5S: P4 Runoff Area=1,031 sf 100.00% Impervious Runoff Depth=6.34"
Tc=5.0 min CN=98 Runoff=0.16 cfs 0.013 af

Subcatchment 6S: P6 Runoff Area=8,755 sf 0.29% Impervious Runoff Depth=0.38"
Tc=5.0 min CN=35 Runoff=0.02 cfs 0.006 af

Subcatchment 7S: P7.3 Runoff Area=861 sf 83.28% Impervious Runoff Depth=5.19"
Tc=5.0 min CN=88 Runoff=0.12 cfs 0.009 af

Subcatchment 9S: P9 Runoff Area=356 sf 0.00% Impervious Runoff Depth=0.15"
Tc=5.0 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment 10S: B1.1 Runoff Area=10,475 sf 100.00% Impervious Runoff Depth=6.34"
Tc=5.0 min CN=98 Runoff=1.61 cfs 0.127 af

Subcatchment 14S: P5 Runoff Area=746 sf 83.38% Impervious Runoff Depth=5.07"
Tc=5.0 min CN=87 Runoff=0.10 cfs 0.007 af

Subcatchment 17S: B1.2 Runoff Area=10,475 sf 100.00% Impervious Runoff Depth=6.34"
Tc=5.0 min CN=98 Runoff=1.61 cfs 0.127 af

Subcatchment 23S: P8 Runoff Area=4,423 sf 0.00% Impervious Runoff Depth=0.44"
Tc=5.0 min CN=36 Runoff=0.02 cfs 0.004 af

Subcatchment 27S: P7.2 Runoff Area=4,330 sf 80.90% Impervious Runoff Depth=4.96"
Tc=5.0 min CN=86 Runoff=0.58 cfs 0.041 af

Subcatchment 28S: P7.1 Runoff Area=4,682 sf 76.53% Impervious Runoff Depth=4.63"
Tc=5.0 min CN=83 Runoff=0.60 cfs 0.041 af

Reach 31R: Apron Avg. Flow Depth=0.03' Max Vel=0.14 fps Inflow=0.02 cfs 0.001 af
n=0.069 L=6.0' S=0.0050 '/' Capacity=2.12 cfs Outflow=0.02 cfs 0.001 af

Pond 14P: CB-3&4 Peak Elev=165.15' Inflow=1.48 cfs 0.087 af
12.0" Round Culvert n=0.012 L=20.0' S=0.0500 '/' Outflow=1.48 cfs 0.087 af

Pond 15P: Retention 2 Peak Elev=162.77' Storage=5,327 cf Inflow=4.45 cfs 0.322 af
Discarded=0.19 cfs 0.248 af Primary=0.88 cfs 0.074 af Outflow=1.06 cfs 0.322 af

Pond 16P: Retention 1 Peak Elev=177.39' Storage=1,446 cf Inflow=1.61 cfs 0.127 af
Discarded=0.05 cfs 0.081 af Primary=0.99 cfs 0.046 af Outflow=1.04 cfs 0.127 af

Pond 19P: MH-2 Peak Elev=164.42' Inflow=0.85 cfs 0.067 af
12.0" Round Culvert n=0.012 L=38.0' S=0.0168 '/' Outflow=0.85 cfs 0.067 af

Pond 20P: CB-1 Peak Elev=166.28' Inflow=0.38 cfs 0.030 af
12.0" Round Culvert n=0.012 L=49.0' S=0.0200 '/' Outflow=0.38 cfs 0.030 af

Pond 21P: MH-1 Peak Elev=165.37' Inflow=0.54 cfs 0.042 af
12.0" Round Culvert n=0.012 L=58.0' S=0.0181 '/' Outflow=0.54 cfs 0.042 af

Pond 22P: CB-2 Peak Elev=165.07' Inflow=0.31 cfs 0.025 af
12.0" Round Culvert n=0.012 L=45.0' S=0.0189 '/' Outflow=0.31 cfs 0.025 af

Pond 23P: Drywell Peak Elev=161.40' Storage=121 cf Inflow=0.10 cfs 0.007 af
Discarded=0.01 cfs 0.007 af Primary=0.02 cfs 0.001 af Outflow=0.02 cfs 0.007 af

Pond 29P: CB-5&6 Peak Elev=162.79' Inflow=0.58 cfs 0.041 af
12.0" Round Culvert n=0.012 L=18.7' S=0.0128 '/' Outflow=0.58 cfs 0.041 af

Pond 30P: ADA CB-4 Peak Elev=167.49' Inflow=0.16 cfs 0.013 af
8.0" Round Culvert n=0.012 L=45.5' S=0.0499 '/' Outflow=0.16 cfs 0.013 af

Link 11L: Flow Off-Site (POC1) Inflow=0.25 cfs 0.017 af
Primary=0.25 cfs 0.017 af

Link 13L: Flow to Wetland (POC2) Inflow=0.95 cfs 0.093 af
Primary=0.95 cfs 0.093 af

Total Runoff Area = 1.231 ac Runoff Volume = 0.447 af Average Runoff Depth = 4.36"
32.05% Pervious = 0.394 ac 67.95% Impervious = 0.836 ac

Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: P1 Runoff Area=2,515 sf 59.88% Impervious Runoff Depth=5.26"
Tc=5.0 min CN=73 Runoff=0.37 cfs 0.025 af

Subcatchment 2S: P2.1 Runoff Area=2,464 sf 100.00% Impervious Runoff Depth=8.27"
Tc=5.0 min CN=98 Runoff=0.49 cfs 0.039 af

Subcatchment 3S: P2.2 Runoff Area=2,027 sf 100.00% Impervious Runoff Depth=8.27"
Tc=5.0 min CN=98 Runoff=0.40 cfs 0.032 af

Subcatchment 4S: P3 Runoff Area=467 sf 0.00% Impervious Runoff Depth=0.54"
Tc=5.0 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment 5S: P4 Runoff Area=1,031 sf 100.00% Impervious Runoff Depth=8.27"
Tc=5.0 min CN=98 Runoff=0.20 cfs 0.016 af

Subcatchment 6S: P6 Runoff Area=8,755 sf 0.29% Impervious Runoff Depth=0.98"
Tc=5.0 min CN=35 Runoff=0.12 cfs 0.016 af

Subcatchment 7S: P7.3 Runoff Area=861 sf 83.28% Impervious Runoff Depth=7.07"
Tc=5.0 min CN=88 Runoff=0.16 cfs 0.012 af

Subcatchment 9S: P9 Runoff Area=356 sf 0.00% Impervious Runoff Depth=0.54"
Tc=5.0 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment 10S: B1.1 Runoff Area=10,475 sf 100.00% Impervious Runoff Depth=8.27"
Tc=5.0 min CN=98 Runoff=2.08 cfs 0.166 af

Subcatchment 14S: P5 Runoff Area=746 sf 83.38% Impervious Runoff Depth=6.95"
Tc=5.0 min CN=87 Runoff=0.14 cfs 0.010 af

Subcatchment 17S: B1.2 Runoff Area=10,475 sf 100.00% Impervious Runoff Depth=8.27"
Tc=5.0 min CN=98 Runoff=2.08 cfs 0.166 af

Subcatchment 23S: P8 Runoff Area=4,423 sf 0.00% Impervious Runoff Depth=1.08"
Tc=5.0 min CN=36 Runoff=0.08 cfs 0.009 af

Subcatchment 27S: P7.2 Runoff Area=4,330 sf 80.90% Impervious Runoff Depth=6.83"
Tc=5.0 min CN=86 Runoff=0.79 cfs 0.057 af

Subcatchment 28S: P7.1 Runoff Area=4,682 sf 76.53% Impervious Runoff Depth=6.47"
Tc=5.0 min CN=83 Runoff=0.82 cfs 0.058 af

Reach 31R: Apron Avg. Flow Depth=0.07' Max Vel=0.25 fps Inflow=0.08 cfs 0.002 af
n=0.069 L=6.0' S=0.0050 '/' Capacity=2.12 cfs Outflow=0.08 cfs 0.002 af

Pond 14P: CB-3&4 Peak Elev=165.28' Inflow=1.99 cfs 0.134 af
12.0" Round Culvert n=0.012 L=20.0' S=0.0500 '/' Outflow=1.99 cfs 0.134 af

Pond 15P: Retention 2 Peak Elev=164.79' Storage=7,132 cf Inflow=5.90 cfs 0.443 af
Discarded=0.19 cfs 0.279 af Primary=1.60 cfs 0.165 af Outflow=1.79 cfs 0.443 af

Pond 16P: Retention 1 Peak Elev=178.46' Storage=1,673 cf Inflow=2.08 cfs 0.166 af
Discarded=0.05 cfs 0.090 af Primary=1.39 cfs 0.075 af Outflow=1.44 cfs 0.166 af

Pond 19P: MH-2 Peak Elev=164.49' Inflow=1.10 cfs 0.087 af
12.0" Round Culvert n=0.012 L=38.0' S=0.0168 '/' Outflow=1.10 cfs 0.087 af

Pond 20P: CB-1 Peak Elev=166.33' Inflow=0.49 cfs 0.039 af
12.0" Round Culvert n=0.012 L=49.0' S=0.0200 '/' Outflow=0.49 cfs 0.039 af

Pond 21P: MH-1 Peak Elev=165.42' Inflow=0.69 cfs 0.055 af
12.0" Round Culvert n=0.012 L=58.0' S=0.0181 '/' Outflow=0.69 cfs 0.055 af

Pond 22P: CB-2 Peak Elev=165.11' Inflow=0.40 cfs 0.032 af
12.0" Round Culvert n=0.012 L=45.0' S=0.0189 '/' Outflow=0.40 cfs 0.032 af

Pond 23P: Drywell Peak Elev=161.48' Storage=125 cf Inflow=0.14 cfs 0.010 af
Discarded=0.01 cfs 0.008 af Primary=0.08 cfs 0.002 af Outflow=0.09 cfs 0.010 af

Pond 29P: CB-5&6 Peak Elev=162.87' Inflow=0.79 cfs 0.057 af
12.0" Round Culvert n=0.012 L=18.7' S=0.0128 '/' Outflow=0.79 cfs 0.057 af

Pond 30P: ADA CB-4 Peak Elev=167.52' Inflow=0.20 cfs 0.016 af
8.0" Round Culvert n=0.012 L=45.5' S=0.0499 '/' Outflow=0.20 cfs 0.016 af

Link 11L: Flow Off-Site (POC1) Inflow=0.37 cfs 0.026 af
Primary=0.37 cfs 0.026 af

Link 13L: Flow to Wetland (POC2) Inflow=1.80 cfs 0.204 af
Primary=1.80 cfs 0.204 af

Total Runoff Area = 1.231 ac Runoff Volume = 0.607 af Average Runoff Depth = 5.92"
32.05% Pervious = 0.394 ac 67.95% Impervious = 0.836 ac

Summary for Pond 15P: Retention 2

Inflow Area = 0.823 ac, 93.63% Impervious, Inflow Depth = 1.84" for 2-yr event
Inflow = 1.67 cfs @ 12.07 hrs, Volume= 0.126 af
Outflow = 0.19 cfs @ 11.62 hrs, Volume= 0.126 af, Atten= 89%, Lag= 0.0 min
Discarded = 0.19 cfs @ 11.62 hrs, Volume= 0.126 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 13L : Flow to Wetland (POC2)

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 160.05' @ 12.84 hrs Surf.Area= 1,620 sf Storage= 1,763 cf
Flood Elev= 165.25' Surf.Area= 1,620 sf Storage= 7,429 cf

Plug-Flow detention time= 65.5 min calculated for 0.126 af (100% of inflow)
Center-of-Mass det. time= 65.5 min (838.0 - 772.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	158.33'	1,291 cf	**18.00'W x 90.00'L x 6.92'H Field A** 11,205 cf Overall - 7,979 cf Embedded = 3,226 cf x 40.0% Voids
#2A	159.08'	6,138 cf	**retain_it retain_it 5.0'** x 22 Inside #1 Inside= 84.0"W x 60.0"H => 36.41 sf x 8.00'L = 291.3 cf Outside= 96.0"W x 68.0"H => 45.33 sf x 8.00'L = 362.7 cf 2 Rows adjusted for 270.1 cf perimeter wall
		7,429 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	161.66'	**8.0" Round Culvert** L= 26.9' Ke= 0.500 Inlet / Outlet Invert= 161.66' / 161.00' S= 0.0245 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Discarded	158.33'	**5.000 in/hr Exfiltration over Surface area**
#3	Device 1	161.66'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.19 cfs @ 11.62 hrs HW=158.40' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=158.33' (Free Discharge)
↑—**1=Culvert** (Controls 0.00 cfs)
↑—**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 15P: Retention 2 - Chamber Wizard Field A

Chamber Model = retain_it retain_it 5.0' (retain-it®)
Inside= 84.0"W x 60.0"H => 36.41 sf x 8.00'L = 291.3 cf
Outside= 96.0"W x 68.0"H => 45.33 sf x 8.00'L = 362.7 cf
2 Rows adjusted for 270.1 cf perimeter wall

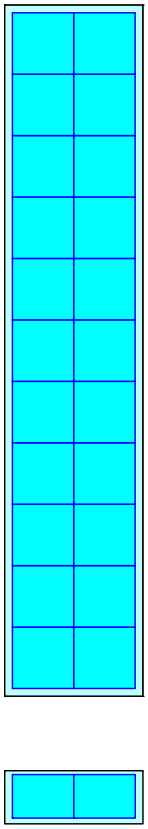
11 Chambers/Row x 8.00' Long = 88.00' Row Length +12.0" End Stone x 2 = 90.00' Base Length
2 Rows x 96.0" Wide + 12.0" Side Stone x 2 = 18.00' Base Width
9.0" Stone Base + 68.0" Chamber Height + 6.0" Stone Cover = 6.92' Field Height

10.4 cf Sidewall x 11 x 2 + 10.4 cf Endwall x 2 x 2 = 270.1 cf Perimeter Wall
22 Chambers x 291.3 cf - 270.1 cf Perimeter wall = 6,138.0 cf Chamber Storage
22 Chambers x 362.7 cf = 7,978.7 cf Displacement

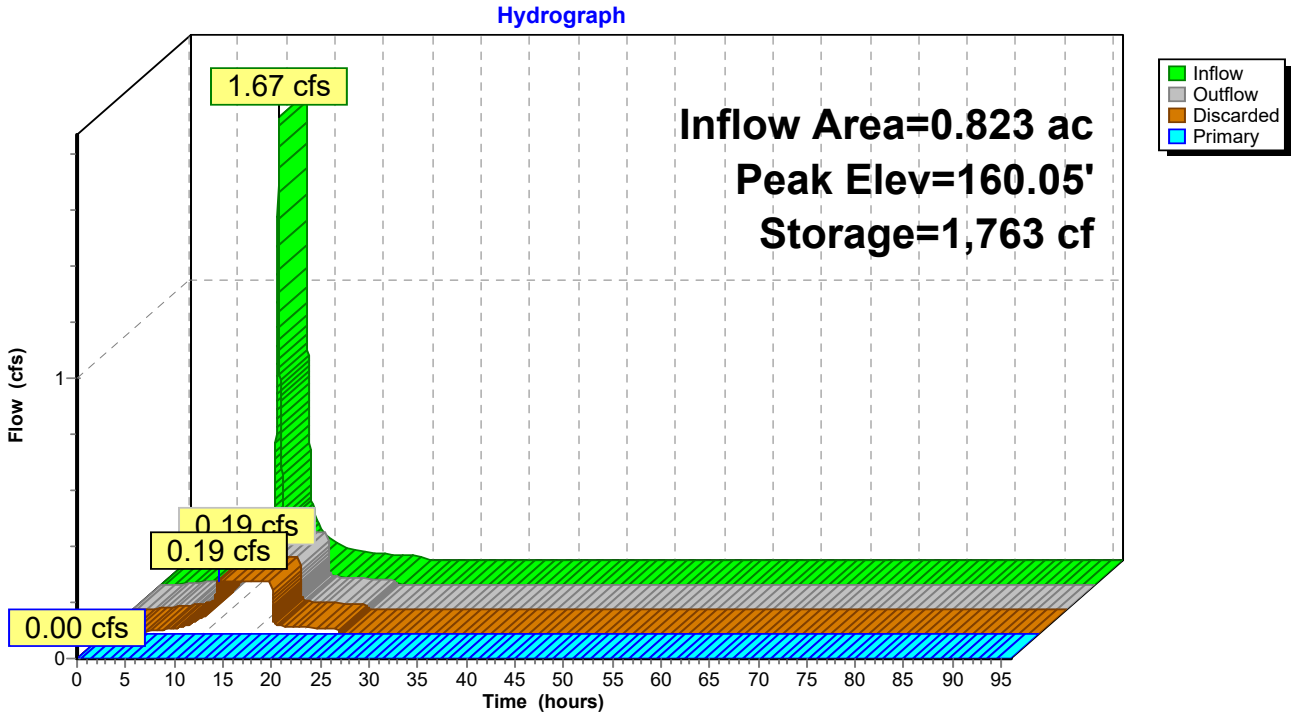
11,205.0 cf Field - 7,978.7 cf Chambers = 3,226.3 cf Stone x 40.0% Voids = 1,290.5 cf Stone Storage

Chamber Storage + Stone Storage = 7,428.6 cf = 0.171 af
Overall Storage Efficiency = 66.3%
Overall System Size = 90.00' x 18.00' x 6.92'

22 Chambers
415.0 cy Field
119.5 cy Stone



Pond 15P: Retention 2



Summary for Pond 16P: Retention 1

Inflow Area = 0.240 ac,100.00% Impervious, Inflow Depth = 3.07" for 2-yr event
Inflow = 0.80 cfs @ 12.07 hrs, Volume= 0.061 af
Outflow = 0.07 cfs @ 12.91 hrs, Volume= 0.061 af, Atten= 91%, Lag= 50.2 min
Discarded = 0.05 cfs @ 10.77 hrs, Volume= 0.060 af
Primary = 0.02 cfs @ 12.91 hrs, Volume= 0.001 af
Routed to Pond 14P : CB-3&4

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 176.12' @ 12.91 hrs Surf.Area= 420 sf Storage= 1,057 cf
Flood Elev= 179.25' Surf.Area= 420 sf Storage= 1,768 cf

Plug-Flow detention time= 164.3 min calculated for 0.061 af (100% of inflow)
Center-of-Mass det. time= 164.3 min (919.1 - 754.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	172.33'	437 cf	**10.00'W x 42.00'L x 6.92'H Field A** 2,905 cf Overall - 1,813 cf Embedded = 1,092 cf x 40.0% Voids
#2A	173.08'	1,332 cf	**retain_it retain_it 5.0'** x 5 Inside #1 Inside= 84.0"W x 60.0"H => 36.41 sf x 8.00'L = 291.3 cf Outside= 96.0"W x 68.0"H => 45.33 sf x 8.00'L = 362.7 cf 1 Rows adjusted for 124.7 cf perimeter wall
		1,768 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	176.04'	**8.0" Round Culvert** L= 88.0' Ke= 0.500 Inlet / Outlet Invert= 176.04' / 169.00' S= 0.0800 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Discarded	172.33'	**5.000 in/hr Exfiltration over Surface area**
#3	Device 1	176.04'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 10.77 hrs HW=172.40' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.02 cfs @ 12.91 hrs HW=176.12' (Free Discharge)
↑—**1=Culvert** (Passes 0.02 cfs of 0.02 cfs potential flow)
↑—**3=Orifice/Grate** (Orifice Controls 0.02 cfs @ 0.96 fps)

Pond 16P: Retention 1 - Chamber Wizard Field A

Chamber Model = retain_it retain_it 5.0' (retain-it®)
Inside= 84.0"W x 60.0"H => 36.41 sf x 8.00'L = 291.3 cf
Outside= 96.0"W x 68.0"H => 45.33 sf x 8.00'L = 362.7 cf
1 Rows adjusted for 124.7 cf perimeter wall

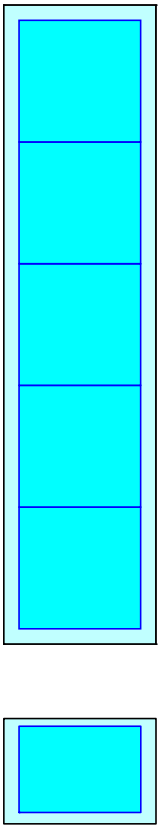
5 Chambers/Row x 8.00' Long = 40.00' Row Length +12.0" End Stone x 2 = 42.00' Base Length
1 Rows x 96.0" Wide + 12.0" Side Stone x 2 = 10.00' Base Width
9.0" Stone Base + 68.0" Chamber Height + 6.0" Stone Cover = 6.92' Field Height

10.4 cf Sidewall x 5 x 2 + 10.4 cf Endwall x 1 x 2 = 124.7 cf Perimeter Wall
5 Chambers x 291.3 cf - 124.7 cf Perimeter wall = 1,331.7 cf Chamber Storage
5 Chambers x 362.7 cf = 1,813.3 cf Displacement

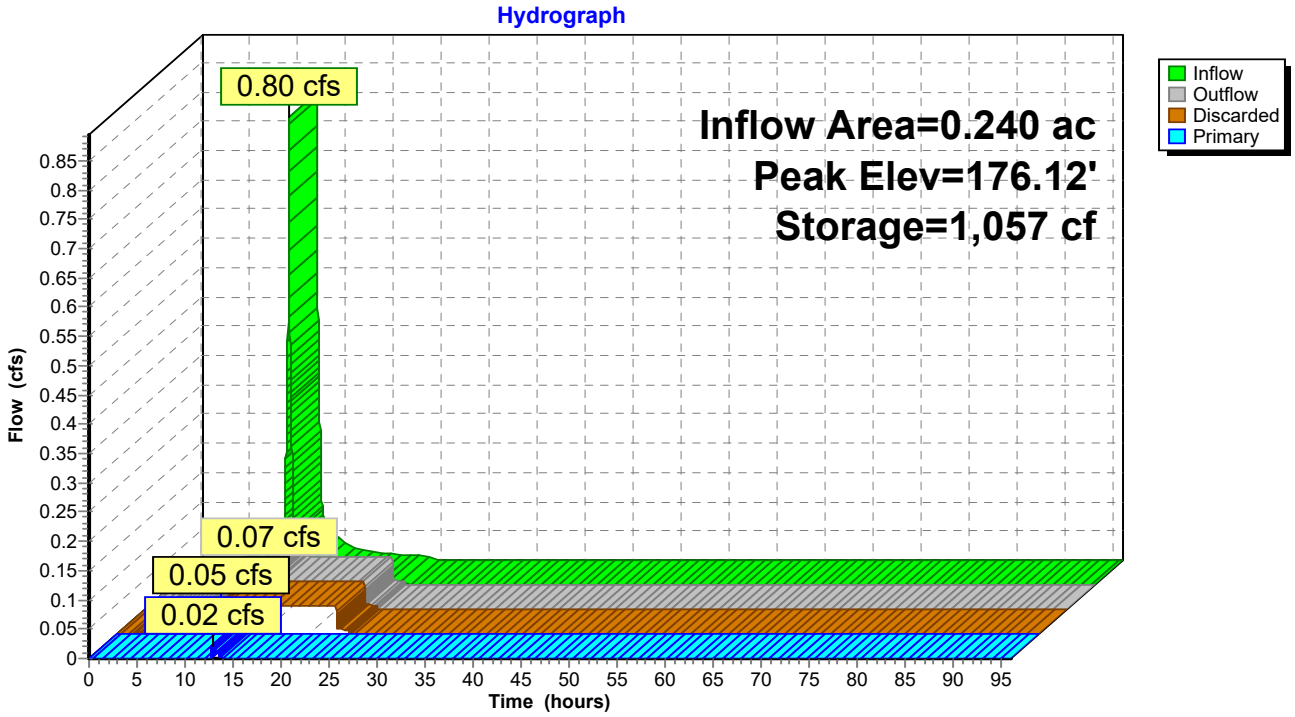
2,905.0 cf Field - 1,813.3 cf Chambers = 1,091.7 cf Stone x 40.0% Voids = 436.7 cf Stone Storage

Chamber Storage + Stone Storage = 1,768.4 cf = 0.041 af
Overall Storage Efficiency = 60.9%
Overall System Size = 42.00' x 10.00' x 6.92'

5 Chambers
107.6 cy Field
40.4 cy Stone



Pond 16P: Retention 1



Summary for Pond 23P: Drywell

Inflow Area = 0.017 ac, 83.38% Impervious, Inflow Depth = 2.00" for 2-yr event
Inflow = 0.04 cfs @ 12.07 hrs, Volume= 0.003 af
Outflow = 0.01 cfs @ 11.73 hrs, Volume= 0.003 af, Atten= 86%, Lag= 0.0 min
Discarded = 0.01 cfs @ 11.73 hrs, Volume= 0.003 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 31R : Apron

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 159.79' @ 12.59 hrs Surf.Area= 50 sf Storage= 40 cf
Flood Elev= 163.00' Surf.Area= 50 sf Storage= 201 cf

Plug-Flow detention time= 48.8 min calculated for 0.003 af (100% of inflow)
Center-of-Mass det. time= 48.8 min (865.4 - 816.6)

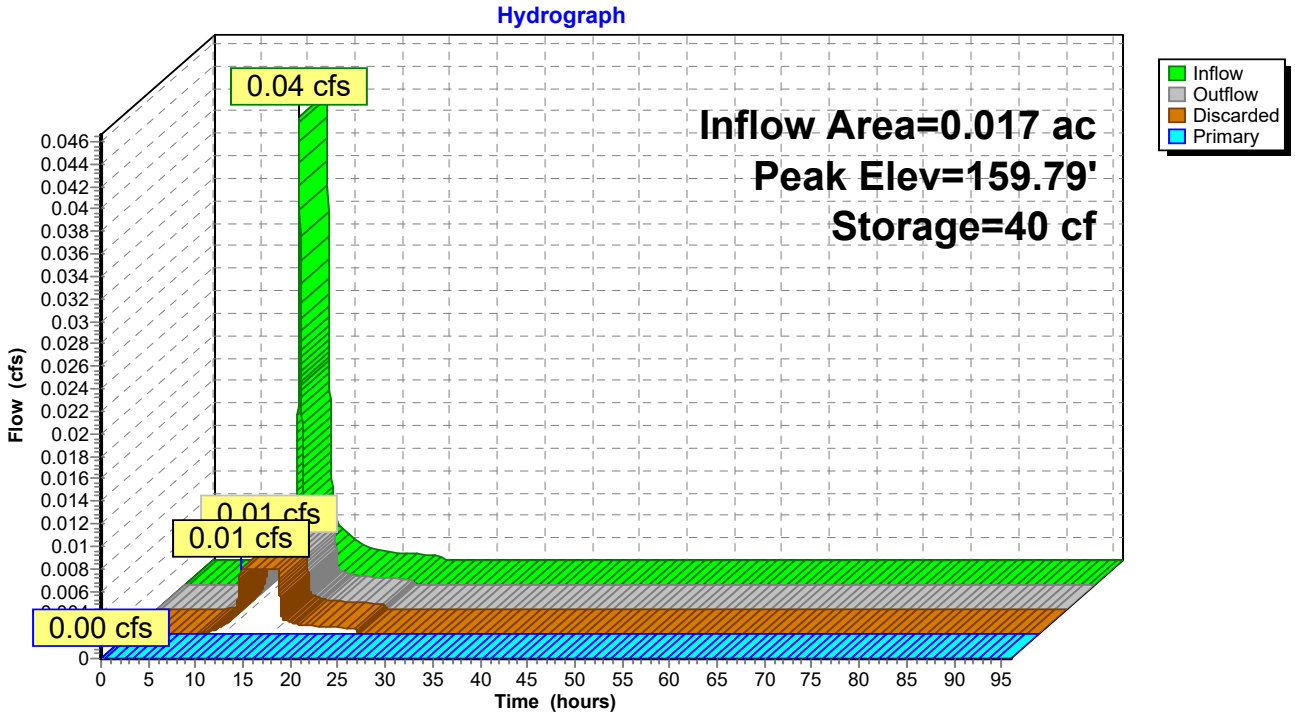
Volume	Invert	Avail.Storage	Storage Description
#1	159.00'	201 cf	**8.00'D x 4.00'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	161.33'	**8.0" Round Culvert** L= 4.0' Ke= 0.500 Inlet / Outlet Invert= 161.33' / 161.13' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Discarded	159.00'	**5.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 11.73 hrs HW=159.04' (Free Discharge)
↑└**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=159.00' (Free Discharge)
↑└**1=Culvert** (Controls 0.00 cfs)

Pond 23P: Drywell



Summary for Pond 15P: Retention 2

Inflow Area = 0.823 ac, 93.63% Impervious, Inflow Depth = 3.57" for 10-yr event
Inflow = 3.15 cfs @ 12.10 hrs, Volume= 0.245 af
Outflow = 0.48 cfs @ 12.64 hrs, Volume= 0.245 af, Atten= 85%, Lag= 32.7 min
Discarded = 0.19 cfs @ 11.12 hrs, Volume= 0.224 af
Primary = 0.29 cfs @ 12.64 hrs, Volume= 0.021 af
Routed to Link 13L : Flow to Wetland (POC2)

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 162.01' @ 12.64 hrs Surf.Area= 1,620 sf Storage= 4,326 cf
Flood Elev= 165.25' Surf.Area= 1,620 sf Storage= 7,429 cf

Plug-Flow detention time= 159.4 min calculated for 0.245 af (100% of inflow)
Center-of-Mass det. time= 159.4 min (921.5 - 762.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	158.33'	1,291 cf	**18.00'W x 90.00'L x 6.92'H Field A** 11,205 cf Overall - 7,979 cf Embedded = 3,226 cf x 40.0% Voids
#2A	159.08'	6,138 cf	**retain_it retain_it 5.0'** x 22 Inside #1 Inside= 84.0"W x 60.0"H => 36.41 sf x 8.00'L = 291.3 cf Outside= 96.0"W x 68.0"H => 45.33 sf x 8.00'L = 362.7 cf 2 Rows adjusted for 270.1 cf perimeter wall
		7,429 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	161.66'	**8.0" Round Culvert** L= 26.9' Ke= 0.500 Inlet / Outlet Invert= 161.66' / 161.00' S= 0.0245 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Discarded	158.33'	**5.000 in/hr Exfiltration over Surface area**
#3	Device 1	161.66'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.19 cfs @ 11.12 hrs HW=158.40' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=0.29 cfs @ 12.64 hrs HW=162.01' (Free Discharge)
↑—**1=Culvert** (Passes 0.29 cfs of 0.37 cfs potential flow)
↑—**3=Orifice/Grate** (Orifice Controls 0.29 cfs @ 2.00 fps)

Pond 15P: Retention 2 - Chamber Wizard Field A

Chamber Model = retain_it retain_it 5.0' (retain-it®)
Inside= 84.0"W x 60.0"H => 36.41 sf x 8.00'L = 291.3 cf
Outside= 96.0"W x 68.0"H => 45.33 sf x 8.00'L = 362.7 cf
2 Rows adjusted for 270.1 cf perimeter wall

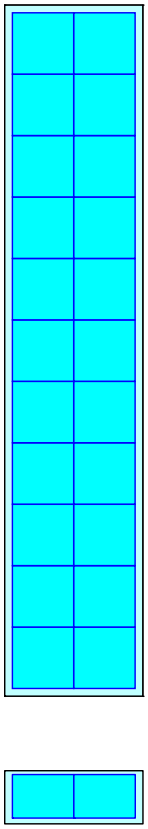
11 Chambers/Row x 8.00' Long = 88.00' Row Length +12.0" End Stone x 2 = 90.00' Base Length
2 Rows x 96.0" Wide + 12.0" Side Stone x 2 = 18.00' Base Width
9.0" Stone Base + 68.0" Chamber Height + 6.0" Stone Cover = 6.92' Field Height

10.4 cf Sidewall x 11 x 2 + 10.4 cf Endwall x 2 x 2 = 270.1 cf Perimeter Wall
22 Chambers x 291.3 cf - 270.1 cf Perimeter wall = 6,138.0 cf Chamber Storage
22 Chambers x 362.7 cf = 7,978.7 cf Displacement

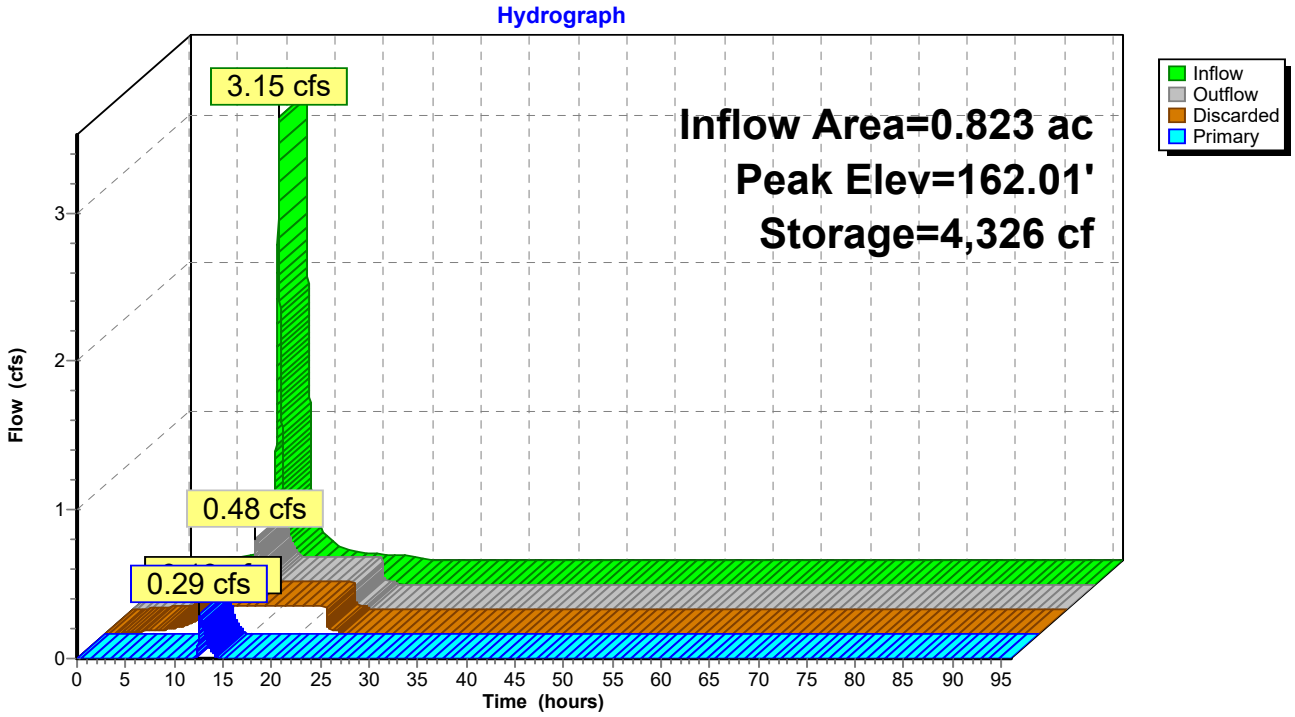
11,205.0 cf Field - 7,978.7 cf Chambers = 3,226.3 cf Stone x 40.0% Voids = 1,290.5 cf Stone Storage

Chamber Storage + Stone Storage = 7,428.6 cf = 0.171 af
Overall Storage Efficiency = 66.3%
Overall System Size = 90.00' x 18.00' x 6.92'

22 Chambers
415.0 cy Field
119.5 cy Stone



Pond 15P: Retention 2



Summary for Pond 16P: Retention 1

Inflow Area = 0.240 ac,100.00% Impervious, Inflow Depth = 5.08" for 10-yr event
Inflow = 1.30 cfs @ 12.07 hrs, Volume= 0.102 af
Outflow = 0.71 cfs @ 12.18 hrs, Volume= 0.102 af, Atten= 45%, Lag= 6.4 min
Discarded = 0.05 cfs @ 9.32 hrs, Volume= 0.075 af
Primary = 0.67 cfs @ 12.18 hrs, Volume= 0.027 af
Routed to Pond 14P : CB-3&4

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 176.79' @ 12.18 hrs Surf.Area= 420 sf Storage= 1,262 cf
Flood Elev= 179.25' Surf.Area= 420 sf Storage= 1,768 cf

Plug-Flow detention time= 132.5 min calculated for 0.102 af (100% of inflow)
Center-of-Mass det. time= 132.5 min (878.6 - 746.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	172.33'	437 cf	**10.00'W x 42.00'L x 6.92'H Field A** 2,905 cf Overall - 1,813 cf Embedded = 1,092 cf x 40.0% Voids
#2A	173.08'	1,332 cf	**retain_it retain_it 5.0'** x 5 Inside #1 Inside= 84.0"W x 60.0"H => 36.41 sf x 8.00'L = 291.3 cf Outside= 96.0"W x 68.0"H => 45.33 sf x 8.00'L = 362.7 cf 1 Rows adjusted for 124.7 cf perimeter wall
		1,768 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	176.04'	**8.0" Round Culvert** L= 88.0' Ke= 0.500 Inlet / Outlet Invert= 176.04' / 169.00' S= 0.0800 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Discarded	172.33'	**5.000 in/hr Exfiltration over Surface area**
#3	Device 1	176.04'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 9.32 hrs HW=172.40' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.67 cfs @ 12.18 hrs HW=176.79' (Free Discharge)
↑—**1=Culvert** (Passes 0.67 cfs of 1.08 cfs potential flow)
↑—**3=Orifice/Grate** (Orifice Controls 0.67 cfs @ 3.39 fps)

Pond 16P: Retention 1 - Chamber Wizard Field A

Chamber Model = retain_it retain_it 5.0' (retain-it®)
Inside= 84.0"W x 60.0"H => 36.41 sf x 8.00'L = 291.3 cf
Outside= 96.0"W x 68.0"H => 45.33 sf x 8.00'L = 362.7 cf
1 Rows adjusted for 124.7 cf perimeter wall

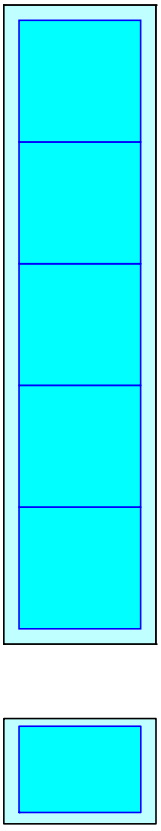
5 Chambers/Row x 8.00' Long = 40.00' Row Length +12.0" End Stone x 2 = 42.00' Base Length
1 Rows x 96.0" Wide + 12.0" Side Stone x 2 = 10.00' Base Width
9.0" Stone Base + 68.0" Chamber Height + 6.0" Stone Cover = 6.92' Field Height

10.4 cf Sidewall x 5 x 2 + 10.4 cf Endwall x 1 x 2 = 124.7 cf Perimeter Wall
5 Chambers x 291.3 cf - 124.7 cf Perimeter wall = 1,331.7 cf Chamber Storage
5 Chambers x 362.7 cf = 1,813.3 cf Displacement

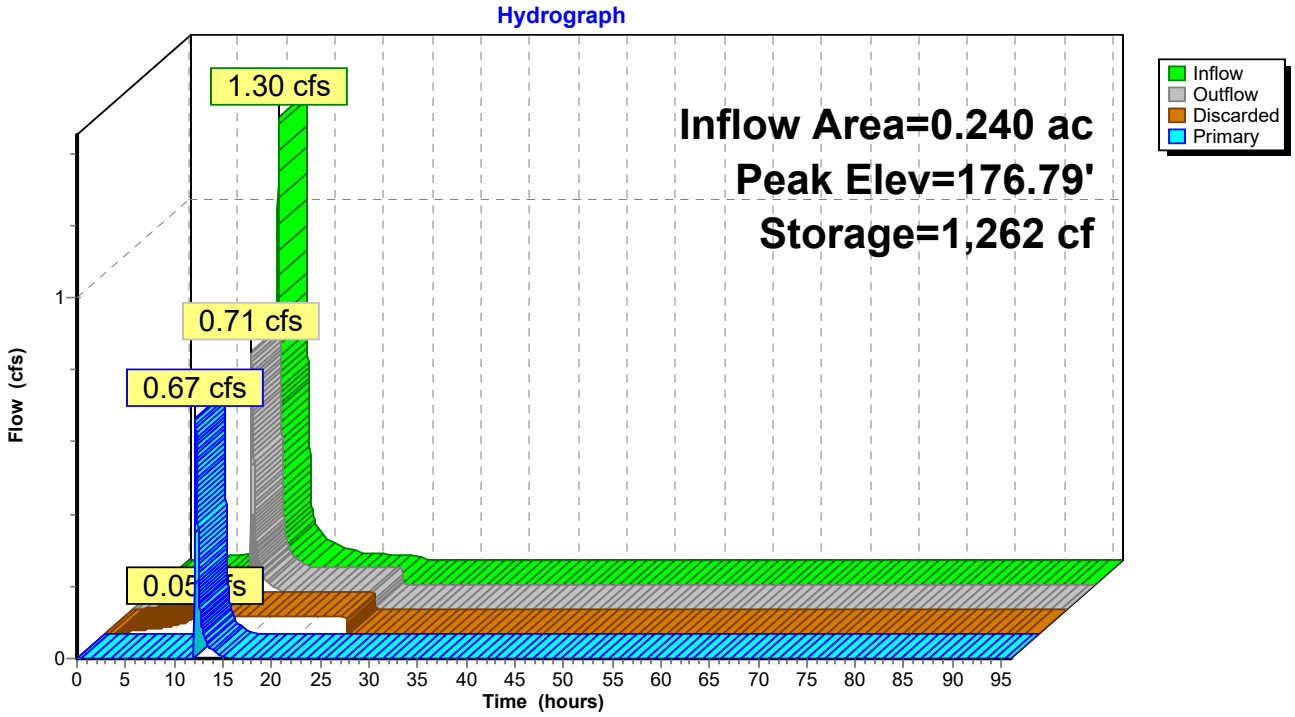
2,905.0 cf Field - 1,813.3 cf Chambers = 1,091.7 cf Stone x 40.0% Voids = 436.7 cf Stone Storage

Chamber Storage + Stone Storage = 1,768.4 cf = 0.041 af
Overall Storage Efficiency = 60.9%
Overall System Size = 42.00' x 10.00' x 6.92'

5 Chambers
107.6 cy Field
40.4 cy Stone



Pond 16P: Retention 1



Summary for Pond 23P: Drywell

Inflow Area = 0.017 ac, 83.38% Impervious, Inflow Depth = 3.87" for 10-yr event
Inflow = 0.08 cfs @ 12.07 hrs, Volume= 0.006 af
Outflow = 0.01 cfs @ 11.40 hrs, Volume= 0.006 af, Atten= 93%, Lag= 0.0 min
Discarded = 0.01 cfs @ 11.40 hrs, Volume= 0.006 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 31R : Apron

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 160.95' @ 13.25 hrs Surf.Area= 50 sf Storage= 98 cf
Flood Elev= 163.00' Surf.Area= 50 sf Storage= 201 cf

Plug-Flow detention time= 141.2 min calculated for 0.006 af (100% of inflow)
Center-of-Mass det. time= 141.2 min (939.2 - 798.0)

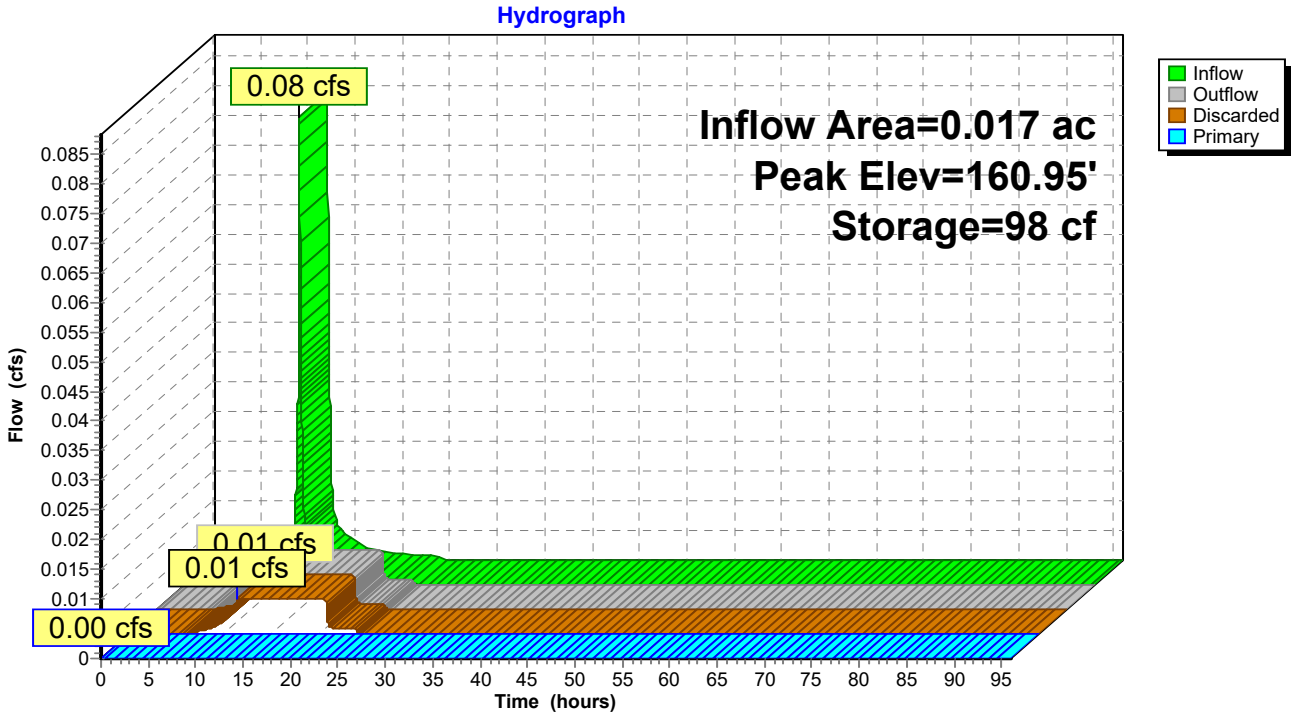
Volume	Invert	Avail.Storage	Storage Description
#1	159.00'	201 cf	**8.00'D x 4.00'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	161.33'	**8.0" Round Culvert** L= 4.0' Ke= 0.500 Inlet / Outlet Invert= 161.33' / 161.13' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Discarded	159.00'	**5.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 11.40 hrs HW=159.04' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=159.00' (Free Discharge)
↑**1=Culvert** (Controls 0.00 cfs)

Pond 23P: Drywell



Summary for Pond 15P: Retention 2

Inflow Area = 0.823 ac, 93.63% Impervious, Inflow Depth = 4.70" for 25-yr event
Inflow = 4.45 cfs @ 12.08 hrs, Volume= 0.322 af
Outflow = 1.06 cfs @ 12.51 hrs, Volume= 0.322 af, Atten= 76%, Lag= 25.8 min
Discarded = 0.19 cfs @ 10.55 hrs, Volume= 0.248 af
Primary = 0.88 cfs @ 12.51 hrs, Volume= 0.074 af
Routed to Link 13L : Flow to Wetland (POC2)

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 162.77' @ 12.51 hrs Surf.Area= 1,620 sf Storage= 5,327 cf
Flood Elev= 165.25' Surf.Area= 1,620 sf Storage= 7,429 cf

Plug-Flow detention time= 141.0 min calculated for 0.322 af (100% of inflow)
Center-of-Mass det. time= 141.0 min (899.6 - 758.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	158.33'	1,291 cf	**18.00'W x 90.00'L x 6.92'H Field A** 11,205 cf Overall - 7,979 cf Embedded = 3,226 cf x 40.0% Voids
#2A	159.08'	6,138 cf	**retain_it retain_it 5.0'** x 22 Inside #1 Inside= 84.0"W x 60.0"H => 36.41 sf x 8.00'L = 291.3 cf Outside= 96.0"W x 68.0"H => 45.33 sf x 8.00'L = 362.7 cf 2 Rows adjusted for 270.1 cf perimeter wall
		7,429 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	161.66'	**8.0" Round Culvert** L= 26.9' Ke= 0.500 Inlet / Outlet Invert= 161.66' / 161.00' S= 0.0245 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Discarded	158.33'	**5.000 in/hr Exfiltration over Surface area**
#3	Device 1	161.66'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.19 cfs @ 10.55 hrs HW=158.40' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=0.88 cfs @ 12.51 hrs HW=162.77' (Free Discharge)
↑—**1=Culvert** (Passes 0.88 cfs of 1.48 cfs potential flow)
↑—**3=Orifice/Grate** (Orifice Controls 0.88 cfs @ 4.46 fps)

Pond 15P: Retention 2 - Chamber Wizard Field A

Chamber Model = retain_it retain_it 5.0' (retain-it®)
Inside= 84.0"W x 60.0"H => 36.41 sf x 8.00'L = 291.3 cf
Outside= 96.0"W x 68.0"H => 45.33 sf x 8.00'L = 362.7 cf
2 Rows adjusted for 270.1 cf perimeter wall

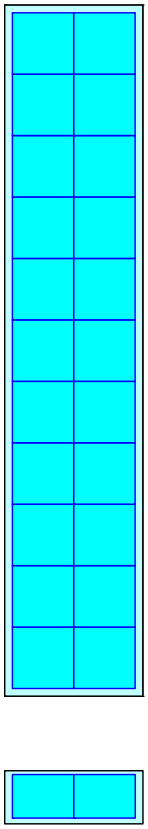
11 Chambers/Row x 8.00' Long = 88.00' Row Length +12.0" End Stone x 2 = 90.00' Base Length
2 Rows x 96.0" Wide + 12.0" Side Stone x 2 = 18.00' Base Width
9.0" Stone Base + 68.0" Chamber Height + 6.0" Stone Cover = 6.92' Field Height

10.4 cf Sidewall x 11 x 2 + 10.4 cf Endwall x 2 x 2 = 270.1 cf Perimeter Wall
22 Chambers x 291.3 cf - 270.1 cf Perimeter wall = 6,138.0 cf Chamber Storage
22 Chambers x 362.7 cf = 7,978.7 cf Displacement

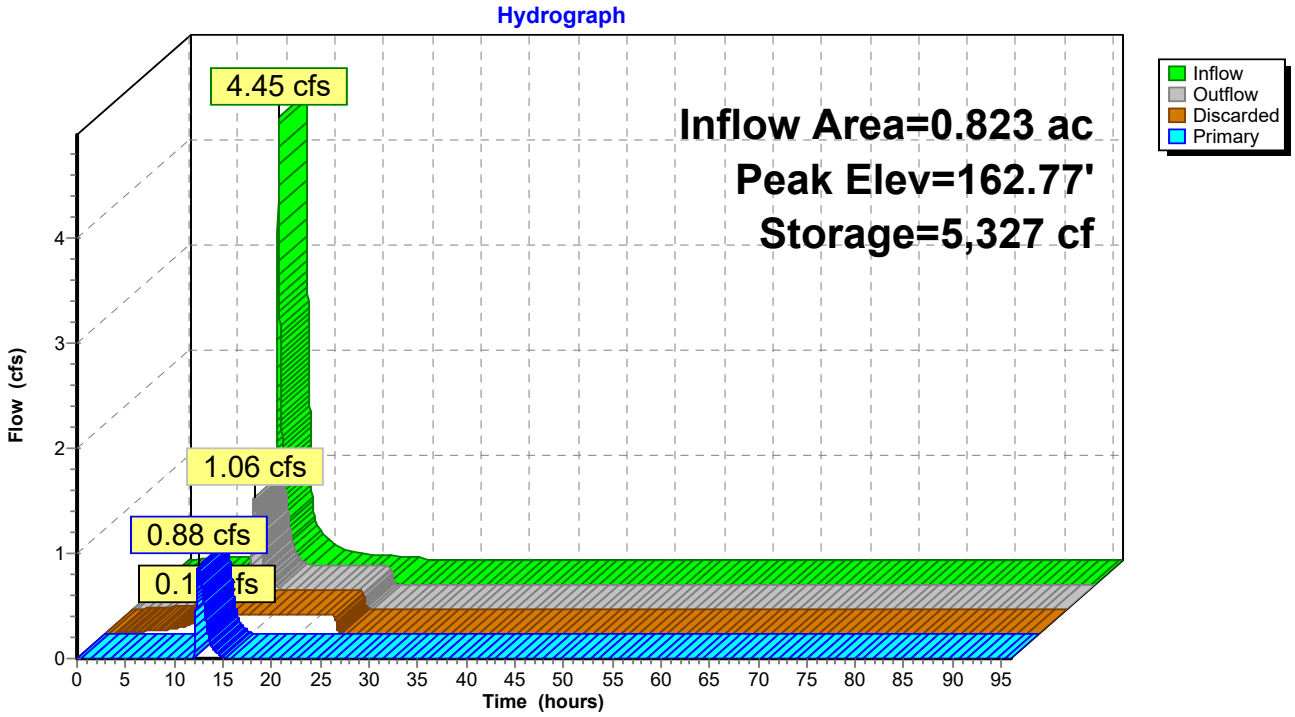
11,205.0 cf Field - 7,978.7 cf Chambers = 3,226.3 cf Stone x 40.0% Voids = 1,290.5 cf Stone Storage

Chamber Storage + Stone Storage = 7,428.6 cf = 0.171 af
Overall Storage Efficiency = 66.3%
Overall System Size = 90.00' x 18.00' x 6.92'

22 Chambers
415.0 cy Field
119.5 cy Stone



Pond 15P: Retention 2



Summary for Pond 16P: Retention 1

Inflow Area = 0.240 ac,100.00% Impervious, Inflow Depth = 6.34" for 25-yr event
Inflow = 1.61 cfs @ 12.07 hrs, Volume= 0.127 af
Outflow = 1.04 cfs @ 12.15 hrs, Volume= 0.127 af, Atten= 35%, Lag= 5.0 min
Discarded = 0.05 cfs @ 8.65 hrs, Volume= 0.081 af
Primary = 0.99 cfs @ 12.15 hrs, Volume= 0.046 af
Routed to Pond 14P : CB-3&4

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 177.39' @ 12.15 hrs Surf.Area= 420 sf Storage= 1,446 cf
Flood Elev= 179.25' Surf.Area= 420 sf Storage= 1,768 cf

Plug-Flow detention time= 121.1 min calculated for 0.127 af (100% of inflow)
Center-of-Mass det. time= 121.1 min (864.0 - 742.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	172.33'	437 cf	**10.00'W x 42.00'L x 6.92'H Field A** 2,905 cf Overall - 1,813 cf Embedded = 1,092 cf x 40.0% Voids
#2A	173.08'	1,332 cf	**retain_it retain_it 5.0'** x 5 Inside #1 Inside= 84.0"W x 60.0"H => 36.41 sf x 8.00'L = 291.3 cf Outside= 96.0"W x 68.0"H => 45.33 sf x 8.00'L = 362.7 cf 1 Rows adjusted for 124.7 cf perimeter wall
		1,768 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	176.04'	**8.0" Round Culvert** L= 88.0' Ke= 0.500 Inlet / Outlet Invert= 176.04' / 169.00' S= 0.0800 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Discarded	172.33'	**5.000 in/hr Exfiltration over Surface area**
#3	Device 1	176.04'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 8.65 hrs HW=172.40' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.99 cfs @ 12.15 hrs HW=177.39' (Free Discharge)
↑—**1=Culvert** (Passes 0.99 cfs of 1.69 cfs potential flow)
↑—**3=Orifice/Grate** (Orifice Controls 0.99 cfs @ 5.04 fps)

Pond 16P: Retention 1 - Chamber Wizard Field A

Chamber Model = retain_it retain_it 5.0' (retain-it®)
Inside= 84.0"W x 60.0"H => 36.41 sf x 8.00'L = 291.3 cf
Outside= 96.0"W x 68.0"H => 45.33 sf x 8.00'L = 362.7 cf
1 Rows adjusted for 124.7 cf perimeter wall

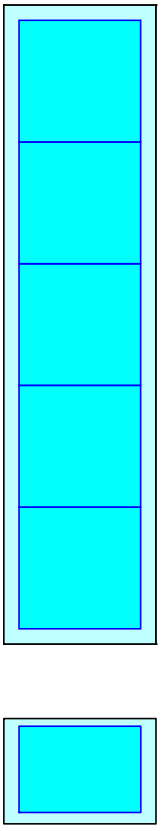
5 Chambers/Row x 8.00' Long = 40.00' Row Length +12.0" End Stone x 2 = 42.00' Base Length
1 Rows x 96.0" Wide + 12.0" Side Stone x 2 = 10.00' Base Width
9.0" Stone Base + 68.0" Chamber Height + 6.0" Stone Cover = 6.92' Field Height

10.4 cf Sidewall x 5 x 2 + 10.4 cf Endwall x 1 x 2 = 124.7 cf Perimeter Wall
5 Chambers x 291.3 cf - 124.7 cf Perimeter wall = 1,331.7 cf Chamber Storage
5 Chambers x 362.7 cf = 1,813.3 cf Displacement

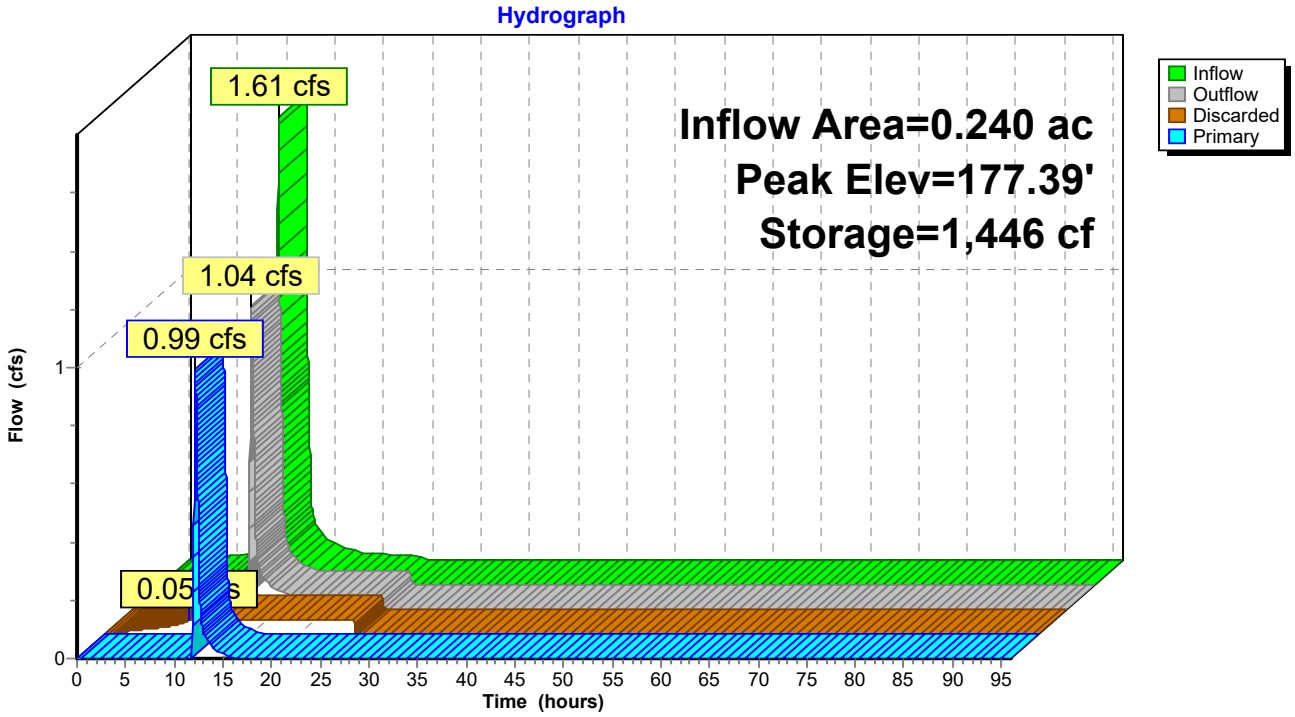
2,905.0 cf Field - 1,813.3 cf Chambers = 1,091.7 cf Stone x 40.0% Voids = 436.7 cf Stone Storage

Chamber Storage + Stone Storage = 1,768.4 cf = 0.041 af
Overall Storage Efficiency = 60.9%
Overall System Size = 42.00' x 10.00' x 6.92'

5 Chambers
107.6 cy Field
40.4 cy Stone



Pond 16P: Retention 1



Summary for Pond 23P: Drywell

Inflow Area = 0.017 ac, 83.38% Impervious, Inflow Depth = 5.07" for 25-yr event
Inflow = 0.10 cfs @ 12.07 hrs, Volume= 0.007 af
Outflow = 0.02 cfs @ 12.45 hrs, Volume= 0.007 af, Atten= 76%, Lag= 22.9 min
Discarded = 0.01 cfs @ 11.10 hrs, Volume= 0.007 af
Primary = 0.02 cfs @ 12.45 hrs, Volume= 0.001 af
Routed to Reach 31R : Apron

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 161.40' @ 12.45 hrs Surf.Area= 50 sf Storage= 121 cf
Flood Elev= 163.00' Surf.Area= 50 sf Storage= 201 cf

Plug-Flow detention time= 163.0 min calculated for 0.007 af (100% of inflow)
Center-of-Mass det. time= 162.9 min (953.5 - 790.5)

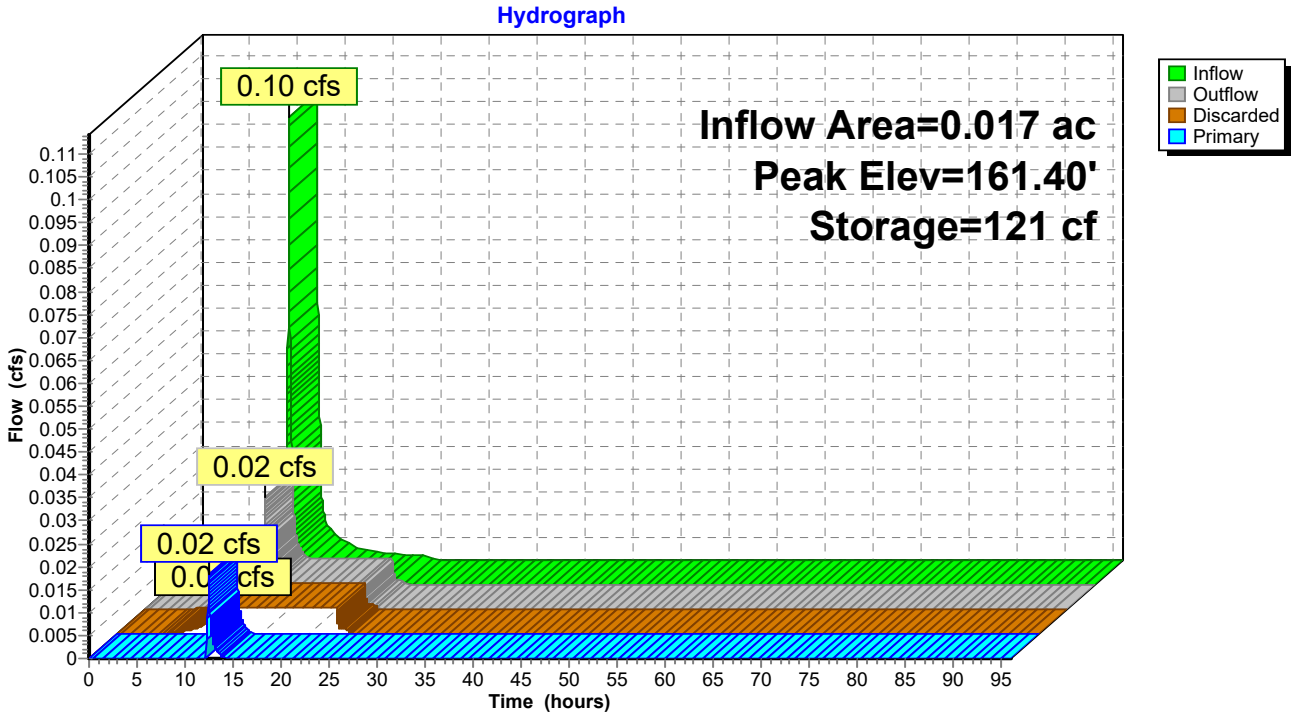
Volume	Invert	Avail.Storage	Storage Description
#1	159.00'	201 cf	**8.00'D x 4.00'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	161.33'	**8.0" Round Culvert** L= 4.0' Ke= 0.500 Inlet / Outlet Invert= 161.33' / 161.13' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Discarded	159.00'	**5.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 11.10 hrs HW=159.04' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.02 cfs @ 12.45 hrs HW=161.40' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 0.02 cfs @ 0.91 fps)

Pond 23P: Drywell



Summary for Pond 15P: Retention 2

Inflow Area = 0.823 ac, 93.63% Impervious, Inflow Depth = 6.47" for 100-yr event
Inflow = 5.90 cfs @ 12.08 hrs, Volume= 0.443 af
Outflow = 1.79 cfs @ 12.46 hrs, Volume= 0.443 af, Atten= 70%, Lag= 23.3 min
Discarded = 0.19 cfs @ 9.79 hrs, Volume= 0.279 af
Primary = 1.60 cfs @ 12.46 hrs, Volume= 0.165 af
Routed to Link 13L : Flow to Wetland (POC2)

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 164.79' @ 12.46 hrs Surf.Area= 1,620 sf Storage= 7,132 cf
Flood Elev= 165.25' Surf.Area= 1,620 sf Storage= 7,429 cf

Plug-Flow detention time= 125.1 min calculated for 0.443 af (100% of inflow)
Center-of-Mass det. time= 125.0 min (880.2 - 755.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	158.33'	1,291 cf	**18.00'W x 90.00'L x 6.92'H Field A** 11,205 cf Overall - 7,979 cf Embedded = 3,226 cf x 40.0% Voids
#2A	159.08'	6,138 cf	**retain_it retain_it 5.0'** x 22 Inside #1 Inside= 84.0"W x 60.0"H => 36.41 sf x 8.00'L = 291.3 cf Outside= 96.0"W x 68.0"H => 45.33 sf x 8.00'L = 362.7 cf 2 Rows adjusted for 270.1 cf perimeter wall
		7,429 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	161.66'	**8.0" Round Culvert** L= 26.9' Ke= 0.500 Inlet / Outlet Invert= 161.66' / 161.00' S= 0.0245 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Discarded	158.33'	**5.000 in/hr Exfiltration over Surface area**
#3	Device 1	161.66'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.19 cfs @ 9.79 hrs HW=158.40' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=1.60 cfs @ 12.46 hrs HW=164.79' (Free Discharge)
↑—**1=Culvert** (Passes 1.60 cfs of 2.81 cfs potential flow)
↑—**3=Orifice/Grate** (Orifice Controls 1.60 cfs @ 8.17 fps)

Pond 15P: Retention 2 - Chamber Wizard Field A

Chamber Model = retain_it retain_it 5.0' (retain-it®)
Inside= 84.0"W x 60.0"H => 36.41 sf x 8.00'L = 291.3 cf
Outside= 96.0"W x 68.0"H => 45.33 sf x 8.00'L = 362.7 cf
2 Rows adjusted for 270.1 cf perimeter wall

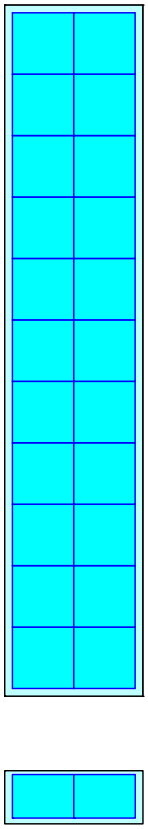
11 Chambers/Row x 8.00' Long = 88.00' Row Length +12.0" End Stone x 2 = 90.00' Base Length
2 Rows x 96.0" Wide + 12.0" Side Stone x 2 = 18.00' Base Width
9.0" Stone Base + 68.0" Chamber Height + 6.0" Stone Cover = 6.92' Field Height

10.4 cf Sidewall x 11 x 2 + 10.4 cf Endwall x 2 x 2 = 270.1 cf Perimeter Wall
22 Chambers x 291.3 cf - 270.1 cf Perimeter wall = 6,138.0 cf Chamber Storage
22 Chambers x 362.7 cf = 7,978.7 cf Displacement

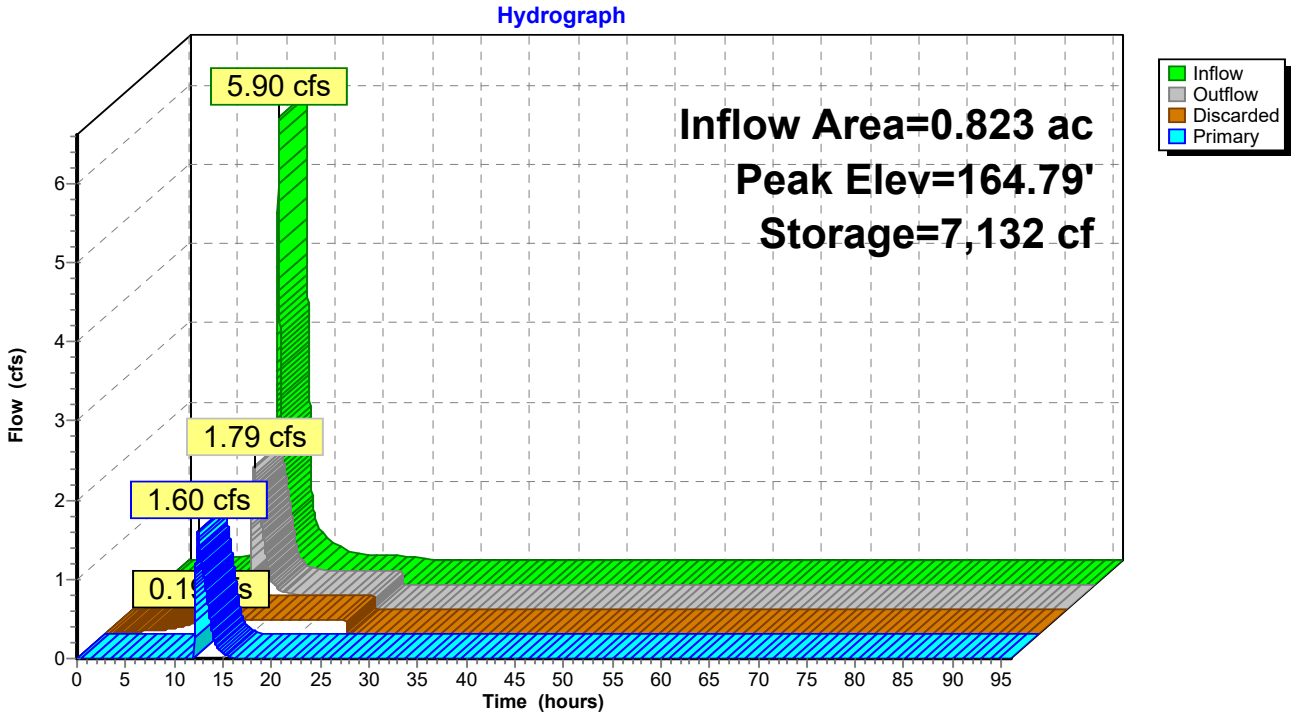
11,205.0 cf Field - 7,978.7 cf Chambers = 3,226.3 cf Stone x 40.0% Voids = 1,290.5 cf Stone Storage

Chamber Storage + Stone Storage = 7,428.6 cf = 0.171 af
Overall Storage Efficiency = 66.3%
Overall System Size = 90.00' x 18.00' x 6.92'

22 Chambers
415.0 cy Field
119.5 cy Stone



Pond 15P: Retention 2



Summary for Pond 16P: Retention 1

Inflow Area = 0.240 ac,100.00% Impervious, Inflow Depth = 8.27" for 100-yr event
Inflow = 2.08 cfs @ 12.07 hrs, Volume= 0.166 af
Outflow = 1.44 cfs @ 12.14 hrs, Volume= 0.166 af, Atten= 31%, Lag= 4.5 min
Discarded = 0.05 cfs @ 7.84 hrs, Volume= 0.090 af
Primary = 1.39 cfs @ 12.14 hrs, Volume= 0.075 af
Routed to Pond 14P : CB-3&4

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 178.46' @ 12.14 hrs Surf.Area= 420 sf Storage= 1,673 cf
Flood Elev= 179.25' Surf.Area= 420 sf Storage= 1,768 cf

Plug-Flow detention time= 109.7 min calculated for 0.166 af (100% of inflow)
Center-of-Mass det. time= 109.7 min (849.2 - 739.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	172.33'	437 cf	**10.00'W x 42.00'L x 6.92'H Field A** 2,905 cf Overall - 1,813 cf Embedded = 1,092 cf x 40.0% Voids
#2A	173.08'	1,332 cf	**retain_it retain_it 5.0'** x 5 Inside #1 Inside= 84.0"W x 60.0"H => 36.41 sf x 8.00'L = 291.3 cf Outside= 96.0"W x 68.0"H => 45.33 sf x 8.00'L = 362.7 cf 1 Rows adjusted for 124.7 cf perimeter wall
		1,768 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	176.04'	**8.0" Round Culvert** L= 88.0' Ke= 0.500 Inlet / Outlet Invert= 176.04' / 169.00' S= 0.0800 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Discarded	172.33'	**5.000 in/hr Exfiltration over Surface area**
#3	Device 1	176.04'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 7.84 hrs HW=172.40' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=1.39 cfs @ 12.14 hrs HW=178.44' (Free Discharge)
↑—**1=Culvert** (Passes 1.39 cfs of 2.42 cfs potential flow)
↑—**3=Orifice/Grate** (Orifice Controls 1.39 cfs @ 7.07 fps)

Pond 16P: Retention 1 - Chamber Wizard Field A

Chamber Model = retain_it retain_it 5.0' (retain-it®)
Inside= 84.0"W x 60.0"H => 36.41 sf x 8.00'L = 291.3 cf
Outside= 96.0"W x 68.0"H => 45.33 sf x 8.00'L = 362.7 cf
1 Rows adjusted for 124.7 cf perimeter wall

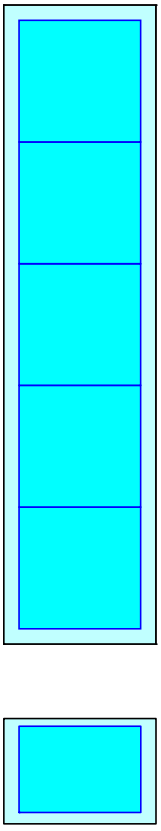
5 Chambers/Row x 8.00' Long = 40.00' Row Length +12.0" End Stone x 2 = 42.00' Base Length
1 Rows x 96.0" Wide + 12.0" Side Stone x 2 = 10.00' Base Width
9.0" Stone Base + 68.0" Chamber Height + 6.0" Stone Cover = 6.92' Field Height

10.4 cf Sidewall x 5 x 2 + 10.4 cf Endwall x 1 x 2 = 124.7 cf Perimeter Wall
5 Chambers x 291.3 cf - 124.7 cf Perimeter wall = 1,331.7 cf Chamber Storage
5 Chambers x 362.7 cf = 1,813.3 cf Displacement

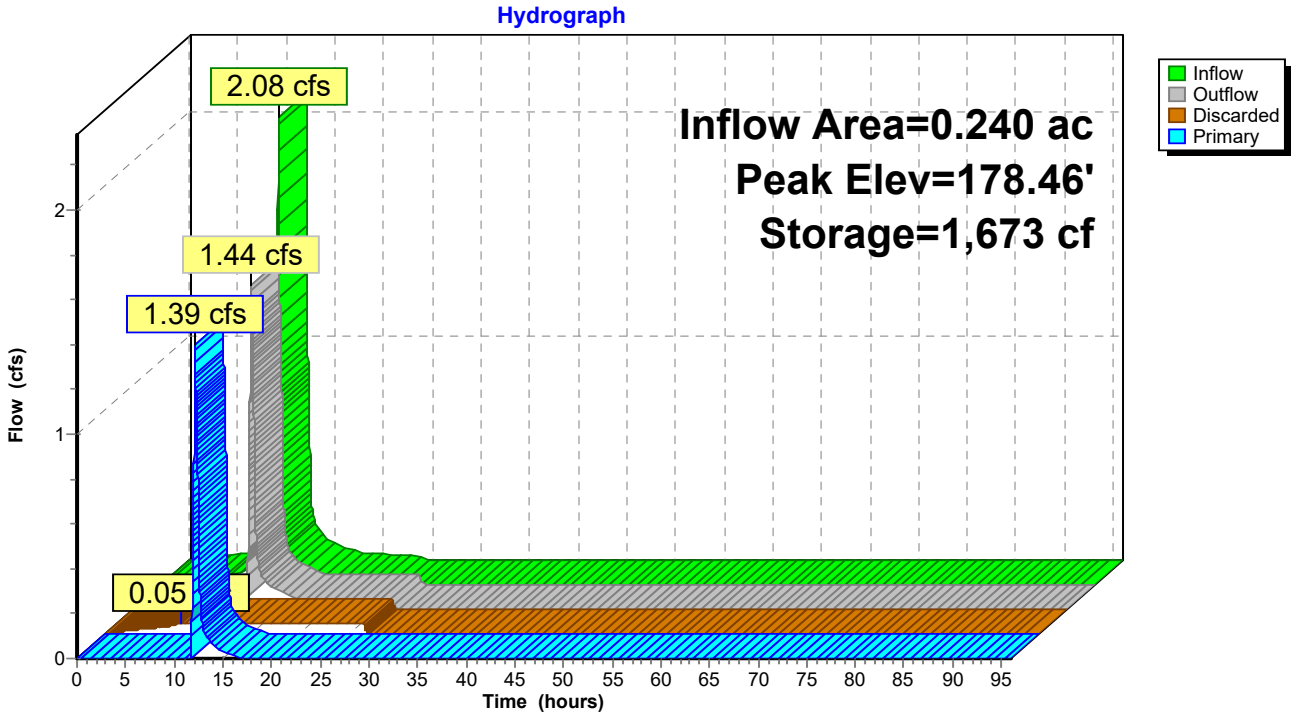
2,905.0 cf Field - 1,813.3 cf Chambers = 1,091.7 cf Stone x 40.0% Voids = 436.7 cf Stone Storage

Chamber Storage + Stone Storage = 1,768.4 cf = 0.041 af
Overall Storage Efficiency = 60.9%
Overall System Size = 42.00' x 10.00' x 6.92'

5 Chambers
107.6 cy Field
40.4 cy Stone



Pond 16P: Retention 1



Summary for Pond 23P: Drywell

Inflow Area = 0.017 ac, 83.38% Impervious, Inflow Depth = 6.95" for 100-yr event
Inflow = 0.14 cfs @ 12.07 hrs, Volume= 0.010 af
Outflow = 0.09 cfs @ 12.16 hrs, Volume= 0.010 af, Atten= 36%, Lag= 5.3 min
Discarded = 0.01 cfs @ 10.38 hrs, Volume= 0.008 af
Primary = 0.08 cfs @ 12.16 hrs, Volume= 0.002 af
Routed to Reach 31R : Apron

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 161.48' @ 12.16 hrs Surf.Area= 50 sf Storage= 125 cf
Flood Elev= 163.00' Surf.Area= 50 sf Storage= 201 cf

Plug-Flow detention time= 140.1 min calculated for 0.010 af (100% of inflow)
Center-of-Mass det. time= 140.1 min (922.2 - 782.1)

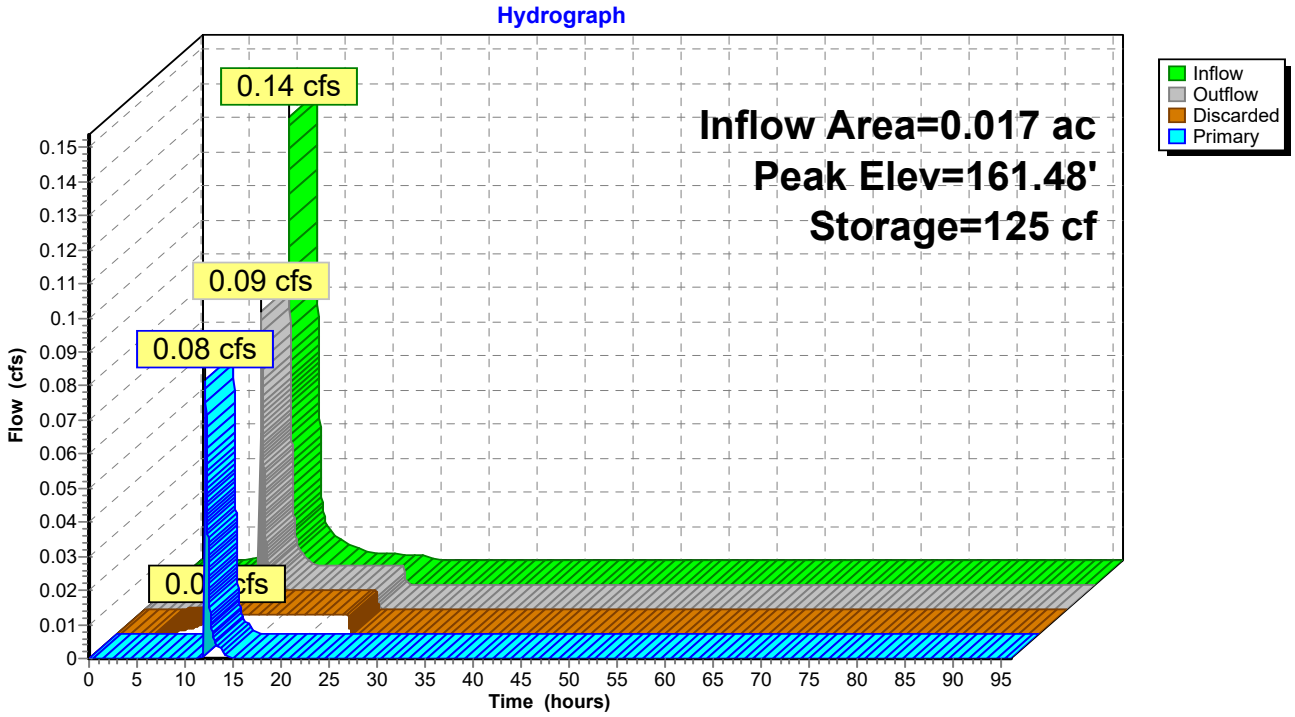
Volume	Invert	Avail.Storage	Storage Description
#1	159.00'	201 cf	**8.00'D x 4.00'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	161.33'	**8.0" Round Culvert** L= 4.0' Ke= 0.500 Inlet / Outlet Invert= 161.33' / 161.13' S= 0.0500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Discarded	159.00'	**5.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 10.38 hrs HW=159.04' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.08 cfs @ 12.16 hrs HW=161.48' (Free Discharge)
↑**1=Culvert** (Inlet Controls 0.08 cfs @ 1.33 fps)

Pond 23P: Drywell



APPENDIX D

Water Quality Volume and Water Quality Flow Calculations

Loureiro
Engineering • Construction • EH&S • Energy
Waste • Facility Services • Laboratory

Project:	894 Hopmeadow Redevelopment		
Calculated By:	TRW	**Date:**	**06/02/22**
Checked By:	GFA	**Date:**	**06/02/22**

Water Quality Volume and Water Quality Flow Worksheet

Watershed:	New Site Development
Condition:	Post-Construction

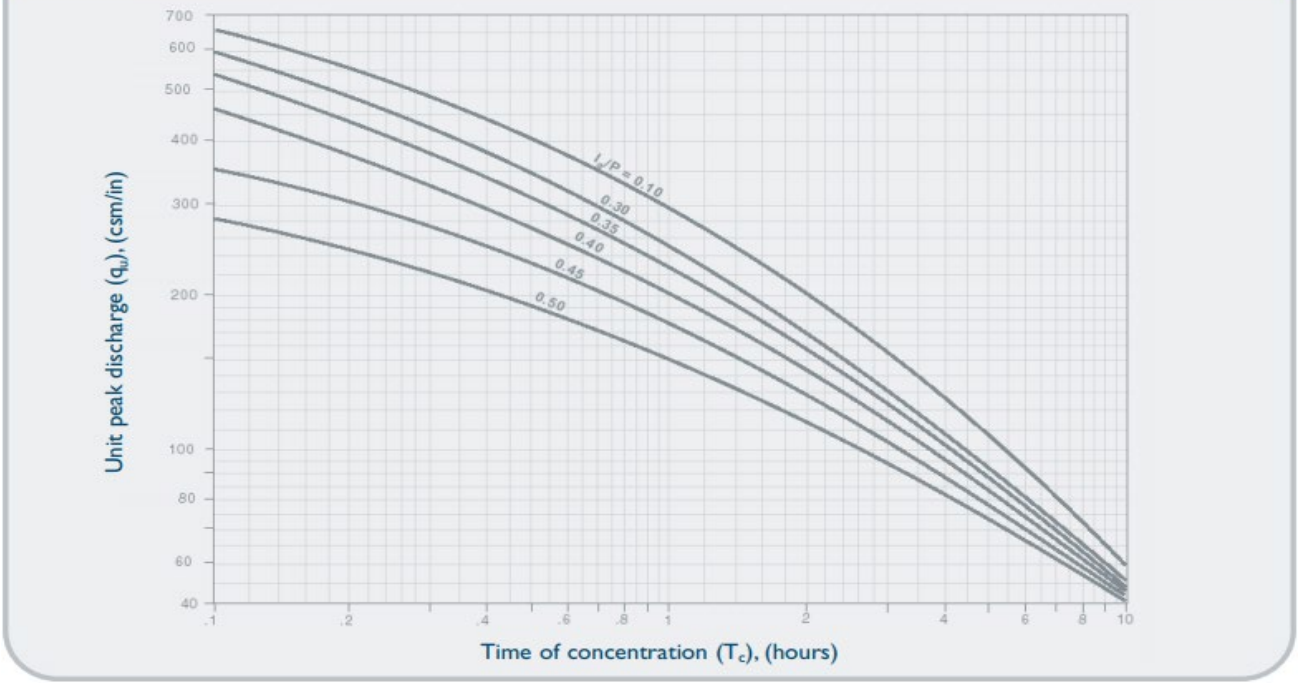
Water Quality Volume

Design Precipitation, P:	1	*in*
Percent Impervious Cover, I:	68%	
Volumetric Runoff Coefficient, R:	*0.662*	
Area, A:	53,773	S.F.
Water Quality Volume, WQV:	***2,966***	C.F.

Water Quality Flow

Runoff Depth, Q:	*0.662*	*in*	
Runoff Curve Number, CN:	*96*		
Time of Concentration, Tc: (>=10 min)	10.0	*min*	
Time of Concentration, Tc:	0.167	*hr*	
Initial Abstraction, I_a:	*0.083*	*in*	
I_a/P:	*0.083*		
Unit Peak Discharge, q_u:	600	*csm/in*	(from Exhibit 4-111 below)
Area, A:	*0.00193*	mi^2	
Water Quality Flow, WQF:	***0.77***	*cfs*	

Exhibit 4-111 Unit peak discharge (q_u) for NRCS (SCS) type III rainfall distribution



APPENDIX E

Stormwater Management Maintenance Program and Inspection Checklist

894 Hopmeadow Street, Simsbury, CT

Stormwater Management System Maintenance Program

There shall be periodic maintenance of the stormwater systems on the property after installation. In order to ensure effective performance of the system, the following stormwater maintenance program has been established. The property owner will be responsible for implementation of this program. A log and schedule of all inspections, cleanings, and repairs shall be maintained by the property owner. All maintenance documents shall be transferred to any future owners upon sale or transfer of the property.

A. Catch basins/Manholes/Trench drain
   A Connecticut-Licensed hauler shall pump the sumps of onsite catch basins and manholes, and shall dispose of the sand legally.

   For the first three years each catch basin and manhole shall be inspected every four months, with one inspection occurring during the month of April. Any debris occurring within one foot from the bottom of each sump shall be removed by vacuum type of maintenance equipment. After the first three years the inspection schedule may be adjusted to meet actual operating conditions however, one inspection shall always be conducted in April.

B. Subsurface Retention Systems/Drywell
   Underground detention systems shall be inspected through the surface openings quarterly and sediment/debris shall be removed as needed to ensure proper functioning of structures and inlets/outlets.

   After the first year of operation, the chambers shall be inspected a minimum of once per year. If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of the sediment. When the average depth of accumulation exceeds 3", a clean-out should be performed and properly disposed off-site. Clean-out should be accomplished using a vacuum process.

   A detailed maintenance logbook shall be kept onsite for the units by the property owner/manager. Information is to include, but not be limited to, the date of inspection, record of sediment depth, general observations, and date of cleaning performed. Maintenance of the retain-it system should follow all manufacturers' recommendations.

   Associated structures shall be maintained yearly, or more frequently, as required, by the condition of the site and system. Waste material will be properly disposed of off-site.

Stormwater Management System Maintenance Program

C. Lawn and vegetated areas

Normal landscaping maintenance shall consist of pruning, mulching, planting, mowing lawns, raking leaves, etc. Use of fertilizers and pesticides will be controlled and limited to minimal amounts necessary for healthy landscape maintenance.

Trees will be fertilized no more than once in the spring with an organic fertilizer. Shrubs and lawn will be fertilized with an organic slow-release fertilizer each spring. Liming of lawn areas to control pH will also be done in the spring if soil testing indicates that it is necessary.

Pesticides will only be used as a control method when a problem has been clearly identified and other natural control methods are not successful. All pesticide applications shall be by licensed applicators, where necessary.

D. Hydrodynamic Separator (Stormceptor)

The hydrodynamic separator shall be inspected and maintained during catch basin inspections and cleaning. An inspection is made by checking the depth of sediment in each manhole with a grade stick or similar device. Maintenance is required when the sediment depth in exceeds 20 inches. Minimum inspection is recommended twice a year to maintain operation and function of the unit.

Maintenance Instructions:

1. Remove the manhole cover to provide access to the pollutant storage. Pollutants are stored in the sump, below the bowl assembly visible from the surface. Access this area through the 10” diameter access cylinder.
2. Use a vacuum truck or other similar equipment to remove all water, debris, oils and sediment.
3. Use a high-pressure hose to clean the manhole of all the remaining sediment and debris. Then, use the vacuum truck to remove the water.
4. Fill the cleaned manhole with water until the level reaches the invert of the outlet pipe.
5. Replace the manhole cover.
6. Dispose of the polluted water, oils, sediment and trash at an approved facility.
    - Check with the local sewer authority for authority to discharge the liquid.

894 Hopmeadow Street, Simsbury, CT

Stormwater Management System Maintenance Checklist

Inspection Date: _____

Inspector: _____

Maintenance Item	Satisfactory	Unsatisfactory	Comments
Drainage Structures			
Sedimentation Accumulation			
Hood			
Oil/Large Floating Debris			
Inlet/Outlet			
Structure walls			
Riser			
Frame and Cover			
Subsurface Detention/Retention System			
Settling Over System			
Sedimentation Accumulation			
Large Floating Debris			
Inspection Structure Integrity			
Inspection Structure Frame and Cover			
Surrounding Lawn and Vegetated Areas			
Signs of Erosion			
Ponding/Settling			
Overgrowth			
Pavers			
Sedimentation/Debris Accumulation			
Visible Vegetation Growth			
Settling/Ponding Areas			
Paver Integrity (Cracks, Missing Pieces, Etc.)			

Additional Comments: _____

_____

_____

APPENDIX F

Geotechnical Study

WELTI GEOTECHNICAL, P.C.
Formerly Dr. Clarence Welti, PE. PC.

227 Williams Street · P.O. Box 397
Glastonbury, CT 06033-0397

(860) 633-4623 / FAX (860) 657-2514

November 13, 2017

Mr. John D. Ritson, Esq
146 Hopmeadow Street
Simsbury, CT 060899

Re: Geotechnical Study for Proposed Apartment Building
894 Hopmeadow Street, Simsbury, CT

Dear Mr. Ritson:

1.0 Herewith are the boring data pertaining to the above. Eight borings were drilled at the proposed building footprint to a maximum depth of 61.5 feet. A water level observation well was placed in one of the borings. The boring locations are shown on the attached plan. *The borings were drilled by Clarence Welti Associates, Inc. and sampling was conducted by this firm solely to obtain indications of subsurface conditions as part of a geotechnical exploration program. No services were performed to evaluate subsurface environmental conditions.* Grain size gradation and water content tests were performed on 5 soil samples and permeability tests on 3 soil samples. The results of those tests are in the Appendix.

2.0 The **Subject Project** will include an apartment building with a ground floor parking level and three levels of apartments above the garage level. The building will have a footprint of about 28,000 sf. There is about 20 feet of topographic relief across the building footprint (Elev. 160 to Elev. 180). The lowest floor (garage level) will range from about Elev.170 to Elev.172. The west end of the lowest floor will be about 10 feet below the existing and finish grades. The building footprint is close to a wetlands area at the east end of the site. There is an existing retail (ice cream) store on the Hopmeadow side of the site, which will be removed. There is a requirement to infiltrate storm water into the soils beneath the structure.

3.0 The **Geologic Origin** of the natural inorganic soils at the site and environs is from glacial lake deposits. These deposits consist generally of medium compact stratified sand with trace to little silt and gravel to about 18 to 36 feet overlying a silt and fine sand to 60+ feet below grade. There will be fills around the existing structure and utilities.

3.1 The **Soils Cross Sections** from the borings are generally as follows:

Topsoil to 5" to 12"; or Asphalt to 2" to 3" atop Processed base to 6" to 8"

Locally FILL; fine to medium SAND, little to some Silt, trace Roots to 3 to 4 feet, loose
Note: There will be existing fills around the existing structure and utilities.

Fine to coarse SAND, trace to little Silt, trace Gravel, with a few layers of fine Sand and Silt to 18 to 36 feet, medium compact

SILT and fine SAND, trace Clay, trace (in thin strata) fine to medium Sand to 61.5+ feet, loose to medium compact

3.2 The **Water Table** in the water level observation well placed at boring B-4 was at 25.3 feet below grade (Elev. 155±) at the completion of the boring. At boring B-7 (i.e., proposed infiltration area) the water table was at about Elev. 154 at boring completion. At the low end of the site water table was at about Elev.150. The water table should normally not effect the construction or long term performance of the building. The proposed recharge of storm water beneath part of the building may cause temporary mounding of the water table.

4.0 The **Criteria for Foundation Type and Loading** are as follows:

1. The maximum total settlement should not exceed 3/4" and the maximum differential settlement shall not exceed ½ the maximum settlement.

2. The Foundations and Structures must address the seismic section of the building code

3. Slab at Grade floors should not settle differentially more than 1/4" in excess of the main structure subsidence.

4.1 Regarding item 2 (above), the seismic site soil profile classification can be **"D"**. The mapped MCE spectral response acceleration values for Simsbury, CT are $\mathbf{S_1 = 0.064}$ for a one second period and $\mathbf{S_S = 0.179}$ for short period. For transfer of ground shear from footings into the soil, the ultimate friction factor is **0.60.**

5.0 Regarding **Foundation Type,** the building can be supported on spread footings. The footings should be on the natural inorganic soils, or on a controlled fill placed after the removal of any existing fills, structures, topsoil or subsoils. There should be a minimum 4" thick layer of compacted 3/8" crushed stone beneath the footings falling on the natural soils to provide a uniformly stiff surface to receive the footings. Controlled fills should conform to section 6.0 and should extend beyond the footings for a horizontal distance equal to the depth of fill beneath the footings.

5.0.1 At the proposed storm water mitigation area there may be a requirement for an increased depth of crushed stone under the footings and the slab on grade, dependent on the depth and influence zone of the storm water infiltration system. The crushed stone layer (with substantial voids) would minimize seepage pressures on the soil beneath the foundation.

5.1 The **Allowable Bearing Pressure** for foundations on the natural inorganic soils or on controlled fill can be 4,000 psf. The allowable bearing pressure can be increased by 1/3 for seismic or wind loading. At retaining walls the maximum pressure on the toe can be 50% higher than the average pressures, cited above.

5.2 The **Static Lateral Soil Loading** on retaining walls that are part of the building should be based on at-rest pressure using the coefficient $\mathbf{K_O = 0.45}$, to be multiplied by unit weight of backfill. Lateral soil loading on retaining walls apart from the building can be designed with active pressure using the active coefficient $\mathbf{K_A = 0.28}$ (for level backfill). The ultimate sliding coefficient for concrete on crushed stone or on controlled fill is **0.60.**

5.2.1 Seismic lateral loading for retaining walls that are part of the building should be with a total lateral force (seismic plus static at-rest pressure) equal to $24H^2$ lb/ft located at ½H above the bottom. The above value is based on the Mononobe-Okabe solution for the case with level backfill, no wall friction and no hydrostatic pressure. This value excludes the inertia of the soil and wall mass. The requirements for the seismic analyses of earth retention structures as part of the building shall be determined from the Connecticut Building Code (IBC) or the ASCE-7.

5.3 The **Frost Protection Depth** in the Building Code is 3.5 feet below finish grades in areas, which are exposed to weather.

5.4 Summary of Foundation Design Parameters:

Parameter	Value
Allowable Bearing Pressure for footings on crushed stone layer atop natural soils or footings on controlled fill	4,000 psf
Soil Unit Weight (Backfill) *	125 pcf
Internal Friction Angle (Backfill) *	34°
At-Rest Pressure Coefficient, K_O	0.45
Active Pressure Coefficient, K_A (level backfill)	0.28
Ultimate Sliding Coefficient, concrete on controlled fill, or on crushed stone over soil	0.60
Seismic Site Soil Profile Classification	D
Mapped MCE Spectral Response Acceleration for 1 second period, S_1	0.064

Mapped MCE Spectral Response Acceleration for short period, S_s	0.179
Frost Protection Depth	3.5 feet

* Backfill material conforming to section 6.0 below

6.0 Regarding **Controlled Fill, Backfill for Retaining Walls and Excavations at Columns and Walls**, **plus Slab at Grade Underlayment** (to within 8" of the slab bottom), the material should conform to the following or should be 3/8" crushed stone:

Percent Passing	Sieve Size
100	3.5"
50 - 100	3/4"
25 - 75	No.4

The fraction, passing the No.4 sieve should have less than 15%, passing the No. 200 sieve.

All backfill and controlled fill must be compacted to at least 95% of modified optimum density.

6.1 Based on the proposed requirement of infiltrating storm water beneath the slab on grade, it is recommended that there be at least 8" of crushed 3/8" stone beneath the floor slab. While normally the highly permeable sands would not require footing drains, the possibly of temporary mounding of the water table from storm water infiltration should dictate the drains to avoid water in proximity to the slab.

6.1.1 As noted in section 5.0.1 above there may be special requirements for the slab on grade and pavement underlay at the storm water infiltration area.

7.0 Regarding **Earthwork,** excavations in soil will largely fall in OSHA Class C. This will require sloping excavations, which are unshored and exceed 5 feet in height, to be cut back to slopes less than 34° from the horizontal.

8.0 Regarding New Pavements outside the building the soils at subgrade are generally non-frost susceptible and pavement design can be based on vehicle load and load repetition. It is assumed that the pavement subgrade is either on the natural fine to coarse sand or on a controlled fill. The proposed driveway between Hopmeadow Street and Ironhorse Boulevard would probably be accessible to trucks. The recommended pavement section above the sub grade is as follows:

For truck Access; 4.5" of bituminous concrete on 8" of processed stone base.

9.0 The **permeability testing** indicated an average permeability value of about 40 feet/day.

10.0 This report has been prepared for specific application to the subject project in accordance with generally accepted soil and foundation engineering practices. No other warranty, express or implied, is made. In the event that any changes in the nature, design and location of structures are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

The analyses and recommendations submitted in this report are based in part upon data obtained from referenced explorations. The extent of variations between explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.

Welti Geotechnical, P.C., should perform a general review of the final design and specifications in order that geotechnical design recommendations may be properly interpreted and implemented as they were intended.

If you have any questions, please call our office.

Very truly yours,

Max Welti, P. E.
President, Welti Geotechnical, PC

Clarence Welti, PhD, P.E.
Vice President

APPENDIX

BORING LOCATION PLAN
+
TEST BORING LOGS
+
LABORATORY TEST RESULTS


TEST BORING LOCATIONS
CLARENCE WELTI ASSOCIATES, INC.
10/31/18
B-1
B-2
B-3
B-4
B-5
B-6
B-7
B-8
Location Map
Hopmeadow St.
Iron Horse Boulevard
Site
N/F Captain Barber House
Joseph D. Digiacomo
N/F D&G Associates
"Simsburytown Shops"
S 77°-53'-13" E
292.26' (292.00 Deed)
53,773 Square Feet
or
1.234 Acres
Zone - SC-1
Existing House
Garage
Paved
Concrete Walk
Walk
302.23' (302.00 Deed)
N 77°-55'-12" W
N/F Vincent Funeral Homes, Inc.
Hopmeadow Street ~ Connecticut Route 10 & 202
Iron Horse Boulevard
N 12°-41'-18" E
181.00'
S 09°-32'-03" W
181.00'
Limit of Wetlands - See Note 1
Map Reference:
Notes:
1. Wetlands delineated by Michael Klein, Soil Scientist and field located by this office on Oct. 16, 1996.
Certified substantially correct and no zoning regulations are violated in reference to the location of the existing foundation, to the best of my information, knowledge and belief.
To: The Simsbury Bank & Trust Company
Gilman & Marks
Connecticut Attorneys Title Insurance Company
To the best of my information, knowledge and belief, I hereby certify that this map and survey were prepared in accordance with the standards of a Class A-2 survey as defined in the Code of Practice for Standards of Accuracy of Surveys and Maps, adopted September 2, 1984 as amended by the Connecticut Association of Land Surveyors, Inc.
Not Valid Without Raised Seal
Arthur M. Neriani, Land Surveyor
10250
Map Showing
Land to be Conveyed to
Thomas J. Herlihy
894 Hopmeadow Street
Simsbury
Connecticut
Scale 1" = 20'
October 1996
Prepared By
Neriani Surveying ~ Avon, Connecticut
Revised: November 8 1996 - Certification
Graphic Scale
Drawn By
Checked By
Job No.
M-96-51

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
JOHN RITSON

PROJECT NAME
PROPOSED APARTMENT BUILDING
LOCATION
894 HOPMEADOW STREET, SIMSBURY, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV.
HOLE NO. B-1

GROUND WATER OBSERVATIONS
AT none FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 11/1/18
FINISH DATE 11/1/18

DEPTH	SAMPLE NO.	BLOWS/6"	DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	1-1-2-2	0.0'-2.0'		TOPSOIL	
					BR.FINE-MED.SAND, SOME SILT, TRACE ROOTS - FILL	0.80
	2	2-3-6-6	2.0'-4.0'			
					BR.FINE-CRS.SAND, TRACE SILT & GRAVEL	3.0
	3	11-10-11-13	4.0'-6.0'			
5						
10	4	6-9-11	10.0'-11.5'			
15	5	6-10-12	15.0'-16.5'			
20	6	8-12-15	20.0'-21.5'		BR.FINE SAND, TRACE SILT & GRAVEL	20.5
					BOTTOM OF BORING @ 21.5'	21.5
25						
30						
35						

LEGEND: COL. A:
SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: J. BREWER
INSPECTOR:

SHEET 1 OF 1 HOLE NO. **B-1**

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
JOHN RITSON

PROJECT NAME
PROPOSED APARTMENT BUILDING
LOCATION
894 HOPMEADOW STREET, SIMSBURY, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV.
HOLE NO. B-2

GROUND WATER OBSERVATIONS
AT none FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 10/31/18
FINISH DATE 10/31/18

DEPTH	SAMPLE NO.	SAMPLE BLOWS/6"	SAMPLE DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0					ASPHALT 0.25	
					GREY FINE-CRS.SAND AND GRAVEL, TRACE SILT 0.66	
	1	7-5-4-3	1.0'-3.0'		BR.FINE-MED.SAND, TRACE TO LITTLE SILT	
	2	2-4-4-5	3.0'-5.0'			
5	3	3-4-3-4	5.0'-7.0'			
10	4	5-7-8	10.0'-11.5'			
15	5	8-10-8	15.0'-16.5'			
					BR.SILT, LITTLE FINE SAND 18.0	
20	6	7-8-10	20.0'-21.5'			
					BOTTOM OF BORING @ 21.5' 21.5	
25						
30						
35						

LEGEND: COL. A:
SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: J. BREWER
INSPECTOR:

SHEET 1 OF 1 HOLE NO. **B-2**

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
JOHN RITSON

PROJECT NAME
PROPOSED APARTMENT BUILDING
LOCATION
894 HOPMEADOW STREET, SIMSBURY, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV.
HOLE NO. B-3

GROUND WATER OBSERVATIONS
AT 12.0 FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 11/1/18
FINISH DATE 11/1/18

DEPTH	SAMPLE NO.	BLOWS/6"	DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	2-1-2-3	0.0'-2.0'		TOPSOIL 0.60	
					BR.FINE-MED.SAND, LITTLE SILT, TRACE ROOTS - FILL	
	2	3-3-4-5	2.0'-4.0'			
					4.0	
	3	6-5-6-7	4.0'-6.0'		BR.FINE-MED.SAND, TRACE SILT	
5						
10	4	10-10-14	10.0'-11.5'			
15	5	7-7-10	15.0'-16.5'			
20	6	4-8-12	20.0'-21.5'		21.0	
					BR.FINE SAND, TRACE TO LITTLE SILT 21.5	
					BOTTOM OF BORING @ 21.5'	
25						
30						
35						

LEGEND: COL. A:
SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: J. BREWER
INSPECTOR:

SHEET 1 OF 1 HOLE NO. **B-3**

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
JOHN RITSON

PROJECT NAME
PROPOSED APARTMENT BUILDING
LOCATION
894 HOPMEADOW STREET, SIMSBURY, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV.
HOLE NO. B-4

GROUND WATER OBSERVATIONS
AT 25.3 FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 10/31/18
FINISH DATE 10/31/18

DEPTH	SAMPLE NO.	SAMPLE BLOWS/6"	SAMPLE DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	1-1-2-1	0.0'-2.0'		TOPSOIL 0.75	
					BR.FINE-MED.SAND, SOME SILT, TRACE ROOTS	
	2	1-3-3-4	2.0'-4.0'		2.0 BR.FINE-CRS.SAND, TRACE SILT	
	3	3-5-5-6	4.0'-6.0'			
5	4	5-7-8	10.0'-11.5'			
10	5	5-5-6	15.0'-16.5'			
15	6	4-6-10	20.0'-21.5'			
20	7	3-5-7	25.0'-26.5'			
25	8	4-5-8	30.0'-31.5'			
30						
35						

LEGEND: COL. A:
SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: J. BREWER
INSPECTOR:

CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033	CLIENT JOHN RITSON	PROJECT NAME PROPOSED APARTMENT BUILDING LOCATION 894 HOPMEADOW STREET, SIMSBURY, CT

DEPTH	SAMPLE NO.	SAMPLE BLOWS/6"	SAMPLE DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
	9	5-6-7	35.0'-36.5'			
					BR.SILT AND FINE SAND, TRACE CLAY, TRACE LAYERS OF FINE-MED.SAND — 36.0	
40	10	2-5-5	40.0'-41.5'			
45	11	2-2-2	45.0'-46.5'			
50	12	2-3-2	50.0'-51.5'			
55	13	2-3-3	55.0'-56.5'			
60	14	3-3-3	60.0'-61.5'			
					BOTTOM OF BORING @ 61.5' — 61.5	
					2" DIA. WELL SET @ 58'	
					10' OF (.010 SLOT) SCREEN	
65					48' OF RISER	
					SAND FROM 61.5' TO 46.0'	
					BENTONITE SEAL FROM 46.0' TO 44.0'	
70					BACKFILLED FROM 44.0' TO 0.5'	
					CONCRETE FROM 0.5' TO SURFACE	
					7" DIA. ROADWAY BOX COVER	
75						

LEGEND: COL. A:

SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON

PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: J. BREWER
INSPECTOR:

SHEET 2 OF 2 | HOLE NO. **B-4**

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
JOHN RITSON

PROJECT NAME
PROPOSED APARTMENT BUILDING
LOCATION
894 HOPMEADOW STREET, SIMSBURY, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV.
HOLE NO. B-5

GROUND WATER OBSERVATIONS
AT 11.3 FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 11/1/18
FINISH DATE 11/1/18

DEPTH	SAMPLE NO.	BLOWS/6"	DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	1-2-1-2	0.0'-2.0'		TOPSOIL 0.40	
					BR.FINE-MED.SAND, LITTLE SILT, TRACE ROOTS - FILL	
	2	2-2-2-3	2.0'-4.0'			
					3.5	
	3	3-2-3-4	4.0'-6.0'		BR.FINE-MED.SAND, TRACE SILT, LITTLE LAYERS OF FINE SAND AND SILT	
5						
10	4	5-4-5	10.0'-11.5'			
15	5	4-3-8	15.0'-16.5'			
20	6	9-10-10	20.0'-21.5'			
					21.0	
					BR.FINE SAND, TRACE TO LITTLE SILT 21.5	
					BOTTOM OF BORING @ 21.5'	
25						
30						
35						

LEGEND: COL. A:
SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: J. BREWER
INSPECTOR:

SHEET 1 OF 1 HOLE NO. **B-5**

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
JOHN RITSON

PROJECT NAME
PROPOSED APARTMENT BUILDING
LOCATION
894 HOPMEADOW STREET, SIMSBURY, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV.
HOLE NO. B-6

GROUND WATER OBSERVATIONS
AT none FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 10/31/18
FINISH DATE 10/31/18

DEPTH	SAMPLE NO.	BLOWS/6"	DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0					ASPHALT 0.10	
					GREY FINE-CRS.SAND AND GRAVEL, TRACE SILT 0.50	
	1	2-1-1-2	1.0'-3.0'		DARK BR.FINE-MED.SAND, SOME SILT	
	2	1-2-3-4	3.0'-5.0'			
					BR.FINE-MED.SAND, TRACE TO LITTLE SILT 4.0	
5						
10	3	5-6-7	10.0'-11.5'			
15	4	9-9-10	15.0'-16.5'			
20	5	8-10-7	20.0'-21.5'			
					BOTTOM OF BORING @ 21.5' 21.5	
25						
30						
35						

LEGEND: COL. A:
SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: J. BREWER
INSPECTOR:

SHEET 1 OF 1 HOLE NO. **B-6**

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
JOHN RITSON

PROJECT NAME
PROPOSED APARTMENT BUILDING
LOCATION
894 HOPMEADOW STREET, SIMSBURY, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV.
HOLE NO. B-7

GROUND WATER OBSERVATIONS
AT 12.0 FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 11/1/18
FINISH DATE 11/1/18

DEPTH	SAMPLE NO.	SAMPLE BLOWS/6"	SAMPLE DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	1-5-5-6	0.0'-2.0'		TOPSOIL 0.50	
					BR.FINE-MED.SAND, LITTLE TO SOME SILT, TRACE ROOTS - FILL	
	2	4-5-3-6	2.0'-4.0'			
					4.0	
	3	4-7-7-8	4.0'-6.0'		BR.FINE-MED.SAND, TRACE SILT, TRACE LAYERS OF FINE SAND WITH SOME SILT	
5						
10	4	7-10-12	10.0'-11.5'			
15	5	14-13-12	15.0'-16.5'			
20	6	11-14-13	20.0'-21.5'			
					21.5	
					BOTTOM OF BORING @ 21.5'	
25						
30						
35						

LEGEND: COL. A:
SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: J. BREWER
INSPECTOR:

SHEET 1 OF 1 HOLE NO. **B-7**

CLARENCE WELTI ASSOC., INC.
P.O. BOX 397
GLASTONBURY, CONN 06033

CLIENT
JOHN RITSON

PROJECT NAME
PROPOSED APARTMENT BUILDING
LOCATION
894 HOPMEADOW STREET, SIMSBURY, CT

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV.
HOLE NO. B-8

GROUND WATER OBSERVATIONS
AT 11.0 FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 11/1/18
FINISH DATE 11/1/18

DEPTH	SAMPLE NO.	BLOWS/6"	DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	2-2-2-3	0.0'-2.0'		TOPSOIL	
					BR.FINE-MED.SAND, TRACE SILT	
	2	2-3-3-4	2.0'-4.0'			
	3	4-5-7-7	4.0'-6.0'			
5						
10	4	5-6-11	10.0'-11.5'			
15	5	4-7-9	15.0'-16.5'			
20	6	6-9-11	20.0'-21.5'			
25						
30						
35						

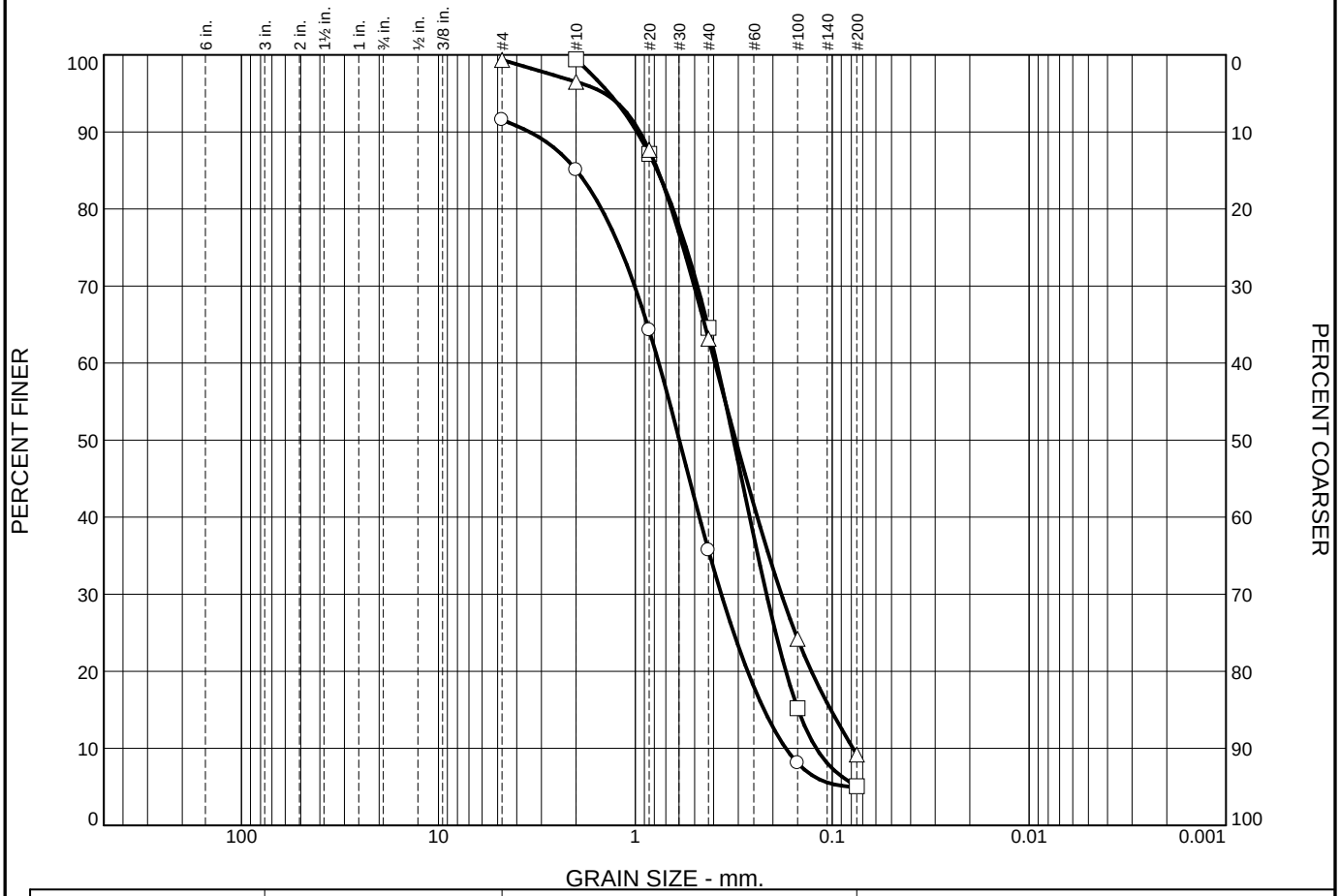
0.75
10.5
21.5
BOTTOM OF BORING @ 21.5'

LEGEND: COL. A:
SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: J. BREWER
INSPECTOR:

SHEET 1 OF 1 HOLE NO. **B-8**

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○				6.5	49.4	30.8	4.9	
□					34.8	59.5	5.1	
△				2.8	33.3	54.0	9.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			1.9899	0.7599	0.5973	0.3658	0.2218	0.1722	1.02	4.41
□			0.7743	0.3856	0.3169	0.2156	0.1490	0.1205	1.00	3.20
△			0.7680	0.3938	0.3090	0.1812	0.1017	0.0784	1.06	5.03

	Material Description	USCS	AASHTO
○			
□			
△			

Project No. **Client:** JOHN RITSON

Project: PROPOSED APARTMENT BUILDING

○ **Source of Sample:** B-1 **Depth:** 10.0 **Sample Number:** 4

□ **Source of Sample:** B-3 **Depth:** 10.0 **Sample Number:** 4

△ **Source of Sample:** B-4 **Depth:** 20.0 **Sample Number:** 6

Remarks:

○water content = 4.9%

□water content = 6.8%

△water content = 8.9%

CLARENCE WELTI ASSOCIATES, INC.

Figure

Particle Size Distribution Report

	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○					8.1	86.9	4.9	
□					19.7	75.8	3.7	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3623	0.2436	0.2113	0.1548	0.1090	0.0919	1.07	2.65
□			0.4868	0.3124	0.2740	0.2111	0.1673	0.1507	0.95	2.07

	Material Description	USCS	AASHTO
○			
□			

Project No. **Client:** JOHN RITSON

Project: PROPOSED APARTMENT BUILDING

○ **Source of Sample:** B-5 **Depth:** 10.0 **Sample Number:** 4

□ **Source of Sample:** B-8 **Depth:** 20.0 **Sample Number:** 6

Remarks:

○water content = 24.4%

□water content = 24.0%

CLARENCE WELTI ASSOCIATES, INC.

Figure

Proposed Apartment Building
894 Hopmeadow Street, Simsbury, CT

Permeability Tests 11/6/18

Boring /Depth	Permeability (feet/day)
B-1@ 15 to 16 feet	40.6
B-4 @ 10 to 11 feet	33
B-4 @ 15 to 16 feet	52.5