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August 3, 2021

ENGINEER'S LETTER REPORT FOR DRAINAGE DESIGN FOR LOCUST TREE RESIDENTIAL PROPERTIES, LLC 80 AIRPORT DRIVE TOWN OF WAPPINGER, NEW YORK

The proposed stormwater management facilities have been designed to provide both water quality and quantity controls by detaining, treating, and releasing stormwater runoff at a rate equal to or less than that which existed prior to construction of improvements at the project site.

1.0 PROJECT SUMMARY

The project parcel is currently developed and contains a landscape business. The existing site improvements include a building and asphalt parking/loading areas. The proposed improvements include reconfiguration of the entrance drive and the addition of additional asphalt parking, landscaping and utility upgrades. The parcel is currently served by a private water supply well and an underground sanitary sewage disposal system. The project includes the abandonment of the on-site well after connection to the DCWWWA water main along the street.

The project will involve the removal of a small amount of existing pervious grass surfaces for the construction of new impervious surfaces related to the new parking. This will result in a net increase in impervious surfaces of approximately 3,800 SF. The project will require the implementation of erosion controls during construction to reduce the impacts of erosion and sedimentation and the installation of permanent stormwater management facilities to control the rate of discharge from the property.

The total disturbance for the project will be 0.49 acres. Therefore, coverage under the NYSDEC General SPDES Permit for Stormwater Discharges from Construction Projects. However, stormwater management facilities have been planned to meet the requirements of the Town of Wappinger and will provide some level of stormwater quality treatment.

2.0 SITE DESCRIPTION

This section briefly describes existing and proposed hydrologic and hydraulic conditions at and around the project site as they relate to surface water management planning considerations. Subsequent sections contain a description of the manner in which site runoff will be managed to minimize effects on areas adjacent to the site.

Location

The parcel proposed to be disturbed for this development project comprises approximately 2.47

acres of land on the east side of Airport Drive. The improvements are proposed at 80 Airport Drive, on Tax Parcel 6259-04-679493. The land in the area surrounding the site consists of mixed uses of residential, commercial and recreational.

The site consists of one watershed that contributes to the Off-Site Discharge Point (ODP) identified as the road side ditch along Airport Drive.

Topography

The property generally slopes from east to west from the back of the property towards the street. The area around the building including the parking areas and truck maneuvering areas have slopes less than 5%. Drainage at the back of the building is collected by catch basins and transmitted by closed pipe to the street drainage ditch on the north end. Runoff on the south side of the building sheet flows down the access drive to the drainage ditch along the street. Runoff from the front of the building sheet flows to the grass slope down to the road side ditch. Slopes are mostly less than 10% across the site with the exception of the grass slope along the road.

Land Cover

The proposed project is on a previously-developed property, consisting of land covers of the building, asphalt parking and wooded/lawn areas.

Soils

According to maps from the National Cooperative Soil Survey for Dutchess County, the on-site soils within the project area are classified into the following mapping unit(s):

Pittstown silt loam (PwB), 3 to 8 percent slopes
This soil is characterized as silt loam and channery silt loam to a depth of 80 inches. Depth to groundwater and densic material may be at 30 inches. The hydrologic soil group is C and is characterized with moderate infiltration rates. The depth to these restrictive features must be verified by an on-site test pit.

Watercourses and Drainage Patterns

No streams are located on the property. The majority of the property drains from the back of the parcel north west towards the street. This drainage pattern will be continued with the proposed work.

Floodplains

According to FEMA floodplain mapping, no floodplains are located on or adjacent to the property.

3.0 METHODOLOGY

The project will result in the disturbance of less than one (1) acre and therefore a SWPPP meeting the NYSDEC General SPDES Permit for Discharges from Construction Activities is not required.

However, the Town requires the management of stormwater from construction projects to not cause flooding of adjacent properties and to not impact the capacity of receiving waters and infrastructure.

Although the project is not required to treat runoff for water quality, water quality treatment will be provided for the net increase in impervious pavement. Maintaining water quality involves the removal or reduction of pollutants including suspended solids, phosphates, nitrates and other chemicals generated by development.

Rainfall Data

Rainfall data utilized in the modeling and analysis was taken from the NYSDEC Stormwater Design Manual:

Table 1 - Precipitation Values

Storm Event *n*	90% Rainfall Event*	1-yr	2-yr	5-yr	10-yr	**25-yr**	50-yr	100-yr
Precipitation $_{24\text{-hr}}P_{n\text{-}yr}$ (inches)	1.4	2.7	-	-	4.9	-	-	9.0

Hydrologic and Hydraulic Analysis

The peak rate of stormwater runoff generated from the proposed improvements during the design storms was calculated to determine the required storage volume of the dry detention basin. The time of concentration (Tc)and runoff curve numbers (CN) were then calculated for each watershed area. A minimum Tc of 0.1 hour was selected due to the small area of the watershed. This data was then entered into the *HydroCAD* computer program for analysis. *HydroCAD*, a Computer-Aided-Design (CAD) program, was used to analyze the hydrologic and hydraulic characteristics of a given watershed and associated stormwater management facilities. It utilizes the latest techniques to predict the consequences of any given storm. *HydroCAD* has the capability of computing hydrographs (which represents discharge rates characteristic of specified watershed conditions, precipitation, and geologic factors) combining hydrographs and routing flows though pipes, streams and ponds. HydroCAD is used to calculate peak runoff flows and to create hydrographs for the various storm events evaluated for both pre-development and post development conditions.

Watershed Description

Existing (Pre-Development) Watershed Conditions

The study area consists of an area equal to the proposed net increase in impervious surfaces as a result of the project. The project property all drains to the road side swale along the front of the property. The front parking area, landscaped area along the property frontage, entrance drive and area on the south side of the building drain via sheet flow to the grass-lined ditch along the street. Areas to the rear and north side of the building are collected by catch basins and discharged to the road side swale via closed pipe. The overall study area is 3,800 sf. The area that will be converted to asphalt pavement by extending the existing parking lot along the front of the building is currently

lawn.

Proposed (Post-Development) Watershed Conditions
The post-development drainage area will be modified by the proposed improvements by converting a lawn area to impervious surfaces related to the asphalt parking area expansion. The net increase in impervious area is 3,800 SF.

A stone infiltration trench will be installed along the edge of the front parking lot to collect sheet flow runoff from the parking lot. The infiltration trench will collect and percolate runoff upto its capacity. Runoff that exceeds the capacity will sheet flow from the trench onto the adjacent grass area that slopes down to the street swale. The area of the parking lot that drains to the infiltration trench is 9,200 SF. The increase in runoff as the result of the new pavement is minor and is 0.1 - 0.2 cfs.

The subcatchment is shown in the Post-Development Watershed Figure.

Proposed Water Quantity and Quality Controls

Water Quantity
The following table summarize the stormwater management system performance and discharge point parameters as found in the engineering calculations attached. The storm chambers were modelled assuming an infiltration rate of 3 inches/hour.

Design Point Summary	Pre-Development	Post-Development	Units	Satisfied
Design Point 1				
Contributing Watershed Area	3,800	3,800	SF	
		Peak Discharge		
1-year event	0.1	0.2	cfs	√
10-year event	0.2	0.4	cfs	√
100-year event	0.6	0.8	cfs	√

Water Quality
The water quality volume is directly related to the amount of impervious surface created at a site. The water quality volume (**WQv**) is designed to improve water quality by treating 90% of the average annual stormwater runoff volume.

Although water quality treatment is not required, the storm system will provide water quality treatment of runoff from the 3,800 sf increase in impervious surfaces. The stormwater management system is as follows:

1. Stone Collection Trench

The runoff from 9,200 sf of parking area will be collected by a stone infiltration trench off of the

edge of the front parking area. This parking area will not be curbed to allow the sheet flow of runoff to the grass area down to the road swale. Collected runoff upto the capacity of the trench will infiltrate into the ground. Runoff that exceeds the trench's capacity will sheet flow onto the adjacent grass area down to the street swale.

The proposed construction will not increase the developed peak discharge rates from the site and will treat the water quality volume from a portion of the impervious areas. The proposed stormwater management system meets the requirements of the Town of Wappinger.

Sincerely,

Troy A. Wojciekofsky, P. E., LEED-AP
Engineer
Attachments:
Soils Information
HydroCAD Report
Watershed Figures

Soil Map—Dutchess County, New York
(80 Airport Drive)

Map Scale: 1:1,190 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 15 30 60 90

Feet
0 50 100 200 300

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

MAP LEGEND

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

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Dutchess County, New York
Survey Area Data: Version 17, Jun 11, 2020

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

Date(s) aerial images were photographed: Oct 7, 2013—Feb 26, 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
Fr	Fredon silt loam	0.1	4.6%
PwB	Pittstown silt loam, 3 to 8 percent slopes	2.5	94.8%
Su	Sun silt loam	0.0	0.6%
Totals for Area of Interest		**2.6**	**100.0%**

Dutchess County, New York

PwB—Pittstown silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9rhn
Elevation: 0 to 1,120 feet
Mean annual precipitation: 41 to 47 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 115 to 195 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Pittstown

Setting

Landform: Drumlinoid ridges, hills, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 22 inches: silt loam
H3 - 22 to 80 inches: channery silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 15 to 30 inches to densic material
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F144AY037MA - Moist Dense Till Uplands
Hydric soil rating: No

Minor Components

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

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

Georgia
Percent of map unit: 4 percent
Hydric soil rating: No

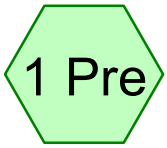
Unnamed soils, fine-loamy
Percent of map unit: 3 percent
Hydric soil rating: No

Sun
Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

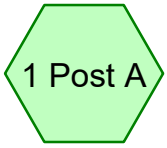
Canandaigua
Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

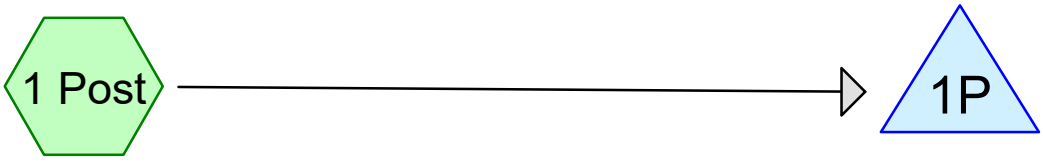
Soil Survey Area: Dutchess County, New York
Survey Area Data: Version 17, Jun 11, 2020



Study Area

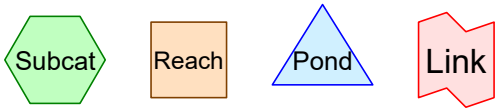


Increase in Pavement



Increase in Impervious

Underground Infiltration



Drainage Diagram for LOCUST 20210803
Prepared by TW Engineering, P.C. 8/3/2021

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

Subcatchment 1 Post: Increase in Impervious Runoff Area=9,200 sf Runoff Depth=2.31"
Tc=6.0 min CN=98 Runoff=0.54 cfs 0.041 af

Subcatchment 1 Post A: Increase in Pavement Runoff Area=3,800 sf Runoff Depth=2.31"
Tc=6.0 min CN=98 Runoff=0.22 cfs 0.017 af

Subcatchment 1 Pre: Study Area Runoff Area=3,800 sf Runoff Depth=0.65"
Tc=6.0 min CN=74 Runoff=0.07 cfs 0.005 af

Pond 1P: Underground Infiltration Peak Elev=174.11' Storage=308 cf Inflow=0.54 cfs 0.041 af
Discarded=0.02 cfs 0.024 af Primary=0.52 cfs 0.015 af Outflow=0.54 cfs 0.039 af

Total Runoff Area = 0.386 ac Runoff Volume = 0.062 af Average Runoff Depth = 1.94"

Subcatchment 1 Post: Increase in Impervious

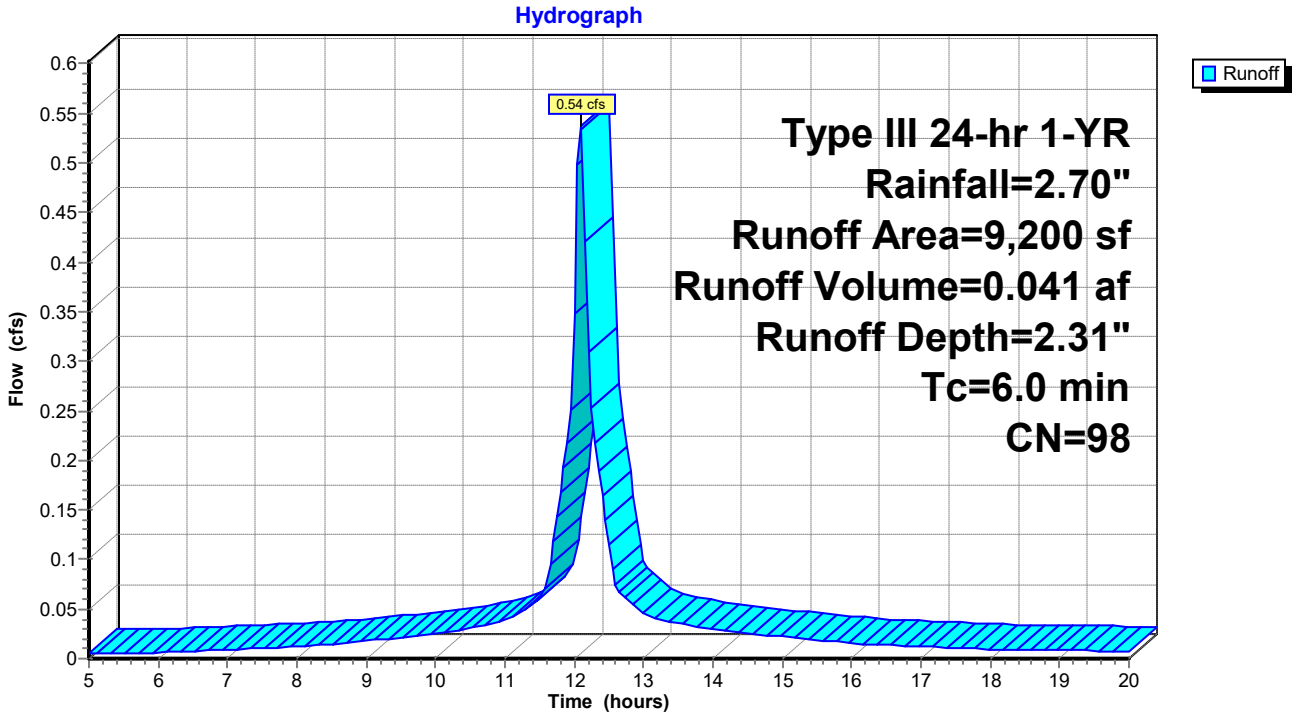
Runoff = 0.54 cfs @ 12.09 hrs, Volume= 0.041 af, Depth= 2.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YR Rainfall=2.70"

Area (sf)	CN	Description
9,200	98	Paved roads w/curbs & sewers

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

Subcatchment 1 Post: Increase in Impervious



Subcatchment 1 Post A: Increase in Pavement

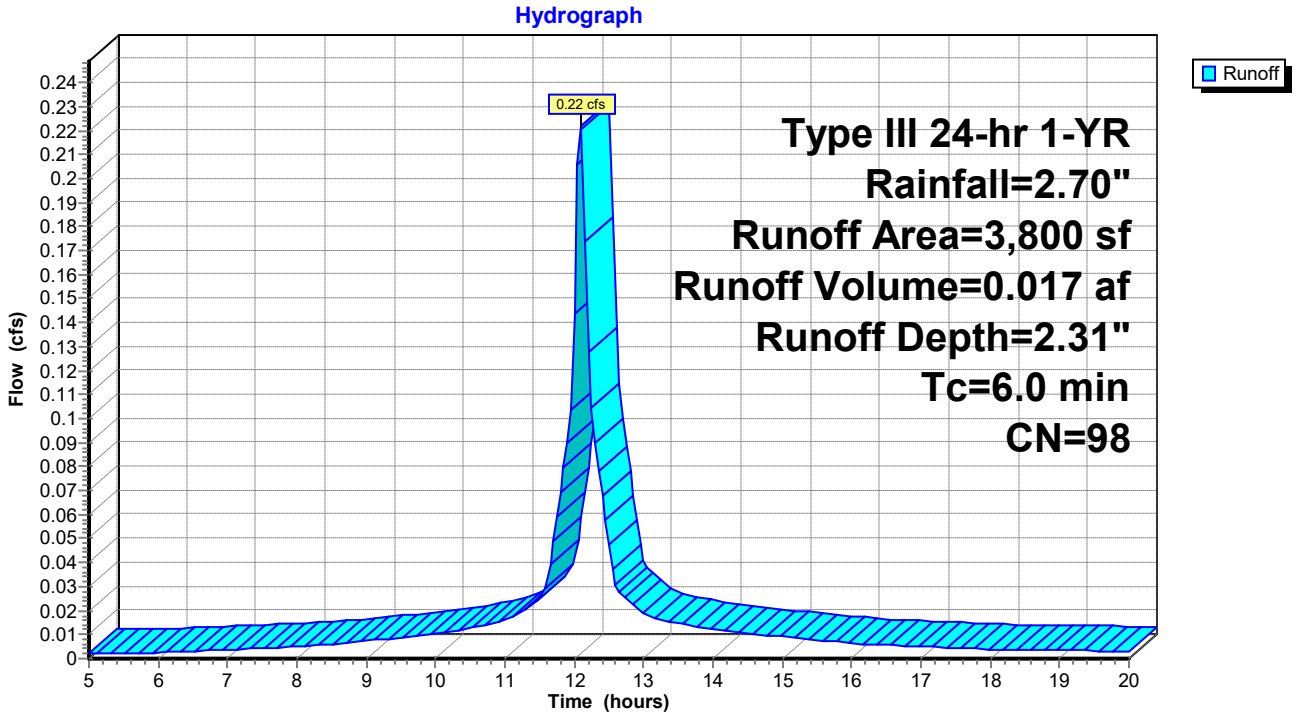
Runoff = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af, Depth= 2.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YR Rainfall=2.70"

Area (sf)	CN	Description
3,800	98	Paved roads w/curbs & sewers

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

Subcatchment 1 Post A: Increase in Pavement



Subcatchment 1 Pre: Study Area

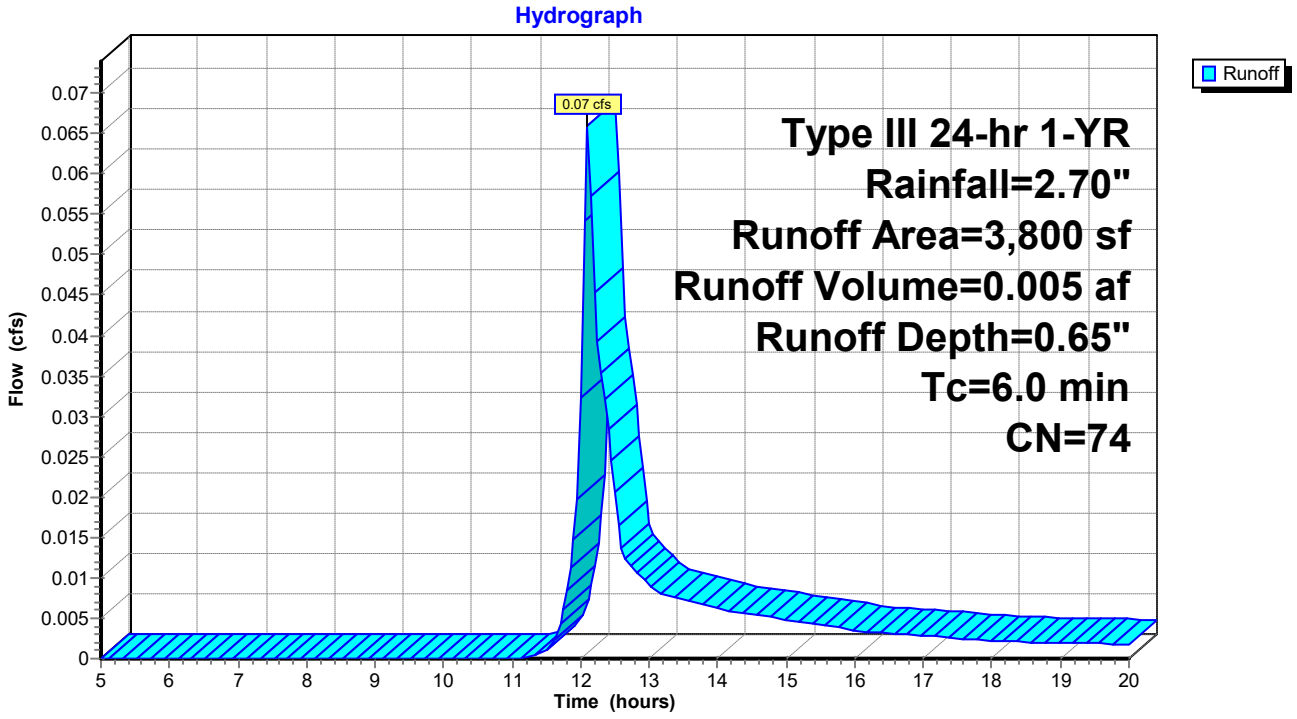
Runoff = 0.07 cfs @ 12.10 hrs, Volume= 0.005 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-YR Rainfall=2.70"

Area (sf)	CN	Description
3,800	74	>75% Grass cover, Good, HSG C

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

Subcatchment 1 Pre: Study Area



Pond 1P: Underground Infiltration

Inflow Area = 0.211 ac, Inflow Depth = 2.31" for 1-YR event
Inflow = 0.54 cfs @ 12.09 hrs, Volume= 0.041 af
Outflow = 0.54 cfs @ 12.09 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.1 min
Discarded = 0.02 cfs @ 10.35 hrs, Volume= 0.024 af
Primary = 0.52 cfs @ 12.09 hrs, Volume= 0.015 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 174.11' @ 12.09 hrs Surf.Area= 350 sf Storage= 308 cf
Plug-Flow detention time= 76.5 min calculated for 0.039 af (95% of inflow)
Center-of-Mass det. time= 57.8 min (798.2 - 740.4)

#	Invert	Avail.Storage	Storage Description
1	171.50'	308 cf	**Custom Stage Data (Prismatic)** Listed below 770 cf Overall x 40.0% Voids

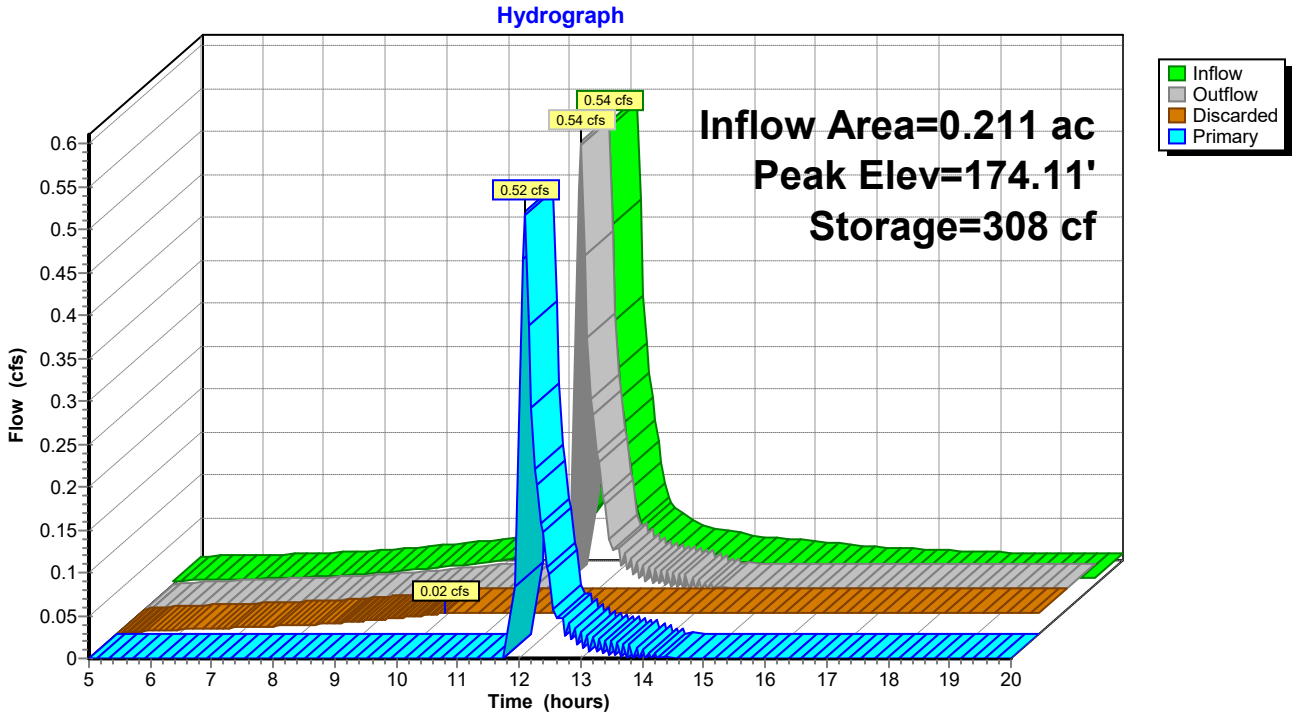
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
171.50	0	0	0
172.10	350	105	105
174.00	350	665	770

#	Routing	Invert	Outlet Devices
1	Discarded	0.00'	**0.004170 fpm Exfiltration over entire Surface area**
2	Primary	174.00'	**6.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.02 cfs @ 10.35 hrs HW=172.10' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.50 cfs @ 12.09 hrs HW=174.11' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.50 cfs @ 0.8 fps)

Pond 1P: Underground Infiltration



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

Subcatchment 1 Post: Increase in Impervious Runoff Area=9,200 sf Runoff Depth=4.33"
Tc=6.0 min CN=98 Runoff=0.99 cfs 0.076 af

Subcatchment 1 Post A: Increase in Pavement Runoff Area=3,800 sf Runoff Depth=4.33"
Tc=6.0 min CN=98 Runoff=0.41 cfs 0.031 af

Subcatchment 1 Pre: Study Area Runoff Area=3,800 sf Runoff Depth=2.12"
Tc=6.0 min CN=74 Runoff=0.23 cfs 0.015 af

Pond 1P: Underground Infiltration Peak Elev=174.17' Storage=308 cf Inflow=0.99 cfs 0.076 af
Discarded=0.02 cfs 0.027 af Primary=0.94 cfs 0.044 af Outflow=0.97 cfs 0.071 af

Total Runoff Area = 0.386 ac Runoff Volume = 0.123 af Average Runoff Depth = 3.83"

Subcatchment 1 Post: Increase in Impervious

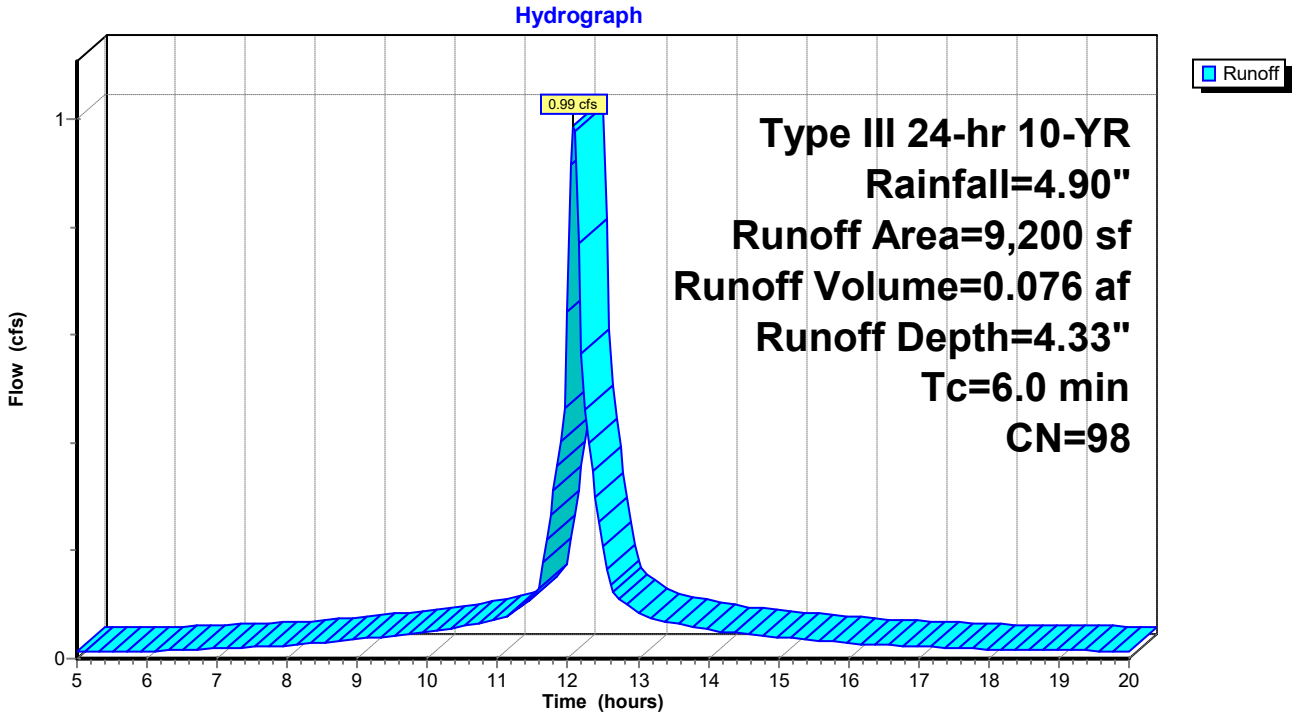
Runoff = 0.99 cfs @ 12.09 hrs, Volume= 0.076 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.90"

Area (sf)	CN	Description
9,200	98	Paved roads w/curbs & sewers

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

Subcatchment 1 Post: Increase in Impervious



Subcatchment 1 Post A: Increase in Pavement

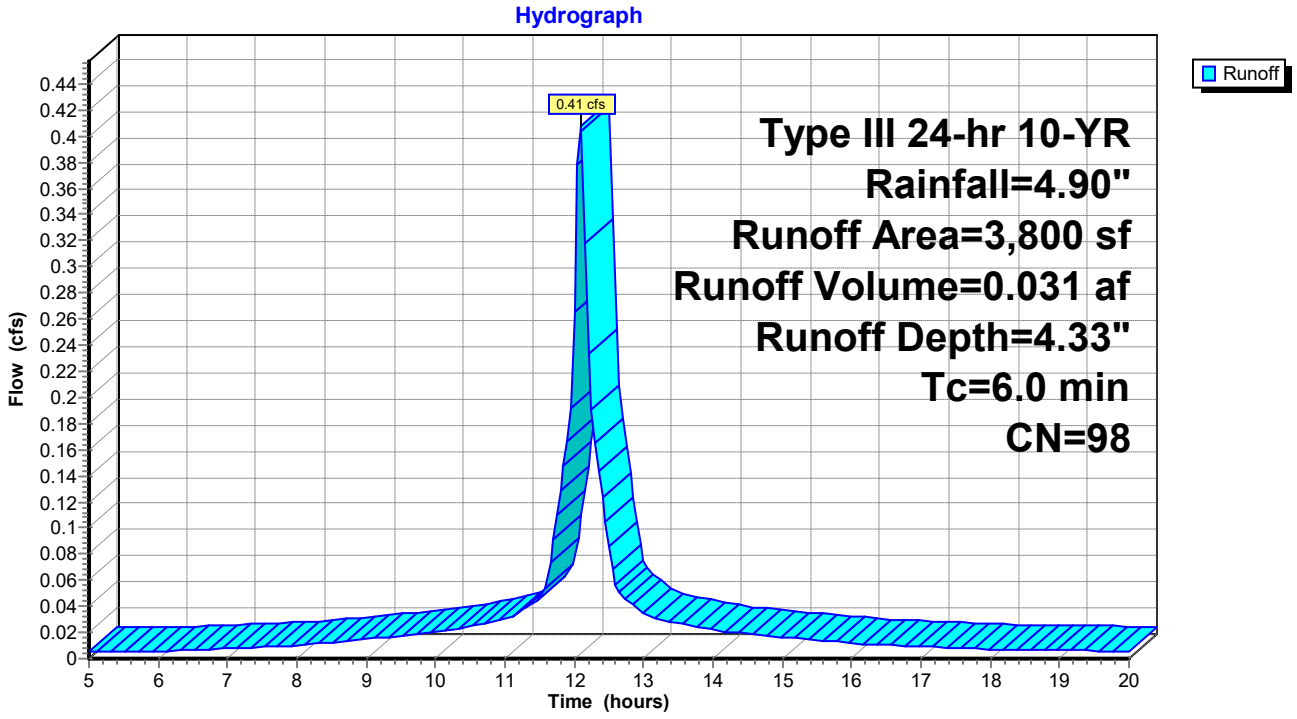
Runoff = 0.41 cfs @ 12.09 hrs, Volume= 0.031 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.90"

Area (sf)	CN	Description
3,800	98	Paved roads w/curbs & sewers

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

Subcatchment 1 Post A: Increase in Pavement



Subcatchment 1 Pre: Study Area

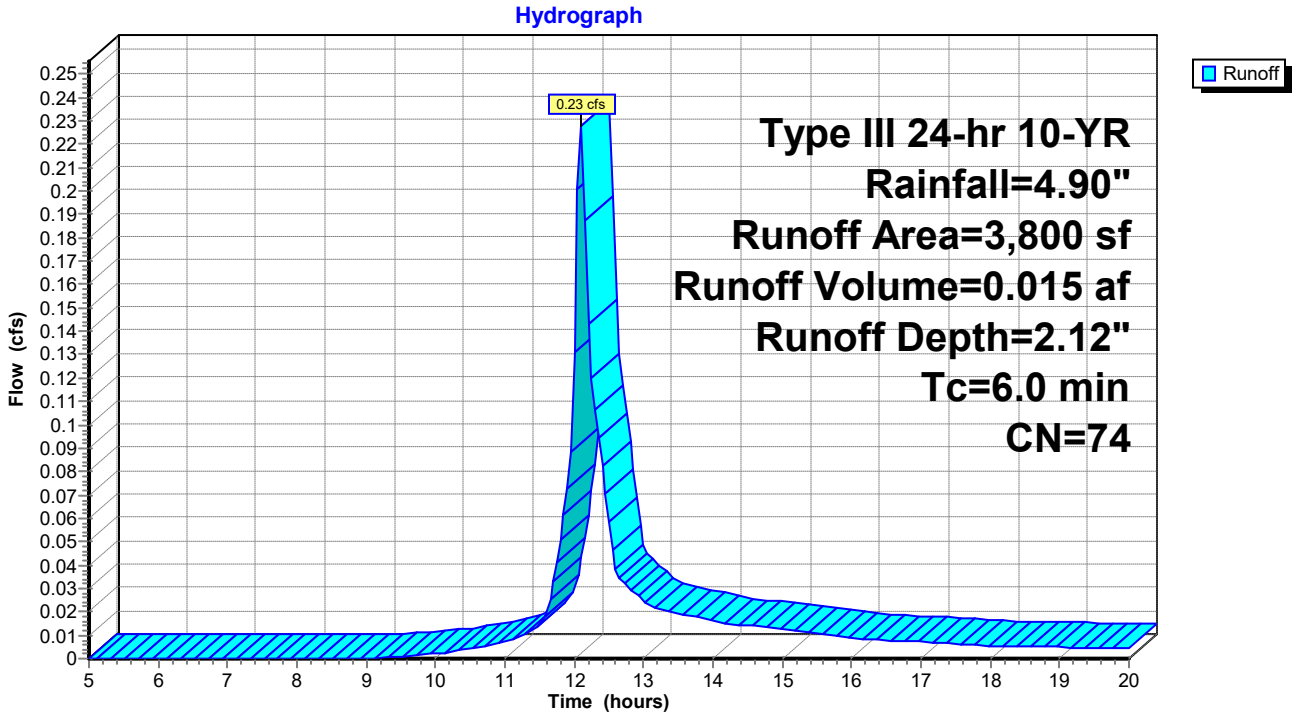
Runoff = 0.23 cfs @ 12.10 hrs, Volume= 0.015 af, Depth= 2.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.90"

Area (sf)	CN	Description
3,800	74	>75% Grass cover, Good, HSG C

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

Subcatchment 1 Pre: Study Area



Pond 1P: Underground Infiltration

Inflow Area = 0.211 ac, Inflow Depth = 4.33" for 10-YR event
Inflow = 0.99 cfs @ 12.09 hrs, Volume= 0.076 af
Outflow = 0.97 cfs @ 12.08 hrs, Volume= 0.071 af, Atten= 2%, Lag= 0.0 min
Discarded = 0.02 cfs @ 8.40 hrs, Volume= 0.027 af
Primary = 0.94 cfs @ 12.08 hrs, Volume= 0.044 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 174.17' @ 12.08 hrs Surf.Area= 350 sf Storage= 308 cf
Plug-Flow detention time= 50.3 min calculated for 0.071 af (93% of inflow)
Center-of-Mass det. time= 25.3 min (760.6 - 735.2)

#	Invert	Avail.Storage	Storage Description
1	171.50'	308 cf	**Custom Stage Data (Prismatic)** Listed below 770 cf Overall x 40.0% Voids

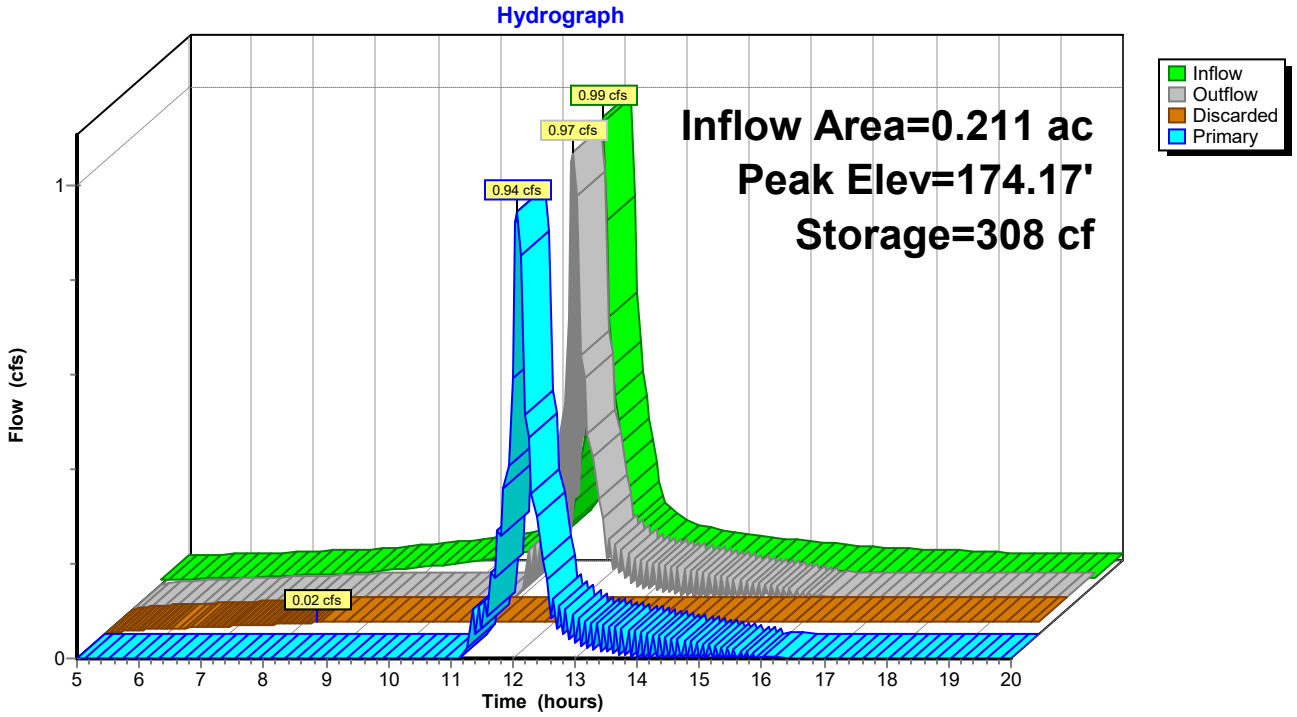
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
171.50	0	0	0
172.10	350	105	105
174.00	350	665	770

#	Routing	Invert	Outlet Devices
1	Discarded	0.00'	**0.004170 fpm Exfiltration over entire Surface area**
2	Primary	174.00'	**6.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.02 cfs @ 8.40 hrs HW=172.10' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.92 cfs @ 12.08 hrs HW=174.16' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.92 cfs @ 0.9 fps)

Pond 1P: Underground Infiltration



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

Subcatchment 1 Post: Increase in Impervious Runoff Area=9,200 sf Runoff Depth=8.05"
Tc=6.0 min CN=98 Runoff=1.82 cfs 0.142 af

Subcatchment 1 Post A: Increase in Pavement Runoff Area=3,800 sf Runoff Depth=8.05"
Tc=6.0 min CN=98 Runoff=0.75 cfs 0.059 af

Subcatchment 1 Pre: Study Area Runoff Area=3,800 sf Runoff Depth=5.47"
Tc=6.0 min CN=74 Runoff=0.58 cfs 0.040 af

Pond 1P: Underground Infiltration Peak Elev=174.25' Storage=308 cf Inflow=1.82 cfs 0.142 af
Discarded=0.02 cfs 0.029 af Primary=1.76 cfs 0.105 af Outflow=1.79 cfs 0.135 af

Total Runoff Area = 0.386 ac Runoff Volume = 0.240 af Average Runoff Depth = 7.47"

Subcatchment 1 Post: Increase in Impervious

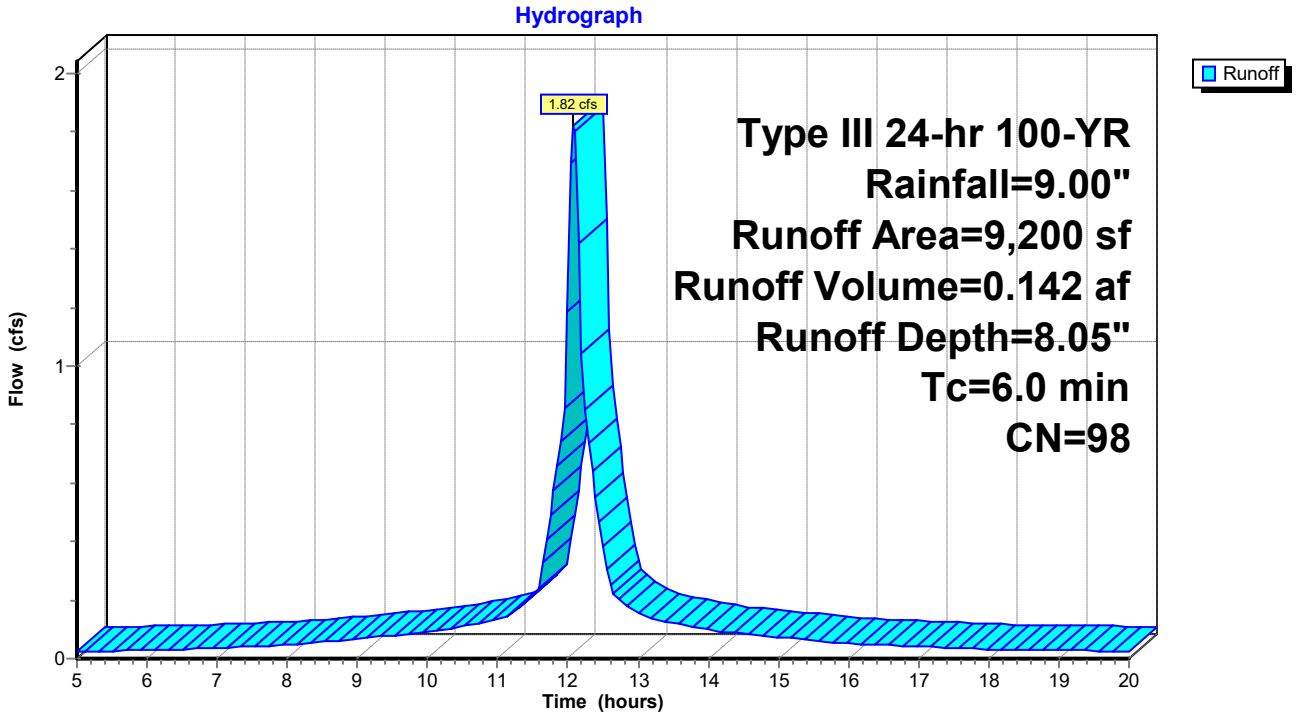
Runoff = 1.82 cfs @ 12.09 hrs, Volume= 0.142 af, Depth= 8.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=9.00"

Area (sf)	CN	Description
9,200	98	Paved roads w/curbs & sewers

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

Subcatchment 1 Post: Increase in Impervious



Subcatchment 1 Post A: Increase in Pavement

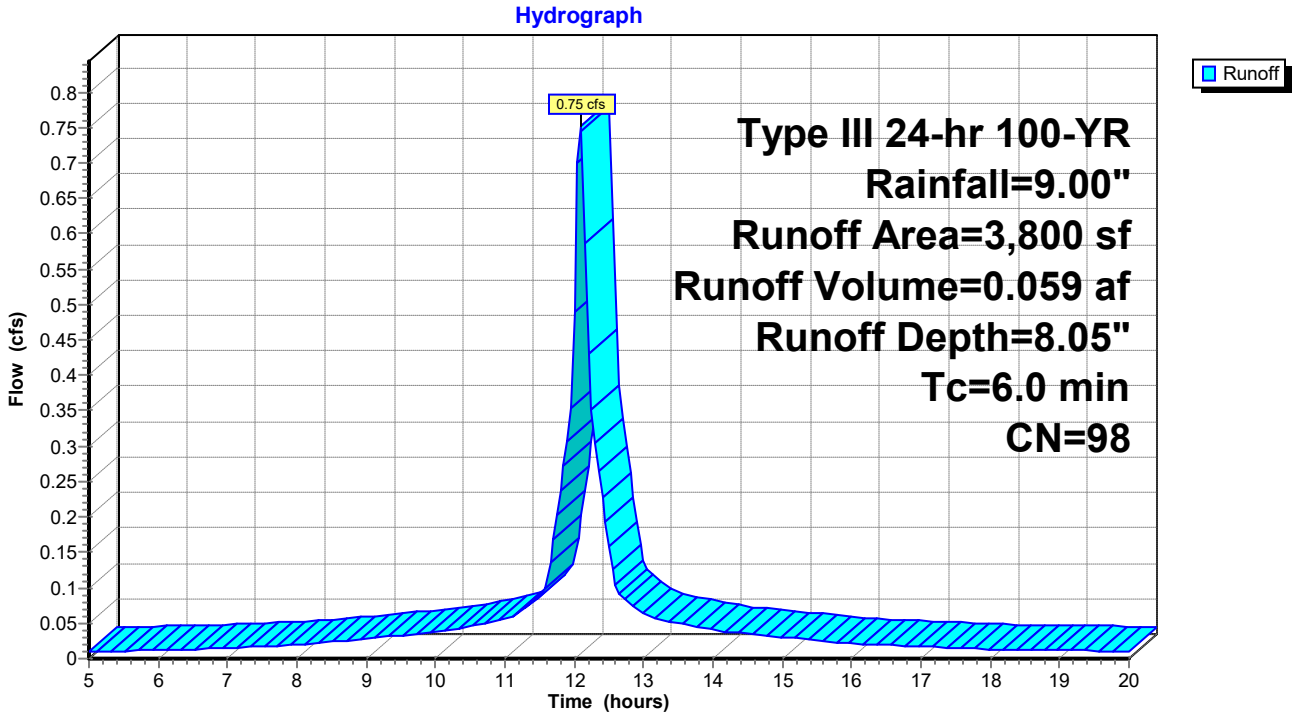
Runoff = 0.75 cfs @ 12.09 hrs, Volume= 0.059 af, Depth= 8.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=9.00"

Area (sf)	CN	Description
3,800	98	Paved roads w/curbs & sewers

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

Subcatchment 1 Post A: Increase in Pavement



Subcatchment 1 Pre: Study Area

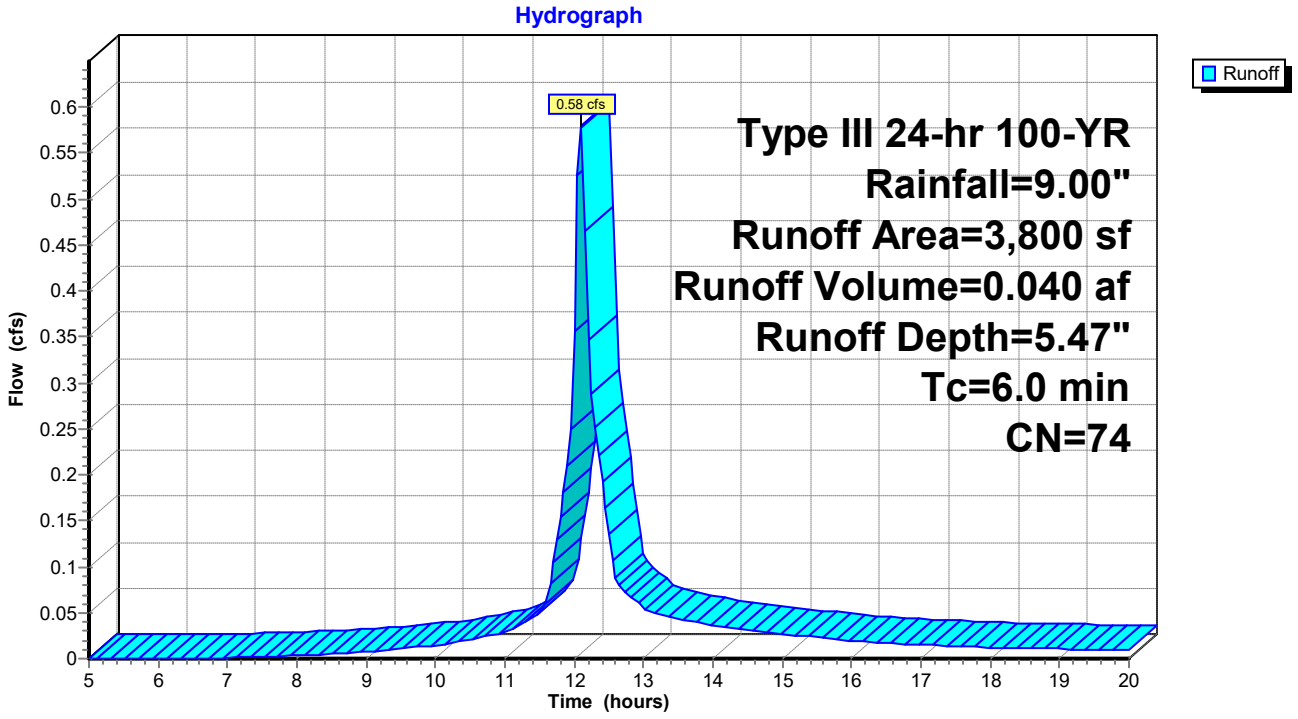
Runoff = 0.58 cfs @ 12.09 hrs, Volume= 0.040 af, Depth= 5.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=9.00"

Area (sf)	CN	Description
3,800	74	>75% Grass cover, Good, HSG C

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

Subcatchment 1 Pre: Study Area



Pond 1P: Underground Infiltration

Inflow Area = 0.211 ac, Inflow Depth = 8.05" for 100-YR event
Inflow = 1.82 cfs @ 12.09 hrs, Volume= 0.142 af
Outflow = 1.79 cfs @ 12.08 hrs, Volume= 0.135 af, Atten= 2%, Lag= 0.0 min
Discarded = 0.02 cfs @ 6.05 hrs, Volume= 0.029 af
Primary = 1.76 cfs @ 12.08 hrs, Volume= 0.105 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 174.25' @ 12.08 hrs Surf.Area= 350 sf Storage= 308 cf
Plug-Flow detention time= 33.5 min calculated for 0.134 af (95% of inflow)
Center-of-Mass det. time= 13.8 min (746.6 - 732.7)

#	Invert	Avail.Storage	Storage Description
1	171.50'	308 cf	**Custom Stage Data (Prismatic)** Listed below 770 cf Overall x 40.0% Voids

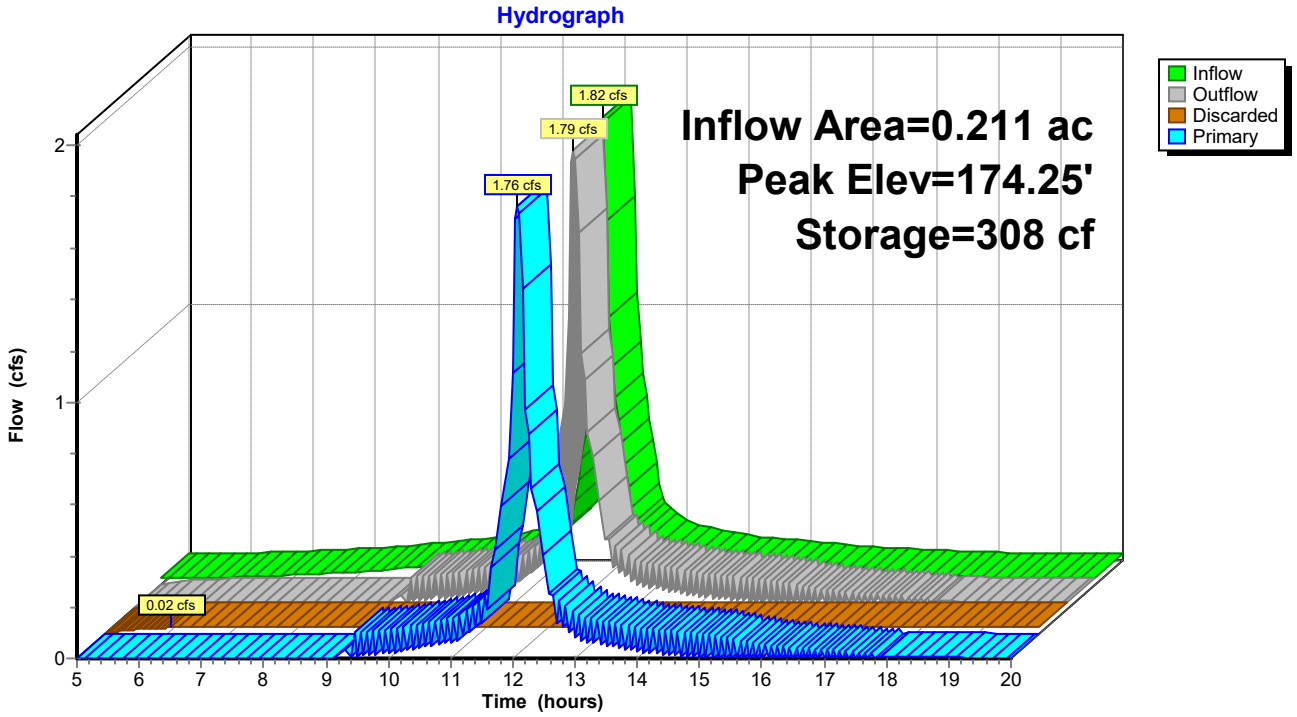
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
171.50	0	0	0
172.10	350	105	105
174.00	350	665	770

#	Routing	Invert	Outlet Devices
1	Discarded	0.00'	**0.004170 fpm Exfiltration over entire Surface area**
2	Primary	174.00'	**6.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.02 cfs @ 6.05 hrs HW=172.10' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=1.72 cfs @ 12.08 hrs HW=174.24' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 1.72 cfs @ 1.2 fps)

Pond 1P: Underground Infiltration



AIRPORT DRIVE

EDGE OF PAVEMENT

DOUBLE YELLOW LINE

EDGE OF PAVEMENT

IMPERVIOUS AREA FIGURE
4/20/2021
RED = NEW IMPERVIOUS = 6,550 SF
GREEN = REMOVED = 2,750 SF
NET INCREASE = 3,800 SF

20 10 0 20
GRAPHIC SCALE

No.	DATE	DESCRIPTION	BY
		REVISIONS	

IT IS A VIOLATION OF NEW YORK STATE EDUCATION LAW FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT IN ANY WAY. IF THIS DOCUMENT IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM HIS SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

TW ENGINEERING, P.C.

P.O. BOX 913
WAPPINGER FALLS, NY 12590
845-594-1529

TROY A. WOJCIEKOFSKY, P.E., LEED-AP CONSULTING ENGINEER

SITE PLAN

FOR

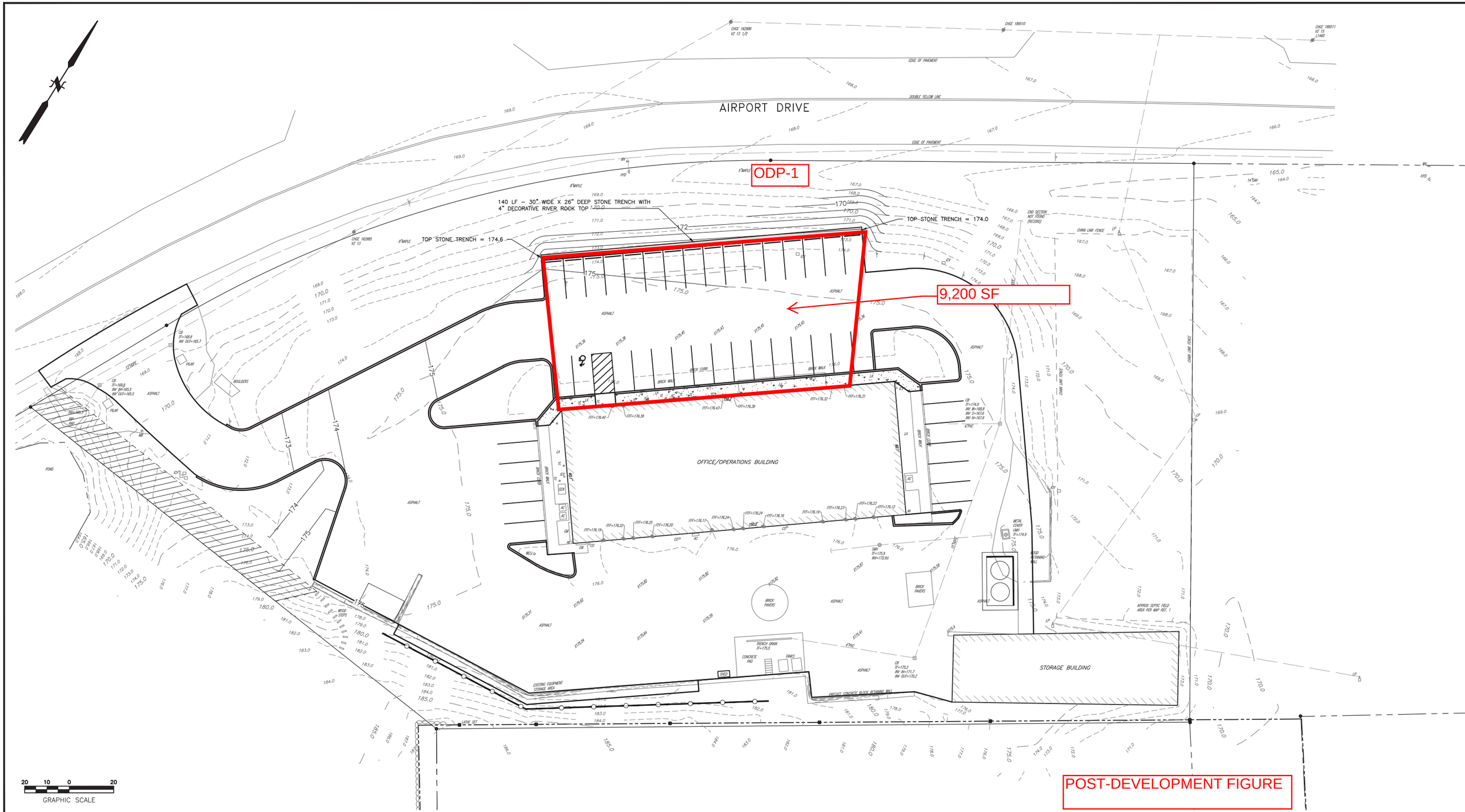
NEAVE GROUP OFFICE BUILDING AMENDED SITE PLAN

80 AIRPORT ROAD

TOWN OF WAPPINGER DUTCHESS COUNTY, NY

PROJ. No.: TW21XX
DATE: FEBRUARY 2021
SCALE: 1" = 20'

C-02



No.	DATE	DESCRIPTION	BY
2	08/03/21	REVISED PER PB COMMENTS	SHW
1	04/16/21	REVISED PER PB COMMENTS	SHW

REVISIONS

TW ENGINEERING, P.C.

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WAPPINGER FALLS, NY 12590
845-594-1529

TROY A. WOJCIEKOFSKY, P.E., LEED-AP CONSULTING ENGINEER

GRADING AND DRAINAGE PLAN

FOR

LOCUST TREES RESIDENTIAL PROPERTIES, LLC AMENDED SITE PLAN

80 AIRPORT ROAD

TOWN OF WAPPINGER DUTCHESS COUNTY, NY

PROJ. No.: TW21XX
DATE: FEBRUARY 2021
SCALE: 1" = 20'

C-03