SEBAGO TECHNICS

CIVIL ENGINEERING ▪ SURVEYING ▪ LANDSCAPE ARCHITECTURE

STORMWATER MANAGEMENT PLAN

for the

Deer Brook Apartments, Phase II
Gray Road (SR-115)
North Yarmouth, Maine

prepared for

United Properties, Inc.
9 Thomas Drive
Westbrook, Maine 04098

January 2021

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STORMWATER MANAGEMENT PLAN

Deer Brook Apartments
Gray Road (SR-115)
North Yarmouth, Maine

EXECUTIVE SUMMARY

The proposed project is a six unit residential apartment complex located on the existing Deer Brook Apartment site off of Gray Road (SR-115) in North Yarmouth, Maine. The site is identified as Lot 27 on the Town of North Yarmouth Tax Map 15 in the Farm Forest Zone. The total parcel area is approximately 33.4 acres.

The proposed development will include three (3), 1,966 square foot duplexes. The three buildings will be accessed by a 22' wide access way loop off of the existing Deer Brook Apartments access way. Other impervious areas associated with this development pavement and gravel areas, utility improvements and stormwater infrastructure. The development will create 21,058 sf (0.48 acres) of new impervious surface and will disturb approximately 116,232 sf (2.67 acres) including the disturbance within the street right-of-way.

The project site is tributary to the Royal River which is not currently classified as an impaired waterway by the Maine Department of Environmental Protection (Maine DEP). The project will be subject to the Town of North Yarmouth Subdivision Plan Final Review Ordinance regarding stormwater management and the Maine DEP Chapter 500 basic standards regarding erosion and sediment control. A detention basin is proposed to provide water quantity control for the proposed development.

STORMWATER MANAGEMENT PLAN

Deer Brook Apartments
Gray Road (SR-115)
North Yarmouth, Maine

I. Introduction

This Stormwater Management Plan has been prepared to address the impacts associated with the construction of the proposed six unit rental and associated access road. The stormwater management controls that are outlined in this plan have been designed to best suit the existing site conditions and to comply with applicable regulatory requirements.

II. Existing Conditions

The project site is currently wooded and sloped, with the existing Deer Brook Apartments located to the south.

A. Land Cover: The site abuts Gray Road (SR-115) to the west, Maine Central Railroad tracks to the east, and residential properties to the north and south. Access to the site is provided by an existing access road to the Deer Brook Apartments from Gray Road (SR-115). The site is comprised of undeveloped woods and terrain.

B. Site Topography: The portion of the property that will be developed is relatively rugged, with slopes in most areas between 10 and 20%. Just north of the extents of the proposed development exists slopes 20% or greater.

C. Surface Water Features: In the pre-developed condition, half of the site slopes towards the existing road, into an existing natural swale to an on-site wetlands, and eventually into the Royal River. The rest of the site drains towards the north into another natural swale, through the same wetland complex and also ends in the Royal River. The existing Deer Brook Apartments on the adjacent site also drains all stormwater to the Royal River.

D. Soils: Soil characteristics were obtained from the Natural Resources Conservation Service Soil Survey. Soils identified on the site (or within close proximity) are identified below in Table 1. These soil boundaries have been identified on the attached Watershed Maps.

Table 1 – Proximity Soil Types and Characteristics		
Soil Type	**Symbol**	**HSG**
Suffield Silt Loam, 15 to 25% Slopes	SuD2	C
Suffield Silt Loam, 8 to 15% Slopes	SuC2	C

The hydrologic soil group (HSG) designation is based on a rating of the relative permeability of a soil, with Group "A" being extremely permeable such as coarse sand, and Group "D" having low permeability such as clay.

E. Historic Flooding: There are no apparent flooding problems associated with this development site.

III. Proposed Development

The proposed development includes the construction of 6 rental units (a total of 5,898 sf total), an access drive, and associated pavement and gravel areas. The project will include public water and on-site septic disposal systems, overhead electric, telephone and cable service and stormwater infrastructure.

Detention of stormwater runoff will be provided using retention basin.

A. Alterations to Land Cover: Approximately 21,058 sf (0.48 acres) of new impervious surface will be created as a result of the proposed project. This area includes the proposed buildings, pavement and gravel areas. The project will disturb an additional 95,174 sf (2.19 acres) which will be revegetated with lawn and landscaping in the post-development condition. The total developed area of the project site is estimated to be 116,232 sf (2.67 acres).

IV. Downstream Ponds and Waterbodies

The majority of stormwater runoff from the site will be directed to the proposed detention basin. Due to the existing terrain of the site, some stormwater runoff from the proposed units will be directed towards the northern side of the property and not to the detention basin. The basin discharges through a proposed 12" CPP culvert crossing under the proposed access drive. Runoff eventually discharges to the Royal River.

V. Regulatory Requirements

A. Town of North Yarmouth, Maine: The Town of North Yarmouth Land Use Ordinance requires development projects to provide "adequate provisions must be made for the collection and disposal of all stormwater that runs off proposed driveways, parking areas, roofs, and other surfaces to prevent adverse impacts on abutting or downstream properties". The Land Use Ordinance also includes provisions for controlling erosion and sedimentation during construction as recommended in the "Maine Erosion and Sediment Control Handbook for

Construction: Best Management Practices" by the Cumberland County Soil and Water Conservation District.

B. Maine Department of Environmental Protection (Maine DEP): As the proposed project does not propose more than an acre of new impervious, the project is subject only to the Maine DEP Chapter 500 Basic Standards for Erosion and Sedimentation Control.

VI. Peak Flow Analysis

This section has been prepared to discuss the management of the peak stormwater flow rates as a result of the development.

A. Modeling Technique: To evaluate drainage characteristics in pre-development and post-development conditions, a quantitative analysis was performed to determine peak rates of runoff for the 2, 10, and 25-year storm events. Runoff calculations were performed following the methodology outlined in the USDA Soil Conservation Service's "Urban Hydrology for Small Watersheds, Technical Release #55" and HydroCAD Stormwater Modeling System software. A 24-hour, SCS Type III storm distribution was used for analysis.

The published 24-hour rainfall values for Cumberland County are as follows:

Storm Frequency Precipitation (in./24 hr)	
2-year	3.0
10-year	4.7
25-year	5.5

B. Drainage Characteristics (Pre-Development and Post-Development Watershed Delineation): Two Watershed Study Points (SP-1 and SP-2) were established to evaluate pre-development and post-development runoff conditions.

Study Point SP-1 represents the natural swale that runs along the southerly property line adjacent to the existing access drive and Deer Brook Apartments. Subcatchments 1 and 2, and 10, 20, 40 and 50 are tributary to this point in the pre-development and post-development models.

Study Point SP-2 represents the natural swale located within the steep slopes line north of the proposed development. Subcatchments 3 and 30 are tributary to this point in the pre-development and post-development models.

C. Comparison: The watershed areas and times of concentration of the post-development watersheds vary from the pre-development conditions due to the proposed site development and grading. Table-2 summarizes the results of

the hydrologic analysis of the project under pre-development and post-development conditions.

Table 2 - Stormwater Runoff Summary Table Pre-development vs. Post-development										
Study Point	Total Watershed Area (Ac)		Avg. Weighted Curve No. (Cn)		Peak Rates of Runoff (cfs)					
					2-Year		10-Year		25-Year	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
SP-1	2.29	2.55	71	76	1.27	1.16	3.35	2.89	4.4	3.14
SP-2	0.73	0.51	70	75	0.41	0.58	1.19	1.39	1.6	1.8

The result of the stormwater modeling at Study Point SP-1 indicates that the peak rate of runoff in the developed condition will be less than or equal to the pre-developed condition for all storm events.

The result of the stormwater modeling at Study Point SP-2 indicates an increase in the post-development condition for all three storm events. This is a slight increase (0.2 cfs in the 25-Year rain event), and the total discharge (sum of SP-1 and SP-2) to the Royal River in the post-development conditions for both the 10-Year and 25-Year events are less than those in the pre-development condition.

VII. Erosion and Sedimentation Control

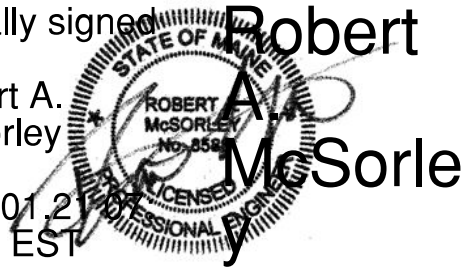
An Erosion & Sedimentation Control Plan will be implemented as an integral part of the Stormwater Management Plan addressing erosion and sediment control during construction and the post-construction stabilization of the site. Temporary erosion control measures to be installed during construction will include riprap, erosion control blanket, and temporary/permanent re-vegetation measures. Included in this report as Attachment B is an Inspection, Maintenance and Housekeeping Plan. Within this plan are during construction and post-construction BMP requirements for the site. Also within this plan is an example Maintenance Log to keep records of any post-construction maintenance performed on the site. These guidelines have also been placed on the plan set for construction reference.

VIII. Conclusions

The proposed development has been designed to meet the requirements of the Town of North Yarmouth's Land Use Ordinance and Maine DEP's Chapter 500 Basic Standards. The proposed detention basin will reduce the overall stormwater discharge to the Royal River for 10-Year and 25-Year storm events. Additionally, erosion and sedimentation controls have been outlined to prevent unreasonable impacts on the site and to the surrounding environment.

Prepared by,

SEBAGO TECHNICS, INC.

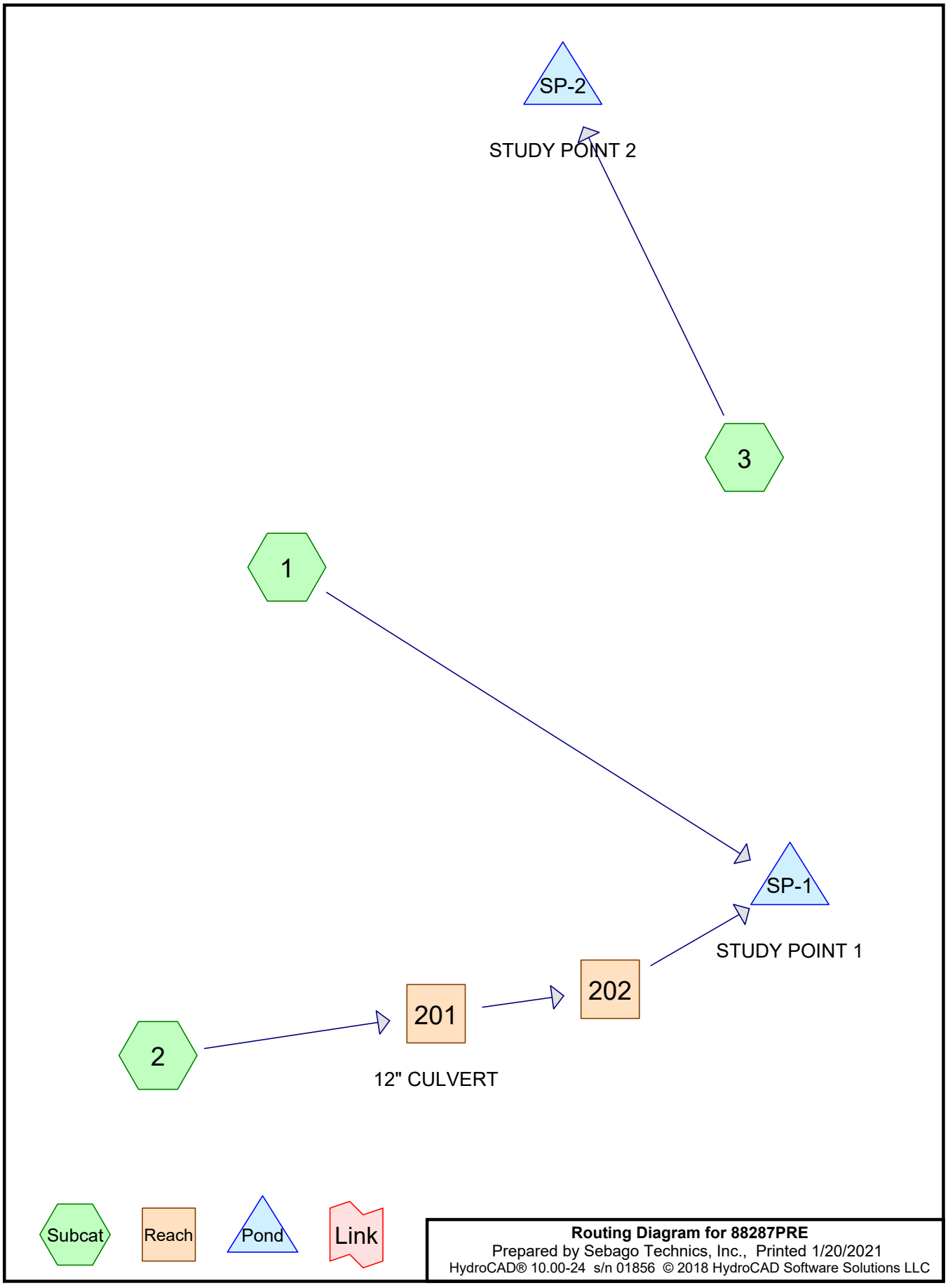


Robert A. McSorley, P.E.
Senior Project Manager

BJB
January 20, 2021

Attachment A

HydroCAD Output – Pre-development and Post-development TR-20 Model



Routing Diagram for 88287PRE
Prepared by Sebago Technics, Inc., Printed 1/20/2021

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.018	74	>75% Grass cover, Good, HSG C (2)
0.118	98	Paved parking & roofs (1, 2)
2.753	70	Woods, Good, HSG C (1, 3)
0.131	72	Woods/grass comb., Good, HSG C (2)
3.020	**71**	**TOTAL AREA**

Soil Listing (selected nodes)

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

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

Subcatchment1: Runoff Area=2.068 ac 2.18% Impervious Runoff Depth>0.68"
Flow Length=472' Tc=22.4 min CN=71 Runoff=1.05 cfs 0.117 af

Subcatchment2: Runoff Area=0.222 ac 32.88% Impervious Runoff Depth>1.21"
Flow Length=81' Slope=0.0680 '/' Tc=11.5 min CN=81 Runoff=0.28 cfs 0.022 af

Subcatchment3: Runoff Area=0.730 ac 0.00% Impervious Runoff Depth>0.64"
Flow Length=214' Tc=13.3 min CN=70 Runoff=0.41 cfs 0.039 af

Reach 201: 12" CULVERT Avg. Flow Depth=0.20' Max Vel=2.54 fps Inflow=0.28 cfs 0.022 af
12.0" Round Pipe n=0.025 L=40.0' S=0.0315 '/' Capacity=3.29 cfs Outflow=0.28 cfs 0.022 af

Reach 202: Avg. Flow Depth=0.05' Max Vel=0.94 fps Inflow=0.28 cfs 0.022 af
n=0.035 L=140.0' S=0.0286 '/' Capacity=17.21 cfs Outflow=0.27 cfs 0.022 af

Pond SP-1: STUDY POINT 1 Inflow=1.27 cfs 0.139 af
Primary=1.27 cfs 0.139 af

Pond SP-2: STUDY POINT 2 Inflow=0.41 cfs 0.039 af
Primary=0.41 cfs 0.039 af

Total Runoff Area = 3.020 ac Runoff Volume = 0.179 af Average Runoff Depth = 0.71"
96.09% Pervious = 2.902 ac 3.91% Impervious = 0.118 ac

Summary for Subcatchment 1:

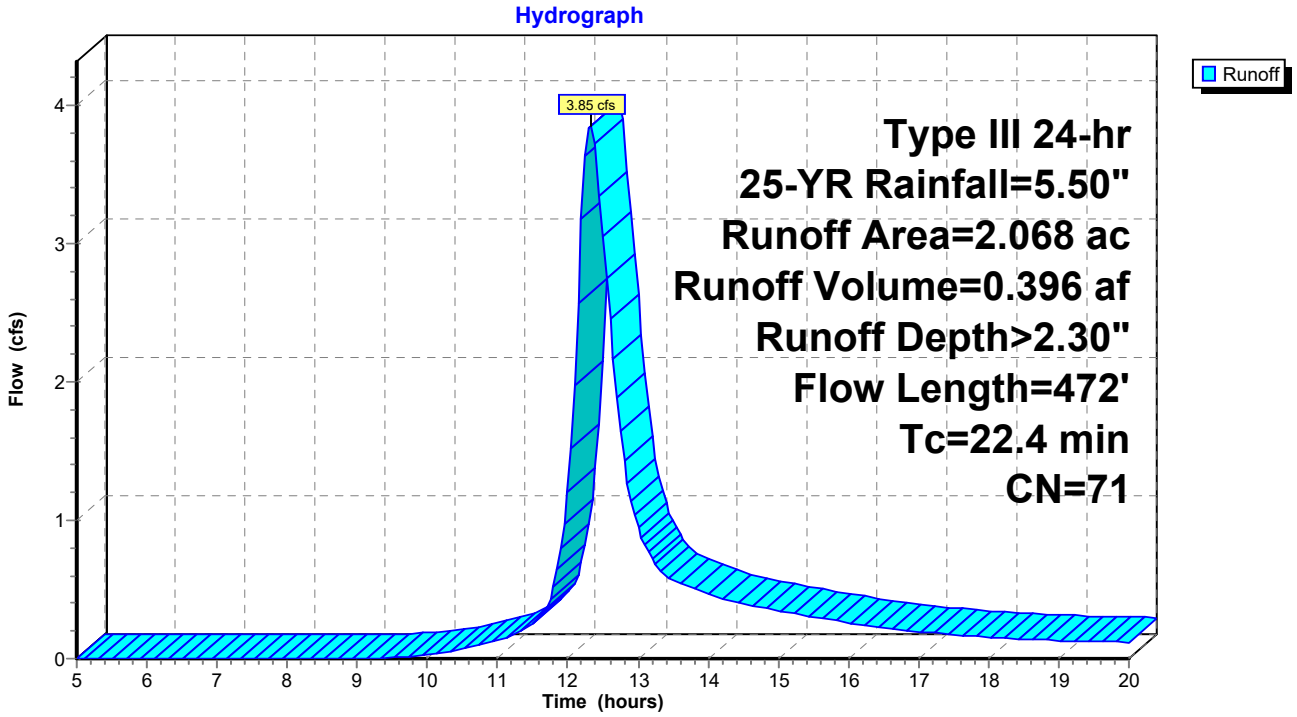
Runoff = 3.85 cfs @ 12.32 hrs, Volume= 0.396 af, Depth> 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
2.023	70	Woods, Good, HSG C
0.045	98	Paved parking & roofs
2.068	71	Weighted Average
2.023		97.82% Pervious Area
0.045		2.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.6	150	0.0800	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
4.8	322	0.0497	1.11		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.4	472	Total			

Subcatchment 1:



Summary for Subcatchment 2:

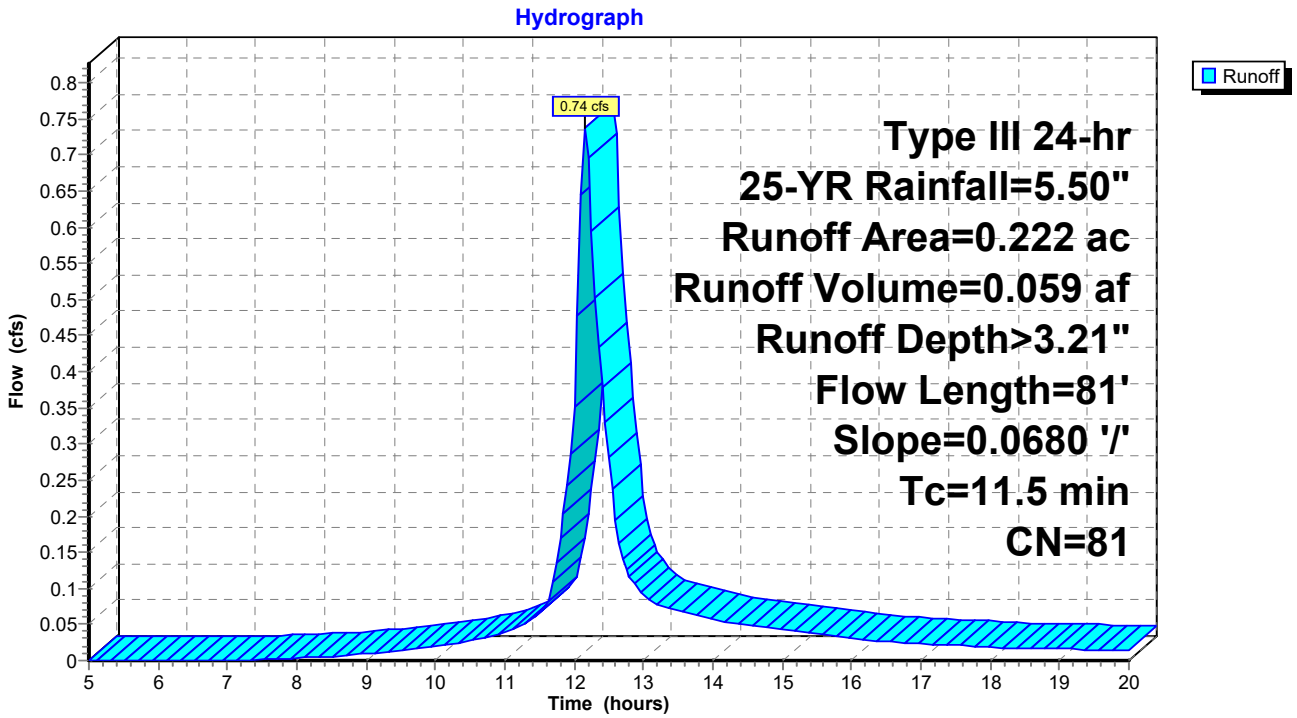
Runoff = 0.74 cfs @ 12.16 hrs, Volume= 0.059 af, Depth> 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.073	98	Paved parking & roofs
0.018	74	>75% Grass cover, Good, HSG C
0.131	72	Woods/grass comb., Good, HSG C
0.222	81	Weighted Average
0.149		67.12% Pervious Area
0.073		32.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	81	0.0680	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"

Subcatchment 2:



Summary for Subcatchment 3:

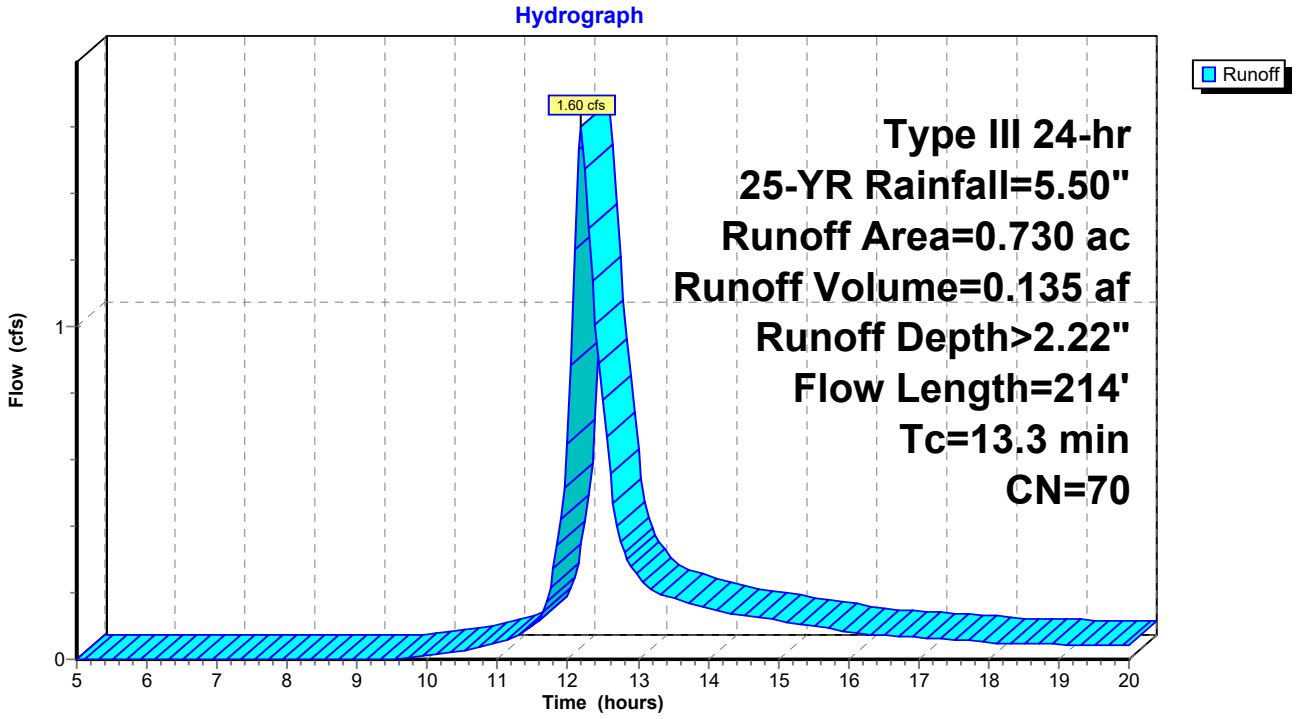
Runoff = 1.60 cfs @ 12.19 hrs, Volume= 0.135 af, Depth> 2.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.730	70	Woods, Good, HSG C
0.730		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	150	0.1800	0.20		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
0.6	64	0.1250	1.77		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.3	214	Total			

Subcatchment 3:



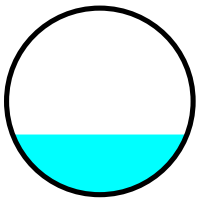
Summary for Reach 201: 12" CULVERT

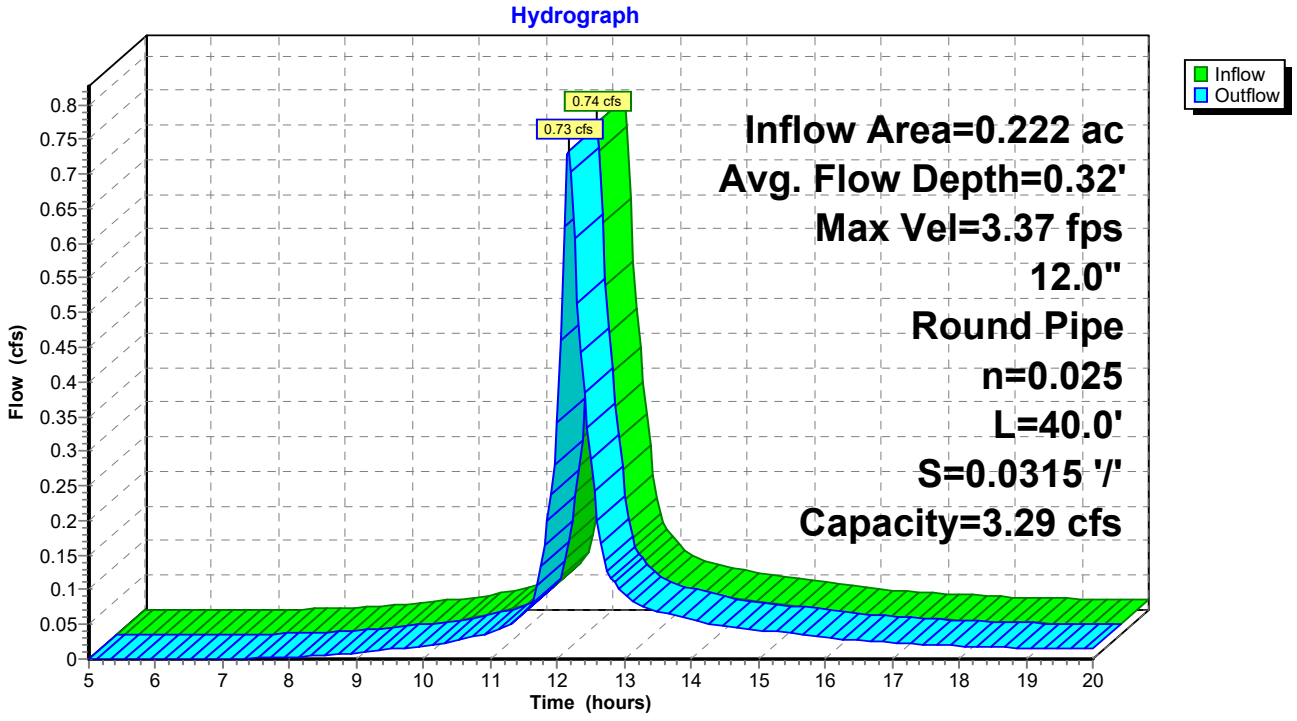
Inflow Area = 0.222 ac, 32.88% Impervious, Inflow Depth > 3.21" for 25-YR event
Inflow = 0.74 cfs @ 12.16 hrs, Volume= 0.059 af
Outflow = 0.73 cfs @ 12.17 hrs, Volume= 0.059 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.37 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.32 fps, Avg. Travel Time= 0.5 min

Peak Storage= 9 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.32'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.29 cfs

12.0" Round Pipe
n= 0.025 Corrugated metal
Length= 40.0' Slope= 0.0315 '/'
Inlet Invert= 178.31', Outlet Invert= 177.05'





Summary for Reach 202:

Inflow Area = 0.222 ac, 32.88% Impervious, Inflow Depth > 3.21" for 25-YR event
Inflow = 0.73 cfs @ 12.17 hrs, Volume= 0.059 af
Outflow = 0.71 cfs @ 12.22 hrs, Volume= 0.059 af, Atten= 3%, Lag= 3.2 min

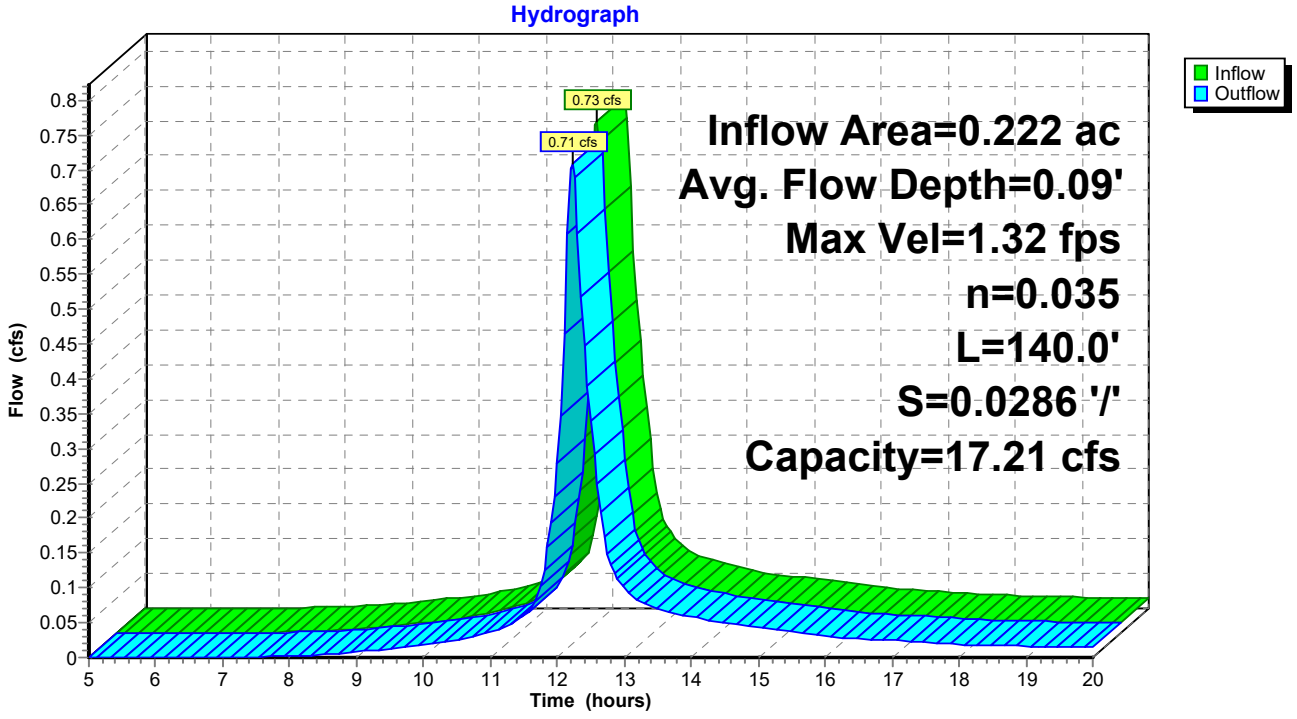
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.32 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 0.43 fps, Avg. Travel Time= 5.4 min

Peak Storage= 76 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 0.50' Flow Area= 5.0 sf, Capacity= 17.21 cfs

5.00' x 0.50' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 10.0 '/' Top Width= 15.00'
Length= 140.0' Slope= 0.0286 '/'
Inlet Invert= 177.00', Outlet Invert= 173.00'

‡

Reach 202:

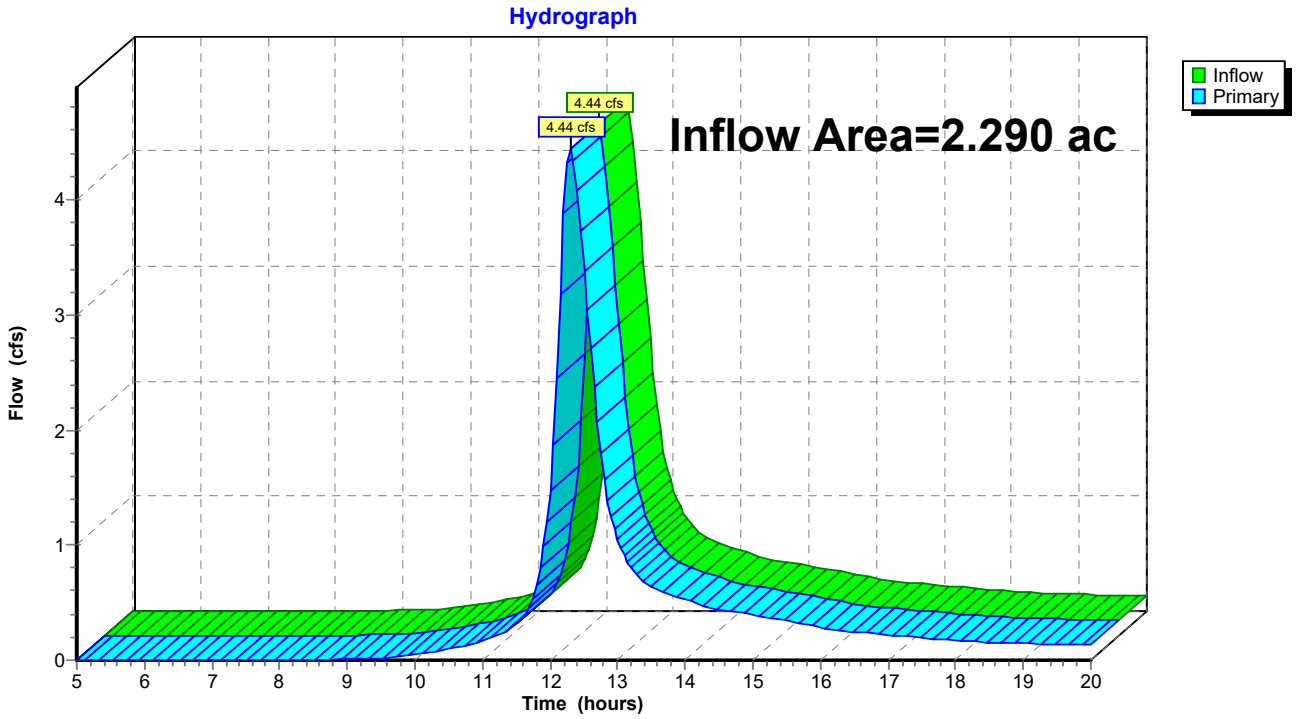


Summary for Pond SP-1: STUDY POINT 1

Inflow Area = 2.290 ac, 5.15% Impervious, Inflow Depth > 2.39" for 25-YR event
Inflow = 4.44 cfs @ 12.30 hrs, Volume= 0.455 af
Primary = 4.44 cfs @ 12.30 hrs, Volume= 0.455 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond SP-1: STUDY POINT 1

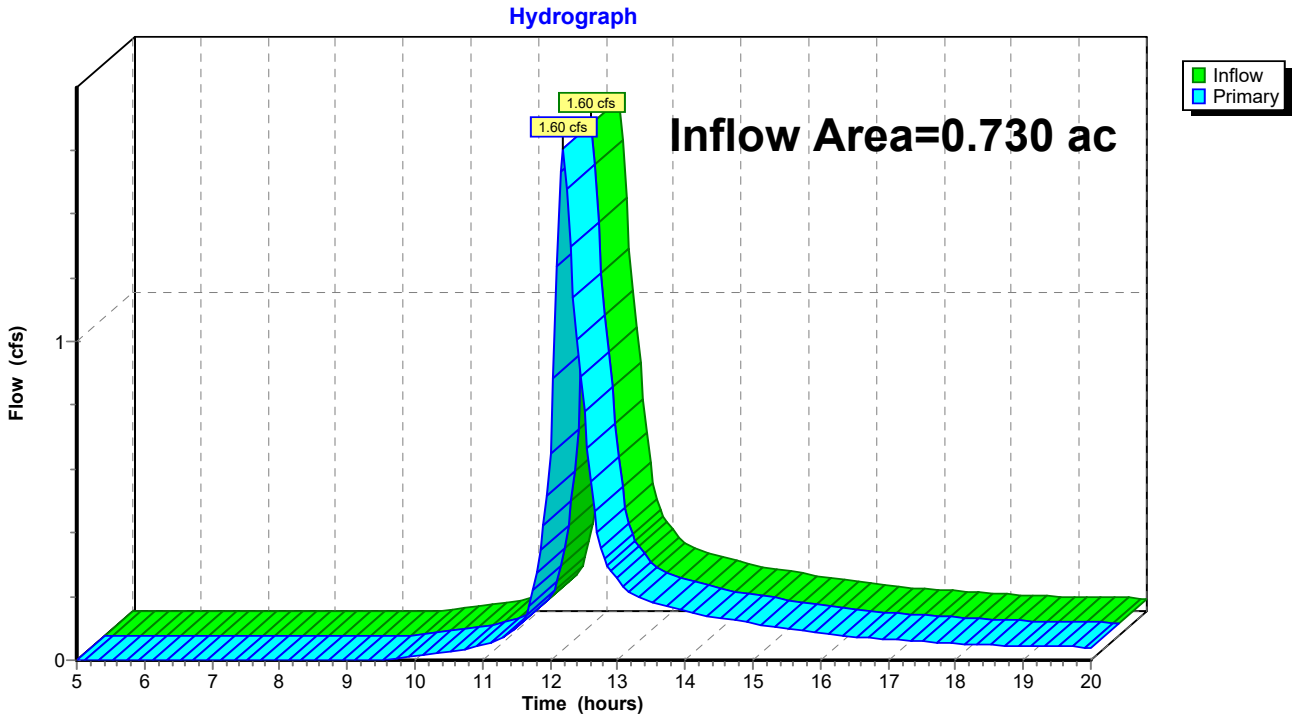


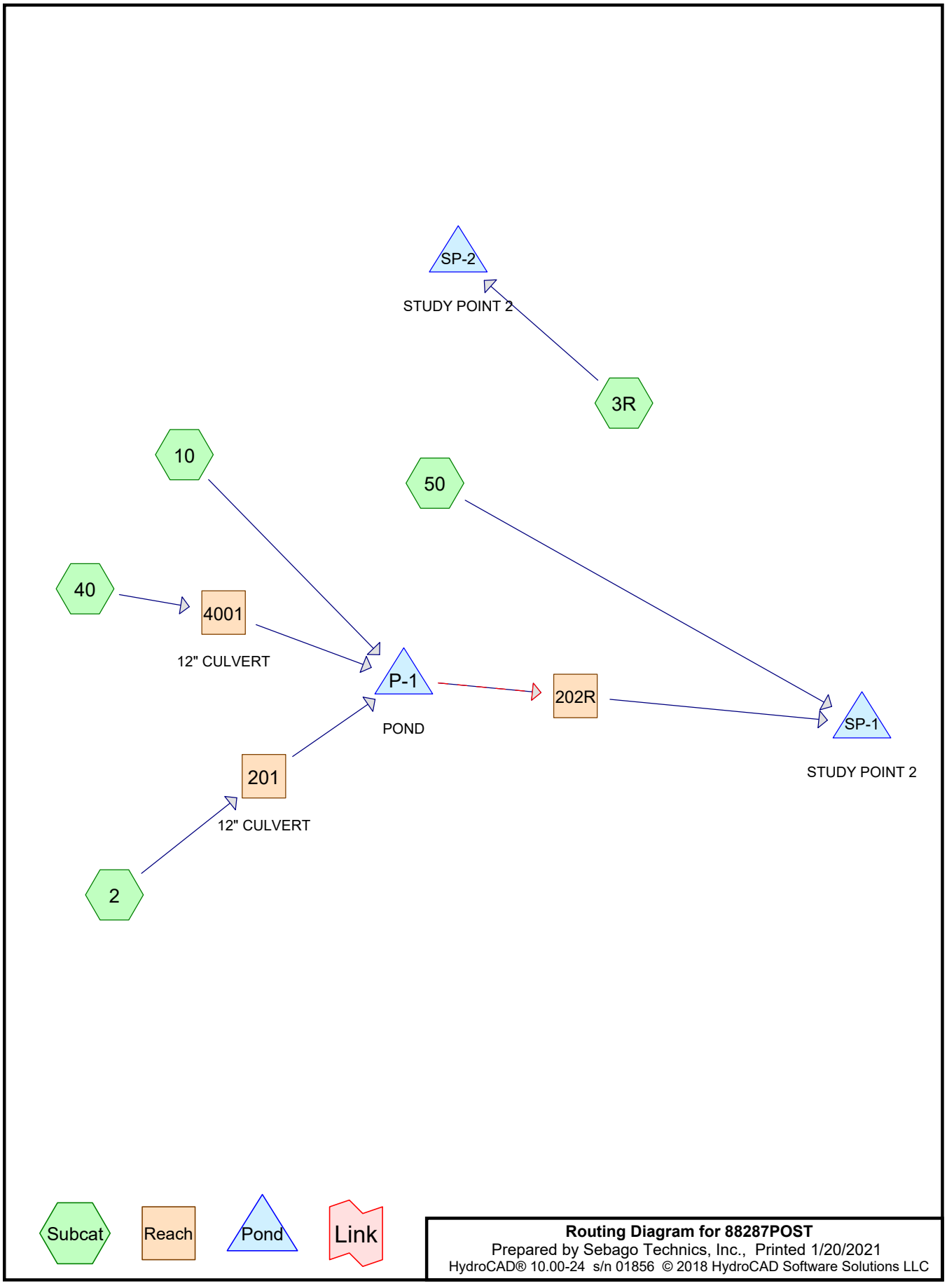
Summary for Pond SP-2: STUDY POINT 2

Inflow Area = 0.730 ac, 0.00% Impervious, Inflow Depth > 2.22" for 25-YR event
Inflow = 1.60 cfs @ 12.19 hrs, Volume= 0.135 af
Primary = 1.60 cfs @ 12.19 hrs, Volume= 0.135 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond SP-2: STUDY POINT 2





Routing Diagram for 88287POST
Prepared by Sebago Technics, Inc., Printed 1/20/2021

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.205	74	>75% Grass cover, Good, HSG C (2, 3R, 10, 50)
0.030	89	Gravel roads, HSG C (10)
0.545	98	Paved parking & roofs (2, 3R, 10, 50)
1.150	70	Woods, Good, HSG C (3R, 10, 40)
0.130	72	Woods/grass comb., Good, HSG C (2)
3.060	**77**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
2.515	HSG C	2, 3R, 10, 40, 50
0.000	HSG D	
0.545	Other	2, 3R, 10, 50
3.060		**TOTAL AREA**

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

Subcatchment2: Runoff Area=0.221 ac 33.03% Impervious Runoff Depth>1.21"
Flow Length=81' Slope=0.0680 '/' Tc=11.5 min CN=81 Runoff=0.28 cfs 0.022 af

Subcatchment3R: Runoff Area=0.549 ac 7.29% Impervious Runoff Depth>0.87"
Flow Length=188' Tc=11.5 min CN=75 Runoff=0.48 cfs 0.040 af

Subcatchment10: Runoff Area=1.450 ac 29.66% Impervious Runoff Depth>1.21"
Flow Length=196' Tc=7.7 min CN=81 Runoff=2.06 cfs 0.146 af

Subcatchment40: Runoff Area=0.730 ac 0.00% Impervious Runoff Depth>0.64"
Flow Length=254' Tc=18.7 min CN=70 Runoff=0.36 cfs 0.039 af

Subcatchment50: Runoff Area=0.110 ac 1.82% Impervious Runoff Depth>0.83"
Flow Length=138' Tc=6.0 min CN=74 Runoff=0.11 cfs 0.008 af

Reach 201: 12" CULVERT Avg. Flow Depth=0.20' Max Vel=2.54 fps Inflow=0.28 cfs 0.022 af
12.0" Round Pipe n=0.025 L=40.0' S=0.0315 '/' Capacity=3.29 cfs Outflow=0.28 cfs 0.022 af

Reach 202R: Avg. Flow Depth=0.16' Max Vel=1.27 fps Inflow=1.22 cfs 0.205 af
n=0.040 L=65.0' S=0.0154 '/' Capacity=34.86 cfs Outflow=1.21 cfs 0.205 af

Reach 4001: 12" CULVERT Avg. Flow Depth=0.25' Max Vel=2.41 fps Inflow=0.36 cfs 0.039 af
12.0" Round Pipe n=0.025 L=70.0' S=0.0214 '/' Capacity=2.71 cfs Outflow=0.36 cfs 0.039 af

Pond P-1: POND Peak Elev=175.36' Storage=1,882 cf Inflow=2.45 cfs 0.208 af
Outflow=1.22 cfs 0.205 af

Pond SP-1: STUDY POINT 2 Inflow=1.25 cfs 0.213 af
Primary=1.25 cfs 0.213 af

Pond SP-2: STUDY POINT 2 Inflow=0.48 cfs 0.040 af
Primary=0.48 cfs 0.040 af

Total Runoff Area = 3.060 ac Runoff Volume = 0.255 af Average Runoff Depth = 1.00"
82.19% Pervious = 2.515 ac 17.81% Impervious = 0.545 ac

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

Subcatchment2: Runoff Area=0.221 ac 33.03% Impervious Runoff Depth>2.54"
Flow Length=81' Slope=0.0680 '/' Tc=11.5 min CN=81 Runoff=0.58 cfs 0.047 af

Subcatchment3R: Runoff Area=0.549 ac 7.29% Impervious Runoff Depth>2.04"
Flow Length=188' Tc=11.5 min CN=75 Runoff=1.17 cfs 0.093 af

Subcatchment10: Runoff Area=1.450 ac 29.66% Impervious Runoff Depth>2.54"
Flow Length=196' Tc=7.7 min CN=81 Runoff=4.31 cfs 0.307 af

Subcatchment40: Runoff Area=0.730 ac 0.00% Impervious Runoff Depth>1.66"
Flow Length=254' Tc=18.7 min CN=70 Runoff=1.04 cfs 0.101 af

Subcatchment50: Runoff Area=0.110 ac 1.82% Impervious Runoff Depth>1.97"
Flow Length=138' Tc=6.0 min CN=74 Runoff=0.27 cfs 0.018 af

Reach 201: 12" CULVERT Avg. Flow Depth=0.29' Max Vel=3.16 fps Inflow=0.58 cfs 0.047 af
12.0" Round Pipe n=0.025 L=40.0' S=0.0315 '/' Capacity=3.29 cfs Outflow=0.58 cfs 0.047 af

Reach 202R: Avg. Flow Depth=0.24' Max Vel=1.58 fps Inflow=2.36 cfs 0.451 af
n=0.040 L=65.0' S=0.0154 '/' Capacity=34.86 cfs Outflow=2.36 cfs 0.451 af

Reach 4001: 12" CULVERT Avg. Flow Depth=0.43' Max Vel=3.22 fps Inflow=1.04 cfs 0.101 af
12.0" Round Pipe n=0.025 L=70.0' S=0.0214 '/' Capacity=2.71 cfs Outflow=1.04 cfs 0.101 af

Pond P-1: POND Peak Elev=176.25' Storage=4,951 cf Inflow=5.45 cfs 0.455 af
Outflow=2.36 cfs 0.451 af

Pond SP-1: STUDY POINT 2 Inflow=2.44 cfs 0.469 af
Primary=2.44 cfs 0.469 af

Pond SP-2: STUDY POINT 2 Inflow=1.17 cfs 0.093 af
Primary=1.17 cfs 0.093 af

Total Runoff Area = 3.060 ac Runoff Volume = 0.566 af Average Runoff Depth = 2.22"
82.19% Pervious = 2.515 ac 17.81% Impervious = 0.545 ac

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

Subcatchment2: Runoff Area=0.221 ac 33.03% Impervious Runoff Depth>3.21"
Flow Length=81' Slope=0.0680 '/' Tc=11.5 min CN=81 Runoff=0.73 cfs 0.059 af

Subcatchment3R: Runoff Area=0.549 ac 7.29% Impervious Runoff Depth>2.66"
Flow Length=188' Tc=11.5 min CN=75 Runoff=1.52 cfs 0.121 af

Subcatchment10: Runoff Area=1.450 ac 29.66% Impervious Runoff Depth>3.21"
Flow Length=196' Tc=7.7 min CN=81 Runoff=5.42 cfs 0.388 af

Subcatchment40: Runoff Area=0.730 ac 0.00% Impervious Runoff Depth>2.22"
Flow Length=254' Tc=18.7 min CN=70 Runoff=1.41 cfs 0.135 af

Subcatchment50: Runoff Area=0.110 ac 1.82% Impervious Runoff Depth>2.57"
Flow Length=138' Tc=6.0 min CN=74 Runoff=0.35 cfs 0.024 af

Reach 201: 12" CULVERT Avg. Flow Depth=0.32' Max Vel=3.37 fps Inflow=0.73 cfs 0.059 af
12.0" Round Pipe n=0.025 L=40.0' S=0.0315 '/' Capacity=3.29 cfs Outflow=0.73 cfs 0.059 af

Reach 202R: Avg. Flow Depth=0.26' Max Vel=1.64 fps Inflow=2.66 cfs 0.578 af
n=0.040 L=65.0' S=0.0154 '/' Capacity=34.86 cfs Outflow=2.66 cfs 0.577 af

Reach 4001: 12" CULVERT Avg. Flow Depth=0.51' Max Vel=3.48 fps Inflow=1.41 cfs 0.135 af
12.0" Round Pipe n=0.025 L=70.0' S=0.0214 '/' Capacity=2.71 cfs Outflow=1.40 cfs 0.135 af

Pond P-1: POND Peak Elev=176.71' Storage=6,772 cf Inflow=6.94 cfs 0.582 af
Outflow=2.66 cfs 0.578 af

Pond SP-1: STUDY POINT 2 Inflow=2.75 cfs 0.601 af
Primary=2.75 cfs 0.601 af

Pond SP-2: STUDY POINT 2 Inflow=1.52 cfs 0.121 af
Primary=1.52 cfs 0.121 af

Total Runoff Area = 3.060 ac Runoff Volume = 0.727 af Average Runoff Depth = 2.85"
82.19% Pervious = 2.515 ac 17.81% Impervious = 0.545 ac

Summary for Subcatchment 2:

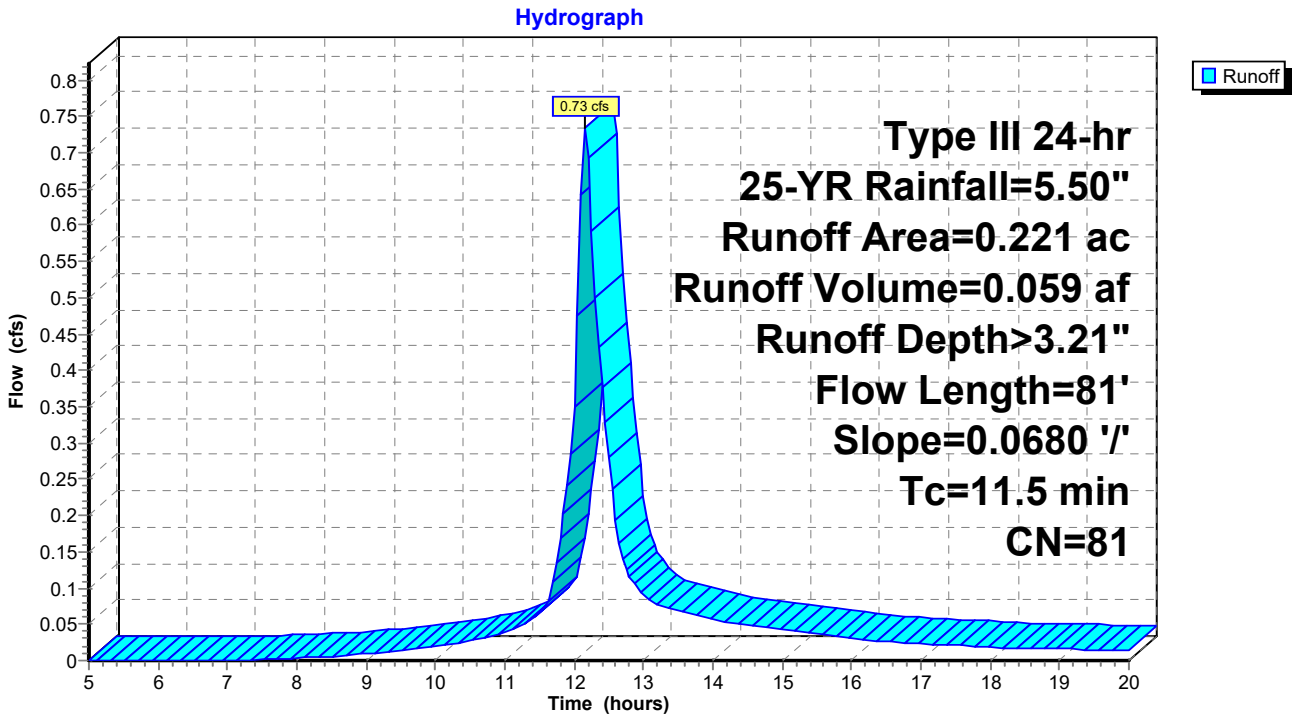
Runoff = 0.73 cfs @ 12.16 hrs, Volume= 0.059 af, Depth> 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.073	98	Paved parking & roofs
0.018	74	>75% Grass cover, Good, HSG C
0.130	72	Woods/grass comb., Good, HSG C
0.221	81	Weighted Average
0.148		66.97% Pervious Area
0.073		33.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	81	0.0680	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"

Subcatchment 2:



Summary for Subcatchment 3R:

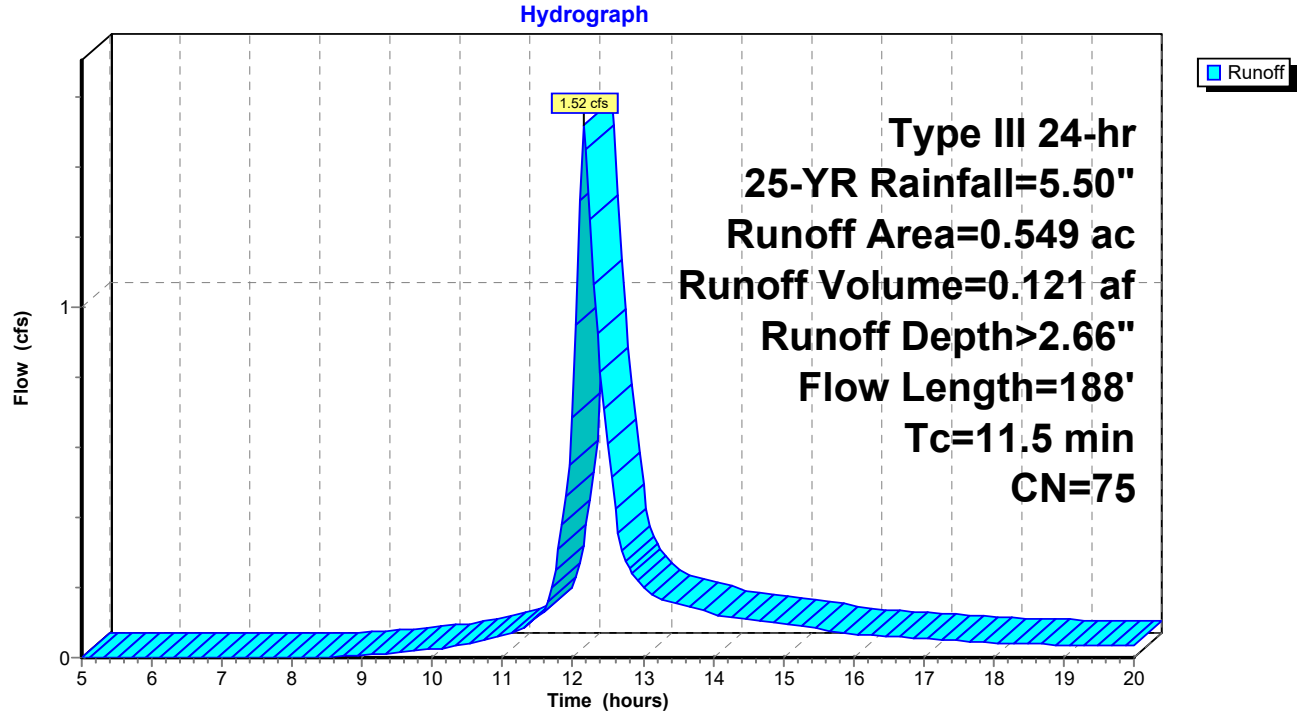
Runoff = 1.52 cfs @ 12.16 hrs, Volume= 0.121 af, Depth> 2.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.160	70	Woods, Good, HSG C
0.040	98	Paved parking & roofs
0.349	74	>75% Grass cover, Good, HSG C
0.549	75	Weighted Average
0.509		92.71% Pervious Area
0.040		7.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	43	0.1400	0.30		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
9.0	105	0.2100	0.19		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
0.1	40	0.1250	11.19	67.13	**Trap/Vee/Rect Channel Flow,** Bot.W=3.00' D=1.00' Z= 3.0 '/' Top.W=9.00' n= 0.035 Earth, dense weeds
11.5	188	Total			

Subcatchment 3R:



Summary for Subcatchment 10:

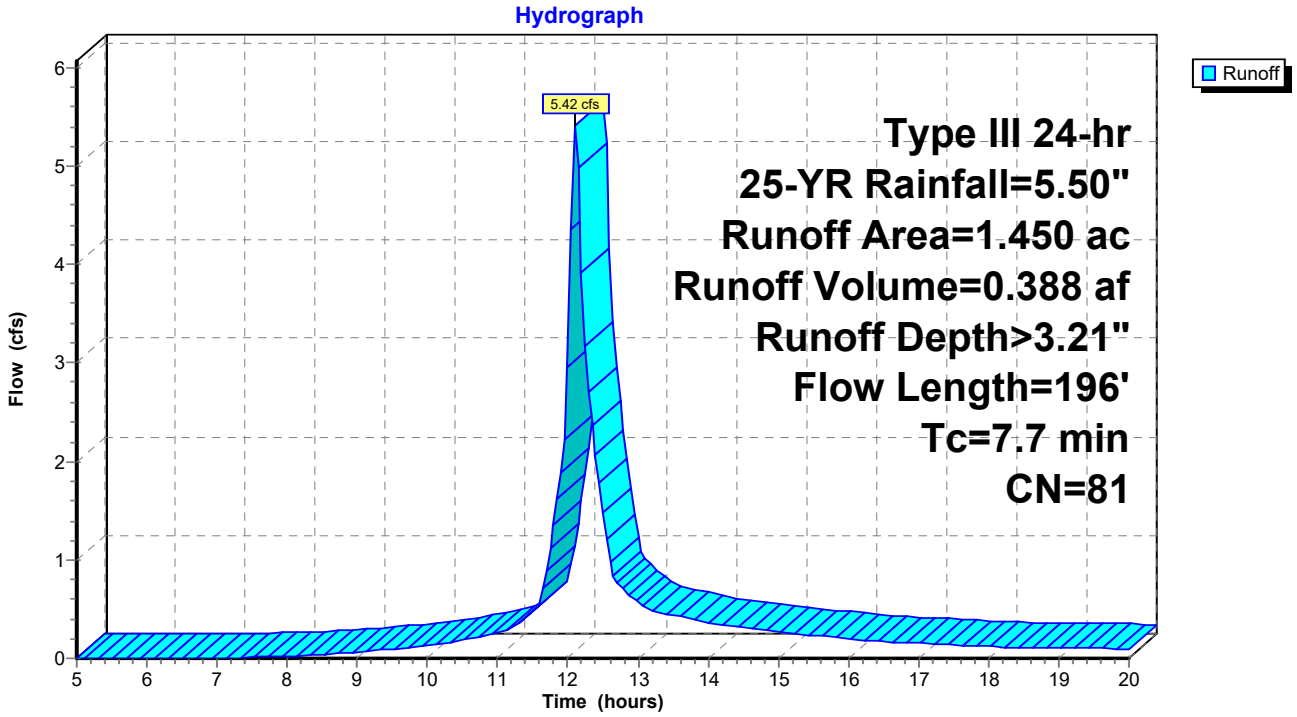
Runoff = 5.42 cfs @ 12.11 hrs, Volume= 0.388 af, Depth> 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.430	98	Paved parking & roofs
0.030	89	Gravel roads, HSG C
0.260	70	Woods, Good, HSG C
0.730	74	>75% Grass cover, Good, HSG C
1.450	81	Weighted Average
1.020		70.34% Pervious Area
0.430		29.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	120	0.0720	0.29		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.5	30	0.0230	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.1	19	0.0530	4.67		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	27	0.2220	7.07		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
7.7	196	Total			

Subcatchment 10:



Summary for Subcatchment 40:

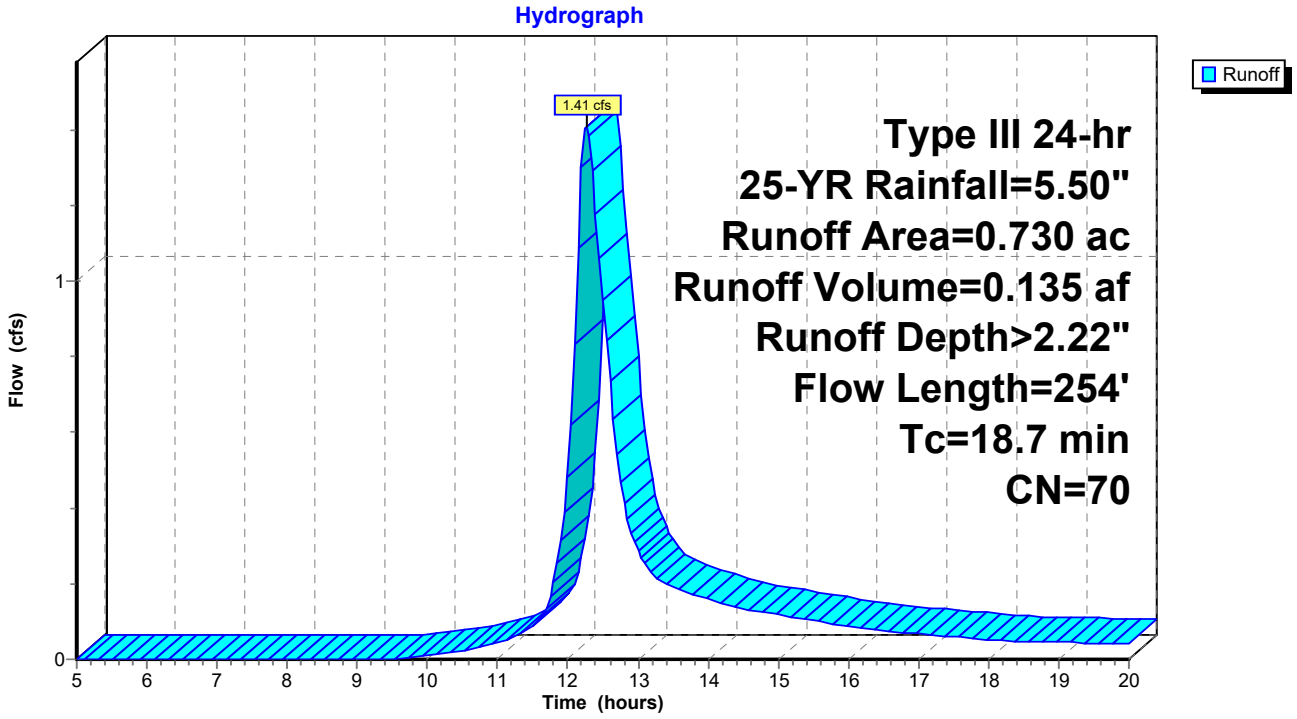
Runoff = 1.41 cfs @ 12.27 hrs, Volume= 0.135 af, Depth> 2.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.730	70	Woods, Good, HSG C
0.730		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.1	150	0.0860	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
1.6	104	0.0480	1.10		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
18.7	254	Total			

Subcatchment 40:



Summary for Subcatchment 50:

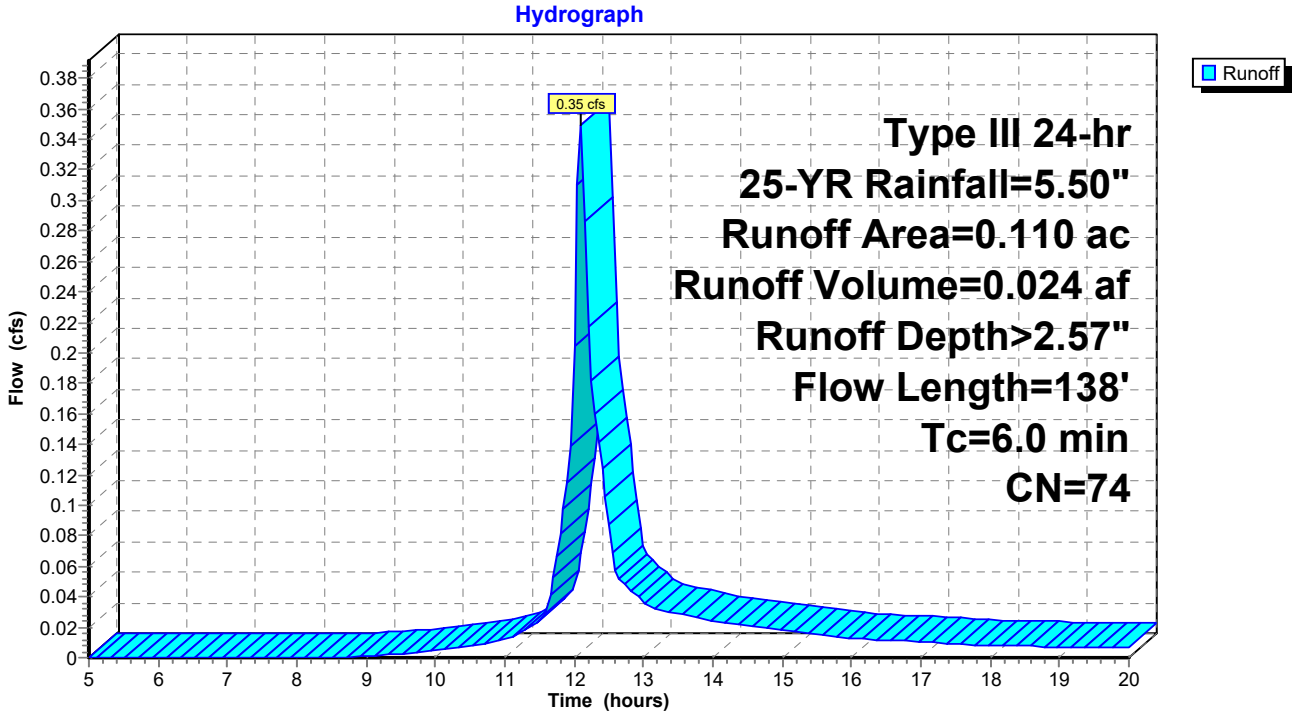
Runoff = 0.35 cfs @ 12.09 hrs, Volume= 0.024 af, Depth> 2.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.108	74	>75% Grass cover, Good, HSG C
0.002	98	Paved parking & roofs
0.110	74	Weighted Average
0.108		98.18% Pervious Area
0.002		1.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	100	0.1300	0.35		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.1	38	0.0530	6.13	49.01	**Trap/Vee/Rect Channel Flow,** Bot.W=3.00' D=1.00' Z= 5.0 '/' Top.W=13.00' n= 0.040 Earth, cobble bottom, clean sides
1.1					**Direct Entry,**
6.0	138	Total			

Subcatchment 50:



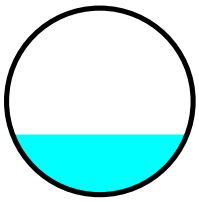
Summary for Reach 201: 12" CULVERT

Inflow Area = 0.221 ac, 33.03% Impervious, Inflow Depth > 3.21" for 25-YR event
Inflow = 0.73 cfs @ 12.16 hrs, Volume= 0.059 af
Outflow = 0.73 cfs @ 12.17 hrs, Volume= 0.059 af, Atten= 1%, Lag= 0.3 min

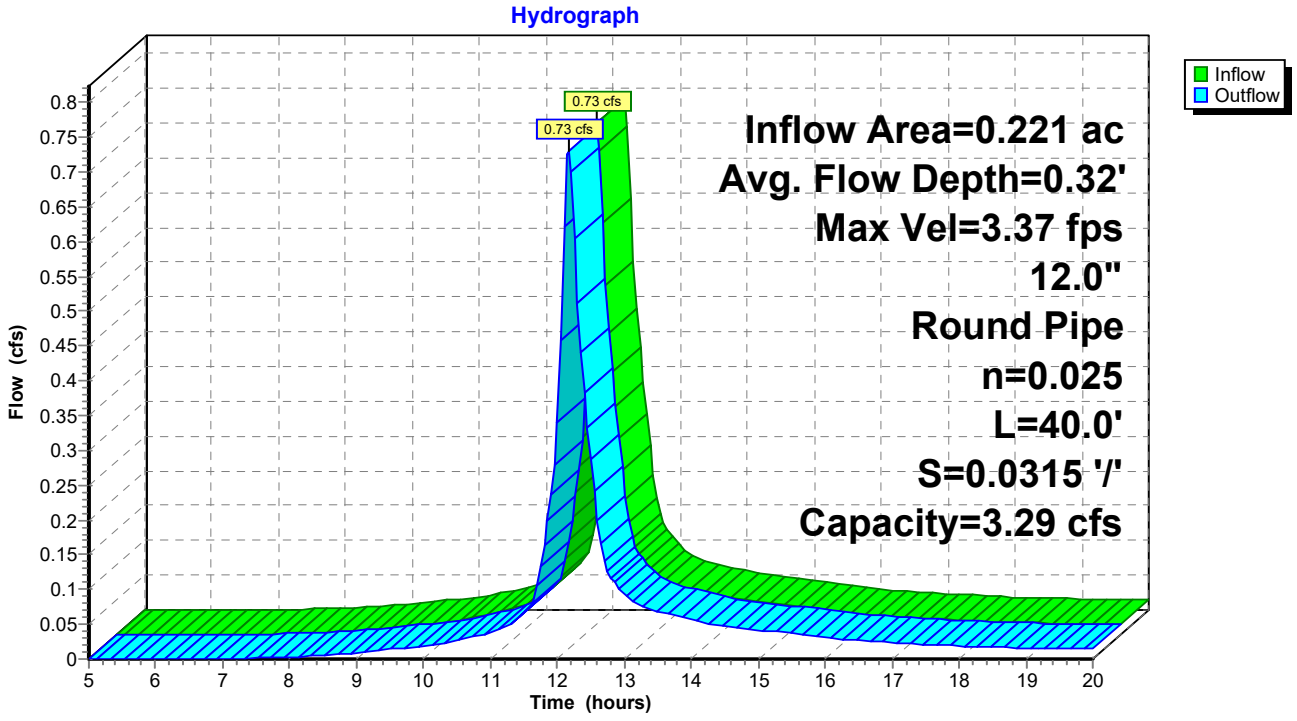
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.37 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.31 fps, Avg. Travel Time= 0.5 min

Peak Storage= 9 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.32'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.29 cfs

12.0" Round Pipe
n= 0.025 Corrugated metal
Length= 40.0' Slope= 0.0315 '/'
Inlet Invert= 178.31', Outlet Invert= 177.05'



Reach 201: 12" CULVERT



Summary for Reach 202R:

Inflow Area = 2.401 ac, 20.95% Impervious, Inflow Depth > 2.89" for 25-YR event
Inflow = 2.66 cfs @ 12.51 hrs, Volume= 0.578 af
Outflow = 2.66 cfs @ 12.53 hrs, Volume= 0.577 af, Atten= 0%, Lag= 1.0 min

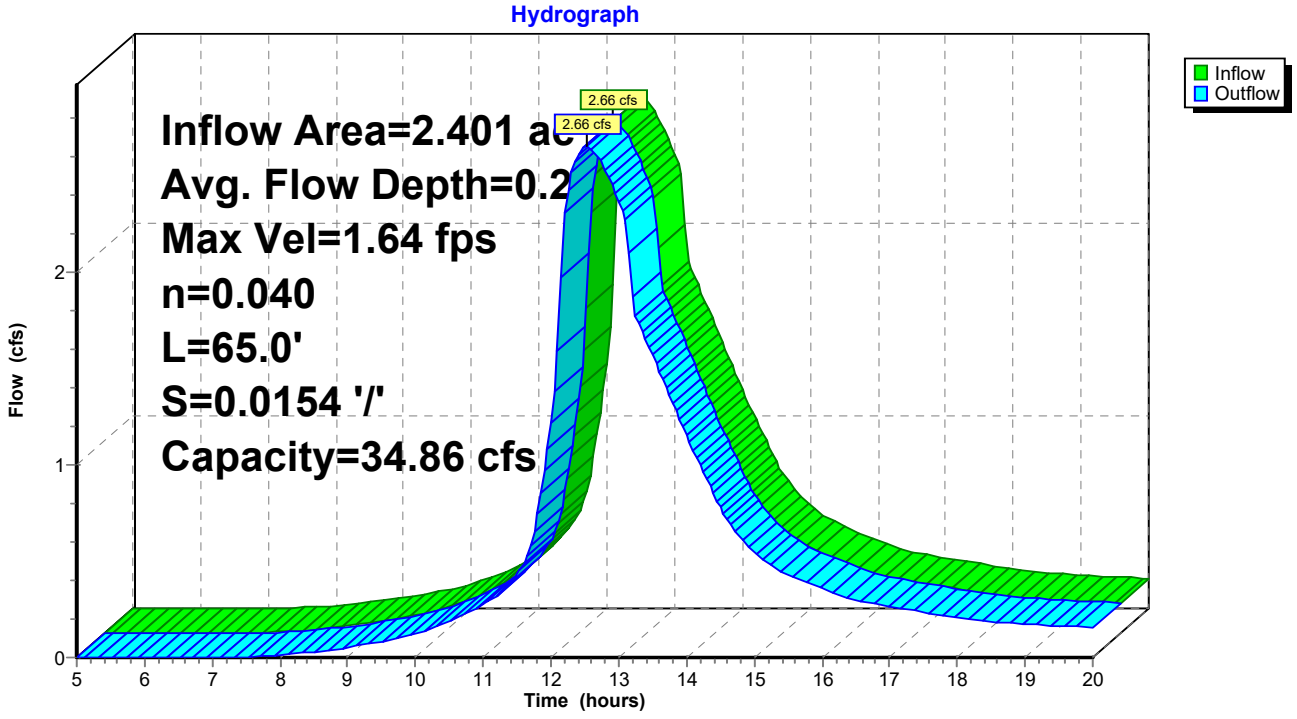
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.64 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.79 fps, Avg. Travel Time= 1.4 min

Peak Storage= 105 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 1.00' Flow Area= 10.0 sf, Capacity= 34.86 cfs

5.00' x 1.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 5.0 '/' Top Width= 15.00'
Length= 65.0' Slope= 0.0154 '/'
Inlet Invert= 173.00', Outlet Invert= 172.00'

‡

Reach 202R:



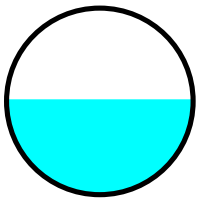
Summary for Reach 4001: 12" CULVERT

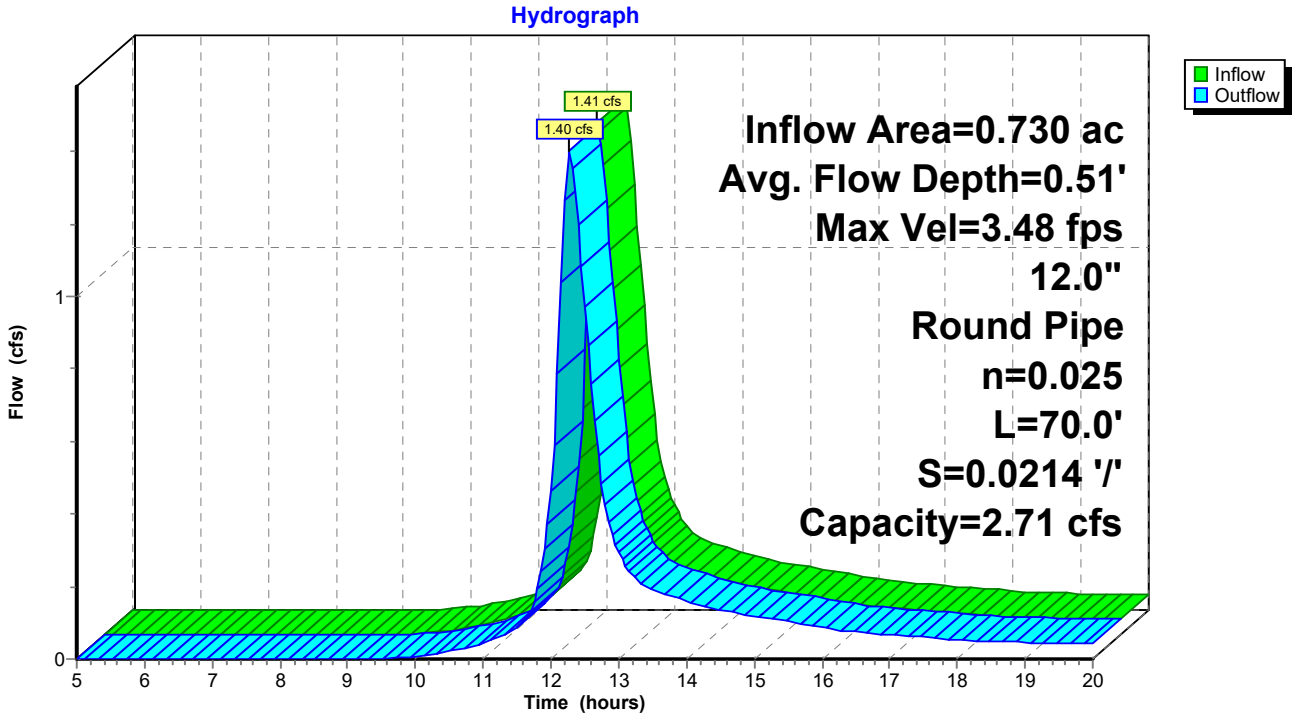
Inflow Area = 0.730 ac, 0.00% Impervious, Inflow Depth > 2.22" for 25-YR event
Inflow = 1.41 cfs @ 12.27 hrs, Volume= 0.135 af
Outflow = 1.40 cfs @ 12.28 hrs, Volume= 0.135 af, Atten= 1%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.48 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.60 fps, Avg. Travel Time= 0.7 min

Peak Storage= 28 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.51'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.71 cfs

12.0" Round Pipe
n= 0.025 Corrugated metal
Length= 70.0' Slope= 0.0214 '/'
Inlet Invert= 181.00', Outlet Invert= 179.50'





Summary for Pond P-1: POND

Inflow Area = 2.401 ac, 20.95% Impervious, Inflow Depth > 2.91" for 25-YR event
Inflow = 6.94 cfs @ 12.12 hrs, Volume= 0.582 af
Outflow = 2.66 cfs @ 12.51 hrs, Volume= 0.578 af, Atten= 62%, Lag= 23.2 min
Primary = 2.66 cfs @ 12.51 hrs, Volume= 0.578 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 176.71' @ 12.51 hrs Surf.Area= 4,088 sf Storage= 6,772 cf

Plug-Flow detention time= 29.1 min calculated for 0.578 af (99% of inflow)
Center-of-Mass det. time= 26.2 min (816.6 - 790.4)

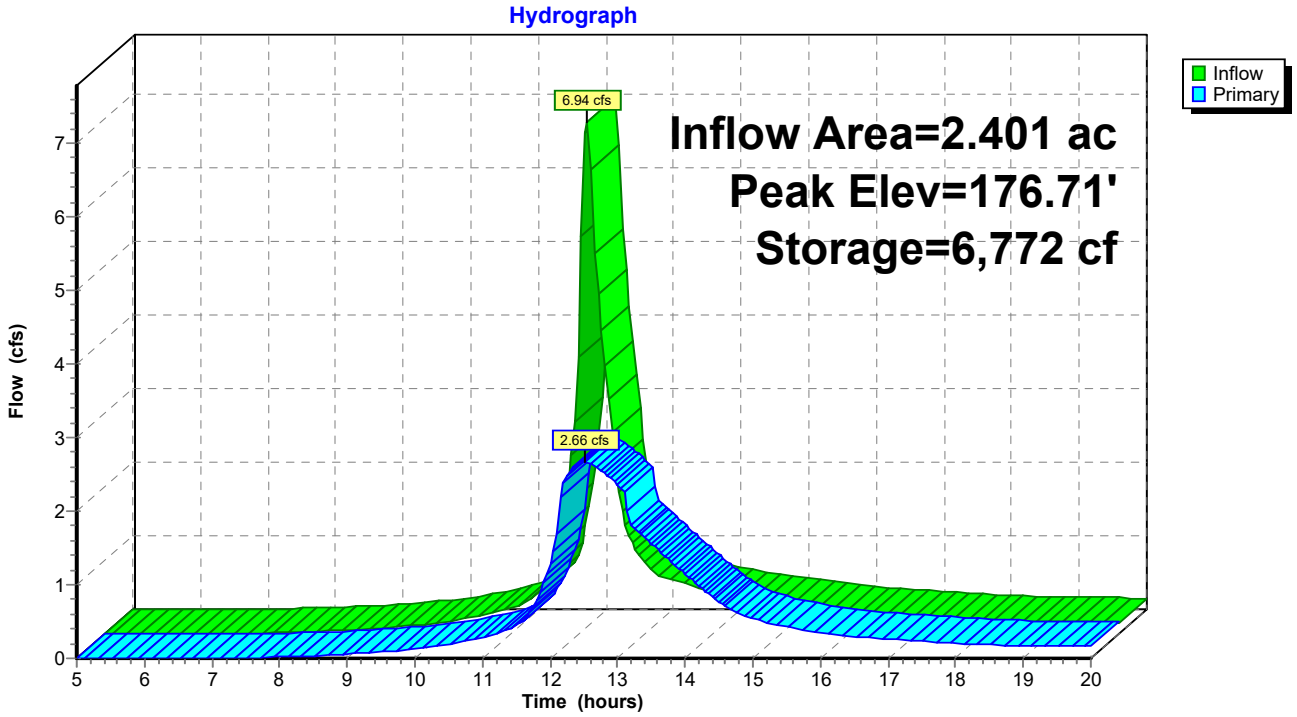
Volume	Invert	Avail.Storage	Storage Description
#1	174.50'	28,499 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
174.50	300	0	0
175.00	2,910	803	803
176.00	3,562	3,236	4,039
178.00	5,034	8,596	12,635
180.00	10,830	15,864	28,499

Device	Routing	Invert	Outlet Devices
#1	Primary	174.00'	**12.0" Round Culvert** L= 91.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 174.00' / 173.50' S= 0.0055 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Device 1	174.50'	**8.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	176.00'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.66 cfs @ 12.51 hrs HW=176.71' (Free Discharge)
└**1=Culvert** (Barrel Controls 2.66 cfs @ 3.38 fps)
  ├**2=Orifice/Grate** (Passes < 2.30 cfs potential flow)
  └**3=Orifice/Grate** (Passes < 12.37 cfs potential flow)

Pond P-1: POND

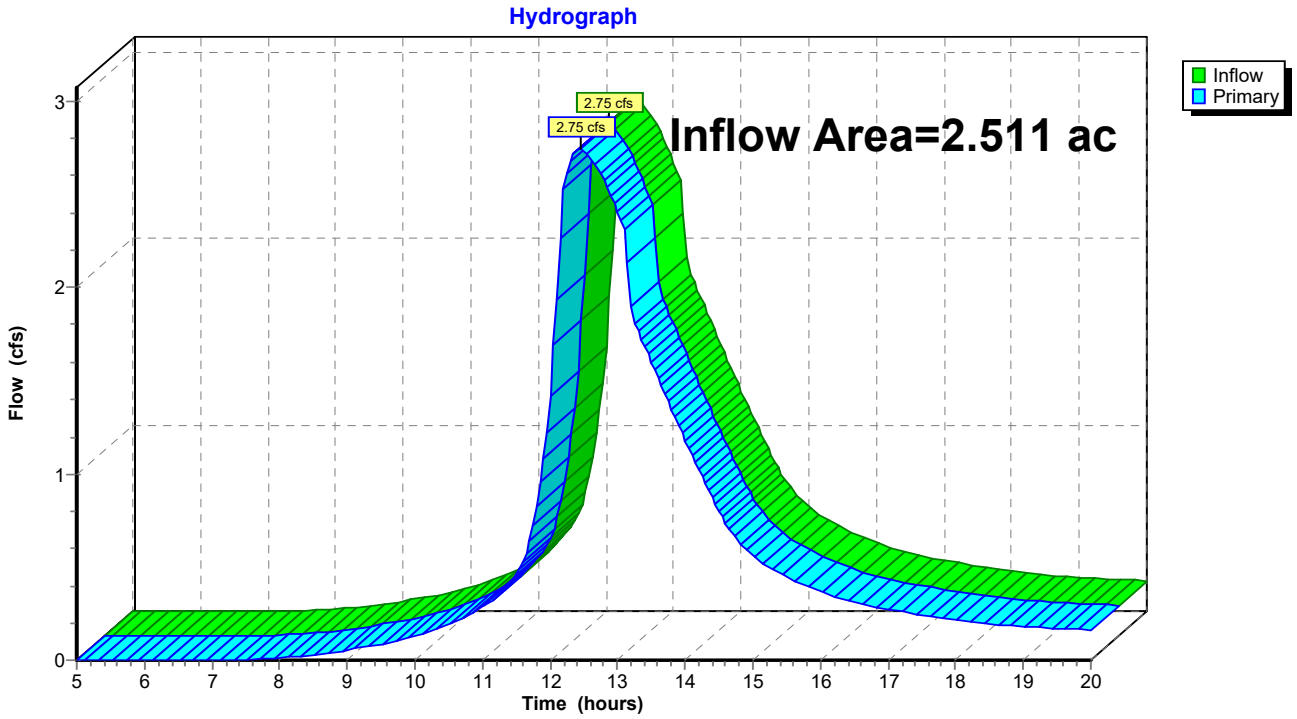

Hydrograph
Inflow
Primary
6.94 cfs
2.66 cfs
Inflow Area=2.401 ac
Peak Elev=176.71'
Storage=6,772 cf
Flow (cfs)
0
1
2
3
4
5
6
7
Time (hours)
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20

Summary for Pond SP-1: STUDY POINT 2

Inflow Area = 2.511 ac, 20.11% Impervious, Inflow Depth > 2.87" for 25-YR event
Inflow = 2.75 cfs @ 12.45 hrs, Volume= 0.601 af
Primary = 2.75 cfs @ 12.45 hrs, Volume= 0.601 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond SP-1: STUDY POINT 2

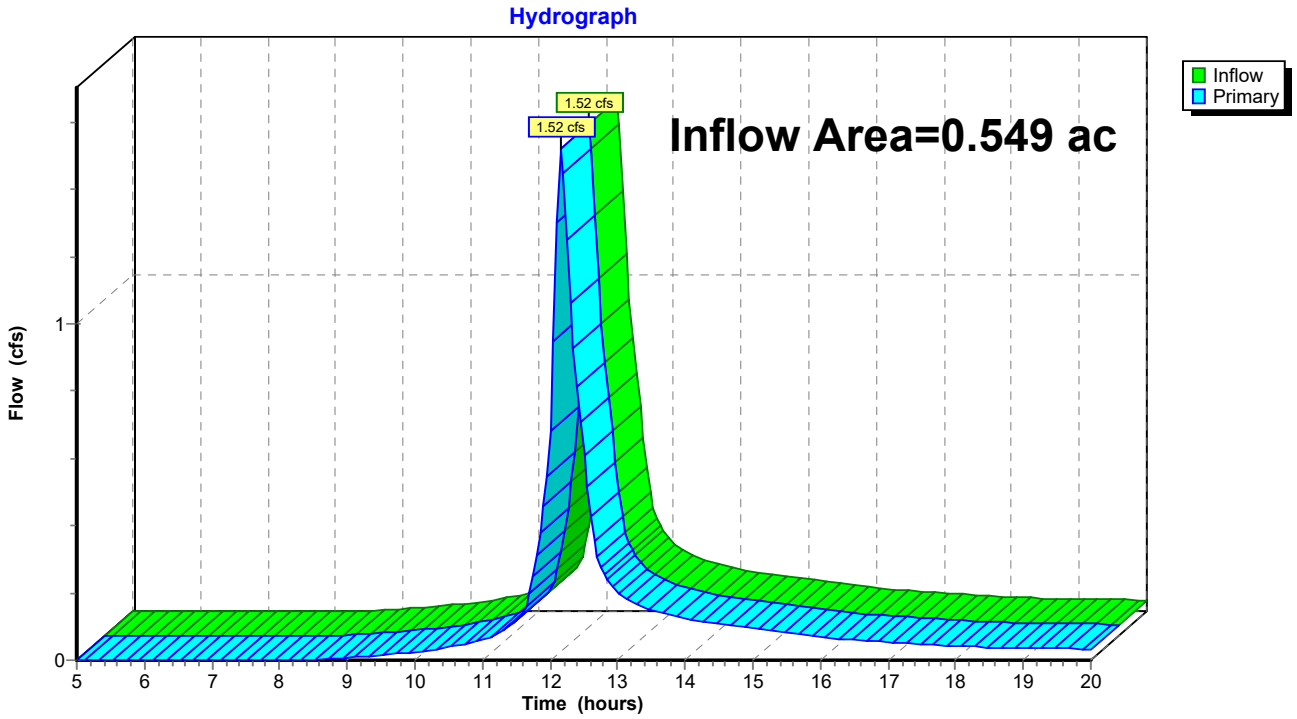


Summary for Pond SP-2: STUDY POINT 2

Inflow Area = 0.549 ac, 7.29% Impervious, Inflow Depth > 2.66" for 25-YR event
Inflow = 1.52 cfs @ 12.16 hrs, Volume= 0.121 af
Primary = 1.52 cfs @ 12.16 hrs, Volume= 0.121 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond SP-2: STUDY POINT 2



Attachment B

Inspection, Maintenance and Housekeeping Plan

INSPECTION, MAINTENANCE, AND HOUSEKEEPING PLAN

Deer Brook Apartments, Phase 2
Gray Road (SR-115)
North Yarmouth, Maine

January, 2021

Introduction

The following plan outlines the anticipated inspection and maintenance procedures for the erosion and sedimentation controls as well as stormwater management devices for the project site. Also, this plan outlines several housekeeping requirements that shall be followed during and after construction. These procedures should be followed in order to ensure the intended function of the designed measures and to prevent unreasonable adverse impacts to the surrounding environment.

The procedures outlined in this inspection and maintenance plan are provided as an overview of the anticipated practices to be used on this site. In some instances, additional measures may be required due to unexpected conditions. For additional detail on any of the erosion and sedimentation control measures or stormwater management devices to be utilized on this project, refer to the most recently revised edition of the "Maine Erosion and Sedimentation Control BMP" manual and/or the "Stormwater Management for Maine: Best Management Practices" manual as published by the Maine Department of Environmental Protection (MDEP).

During Construction

1. **Inspection:** During the construction process, it is the Contractor's responsibility to comply with the inspection and maintenance procedures outlined in this section. These responsibilities include inspecting disturbed and impervious areas, erosion control measures, materials storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. These areas shall be inspected at least once a week as well as before and after a storm event, and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in any applicable permits, shall conduct the inspections.

2. **Maintenance:** All measures shall be maintained in an effective operating condition until areas are permanently stabilized. If Best Management Practices (BMPs) need to be maintained or modified, additional BMPs are necessary, or other corrective action is needed, implementation must be completed within 7 calendar days and prior to any storm event (rainfall).

3. **Documentation:** A log summarizing the inspections and any corrective action taken must be maintained on-site. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, material storage areas, and vehicle access points to the site. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken. The log must be made accessible to the appropriate regulatory agency upon request. The permittee shall retain a copy of the log for a period of at least three years from the completion of permanent stabilization.

4. **Specific Inspection and Maintenance Tasks:** The following is a list of erosion control and stormwater management measures and the specific inspection and maintenance tasks to be performed during construction.

   A. Sediment Barriers:

   - Hay bale barriers, silt fences, and filter berms shall be inspected immediately after each rainfall and at least daily during prolonged rainfall.
   - If the fabric on a silt fence or filter barrier should decompose or become ineffective prior to the end of the expected usable life and the barrier is still necessary, it shall be replaced.
   - Sediment deposits should be removed after each storm event. They must be removed before deposits reach approximately one-half the height of the barrier.
   - Filter berms shall be reshaped as needed.
   - Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required should be dressed to conform to the existing grade, prepared, and seeded.

   B. Riprap Materials:

   - Once a riprap installation has been completed, it should require very little maintenance. It shall, however, be inspected periodically to determine if high flows have caused scour beneath the riprap or dislodged any of the stone.

   C. Erosion Control Blankets:

   - Inspect these reinforced areas semi-annually and after significant rainfall events for slumping, sliding, seepage, and scour. Pay close attention to unreinforced areas adjacent to the erosion control blankets, which may experience accelerated erosion.
   - Review all applicable inspection and maintenance procedures recommended by the specific blanket manufacturer. These tasks shall be included in addition to the requirements of this plan.

D. Temporary Storm Drain Inlet Protection:

- The inlet protection structure shall be inspected before each rain event and repaired as necessary.
- Sediment shall be removed and the storm drain sediment barrier restored to its original dimensions when the sediment has accumulated to half of the design depth of the trap.
- Structures shall be removed upon permanent stabilization of the tributary area.
- Upon removal of the structure, all accumulated sediments downstream of the structure shall be cleaned from the storm drain system.

E. Stabilized Construction Entrances/Exits:

- The exit shall be maintained in a condition that will prevent tracking of sediment onto public rights-of-way.
- When the control pad becomes ineffective, the stone shall be removed along with the collected soil material. The entrance should then be reconstructed.
- Areas that have received mud-tracking or sediment deposits shall be swept or washed. Washing shall be done on an area stabilized with aggregate, which drains into an approved sediment-trapping device (not into storm drains, ditches, or waterways).

F. Temporary Seed and Mulch:

- Mulched areas should be inspected after rain events to check for rill erosion.
- If less than 90% of the soil surface is covered by mulch, additional mulch shall be applied in bare areas.
- In applications where seeding and mulch have been applied in conjunction with erosion control blankets, the blankets must be inspected after rain events for dislocation or undercutting.
- Mulch shall continue to be reapplied until 95% of the soil surface has established temporary vegetative cover.

G. Stabilized Temporary Drainage Swales:

- Sediment accumulation in the swale shall be removed once the cross section of the swale is reduced by 25%.
- The swales shall be inspected after rainfall events. Any evidence of sloughing of the side slopes or channel erosion shall be repaired and corrective action should be taken to prevent reoccurrence of the problem.
- In addition to the stabilized lining of the channel (i.e. erosion control blankets), stone check dams may be needed to further reduce channel velocity.

5. **Housekeeping:** The following general performance standards apply to the proposed project.

A. Spill prevention: Controls must be used to prevent pollutants from being discharged from materials on-site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.

B. Groundwater protection: During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors, accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials.

C. Fugitive sediment and dust: Actions must be taken to insure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control.

D. Debris and other materials: Litter, construction debris, and chemicals exposed to stormwater must be prevented from becoming a pollutant source.

E. Trench or foundation dewatering: Trench dewatering is the removal of water from trenches, foundations, cofferdams, ponds, and other areas within the construction area that retain water after excavation. In most cases, the collected water is heavily silted and hinders correct and safe construction practices. The collected water must be removed from the ponded area, either through gravity or pumping, and must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved.

After Construction

1. **Inspection:** After construction, it is the responsibility of the owner or assigned heirs to comply with the inspection and maintenance procedures outlined in this section. All measures must be maintained in effective operating condition. A person with knowledge of erosion and stormwater control, including the standards and conditions in all applicable permits, shall conduct the inspections.

2. **Specific Inspection and Maintenance Tasks:** The following is a list of permanent erosion control and stormwater management measures and the inspection and maintenance tasks to be performed after construction.

   A. Vegetated Areas:

   - Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after heavy rains to identify active or potential erosion

problems.

- Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.

B. Ditches, Swales, and Other Open Channels:

- Inspect ditches, swales and other open stormwater channels in the spring, in the late Fall, and after heavy rains to remove any obstructions to flow. Remove accumulated sediments and debris, remove woody vegetative growth that could obstruct flow, and repair any erosion of the ditch lining.
- Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity.
- Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable.
- If the ditch has a riprap lining, replace riprap in areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged.

C. Culverts:

- Inspect culverts in the spring, in the late fall, and after heavy rains to remove any obstructions to flow.
- Remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit.
- Inspect and repair any erosion damage at the culvert's inlet and outlet.

D. Catch Basins:

- Inspect and, if required, clean-out catch basins at least once a year, preferably in early spring.
- Clean out must include the removal and legal disposal of accumulated sediments and debris at the bottom of the basin, at any inlet grates, at any inflow channels to the basin, and at any pipes between basins.
- If the basin outlet is designed to trap floatable materials, then remove the floating debris and any floating oils (using oil-absorptive pads).

E. Winter Sanding:

- Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring.
- Accumulations on pavement may be removed by pavement sweeping.
- Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader or other acceptable method.

F. Detention Basin:

- The inlet and outlet of the pond should be checked periodically to ensure that flow structures and emergency spillway are not blocked by debris. All ditches or pipes discharging runoff to the basin should also be checked for debris that may obstruct flow.
- Inspect the berm surrounding the detention basin for erosion or sloughing of the slopes. Remove, as necessary, any woody vegetation that may destabilize the embankment or emergency spillway(s). If damage is evident, contact a qualified licensed professional engineer for recommendations on remedial measures.
- Inspect the basin for accumulated sediment and remove, as necessary. All areas where sediment has been removed shall be reseeded and properly stabilized.

1. **Documentation:** A log summarizing the inspections and any corrective action taken must be maintained. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of controls. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken. The log must be made accessible to the appropriate regulatory agency upon request. A sample "Stormwater Inspection and Maintenance Form" has been included as Attachment 1 of this Inspection, Maintenance, and Housekeeping Plan.

2. **Duration of Maintenance:** Perform maintenance as described and required for any associated permits unless and until the system is formally accepted by a municipality or quasi-municipal district, or is placed under the jurisdiction of a legally created association that will be responsible for the maintenance of the system. If a municipality or quasi-municipal district chooses to accept a stormwater management system, or a component of a stormwater system, it must provide a letter to the MDEP stating that it assumes responsibility for the system. The letter must specify the components of the system for which the municipality or district will assume responsibility, and that the municipality or district agrees to maintain those components of the system in compliance with MDEP standards. Upon such assumption of responsibility, and approval by the MDEP, the municipality, quasi-municipal district, or association becomes a co-permittee for this purpose only and must comply with all terms and conditions of the permit.

Attachments

Attachment 1 – Sample Stormwater Inspection and Maintenance Form

Stormwater Management Facility Maintenance Log
Deer Brook Apartments, Phase 2
Gray Road (SR-115), North Yarmouth, Maine
STI #88287

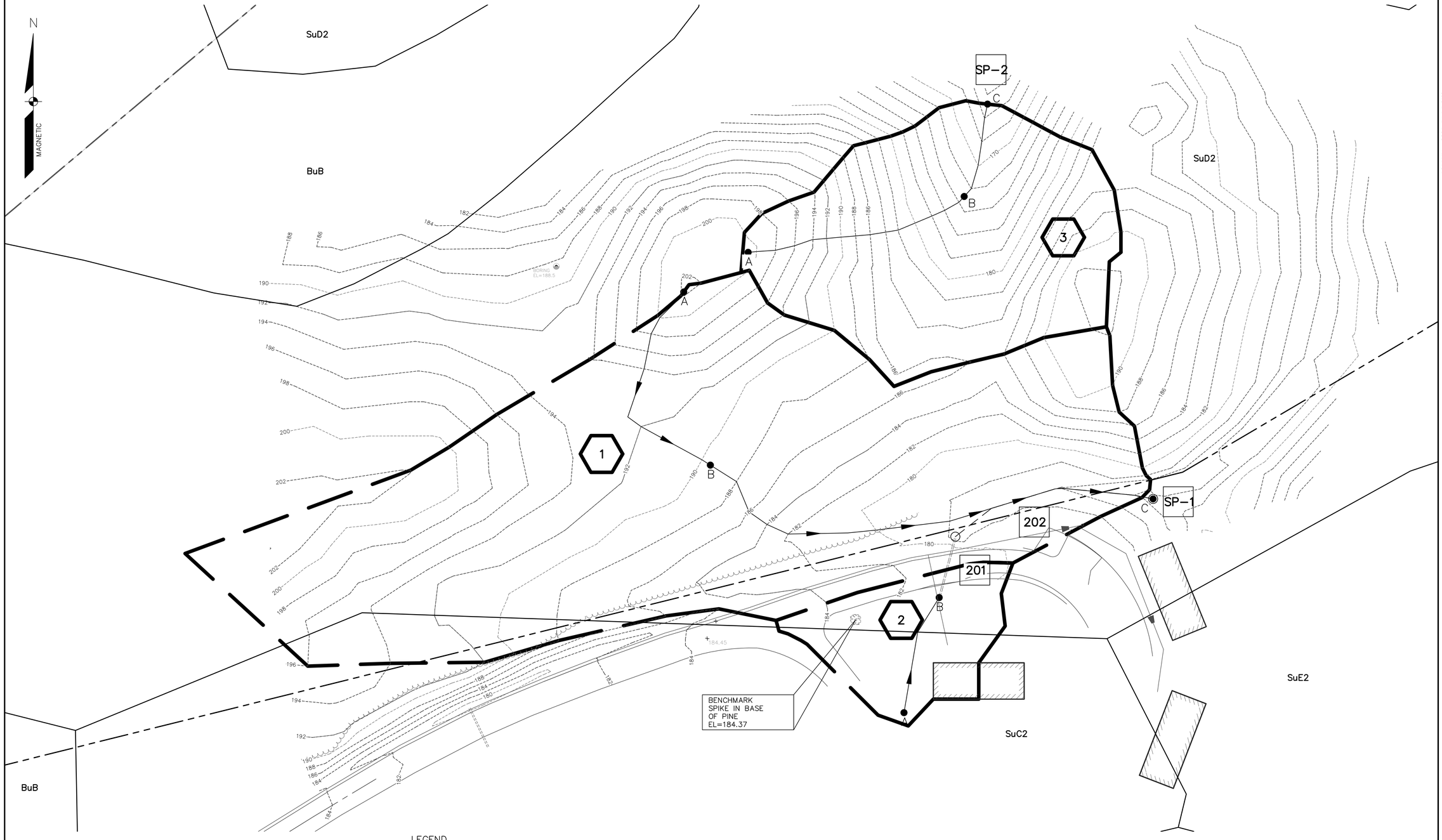
Sebago Technics
75 John Roberts Road,
Suite 4A
South Portland, ME 04106
p. 207-200-2100 f. 856-2206

Wet Pond # _____	Inspection & Maintenance Description	Inspection & Maintenance Interval	Date Performed _____	Date Performed _____	Date Performed _____	Date Performed _____	Date Performed _____
Inspector & Weather Conditions							
Embankment & Other Vegetated Areas	Inspect all vegetated areas for erosion	Monthly					
	Inspect embankment for erosion, settling, and structural failure	Annually					
Ditches & Swales	Inspect for erosion and remove sediment	Semi-annually and/or after rains >1inch					
Culverts & Storm Drains	Inspect for accumulated sediment and/or erosion	Semi-annually and/or after rains >1inch					
Permanent Pool	Inspect inlets and outlets for erosion or blockage	Monthly					
	Inspect for sediment accumulation	Annually					
Debris Found	*(Note approximate amount of accumulated sediment removed)*						
Sediment Disposal	*(Note location of sediment disposal)*						
Comments							

NOTES:

Attachment C

Pre-development Watershed Map



ROBERT A. MCSORLEY, P.E. 8588

STATE OF MAINE · REGISTERED PROFESSIONAL ENGINEER · ROBERT A. MCSORLEY · 8588 · 01/21/21

REV.	BY:	DATE:	STATUS
C.	RAM	01/21/21	RESUBMIT FOR PLANNING BOARD REVIEW
B.	RAM	6/26/13	REVISED PER PEER REVIEW COMMENTS
A.	RAM	5/28/13	SUBMIT SUBDIVISION APPLICATION TO TOWN

SEBAGO TECHNICS
WWW.SEBAGOTECHNICS.COM
75 John Roberts Rd.
Suite A
South Portland, ME 04106
Tel. 207-200-2100

PRE DEVELOPMENT WATERSHED MAP
OF:
DEER BROOK APARTMENTS (PHASE 2)
GRAY ROAD/ROUTE 115
NORTH YARMOUTH, MAINE
FOR:
UNITED PROPERTIES, INC.
9 THOMAS DRIVE
WESTBROOK, MAINE 04098

DESIGNED	RAM
DRAWN	ACL
CHECKED	RAM
DATE	01/21/21
SCALE	1" = 30'
PROJECT	88287

SHEET 1 OF 2

88287swp.dwg, TAB:PRE

Attachment D

Post-development Watershed Map

ROBERT A. MCSORLEY, P.E. 8588

STATE OF MAINE — ROBERT A. MCSORLEY — 8588 — REGISTERED PROFESSIONAL ENGINEER — 01/21/21

REV.	BY	DATE:	STATUS
C.	RAM	01/21/21	RESUBMIT FOR PLANNING BOARD REVIEW
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DESIGNED	RAM
DRAWN	ACL
CHECKED	RAM
DATE	01/21/21
SCALE	1" = 30'
PROJECT	88287

SHEET 2 OF 2

88287swp.dwg, TAB-POST