
SITE ENGINEERING REPORT

Prepared For

863 Danbury Road
Wilton, CT

Prepared by

Redniss & Mead, Inc.
22 First Street
Stamford, CT
(203) 327-0500

Issued on

July 1, 2021


Craig J. Flaherty, P.E.
CT Lic. No. 21149

**REDNISS
& MEAD**

LAND SURVEYING
CIVIL ENGINEERING
PLANNING & ZONING CONSULTING
PERMITTING

22 First Street
Stamford, CT 06905
203.327.0500
www.rednissmead.com



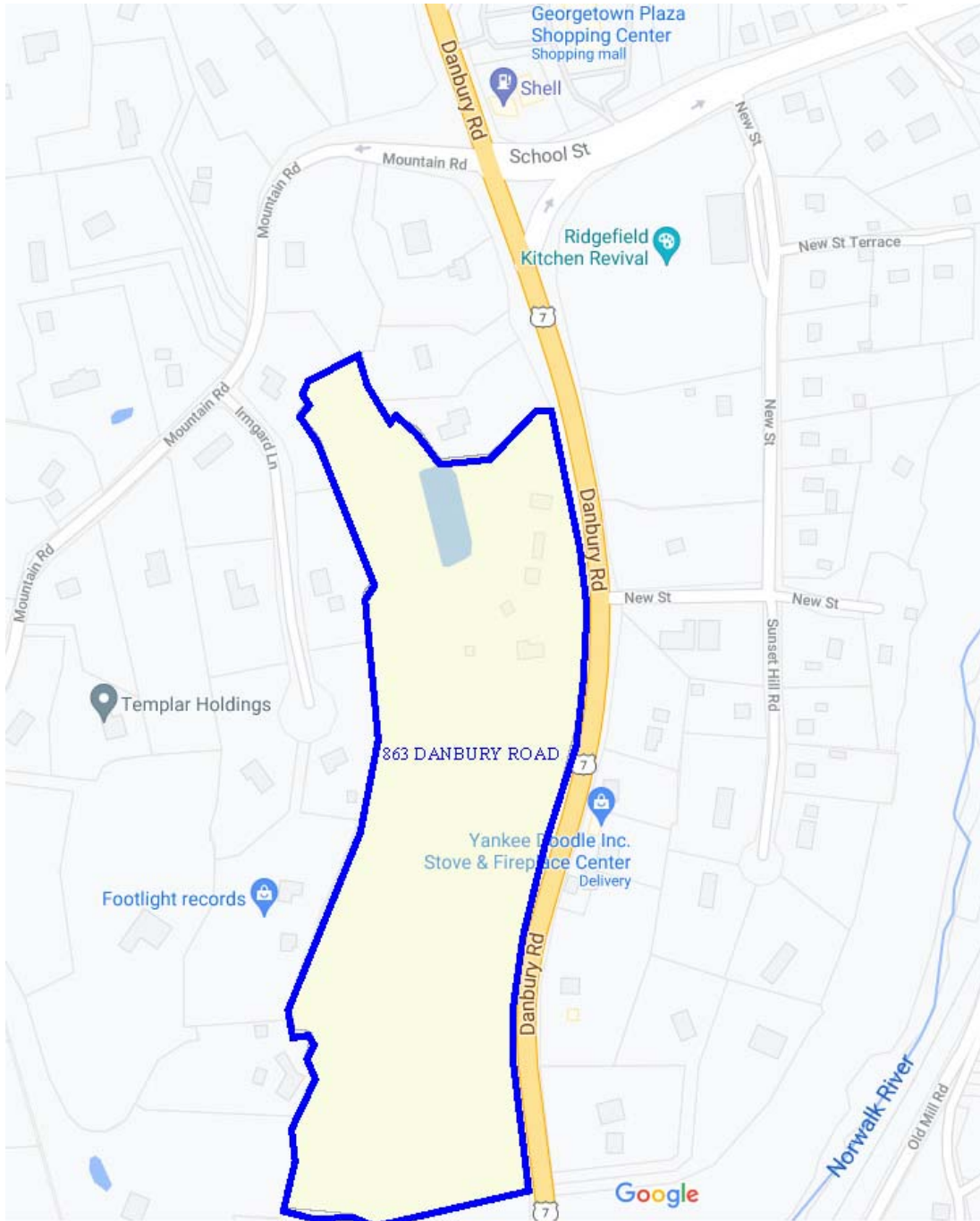
TABLE OF CONTENTS

Orientation	3
Drainage Narrative	4
Septic System Narrative	8

APPENDICES

Exhibits	App 1
Existing and Proposed Overall Drainage Basin Maps	
Existing and Proposed Onsite Drainage Basin Maps	
Existing and Proposed Pipe Conveyance Exhibits	
Hydrologic and Hydraulic Data	App 2
Hydrologic Model (HydroCad)	
Pipe Capacity Calculations	
Water Quality Calculations	App 3
WQV Calculations, GRV Calculations, & Storage Calculations	
Operations & Maintenance Plan	
Reference Data	App 4
Rainfall Intensity Data	
USGS Quadrangle Map	
NRCS Web Soil Survey	
Sanitary Sewer	App 5
Wastewater Generation Calculation	
Pump Sizing Calculation	
Other Calculations & Information	App 6
Steep Slopes Exhibit	
Earthwork Calculations	
Average Grade Exhibit & Calculations	

Orientation



Drainage Narrative

Project Description

The Connecticut Humane Society is proposing to redevelop the property located at 863 Danbury Road in Wilton, CT. The redevelopment includes the demolition of the existing on-site structures and the construction of a new single-story commercial building, parking, driveways, walkways, and associated site improvements. The parcel is approximately 18.32 acres and lies within the R-1A zone. Reference is made to the Civil Site Plan set prepared by Redniss & Mead, Inc. dated 7/1/2021 and Property and Topographic Survey dated 1/20/2021.

Existing Conditions

The site is currently developed with six buildings (four dwellings and two detached garages), asphalt parking and driveways, gravel driveways, sidewalks, and other ancillary site improvements. In total, the site is approximately 18.32 acres. For the purpose of this report an on-site area of approximately 10.12 acres is studied. The study area contains $1.02 \pm$ acres of impervious coverage. The remaining portion of the site consists of watercourses, wetlands, landscaping and wooded area. There is no formal storm water quality system on site under existing conditions. There are State owned storm drainage facilities in Danbury Road which discharge into the watercourse on the parcel. There is an existing State of Connecticut Drainage Right-of-Way recorded for the above-mentioned discharge (Deed Vol. 1188, Pg. 342 W.L.R.). The Connecticut DOT District 3, on February 16th, 2021 confirmed there are no known drainage concerns at this location attributable to the site.

Storm water runoff from the property generally drains toward the on-site watercourses that bisect the property. In particular, this report focuses on two segments of watercourse and the study point is their intersection: the first starts in the northeast corner of the site and flows toward the south/southeast; and the second starts along the eastern property line and flows toward the south/southwest. Refer to the Existing Drainage Basin Exhibits (Appendix I) for the breakdown of tributary area and the location of the discharge study point. Ultimately, the watercourse continues southeast where it is collected via a 30" RCP pipe and connected into the Danbury Road drainage system, with an eventual outfall into the Norwalk River. Including offsite area, the total tributary area to the study point is $66.8 \pm$ acres ($12.3 \pm$ acres of impervious coverage). As part of this drainage report, each of the two segments of watercourse (West Basin and East Basin) are analyzed, using Hydrocad software, to compare existing and proposed peak flow rates.

The west basin is $35.71 \pm$ acres ($7.56 \pm$ acres onsite area), of which $4.95 \pm$ acres is impervious coverage ($0.52 \pm$ acres onsite impervious coverage). Runoff from offsite areas generally sheet flow onto the subject property and eventually into the watercourse or into the town owned drainage infrastructure within Irmgard Lane and Mountain Road where it then piped directly to the head of the watercourse. The onsite runoff is tributary to the watercourse via overland sheet flow.

The east basin is $31.14 \pm$ acres ($2.56 \pm$ acres onsite area), of which $7.39 \pm$ acres is impervious coverage ($0.50 \pm$ acres onsite impervious coverage). A majority of the offsite area within this basin is collected via existing catch basins within Danbury Road and piped directly into the watercourse. Runoff

from the onsite areas sheet flow overland into the watercourse. Onsite impervious coverage discharges at grade and sheet flows to the watercourse.

Proposed Conditions

Under proposed conditions, the existing buildings and improvements will be razed and replaced with a new single-story commercial building (approximately 14,490 square feet of floor area), surface parking (59 parking spaces), and associated site amenities and improvements. In all, impervious coverage on the property is increased by $0.48\pm$ acres ($1.50\pm$ acres in total). However, the new driveways and parking areas will be either porous asphalt or permeable pavers, both of which have crushed stone reservoirs below, which will result in an effective impervious coverage of 0.65 acres (or a decrease of approximately 0.37 acres). Reference is made to the site and utility plans prepared by Redniss & Mead, Inc.

The proposed improvements are primarily kept to the eastern portion of the property (along Danbury Road), with the exception of gravel surfaces and the proposed septic system. Site constraints include steep slopes, watercourse and wetland limits, and shallow depths to ledge and/or groundwater. Considering these constraints, the proposed onsite storm system was designed with an emphasis on maintaining peak flow attenuation and providing water quality improvements via surface treatments where practicable. To that point, a system of porous asphalt and permeable pavers are proposed.

The driveway and parking areas are split into seven porous basins (Porous 1 (P1) through Porous 7 (P7)). The porous asphalt and permeable paver systems within these basins consist of the same profile: porous pavement over 2" of stone bedding course and 18" of crushed stone reservoir. Each has a high overflow set using a flush concrete curb (weir) at the low elevation within each basin. An additional porous basin (P8) is provided at the exterior play area to the west of the building and consists of permeable pavers over 2" of stone bedding and a 1.4'+ sand filter. Each of the noted porous basins is sized to treat the tributary water quality volume.

Within the west basin, tributary area increases by 0.05 acres. The total tributary area under proposed conditions is $35.76\pm$ acres with $5.00\pm$ acres of impervious coverage (0.57 acres of which is onsite). The offsite runoff will continue to flow into the watercourse as it does under existing conditions. Porous basins P6 through P8 are tributary to the west basin and provide treatment for approximately 0.39 acres of impervious coverage. Untreated impervious coverage within the west basin consists of gravel paths and drives and a portion of concrete walkway. In total, the crushed stone reservoirs provide 3,637 ft³ of water quality volume (1,406 ft³ required). With the proposed porous asphalt and permeable pavers, the discharge for the western watercourse segment is decreased from 73.21 cfs under existing conditions to 72.66 cfs under proposed conditions (25-year storm event).

Within the east basin, tributary area decreases by 0.05 acres. The total tributary area under proposed conditions is $31.09\pm$ acres with $7.82\pm$ acres of impervious coverage (0.93 acres of which is onsite). The offsite runoff will continue to flow into the watercourse as it does under existing conditions. Porous basins P1 through P5 are tributary to the east basin and provide treatment for approximately 0.59 acres of impervious coverage. Untreated impervious coverage within the east basin consists of a small portion of the driveway entrance and the building roof; building roof is generally considered clean as it relates to stormwater runoff. In total, the crushed stone reservoirs provide 4,820 ft³ of water quality

volume (2,070 ft³ required). With the proposed porous asphalt and permeable pavers and a decrease in tributary area, the discharge for the eastern watercourse segment is decreased from 67.69 cfs under existing conditions to 67.07 cfs under proposed conditions (25-year storm event).

For purposes of this report, the 10 and 25-year storm events were compared. Note that the rainfall rates used are based upon the National Oceanic and Atmospheric Administration (NOAA) National Weather Service Hydrometeorological Design Studies Center Precipitation Frequency Data Server (PFDS) for the area. The NRCS Soil Survey indicates that soils within the studied watershed are within Hydrologic Soil Group classifications A, B, and D; refer to appendix 4 for soil data.

Storm Event (year)	East Basin			West Basin		
	Existing Conditions (cfs)	Proposed Conditions (cfs)	Reduction from Existing (%)	Existing Conditions (cfs)	Proposed Conditions (cfs)	Reduction from Existing (%)
10	47.28	46.66	-1.3	50.49	50.07	-0.8
25	67.69	67.07	-0.9	73.21	72.66	-0.8

Storm Event (year)	Overall Study Point		
	Existing Conditions (cfs)	Proposed Conditions (cfs)	Reduction from Existing (%)
10	97.73	96.72	-1.0
25	140.89	139.73	-0.8

Water Quality Improvements

The site impervious area increases by 0.48 acres to 1.50 acres in total for the site under proposed conditions. As this includes approximately 0.85 acres of porous asphalt and permeable pavers which are proposed for the driving surfaces within the site, the effective impervious coverage is 0.65 acres (or a decrease of approximately 0.37 acres). In addition to the reduction in effective impervious coverage, water quality from the proposed development will be improved as compared to existing conditions via the following methods:

1. Implementation of water quality and groundwater recharge designs where none exist under existing conditions.
2. Refer to detail sheet SE-7 for design information of the porous asphalt and permeable paver systems. The systems will consist of 4" porous surface placed above two layers of crushed stone (2" bedding course and 18" reservoir); note, the profile of the permeable paver exterior play area varies in that it consists of a 2" bedding course over a varied depth (minimum 1.4') of sand filter. In total, there is approximately 0.98 acres of impervious coverage treated via the pervious systems. Refer to the below chart for the total required water quality volume and total provided for the tributary area:

Reservoir	Required WQV (cf)	Provided WQV (cf)
Porous #1	515	1,007
Porous #2	250	657
Porous #3	337	1,612
Porous #4	227	631
Porous #5	741	913
Porous #6	684	1,711
Porous #7	420	439
Porous #8	302	1,487

3. The groundwater recharge volume for the site (652 cf) is met via the porous asphalt and permeable paver systems.
4. Implementation of a wetlands mitigation plan that will include removal of invasive plants, restore portions of the watercourse and surrounding upland area, and remove a majority of the existing impervious coverage from within 25' of the wetlands.
5. A detailed Sediment and Erosion Control Plan, including a system of both temporary and permanent controls, is designed to minimize erosion, and contain and properly dispose of any accumulation of sediment during construction.

Conclusion

The proposed storm water management system is designed to accommodate a “25-year” storm and provide water quality improvements. Pursuant to the proper implementation of the design plans, there will be no adverse impacts to adjacent or downstream properties or town/state facilities from the proposed development.

Other Zoning Criteria

Refer to Appendix 6 for zoning exhibits, including information as it relates to protections of slopes, earthwork calculations (grade cuts/fills), and average grade plane calculations. Note, the maximum contiguous disturbed area where slopes exceed 15% is approximately 11,750 sf, which is below the minimum requirements for slope alteration of both slopes exceeding 15% (15,000 sf) and 35% (11,972 sf) as required by section 29-9.1.2 of the Zoning Regulations of the Town of Wilton.

Septic System Narrative

The Connecticut Humane Society is proposing to redevelop the property located at 863 Danbury Road in Wilton, CT. The redevelopment includes the demolition of the existing on-site structures and the construction of a new single-story commercial building, parking, driveways, walkways, and associated site improvements. The parcel is approximately 18.32 acres and lies within the R-1A zone. Reference is made to the Civil Site Plan set prepared by Redniss & Mead, Inc. dated 7/1/2021 and Property and Topographic Survey dated 1/20/2021.

As there is no municipal sanitary sewer available to the project site, the proposed building will be served by a septic system located uphill on the southern end of the parcel. The system will consist of a 2,500-gallon septic tank and a duplex pump chamber which will pump uphill, with an 870' long, three-inch force main, to 120 linear feet of Cur-Tech CTL-24's. Soil testing was observed by the Town of Wilton Health Department and this office on March 2, 2021. The septic system design calculations, design details, and soil testing data are included within the site plan package (sheets SE-4, SE-5, SE-8, and SE-9). Further calculations as it relates to projected wastewater generation and pump sizing are provided within Appendix 5 of this report. It is worth noting that the projected wastewater generation is based upon available water usage data from other Connecticut Humane Society facilities, which average approximately 0.10 gallons per day per square foot. The sizing of the proposed septic system is based upon this flow rate and an applied factor of safety of 1.5.

Appendix 1



DRAINAGE BASIN SUMMARY TABLE		
BASIN	CN	SIZE (ac)
EAST BASIN	67.7	31.13
WEST BASIN	66.2	35.71

LEGEND


DRAINAGE BASIN BOUNDARY

SOIL CLASSIFICATION BOUNDARY

EXISTING OVERALL DRAINAGE BASIN EXHIBIT

863 DANBURY ROAD

WILTON, CT



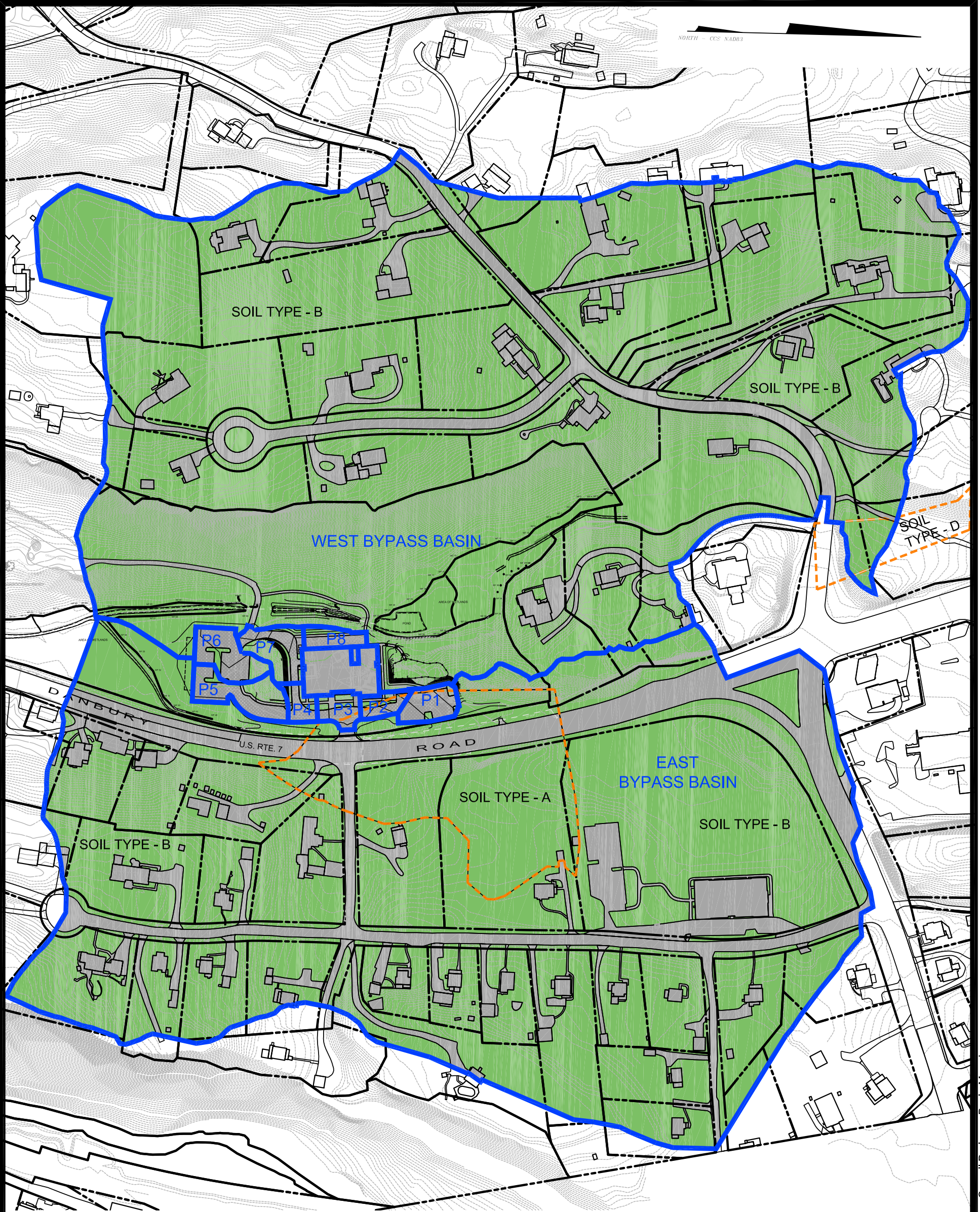
REDNISS
& MEAD

LAND SURVEYING
CIVIL ENGINEERING
PLANNING & ZONING CONSULTING
PERMITTING

22 First Street | Stamford, CT 06905
Tel: 203.327.0500 | Fax: 203.357.1118
www.rednissmead.com

COMM. NO.:
10258

DATE:
07/01/2021
SCALE:
1" = 200'



DRAINAGE BASIN SUMMARY TABLE		
BASIN	CN	SIZE (ac)
EAST BYPASS BASIN	67.7	30.28
POROUS 1	83.7	0.17
POROUS 2	80.9	0.10
POROUS 3	83.6	0.13
POROUS 4	79.5	0.10
POROUS 5	81.1	0.30
WEST BYPASS BASIN	66.0	35.12
POROUS 6	82.2	0.26
POROUS 7	73.9	0.26
POROUS 8	83.4	0.11

LEGEND


DRAINAGE BASIN BOUNDARY

SOIL CLASSIFICATION BOUNDARY

PROPOSED OVERALL DRAINAGE BASIN EXHIBIT

863 DANBURY ROAD

WILTON, CT



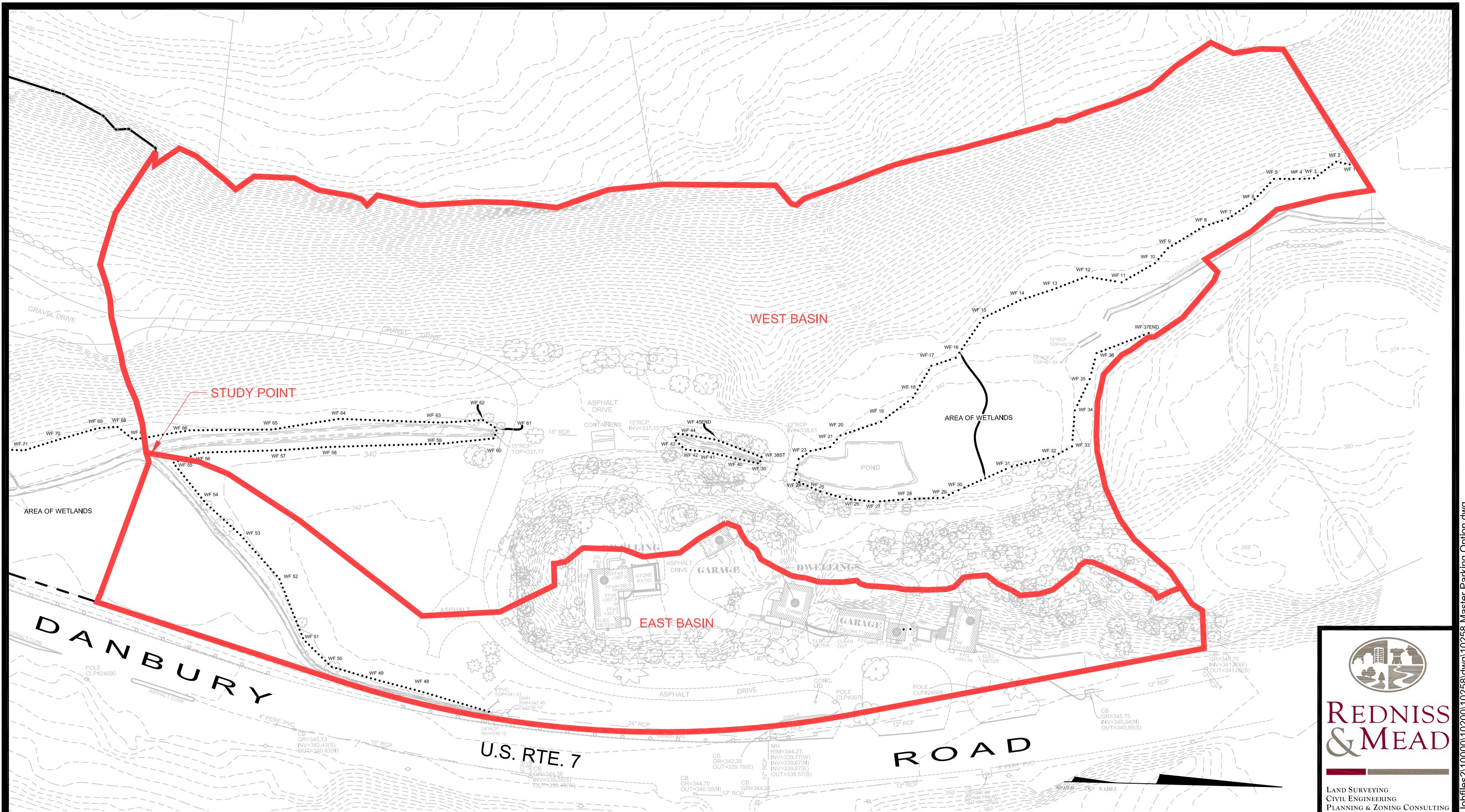
REDNISS
& MEAD

LAND SURVEYING
CIVIL ENGINEERING
PLANNING & ZONING CONSULTING
PERMITTING

22 First Street | Stamford, CT 06905
Tel: 203.327.0500 | Fax: 203.357.1118
www.rednissmead.com

COMM. NO.:
10258

DATE:
07/01/2021
SCALE:
1" = 200'



EXISTING ON-SITE DRAINAGE BASIN EXHIBIT
863 DANBURY ROAD
WILTON, CT

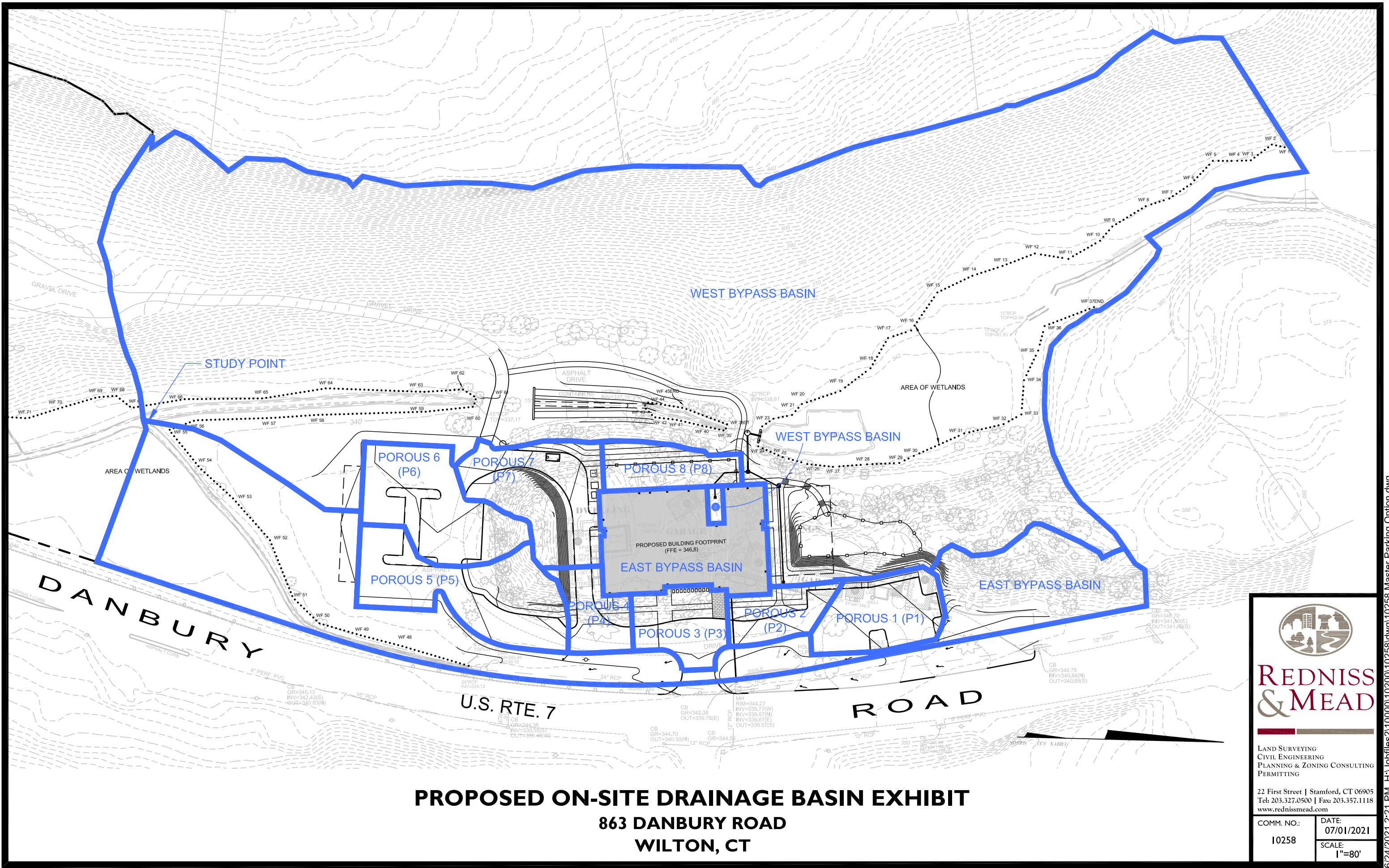

**REDNISS
& MEAD**

LAND SURVEYING
CIVIL ENGINEERING
PLANNING & ZONING CONSULTING
PERMITTING

22 First Street | Stamford, CT 06905
Tel: 203.327.0500 | Fax: 203.357.1118
www.rednissmead.com

COMM. NO.: 10258	DATE: 07/01/2021 SCALE: 1"=80'
---------------------	---

6/22/2021 3:55 PM H:\Jobfiles\10000\10200\10258\dwg\10258 Master Parking Option.dwg



PROPOSED ON-SITE DRAINAGE BASIN EXHIBIT
863 DANBURY ROAD
WILTON, CT

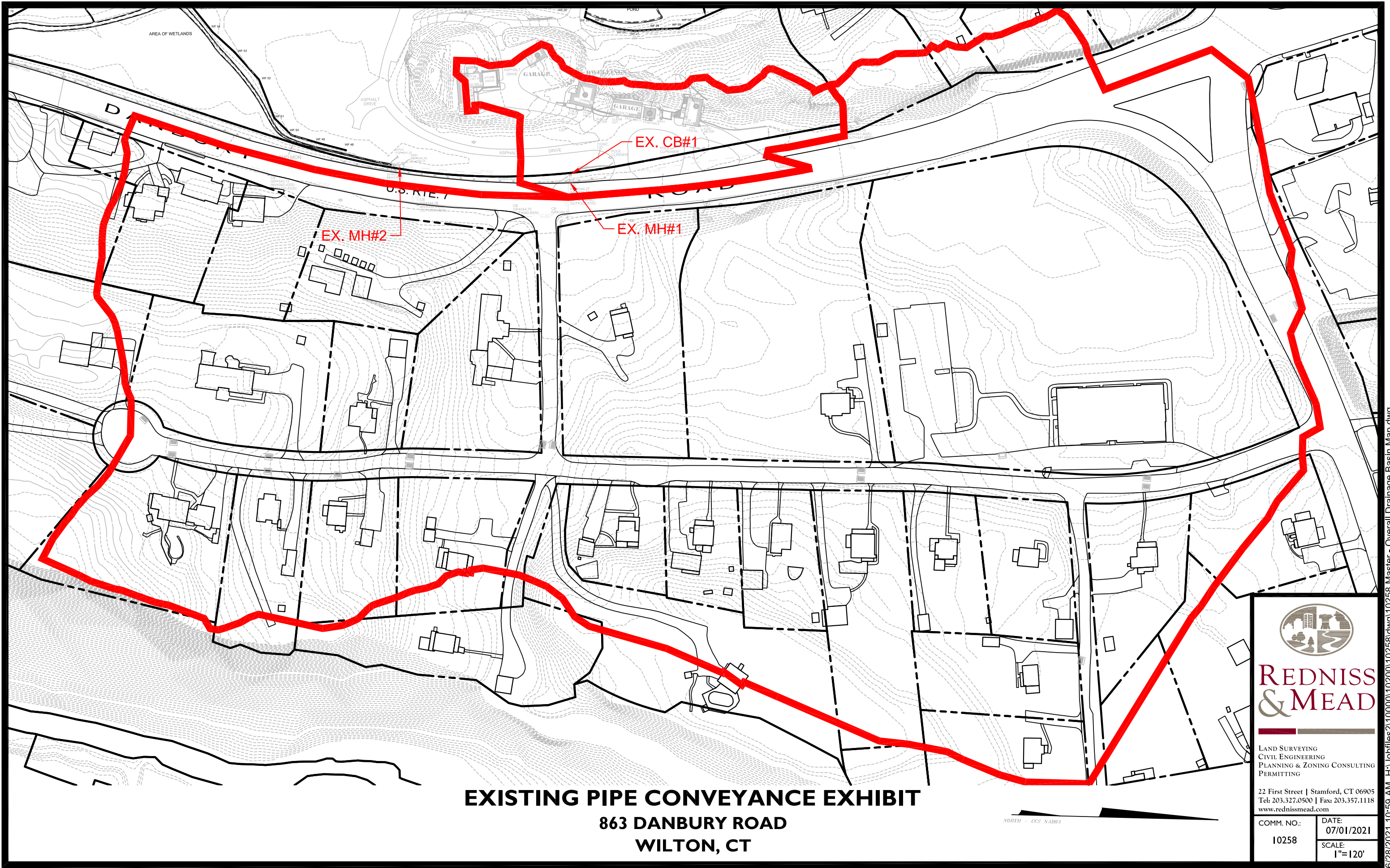


**REDNISS
& MEAD**

LAND SURVEYING
CIVIL ENGINEERING
PLANNING & ZONING CONSULTING
PERMITTING

22 First Street | Stamford, CT 06905
Tel: 203.327.0500 | Fax: 203.357.1118
www.rednissmead.com

COMM. NO.: 10258	DATE: 07/01/2021 SCALE: 1"=80'
---------------------	---



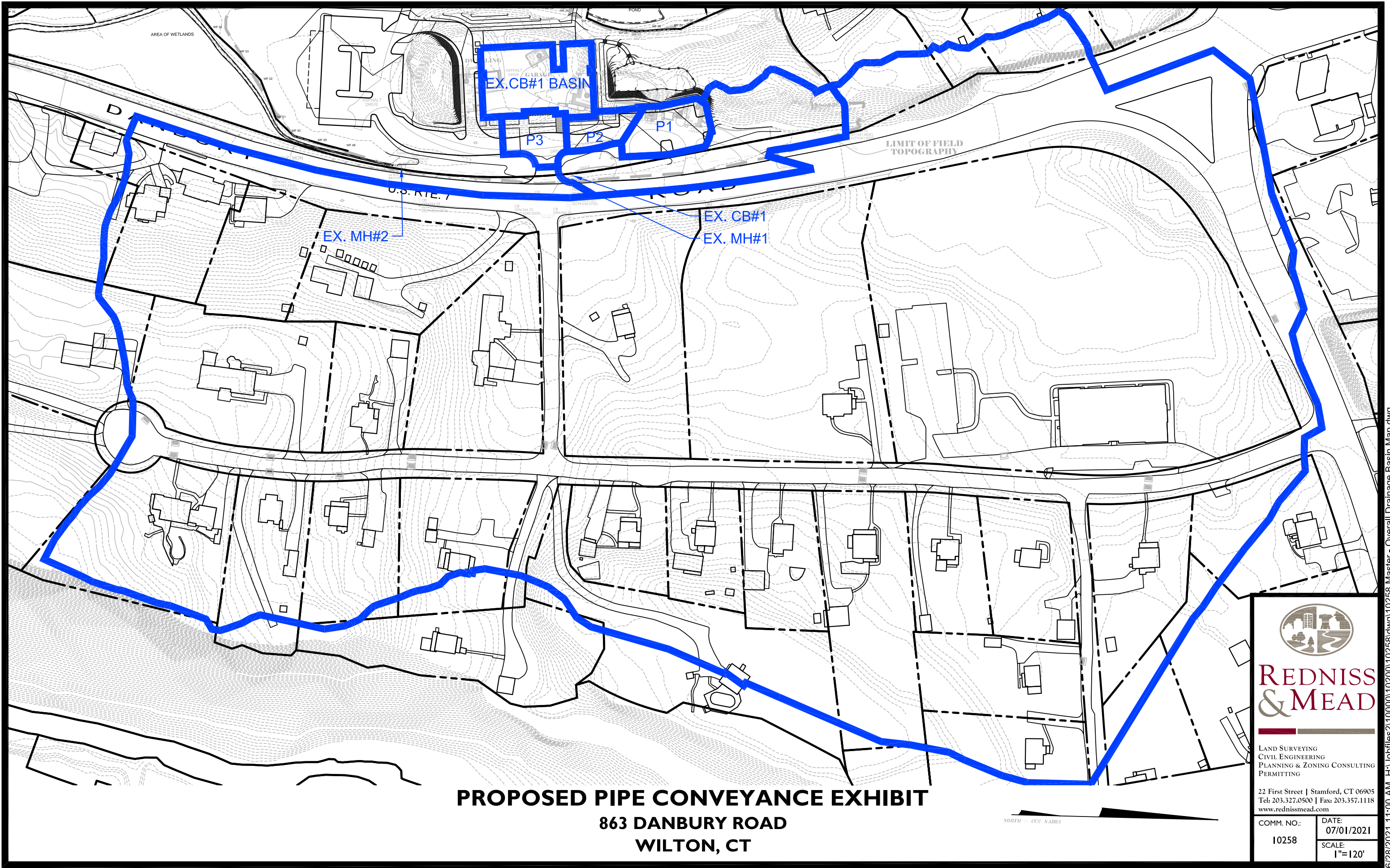
EXISTING PIPE CONVEYANCE EXHIBIT
863 DANBURY ROAD
WILTON, CT


**REDNISS
& MEAD**

LAND SURVEYING
CIVIL ENGINEERING
PLANNING & ZONING CONSULTING
PERMITTING

22 First Street | Stamford, CT 06905
Tel: 203.327.0500 | Fax: 203.357.1118
www.rednissmead.com

COMM. NO.: 10258	DATE: 07/01/2021 SCALE: 1"=120'
---------------------	--



Appendix 2

10258 hydrocad 1

Prepared by {enter your company name here}

Printed 6/24/2021

HydroCAD® 10.10-6a s/n 08721 © 2020 HydroCAD Software Solutions LLC

Page 2

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type III 24-hr		Default	24.00	1	3.57	2
2	10-Year	Type III 24-hr		Default	24.00	1	5.48	2
3	25-Year	Type III 24-hr		Default	24.00	1	6.66	2
4	100-Year	Type III 24-hr		Default	24.00	1	8.49	2

10258 hydrocad 1

Type III 24-hr 2-Year Rainfall=3.57"

Prepared by {enter your company name here}

Printed 6/24/2021

HydroCAD® 10.10-6a s/n 08721 © 2020 HydroCAD Software Solutions LLC

Page 3

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1C: West Basin

Runoff Area=35.707 ac 13.87% Impervious Runoff Depth>0.84"
Flow Length=985' Tc=26.4 min CN=66.2 Runoff=18.49 cfs 2.505 af

Subcatchment2C: East Basin

Runoff Area=31.131 ac 23.71% Impervious Runoff Depth>0.92"
Flow Length=499' Tc=26.1 min CN=67.7 Runoff=18.15 cfs 2.384 af

Subcatchment3C: Porous 6

Runoff Area=11,337 sf 2.38% Impervious Runoff Depth>1.85"
Tc=5.0 min CN=82.2 Runoff=0.59 cfs 0.040 af

Subcatchment4C: Porous 7

Runoff Area=11,373 sf 7.35% Impervious Runoff Depth>1.28"
Tc=5.0 min CN=73.9 Runoff=0.39 cfs 0.028 af

Subcatchment5C: Porous 8

Runoff Area=4,967 sf 15.40% Impervious Runoff Depth>1.95"
Tc=5.0 min CN=83.4 Runoff=0.27 cfs 0.019 af

Subcatchment6C: West Bypass

Runoff Area=35.124 ac 13.12% Impervious Runoff Depth>0.83"
Flow Length=985' Tc=26.4 min CN=66.0 Runoff=17.90 cfs 2.435 af

Subcatchment7C: East Bypass

Runoff Area=30.282 ac 23.78% Impervious Runoff Depth>0.92"
Flow Length=499' Tc=26.1 min CN=67.7 Runoff=17.66 cfs 2.319 af

Subcatchment8C: Porous 1

Runoff Area=7,524 sf 9.04% Impervious Runoff Depth>1.97"
Tc=5.0 min CN=83.7 Runoff=0.41 cfs 0.028 af

Subcatchment9C: Porous 2

Runoff Area=4,365 sf 17.18% Impervious Runoff Depth>1.76"
Tc=5.0 min CN=80.9 Runoff=0.21 cfs 0.015 af

Subcatchment10C: Porous 3

Runoff Area=5,707 sf 21.55% Impervious Runoff Depth>1.96"
Tc=5.0 min CN=83.6 Runoff=0.31 cfs 0.021 af

Subcatchment11C: Porous 4

Runoff Area=4,406 sf 8.08% Impervious Runoff Depth>1.65"
Tc=5.0 min CN=79.5 Runoff=0.20 cfs 0.014 af

Subcatchment12C: Porous 5

Runoff Area=13,103 sf 6.53% Impervious Runoff Depth>1.77"
Tc=5.0 min CN=81.1 Runoff=0.65 cfs 0.044 af

Pond P1: Porous 1

Peak Elev=344.73' Storage=1,031 cf Inflow=0.41 cfs 0.028 af
Outflow=0.01 cfs 0.005 af

Pond P2: Porous 2

Peak Elev=344.25' Storage=639 cf Inflow=0.21 cfs 0.015 af
Outflow=0.00 cfs 0.000 af

Pond P3: Porous 3

Peak Elev=343.94' Storage=933 cf Inflow=0.31 cfs 0.021 af
Outflow=0.00 cfs 0.000 af

Pond P4: Porous 4

Peak Elev=344.93' Storage=607 cf Inflow=0.20 cfs 0.014 af
Outflow=0.00 cfs 0.000 af

10258 hydrocad 1*Type III 24-hr 2-Year Rainfall=3.57"*

Prepared by {enter your company name here}

Printed 6/24/2021

HydroCAD® 10.10-6a s/n 08721 © 2020 HydroCAD Software Solutions LLC

Page 4

Pond P5: Porous 5	Peak Elev=343.91' Storage=920 cf Inflow=0.65 cfs 0.044 af Outflow=0.21 cfs 0.023 af
Pond P6: Porous 6	Peak Elev=343.00' Storage=1,712 cf Inflow=0.59 cfs 0.040 af Outflow=0.01 cfs 0.001 af
Pond P7: Porous 7	Peak Elev=342.17' Storage=455 cf Inflow=0.39 cfs 0.028 af Outflow=0.17 cfs 0.018 af
Pond P8: Porous 8	Peak Elev=345.17' Storage=332 cf Inflow=0.27 cfs 0.019 af Outflow=0.09 cfs 0.014 af
Link 1L: Out Existing	Inflow=36.63 cfs 4.889 af Primary=36.63 cfs 4.889 af
Link 2L: Out Proposed	Inflow=35.97 cfs 4.815 af Primary=35.97 cfs 4.815 af
Link 3L: Junction 1	Inflow=0.01 cfs 0.005 af Primary=0.01 cfs 0.005 af
Link 4L: Junction 2	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af
Link 5L: East	Inflow=17.86 cfs 2.348 af Primary=17.86 cfs 2.348 af
Link 6L: West	Inflow=18.12 cfs 2.467 af Primary=18.12 cfs 2.467 af

Total Runoff Area = 133.685 ac Runoff Volume = 9.853 af Average Runoff Depth = 0.88"
81.84% Pervious = 109.411 ac 18.16% Impervious = 24.274 ac

10258 hydrocad 1

Type III 24-hr 10-Year Rainfall=5.48"

Prepared by {enter your company name here}

Printed 6/24/2021

HydroCAD® 10.10-6a s/n 08721 © 2020 HydroCAD Software Solutions LLC

Page 51

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1C: West Basin	Runoff Area=35.707 ac 13.87% Impervious Runoff Depth>2.06" Flow Length=985' Tc=26.4 min CN=66.2 Runoff=50.49 cfs 6.144 af
Subcatchment2C: East Basin	Runoff Area=31.131 ac 23.71% Impervious Runoff Depth>2.19" Flow Length=499' Tc=26.1 min CN=67.7 Runoff=47.28 cfs 5.680 af
Subcatchment3C: Porous 6	Runoff Area=11,337 sf 2.38% Impervious Runoff Depth>3.53" Tc=5.0 min CN=82.2 Runoff=1.11 cfs 0.077 af
Subcatchment4C: Porous 7	Runoff Area=11,373 sf 7.35% Impervious Runoff Depth>2.74" Tc=5.0 min CN=73.9 Runoff=0.87 cfs 0.060 af
Subcatchment5C: Porous 8	Runoff Area=4,967 sf 15.40% Impervious Runoff Depth>3.65" Tc=5.0 min CN=83.4 Runoff=0.50 cfs 0.035 af
Subcatchment6C: West Bypass	Runoff Area=35.124 ac 13.12% Impervious Runoff Depth>2.05" Flow Length=985' Tc=26.4 min CN=66.0 Runoff=49.22 cfs 5.996 af
Subcatchment7C: East Bypass	Runoff Area=30.282 ac 23.78% Impervious Runoff Depth>2.19" Flow Length=499' Tc=26.1 min CN=67.7 Runoff=45.99 cfs 5.525 af
Subcatchment8C: Porous 1	Runoff Area=7,524 sf 9.04% Impervious Runoff Depth>3.68" Tc=5.0 min CN=83.7 Runoff=0.76 cfs 0.053 af
Subcatchment9C: Porous 2	Runoff Area=4,365 sf 17.18% Impervious Runoff Depth>3.40" Tc=5.0 min CN=80.9 Runoff=0.41 cfs 0.028 af
Subcatchment10C: Porous 3	Runoff Area=5,707 sf 21.55% Impervious Runoff Depth>3.67" Tc=5.0 min CN=83.6 Runoff=0.58 cfs 0.040 af
Subcatchment11C: Porous 4	Runoff Area=4,406 sf 8.08% Impervious Runoff Depth>3.26" Tc=5.0 min CN=79.5 Runoff=0.40 cfs 0.028 af
Subcatchment12C: Porous 5	Runoff Area=13,103 sf 6.53% Impervious Runoff Depth>3.42" Tc=5.0 min CN=81.1 Runoff=1.24 cfs 0.086 af
Pond P1: Porous 1	Peak Elev=344.82' Storage=1,102 cf Inflow=0.76 cfs 0.053 af Outflow=0.29 cfs 0.029 af
Pond P2: Porous 2	Peak Elev=344.35' Storage=673 cf Inflow=0.41 cfs 0.028 af Outflow=0.10 cfs 0.013 af
Pond P3: Porous 3	Peak Elev=344.55' Storage=1,615 cf Inflow=0.58 cfs 0.040 af Outflow=0.01 cfs 0.003 af
Pond P4: Porous 4	Peak Elev=345.05' Storage=647 cf Inflow=0.40 cfs 0.028 af Outflow=0.09 cfs 0.013 af

10258 hydrocad 1*Type III 24-hr 10-Year Rainfall=5.48"*

Prepared by {enter your company name here}

Printed 6/24/2021

HydroCAD® 10.10-6a s/n 08721 © 2020 HydroCAD Software Solutions LLC

Page 52

Pond P5: Porous 5	Peak Elev=343.93' Storage=938 cf Inflow=1.24 cfs 0.086 af Outflow=1.24 cfs 0.065 af
Pond P6: Porous 6	Peak Elev=343.02' Storage=1,732 cf Inflow=1.11 cfs 0.077 af Outflow=0.39 cfs 0.037 af
Pond P7: Porous 7	Peak Elev=342.24' Storage=470 cf Inflow=0.87 cfs 0.060 af Outflow=0.87 cfs 0.049 af
Pond P8: Porous 8	Peak Elev=345.34' Storage=483 cf Inflow=0.50 cfs 0.035 af Outflow=0.29 cfs 0.030 af
Link 1L: Out Existing	Inflow=97.73 cfs 11.824 af Primary=97.73 cfs 11.824 af
Link 2L: Out Proposed	Inflow=96.72 cfs 11.761 af Primary=96.72 cfs 11.761 af
Link 3L: Junction 1	Inflow=0.31 cfs 0.043 af Primary=0.31 cfs 0.043 af
Link 4L: Junction 2	Inflow=0.09 cfs 0.016 af Primary=0.09 cfs 0.016 af
Link 5L: East	Inflow=46.66 cfs 5.648 af Primary=46.66 cfs 5.648 af
Link 6L: West	Inflow=50.07 cfs 6.113 af Primary=50.07 cfs 6.113 af

Total Runoff Area = 133.685 ac Runoff Volume = 23.750 af Average Runoff Depth = 2.13"
81.84% Pervious = 109.411 ac 18.16% Impervious = 24.274 ac

10258 hydrocad 1

Type III 24-hr 25-Year Rainfall=6.66"

Prepared by {enter your company name here}

Printed 6/24/2021

HydroCAD® 10.10-6a s/n 08721 © 2020 HydroCAD Software Solutions LLC

Page 99

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1C: West Basin	Runoff Area=35.707 ac 13.87% Impervious Runoff Depth>2.94" Flow Length=985' Tc=26.4 min CN=66.2 Runoff=73.21 cfs 8.752 af
Subcatchment2C: East Basin	Runoff Area=31.131 ac 23.71% Impervious Runoff Depth>3.09" Flow Length=499' Tc=26.1 min CN=67.7 Runoff=67.69 cfs 8.014 af
Subcatchment3C: Porous 6	Runoff Area=11,337 sf 2.38% Impervious Runoff Depth>4.62" Tc=5.0 min CN=82.2 Runoff=1.44 cfs 0.100 af
Subcatchment4C: Porous 7	Runoff Area=11,373 sf 7.35% Impervious Runoff Depth>3.73" Tc=5.0 min CN=73.9 Runoff=1.18 cfs 0.081 af
Subcatchment5C: Porous 8	Runoff Area=4,967 sf 15.40% Impervious Runoff Depth>4.75" Tc=5.0 min CN=83.4 Runoff=0.64 cfs 0.045 af
Subcatchment6C: West Bypass	Runoff Area=35.124 ac 13.12% Impervious Runoff Depth>2.92" Flow Length=985' Tc=26.4 min CN=66.0 Runoff=71.49 cfs 8.552 af
Subcatchment7C: East Bypass	Runoff Area=30.282 ac 23.78% Impervious Runoff Depth>3.09" Flow Length=499' Tc=26.1 min CN=67.7 Runoff=65.84 cfs 7.796 af
Subcatchment8C: Porous 1	Runoff Area=7,524 sf 9.04% Impervious Runoff Depth>4.78" Tc=5.0 min CN=83.7 Runoff=0.98 cfs 0.069 af
Subcatchment9C: Porous 2	Runoff Area=4,365 sf 17.18% Impervious Runoff Depth>4.48" Tc=5.0 min CN=80.9 Runoff=0.54 cfs 0.037 af
Subcatchment10C: Porous 3	Runoff Area=5,707 sf 21.55% Impervious Runoff Depth>4.77" Tc=5.0 min CN=83.6 Runoff=0.74 cfs 0.052 af
Subcatchment11C: Porous 4	Runoff Area=4,406 sf 8.08% Impervious Runoff Depth>4.32" Tc=5.0 min CN=79.5 Runoff=0.53 cfs 0.036 af
Subcatchment12C: Porous 5	Runoff Area=13,103 sf 6.53% Impervious Runoff Depth>4.50" Tc=5.0 min CN=81.1 Runoff=1.62 cfs 0.113 af
Pond P1: Porous 1	Peak Elev=344.87' Storage=1,150 cf Inflow=0.98 cfs 0.069 af Outflow=0.82 cfs 0.045 af
Pond P2: Porous 2	Peak Elev=344.41' Storage=692 cf Inflow=0.54 cfs 0.037 af Outflow=0.31 cfs 0.022 af
Pond P3: Porous 3	Peak Elev=344.57' Storage=1,627 cf Inflow=0.74 cfs 0.052 af Outflow=0.05 cfs 0.015 af
Pond P4: Porous 4	Peak Elev=345.11' Storage=666 cf Inflow=0.53 cfs 0.036 af Outflow=0.29 cfs 0.022 af

10258 hydrocad 1*Type III 24-hr 25-Year Rainfall=6.66"*

Prepared by {enter your company name here}

Printed 6/24/2021

HydroCAD® 10.10-6a s/n 08721 © 2020 HydroCAD Software Solutions LLC

Page 100

Pond P5: Porous 5	Peak Elev=343.94' Storage=944 cf Inflow=1.62 cfs 0.113 af Outflow=1.61 cfs 0.092 af
Pond P6: Porous 6	Peak Elev=343.05' Storage=1,758 cf Inflow=1.44 cfs 0.100 af Outflow=1.17 cfs 0.061 af
Pond P7: Porous 7	Peak Elev=342.26' Storage=474 cf Inflow=1.18 cfs 0.081 af Outflow=1.18 cfs 0.071 af
Pond P8: Porous 8	Peak Elev=345.42' Storage=556 cf Inflow=0.64 cfs 0.045 af Outflow=0.39 cfs 0.040 af
Link 1L: Out Existing	Inflow=140.89 cfs 16.766 af Primary=140.89 cfs 16.766 af
Link 2L: Out Proposed	Inflow=139.73 cfs 16.716 af Primary=139.73 cfs 16.716 af
Link 3L: Junction 1	Inflow=0.98 cfs 0.067 af Primary=0.98 cfs 0.067 af
Link 4L: Junction 2	Inflow=0.29 cfs 0.037 af Primary=0.29 cfs 0.037 af
Link 5L: East	Inflow=67.07 cfs 7.992 af Primary=67.07 cfs 7.992 af
Link 6L: West	Inflow=72.66 cfs 8.724 af Primary=72.66 cfs 8.724 af

Total Runoff Area = 133.685 ac Runoff Volume = 33.648 af Average Runoff Depth = 3.02"
81.84% Pervious = 109.411 ac 18.16% Impervious = 24.274 ac

10258 hydrocad 1

Type III 24-hr 25-Year Rainfall=6.66"

Prepared by {enter your company name here}

Printed 6/24/2021

HydroCAD® 10.10-6a s/n 08721 © 2020 HydroCAD Software Solutions LLC

Page 101

Summary for Subcatchment 1C: West Basin

Runoff = 73.21 cfs @ 12.38 hrs, Volume= 8.752 af, Depth> 2.94"
 Routed to Link 1L : Out Existing

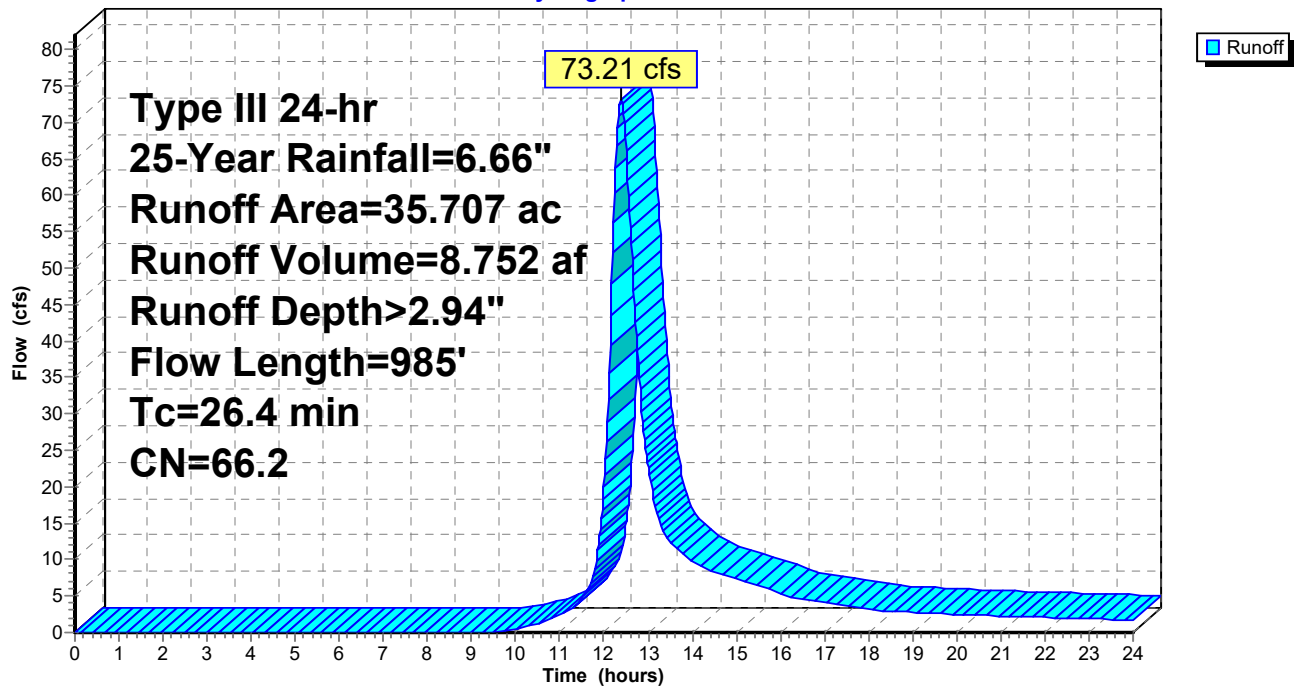
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Type III 24-hr 25-Year Rainfall=6.66"

Area (ac)	CN	Description
0.517	98.0	Paved parking, HSG B
7.047	61.0	>75% Grass cover, Good, HSG B
* 4.434	98.0	Paved parking, HSG B, Offsite
* 23.510	61.0	>75% Grass cover, Good, HSG B, Offsite
* 0.199	80.0	>75% Grass cover, Good, HSG D, Offsite
35.707	66.2	Weighted Average
30.756		86.13% Pervious Area
4.951		13.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.8	100	0.0200	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.40"
2.3	755	0.1166	5.50		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	51	0.0880	6.02		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	79	0.1203	5.58		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
3.0					Direct Entry, Pipe flow
26.4	985	Total			

Subcatchment 1C: West Basin

Hydrograph



Summary for Subcatchment 2C: East Basin

Runoff = 67.69 cfs @ 12.38 hrs, Volume= 8.014 af, Depth> 3.09"
 Routed to Link 1L : Out Existing

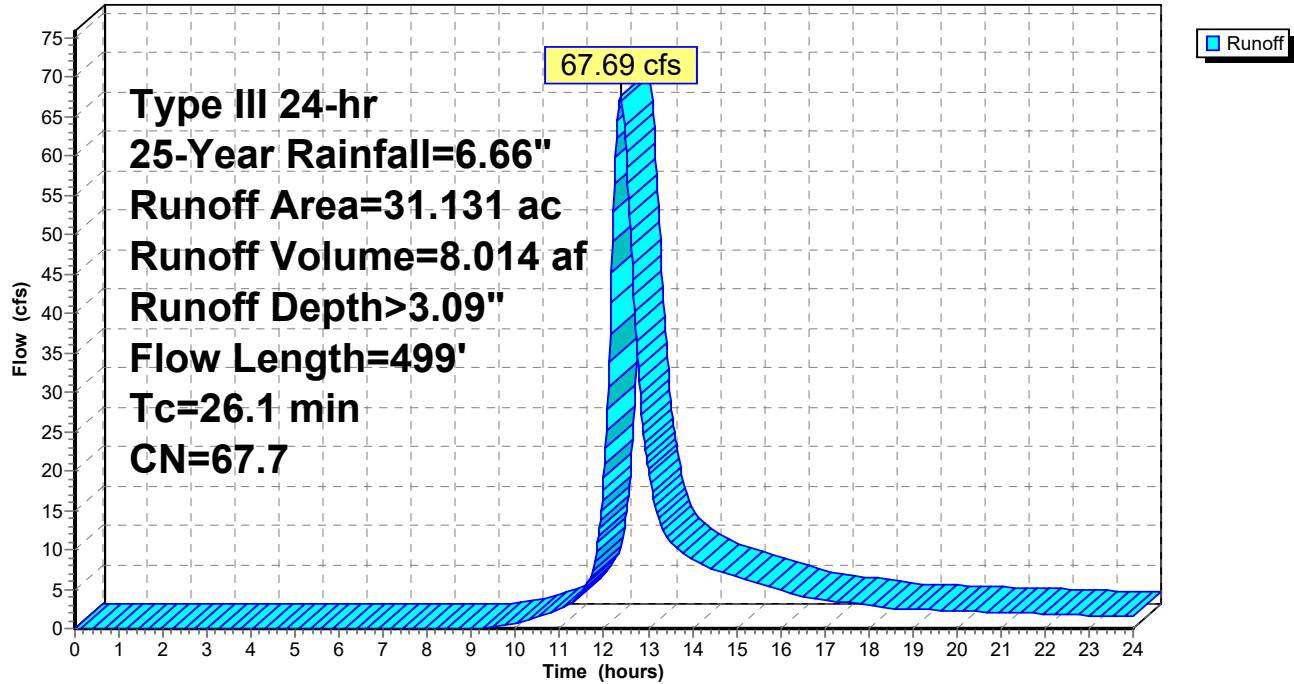
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Type III 24-hr 25-Year Rainfall=6.66"

Area (ac)	CN	Description
0.501	98.0	Paved parking, HSG B
1.698	61.0	>75% Grass cover, Good, HSG B
0.358	39.0	>75% Grass cover, Good, HSG A
* 6.880	98.0	Paved parking, HSG B, Offsite
* 19.151	61.0	>75% Grass cover, Good, HSG B, Offsite
* 2.543	39.0	>75% Grass cover, Good, HSG A, Offsite
31.131	67.7	Weighted Average
23.750		76.29% Pervious Area
7.381		23.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.2	74	0.0135	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.40"
2.7	29	0.2760	0.18		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.40"
0.5	140	0.0710	4.29		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.7	256	0.0820	5.81		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.0					Direct Entry, Pipe Flow
26.1	499	Total			

Subcatchment 2C: East Basin

Hydrograph



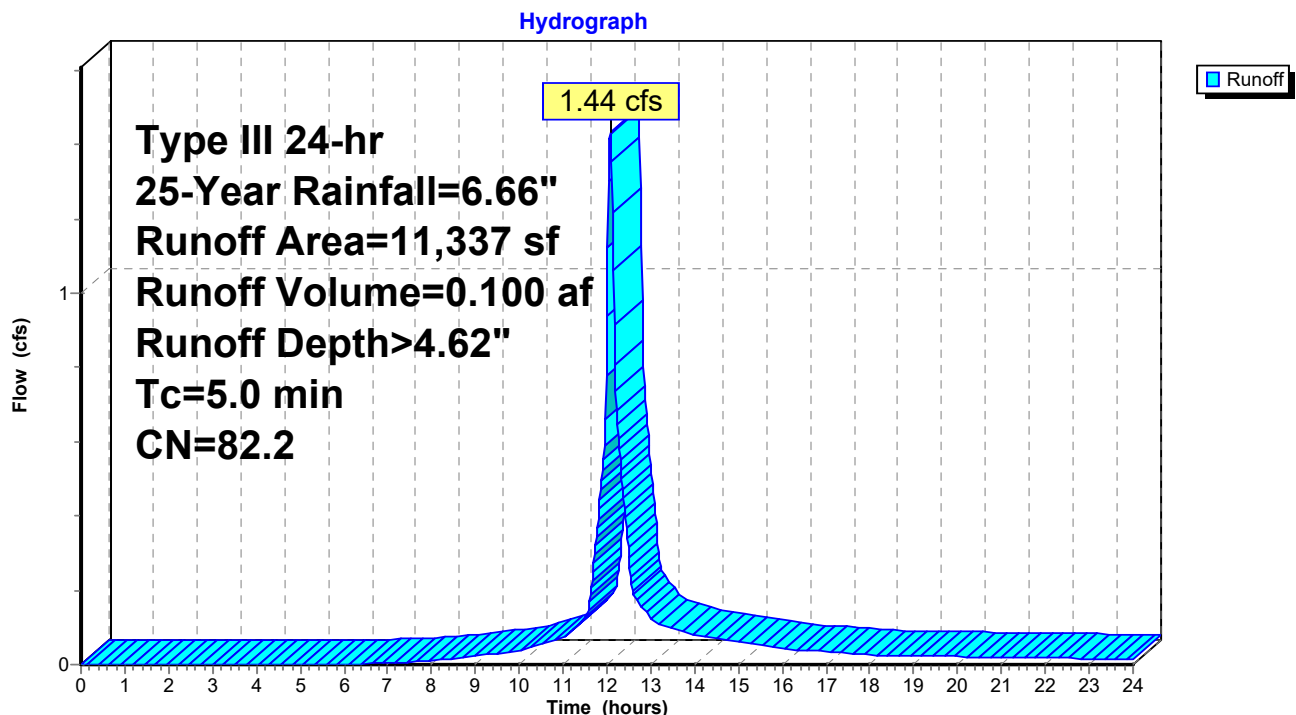
Summary for Subcatchment 3C: Porous 6

Runoff = 1.44 cfs @ 12.07 hrs, Volume= 0.100 af, Depth> 4.62"
 Routed to Pond P6 : Porous 6

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Type III 24-hr 25-Year Rainfall=6.66"

Area (sf)	CN	Description
270	98.0	Paved parking, HSG B
* 8,217	89.0	Porous Pavement, HSG B
2,850	61.0	>75% Grass cover, Good, HSG B
11,337	82.2	Weighted Average
11,067		97.62% Pervious Area
270		2.38% Impervious Area

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

Subcatchment 3C: Porous 6

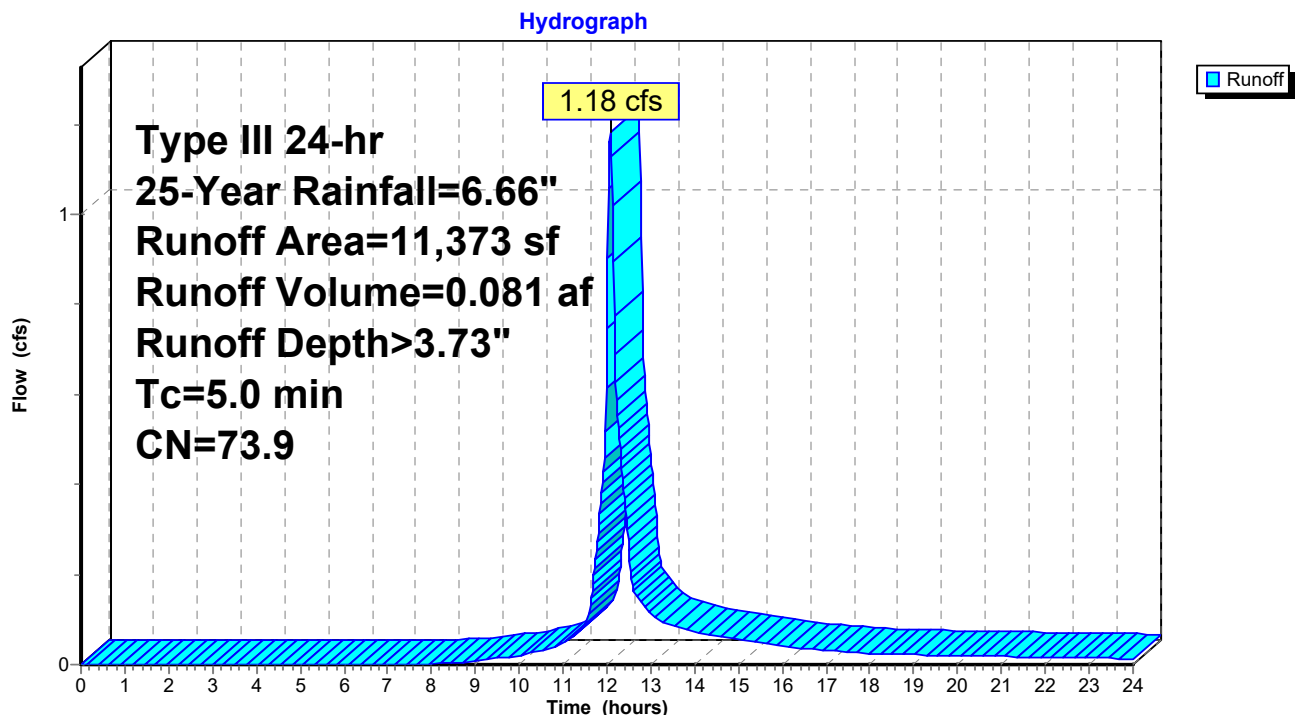
Summary for Subcatchment 4C: Porous 7

Runoff = 1.18 cfs @ 12.08 hrs, Volume= 0.081 af, Depth> 3.73"
 Routed to Pond P7 : Porous 7

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Type III 24-hr 25-Year Rainfall=6.66"

Area (sf)	CN	Description
836	98.0	Paved parking, HSG B
* 4,119	89.0	Porous Pavement, HSG B
6,418	61.0	>75% Grass cover, Good, HSG B
11,373	73.9	Weighted Average
10,537		92.65% Pervious Area
836		7.35% Impervious Area

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

Subcatchment 4C: Porous 7

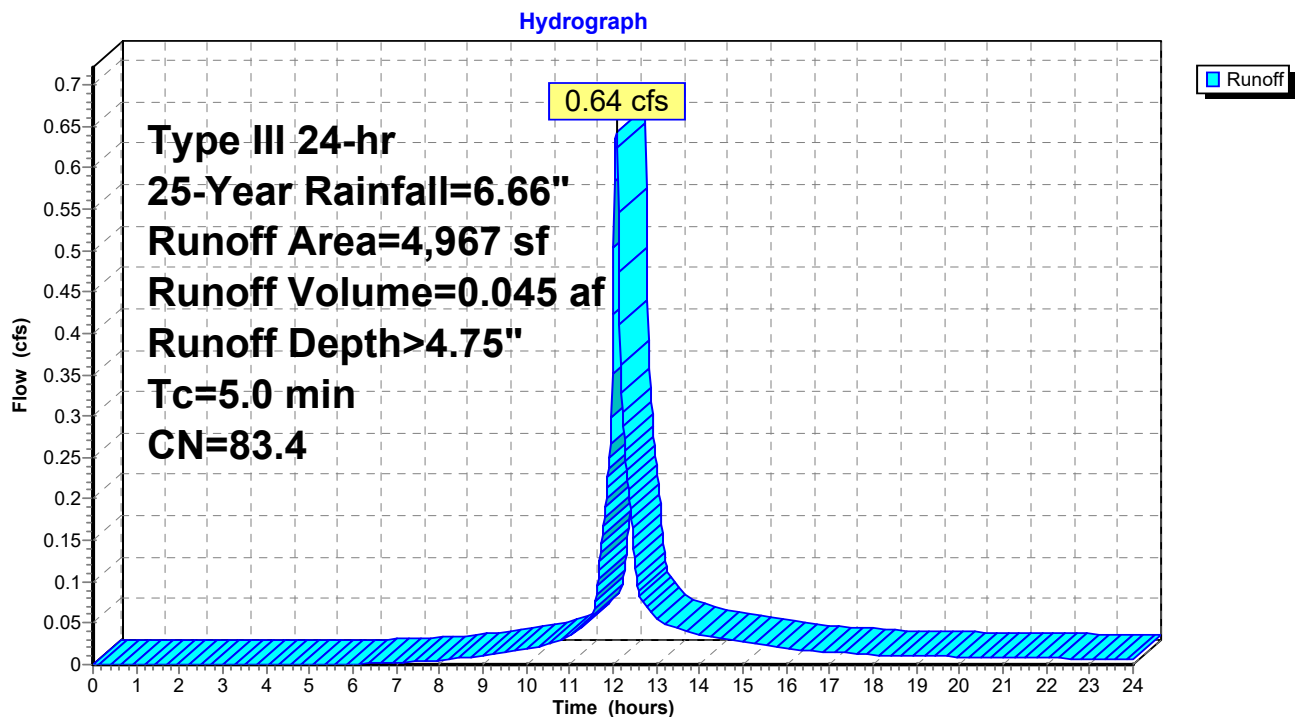
Summary for Subcatchment 5C: Porous 8

Runoff = 0.64 cfs @ 12.07 hrs, Volume= 0.045 af, Depth> 4.75"
 Routed to Pond P8 : Porous 8

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Type III 24-hr 25-Year Rainfall=6.66"

Area (sf)	CN	Description
765	98.0	Paved parking, HSG B
* 2,967	89.0	Porous Pavement, HSG B
1,235	61.0	>75% Grass cover, Good, HSG B
4,967	83.4	Weighted Average
4,202		84.60% Pervious Area
765		15.40% Impervious Area

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

Subcatchment 5C: Porous 8

10258 hydrocad 1

Type III 24-hr 25-Year Rainfall=6.66"

Prepared by {enter your company name here}

Printed 6/24/2021

HydroCAD® 10.10-6a s/n 08721 © 2020 HydroCAD Software Solutions LLC

Page 108

Summary for Subcatchment 6C: West Bypass

Runoff = 71.49 cfs @ 12.38 hrs, Volume= 8.552 af, Depth> 2.92"
 Routed to Link 6L : West

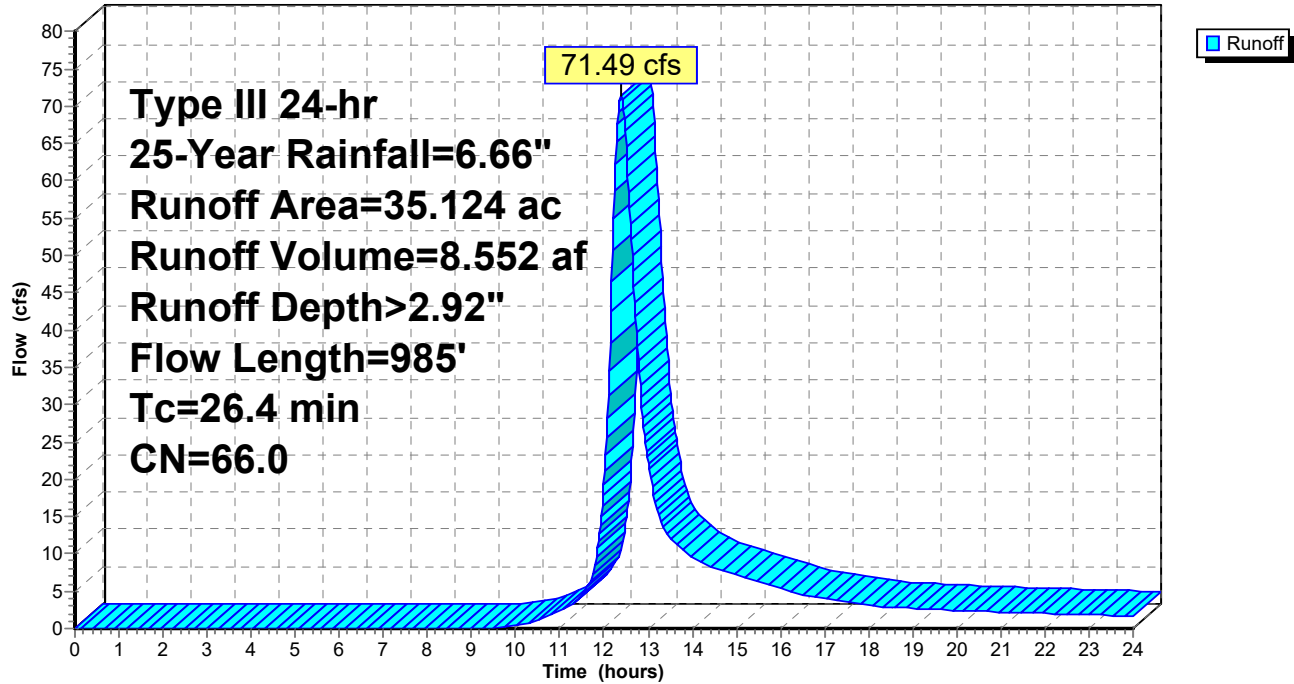
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Type III 24-hr 25-Year Rainfall=6.66"

Area (ac)	CN	Description
0.174	98.0	Paved parking, HSG B
6.807	61.0	>75% Grass cover, Good, HSG B
* 4.434	98.0	Paved parking, HSG B, Offsite
* 23.510	61.0	>75% Grass cover, Good, HSG B, Offsite
* 0.199	80.0	>75% Grass cover, Good, HSG D, Offsite
35.124	66.0	Weighted Average
30.516		86.88% Pervious Area
4.608		13.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.8	100	0.0200	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.40"
2.3	755	0.1166	5.50		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	51	0.0880	6.02		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	79	0.1203	5.58		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
3.0					Direct Entry, Pipe flow
26.4	985	Total			

Subcatchment 6C: West Bypass

Hydrograph



10258 hydrocad 1

Type III 24-hr 25-Year Rainfall=6.66"

Prepared by {enter your company name here}

Printed 6/24/2021

HydroCAD® 10.10-6a s/n 08721 © 2020 HydroCAD Software Solutions LLC

Page 110

Summary for Subcatchment 7C: East Bypass

Runoff = 65.84 cfs @ 12.38 hrs, Volume= 7.796 af, Depth> 3.09"
 Routed to Link 5L : East

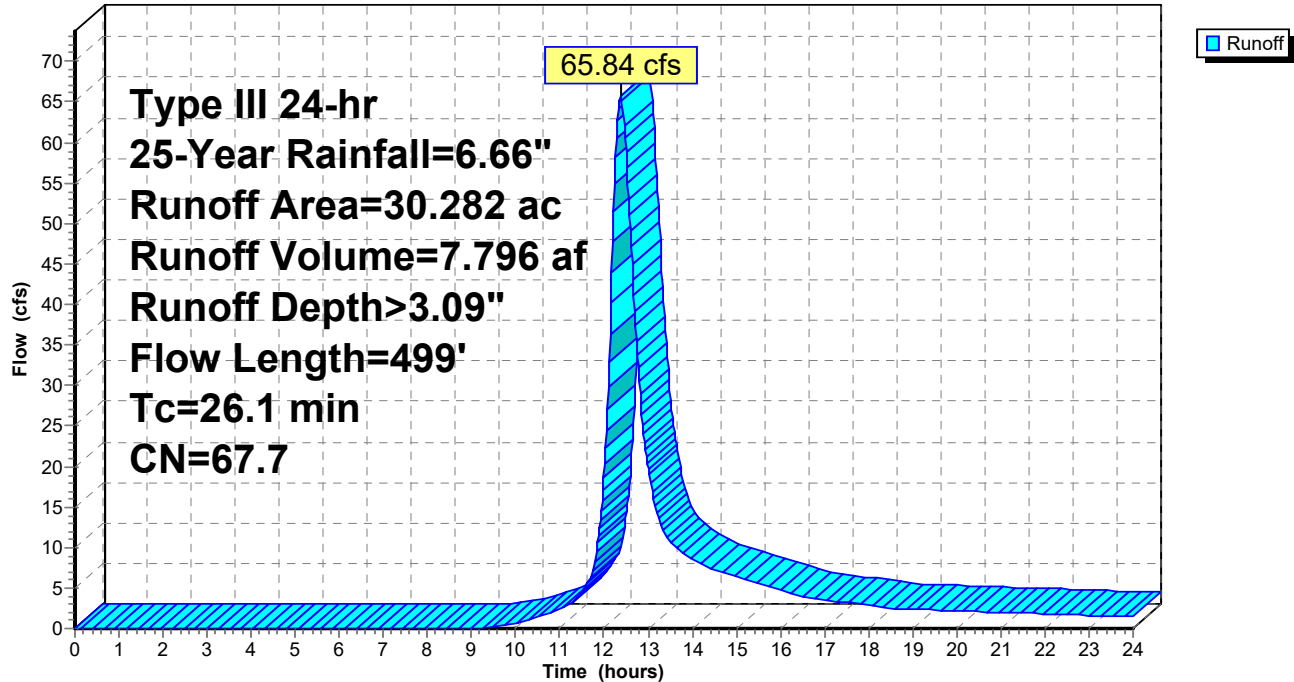
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Type III 24-hr 25-Year Rainfall=6.66"

Area (ac)	CN	Description
0.347	98.0	Paved parking, HSG B
1.064	61.0	>75% Grass cover, Good, HSG B
0.289	39.0	>75% Grass cover, Good, HSG A
* 6.855	98.0	Paved parking, HSG B, Offsite
* 19.151	61.0	>75% Grass cover, Good, HSG B, Offsite
* 2.576	39.0	>75% Grass cover, Good, HSG A, Offsite
30.282	67.7	Weighted Average
23.080		76.22% Pervious Area
7.202		23.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.2	74	0.0135	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.40"
2.7	29	0.2760	0.18		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.40"
0.5	140	0.0710	4.29		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.7	256	0.0820	5.81		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.0					Direct Entry, Pipe Flow
26.1	499	Total			

Subcatchment 7C: East Bypass

Hydrograph



10258 hydrocad 1

Prepared by {enter your company name here}

HydroCAD® 10.10-6a s/n 08721 © 2020 HydroCAD Software Solutions LLC

Type III 24-hr 25-Year Rainfall=6.66"

Printed 6/24/2021

Page 112

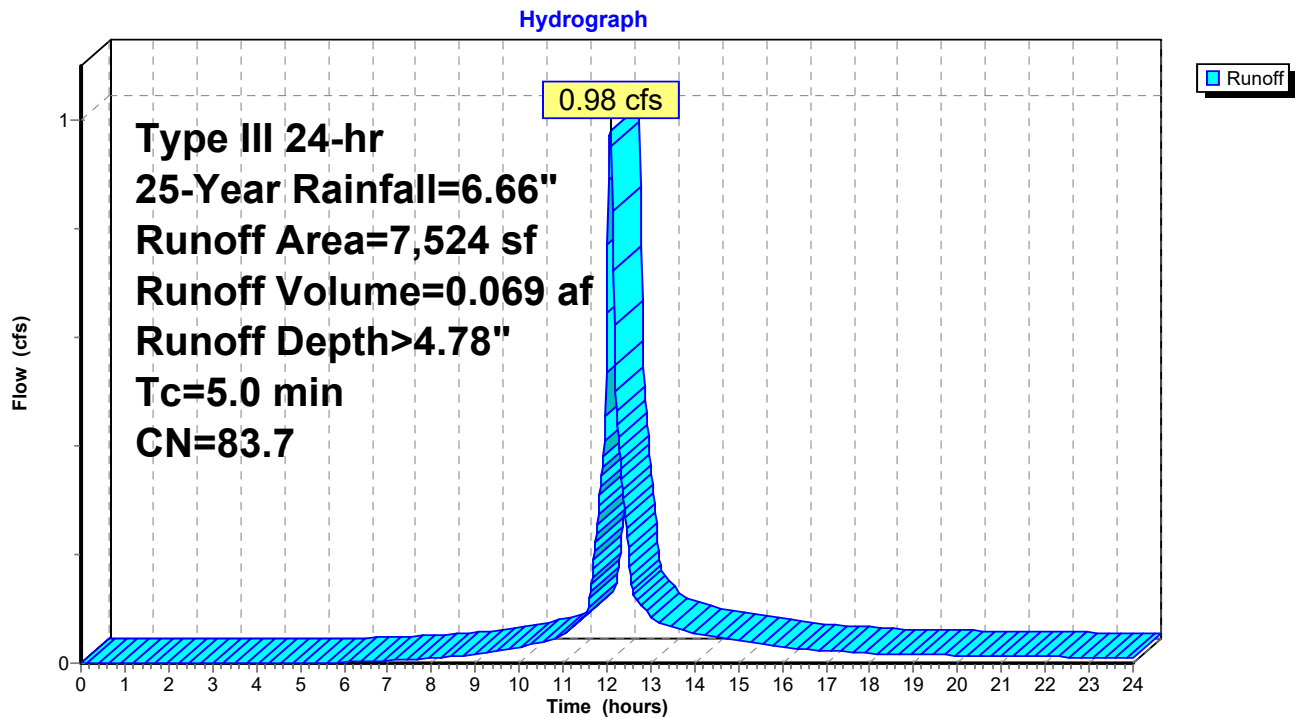
Summary for Subcatchment 8C: Porous 1

Runoff = 0.98 cfs @ 12.07 hrs, Volume= 0.069 af, Depth> 4.78"
 Routed to Pond P1 : Porous 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Type III 24-hr 25-Year Rainfall=6.66"

Area (sf)	CN	Description
228	98.0	Paved parking, HSG A
* 5,690	89.0	Porous Pavement, HSG A
753	39.0	>75% Grass cover, Good, HSG A
452	98.0	Paved parking, HSG B
* 92	89.0	Porous Pavement, HSG B
309	61.0	>75% Grass cover, Good, HSG B
7,524	83.7	Weighted Average
6,844		90.96% Pervious Area
680		9.04% Impervious Area

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

Subcatchment 8C: Porous 1

10258 hydrocad 1

Prepared by {enter your company name here}

HydroCAD® 10.10-6a s/n 08721 © 2020 HydroCAD Software Solutions LLC

Type III 24-hr 25-Year Rainfall=6.66"

Printed 6/24/2021

Page 113

Summary for Subcatchment 9C: Porous 2

Runoff = 0.54 cfs @ 12.07 hrs, Volume= 0.037 af, Depth> 4.48"
 Routed to Pond P2 : Porous 2

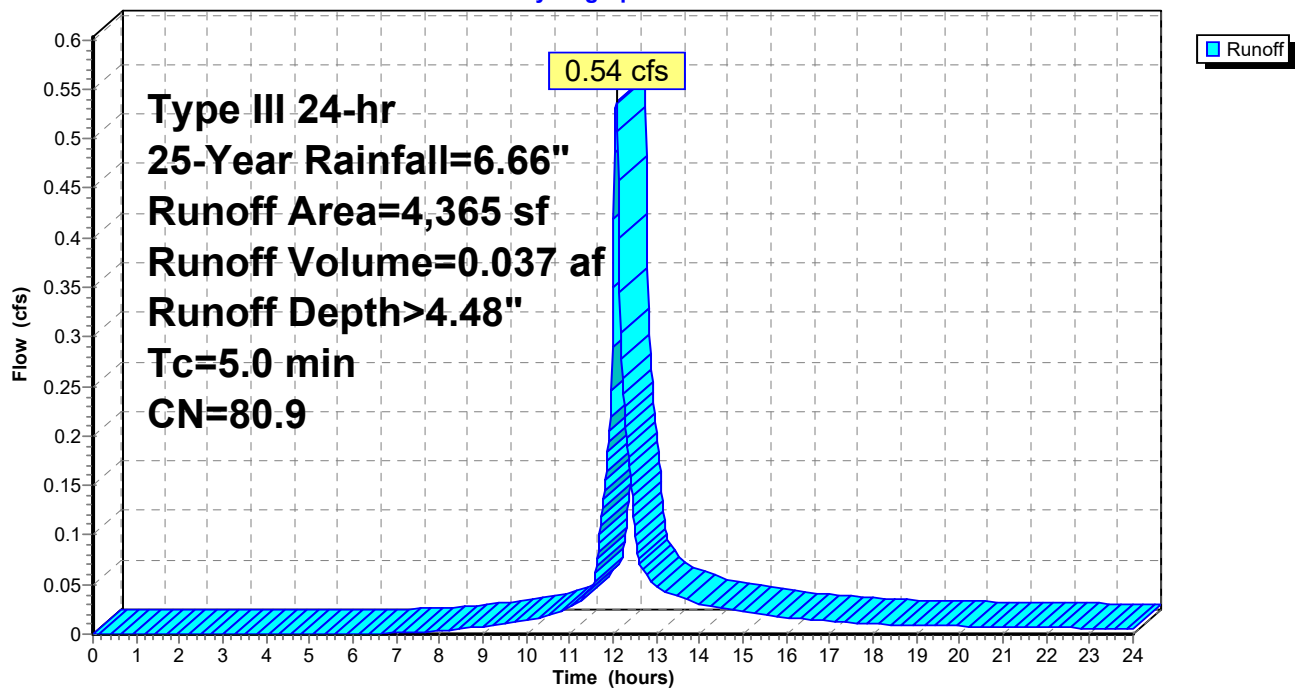
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Type III 24-hr 25-Year Rainfall=6.66"

Area (sf)	CN	Description
159	98.0	Paved parking, HSG A
* 2,134	89.0	Porous Pavement, HSG A
264	39.0	>75% Grass cover, Good, HSG A
591	98.0	Paved parking, HSG B
* 183	89.0	Porous Pavement, HSG B
1,034	61.0	>75% Grass cover, Good, HSG B
4,365	80.9	Weighted Average
3,615		82.82% Pervious Area
750		17.18% Impervious Area

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

Subcatchment 9C: Porous 2

Hydrograph



10258 hydrocad 1

Prepared by {enter your company name here}

HydroCAD® 10.10-6a s/n 08721 © 2020 HydroCAD Software Solutions LLC

Type III 24-hr 25-Year Rainfall=6.66"

Printed 6/24/2021

Page 114

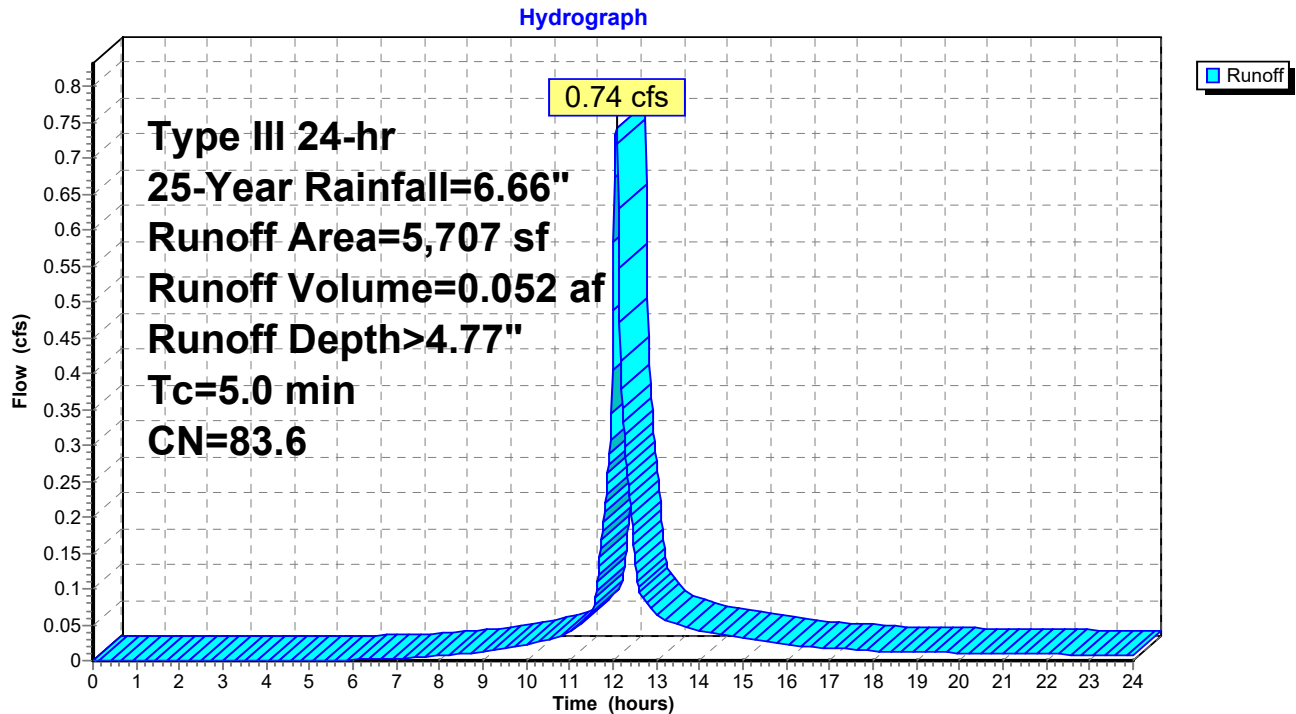
Summary for Subcatchment 10C: Porous 3

Runoff = 0.74 cfs @ 12.07 hrs, Volume= 0.052 af, Depth> 4.77"
 Routed to Pond P3 : Porous 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Type III 24-hr 25-Year Rainfall=6.66"

Area (sf)	CN	Description
37	98.0	Paved parking, HSG A
* 1,091	89.0	Porous Pavement, HSG A
1,193	98.0	Paved parking, HSG B
* 1,885	89.0	Porous Pavement, HSG B
1,501	61.0	>75% Grass cover, Good, HSG B
5,707	83.6	Weighted Average
4,477		78.45% Pervious Area
1,230		21.55% Impervious Area

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

Subcatchment 10C: Porous 3

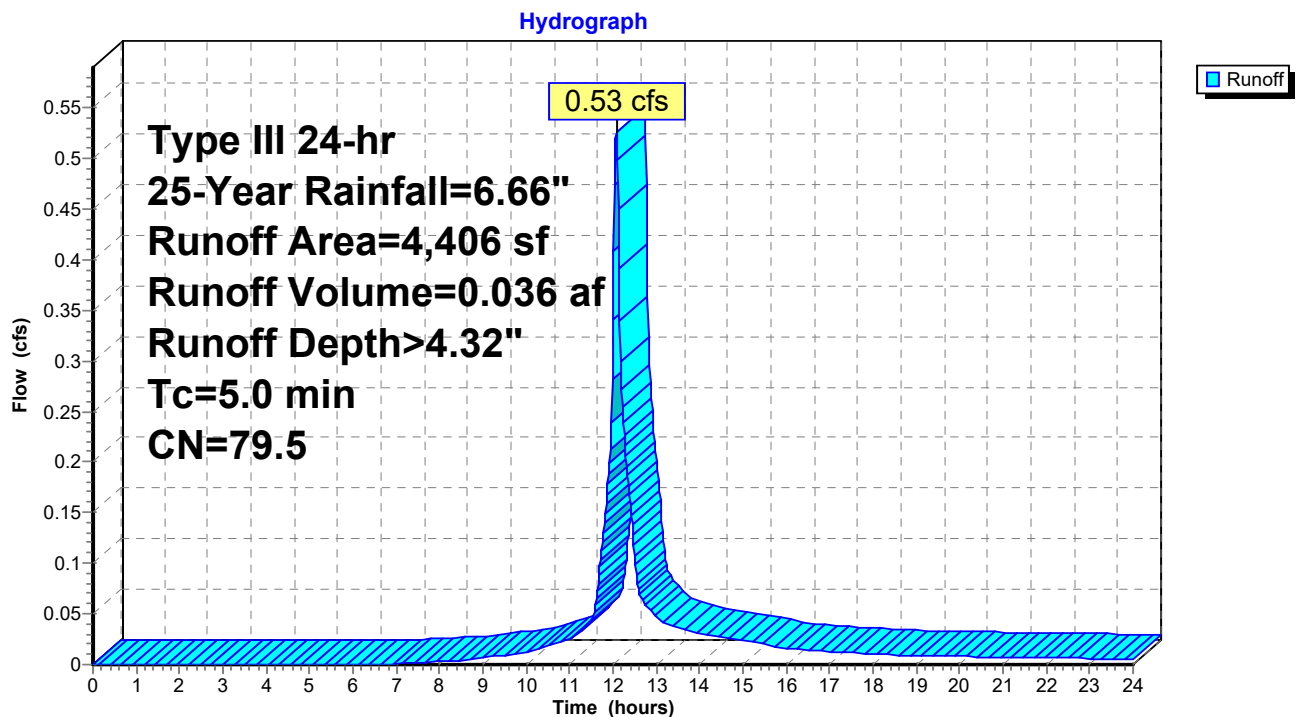
Summary for Subcatchment 11C: Porous 4

Runoff = 0.53 cfs @ 12.07 hrs, Volume= 0.036 af, Depth> 4.32"
 Routed to Pond P4 : Porous 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Type III 24-hr 25-Year Rainfall=6.66"

Area (sf)	CN	Description
356	98.0	Paved parking, HSG B
* 2,434	89.0	Porous Pavement, HSG B
1,616	61.0	>75% Grass cover, Good, HSG B
4,406	79.5	Weighted Average
4,050		91.92% Pervious Area
356		8.08% Impervious Area

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

Subcatchment 11C: Porous 4

10258 hydrocad 1

Prepared by {enter your company name here}

HydroCAD® 10.10-6a s/n 08721 © 2020 HydroCAD Software Solutions LLC

Type III 24-hr 25-Year Rainfall=6.66"

Printed 6/24/2021

Page 116

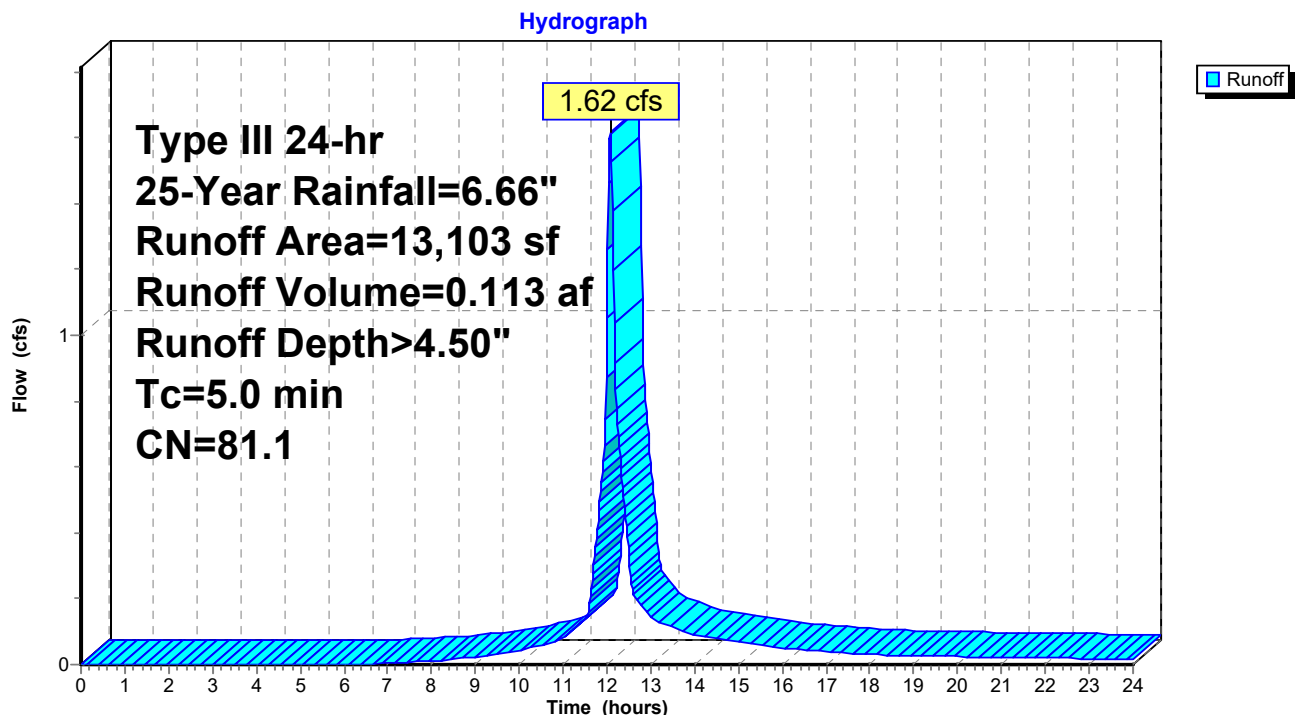
Summary for Subcatchment 12C: Porous 5

Runoff = 1.62 cfs @ 12.07 hrs, Volume= 0.113 af, Depth> 4.50"
 Routed to Pond P5 : Porous 5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Type III 24-hr 25-Year Rainfall=6.66"

Area (sf)	CN	Description
856	98.0	Paved parking, HSG B
* 8,274	89.0	Porous Pavement, HSG B
3,973	61.0	>75% Grass cover, Good, HSG B
13,103	81.1	Weighted Average
12,247		93.47% Pervious Area
856		6.53% Impervious Area

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

Subcatchment 12C: Porous 5

10258 hydrocad 1

Type III 24-hr 25-Year Rainfall=6.66"

Prepared by {enter your company name here}

Printed 6/24/2021

HydroCAD® 10.10-6a s/n 08721 © 2020 HydroCAD Software Solutions LLC

Page 117

Summary for Pond P1: Porous 1

Inflow Area = 0.173 ac, 9.04% Impervious, Inflow Depth > 4.78" for 25-Year event
 Inflow = 0.98 cfs @ 12.07 hrs, Volume= 0.069 af
 Outflow = 0.82 cfs @ 12.13 hrs, Volume= 0.045 af, Atten= 16%, Lag= 3.2 min
 Primary = 0.82 cfs @ 12.13 hrs, Volume= 0.045 af
 Routed to Link 3L : Junction 1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 344.87' @ 12.13 hrs Storage= 1,150 cf

Plug-Flow detention time= 171.3 min calculated for 0.045 af (66% of inflow)
 Center-of-Mass det. time= 73.8 min (872.8 - 799.0)

Volume	Invert	Avail.Storage	Storage Description
#1	342.70'	1,295 cf	Custom Stage Data Listed below

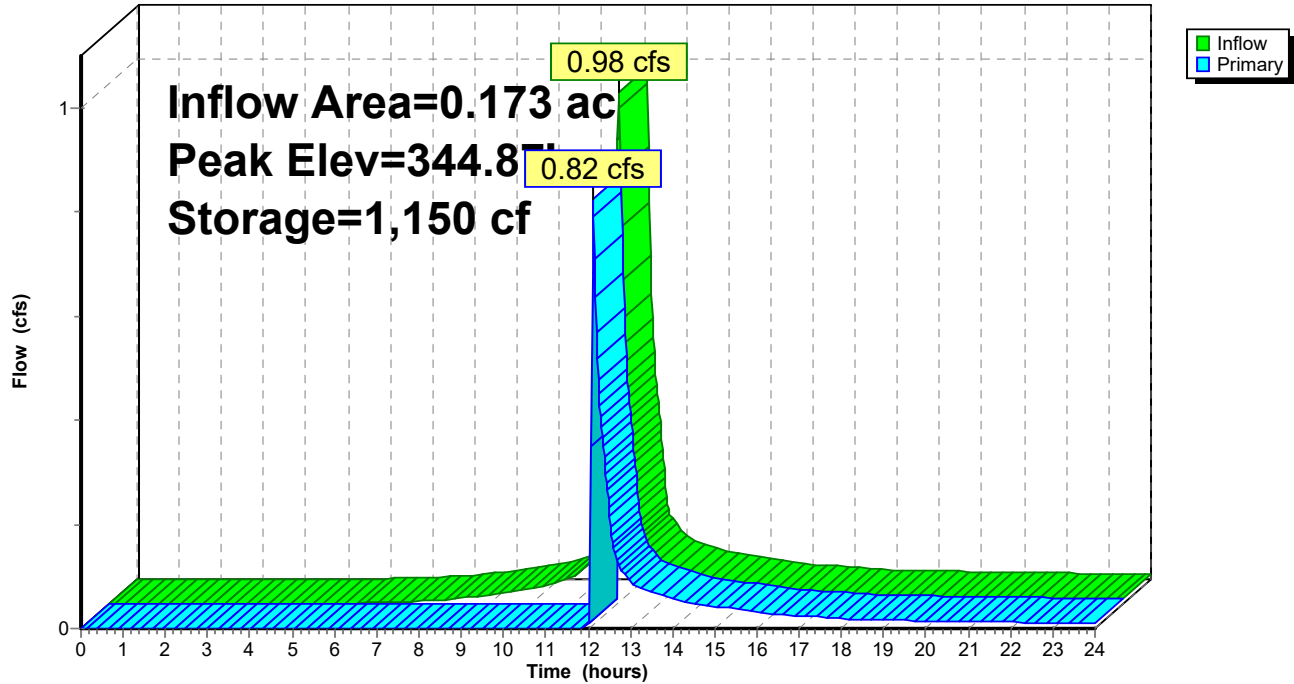
Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
342.70	0	0
344.20	608	608
344.37	138	746
344.70	262	1,008
345.05	287	1,295

Device	Routing	Invert	Outlet Devices
#1	Primary	344.70'	Asymmetrical Weir, C= 3.27 Offset (feet) 0.00 0.01 17.50 Height (feet) 0.35 0.00 0.35

Primary OutFlow Max=0.80 cfs @ 12.13 hrs HW=344.87' (Free Discharge)
 ↑1=Asymmetrical Weir (Weir Controls 0.80 cfs @ 0.54 fps)

Pond P1: Porous 1

Hydrograph



Stage-Area-Storage for Pond P1: Porous 1

Elevation (feet)	Storage (cubic-feet)
342.70	0
342.80	41
342.90	81
343.00	122
343.10	162
343.20	203
343.30	243
343.40	284
343.50	324
343.60	365
343.70	405
343.80	446
343.90	486
344.00	527
344.10	567
344.20	608
344.30	689
344.40	770
344.50	849
344.60	929
344.70	1,008
344.80	1,090
344.90	1,172
345.00	1,254

Summary for Pond P2: Porous 2

Inflow Area = 0.100 ac, 17.18% Impervious, Inflow Depth > 4.48" for 25-Year event
 Inflow = 0.54 cfs @ 12.07 hrs, Volume= 0.037 af
 Outflow = 0.31 cfs @ 12.19 hrs, Volume= 0.022 af, Atten= 43%, Lag= 6.7 min
 Primary = 0.31 cfs @ 12.19 hrs, Volume= 0.022 af
 Routed to Link 3L : Junction 1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 344.41' @ 12.19 hrs Storage= 692 cf

Plug-Flow detention time= 188.7 min calculated for 0.022 af (59% of inflow)
 Center-of-Mass det. time= 84.4 min (890.7 - 806.3)

Volume	Invert	Avail.Storage	Storage Description
#1	342.30'	1,012 cf	Custom Stage Data Listed below

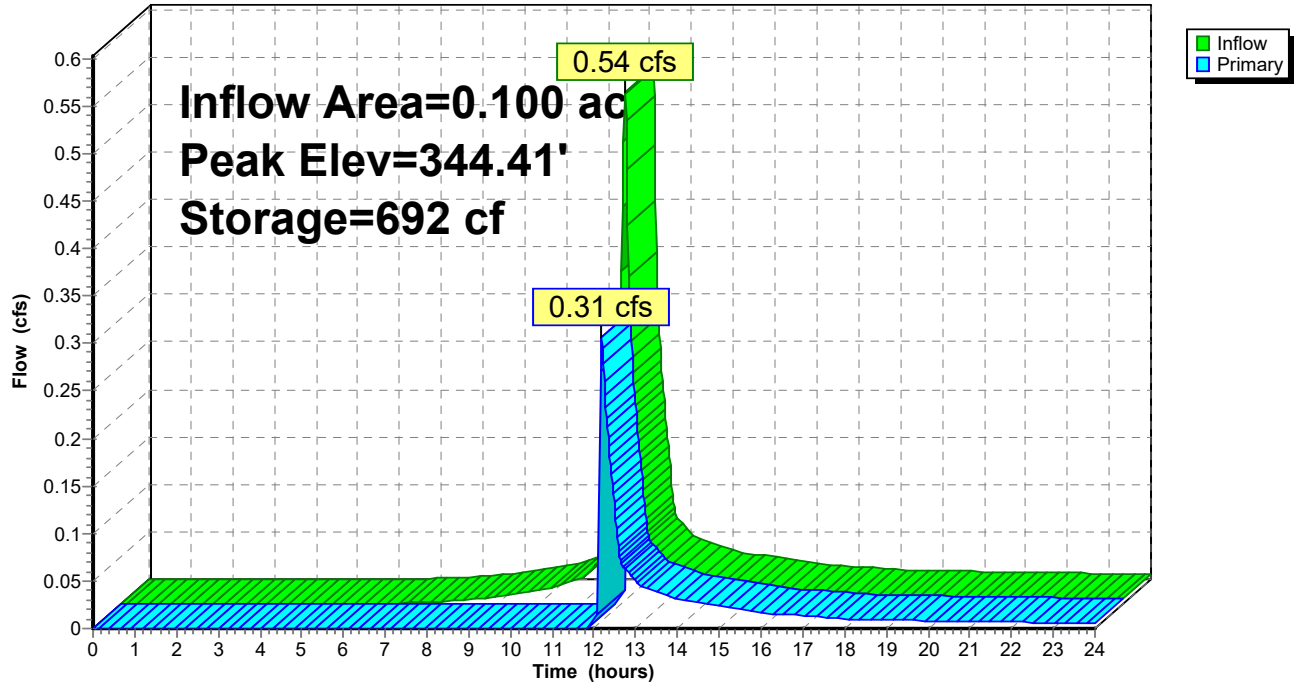
Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
342.30	0	0
342.72	78	78
343.97	465	543
344.30	114	657
344.72	133	790
345.05	222	1,012

Device	Routing	Invert	Outlet Devices
#1	Primary	344.30'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.30 cfs @ 12.19 hrs HW=344.41' (Free Discharge)
 ↑1=**Broad-Crested Rectangular Weir** (Weir Controls 0.30 cfs @ 0.92 fps)

Pond P2: Porous 2

Hydrograph



Stage-Area-Storage for Pond P2: Porous 2

Elevation (feet)	Storage (cubic-feet)
342.30	0
342.40	19
342.50	37
342.60	56
342.70	74
342.80	108
342.90	145
343.00	182
343.10	219
343.20	257
343.30	294
343.40	331
343.50	368
343.60	405
343.70	443
343.80	480
343.90	517
344.00	553
344.10	588
344.20	622
344.30	657
344.40	689
344.50	720
344.60	752
344.70	784
344.80	844
344.90	911
345.00	978

10258 hydrocad 1

Type III 24-hr 25-Year Rainfall=6.66"

Prepared by {enter your company name here}

Printed 6/24/2021

HydroCAD® 10.10-6a s/n 08721 © 2020 HydroCAD Software Solutions LLC

Page 123

Summary for Pond P3: Porous 3

Inflow Area = 0.131 ac, 21.55% Impervious, Inflow Depth > 4.77" for 25-Year event
 Inflow = 0.74 cfs @ 12.07 hrs, Volume= 0.052 af
 Outflow = 0.05 cfs @ 13.73 hrs, Volume= 0.015 af, Atten= 94%, Lag= 99.5 min
 Primary = 0.05 cfs @ 13.73 hrs, Volume= 0.015 af
 Routed to Link 4L : Junction 2

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 344.57' @ 13.73 hrs Storage= 1,627 cf

Plug-Flow detention time= 368.5 min calculated for 0.015 af (29% of inflow)
 Center-of-Mass det. time= 227.8 min (1,027.1 - 799.3)

Volume	Invert	Avail.Storage	Storage Description
#1	342.55'	2,990 cf	Custom Stage Data Listed below

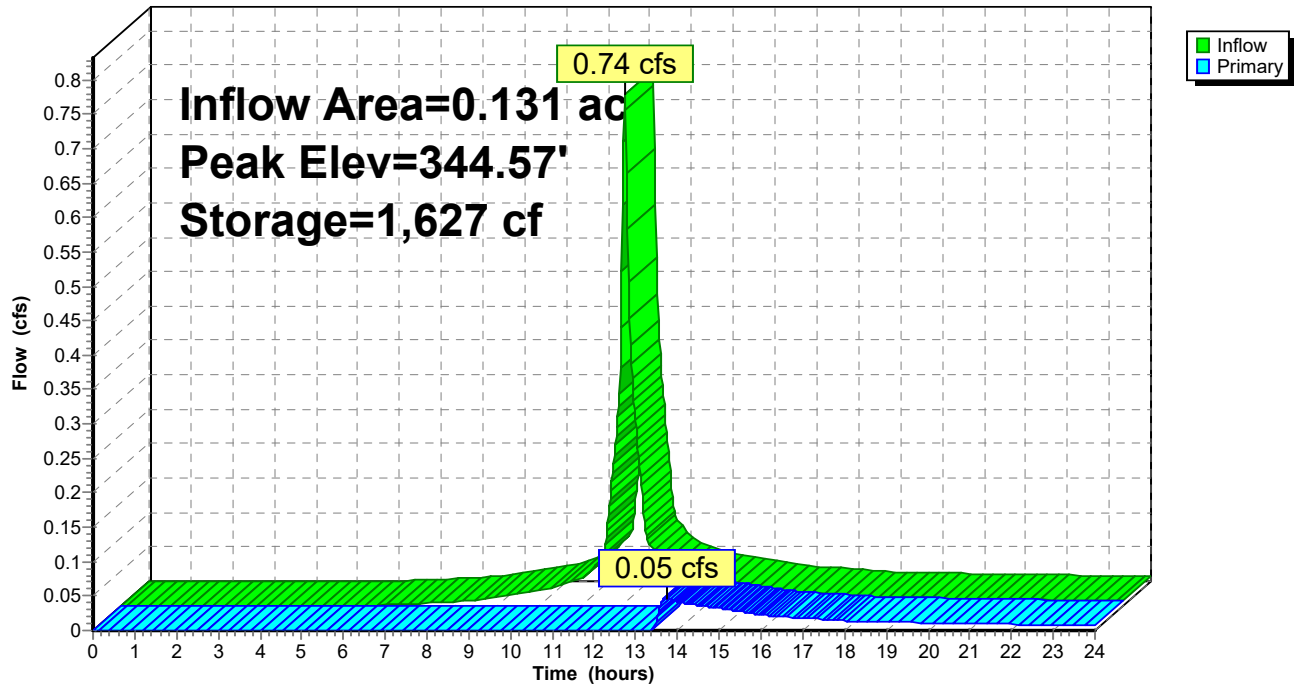
Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
342.55	0	0
343.70	656	656
344.22	594	1,250
344.55	362	1,612
345.37	663	2,275
345.70	715	2,990

Device	Routing	Invert	Outlet Devices
#1	Primary	344.55'	6.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.04 cfs @ 13.73 hrs HW=344.57' (Free Discharge)
 ↑1=**Broad-Crested Rectangular Weir** (Weir Controls 0.04 cfs @ 0.38 fps)

Pond P3: Porous 3

Hydrograph



Stage-Area-Storage for Pond P3: Porous 3

Elevation (feet)	Storage (cubic-feet)
342.55	0
342.65	57
342.75	114
342.85	171
342.95	228
343.05	285
343.15	342
343.25	399
343.35	456
343.45	513
343.55	570
343.65	627
343.75	713
343.85	827
343.95	942
344.05	1,056
344.15	1,170
344.25	1,283
344.35	1,393
344.45	1,502
344.55	1,612
344.65	1,693
344.75	1,774
344.85	1,855
344.95	1,935
345.05	2,016
345.15	2,097
345.25	2,178
345.35	2,259
345.45	2,448
345.55	2,665
345.65	2,882

10258 hydrocad 1

Type III 24-hr 25-Year Rainfall=6.66"

Prepared by {enter your company name here}

Printed 6/24/2021

HydroCAD® 10.10-6a s/n 08721 © 2020 HydroCAD Software Solutions LLC

Page 126

Summary for Pond P4: Porous 4

Inflow Area = 0.101 ac, 8.08% Impervious, Inflow Depth > 4.32" for 25-Year event
 Inflow = 0.53 cfs @ 12.07 hrs, Volume= 0.036 af
 Outflow = 0.29 cfs @ 12.19 hrs, Volume= 0.022 af, Atten= 46%, Lag= 7.1 min
 Primary = 0.29 cfs @ 12.19 hrs, Volume= 0.022 af
 Routed to Link 4L : Junction 2

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 345.11' @ 12.19 hrs Storage= 666 cf

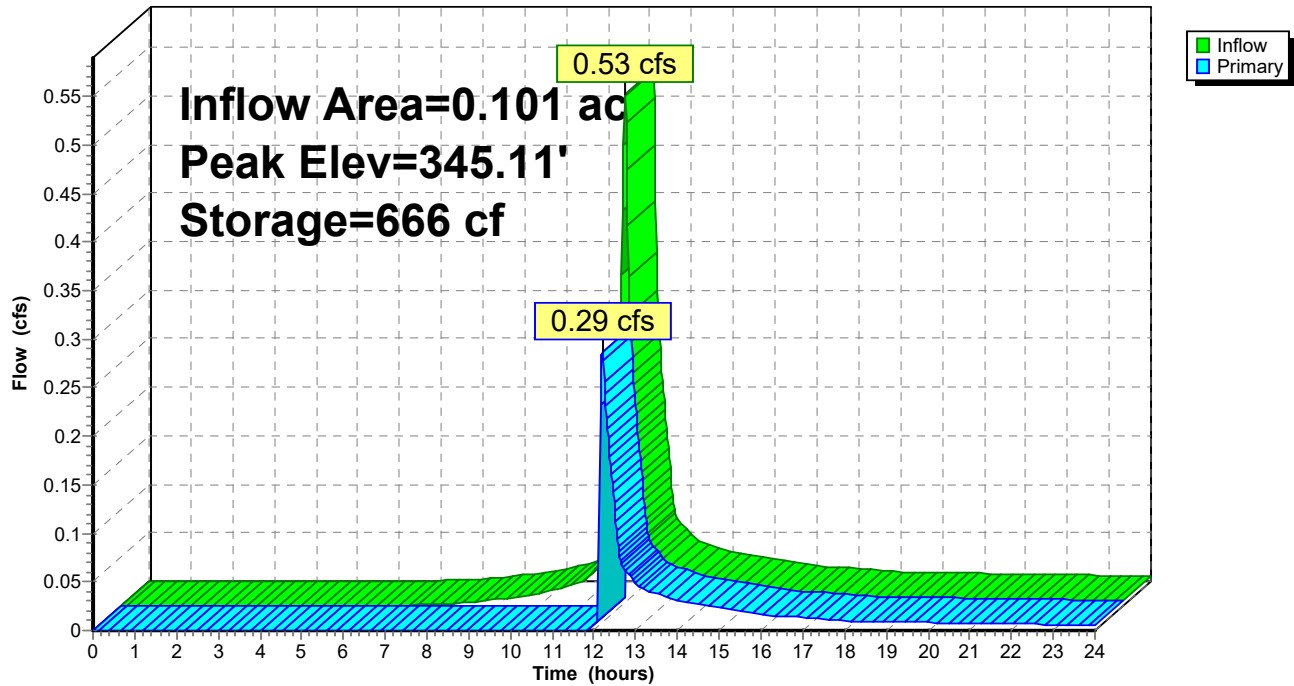
Plug-Flow detention time= 187.2 min calculated for 0.022 af (60% of inflow)
 Center-of-Mass det. time= 82.9 min (892.6 - 809.7)

Volume	Invert	Avail.Storage	Storage Description
#1	343.00'	977 cf	Custom Stage Data Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
343.00	0	0
343.70	136	136
344.67	376	512
345.00	119	631
345.37	122	753
345.70	224	977

Device	Routing	Invert	Outlet Devices
#1	Primary	345.00'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.28 cfs @ 12.19 hrs HW=345.10' (Free Discharge)
 ↑1=Broad-Crested Rectangular Weir (Weir Controls 0.28 cfs @ 0.91 fps)

Pond P4: Porous 4**Hydrograph**

Stage-Area-Storage for Pond P4: Porous 4

Elevation (feet)	Storage (cubic-feet)
343.00	0
343.10	19
343.20	39
343.30	58
343.40	78
343.50	97
343.60	117
343.70	136
343.80	175
343.90	214
344.00	252
344.10	291
344.20	330
344.30	369
344.40	407
344.50	446
344.60	485
344.70	523
344.80	559
344.90	595
345.00	631
345.10	664
345.20	697
345.30	730
345.40	773
345.50	841
345.60	909
345.70	977

Summary for Pond P5: Porous 5

Inflow Area = 0.301 ac, 6.53% Impervious, Inflow Depth > 4.50" for 25-Year event
 Inflow = 1.62 cfs @ 12.07 hrs, Volume= 0.113 af
 Outflow = 1.61 cfs @ 12.08 hrs, Volume= 0.092 af, Atten= 1%, Lag= 0.2 min
 Primary = 1.61 cfs @ 12.08 hrs, Volume= 0.092 af
 Routed to Link 5L : East

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 343.94' @ 12.08 hrs Storage= 944 cf

Plug-Flow detention time= 110.1 min calculated for 0.092 af (81% of inflow)
 Center-of-Mass det. time= 37.7 min (843.5 - 805.8)

Volume	Invert	Avail.Storage	Storage Description
#1	341.90'	1,064 cf	Custom Stage Data Listed below

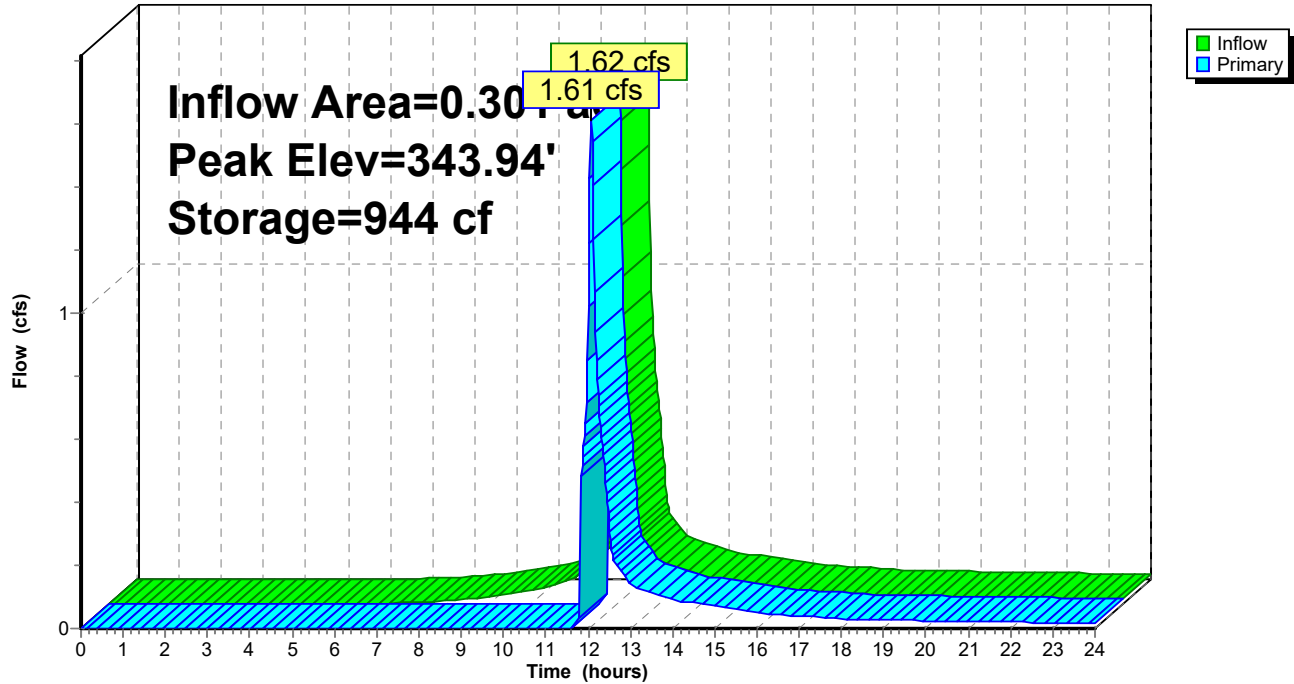
Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
341.90	0	0
342.10	52	52
343.57	762	814
343.77	73	887
343.90	27	914
344.10	150	1,064

Device	Routing	Invert	Outlet Devices
#1	Primary	343.90'	72.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.57 cfs @ 12.08 hrs HW=343.94' (Free Discharge)
 ↑1=Broad-Crested Rectangular Weir (Weir Controls 1.57 cfs @ 0.55 fps)

Pond P5: Porous 5

Hydrograph



Stage-Area-Storage for Pond P5: Porous 5

Elevation (feet)	Storage (cubic-feet)
341.90	0
342.00	26
342.10	52
342.20	104
342.30	156
342.40	208
342.50	259
342.60	311
342.70	363
342.80	415
342.90	467
343.00	519
343.10	570
343.20	622
343.30	674
343.40	726
343.50	778
343.60	825
343.70	861
343.80	893
343.90	914
344.00	989
344.10	1,064

Summary for Pond P6: Porous 6

Inflow Area = 0.260 ac, 2.38% Impervious, Inflow Depth > 4.62" for 25-Year event
 Inflow = 1.44 cfs @ 12.07 hrs, Volume= 0.100 af
 Outflow = 1.17 cfs @ 12.14 hrs, Volume= 0.061 af, Atten= 19%, Lag= 4.1 min
 Primary = 1.17 cfs @ 12.14 hrs, Volume= 0.061 af
 Routed to Link 6L : West

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 343.05' @ 12.14 hrs Storage= 1,758 cf

Plug-Flow detention time= 182.6 min calculated for 0.061 af (61% of inflow)
 Center-of-Mass det. time= 80.2 min (883.2 - 803.0)

Volume	Invert	Avail.Storage	Storage Description
#1	341.00'	2,870 cf	Custom Stage Data Listed below

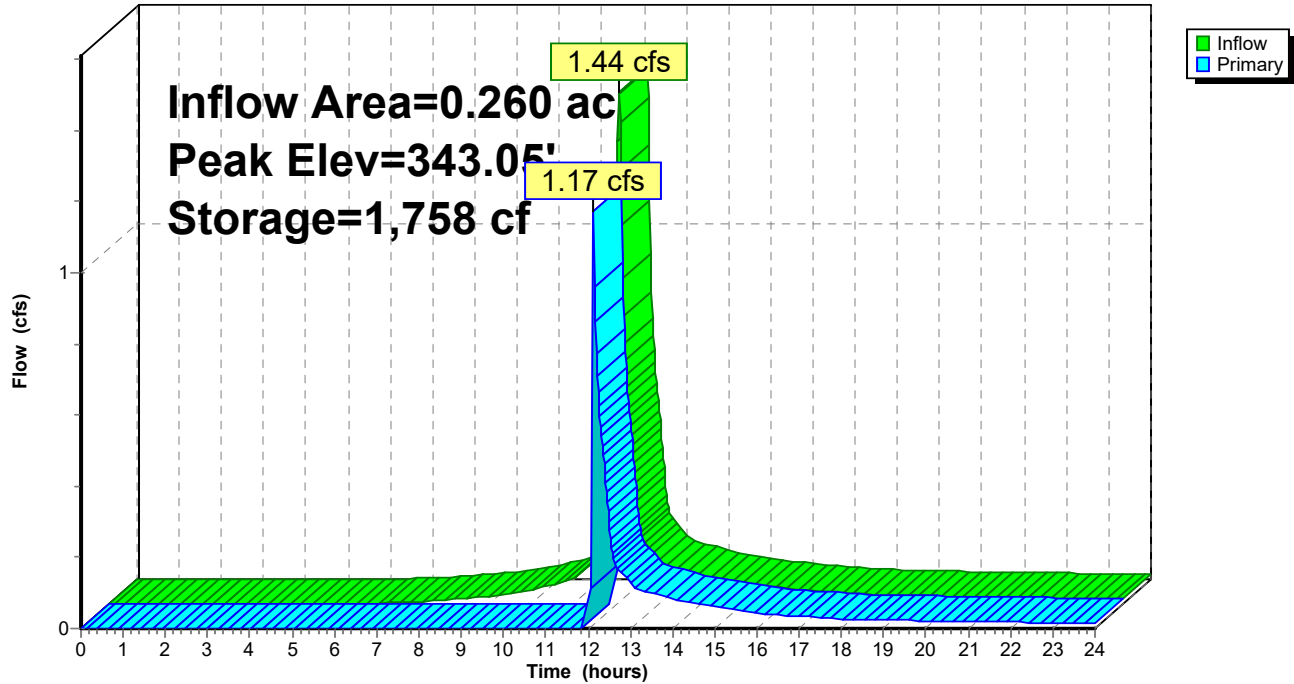
Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
341.00	0	0
341.80	436	436
342.67	949	1,385
343.00	326	1,711
343.47	453	2,164
343.80	706	2,870

Device	Routing	Invert	Outlet Devices
#1	Primary	343.00'	38.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.14 cfs @ 12.14 hrs HW=343.05' (Free Discharge)
 ↑1=Broad-Crested Rectangular Weir (Weir Controls 1.14 cfs @ 0.62 fps)

Pond P6: Porous 6

Hydrograph



Stage-Area-Storage for Pond P6: Porous 6

Elevation (feet)	Storage (cubic-feet)
341.00	0
341.10	55
341.20	109
341.30	164
341.40	218
341.50	272
341.60	327
341.70	381
341.80	436
341.90	545
342.00	654
342.10	763
342.20	872
342.30	981
342.40	1,090
342.50	1,200
342.60	1,309
342.70	1,415
342.80	1,513
342.90	1,612
343.00	1,711
343.10	1,807
343.20	1,904
343.30	2,000
343.40	2,097
343.50	2,228
343.60	2,442
343.70	2,656
343.80	2,870

10258 hydrocad 1

Type III 24-hr 25-Year Rainfall=6.66"

Prepared by {enter your company name here}

Printed 6/24/2021

HydroCAD® 10.10-6a s/n 08721 © 2020 HydroCAD Software Solutions LLC

Page 135

Summary for Pond P7: Porous 7

Inflow Area = 0.261 ac, 7.35% Impervious, Inflow Depth > 3.73" for 25-Year event
 Inflow = 1.18 cfs @ 12.08 hrs, Volume= 0.081 af
 Outflow = 1.18 cfs @ 12.08 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.2 min
 Primary = 1.18 cfs @ 12.08 hrs, Volume= 0.071 af
 Routed to Link 6L : West

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 342.26' @ 12.08 hrs Storage= 474 cf

Plug-Flow detention time= 81.8 min calculated for 0.071 af (87% of inflow)
 Center-of-Mass det. time= 24.9 min (847.8 - 822.9)

Volume	Invert	Avail.Storage	Storage Description
#1	340.10'	726 cf	Custom Stage Data Listed below

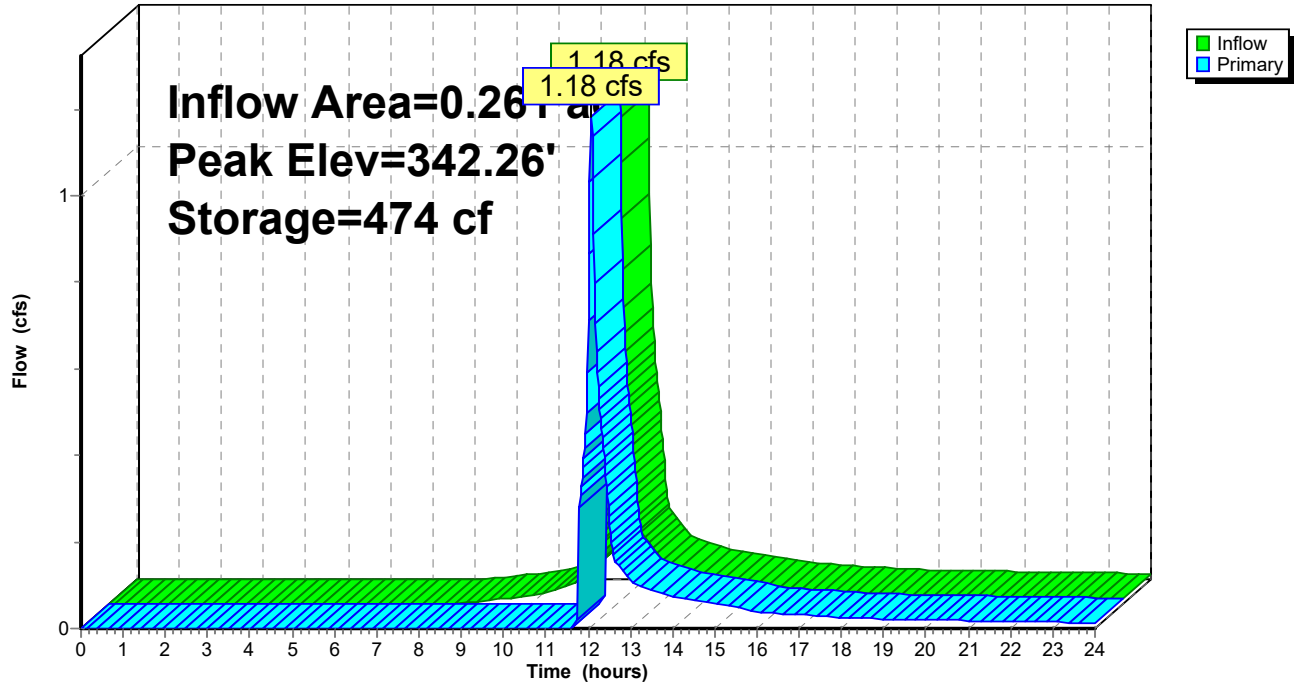
Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
340.10	0	0
341.00	129	129
341.77	220	349
342.10	91	440
342.67	119	559
343.00	167	726

Device	Routing	Invert	Outlet Devices
#1	Primary	342.10'	Asymmetrical Weir, C= 3.27 Offset (feet) 0.00 4.60 16.60 Height (feet) 0.20 0.00 0.20

Primary OutFlow Max=1.17 cfs @ 12.08 hrs HW=342.26' (Free Discharge)
 ↑1=Asymmetrical Weir (Weir Controls 1.17 cfs @ 0.53 fps)

Pond P7: Porous 7

Hydrograph



Stage-Area-Storage for Pond P7: Porous 7

Elevation (feet)	Storage (cubic-feet)
340.10	0
340.20	14
340.30	29
340.40	43
340.50	57
340.60	72
340.70	86
340.80	100
340.90	115
341.00	129
341.10	158
341.20	186
341.30	215
341.40	243
341.50	272
341.60	300
341.70	329
341.80	357
341.90	385
342.00	412
342.10	440
342.20	461
342.30	482
342.40	503
342.50	524
342.60	544
342.70	574
342.80	625
342.90	675
343.00	726

Summary for Pond P8: Porous 8

Inflow Area = 0.114 ac, 15.40% Impervious, Inflow Depth > 4.75" for 25-Year event
 Inflow = 0.64 cfs @ 12.07 hrs, Volume= 0.045 af
 Outflow = 0.39 cfs @ 12.17 hrs, Volume= 0.040 af, Atten= 39%, Lag= 5.7 min
 Primary = 0.39 cfs @ 12.17 hrs, Volume= 0.040 af
 Routed to Link 6L : West

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
 Peak Elev= 345.42' @ 12.17 hrs Storage= 556 cf

Plug-Flow detention time= 97.5 min calculated for 0.040 af (89% of inflow)
 Center-of-Mass det. time= 45.8 min (845.6 - 799.8)

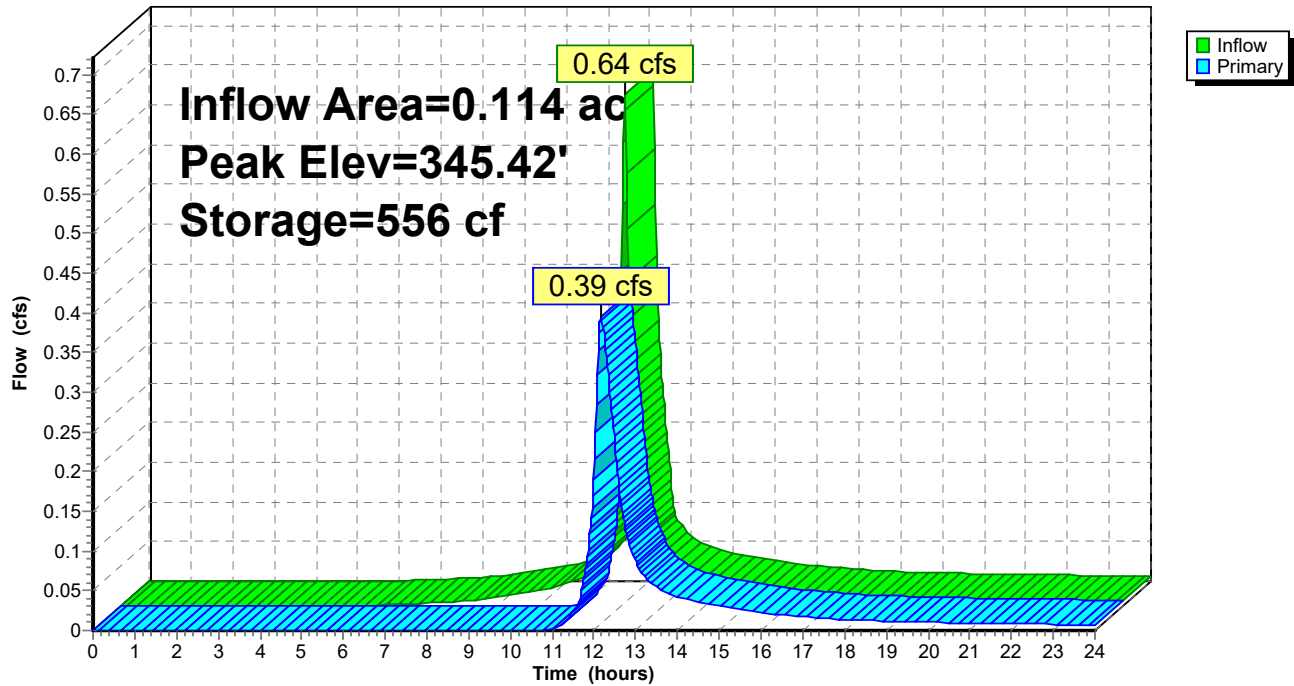
Volume	Invert	Avail.Storage	Storage Description
#1	344.80'	2,067 cf	Custom Stage Data Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
344.80	0	0
346.03	1,095	1,095
346.20	170	1,265
346.38	170	1,435
346.45	53	1,488
346.55	60	1,548
346.80	519	2,067

Device	Routing	Invert	Outlet Devices
#1	Primary	345.00'	6.0" Round Culvert L= 21.0' Ke= 0.500 Inlet / Outlet Invert= 345.00' / 344.50' S= 0.0238 ' S= 0.0238 ' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#2	Primary	346.50'	Asymmetrical Weir, C= 3.27 Offset (feet) 0.00 0.01 18.95 Height (feet) 1.30 0.00 1.30

Primary OutFlow Max=0.39 cfs @ 12.17 hrs HW=345.42' (Free Discharge)

↑ **1=Culvert** (Inlet Controls 0.39 cfs @ 2.22 fps)
 ↓ **2=Asymmetrical Weir** (Controls 0.00 cfs)

Pond P8: Porous 8**Hydrograph**

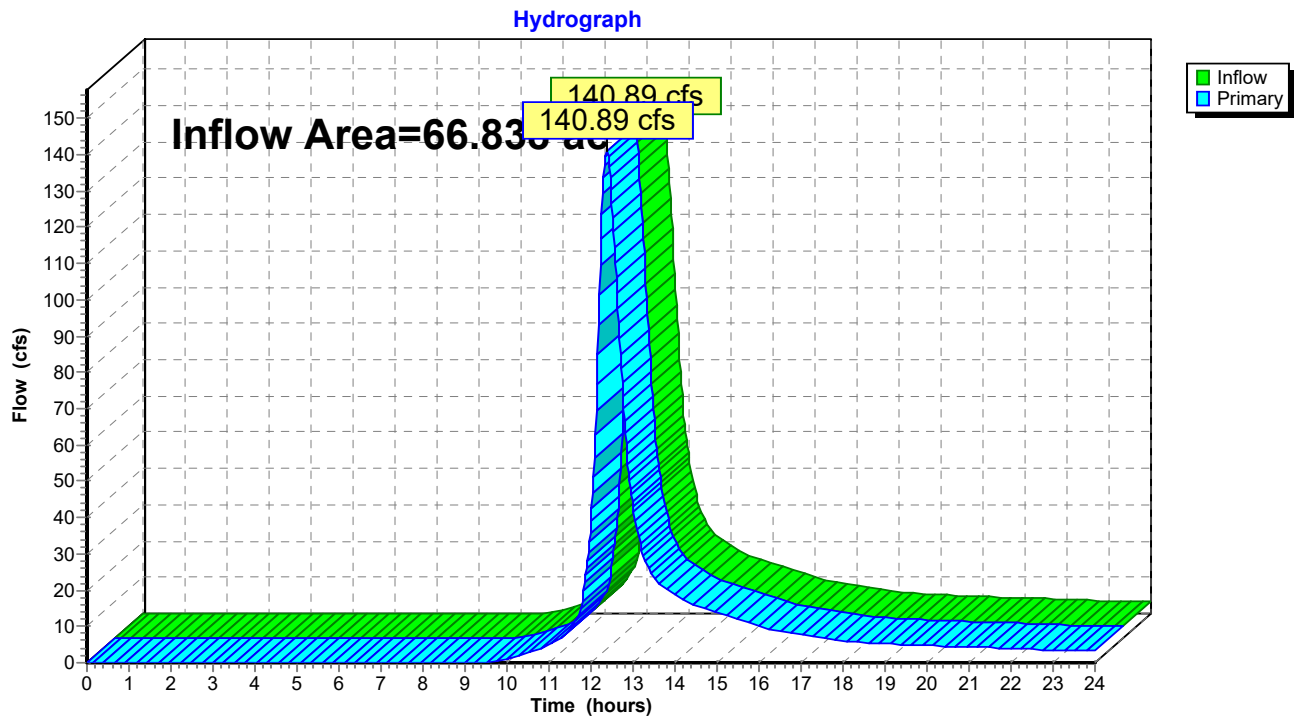
Stage-Area-Storage for Pond P8: Porous 8

Elevation (feet)	Storage (cubic-feet)
344.80	0
344.90	89
345.00	178
345.10	267
345.20	356
345.30	445
345.40	534
345.50	623
345.60	712
345.70	801
345.80	890
345.90	979
346.00	1,068
346.10	1,165
346.20	1,265
346.30	1,359
346.40	1,450
346.50	1,518
346.60	1,652
346.70	1,859
346.80	2,067
346.90	2,067
347.00	2,067
347.10	2,067
347.20	2,067
347.30	2,067
347.40	2,067
347.50	2,067
347.60	2,067
347.70	2,067
347.80	2,067

Summary for Link 1L: Out Existing

Inflow Area = 66.838 ac, 18.45% Impervious, Inflow Depth > 3.01" for 25-Year event
Inflow = 140.89 cfs @ 12.38 hrs, Volume= 16.766 af
Primary = 140.89 cfs @ 12.38 hrs, Volume= 16.766 af, Atten= 0%, Lag= 0.0 min

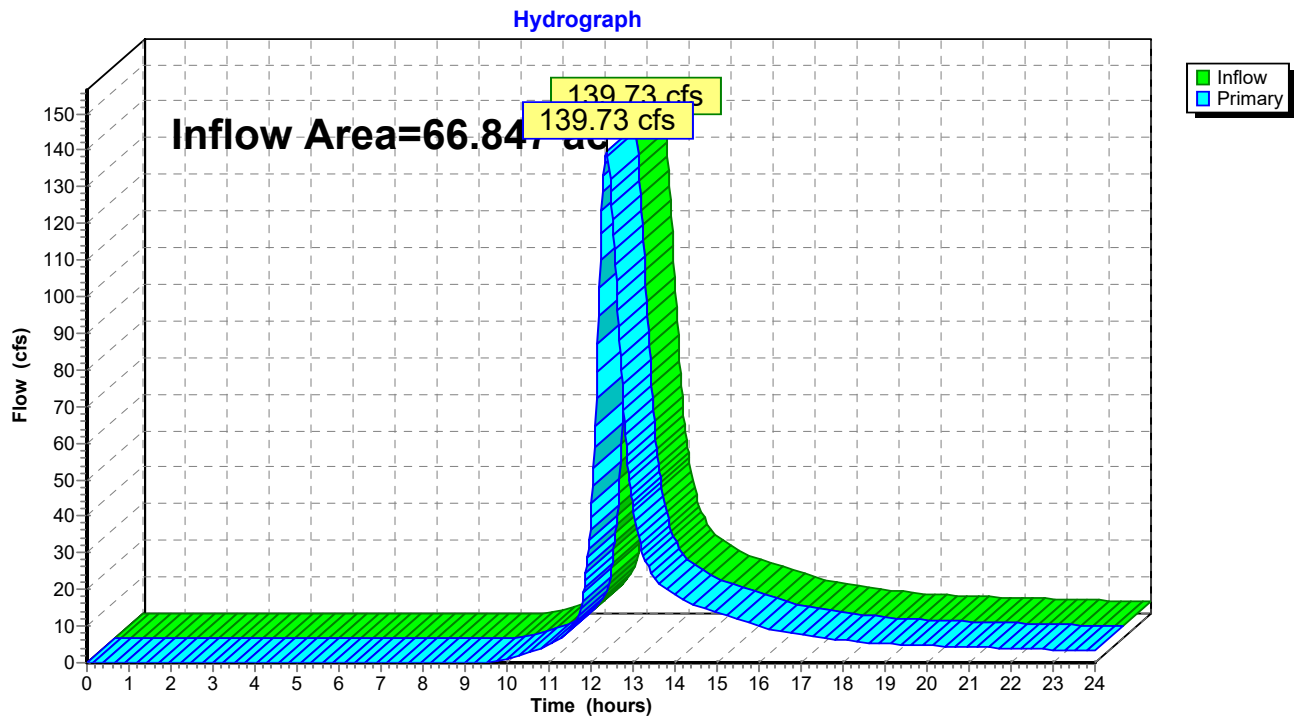
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Link 1L: Out Existing

Summary for Link 2L: Out Proposed

Inflow Area = 66.847 ac, 17.86% Impervious, Inflow Depth > 3.00" for 25-Year event
Inflow = 139.73 cfs @ 12.37 hrs, Volume= 16.716 af
Primary = 139.73 cfs @ 12.37 hrs, Volume= 16.716 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Link 2L: Out Proposed

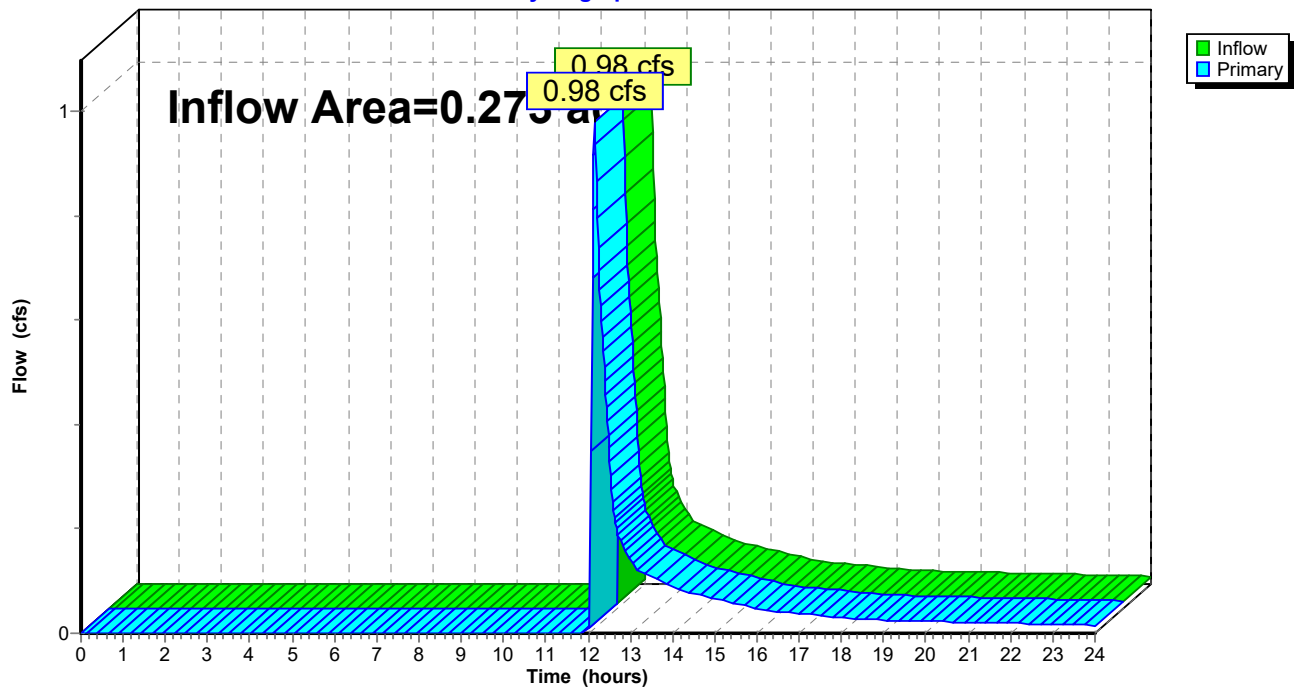
Summary for Link 3L: Junction 1

Inflow Area = 0.273 ac, 12.03% Impervious, Inflow Depth > 2.96" for 25-Year event
Inflow = 0.98 cfs @ 12.16 hrs, Volume= 0.067 af
Primary = 0.98 cfs @ 12.16 hrs, Volume= 0.067 af, Atten= 0%, Lag= 0.0 min
Routed to Link 5L : East

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Link 3L: Junction 1

Hydrograph



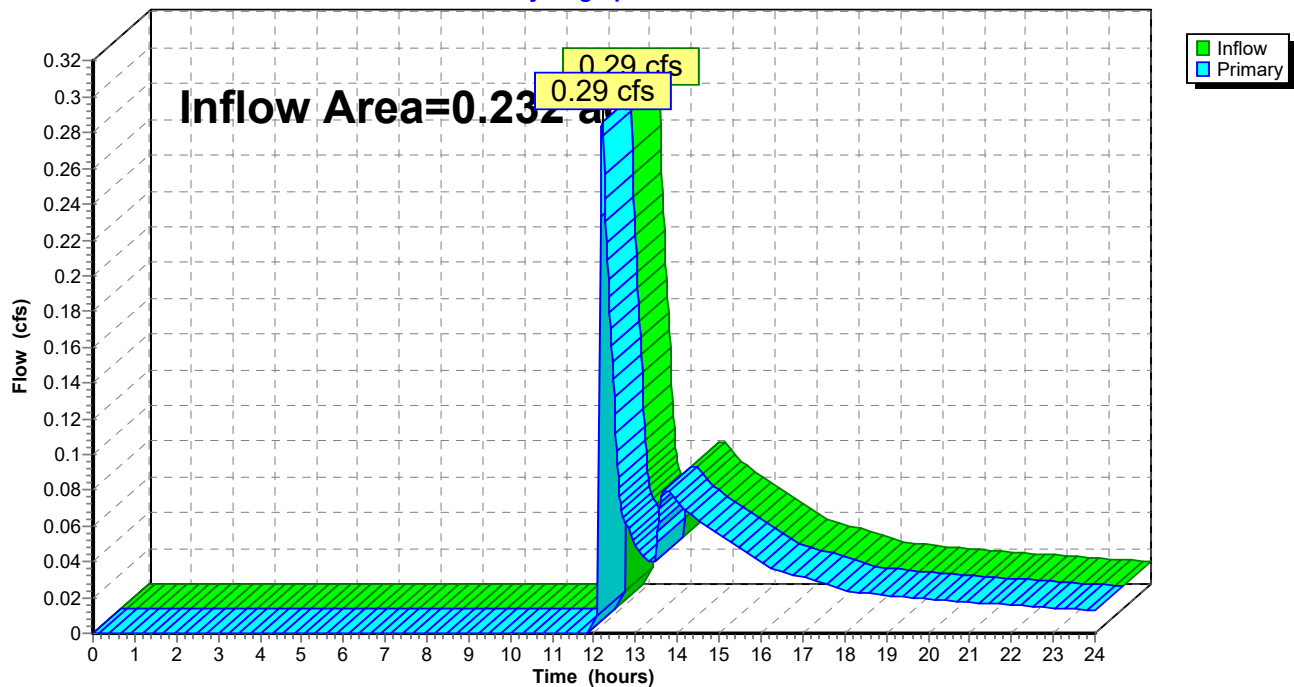
Summary for Link 4L: Junction 2

Inflow Area = 0.232 ac, 15.68% Impervious, Inflow Depth > 1.91" for 25-Year event
Inflow = 0.29 cfs @ 12.19 hrs, Volume= 0.037 af
Primary = 0.29 cfs @ 12.19 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min
Routed to Link 5L : East

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Link 4L: Junction 2

Hydrograph



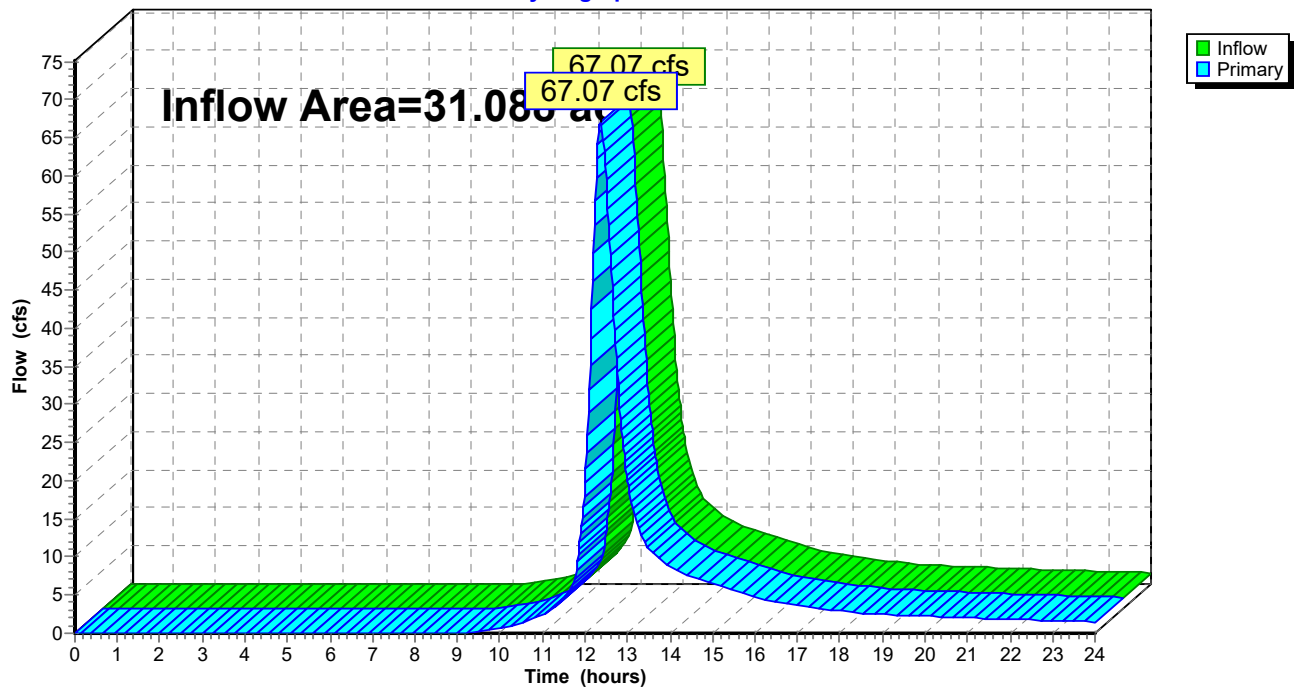
Summary for Link 5L: East

Inflow Area = 31.088 ac, 23.45% Impervious, Inflow Depth > 3.08" for 25-Year event
Inflow = 67.07 cfs @ 12.37 hrs, Volume= 7.992 af
Primary = 67.07 cfs @ 12.37 hrs, Volume= 7.992 af, Atten= 0%, Lag= 0.0 min
Routed to Link 2L : Out Proposed

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Link 5L: East

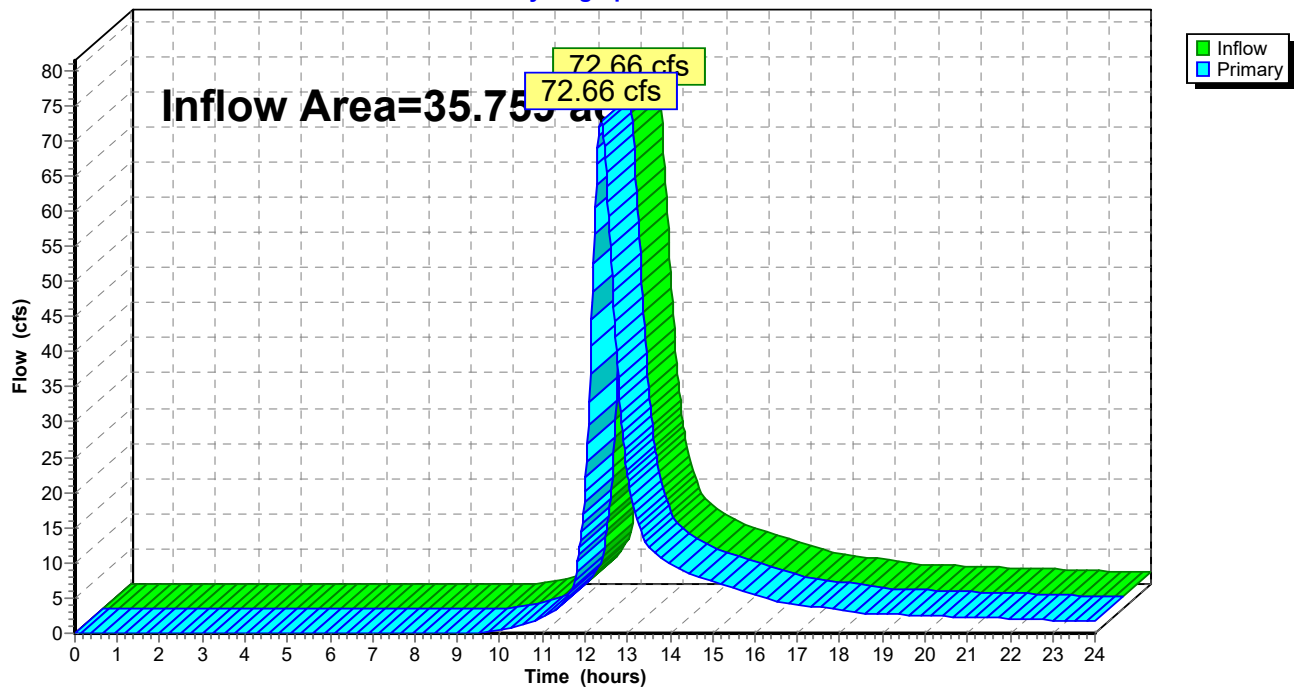
Hydrograph



Summary for Link 6L: West

Inflow Area = 35.759 ac, 13.01% Impervious, Inflow Depth > 2.93" for 25-Year event
Inflow = 72.66 cfs @ 12.38 hrs, Volume= 8.724 af
Primary = 72.66 cfs @ 12.38 hrs, Volume= 8.724 af, Atten= 0%, Lag= 0.0 min
Routed to Link 2L : Out Proposed

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Link 6L: West**Hydrograph**

10258 hydrocad 1

Type III 24-hr 100-Year Rainfall=8.49"

Prepared by {enter your company name here}

Printed 6/24/2021

HydroCAD® 10.10-6a s/n 08721 © 2020 HydroCAD Software Solutions LLC

Page 147

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1C: West Basin	Runoff Area=35.707 ac 13.87% Impervious Runoff Depth>4.41" Flow Length=985' Tc=26.4 min CN=66.2 Runoff=111.02 cfs 13.127 af
Subcatchment2C: East Basin	Runoff Area=31.131 ac 23.71% Impervious Runoff Depth>4.59" Flow Length=499' Tc=26.1 min CN=67.7 Runoff=101.19 cfs 11.906 af
Subcatchment3C: Porous 6	Runoff Area=11,337 sf 2.38% Impervious Runoff Depth>6.35" Tc=5.0 min CN=82.2 Runoff=1.95 cfs 0.138 af
Subcatchment4C: Porous 7	Runoff Area=11,373 sf 7.35% Impervious Runoff Depth>5.35" Tc=5.0 min CN=73.9 Runoff=1.69 cfs 0.116 af
Subcatchment5C: Porous 8	Runoff Area=4,967 sf 15.40% Impervious Runoff Depth>6.49" Tc=5.0 min CN=83.4 Runoff=0.87 cfs 0.062 af
Subcatchment6C: West Bypass	Runoff Area=35.124 ac 13.12% Impervious Runoff Depth>4.39" Flow Length=985' Tc=26.4 min CN=66.0 Runoff=108.60 cfs 12.843 af
Subcatchment7C: East Bypass	Runoff Area=30.282 ac 23.78% Impervious Runoff Depth>4.59" Flow Length=499' Tc=26.1 min CN=67.7 Runoff=98.43 cfs 11.582 af
Subcatchment8C: Porous 1	Runoff Area=7,524 sf 9.04% Impervious Runoff Depth>6.53" Tc=5.0 min CN=83.7 Runoff=1.32 cfs 0.094 af
Subcatchment9C: Porous 2	Runoff Area=4,365 sf 17.18% Impervious Runoff Depth>6.19" Tc=5.0 min CN=80.9 Runoff=0.74 cfs 0.052 af
Subcatchment10C: Porous 3	Runoff Area=5,707 sf 21.55% Impervious Runoff Depth>6.51" Tc=5.0 min CN=83.6 Runoff=1.00 cfs 0.071 af
Subcatchment11C: Porous 4	Runoff Area=4,406 sf 8.08% Impervious Runoff Depth>6.02" Tc=5.0 min CN=79.5 Runoff=0.73 cfs 0.051 af
Subcatchment12C: Porous 5	Runoff Area=13,103 sf 6.53% Impervious Runoff Depth>6.21" Tc=5.0 min CN=81.1 Runoff=2.21 cfs 0.156 af
Pond P1: Porous 1	Peak Elev=344.91' Storage=1,179 cf Inflow=1.32 cfs 0.094 af Outflow=1.29 cfs 0.070 af
Pond P2: Porous 2	Peak Elev=344.49' Storage=718 cf Inflow=0.74 cfs 0.052 af Outflow=0.72 cfs 0.037 af
Pond P3: Porous 3	Peak Elev=344.62' Storage=1,672 cf Inflow=1.00 cfs 0.071 af Outflow=0.34 cfs 0.034 af
Pond P4: Porous 4	Peak Elev=345.19' Storage=694 cf Inflow=0.73 cfs 0.051 af Outflow=0.70 cfs 0.036 af

10258 hydrocad 1*Type III 24-hr 100-Year Rainfall=8.49"*

Prepared by {enter your company name here}

Printed 6/24/2021

HydroCAD® 10.10-6a s/n 08721 © 2020 HydroCAD Software Solutions LLC

Page 148

Pond P5: Porous 5	Peak Elev=343.95' Storage=951 cf Inflow=2.21 cfs 0.156 af Outflow=2.20 cfs 0.135 af
Pond P6: Porous 6	Peak Elev=343.07' Storage=1,778 cf Inflow=1.95 cfs 0.138 af Outflow=1.94 cfs 0.098 af
Pond P7: Porous 7	Peak Elev=342.29' Storage=479 cf Inflow=1.69 cfs 0.116 af Outflow=1.69 cfs 0.106 af
Pond P8: Porous 8	Peak Elev=345.55' Storage=665 cf Inflow=0.87 cfs 0.062 af Outflow=0.51 cfs 0.057 af
Link 1L: Out Existing	Inflow=212.20 cfs 25.033 af Primary=212.20 cfs 25.033 af
Link 2L: Out Proposed	Inflow=210.65 cfs 24.997 af Primary=210.65 cfs 24.997 af
Link 3L: Junction 1	Inflow=2.01 cfs 0.107 af Primary=2.01 cfs 0.107 af
Link 4L: Junction 2	Inflow=0.70 cfs 0.070 af Primary=0.70 cfs 0.070 af
Link 5L: East	Inflow=100.42 cfs 11.893 af Primary=100.42 cfs 11.893 af
Link 6L: West	Inflow=110.23 cfs 13.104 af Primary=110.23 cfs 13.104 af

Total Runoff Area = 133.685 ac Runoff Volume = 50.196 af Average Runoff Depth = 4.51"
81.84% Pervious = 109.411 ac 18.16% Impervious = 24.274 ac

HYDRAULIC DATA FOR RATIONAL METHOD

Project: *Connecituct Humane Society*

Project #: *10258*

Date: *7/1/2021*

Location: *863 Danbury Road, Wilton, CT*

By: *VJH*

Checked: *CJF*

Drainage Basin	Basin Description				Drainage Path				Time (min)	25-yr. Rainfall Intensity (in/hr)	Q = ACI (cfs)
	Acres	C	Description	AC	Length (ft)	ΔH	Slope (%)	Description			
Existing to CB#1	0.62	0.95	Impervious	0.59							
	0.96	0.30	Pervious	0.29							
	1.58		Total	0.88	N/A	N/A	N/A	Pavement	5	8.6	7.55
Proposed to CB#1	0.48	0.95	Impervious	0.45							
	0.61	0.30	Pervious	0.18							
	1.08		Total	0.63	N/A	N/A	N/A	Pavement	5	8.6	5.45
Existing to MH#1	6.45	0.95	Impervious	6.13							
	21.39	0.30	Pervious	6.42							
	27.85		Total	12.55	N/A	N/A	N/A	Pavement	5	3.7	46.43
Proposed to MH#1	6.45	0.95	Impervious	6.13							
	21.39	0.30	Pervious	6.42							
	27.85		Total	12.55	N/A	N/A	N/A	Pavement	5	3.7	46.43

HYDRAULIC DATA FOR RATIONAL METHOD

Project:	<i>Connecticut Humane Society</i>	Project #: 10258	Date: 7/1/2021
Location:	<i>863 Danbury Road, Wilton, CT</i>	By: VJH	Checked: CJF

Pipe Capacity Calculations

25-Year Storm

Pipe from EX.CB#1 to EX.MH#1	Existing Q in system (cfs)	Pipe Size (in)	Pipe Length (ft)	Roughness coefficient	Material	Slope (ft/ft)	Q _{full} (cfs)	Q _{system} / Q _{full} (%)
	7.55 (Note 1)	12	6	0.013	RCP	0.0017	1.47	512.6%
	Proposed Q in system (cfs)	Pipe Size (in)	Pipe Length (ft)	Roughness coefficient	Material	Slope (ft/ft)	Q _{full} (cfs)	Q _{system} / Q _{full} (%)
	6.63 (Note 2)	12	6	0.013	RCP	0.0017	1.47	450.1%
Pipe from EXMH#1 to EX.MH#2	Existing Q in system (cfs)	Pipe Size (in)	Pipe Length (ft)	Roughness coefficient	Material	Slope (ft/ft)	Q _{full} (cfs)	Q _{system} / Q _{full} (%)
	53.98 (Note 1)	24	228	0.013	RCP	0.0020	10.14	532.1%
	Proposed Q in system (cfs)	Pipe Size (in)	Pipe Length (ft)	Roughness coefficient	Material	Slope (ft/ft)	Q _{full} (cfs)	Q _{system} / Q _{full} (%)
	53.06 (Note 2)	24	228	0.013	RCP	0.0020	10.14	523.1%

Note 1: Flow is equal to the tributary on-site and off-site flow (refer to Rational Method calculation for further information)

Note 2: Flow is equal to the tributary on-site and off-site flow plus the 25-year storm discharge from Porous Basins 1, 2, and 3 (refer to Rational Method calculation and hydrocad report for further information).

Appendix 3

Water Quality Volume Calculations

Project: <i>Connecticut Humane Society</i>	Project #: <i>10258</i>	Date: <i>7/1/2021</i>
Location: <i>863 Danbury Road, Wilton, CT</i>	By: <i>VJH</i>	Checked: <i>CJF</i>

Porous 1 and 2

Porous 1

Area=	0.173	acres	7,523	ft. ²
Impervious Area=	0.148	acres		
I=	0.855	^a		
R=	0.820	^b		
WQV=	0.012	ac. ft. ^c		

WQV=	515 ft.³
-------------	----------------------------

Note: The high overflow elevation within Porous 1 is set at 344.70. The water quality volume provided below the high overflow is 1,007 cf. This volume is filtered through porous asphalt, bedding stone, and a crushed stone reservoir prior to flowing out of the system via exfiltration or the high overflow.

Porous 2

Area=	0.100	acres	4,364	ft. ²
Impervious Area=	0.071	acres		
I=	0.710	^a		
R=	0.689	^b		
WQV=	0.006	ac. ft. ^c		

WQV=	250 ft.³
-------------	----------------------------

Note: The high overflow elevation within Porous 2 is set at 344.30. The water quality volume provided below the high overflow is 657 cf. This volume is filtered through porous asphalt, bedding stone, and a crushed stone reservoir prior to flowing out of the system via exfiltration or the high overflow.

^a I=Percent Impervious Coverage

^b R=0.05+0.009(I); Volumetric runoff Coefficient, Equation taken from 2004 Connecticut Stormwater Quality Manual section 7.4.1

^c WQV=(1"xRxA)/12; Water Quality Volume, Equation taken from 2004 Connecticut Stormwater Quality Manual section 7.4.1

Water Quality Volume Calculations

Project: <i>Connecticut Humane Society</i>	Project #: <i>10258</i>	Date: <i>7/1/2021</i>
Location: <i>863 Danbury Road, Wilton, CT</i>	By: <i>VJH</i>	Checked: <i>CJF</i>

Porous 3 and 4

Porous 3

Area=	0.131	acres	5,707	ft. ²
Impervious Area=	0.096	acres		
I=	0.733	^a		
R=	0.710	^b		
WQV=	0.008	ac. ft. ^c		

WQV=	337 ft.³
-------------	----------------------------

Note: The high overflow elevation within Porous 3 is set at 344.55. The water quality volume provided below the high overflow is 1,612 cf. This volume is filtered through porous asphalt or permeable pavers, bedding stone, and a crushed stone reservoir prior to flowing out of the system via exfiltration or the high overflow.

Porous 4

Area=	0.101	acres	4,406	ft. ²
Impervious Area=	0.064	acres		
I=	0.634	^a		
R=	0.620	^b		
WQV=	0.005	ac. ft. ^c		

WQV=	227 ft.³
-------------	----------------------------

Note: The high overflow elevation within Porous 4 is set at 345.00. The water quality volume provided below the high overflow is 631 cf. This volume is filtered through porous asphalt, bedding stone, and a crushed stone reservoir prior to flowing out of the system via exfiltration or the high overflow.

^a I=Percent Impervious Coverage

^b R=0.05+0.009(I); Volumetric runoff Coefficient, Equation taken from 2004 Connecticut Stormwater Quality Manual section 7.4.1

^c WQV=(1"xRxA)/12; Water Quality Volume, Equation taken from 2004 Connecticut Stormwater Quality Manual section 7.4.1

Water Quality Volume Calculations

Project: <i>Connecticut Humane Society</i>	Project #: 10258	Date: 7/1/2021
Location: 863 Danbury Road, Wilton, CT	By: VJH	Checked: CJF

Porous 5 and 6

Porous 5

Area=	0.301	acres	13,103	ft. ²
Impervious Area=	0.210	acres		
I=	0.698	^a		
R=	0.678	^b		
WQV=	0.017	ac. ft. ^c		

WQV=	741 ft.³
-------------	----------------------------

Note: The high overflow elevation within Porous 5 is set at 343.90. The water quality volume provided below the high overflow is 913 cf. This volume is filtered through porous asphalt, bedding stone, and a crushed stone reservoir prior to flowing out of the system via exfiltration or the high overflow.

Porous 6

Area=	0.260	acres	11,337	ft. ²
Impervious Area=	0.195	acres		
I=	0.750	^a		
R=	0.725	^b		
WQV=	0.016	ac. ft. ^c		

WQV=	684 ft.³
-------------	----------------------------

Note: The high overflow elevation within Porous 6 is set at 343.00. The water quality volume provided below the high overflow is 1,711 cf. This volume is filtered through porous asphalt, bedding stone, and a crushed stone reservoir prior to flowing out of the system via exfiltration or the high overflow.

^a I=Percent Impervious Coverage

^b R=0.05+0.009(I); Volumetric runoff Coefficient, Equation taken from 2004 Connecticut Stormwater Quality Manual section 7.4.1

^c WQV=(1"xRxA)/12; Water Quality Volume, Equation taken from 2004 Connecticut Stormwater Quality Manual section 7.4.1

Water Quality Volume Calculations

Project: <i>Connecticut Humane Society</i>	Project #: <i>10258</i>	Date: <i>7/1/2021</i>
Location: <i>863 Danbury Road, Wilton, CT</i>	By: <i>VJH</i>	Checked: <i>CJF</i>

Porous 7 and 8

Porous 7

Area=	0.261	acres	11,373	ft. ²
Impervious Area=	0.114	acres		
I=	0.437	^a		
R=	0.443	^b		
WQV=	0.010	ac. ft. ^c		

WQV=	420 ft.³
-------------	----------------------------

Note: The high overflow elevation within Porous 7 is set at 342.10. The water quality volume provided below the high overflow is 439 cf. This volume is filtered through porous asphalt, bedding stone, and a crushed stone reservoir prior to flowing out of the system via exfiltration or the high overflow.

Porous 8

Area=	0.114	acres	4,966	ft. ²
Impervious Area=	0.086	acres		
I=	0.754	^a		
R=	0.729	^b		
WQV=	0.007	ac. ft. ^c		

WQV=	302 ft.³
-------------	----------------------------

Note: The high overflow elevation within Porous 8 is set at 346.30. The water quality volume provided below the high overflow is 1,487 cf. This volume is filtered through permeable pavers, bedding stone, and sand prior to flowing out of the system via an underdrain pipe.

^a I=Percent Impervious Coverage

^b R=0.05+0.009(I); Volumetric runoff Coefficient, Equation taken from 2004 Connecticut Stormwater Quality Manual section 7.4.1

^c WQV=(1"xRxA)/12; Water Quality Volume, Equation taken from 2004 Connecticut Stormwater Quality Manual section 7.4.1

Groundwater Recharge Volume Calculation

Project: Connecticut Humane Society	Project #: 10258	Date: 7/1/2021
Location: 863 Danbury Road, Wilton CT	By: VJH	Checked: CJF

Onsite Existing vs. Proposed

Net Increase In Impervious Area (I) =	0.046 acres
NRCS Hydrologic Soil Group =	A ^a
Design Rainfall =	1.0 inches
Groundwater Recharge Depth (F) =	0.60 ^b

Groundwater Recharge Volume (GRV)=	0.002 ac. ft.^c
---	----------------------------------

99.80 ft.³

Net Increase In Impervious Area (I) =	0.435 acres
NRCS Hydrologic Soil Group =	B ^a
Design Rainfall =	1.0 inches
Groundwater Recharge Depth (F) =	0.35 ^b

Groundwater Recharge Volume (GRV)=	0.013 ac. ft.^c
---	----------------------------------

552.18 ft.³

Total GRV =	0.015 ac. ft.^c
--------------------	----------------------------------

651.98 ft.³

^a From Natural Resources Conservation Service

^b Table 5-2 from the 2012 Town of Greenwich Drainage Manual Section 5.6.1

^c GRV = F x I from the 2012 Town of Greenwich Drainage Manual Section 5.6.1

Note, for calculation purposes the proposed increase in impervious coverage includes permeable pavers, porous asphalt, and gravel paths.

Elevation-Volume Storage Calculations

Project: <i>Connecticut Humane Society</i>	Project #: <i>10258</i>	Date: <i>7/1/2021</i>
Location: <i>863 Danbury Road, Wilton, CT</i>	By: <i>VJH</i>	Checked: <i>CJF</i>

Porous Asphalt #1

Bottom of Storage=	342.70	
Top of Calculated Storage=	345.05	
Stone Void Ratio=	0.40	
Porous Asphalt Void Ratio=	0.16	
Req. Water Quality Volume =	515.0	ft ³
WQV Storage Volume Provided =	1,007.6	ft ³

Elevation (ft)	Area of Gravel or Soil (ft ²)	Storage Volume of Gravel or Soil (ft ³)	Area of Porous Storage (ft ²)	Volume of Porous Storage (ft ³)	Area of Open Air Storage (ft ²)	Volume of Open Air Storage (ft ³)	Total Increment al Storage (ft ³)	Total Storage (ft ³)
342.70	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
344.20	2026.0	607.8	0.0	0.0	0.0	0.0	607.8	607.8
344.37	2026.0	137.8	0.0	0.0	0.0	0.0	137.8	745.6
344.70	2026.0	258.5	135.9	3.6	0.0	0.0	262.1	1007.6
345.05	1890.1	238.0	516.0	25.1	135.9	23.8	286.9	1294.5

* Refer to Water Quality Volume Calculations for proposed WQV

Elevation-Volume Storage Calculations

Project: <i>Connecticut Humane Society</i>	Project #: <i>10258</i>	Date: <i>7/1/2021</i>
Location: <i>863 Danbury Road, Wilton, CT</i>	By: <i>VJH</i>	Checked: <i>CJF</i>

Porous Asphalt #2

Bottom of Storage=	342.30
Top of Calculated Storage=	345.05
Stone Void Ratio=	0.40
Porous Asphalt Void Ratio=	0.16
Req. Water Quality Volume =	250.0 ^{ft³}
WQV Storage Volume Provided =	657.3 ^{ft³}

Elevation (ft)	Area of Gravel or Soil (ft ²)	Storage Volume of Gravel or Soil (ft ³)	Area of Porous Storage (ft ²)	Volume of Porous Storage (ft ³)	Area of Open Air Storage (ft ²)	Volume of Open Air Storage (ft ³)	Total Increment al Storage (ft ³)	Total Storage (ft ³)
342.30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
342.72	930.5	78.2	0.0	0.0	0.0	0.0	78.2	78.2
343.97	930.5	465.3	0.0	0.0	0.0	0.0	465.3	543.4
344.30	930.5	108.0	225.3	5.9	0.0	0.0	113.9	657.3
344.72	612.7	51.5	930.5	34.4	225.3	47.3	133.2	790.5
345.05	0.0	0.0	612.7	16.2	930.5	206.0	222.1	1012.6

* Refer to Water Quality Volume Calculations for proposed WQV

Elevation-Volume Storage Calculations

Project: <i>Connecticut Humane Society</i>	Project #: <i>10258</i>	Date: <i>7/1/2021</i>
Location: <i>863 Danbury Road, Wilton, CT</i>	By: <i>VJH</i>	Checked: <i>CJF</i>

Porous Asphalt #3

Bottom of Storage=	342.55
Top of Calculated Storage=	345.70
Stone Void Ratio=	0.40
Porous Asphalt Void Ratio=	0.16
Req. Water Quality Volume =	337.0 ^{ft³}
WQV Storage Volume Provided =	1,612.1 ^{ft³}

Elevation (ft)	Area of Gravel or Soil (ft ²)	Storage Volume of Gravel or Soil (ft ³)	Area of Porous Storage (ft ²)	Volume of Porous Storage (ft ³)	Area of Open Air Storage (ft ²)	Volume of Open Air Storage (ft ³)	Total Increment al Storage (ft ³)	Total Storage (ft ³)
342.55	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
343.70	2854.0	656.4	0.0	0.0	0.0	0.0	656.4	656.4
344.22	2854.0	593.6	0.0	0.0	0.0	0.0	593.6	1250.1
344.55	2854.0	352.3	369.6	9.8	0.0	0.0	362.1	1612.1
345.37	1638.5	268.7	2854.0	242.7	369.6	151.5	663.0	2275.1
345.70	0.0	0.0	1638.5	43.3	2854.0	671.5	714.7	2989.8

* Refer to Water Quality Volume Calculations for proposed WQV

Elevation-Volume Storage Calculations

Project: <i>Connecticut Humane Society</i>	Project #: <i>10258</i>	Date: <i>7/1/2021</i>
Location: <i>863 Danbury Road, Wilton, CT</i>	By: <i>VJH</i>	Checked: <i>CJF</i>

Porous Asphalt #4

Bottom of Storage=	343.00
Top of Calculated Storage=	345.70
Stone Void Ratio=	0.40
Porous Asphalt Void Ratio=	0.16
Req. Water Quality Volume =	227.0 ^{ft³}
WQV Storage Volume Provided =	631.6 ^{ft³}

Elevation (ft)	Area of Gravel or Soil (ft ²)	Storage Volume of Gravel or Soil (ft ³)	Area of Porous Storage (ft ²)	Volume of Porous Storage (ft ³)	Area of Open Air Storage (ft ²)	Volume of Open Air Storage (ft ³)	Total Increment al Storage (ft ³)	Total Storage (ft ³)
343.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
343.70	970.0	135.8	0.0	0.0	0.0	0.0	135.8	135.8
344.67	970.0	376.4	0.0	0.0	0.0	0.0	376.4	512.2
345.00	970.0	113.6	218.3	5.8	0.0	0.0	119.4	631.6
345.37	696.1	51.5	970.0	30.4	218.3	40.4	122.3	753.8
345.70	0.0	0.0	696.1	18.4	970.0	205.2	223.6	977.4

* Refer to Water Quality Volume Calculations for proposed WQV

Elevation-Volume Storage Calculations

Project: <i>Connecticut Humane Society</i>	Project #: <i>10258</i>	Date: <i>7/1/2021</i>
Location: <i>863 Danbury Road, Wilton, CT</i>	By: <i>VJH</i>	Checked: <i>CJF</i>

Porous Asphalt #5

Bottom of Storage=	341.90
Top of Calculated Storage=	344.10
Stone Void Ratio=	0.40
Porous Asphalt Void Ratio=	0.16
Req. Water Quality Volume =	741.0 ^{ft³}
WQV Storage Volume Provided =	913.4 ^{ft³}

Elevation (ft)	Area of Gravel or Soil (ft ²)	Storage Volume of Gravel or Soil (ft ³)	Area of Porous Storage (ft ²)	Volume of Porous Storage (ft ³)	Area of Open Air Storage (ft ²)	Volume of Open Air Storage (ft ³)	Total Increment al Storage (ft ³)	Total Storage (ft ³)
341.90	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
342.10	1296.0	51.8	0.0	0.0	0.0	0.0	51.8	51.8
343.57	1296.0	762.0	0.0	0.0	0.0	0.0	762.0	813.9
343.77	1296.0	51.8	1296.0	20.7	0.0	0.0	72.6	886.5
343.90	0.0	0.0	1296.0	27.0	0.0	0.0	27.0	913.4
344.10	0.0	0.0	1296.0	20.7	1296.0	129.6	150.3	1063.8

* Refer to Water Quality Volume Calculations for proposed WQV

Elevation-Volume Storage Calculations

Project: <i>Connecticut Humane Society</i>	Project #: <i>10258</i>	Date: <i>7/1/2021</i>
Location: <i>863 Danbury Road, Wilton, CT</i>	By: <i>VJH</i>	Checked: <i>CJF</i>

Porous Asphalt #6

Bottom of Storage=	341.00
Top of Calculated Storage=	343.80
Stone Void Ratio=	0.40
Porous Asphalt Void Ratio=	0.16
Req. Water Quality Volume =	684.0 ft ³
WQV Storage Volume Provided =	1,711.3 ft ³

Elevation (ft)	Area of Gravel or Soil (ft ²)	Storage Volume of Gravel or Soil (ft ³)	Area of Porous Storage (ft ²)	Volume of Porous Storage (ft ³)	Area of Open Air Storage (ft ²)	Volume of Open Air Storage (ft ³)	Total Increment al Storage (ft ³)	Total Storage (ft ³)
341.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
341.80	2726.7	436.3	0.0	0.0	0.0	0.0	436.3	436.3
342.67	2726.7	948.9	0.0	0.0	0.0	0.0	948.9	1385.2
343.00	2726.7	303.5	854.4	22.6	0.0	0.0	326.1	1711.3
343.47	1397.2	131.3	2726.7	120.4	854.4	200.8	452.5	2163.8
343.80	0.0	0.0	1397.2	36.9	2726.7	669.3	706.2	2869.9

* Refer to Water Quality Volume Calculations for proposed WQV

Elevation-Volume Storage Calculations

Project: <i>Connecticut Humane Society</i>	Project #: <i>10258</i>	Date: <i>7/1/2021</i>
Location: <i>863 Danbury Road, Wilton, CT</i>	By: <i>VJH</i>	Checked: <i>CJF</i>

Porous Asphalt #7

Bottom of Storage=	340.10
Top of Calculated Storage=	343.00
Stone Void Ratio=	0.40
Porous Asphalt Void Ratio=	0.16
Req. Water Quality Volume =	420.0 ^{ft³}
WQV Storage Volume Provided =	439.7 ^{ft³}

Elevation (ft)	Area of Gravel or Soil (ft ²)	Storage Volume of Gravel or Soil (ft ³)	Area of Porous Storage (ft ²)	Volume of Porous Storage (ft ³)	Area of Open Air Storage (ft ²)	Volume of Open Air Storage (ft ³)	Total Increment al Storage (ft ³)	Total Storage (ft ³)
340.10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
341.00	714.6	128.6	0.0	0.0	0.0	0.0	128.6	128.6
341.77	714.6	220.1	0.0	0.0	0.0	0.0	220.1	348.7
342.10	714.6	88.8	83.7	2.2	0.0	0.0	91.0	439.7
342.67	496.0	56.5	714.6	38.7	83.7	23.9	119.1	558.9
343.00	0.0	0.0	496.0	13.1	714.6	154.0	167.1	725.9

* Refer to Water Quality Volume Calculations for proposed WQV

Elevation-Volume Storage Calculations

Project: <i>Connecticut Humane Society</i>	Project #: <i>10258</i>	Date: <i>7/1/2021</i>
Location: <i>863 Danbury Road, Wilton, CT</i>	By: <i>VJH</i>	Checked: <i>CJF</i>

Porous Asphalt #8

Bottom of Storage=	344.20
Top of Calculated Storage=	346.80
Stone Void Ratio=	0.40
Sand Void Ratio=	0.30
Porous Asphalt Void Ratio=	0.16
Req. Water Quality Volume =	302.0 ft ³
WQV Storage Volume Provided =	1,487.8 ft ³

Elevation (ft)	Area of Gravel or Soil (ft ²)	Storage Volume of Gravel or Soil (ft ³)	Area of Porous Storage (ft ²)	Volume of Porous Storage (ft ³)	Area of Open Air Storage (ft ²)	Volume of Open Air Storage (ft ³)	Total Incremental Storage (ft ³)	Total Storage (ft ³)
344.80	2966.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
346.03	2966.8	1094.7	0.0	0.0	0.0	0.0	1094.7	1094.7
346.20	2966.8	170.2	0.0	0.0	0.0	0.0	170.2	1264.9
346.38	2966.8	149.0	1441.4	20.8	0.0	0.0	169.7	1434.6
346.45	1586.9	33.2	2118.7	19.9	0.0	0.0	53.2	1487.8
346.55	0.0	0.0	2118.7	17.6	848.2	42.4	60.0	1547.9
346.80	0.0	0.0	2118.6	42.4	2966.8	476.9	519.2	2067.1

* Refer to Water Quality Volume Calculations for proposed WQV

Operations and Maintenance Plan

863 Danbury Road

July 1, 2021

Scope:

The purpose of the Operations and Maintenance Plan is to ensure that the existing and proposed stormwater components installed at *863 Danbury Road* are maintained in operational condition throughout the life of the project. The service procedures associated with this plan shall be performed as required by the parties legally responsible for their maintenance. Reports certifying the completion of all inspections and documentation of maintenance and repairs should be submitted as required.

Recommended Frequency of Service:

As further defined below, all stormwater components should be checked on a periodic basis and kept in full working order. Ultimately, the required frequency of inspection and service will depend on runoff quantities, pollutant loading, and clogging due to debris. At a minimum, we recommend that all stormwater components be inspected and serviced twice per year, once before winter begins and once during spring cleanup.

Qualified Inspector:

The inspections must be completed by an individual experienced in the construction and maintenance of stormwater drainage systems. Once every five years the inspections must be completed by a professional engineer.

Service Procedures:

1. Catch Basins & Drainage Inlets:

- a. Catch basins and drainage inlets shall be completely cleaned of accumulated debris and sediments at the completion of construction.
- b. For the first year, catch basins and drainage inlets shall be inspected on a quarterly basis.
- c. Any accumulated debris within the catch basins/inlets shall be removed and any repairs as required.
- d. From the second year onward, visual inspections shall occur twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.
- e. Accumulated debris within the catch basins/inlets shall be removed and repairs made as required.
- f. Accumulated sediments shall be removed at which time they are within 12 inches of the invert of the outlet pipe.
- g. Any additional maintenance required per the manufacturer's specifications shall also be completed.

2. Storm Drainage Piping and Manholes/Junction Boxes:

- a. All storm drainage piping shall be completely flushed of debris and accumulated sediment at the completion of construction.
- b. Manholes/Junction Boxes shall be inspected and repaired on an annual basis.
- c. Unless system performance indicates degradation of piping, comprehensive video inspection of storm drainage piping shall occur once every ten years.
- d. Any additional maintenance required per the manufacturer's specifications shall also be completed.

3. Porous Pavement (Porous Asphalt, Permeable Pavers, Etc.):

- a. Changing the porous pavement surface to an impervious surface requires the review and approval of the Town of Wilton Department of Public Works.
- b. Clean and vacuum (Regenerative Air Vacuum for Permeable Interlocking Concrete Pavers) the porous pavement upon the completion of construction.
- c. Check for standing water on the surface of the pavement after a precipitation event. If standing water remains within 30 minutes after rainfall had ended, cleaning of porous pavement is recommended.
- d. Vacuum sweeper shall be used regularly to remove sediment and organic debris on the pavement surface. The sweeper may be fitted with water jets.
- e. Pavement vacuuming should occur during spring cleanup following the last snow event to remove accumulated debris, at a minimum.
- f. Pavement vacuuming should occur during fall cleanup to remove dead leaves, at a minimum.
- g. Power washing can be an effective tool for cleaning clogged areas. See manufacturer's specifications.
- h. Check for debris accumulating on pavement, especially debris buildup in winter. For loose debris, a power/leaf blower or gutter broom can be used to remove leaves and trash.
- i. In the event that the porous surface becomes clogged an engineer must be retained to determine how to restore the porous surface to its original condition.
- j. Any additional maintenance required per the manufacturer's specifications shall also be completed.

Disposal of Debris and Sediment:

All debris and sediment removed from the stormwater structures and bioretention/biofiltration basins shall be disposed of legally. There shall be no dumping of silt or debris into or in proximity to any inland or tidal wetlands.

Maintenance Records:

The Owners(s) must maintain all records (logs, invoices, reports, data, etc.) and have them readily available for inspection at all times.

Appendix 4



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aerals](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.361 (0.276-0.464)	0.422 (0.322-0.542)	0.521 (0.397-0.671)	0.604 (0.457-0.781)	0.717 (0.527-0.957)	0.803 (0.580-1.09)	0.892 (0.624-1.24)	0.986 (0.662-1.40)	1.12 (0.722-1.63)	1.22 (0.772-1.81)
10-min	0.512 (0.391-0.657)	0.598 (0.457-0.768)	0.739 (0.563-0.952)	0.855 (0.648-1.11)	1.02 (0.747-1.36)	1.14 (0.820-1.54)	1.26 (0.885-1.76)	1.40 (0.937-1.99)	1.58 (1.02-2.31)	1.73 (1.09-2.57)
15-min	0.602 (0.461-0.773)	0.703 (0.537-0.904)	0.868 (0.662-1.12)	1.01 (0.762-1.30)	1.20 (0.878-1.60)	1.34 (0.965-1.82)	1.49 (1.04-2.07)	1.64 (1.10-2.34)	1.86 (1.20-2.72)	2.03 (1.29-3.02)
30-min	0.845 (0.646-1.09)	0.984 (0.752-1.26)	1.21 (0.922-1.56)	1.40 (1.06-1.81)	1.66 (1.22-2.21)	1.86 (1.34-2.51)	2.06 (1.44-2.85)	2.26 (1.52-3.22)	2.54 (1.65-3.72)	2.75 (1.74-4.10)
60-min	1.09 (0.832-1.40)	1.26 (0.966-1.62)	1.55 (1.18-2.00)	1.79 (1.36-2.32)	2.12 (1.56-2.82)	2.38 (1.71-3.21)	2.63 (1.83-3.64)	2.88 (1.94-4.10)	3.22 (2.09-4.71)	3.48 (2.20-5.17)
2-hr	1.40 (1.08-1.79)	1.65 (1.26-2.10)	2.05 (1.57-2.62)	2.38 (1.81-3.05)	2.83 (2.09-3.76)	3.17 (2.30-4.28)	3.53 (2.49-4.90)	3.92 (2.64-5.55)	4.48 (2.91-6.51)	4.93 (3.13-7.28)
3-hr	1.62 (1.25-2.05)	1.91 (1.47-2.42)	2.38 (1.83-3.04)	2.78 (2.12-3.55)	3.32 (2.47-4.40)	3.73 (2.72-5.03)	4.16 (2.95-5.78)	4.65 (3.14-6.55)	5.36 (3.49-7.77)	5.95 (3.78-8.76)
6-hr	2.03 (1.57-2.56)	2.42 (1.87-3.05)	3.05 (2.36-3.86)	3.58 (2.75-4.55)	4.30 (3.21-5.67)	4.84 (3.55-6.50)	5.42 (3.88-7.51)	6.09 (4.12-8.53)	7.09 (4.62-10.2)	7.93 (5.06-11.6)
12-hr	2.50 (1.95-3.13)	3.00 (2.34-3.76)	3.82 (2.97-4.81)	4.50 (3.48-5.69)	5.44 (4.09-7.14)	6.14 (4.53-8.20)	6.89 (4.95-9.50)	7.76 (5.27-10.8)	9.06 (5.93-13.0)	10.1 (6.49-14.7)
24-hr	2.94 (2.31-3.66)	3.57 (2.80-4.45)	4.61 (3.60-5.76)	5.48 (4.25-6.87)	6.66 (5.03-8.69)	7.54 (5.59-10.0)	8.49 (6.15-11.7)	9.62 (6.55-13.3)	11.3 (7.42-16.1)	12.7 (8.18-18.4)
2-day	3.32 (2.62-4.11)	4.10 (3.23-5.07)	5.37 (4.22-6.67)	6.43 (5.02-8.01)	7.88 (5.99-10.2)	8.95 (6.69-11.9)	10.1 (7.39-13.9)	11.6 (7.89-15.9)	13.8 (9.05-19.4)	15.7 (10.1-22.4)
3-day	3.61 (2.86-4.45)	4.46 (3.53-5.50)	5.86 (4.62-7.24)	7.02 (5.50-8.71)	8.61 (6.57-11.1)	9.78 (7.33-12.9)	11.1 (8.11-15.1)	12.6 (8.65-17.3)	15.1 (9.94-21.2)	17.2 (11.1-24.5)
4-day	3.88 (3.08-4.76)	4.78 (3.79-5.87)	6.25 (4.94-7.70)	7.48 (5.87-9.25)	9.16 (7.00-11.8)	10.4 (7.81-13.7)	11.8 (8.62-16.0)	13.4 (9.20-18.3)	16.0 (10.5-22.4)	18.2 (11.7-25.8)
7-day	4.65 (3.71-5.67)	5.63 (4.49-6.89)	7.25 (5.75-8.88)	8.59 (6.78-10.6)	10.4 (7.99-13.3)	11.8 (8.87-15.4)	13.3 (9.73-17.9)	15.0 (10.3-20.4)	17.7 (11.7-24.6)	19.9 (12.9-28.2)
10-day	5.40 (4.32-6.57)	6.44 (5.15-7.84)	8.14 (6.48-9.94)	9.56 (7.57-11.7)	11.5 (8.83-14.6)	13.0 (9.75-16.8)	14.5 (10.6-19.4)	16.3 (11.3-22.0)	19.0 (12.6-26.3)	21.2 (13.7-29.9)
20-day	7.65 (6.16-9.25)	8.82 (7.09-10.7)	10.7 (8.60-13.0)	12.3 (9.81-15.0)	14.5 (11.2-18.2)	16.2 (12.2-20.6)	17.9 (13.0-23.4)	19.7 (13.7-26.4)	22.3 (14.9-30.7)	24.3 (15.8-34.0)
30-day	9.51 (7.68-11.5)	10.8 (8.69-13.0)	12.8 (10.3-15.5)	14.5 (11.6-17.6)	16.9 (13.0-21.1)	18.7 (14.1-23.7)	20.5 (14.9-26.6)	22.4 (15.6-29.8)	24.9 (16.6-34.1)	26.8 (17.5-37.3)
45-day	11.8 (9.56-14.1)	13.2 (10.7-15.8)	15.4 (12.4-18.5)	17.2 (13.8-20.8)	19.8 (15.3-24.5)	21.7 (16.4-27.4)	23.7 (17.2-30.5)	25.6 (17.9-34.0)	28.1 (18.8-38.3)	29.9 (19.5-41.5)
60-day	13.7 (11.1-16.4)	15.1 (12.3-18.1)	17.5 (14.1-21.0)	19.5 (15.6-23.4)	22.2 (17.2-27.4)	24.3 (18.3-30.4)	26.3 (19.1-33.7)	28.3 (19.8-37.4)	30.7 (20.6-41.8)	32.5 (21.2-45.0)
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.										

[Back to Top](#)

PF graphical



NOAA Atlas 14, Volume 10, Version 3
Location name: Wilton, Connecticut, USA*
Latitude: 41.2519°, Longitude: -73.4352°
Elevation: 379.55 ft**
* source: ESRI Maps
** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aerals](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	4.33 (3.31-5.57)	5.06 (3.86-6.50)	6.25 (4.76-8.05)	7.25 (5.48-9.37)	8.60 (6.32-11.5)	9.64 (6.96-13.1)	10.7 (7.49-14.9)	11.8 (7.94-16.8)	13.4 (8.66-19.6)	14.6 (9.26-21.8)
10-min	3.07 (2.35-3.94)	3.59 (2.74-4.61)	4.43 (3.38-5.71)	5.13 (3.89-6.64)	6.10 (4.48-8.14)	6.83 (4.92-9.26)	7.58 (5.31-10.6)	8.38 (5.62-11.9)	9.49 (6.14-13.9)	10.4 (6.56-15.4)
15-min	2.41 (1.84-3.09)	2.81 (2.15-3.62)	3.47 (2.65-4.47)	4.02 (3.05-5.20)	4.78 (3.51-6.38)	5.36 (3.86-7.26)	5.94 (4.16-8.28)	6.57 (4.41-9.36)	7.44 (4.82-10.9)	8.13 (5.14-12.1)
30-min	1.69 (1.29-2.17)	1.97 (1.50-2.53)	2.42 (1.84-3.12)	2.80 (2.12-3.62)	3.32 (2.43-4.42)	3.71 (2.67-5.02)	4.11 (2.87-5.71)	4.53 (3.04-6.44)	5.08 (3.29-7.43)	5.51 (3.49-8.19)
60-min	1.09 (0.832-1.40)	1.26 (0.966-1.62)	1.55 (1.18-2.00)	1.79 (1.36-2.32)	2.12 (1.56-2.82)	2.38 (1.71-3.21)	2.63 (1.83-3.64)	2.88 (1.94-4.10)	3.22 (2.09-4.71)	3.48 (2.20-5.17)
2-hr	0.702 (0.540-0.895)	0.824 (0.632-1.05)	1.02 (0.783-1.31)	1.19 (0.904-1.53)	1.41 (1.05-1.88)	1.59 (1.15-2.14)	1.76 (1.25-2.45)	1.96 (1.32-2.77)	2.24 (1.45-3.26)	2.46 (1.56-3.64)
3-hr	0.538 (0.415-0.683)	0.635 (0.489-0.807)	0.793 (0.609-1.01)	0.925 (0.707-1.18)	1.11 (0.821-1.47)	1.24 (0.905-1.68)	1.39 (0.984-1.93)	1.55 (1.04-2.18)	1.79 (1.16-2.59)	1.98 (1.26-2.92)
6-hr	0.339 (0.263-0.428)	0.404 (0.313-0.510)	0.510 (0.394-0.645)	0.597 (0.459-0.760)	0.718 (0.537-0.948)	0.809 (0.593-1.09)	0.905 (0.647-1.25)	1.02 (0.688-1.43)	1.18 (0.772-1.70)	1.32 (0.844-1.94)
12-hr	0.207 (0.162-0.260)	0.249 (0.194-0.312)	0.317 (0.247-0.399)	0.374 (0.289-0.472)	0.452 (0.339-0.592)	0.510 (0.376-0.680)	0.572 (0.411-0.788)	0.644 (0.437-0.896)	0.752 (0.492-1.08)	0.842 (0.539-1.22)
24-hr	0.122 (0.096-0.152)	0.149 (0.117-0.186)	0.192 (0.150-0.240)	0.228 (0.177-0.286)	0.278 (0.210-0.362)	0.314 (0.233-0.417)	0.354 (0.256-0.486)	0.401 (0.273-0.554)	0.471 (0.309-0.669)	0.531 (0.341-0.766)
2-day	0.069 (0.055-0.086)	0.085 (0.067-0.106)	0.112 (0.088-0.139)	0.134 (0.105-0.167)	0.164 (0.125-0.213)	0.186 (0.139-0.247)	0.211 (0.154-0.289)	0.241 (0.164-0.331)	0.287 (0.189-0.404)	0.326 (0.210-0.467)
3-day	0.050 (0.040-0.062)	0.062 (0.049-0.076)	0.081 (0.064-0.101)	0.097 (0.076-0.121)	0.120 (0.091-0.155)	0.136 (0.102-0.179)	0.154 (0.113-0.210)	0.176 (0.120-0.240)	0.209 (0.138-0.294)	0.239 (0.154-0.341)
4-day	0.040 (0.032-0.050)	0.050 (0.039-0.061)	0.065 (0.051-0.080)	0.078 (0.061-0.096)	0.095 (0.073-0.123)	0.108 (0.081-0.142)	0.122 (0.090-0.167)	0.140 (0.096-0.191)	0.166 (0.110-0.233)	0.189 (0.122-0.269)
7-day	0.028 (0.022-0.034)	0.034 (0.027-0.041)	0.043 (0.034-0.053)	0.051 (0.040-0.063)	0.062 (0.048-0.079)	0.070 (0.053-0.092)	0.079 (0.058-0.106)	0.089 (0.062-0.121)	0.105 (0.070-0.147)	0.119 (0.077-0.168)
10-day	0.022 (0.018-0.027)	0.027 (0.021-0.033)	0.034 (0.027-0.041)	0.040 (0.032-0.049)	0.048 (0.037-0.061)	0.054 (0.041-0.070)	0.060 (0.044-0.081)	0.068 (0.047-0.092)	0.079 (0.052-0.110)	0.088 (0.057-0.124)
20-day	0.016 (0.013-0.019)	0.018 (0.015-0.022)	0.022 (0.018-0.027)	0.026 (0.020-0.031)	0.030 (0.023-0.038)	0.034 (0.025-0.043)	0.037 (0.027-0.049)	0.041 (0.028-0.055)	0.046 (0.031-0.064)	0.051 (0.033-0.071)
30-day	0.013 (0.011-0.016)	0.015 (0.012-0.018)	0.018 (0.014-0.022)	0.020 (0.016-0.024)	0.023 (0.018-0.029)	0.026 (0.020-0.033)	0.028 (0.021-0.037)	0.031 (0.022-0.041)	0.035 (0.023-0.047)	0.037 (0.024-0.052)
45-day	0.011 (0.009-0.013)	0.012 (0.010-0.015)	0.014 (0.011-0.017)	0.016 (0.013-0.019)	0.018 (0.014-0.023)	0.020 (0.015-0.025)	0.022 (0.016-0.028)	0.024 (0.017-0.031)	0.026 (0.017-0.035)	0.028 (0.018-0.038)
60-day	0.010 (0.008-0.011)	0.011 (0.009-0.013)	0.012 (0.010-0.015)	0.014 (0.011-0.016)	0.015 (0.012-0.019)	0.017 (0.013-0.021)	0.018 (0.013-0.023)	0.020 (0.014-0.026)	0.021 (0.014-0.029)	0.023 (0.015-0.031)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

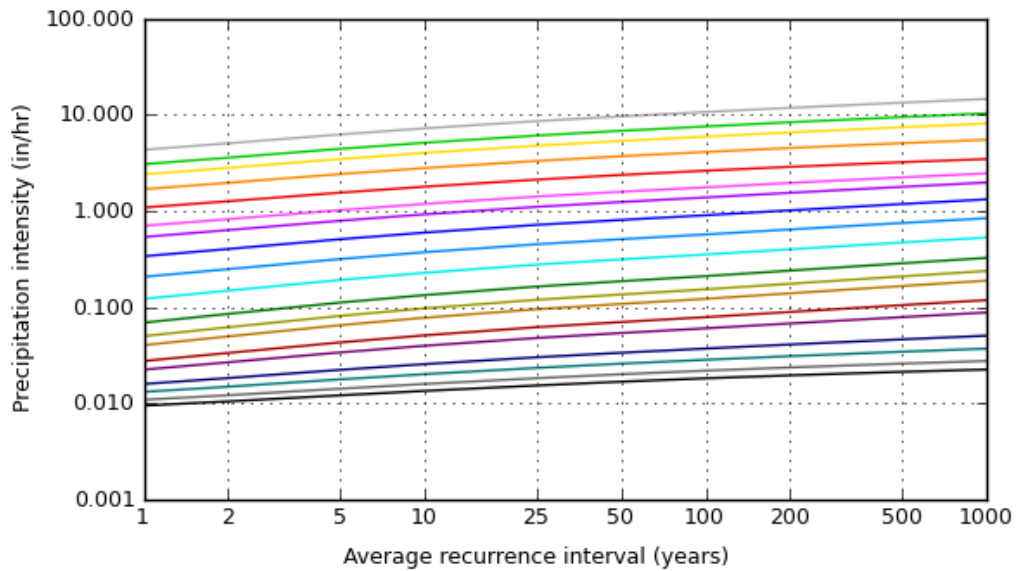
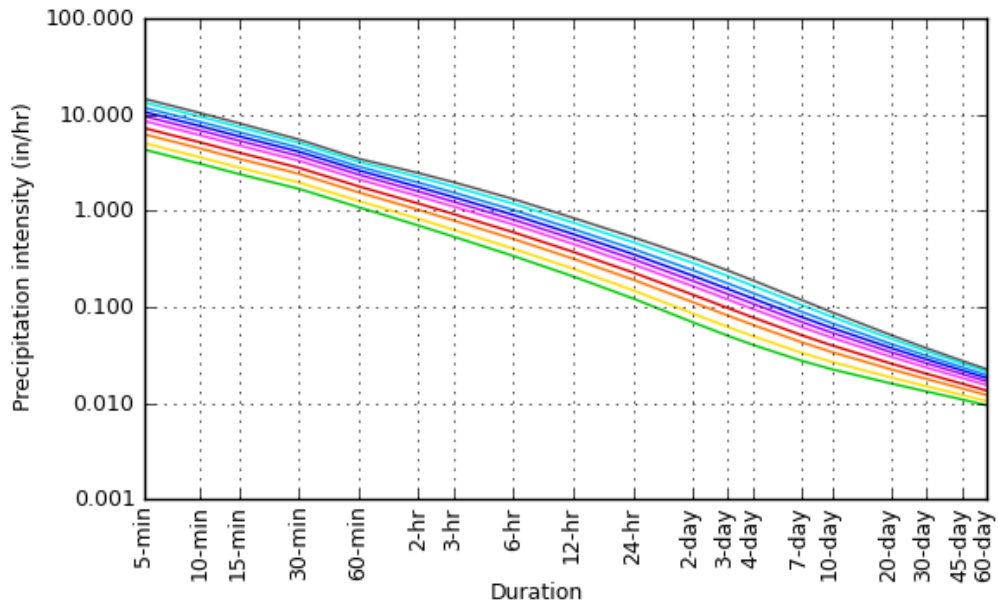
Please refer to NOAA Atlas 14 document for more information.

[Back to Top](#)

PF graphical

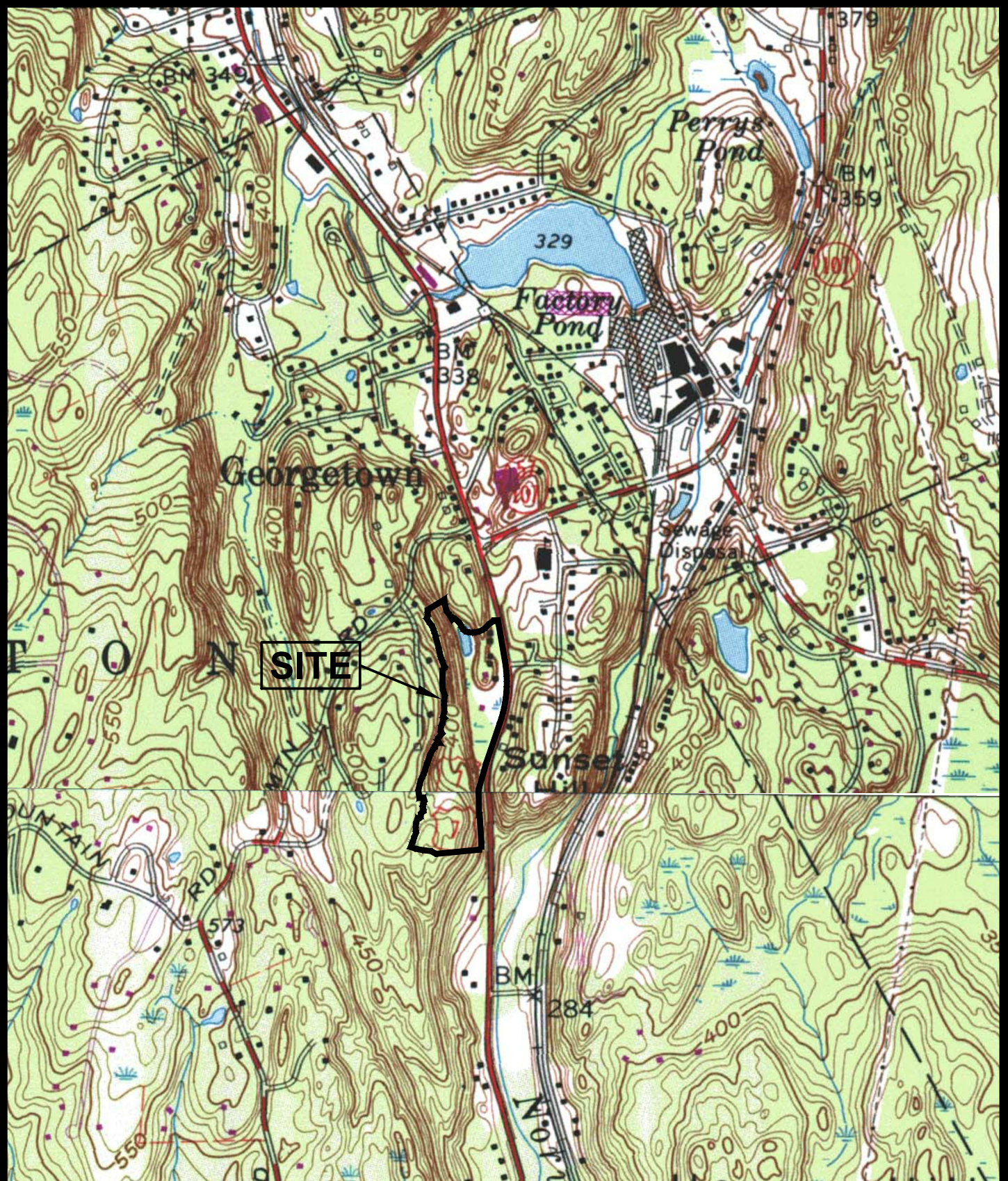
PDS-based intensity-duration-frequency (IDF) curves

Latitude: 41.2519°, Longitude: -73.4352°



Maps & aerials

Small scale terrain



USGS QUADRANGLE MAP
863 DANBURY ROAD
WILTON, CT

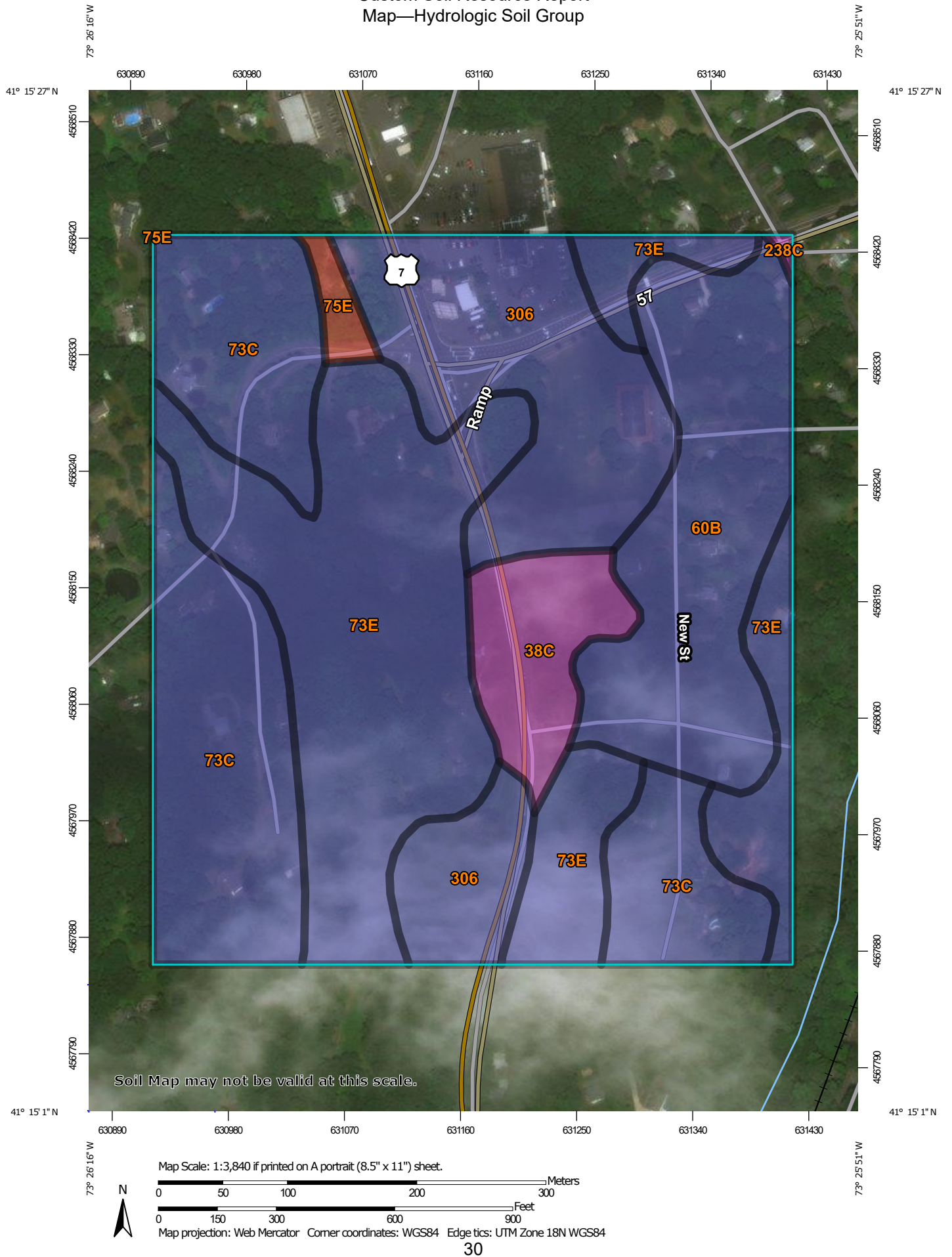
**REDNISS
& MEAD**

COMM. NO.: 10258

DATE: 07/01/2021

SCALE: 1"=1000'

Custom Soil Resource Report
Map—Hydrologic Soil Group



MAP LEGEND

Area of Interest (AOI)









 Area of Interest (AOI)

Soils

Soil Rating Polygons





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

Soil Rating Lines


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

Soil Rating Points






 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

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 20, Jun 9, 2020

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

Date(s) aerial images were photographed: Dec 31, 2009—Oct 5, 2016

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.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
38C	Hinckley loamy sand, 3 to 15 percent slopes	A	3.8	5.5%
60B	Canton and Charlton fine sandy loams, 3 to 8 percent slopes	B	11.3	16.3%
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	B	17.6	25.4%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	B	23.0	33.1%
75E	Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	D	0.7	1.0%
238C	Hinckley-Urban land complex, 3 to 15 percent slopes	A	0.1	0.1%
306	Udorthents-Urban land complex	B	12.8	18.5%
Totals for Area of Interest			69.4	100.0%

Rating Options—Hydrologic Soil Group*Aggregation Method: Dominant Condition**Component Percent Cutoff: None Specified**Tie-break Rule: Higher*

References

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

Custom Soil Resource Report

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

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

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

Appendix 5

Existing Wastewater Generation

Project:	<i>Connecticut Humane Society</i>	Project #:	<i>10258</i>	Date:	<i>7/1/2021</i>
Location:	<i>863 Danbury Road, Wilton CT</i>	By:	<i>VJH</i>	Checked:	<i>CJF</i>

Newington, CT Facility

Previous Reading Date	Present Reading Date	Water Usage (100 cu.ft.)	Water Usage (gallons)	Daily Water Usage (gallons/day)
11/9/2019	12/9/2019	121.2	90,658	3,022
12/10/2019	1/10/2020	131.5	98,362	3,173
1/11/2020	2/5/2020	110.8	82,878	3,315
2/6/2020	3/5/2020	160.6	120,129	4,290
3/6/2020	4/8/2020	174.2	130,302	3,949
Average Daily Water Use				3,550 gpd
Average Daily Water Use per Building SF *				0.10 gpd/sf

Notes:

1. Water Usage per available data provided by Connecticut Humane Society
2. Approximate Building Square Footage 36,000

*Average Daily Water Use per Building SF = 3,550 gpd / 36,000 sf

Westport, CT Facility

Previous Reading Date	Present Reading Date	Water Usage (100 cu.ft.)	Water Usage (gallons)	Daily Water Usage (gallons/day)
11/9/2019	12/9/2019	32	23,936	798
12/10/2019	1/10/2020	29	21,692	700
1/11/2020	2/5/2020	30	22,440	898
2/6/2020	3/5/2020	34	25,432	908
3/6/2020	4/8/2020	11	8,228	249
Average Daily Water Use				711 gpd
Average Daily Water Use per Building SF *				0.10 gpd/sf

Notes:

1. Water Usage per available data provided by Connecticut Humane Society
2. Approximate Building Square Footage 7,000

*Average Daily Water Use per Building SF = 711 gpd / 7,000 sf

Pump Curve Calculation

Project: <i>Connecticut Humane Society</i>	Project #: 10258	Date: 7/1/2021
Location: 863 Danbury Road, Wilton, CT	By: VJH	Checked: CJF

Pump #1

Bottom of Tank Elevation	329 ft
Invert out of Tank	335 ft
Invert into Receiving Structure	416.35 ft
Total Static Head	87.35 ^a
Diameter of Pipe (D)	3 inch
Hazen Williams Roughness Coefficient (C)	140 ^b
Horizontal length of Pipe	871 ft
Pipe within Tank	6.00 ft
Number of 90° Elbows	4
Equivalent Length of 90° Elbows	30 ft
Number of 45° Elbows	4
Equivalent Length of 45° Elbows	20.0 ft
Number of Check Valves	2
Equivalent Length of Check Valves	67.5 ft
Number of Gate Valves	2
Equivalent Length of Gate Valves	6.5 ft
Total Equivalent Length of Pipe (L)	1001.00 ft

Flow (Q-gpm)	Friction Head Loss (ft)^c	Total Dynamic Head (ft)^d
0	0.00	87.35
15	0.80	88.15
30	2.87	90.22
45	6.08	93.43
60	10.35	97.70
75	15.63	102.98
90	21.91	109.26
105	29.14	116.49
120	37.30	124.65

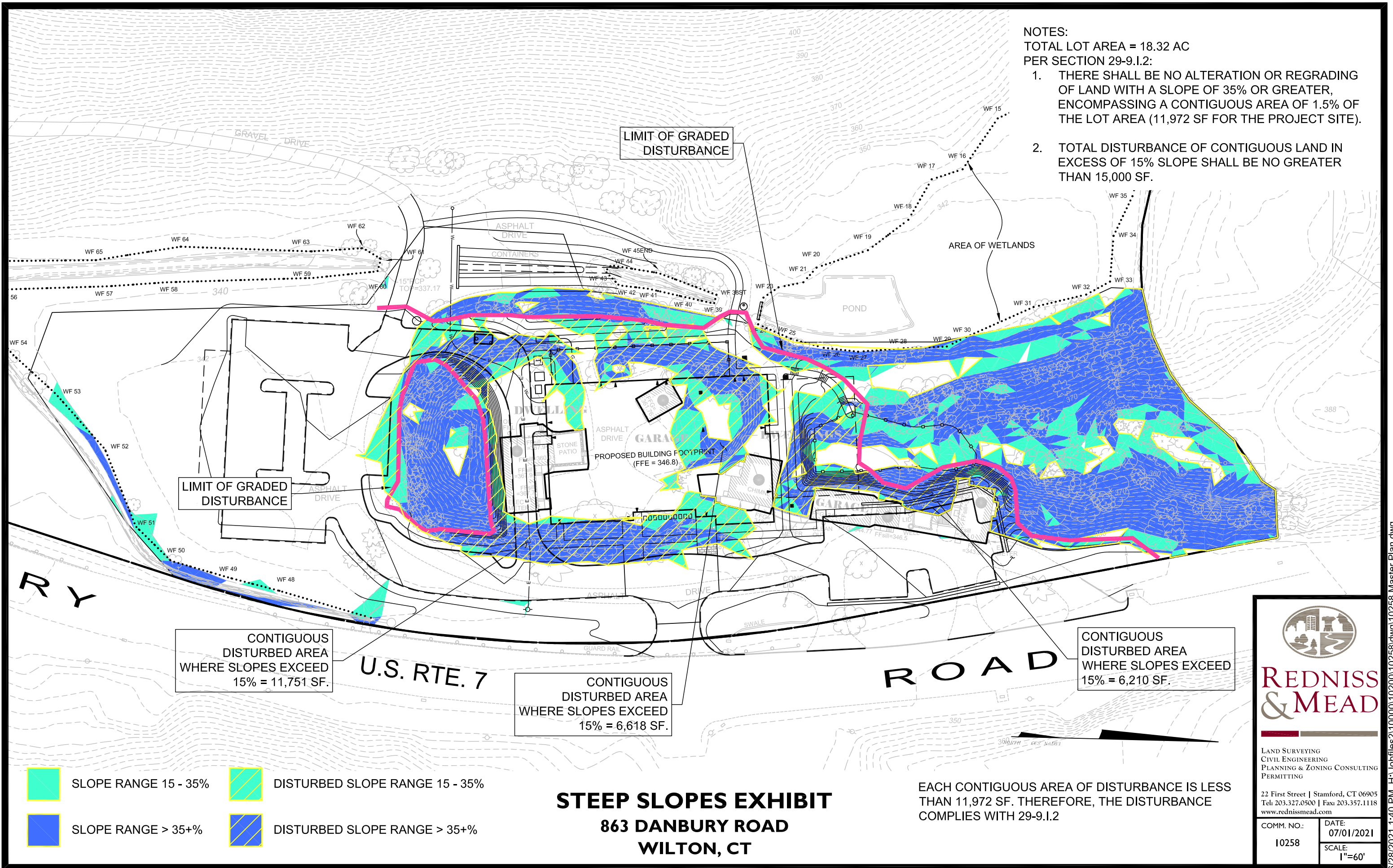
^a Total Static Head = Invert in Receiving Structure - Bottom of Tank Elevation

^b Ranges from 130-150 for PVC, Polyethylene (PE) or Plastic Pipe

^c Hazen Williams Friction Head Loss = $(10.44 \times L \times Q^{1.85}) / (C^{1.85} \times D^{4.87})$

^d Total Dynamic Head = Total Static Head + Friction Head Loss

Appendix 6







- NOTES:
TOTAL LOT AREA = 18.32 AC
PER SECTION 29-9.I.2:
1. THERE SHALL BE NO ALTERATION OR REGRADING OF LAND WITH A SLOPE OF 35% OR GREATER, ENCOMPASSING A CONTIGUOUS AREA OF 1.5% OF THE LOT AREA (11,972 SF FOR THE PROJECT SITE).
 2. TOTAL DISTURBANCE OF CONTIGUOUS LAND IN EXCESS OF 15% SLOPE SHALL BE NO GREATER THAN 15,000 SF.

CONTIGUOUS
DISTURBED AREA
WHERE SLOPES EXCEED
15% = 11,751 SF.


CONTIGUOUS
DISTURBED AREA
WHERE SLOPES EXCEED
15% = 6,618 SF.

CONTIGUOUS
DISTURBED AREA
WHERE SLOPES EXCEED
15% = 6,210 SF.

- | | | | |
|---|----------------------|---|--------------------------------|
|  | SLOPE RANGE 15 - 35% |  | DISTURBED SLOPE RANGE 15 - 35% |
|  | SLOPE RANGE > 35+% |  | DISTURBED SLOPE RANGE > 35+% |

STEEP SLOPES EXHIBIT
863 DANBURY ROAD
WILTON, CT

EACH CONTIGUOUS AREA OF DISTURBANCE IS LESS THAN 11,972 SF. THEREFORE, THE DISTURBANCE COMPLIES WITH 29-9.I.2



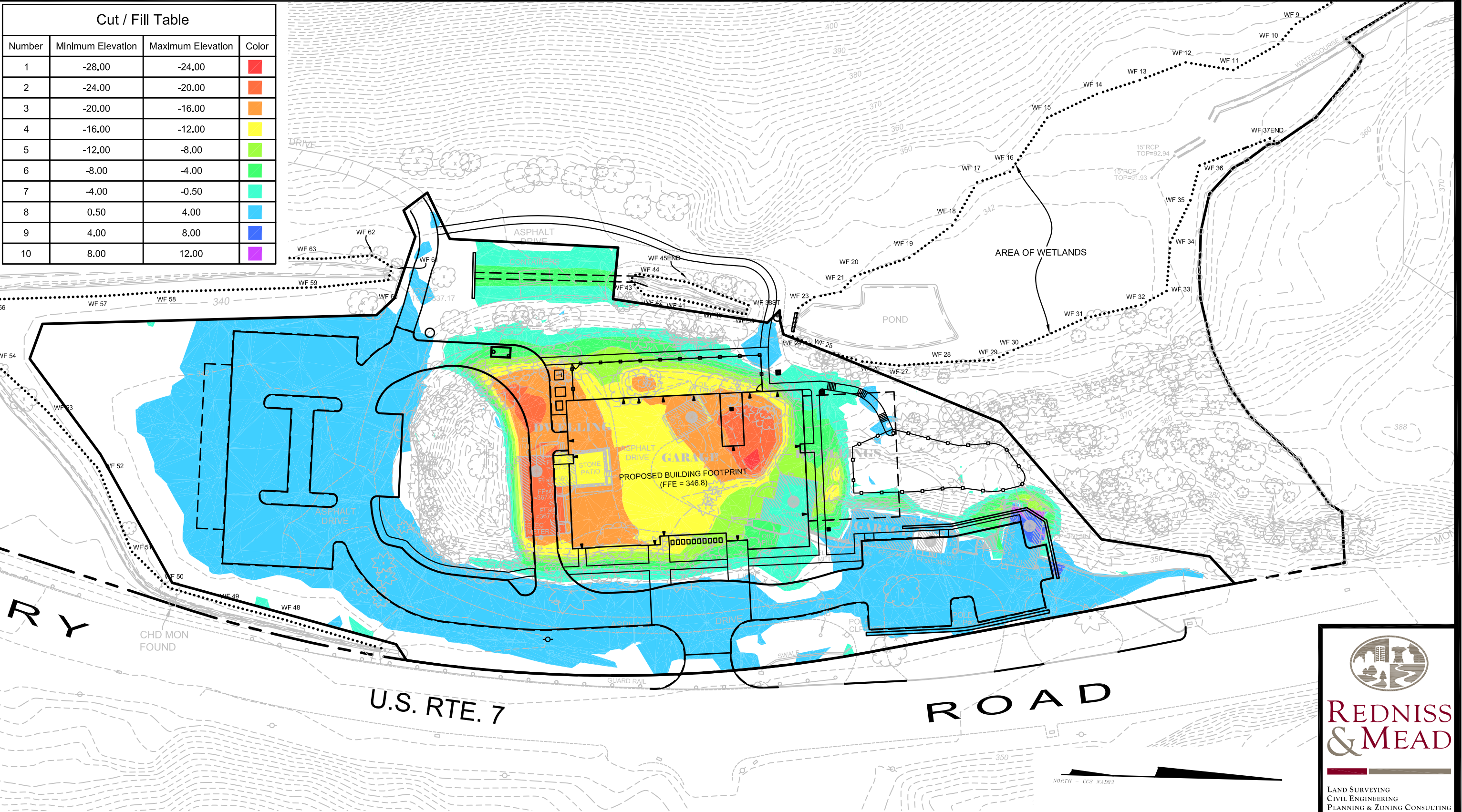
**REDNISS
& MEAD**

LAND SURVEYING
CIVIL ENGINEERING
PLANNING & ZONING CONSULTING
PERMITTING

22 First Street | Stamford, CT 06905
Tel: 203.327.0500 | Fax: 203.357.1118
www.rednissmead.com

COMM. NO.: 10258	DATE: 07/01/2021 SCALE: 1"=60'
---------------------	---

Cut / Fill Table			
Number	Minimum Elevation	Maximum Elevation	Color
1	-28.00	-24.00	Red
2	-24.00	-20.00	Orange
3	-20.00	-16.00	Light Orange
4	-16.00	-12.00	Yellow
5	-12.00	-8.00	Light Green
6	-8.00	-4.00	Green
7	-4.00	-0.50	Light Blue
8	0.50	4.00	Blue
9	4.00	8.00	Dark Blue
10	8.00	12.00	Purple



	TOTAL VOLUME
CUT	15,783 YD³
FILL	3,804 YD³
NET VOLUME	11,979 YD³ (CUT)

CUT & FILL VOLUME SURFACE EXHIBIT **863 DANBURY ROAD** **WILTON, CT**

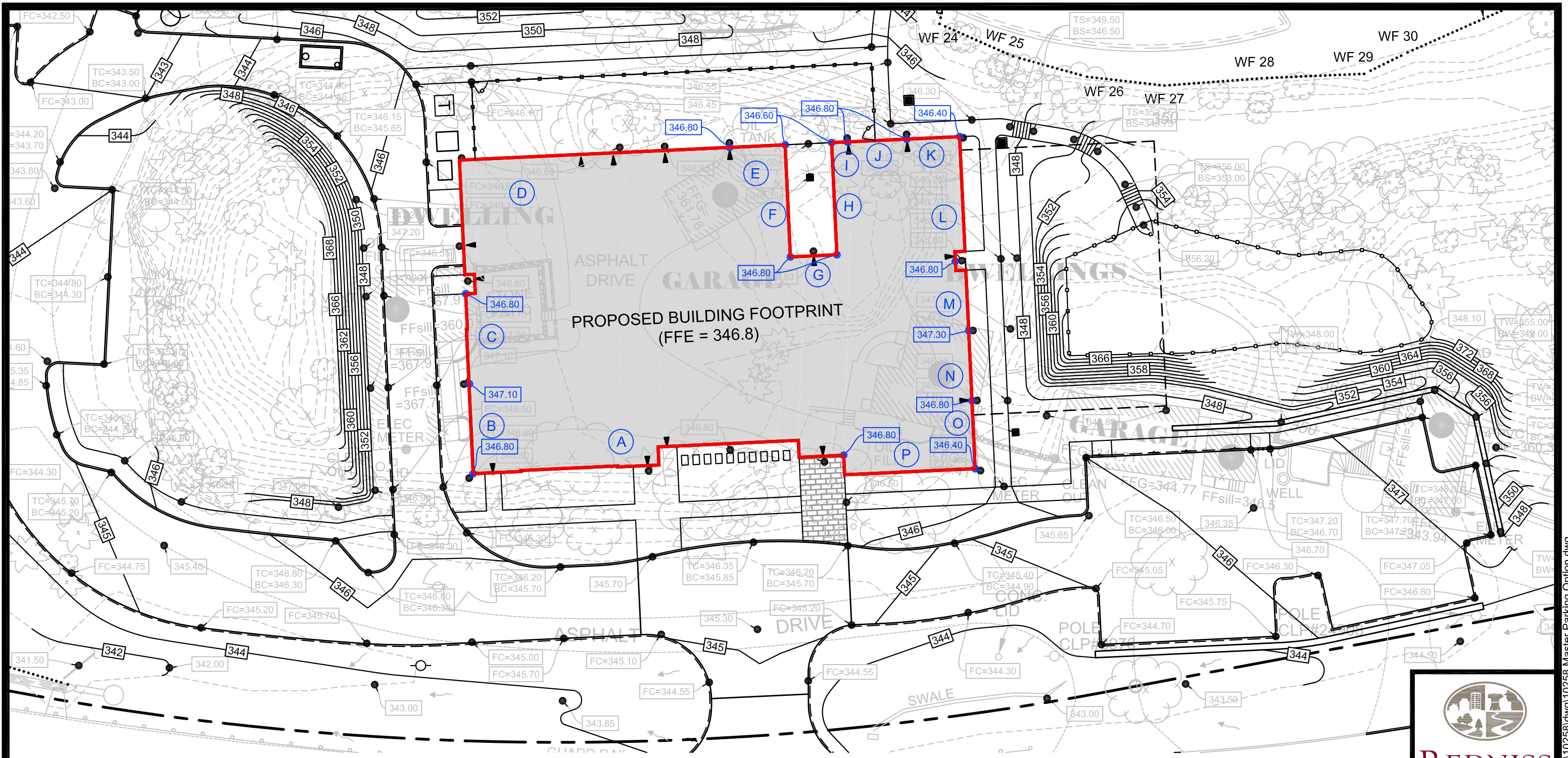
NOTE: TOTAL LOT AREA = 18.32 AC

REDNISS & MEAD

LAND SURVEYING
CIVIL ENGINEERING
PLANNING & ZONING CONSULTING
PERMITTING

22 First Street | Stamford, CT 06905
Tel: 203.327.0500 | Fax: 203.357.1118
www.rednissmead.com

COMM. NO.: 10258	DATE: 07/01/2021
	SCALE: 1"=60'



LEGEND

- BOUNDARY
- SECTION LETTER
- GRADE AT FOUNDATION
- PROPOSED GRADE

PROPOSED AVERAGE GRADE PLANE
863 DANBURY ROAD
WILTON, CT

REDNISS & MEAD

LAND SURVEYING
CIVIL ENGINEERING
PLANNING & ZONING CONSULTING
PERMITTING

22 First Street | Stamford, CT 06905
Tel: 203.327.0500 | Fax: 203.357.1118
www.rednissmead.com

COMM. NO.: 10258	DATE: 07/01/2021 SCALE: 1"=30'
---------------------	---

REFER TO GRADE PLANE WORKSHEET FOR
CALCULATED AVERAGE GRADE ELEVATION

Project: Connecticut Humane Society
Site Location: 863 Danbury Road Wilton CT
Calculated by: VJH

Job No.: 10258
Date: July 1, 2021
Checked: CJF

~ PROPOSED CONDITIONS FOR BUILDING ~

Average Grade Calculations

(REFER TO ATTACHED EXHIBIT)

Elevation 1	Elevation 2	Wall Segment	Wall Length	Avg. Elev.	Product (Y)
346.8	346.8	A	126.2	346.8	43,766.2
346.8	347.1	B	27.8	347.0	9,646.6
347.1	346.8	C	28.2	347.0	9,785.4
346.8	346.8	D	131.0	346.8	45,430.8
346.8	346.6	E	17.2	346.7	5,963.2
346.6	346.8	F	34.7	346.7	12,030.5
346.8	346.8	G	14.4	346.8	4,993.9
346.8	346.6	H	34.7	346.7	12,030.5
346.6	346.8	I	4.9	346.7	1,698.8
346.8	346.8	J	18.4	346.8	6,381.1
346.8	346.4	K	16.4	346.6	5,684.2
346.4	346.8	L	41.5	346.6	14,383.9
346.8	347.3	M	24.8	347.1	8,608.1
347.3	346.8	N	21.7	347.1	7,532.1
346.8	346.4	O	21.1	346.6	7,313.3
346.4	346.8	P	46.5	346.6	16,116.9
Total			563.0	5,202.0	195,248.6
Average Grade =			346.8		

On _____ By _____
Craig J. Flaherty CT P.E. 21149

This document and copies thereof are valid only if they bear the signature and embossed seal of the designated licensed professional. Unauthorized alterations render any declaration hereon null and void.