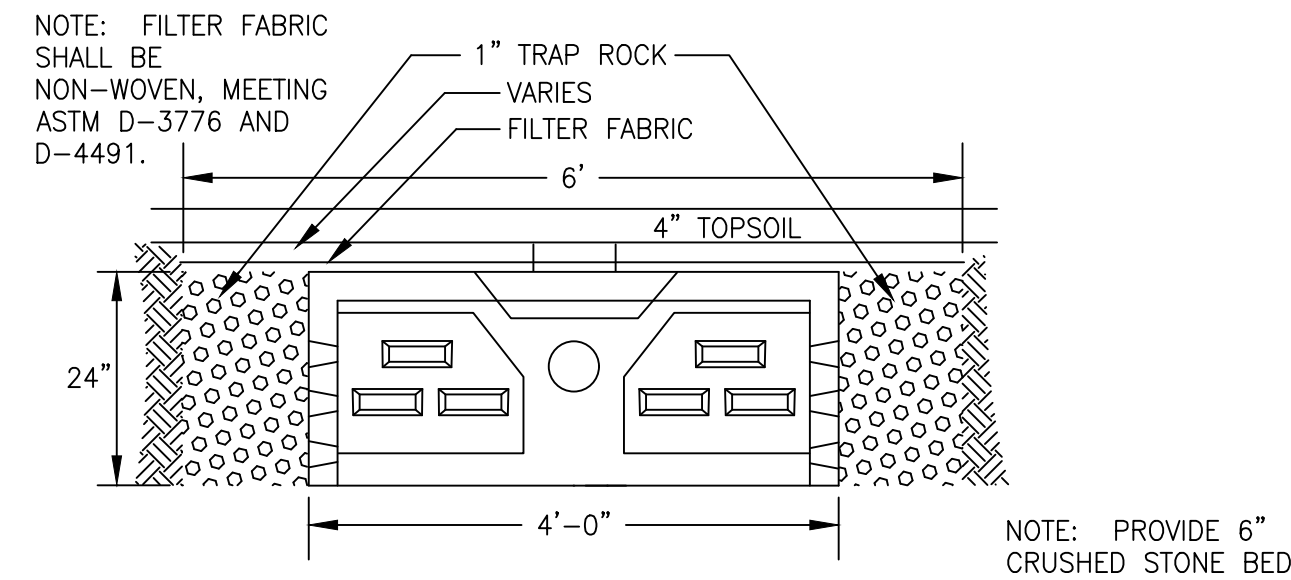
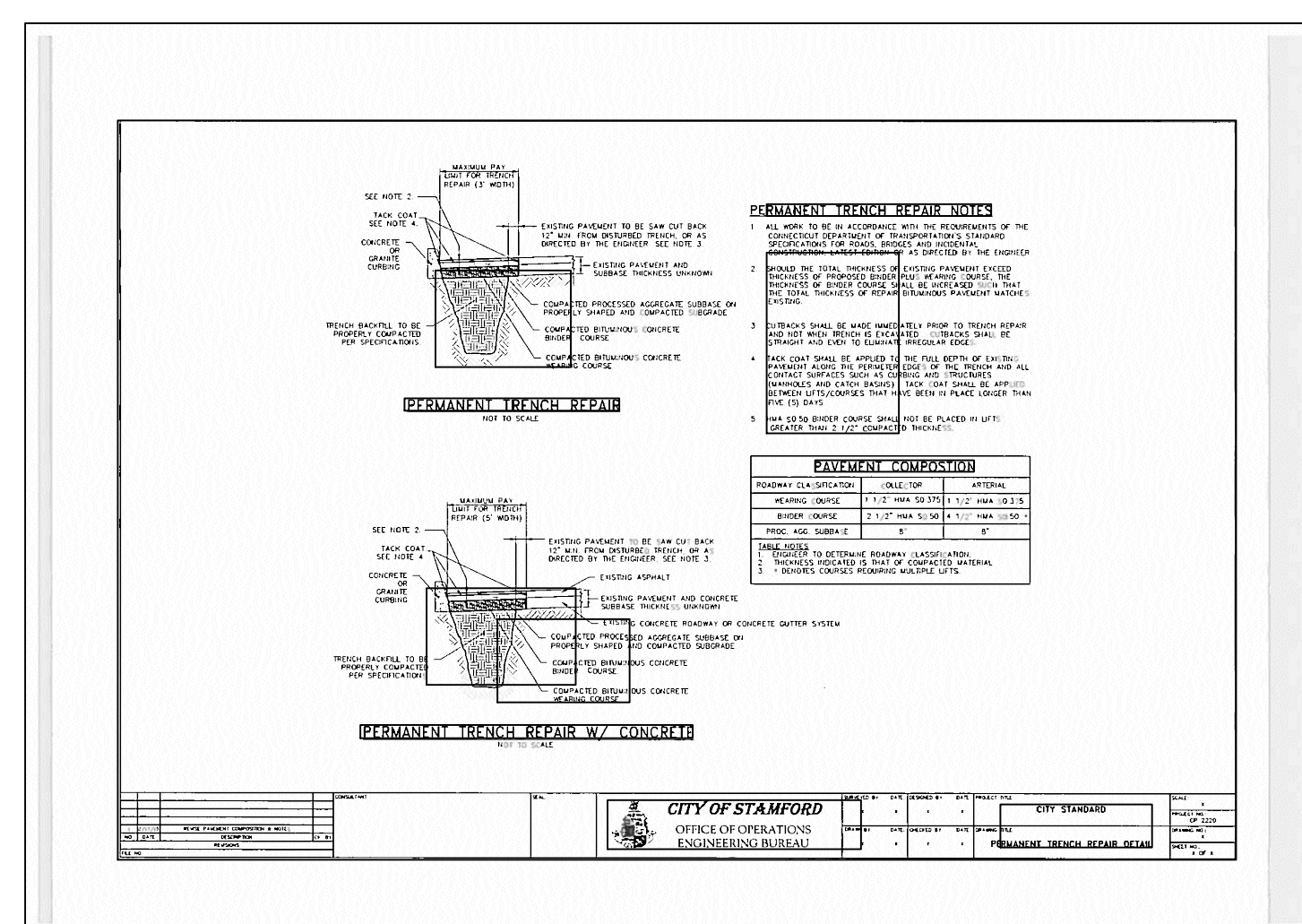
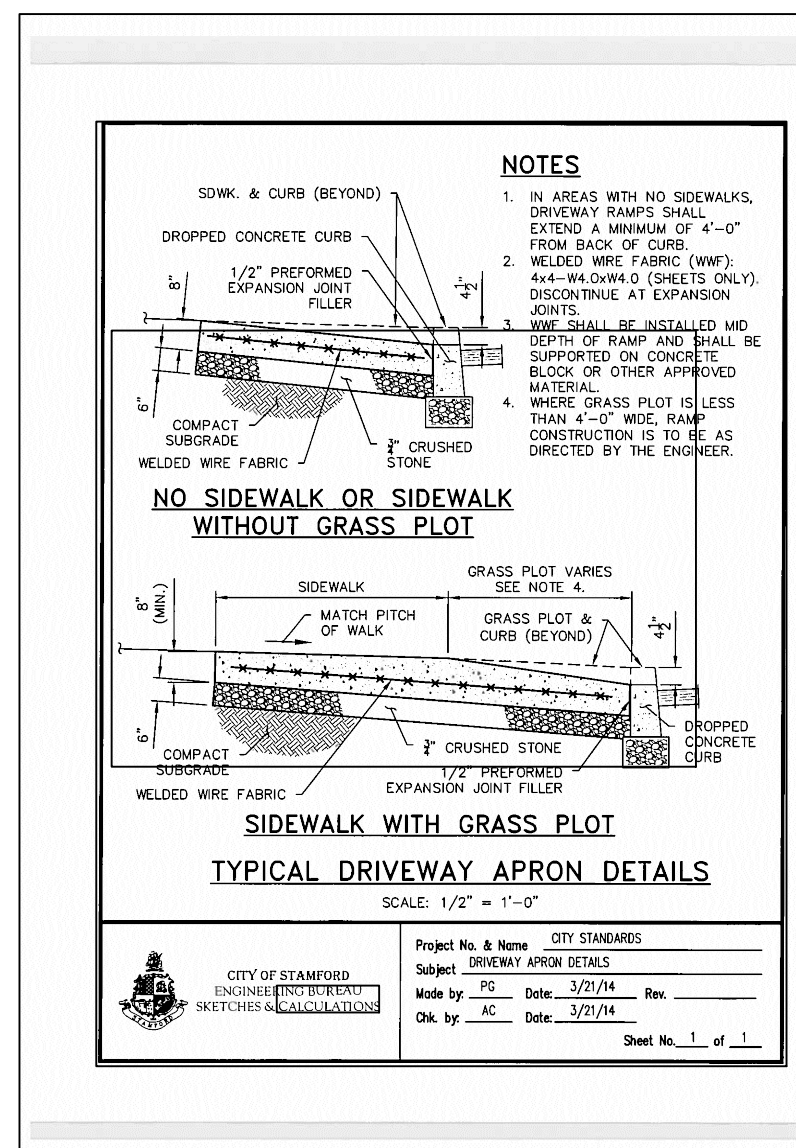


FCE Project #	1673	Date Performed:	9/18/20
Client:	239-241 Henry Street Associates LLC		
Location:	239-241 Henry Street, Stamford		
Observed by:	Wayne D'Avanzo		
Test Hole 1:			
0-9"	Topsoil		
9-26"	Brown Silty Loam		
26-60"	Light Brown Gravel and Silt		
	No Ground Water		
	No Mottling		
	No Ledge		
Test Hole 2:			
0-9"	Topsoil		
9-72"	Tan fine Gravel, stony		
	No Ground Water		
	No Mottling		
	No Ledge		
Test Hole 3:			
0-9"	Topsoil		
9-72"	Tan fine Gravel, stony		
	No Ground Water		
	No Mottling		
	No Ledge		



24" LEACHING GALLERY H-20 RATED

NOT TO SCALE



Conducted by:	Wayne D'Avanzo	Project:	1673
Type:	Borehole infiltration; 4" solid pipe	Town:	Stamford
Location:	239-241 Henry Street	Date:	9/18/2020
Client:	239-242 Henry Street Associates LLC		

Weather conditions prior to and during tests:
Overcast, no rain

Single Lot:	X	Subdivision:	
Diameter of Hole:	4"	Depth of Hole:	48"

PT-1		Design	
Pre-Soak @: 9:15 AM		0.89"/Hr.	

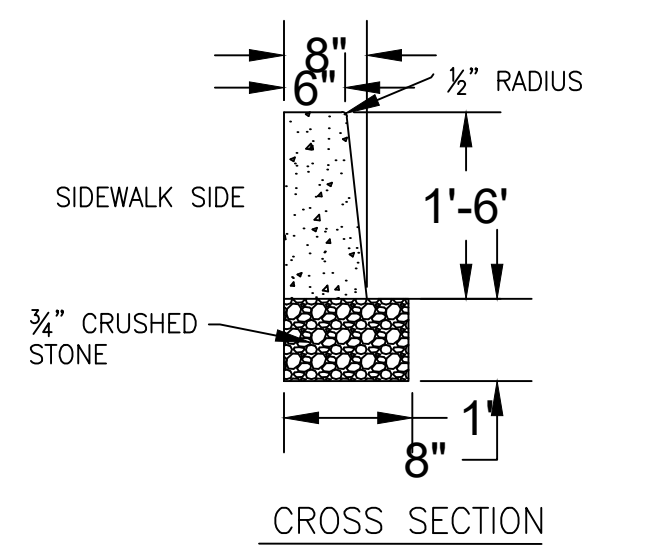
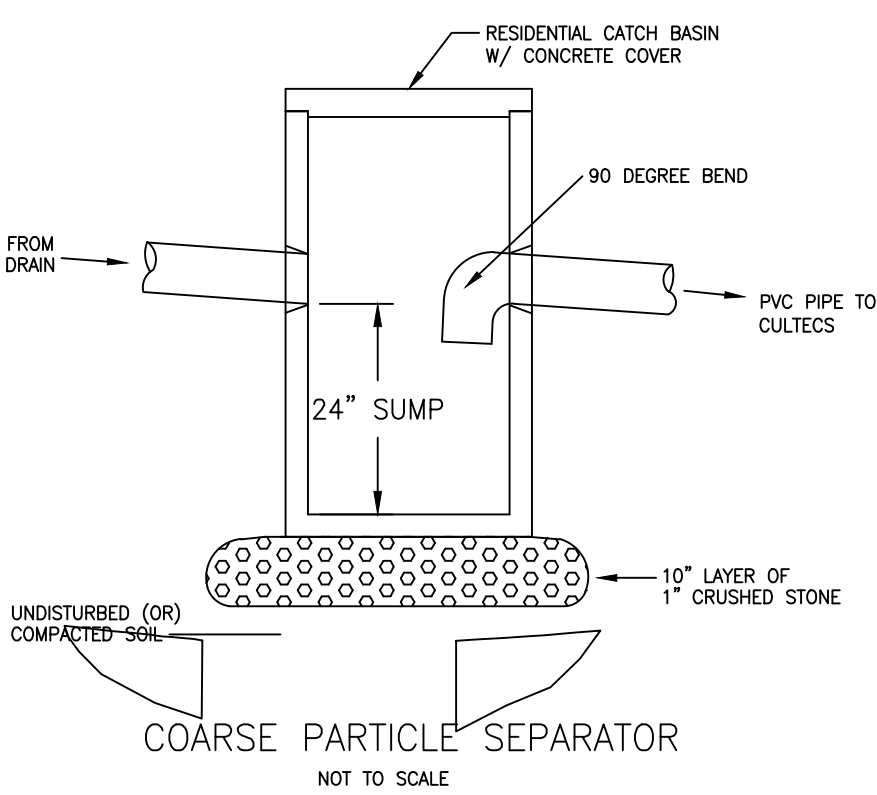
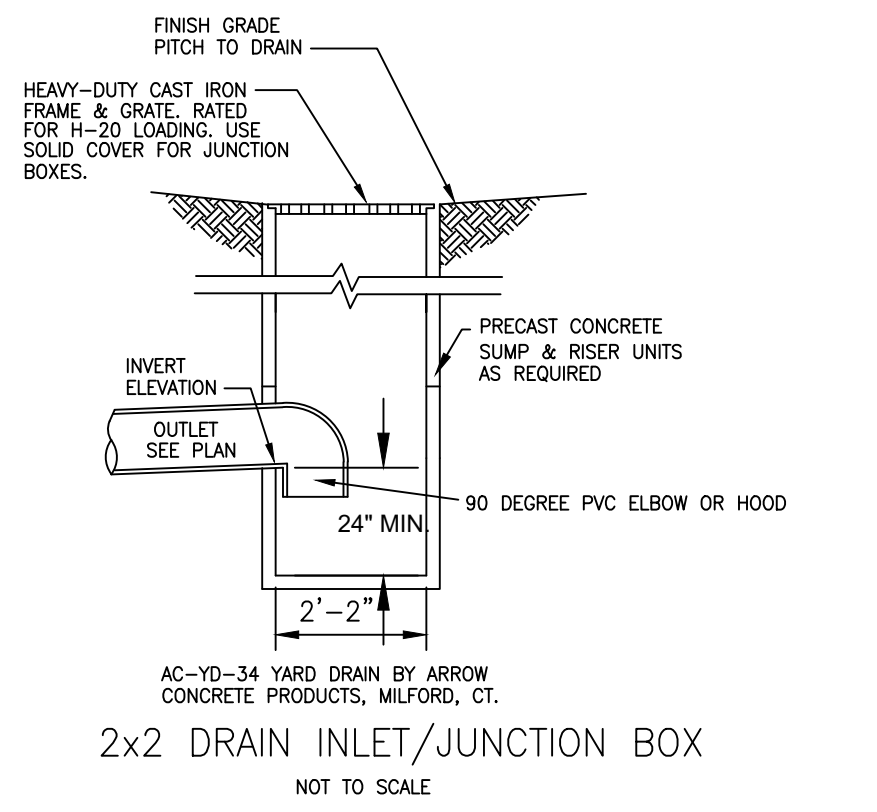
Time	Time Increment	Depth to Water	Drop in inches	Soil Percolation Rate Time to drop 1 inch	
10:00 AM	---	24"	---	---	---
11:00 AM	1 Hr.	25 1/2"	1 1/2"	40.0 Min.	Refill to 24"
11:05 AM	---	24"	---	---	---
12:05 PM	1 Hr.	25 3/4"	1 3/4"	34.3 Min.	Refill to 24"
12:10 PM	---	24"	---	---	---
1:10 PM	1 Hr.	25 7/8"	1 7/8"	32.0 Min.	Refill to 24"
1:12 PM	---	24"	---	---	---
2:12 PM	1 Hr.	26"	2"	30.0 Min.	---
				Avg. = 1.78"	

PT-2		Design	
Pre-Soak @: 9:17 AM		1.70"/Hr.	

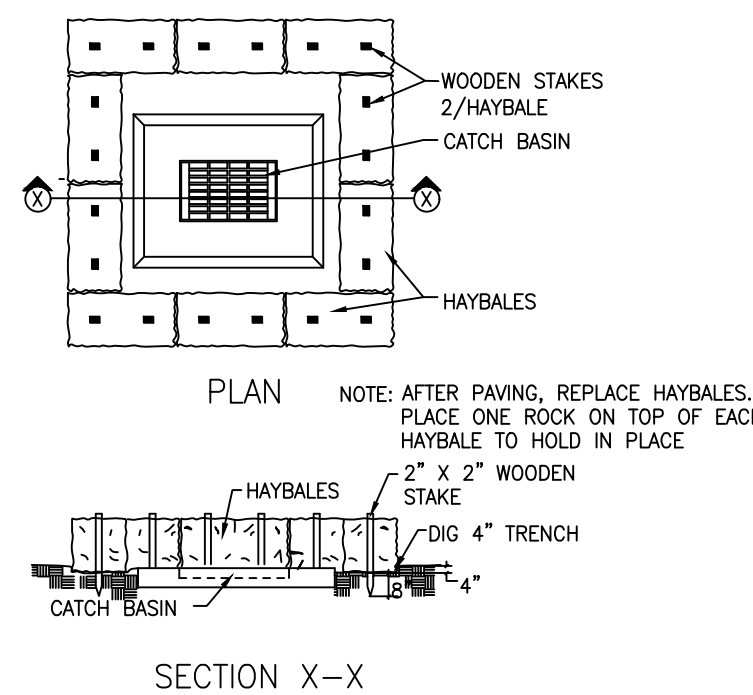
Time	Time Increment	Depth to Water	Drop in inches	Soil Percolation Rate Time to drop 1 inch	
10:03 AM	---	24"	---	---	---
11:03 AM	1 Hr.	26 1/4"	3 1/4"	18.5 Min.	Refill to 24"
11:08 AM	---	24"	---	---	---
12:08 PM	1 Hr.	25 7/8"	3 1/2"	17.1 Min.	Refill to 24"
12:08 PM	---	24"	---	---	---
1:08 PM	1 Hr.	26 1/8"	3 3/8"	17.8 Min.	Refill to 24"
1:14 PM	---	24"	---	---	---
2:14 PM	1 Hr.	26 1/2"	3 1/2"	17.1 Min.	---
				Avg. = 3.41"	

PT-3		Design	
Pre-Soak @: 9:17 AM		1.73"/Hr.	

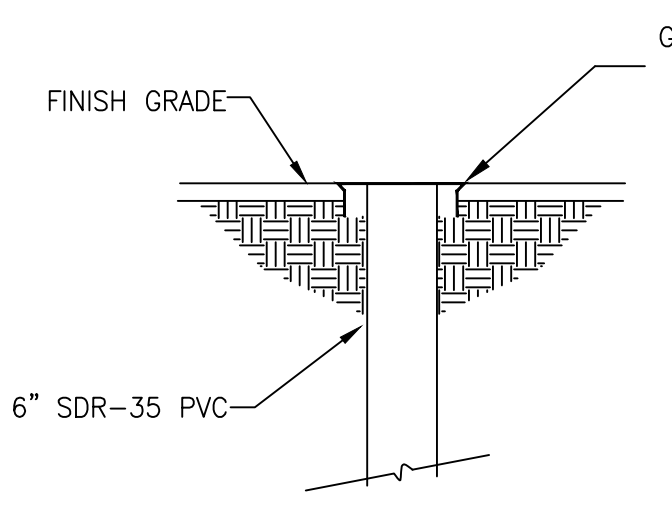
Time	Time Increment	Depth to Water	Drop in inches	Soil Percolation Rate Time to drop 1 inch	
10:06 AM	---	24"	---	---	---
11:06 AM	1 Hr.	26 1/4"	3"	20.0 Min.	Refill to 24"
11:11 AM	---	24"	---	---	---
12:11 PM	1 Hr.	25 7/8"	3 5/8"	16.6 Min.	Refill to 24"
12:12 PM	---	24"	---	---	---
1:12 PM	1 Hr.	26 1/8"	3 1/2"	17.1 Min.	Refill to 24"
1:17 PM	---	24"	---	---	---
2:17 PM	1 Hr.	26 1/2"	3 3/4"	16.0 Min.	---
				Avg. = 3.47"	



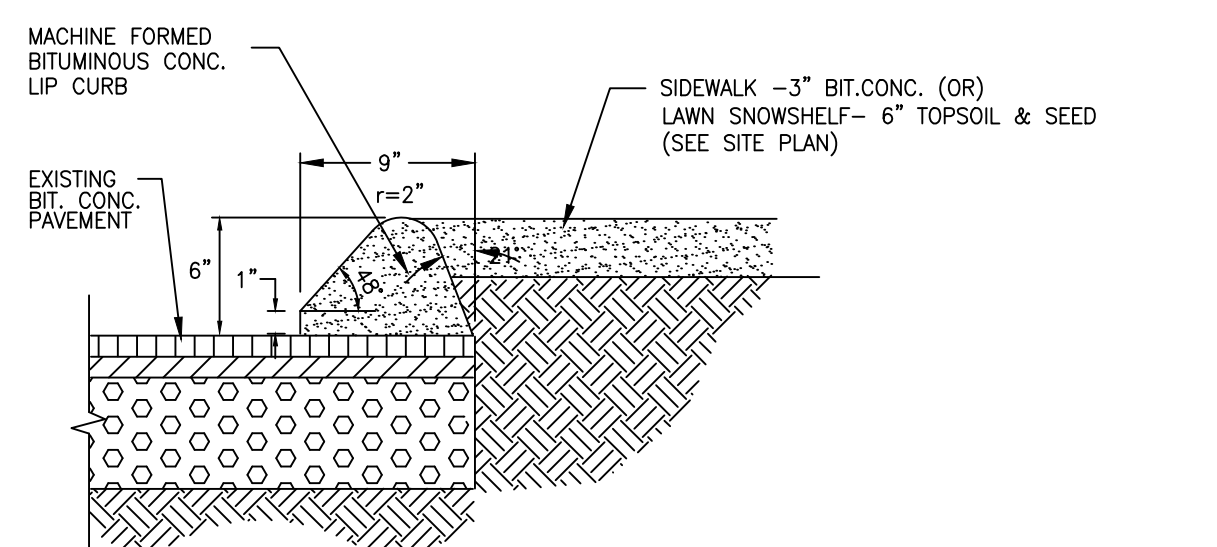
STANDARD CURB
NOT TO SCALE



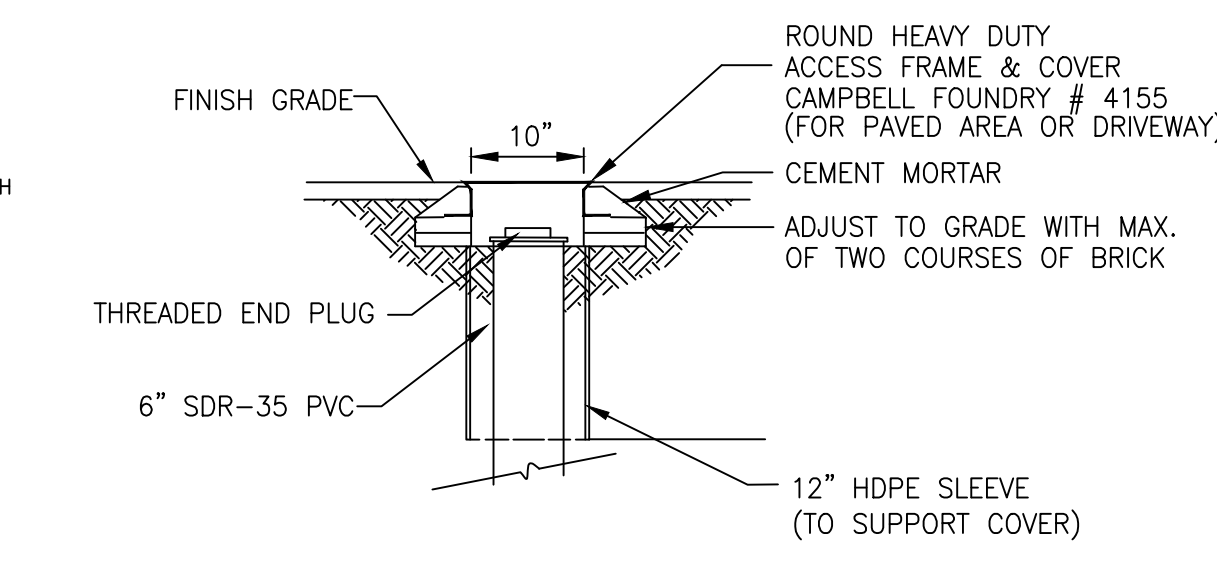
CATCHBASIN - SILT PROTECTION
NOT TO SCALE



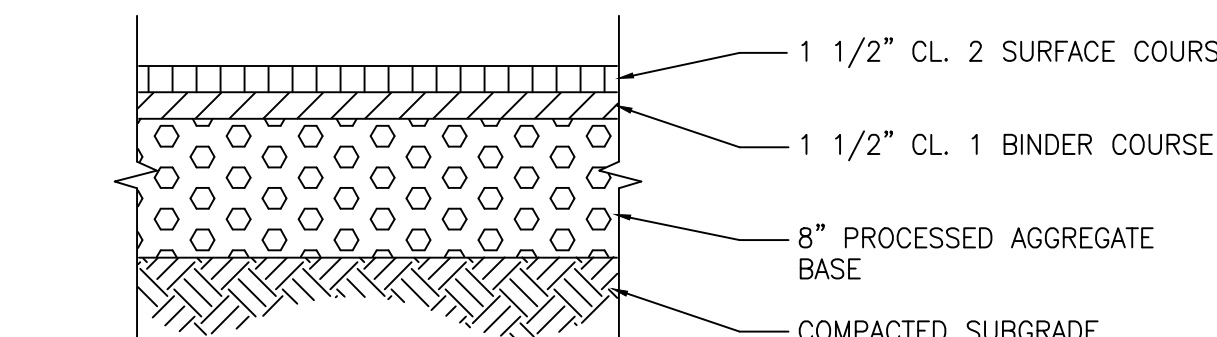
OVERFLOW
NOT TO SCALE



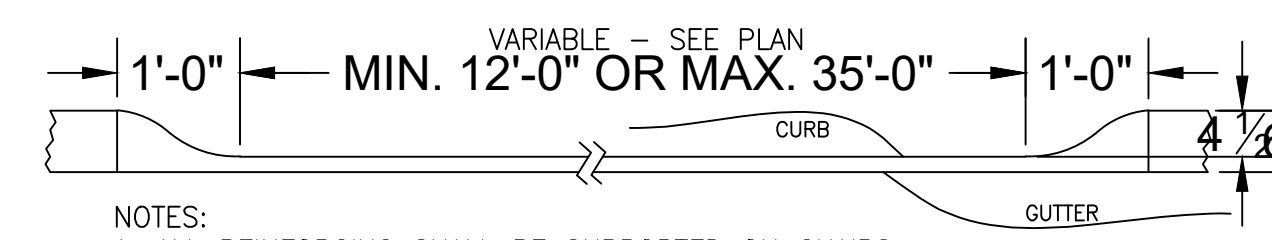
BIT. CONC. CURB
NOT TO SCALE



INSPECTION PORT
NOT TO SCALE



DRIVEWAY PAVEMENT
NOT TO SCALE



TYPICAL CONSTRUCTION OF CURB AT DRIVEWAY
NOT TO SCALE

- NOTES:
- ALL REINFORCING SHALL BE SUPPORTED ON CHAIRS OR OTHER POSITIVE TYPE SUPPORTS; ONE PER 25 S.F.
 - CONCRETE SHALL BE CLASS 'C' CEMENT TYPE B, 3000 PSI
 - AIR ENTRAPMENT SHALL BE BETWEEN 6% AND 7%.

Tables - Hydrologic Soil Group - Summary By Map Unit		Summary by Map Unit - State of Connecticut (CT600)		
Summary by Map Unit - State of Connecticut (CT600)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
307	Urban land	D	0.4	100.0%
Totals for Area of Interest			0.4	100.0%

Stormwater Facilities Maintenance Plan

239-241 Henry Street Associates LLC
239-241 Henry Street, Stamford, CT

Scope:

The purpose of the Stormwater Facility Maintenance Plan is to ensure that the proposed stormwater components to be installed at 239-242 Henry Street are maintained in operational condition throughout the life of the project.

Recommended Frequency of Service:

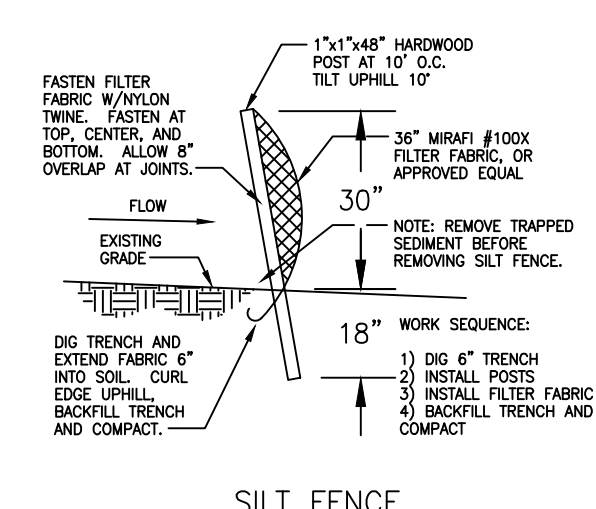
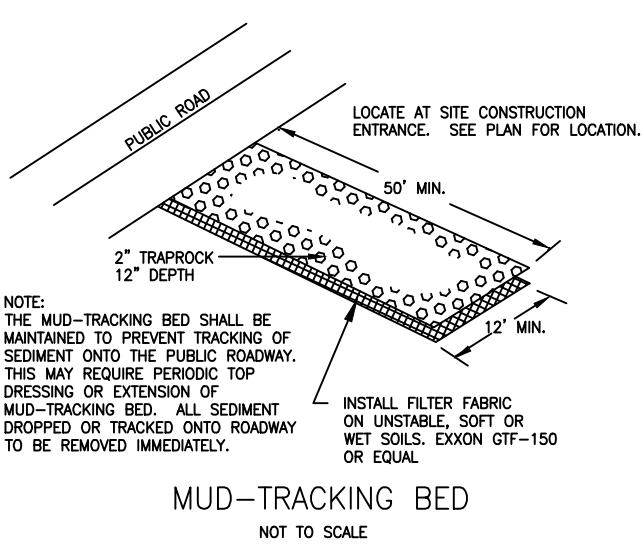
All of the stormwater components installed for this property should be checked periodically and kept in full working order. Ultimately, the frequency of inspection and service cleaning depends on the amount of runoff, pollutant loading and interference from debris (leaves, vegetation, trash, etc.); however it is recommended that the facility be inspected and cleaned a minimum of four times a year. The guidelines for the timing of service include early spring, after the last snowfall, and late fall after the leaves have fallen from the trees.

Service Procedures:

- Concrete galleries:** The maintenance of the concrete gallery units shall be in accordance with the aforementioned schedule. The units shall be inspected via the inspection port and removed of sediment and debris as needed. The overflow grate shall be cleared of any accumulated debris.
- Roof gutters:** The roof gutters of the house shall be inspected and cleared of any leaves, twigs, debris, etc. This shall be done in the early spring, and late fall after all of the leaves have fallen from trees.
- Roof Leaders:** The maintenance of the roof leaders shall be in accordance with the aforementioned schedule and shall include the inspection of the leaders via the cleanouts and removal of any debris, obstruction and sediment.
- Driveway Drains:** The driveway drains shall be inspected and the grates cleared of any leaves, twigs, debris, etc. This shall be done in the early spring, and late fall after all of the leaves have fallen from trees. The sump shall be inspected and cleared of any accumulated silt, debris, etc. The outflow elbow shall be inspected. The structure shall be inspected for integrity, and repaired/replaced as necessary.
- Coarse Particle Separator:** The coarse particle separator shall be inspected and cleared of any leaves, twigs, debris, etc. This shall be done in the early spring, and late fall after all of the leaves have fallen from trees. The sump shall be inspected and cleared of any accumulated silt, debris, etc. The outflow elbow shall be inspected. The structure shall be inspected for integrity, and repaired/replaced as necessary.

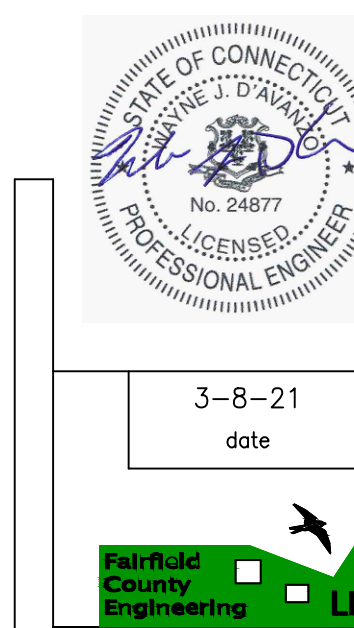
Reporting:

A maintenance log shall be kept of each inspection outlining the items inspected and the maintenance performed. These logs should be kept on file by the Owner, and must be shared with the City upon request.



CONSTRUCTION SEQUENCE

- Install silt fencing and other erosion controls as shown on plan.
- Install mud anti tracking pad as shown on plan.
- Remove existing structures.
- Construct building, rough in driveway.
- Install PVC roof leaders to area of retention system.
- Install driveway drains, coarse particle separator.
- Install underground retention systems, connect roof leaders, pipes from driveway drainage.
- Grade as shown on plan.
- Fine grade, topsoil and seed all areas.



REV. 3/24/21: PER ENGINEERING BUREAU COMMENTS.
239-241 HENRY STREET ASSOCIATES LLC
239-241 HENRY STREET STAMFORD, CONNECTICUT

3-8-21
date

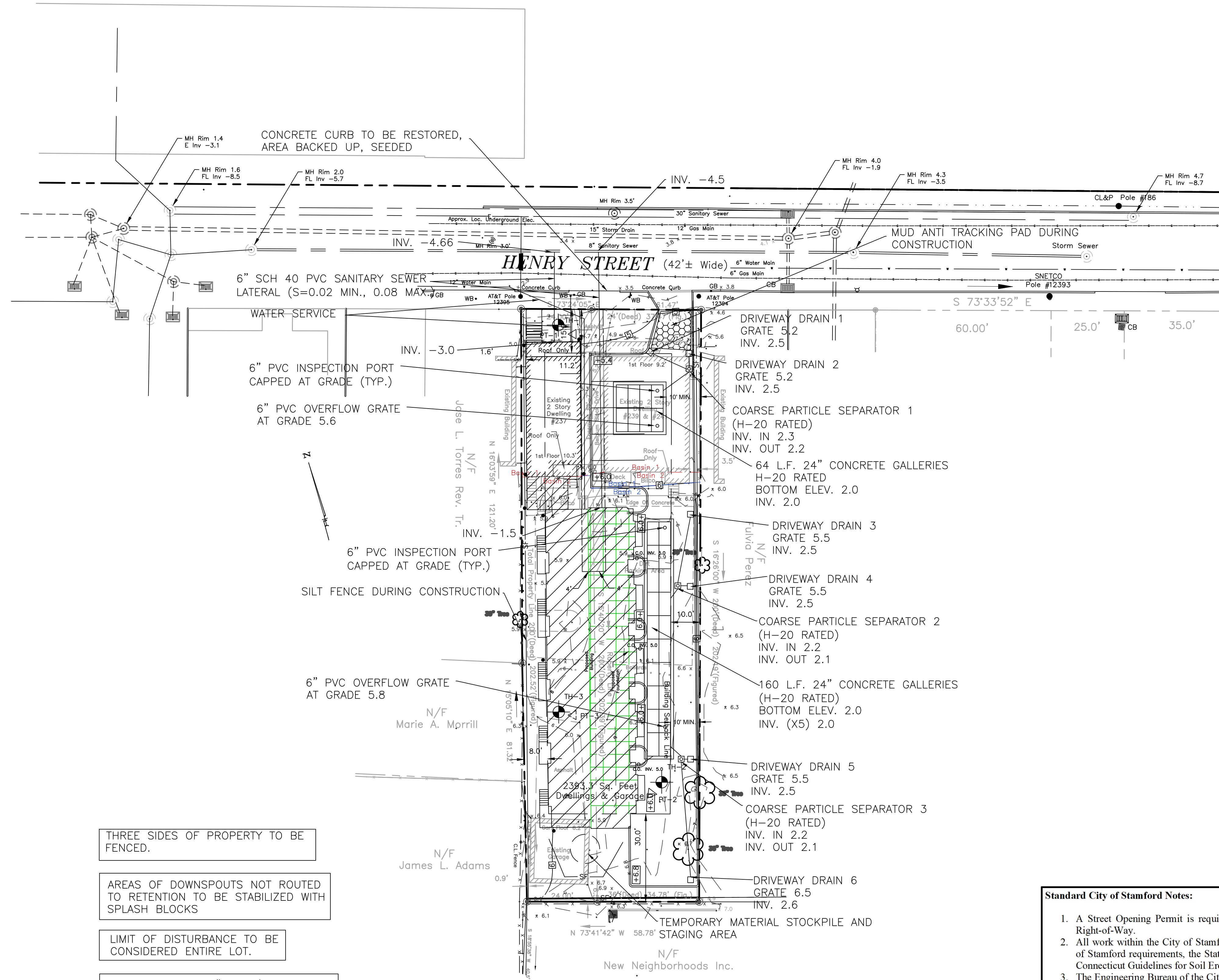
DETAIL SHEET

CIVIL ENGINEERS

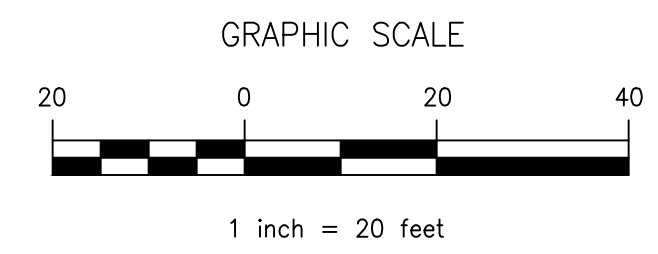
1673
project

FAIRFIELD COUNTY ENGINEERING L.L.C.
80 WINFIELD STREET, NORWALK, CONNECTICUT 06855 PH: (203) 831-8005 FAX: (203) 831-8006

2 OF 2
sheet

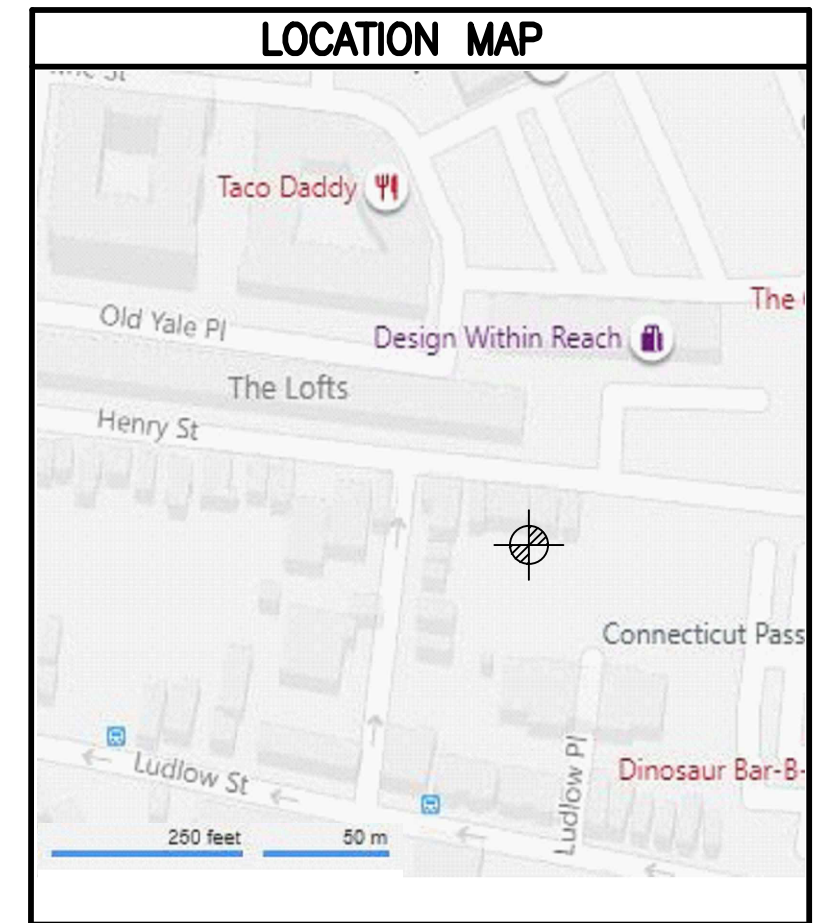


- THREE SIDES OF PROPERTY TO BE FENCED.
- AREAS OF DOWNSPOUTS NOT ROUTED TO RETENTION TO BE STABILIZED WITH SPLASH BLOCKS
- LIMIT OF DISTURBANCE TO BE CONSIDERED ENTIRE LOT.
- ALL PIPES TO BE 6" PVC (S=0.01 MIN. UNLESS OTHERWISE NOTED.



GENERAL CONSTRUCTION NOTES:

1. CONSTRUCTION AND STRUCTURES SHALL COMPLY WITH ALL MUNICIPAL OR STATE REQUIREMENTS. ALL WORK SHALL BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER, TO THE SATISFACTION OF THE ENGINEERING BUREAU, THAT CONSTRUCTION IS IN ACCORDANCE WITH THESE PLANS.
2. THE ENGINEERING BUREAU OF THE DEPARTMENT OF PUBLIC WORKS AND THE ENGINEER OF RECORD SHALL BE NOTIFIED THREE DAYS PRIOR TO THE COMMENCEMENT OF EACH PHASE OF CONSTRUCTION.
3. NO CERTIFICATE OF CONFORMANCE TO STANDARDS SHALL BE ISSUED BY THE DESIGN ENGINEER IF PROPER NOTICE IS NOT PROVIDED FOR INSPECTIONS OR IF INSPECTIONS ARE NOT MADE PRIOR TO BACKFILLING OF BELOW GROUND STRUCTURES AND APPURTENANCES.
4. SUBSURFACE STRUCTURES AND UTILITIES HAVE BEEN DETERMINED FROM EXISTING RECORDS AND ARE NOT GUARANTEED TO BE COMPLETE OR ACCURATE. IN ORDER TO AVOID CONFLICT OF THE PROPOSED WORK AND EXISTING UTILITIES, THE CONTRACTOR SHALL LOCATE EXISTING UTILITIES BY EXCAVATING TEST HOLES. IF THE CONTRACTOR DETERMINES THAT A CONFLICT EXISTS, HE SHALL IMMEDIATELY NOTIFY THE ENGINEER, WHO WILL MAKE THE NECESSARY ADJUSTMENTS.
5. EXISTING PROPERTY AND UTILITY INFORMATION WAS TAKEN FROM A SURVEY BY EDWARD J. FRATTAROLI, INC. TITLED "PLOT PLAN PREPARED FOR 239-241 HENRY STREET ASSOCIATES LLC", DATED SEPTEMBER 17, 2018.
6. ALL SANITARY SEWER PIPE SHALL BE EITHER SDR-35 P.V.C. (ASTM D-3034) OR CLASS 52 DUCTILE IRON (ANSI A 21-51), AS INDICATED ON THE PLANS, UNLESS OTHERWISE INDICATED. ALL SANITARY SEWER PIPE SHALL HAVE RUBBER GASKET SLIP-TYPE JOINTS. INFILTRATION INTO SANITARY SEWERS SHALL NOT EXCEED 150 GALLONS PER INCH OF PIPE DIAMETER PER MILE OF PIPE IN 24 HOURS.
7. NO PIPE SHALL HAVE A BEND OF GREATER THAN 45 DEGREES.
8. THE CONTRACTOR SHALL NOTIFY "CALL BEFORE YOU DIG" AT 1-800-922-4455, OR OTHER APPROPRIATE CONTACT POINT PRIOR TO START OF CONSTRUCTION.
9. ALL UTILITY LOCATIONS ARE APPROXIMATE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONFIRM THE LOCATION OF THE UTILITIES IN THE FIELD BY WHATEVER MEANS HE DEEMS PRUDENT.
10. THIS DESIGN CONFORMS TO APPLICABLE CODES AND ACCEPTED PRACTICE, NO OTHER WARRANTY IS EXPRESSED OR IMPLIED.
11. PROPERTY IS SUBJECT OF ZONING APPLICATION 221-10.
12. TOTAL SITE AREA = 0.2812 ACRES



- Standard City of Stamford Notes:**
1. A Street Opening Permit is required for all work within the City of Stamford Right-of-Way.
 2. All work within the City of Stamford Right-of-Way shall be constructed to City of Stamford requirements, the State of Connecticut Basic Building Code and the Connecticut Guidelines for Soil Erosion and Sedimentation Control.
 3. The Engineering Bureau of the City of Stamford shall be notified three days prior to any commencement within the City of Stamford Right-of-Way.
 4. Trees within the City of Stamford Right-of-Way to be removed shall be posted in accordance with the Tree Ordinance.
 5. Prior to any excavation the Contractor and/or Applicant/Owner, in accordance with Public Act 77-350, shall be required to contact "Call Before You Dig" at 1-800-922-4455 for mark out of underground utilities.
 6. All retaining walls greater than three (3) feet measured from finished grade at the top of the wall to finished grade at the bottom of the wall and retaining walls supporting a surcharge or impounding Class I, II, or II-A liquids are required to have a Building Permit. Retaining walls shall be designed, and inspected during construction by a Professional Engineer licensed in the State of Connecticut. Prior to issuance of a Certificate of Occupancy, retaining walls shall be certified by a Professional Engineer licensed in the State of Connecticut.
 7. Certification will be required by a professional engineer licensed in the State of Connecticut that work has been completed in compliance with the approved drawings.
 8. A Final Improvement Location Survey will be required by a professional land surveyor licensed in the State of Connecticut.
 9. Connection to a city-owned storm sewer shall require the Waiver Covering Storm Sewer Connection to be filed with the City of Stamford Engineering Bureau.
 10. Granite block or other decorative stone or brick, depressed curb, driveway apron and curbing within the City of Stamford Right-of-Way shall require a waiver from the City of Stamford Engineering Bureau.
 11. Sediment and erosion controls shall be maintained and repaired as necessary throughout construction until the site is stabilized.
 12. To obtain a Certificate of Occupancy, submittal must include all items outlined in the Checklist for Certificate of Occupancy (Appendix D of the City of Stamford Drainage Manual).
 13. No EPB Permit #, Zoning Permit #, Zoning Board of Appeals # is applicable.

- SEDIMENTATION AND EROSION CONTROL NOTES**
1. LAND DISTURBANCE SHALL BE KEPT TO A MINIMUM. PERMANENT STABILIZATION SHALL BE SCHEDULED AS SOON AS FINAL GRADES ARE ESTABLISHED.
 2. ALL DISTURBED AREAS SHALL BE FINE GRADED AND SEEDED WITH AN APPROVED SEED MIXTURE. COVER NEWLY SEEDED AREAS WITH MULCH HAY OR SALT HAY.
 3. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE 2002 CONNECTICUT 'GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL' HANDBOOK.
 4. ALL CONTROL MEASURES SHALL BE MAINTAINED IN EFFECTIVE CONDITION THROUGHOUT THE CONSTRUCTION PERIOD. CHECK AFTER EACH STORM EVENT.
 5. ADDITIONAL CONTROL MEASURES SHALL BE INSTALLED DURING THE CONSTRUCTION PERIOD, IF REQUIRED BY TOWN AUTHORITIES.
 6. SEDIMENT DEPOSITS REMOVED FROM FILTER BARRIERS SHALL BE PLACED IN FILL AREAS OR SPREAD WHERE THERE IS PROPOSED VEGETATIVE COVER. ANY SEDIMENT DEPOSITS REMAINING AFTER THE FILTER BARRIER IS REMOVED SHALL BE FINE GRADED AND PLANTED ACCORDING TO PLAN.
 7. THE SITE CONSTRUCTION CONTRACTOR IS ASSIGNED THE RESPONSIBILITY FOR IMPLEMENTING THIS EROSION AND SEDIMENT CONTROL PLAN. THIS RESPONSIBILITY INCLUDES THE INSTALLATION AND MAINTENANCE OF CONTROL MEASURES, INFORMING ALL PARTIES ENGAGED ON THE CONSTRUCTION SITE OF THE REQUIREMENTS AND OBJECTIVES OF THE PLAN, NOTIFYING THE PLANNING AND ZONING OFFICE (AND/OR THE CONSERVATION COMMISSION) OF ANY TRANSFER OF THIS RESPONSIBILITY AND CONVEYING A COPY OF THE EROSION AND SEDIMENT CONTROL PLAN IF THE TITLE TO THE LAND IS TRANSFERRED TO A NEW OWNER.

3-8-21
date

REV. 3/24/21: PER ENGINEERING BUREAU COMMENTS.

239-241 HENRY STREET ASSOCIATES LLC

239-241 HENRY STREET STAMFORD, CONNECTICUT

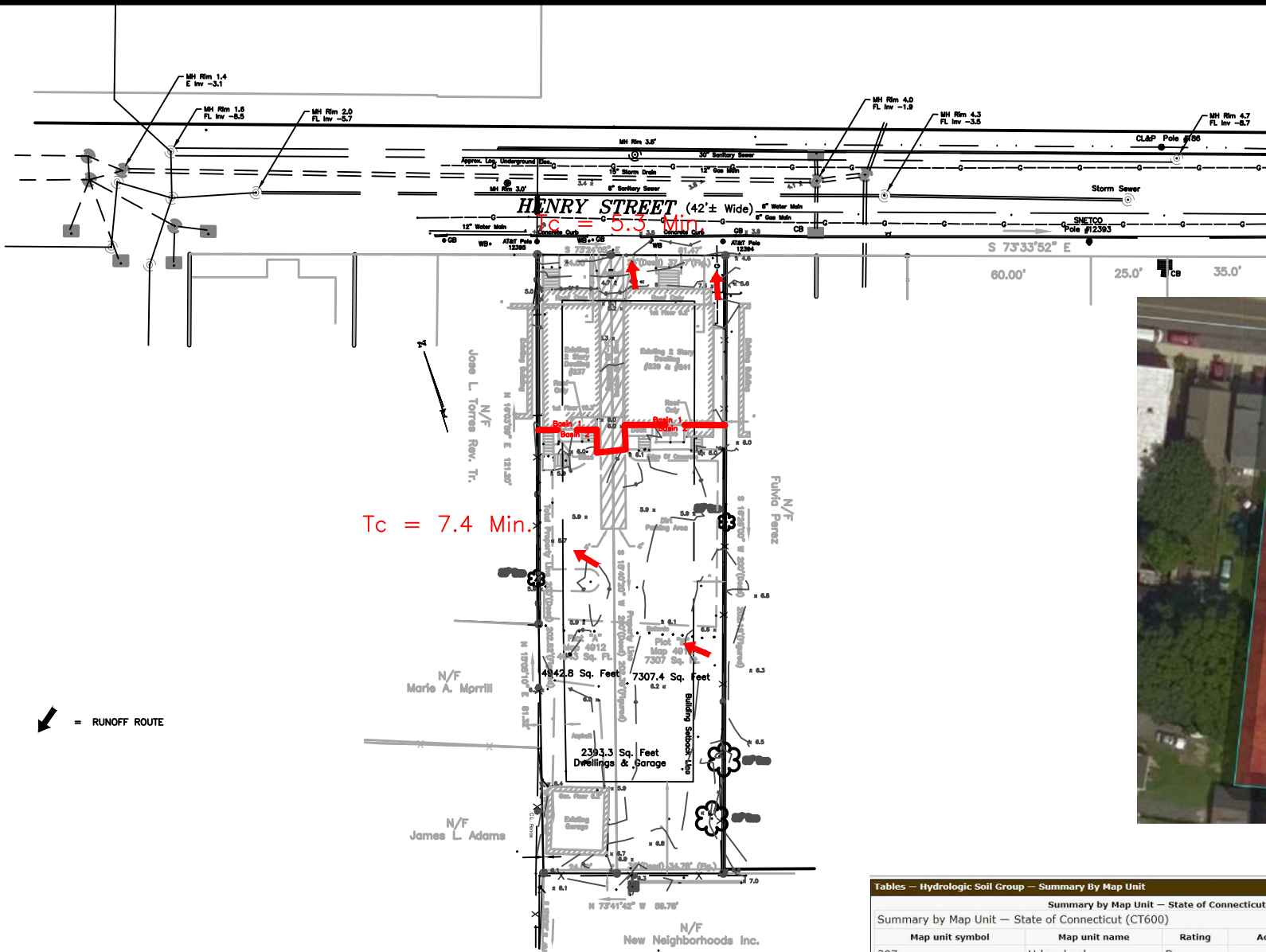
DRAINAGE PLAN

CIVIL ENGINEERS

80 WINFIELD STREET, NORWALK, CONNECTICUT 06855 PH: (203) 831-8005 FAX: (203) 831-8006

1673 project

1 OF 2 sheet



Tc = 7.4 Min.

Tc = 5.3 Min.

↙ = RUNOFF ROUTE



Tables — Hydrologic Soil Group — Summary By Map Unit

Summary by Map Unit — State of Connecticut (CT600)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
307	Urban land	D	0.4	100.0%
Totals for Area of Interest			0.4	100.0%

8-13-20
date

239-241 HENRY STREET ASSOCIATES LLC
239-241 HENRY STREET STAMFORD, CONNECTICUT

EXISTING BASIN

CIVIL ENGINEERS

1673
project

FAIRFIELD COUNTY ENGINEERING L.L.C.

1 OF 1
sheet

80 WINDY STREET, WINDY, CONNECTICUT 06897 Ph: (203) 831-8000 Fax: (203) 831-8000

DRAINAGE REPORT PREPARED FOR EXISTING AND PROPOSED SITE CONDITIONS

LOCATED AT: 239-241 HENRY STEET
STAMFORD, CONNECTICUT

FCE # 1673

March 8, 2021

Revised to March 24, 2021



FAIRFIELD COUNTY ENGINEERING, LLC

CIVIL ENGINEERS

60 WINFIELD ST.

NORWALK, CONNECTICUT 06855

(203) 831-8005 FAX: (203) 831-8006 E-mail to: wayne@fairfieldce.com



NARRATIVE:

The subject of this report is a 0.281 acre parcel located at 239-241 Henry Street in Stamford. The property is currently zoned RMF. The purpose of this report is to determine the existing and proposed runoffs resulting from the proposed site improvements.

EXISTING CONDITIONS:

The subject parcel is located at the south of Henry Street, approximately 600 feet from its intersection with South Pacific Street. The lot currently contains two residences, associated asphalt driveway, parking area, and detached garage. The lot contains two drainage basins; one flowing to the north and to the road, the other basin in the rear flowing to the west. The lot is relatively flat. The drainage pattern follows the terrain as described. The property does not directly discharge to an impaired waterbody per the State of Connecticut's most recent Integrated Water Quality Report, List of Impaired Waters, Appendix B-1.

Existing soils at this location, as identified in the NRCS Soil Survey of Fairfield County, Connecticut, consists of Urban Land, which has a Hydrologic classification of "D".

The existing runoff from a 50-Year rainfall event in Basin 1 is 0.59 c.f.s.

The existing runoff from a 50-Year rainfall event in Basin 2 is 1.32 c.f.s.

PROPOSED CONDITIONS:

The proposal for this property is to raze the existing structures, and construct a new 5 unit residence, with associated driveway and parking, along with the reconstruction of the residential structure in the northwest quadrant of the property.

The proposed runoff from a 50-Year rainfall event in Basin 1 is 0.60 c.f.s.

The proposed runoff from a 50-Year rainfall event in Basin 2 is 1.27 c.f.s.

Due to the positioning of the proposed structure and proposed grading, Basin 1 increases in size by 172 square feet, while Basin 2 decreases by the same amount in the proposed conditions.

The increased runoff resulting from the proposed improvements in each basin will be routed to an underground retention system sized to temporarily store the increased runoff before draining into the surrounding soils.

The disturbed areas will be protected with a silt fence on the downgrade elevations, properly backed up. A mud anti tracking pad will be placed on the construction entrance, and the roadway swept clean as necessary.

COMPUTATIONS:

The following computations of the existing and proposed conditions runoff flows were derived from the HydroCAD computer software. HydroCAD follows the NRCS TR-20 procedure for computing stormwater runoff. Computations were performed for a 1-year storm event, which has a 100% chance of occurring in any given 12 month period, through a 100-year storm event, which has a 1% chance of occurring in any given 12 month period.

Existing Conditions (Basin 1):

Buildings	2,252	s.f.	CN 98
Driveway	533	s.f.	CN 98
Walks	196	s.f.	CN 98
Lawn	513	s.f.	CN 84
Total	3,494	s.f.	

Weighted CN = 96

Proposed Conditions (Basin 1):

Building	878	s.f.	CN 98
Driveway/Parking	1,818	s.f.	CN 98
Walk	26	s.f.	CN 98
Lawn	944	s.f.	CN 84
Total	3,666	s.f.	

Weighted CN = 94

Groundwater Recharge Volume (GWV) Basin 1:

Impervious area = 74.2 %

$$WQV = (0.7178 * 0.084 \text{ ac})/12 = 0.0050246 \text{ ac-ft} = 218.9 \text{ ft}^3$$

$$GWQ = 218.9 * 0.1 = 21.9 \text{ ft}^3$$

Manning's Equation:

$$V = (1/n) A^{2/3} S^{1/2}$$

$$Q = V * \text{Cross sectional Area}$$

$$\text{For 6" PVC pipe: } V = (1/0.011) (0.125)^{2/3} (0.01)^{1/2} = 2.27 \text{ ft./sec}$$

$$Q = 2.27 * 0.196 \text{ ft}^2 = 0.44 \text{ c.f.s.}$$

Existing Conditions (Basin 2):

Building	215	s.f.	CN 98
Dirt Parking	2,863	s.f.	CN 91
Deck	49	s.f.	CN 91
Asphalt area	530	s.f.	CN 98
Garage	460	s.f.	CN 98
Lawn	4,639	s.f.	CN 84
Total	8,756	s.f.	

Weighted CN = **88**

Proposed Conditions (Basin 2):

Building	3,462	s.f.	CN 98
Driveway	2,639	s.f.	CN 98
Deck/stairs	225	s.f.	CN 91
Lawn	2,258	s.f.	CN 84
Total	8,584	s.f.	

Weighted CN = **95**

Groundwater Recharge Volume (GWV) Basin 2:

Impervious area = 73.7 %

WQV = (0.7133 * 0.197 ac)/12 = 0.01117100 ac-ft = 510.1 ft³

GWQ = 510.1 * 0.1 = 51.0 ft³

SUMMARY:

Basin 1:

	100 Year	50 Year	25Yr.	10Yr.	5Yr.	2Yr.	1Yr.
Existing Runoff :	0.67 c.f.s.	0.59 c.f.s.	0.52	0.43	0.36	0.28	0.23
Proposed Runoff :	0.67 c.f.s.	0.60 c.f.s.	0.53	0.43	0.36	0.27	0.22
Runoff Retained:	0.31 c.f.s.	0.27 c.f.s.	0.24	0.20	0.17	0.13	0.11
Areas Bypassing Retention							
Plus overflow:	0.95 c.f.s.	0.46 c.f.s.	0.30	0.24	0.20	0.15	0.12
% +/- Basin 2:	+41.8	-22.0	-42.3	-44.2	-44.4	-46.4	-47.8

	100 Year	50 Year	25Yr.	10Yr.	5Yr.	2Yr.	1Yr.
Existing Runoff :	1.51 c.f.s.	1.32 c.f.s.	1.15	0.92	0.75	0.54	0.42
Proposed Runoff :	1.44 c.f.s.	1.27 c.f.s.	1.12	0.92	0.77	0.59	0.48
Runoff Retained:	0.84 c.f.s.	0.74 c.f.s.	0.66	0.55	0.46	0.36	0.30
Areas Bypassing Retention Plus overflow:	2.01 c.f.s.	1.22 c.f.s.	0.89	0.37	0.31	0.23	0.18
% +/-	+39.7	-7.6	-22.6	-59.8	-58.7	-57.4	-57.1

<u>Basin</u>	<u>Area</u>	<u>Slope</u>	<u>Reach/Length</u>	<u>CN</u>	<u>Tc</u>
1	3,766 s.f.	0.024	57'	84	5.3 (5.0 Proposed)
2	8,484 s.f.	0.007	103'	84	7.4 (14.3 Proposed)

CONCLUSIONS:

The increased run-off resulting from the proposed site improvements will be retained in an on-site retention system.

In Basin 1, the runoff from a portion of the driveway and parking area will be routed to 64 linear feet of 24" concrete galleries. The increase in stormwater runoff is mitigated on-site.

This system will reduce the net peak run-off during a 50 Year (2%) rainfall event to 0.46 c.f.s. from its current peak of 0.59 c.f.s.

A Tc of 5.0 minutes was used for the lawn area for Basin 1, rather than the calculated sheet flow Tc.

The bottom of the concrete galleries will be at elevation 2.0, while the bottom of the stone bed will be at elevation 1.5. No restrictive layer was found to an elevation of 0.0. The volume of the voids in the stone bed is not counted in the retention capacity of the system.

The high level overflow for the retention system is a grate over the galleries at grade.

The 6" PVC pipes from the driveway drains routed to the retention system each have a minimum capacity of 0.44 c.f.s. This is in excess of the 0.27 c.f.s. peak flow of runoff routed through them at the peak of a 50 Year rainfall event.

The proposed retention system in Basin 1 provides a total of 516 ft³ of storage, which will be adequate to maintain the net runoff during a 50 Year rainfall event, meets the Water Quality Volume, and will provide groundwater recharge.

The maximum peak net runoff in Basin 1 from the proposed conditions do not increase compared to the peak runoff from the existing conditions for each of the rainfall events from the 2 Year to the 50 Year rainfall events, as the table above illustrates.

In Basin 2, the runoff from a portion of the building roof and the driveway and parking area will be routed to 160 linear feet of 24" concrete galleries. The increase in stormwater runoff is mitigated on-site.

This system will reduce the net peak run-off during a 50 Year (2%) rainfall event to 1.22 c.f.s. from its current peak of 1.32 c.f.s.

The bottom of the concrete galleries will be at elevation 2.0, while the bottom of the stone bed will be at elevation 1.5. No restrictive layer was found to an elevation of 0.0. The volume of the voids in the stone bed is not counted in the retention capacity of the system.

The high level overflow for the retention system is a grate over the galleries at grade.

The 6" PVC roof leader and pipes from the driveway drains routed to the retention system each have a minimum capacity of 0.44 c.f.s. This is in excess of the 0.37 c.f.s. peak flow of runoff routed through them at the peak of a 50 Year rainfall event. (Half of the total collected runoff, with it being split between the driveway pipes and roof leaders.)

The proposed retention system in Basin 2 provides a total of 1,297 ft³ of storage, which will be adequate to maintain the net runoff during a 50 Year rainfall event, meets the Water Quality Volume, and will provide groundwater recharge.

The maximum peak net runoff in Basin 2 from the proposed conditions do not increase compared to the peak runoff from the existing conditions for each of the rainfall events from the 2 Year to the 50 Year rainfall events, as the table above illustrates.

The retention system in Basin 1 empties completely in 44 hours after a 50 Year rainfall event.

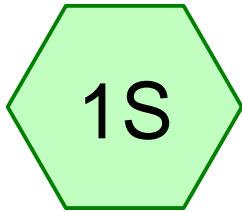
The retention system in Basin 2 empties completely in 30 hours after a 50 Year rainfall event.

The proposed impervious surfaces other than the frontmost portion of the driveway are isolated from the City's infrastructure. The runoff from these surfaces disperses onto the rear or side pervious lawn areas, following the existing terrain to the front (north), over a length

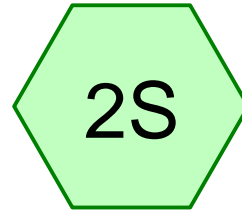
of approximately 50 feet to the road. As such, they do not connect to any part of the City's drainage infrastructure, and are not included in the DCIA totals.

The existing DCIA consists of the existing asphalt driveway, which runs off to the road, and the City drainage infrastructure.

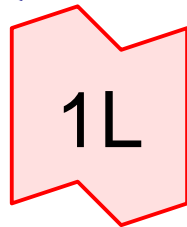
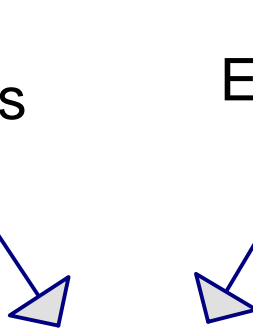
Based on the above information, the proposed improvements are designed in accordance with the City of Stamford Stormwater Drainage Manual and will not adversely impact adjacent or downstream properties or City-owned drainage facilities.



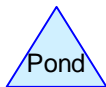
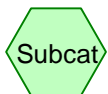
Existing Conditions
(Impervious)



Existing Conditions
(Lawn)



Combined Hydrograph



Routing Diagram for 1673ExistingBasin1
Prepared by Fairfield County Engineering LLC, Printed 3/25/2021
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1673ExistingBasin1

Prepared by Fairfield County Engineering LLC

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Type III 24-hr 50 Year Rainfall=7.54"

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Page 9

Summary for Subcatchment 1S: Existing Conditions (Impervious)

Runoff = 0.52 cfs @ 12.07 hrs, Volume= 0.042 af, Depth> 7.30"

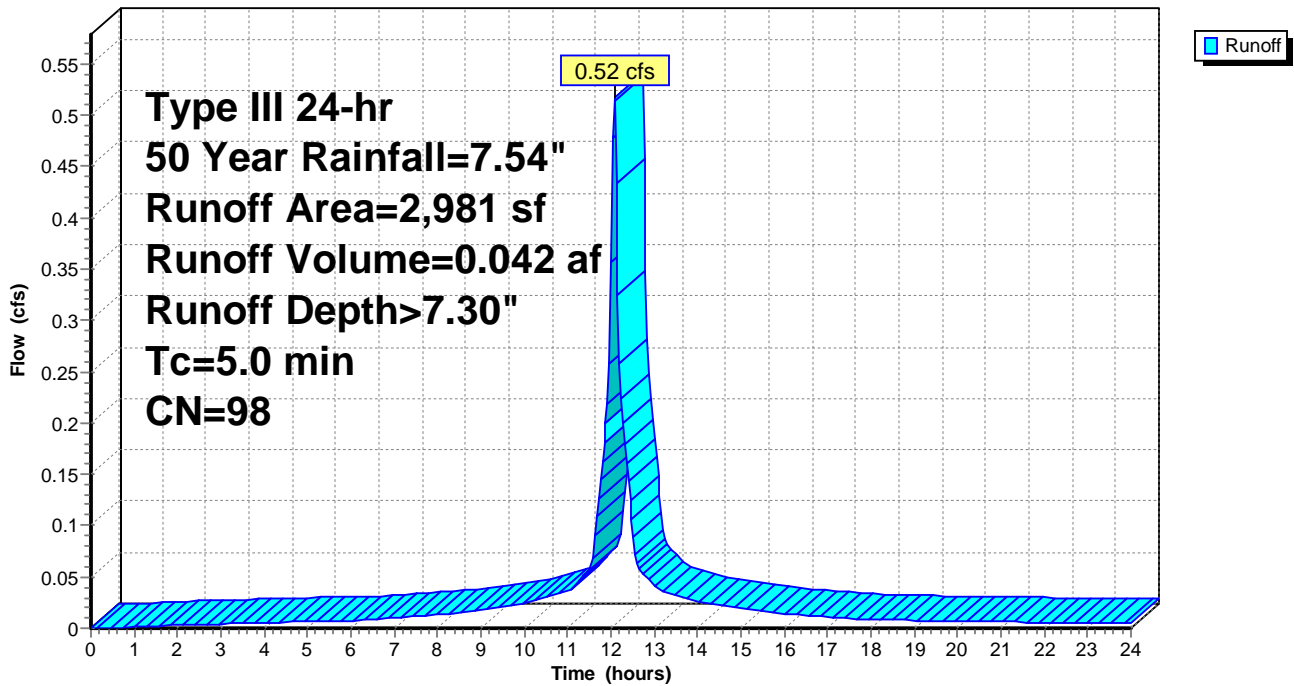
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 50 Year Rainfall=7.54"

	Area (sf)	CN	Description
*	2,252	98	Buildings
*	533	98	Driveway
*	196	98	Walks
<hr/>			
	2,981	98	Weighted Average
	2,981		100.00% Impervious Area

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

Subcatchment 1S: Existing Conditions (Impervious)

Hydrograph



1673ExistingBasin1

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Type III 24-hr 50 Year Rainfall=7.54"

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Page 10

Summary for Subcatchment 2S: Existing Conditions (Lawn)

Runoff = 0.08 cfs @ 12.08 hrs, Volume= 0.006 af, Depth> 5.65"

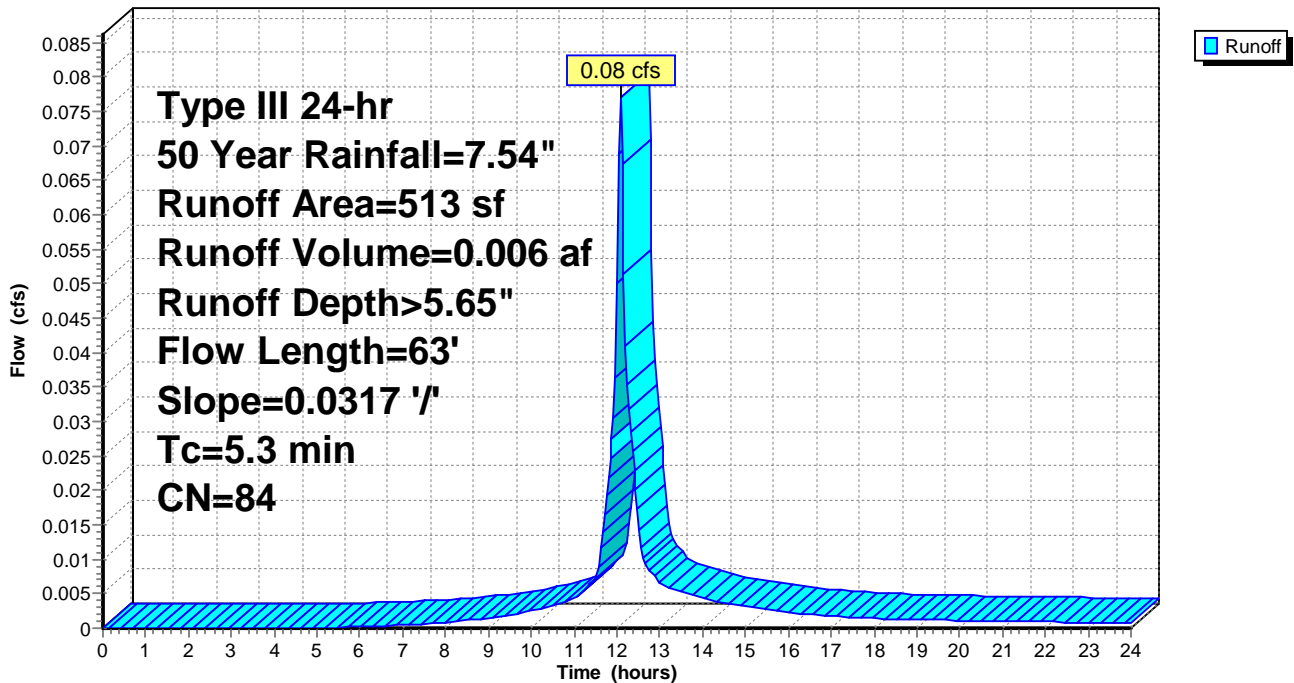
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 50 Year Rainfall=7.54"

Area (sf)	CN	Description
513	84	50-75% Grass cover, Fair, HSG D
513		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	63	0.0317	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.64"

Subcatchment 2S: Existing Conditions (Lawn)

Hydrograph

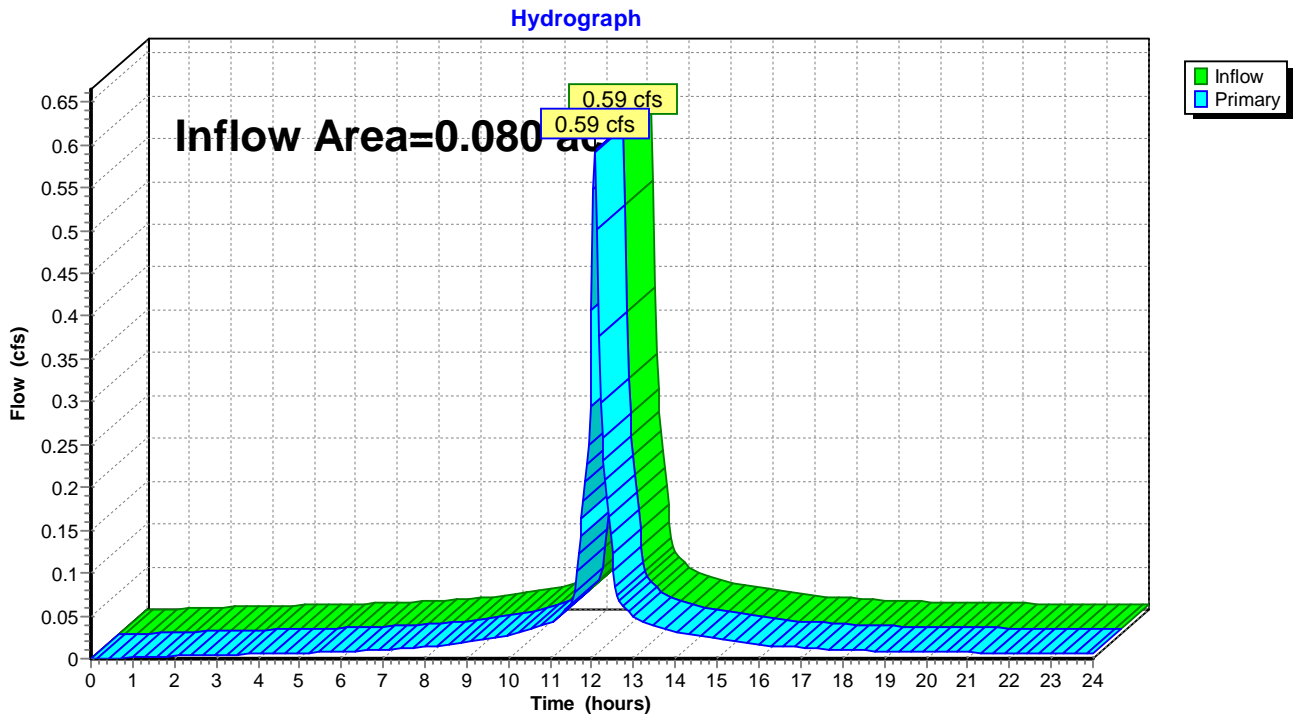


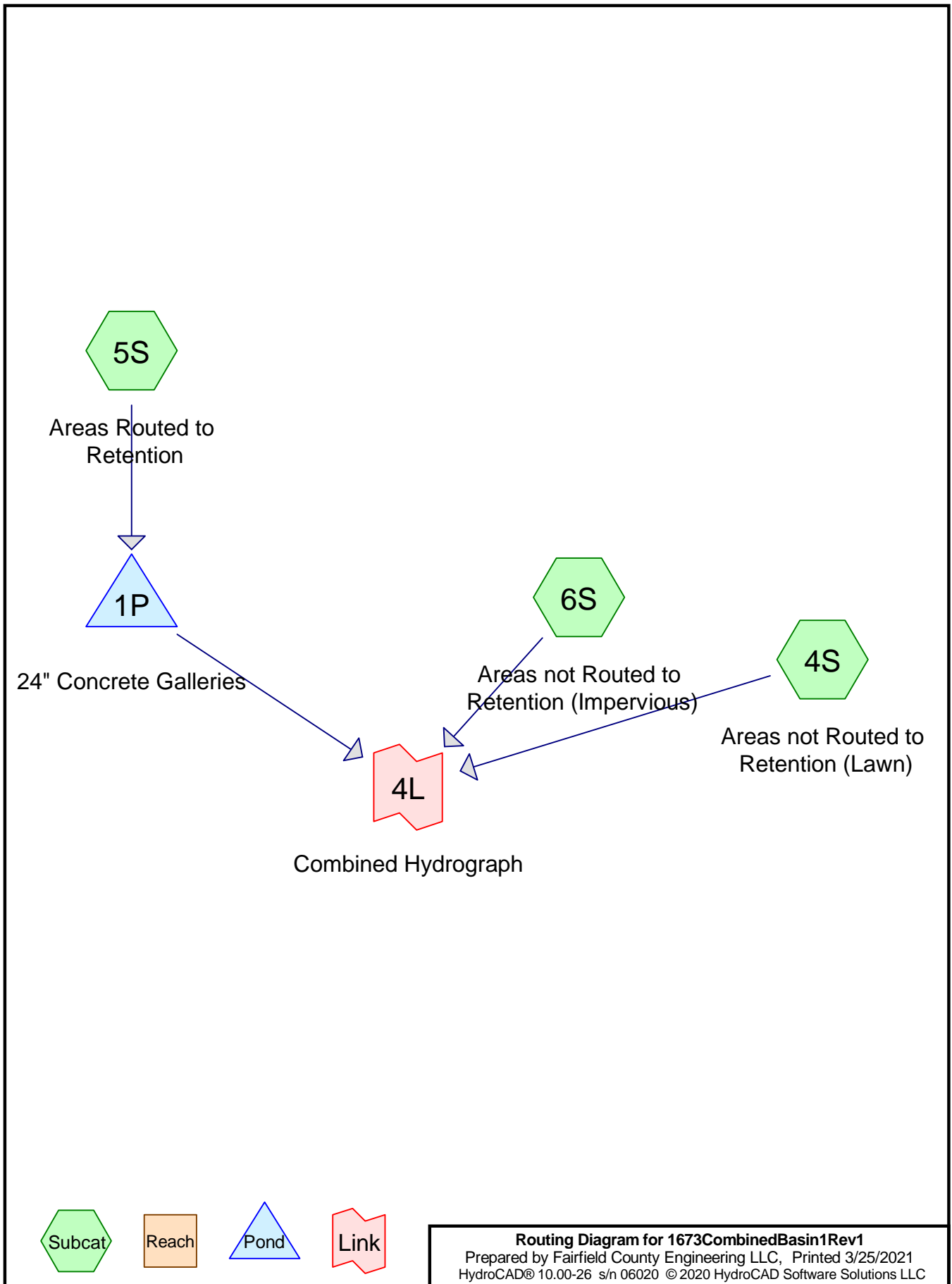
Summary for Link 1L: Combined Hydrograph

Inflow Area = 0.080 ac, 85.32% Impervious, Inflow Depth > 7.06" for 50 Year event
Inflow = 0.59 cfs @ 12.07 hrs, Volume= 0.047 af
Primary = 0.59 cfs @ 12.07 hrs, Volume= 0.047 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Link 1L: Combined Hydrograph





Summary for Subcatchment 4S: Areas not Routed to Retention (Lawn)

Runoff = 0.14 cfs @ 12.07 hrs, Volume= 0.010 af, Depth> 5.65"

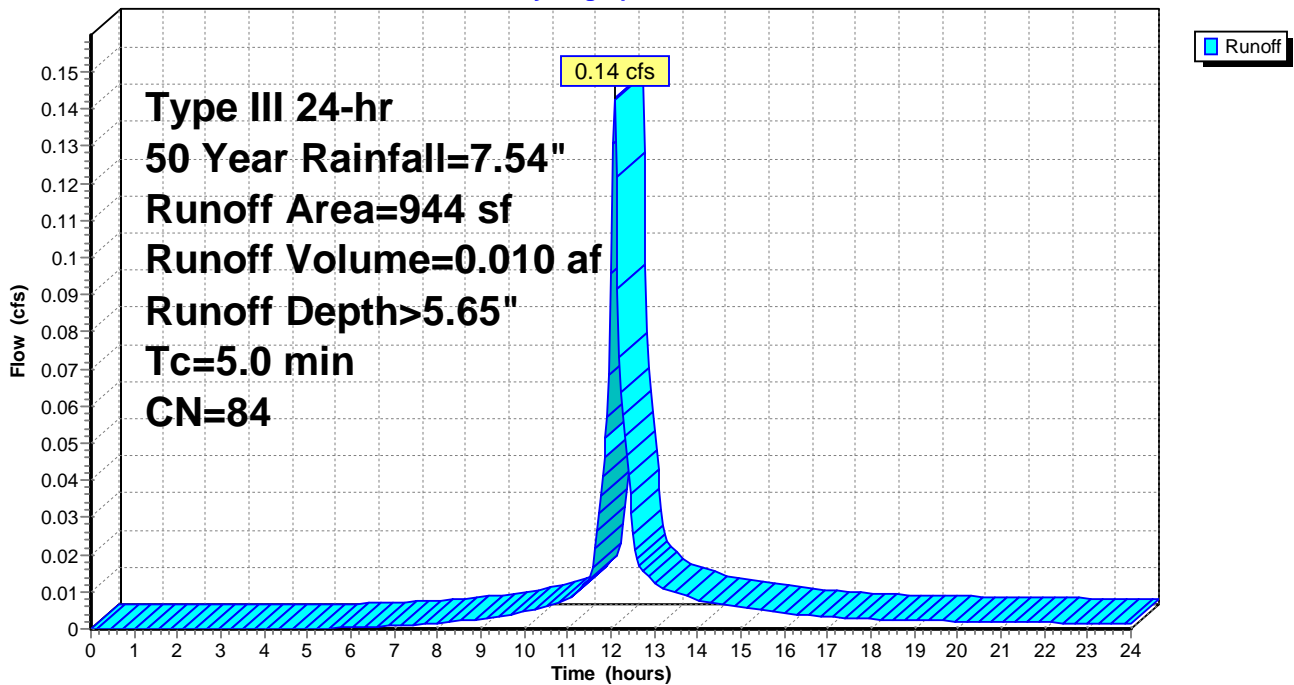
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Type III 24-hr 50 Year Rainfall=7.54"

Area (sf)	CN	Description
944	84	50-75% Grass cover, Fair, HSG D
944		100.00% Pervious Area

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

Subcatchment 4S: Areas not Routed to Retention (Lawn)

Hydrograph



Summary for Subcatchment 5S: Areas Routed to Retention

Runoff = 0.27 cfs @ 12.07 hrs, Volume= 0.022 af, Depth> 7.30"

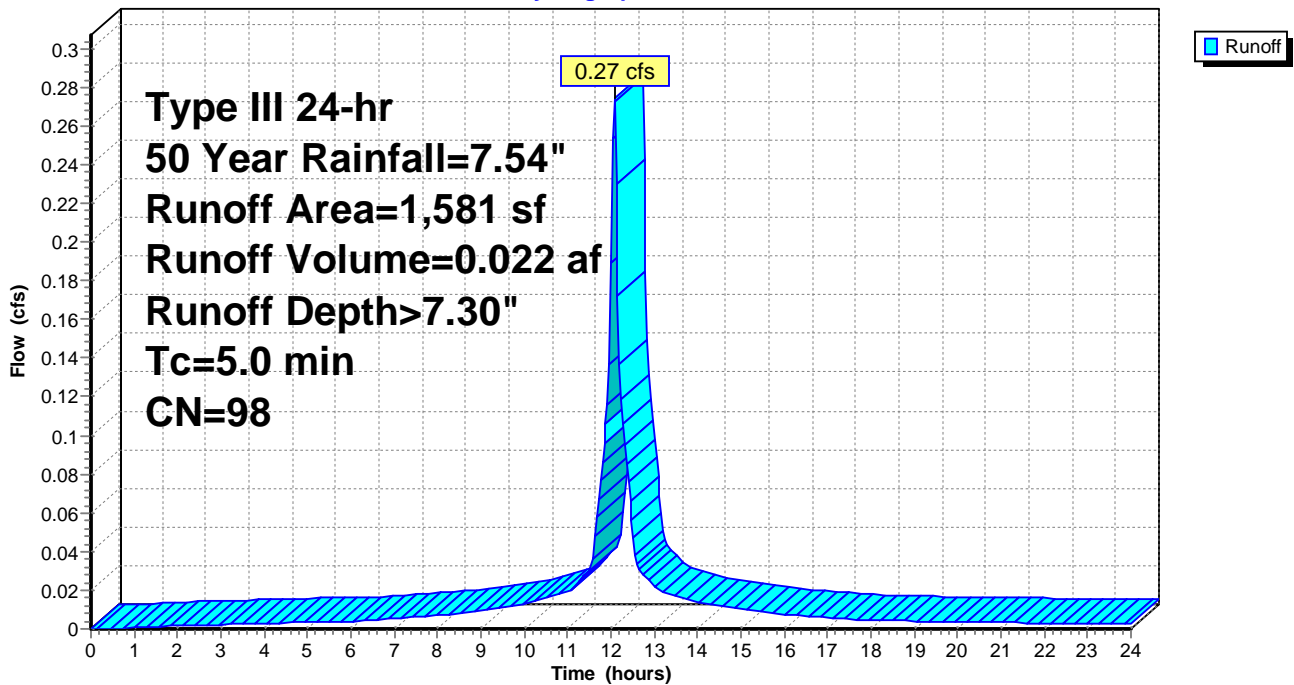
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Type III 24-hr 50 Year Rainfall=7.54"

Area (sf)	CN	Description
* 1,581	98	Portion of Driveway/Parking
1,581		100.00% Impervious Area

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

Subcatchment 5S: Areas Routed to Retention

Hydrograph



Summary for Subcatchment 6S: Areas not Routed to Retention (Impervious)

Runoff = 0.20 cfs @ 12.07 hrs, Volume= 0.016 af, Depth> 7.30"

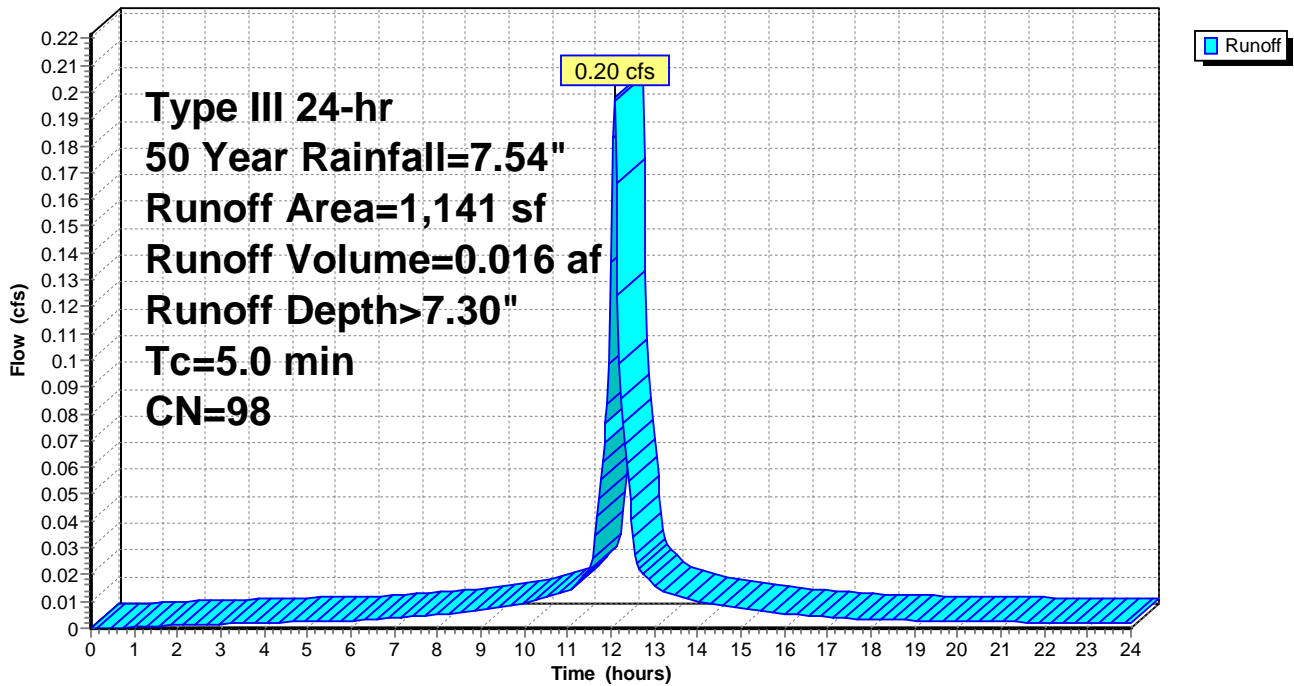
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Type III 24-hr 50 Year Rainfall=7.54"

Area (sf)	CN	Description
* 878	98	Building
* 237	98	Driveway/Parking
* 26	98	Walk
1,141	98	Weighted Average
1,141		100.00% Impervious Area

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

Subcatchment 6S: Areas not Routed to Retention (Impervious)

Hydrograph



Summary for Pond 1P: 24" Concrete Galleries

Inflow Area = 0.036 ac, 100.00% Impervious, Inflow Depth > 7.30" for 50 Year event
 Inflow = 0.27 cfs @ 12.07 hrs, Volume= 0.022 af
 Outflow = 0.28 cfs @ 12.20 hrs, Volume= 0.010 af, Atten= 0%, Lag= 7.7 min
 Primary = 0.28 cfs @ 12.20 hrs, Volume= 0.010 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs / 3
 Peak Elev= 4.15' @ 12.20 hrs Surf.Area= 324 sf Storage= 516 cf

Plug-Flow detention time= 296.4 min calculated for 0.010 af (45% of inflow)
 Center-of-Mass det. time= 150.7 min (891.4 - 740.7)

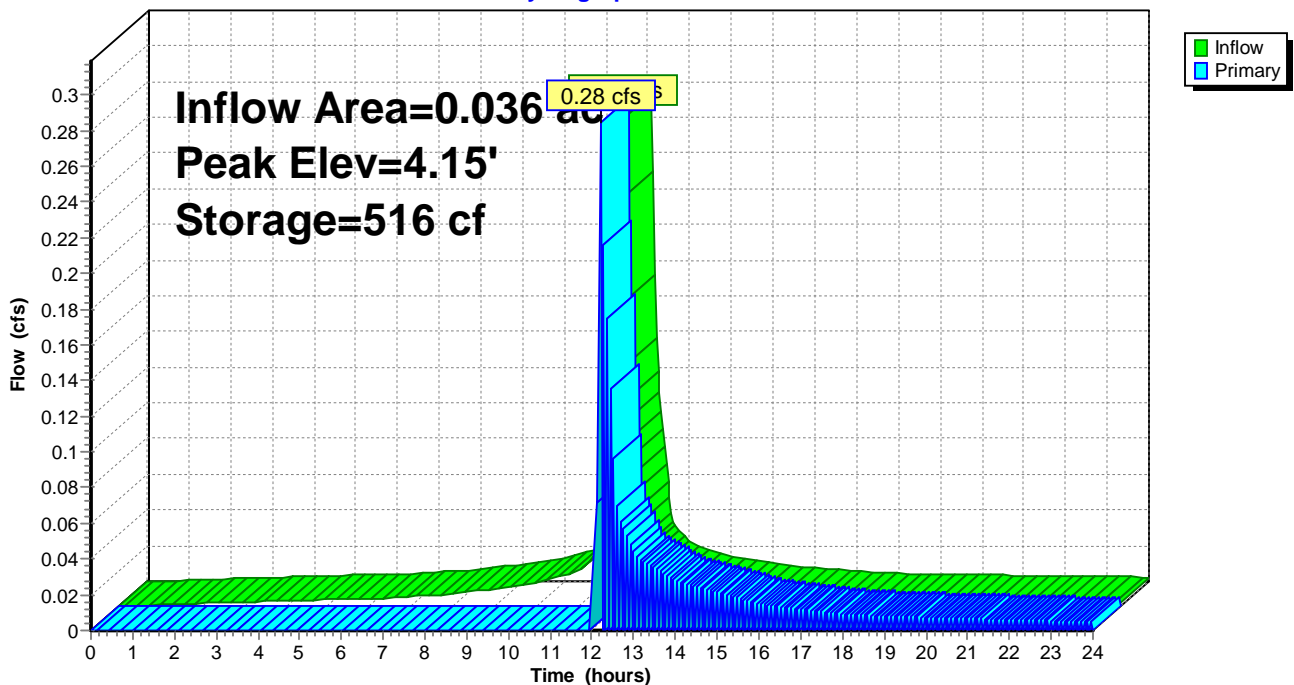
Volume	Invert	Avail.Storage	Storage Description
#1	2.00'	88 cf	18.00'W x 18.00'L x 2.00'H Stone 648 cf Overall - 428 cf Embedded = 220 cf x 40.0% Voids
#2	2.00'	428 cf	16.00'W x 16.00'L x 1.67'H 24" Concrete Galleries Inside #1
		516 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	4.00'	6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.28 cfs @ 12.20 hrs HW=4.15' (Free Discharge)
 ↑ **1=Orifice/Grate** (Weir Controls 0.28 cfs @ 1.25 fps)

Pond 1P: 24" Concrete Galleries

Hydrograph

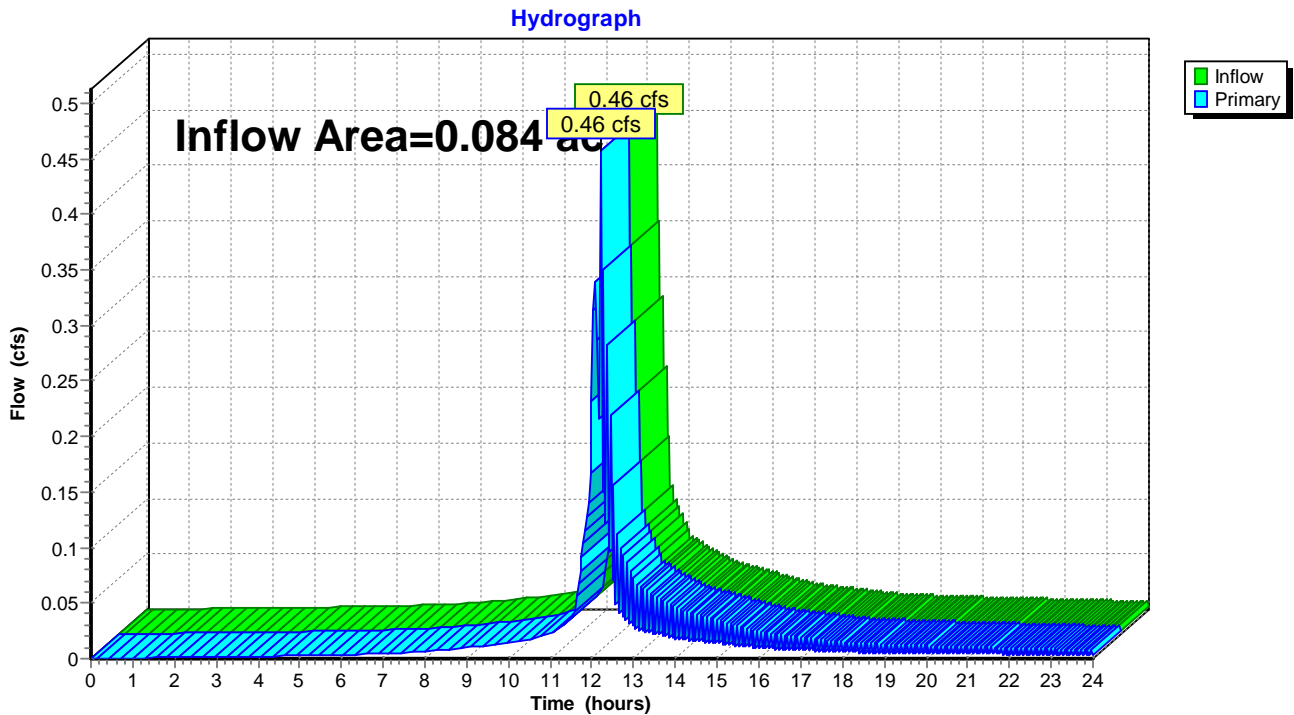


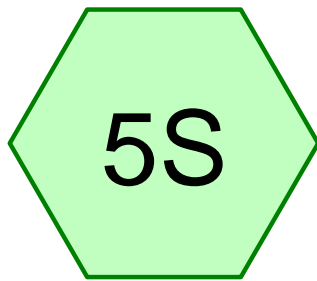
Summary for Link 4L: Combined Hydrograph

Inflow Area = 0.084 ac, 74.25% Impervious, Inflow Depth > 5.13" for 50 Year event
Inflow = 0.46 cfs @ 12.20 hrs, Volume= 0.036 af
Primary = 0.46 cfs @ 12.20 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min

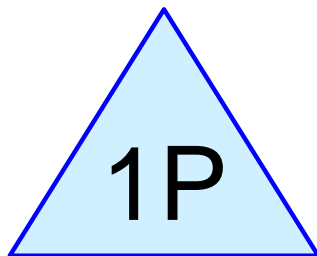
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Link 4L: Combined Hydrograph

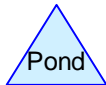
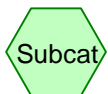




Areas Routed to
Retention



24" Concrete Galleries



Routing Diagram for 1673DischargeBasin1
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1673DischargeBasin1

Type III 24-hr 50 Year Rainfall=7.54"

Prepared by Fairfield County Engineering LLC

Printed 3/25/2021

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Page 19

Summary for Subcatchment 5S: Areas Routed to Retention

Runoff = 0.27 cfs @ 12.07 hrs, Volume= 0.022 af, Depth= 7.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.04 hrs
Type III 24-hr 50 Year Rainfall=7.54"

Area (sf)	CN	Description
* 1,581	98	Portion of Driveway/Parking
1,581		100.00% Impervious Area

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

1673DischargeBasin1

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Type III 24-hr 50 Year Rainfall=7.54"

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Page 20

Hydrograph for Subcatchment 5S: Areas Routed to Retention

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	43.20	7.54	7.30	0.00
0.80	0.06	0.00	0.00	44.00	7.54	7.30	0.00
1.60	0.12	0.02	0.00	44.80	7.54	7.30	0.00
2.40	0.18	0.06	0.00	45.60	7.54	7.30	0.00
3.20	0.25	0.11	0.00	46.40	7.54	7.30	0.00
4.00	0.32	0.16	0.00	47.20	7.54	7.30	0.00
4.80	0.41	0.23	0.00	48.00	7.54	7.30	0.00
5.60	0.50	0.31	0.00	48.80	7.54	7.30	0.00
6.40	0.59	0.40	0.00	49.60	7.54	7.30	0.00
7.20	0.71	0.52	0.01	50.40	7.54	7.30	0.00
8.00	0.86	0.66	0.01	51.20	7.54	7.30	0.00
8.80	1.04	0.83	0.01	52.00	7.54	7.30	0.00
9.60	1.28	1.07	0.01	52.80	7.54	7.30	0.00
10.40	1.59	1.37	0.02	53.60	7.54	7.30	0.00
11.20	2.01	1.78	0.02	54.40	7.54	7.30	0.00
12.00	3.77	3.54	0.19	55.20	7.54	7.30	0.00
12.80	5.53	5.29	0.03	56.00	7.54	7.30	0.00
13.60	5.95	5.71	0.02	56.80	7.54	7.30	0.00
14.40	6.26	6.02	0.01	57.60	7.54	7.30	0.00
15.20	6.50	6.26	0.01	58.40	7.54	7.30	0.00
16.00	6.68	6.44	0.01	59.20	7.54	7.30	0.00
16.80	6.83	6.59	0.01	60.00	7.54	7.30	0.00
17.60	6.95	6.71	0.01				
18.40	7.04	6.81	0.00				
19.20	7.13	6.89	0.00				
20.00	7.22	6.98	0.00				
20.80	7.29	7.05	0.00				
21.60	7.36	7.12	0.00				
22.40	7.43	7.19	0.00				
23.20	7.49	7.25	0.00				
24.00	7.54	7.30	0.00				
24.80	7.54	7.30	0.00				
25.60	7.54	7.30	0.00				
26.40	7.54	7.30	0.00				
27.20	7.54	7.30	0.00				
28.00	7.54	7.30	0.00				
28.80	7.54	7.30	0.00				
29.60	7.54	7.30	0.00				
30.40	7.54	7.30	0.00				
31.20	7.54	7.30	0.00				
32.00	7.54	7.30	0.00				
32.80	7.54	7.30	0.00				
33.60	7.54	7.30	0.00				
34.40	7.54	7.30	0.00				
35.20	7.54	7.30	0.00				
36.00	7.54	7.30	0.00				
36.80	7.54	7.30	0.00				
37.60	7.54	7.30	0.00				
38.40	7.54	7.30	0.00				
39.20	7.54	7.30	0.00				
40.00	7.54	7.30	0.00				
40.80	7.54	7.30	0.00				
41.60	7.54	7.30	0.00				
42.40	7.54	7.30	0.00				

1673DischargeBasin1

Type III 24-hr 50 Year Rainfall=7.54"

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Page 21

Summary for Pond 1P: 24" Concrete Galleries

Inflow Area = 0.036 ac, 100.00% Impervious, Inflow Depth = 7.30" for 50 Year event
 Inflow = 0.27 cfs @ 12.07 hrs, Volume= 0.022 af
 Outflow = 0.02 cfs @ 13.20 hrs, Volume= 0.022 af, Atten= 92%, Lag= 67.7 min
 Discarded = 0.01 cfs @ 8.16 hrs, Volume= 0.021 af
 Primary = 0.01 cfs @ 13.20 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.04 hrs / 3
 Peak Elev= 4.02' @ 13.20 hrs Surf.Area= 324 sf Storage= 516 cf

Plug-Flow detention time= 627.8 min calculated for 0.022 af (100% of inflow)
 Center-of-Mass det. time= 628.0 min (1,369.1 - 741.0)

Volume	Invert	Avail.Storage	Storage Description
#1	2.00'	88 cf	18.00'W x 18.00'L x 2.00'H Stone 648 cf Overall - 428 cf Embedded = 220 cf x 40.0% Voids
#2	2.00'	428 cf	16.00'W x 16.00'L x 1.67'H 24" Concrete Galleries Inside #1
		516 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	4.00'	6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	2.00'	0.890 in/hr Exfiltration over Horizontal area

Discarded OutFlow Max=0.01 cfs @ 8.16 hrs HW=2.02' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.01 cfs @ 13.20 hrs HW=4.02' (Free Discharge)
 ↑**1=Orifice/Grate** (Weir Controls 0.01 cfs @ 0.46 fps)

1673DischargeBasin1*Type III 24-hr 50 Year Rainfall=7.54"*

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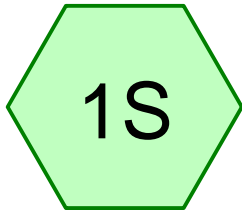
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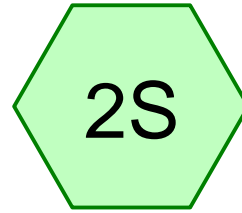
Page 22

Hydrograph for Pond 1P: 24" Concrete Galleries

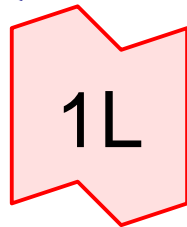
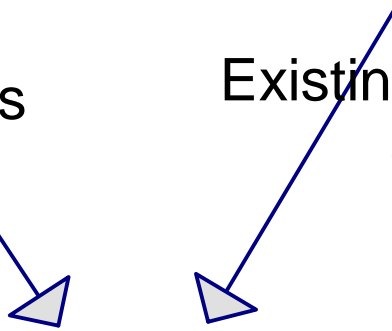
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	2.00	0.00	0.00	0.00
2.00	0.00	1	2.00	0.00	0.00	0.00
4.00	0.00	2	2.01	0.00	0.00	0.00
6.00	0.00	3	2.01	0.00	0.00	0.00
8.00	0.01	5	2.02	0.01	0.01	0.00
10.00	0.01	28	2.10	0.01	0.01	0.00
12.00	0.19	225	2.79	0.01	0.01	0.00
14.00	0.01	516	4.01	0.02	0.01	0.01
16.00	0.01	516	4.00	0.01	0.01	0.00
18.00	0.00	510	3.95	0.01	0.01	0.00
20.00	0.00	491	3.81	0.01	0.01	0.00
22.00	0.00	466	3.65	0.01	0.01	0.00
24.00	0.00	438	3.54	0.01	0.01	0.00
26.00	0.00	390	3.38	0.01	0.01	0.00
28.00	0.00	342	3.21	0.01	0.01	0.00
30.00	0.00	294	3.04	0.01	0.01	0.00
32.00	0.00	246	2.87	0.01	0.01	0.00
34.00	0.00	198	2.70	0.01	0.01	0.00
36.00	0.00	150	2.53	0.01	0.01	0.00
38.00	0.00	102	2.36	0.01	0.01	0.00
40.00	0.00	54	2.19	0.01	0.01	0.00
42.00	0.00	6	2.02	0.01	0.01	0.00
44.00	0.00	0	2.00	0.00	0.00	0.00
46.00	0.00	0	2.00	0.00	0.00	0.00
48.00	0.00	0	2.00	0.00	0.00	0.00
50.00	0.00	0	2.00	0.00	0.00	0.00
52.00	0.00	0	2.00	0.00	0.00	0.00
54.00	0.00	0	2.00	0.00	0.00	0.00
56.00	0.00	0	2.00	0.00	0.00	0.00
58.00	0.00	0	2.00	0.00	0.00	0.00
60.00	0.00	0	2.00	0.00	0.00	0.00



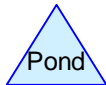
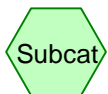
Existing Conditions
(Impervious)



Existing Conditions
(Lawn)



Combined Hydrograph



Routing Diagram for 1673ExistingBasin2
Prepared by Fairfield County Engineering LLC, Printed 3/25/2021
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1673ExistingBasin2

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Type III 24-hr 50 Year Rainfall=7.54"

Printed 3/25/2021

Page 24

Summary for Subcatchment 1S: Existing Conditions (Impervious)

Runoff = 0.69 cfs @ 12.07 hrs, Volume= 0.053 af, Depth> 6.70"

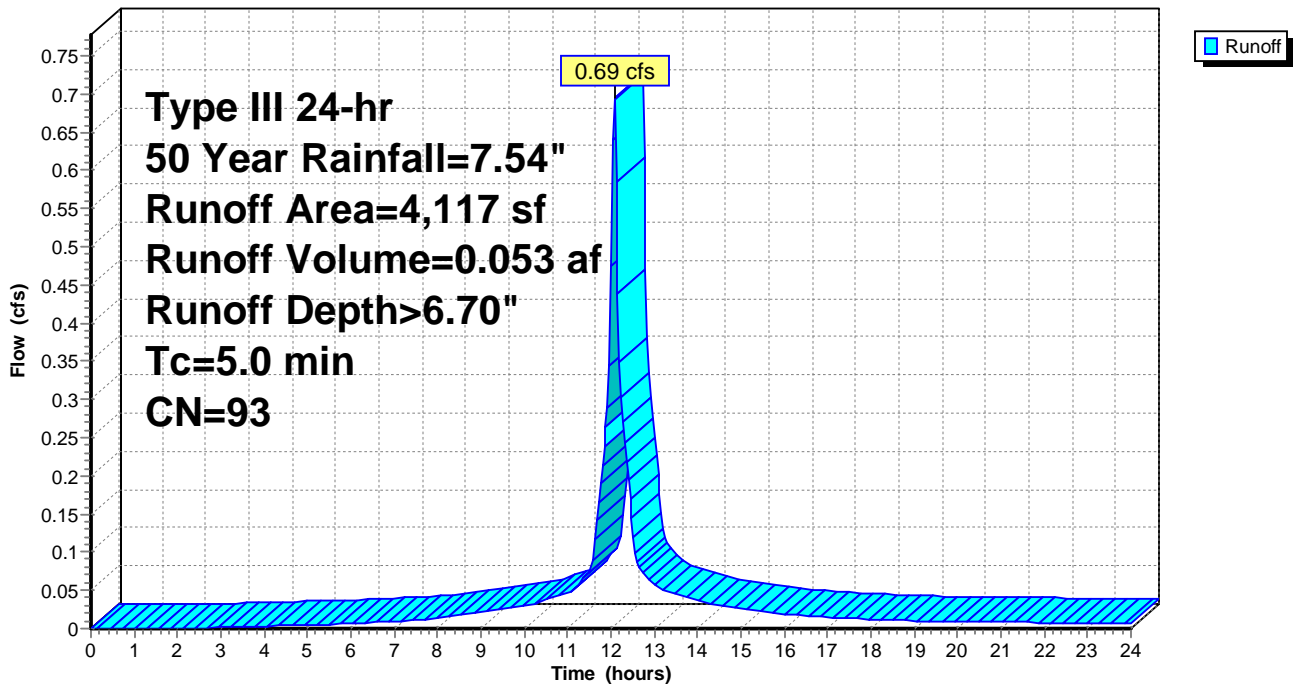
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Type III 24-hr 50 Year Rainfall=7.54"

	Area (sf)	CN	Description
*	215	98	Buildings
*	2,863	91	Dirt Parking
*	49	91	Deck
*	530	98	Asphalt Area
*	460	98	Garage
			<hr/>
	4,117	93	Weighted Average
	2,912		70.73% Pervious Area
	1,205		29.27% Impervious Area

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

Subcatchment 1S: Existing Conditions (Impervious)

Hydrograph



1673ExistingBasin2

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Type III 24-hr 50 Year Rainfall=7.54"

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Page 25

Summary for Subcatchment 2S: Existing Conditions (Lawn)

Runoff = 0.65 cfs @ 12.10 hrs, Volume= 0.050 af, Depth> 5.65"

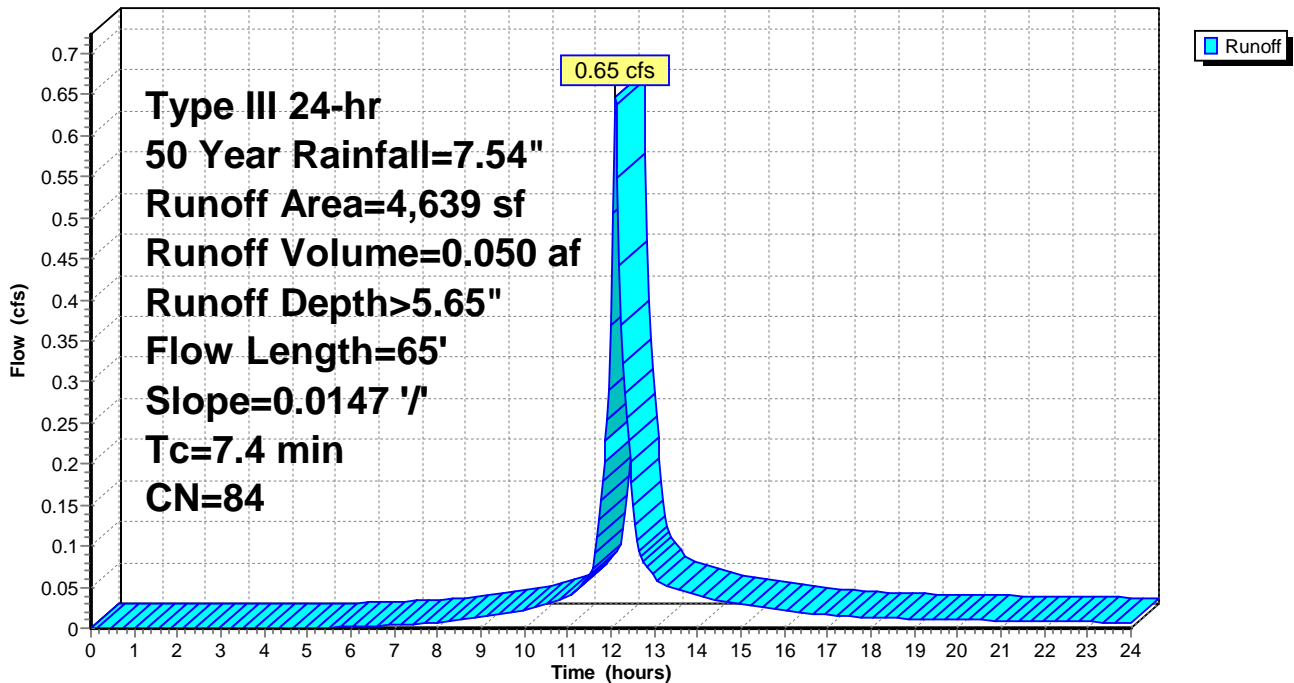
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 50 Year Rainfall=7.54"

Area (sf)	CN	Description
4,639	84	50-75% Grass cover, Fair, HSG D
4,639		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	65	0.0147	0.15		Sheet Flow, Grass: Short n= 0.150 P2= 3.64"

Subcatchment 2S: Existing Conditions (Lawn)

Hydrograph

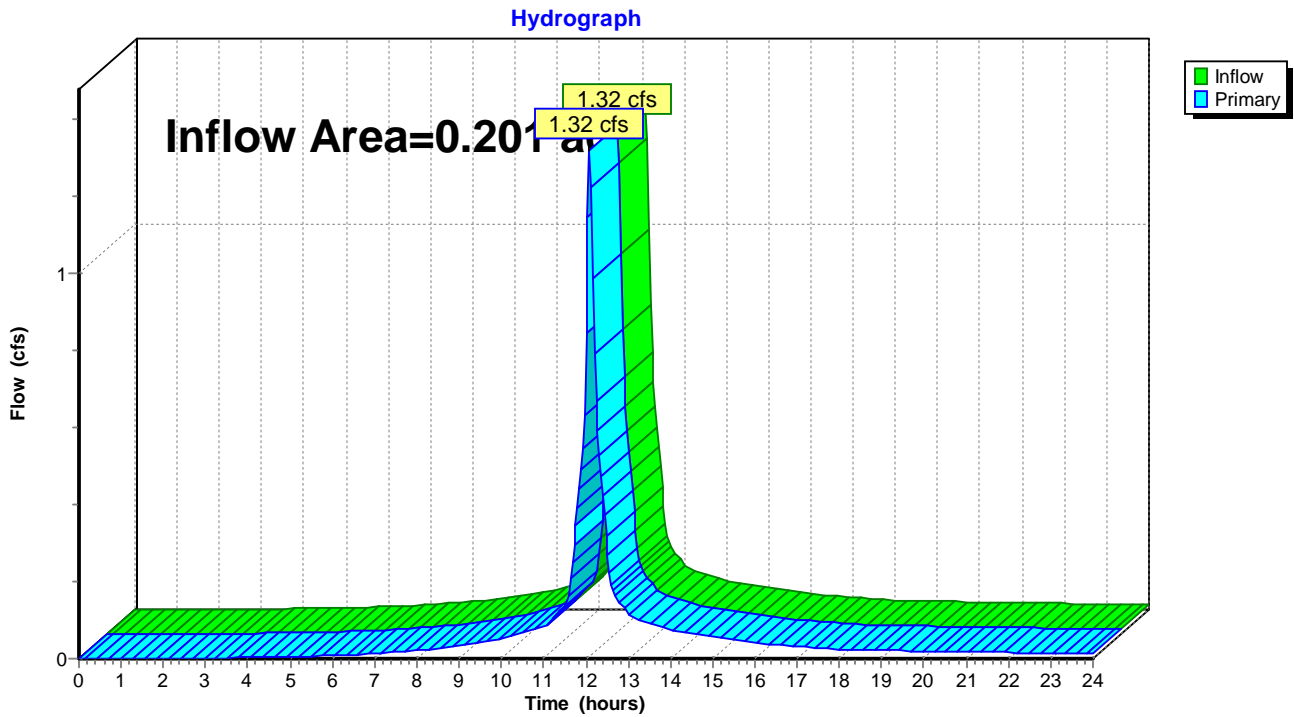


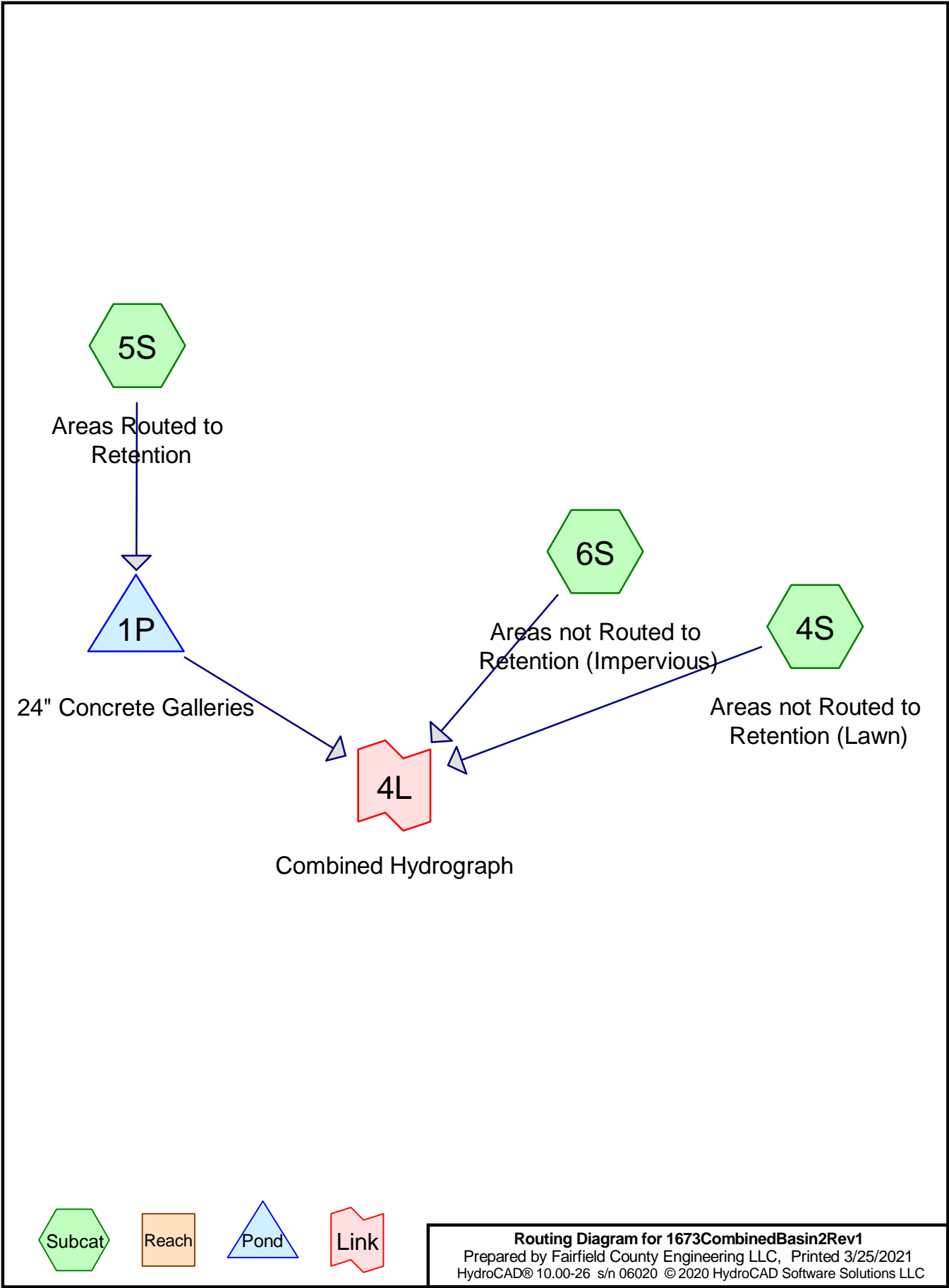
Summary for Link 1L: Combined Hydrograph

Inflow Area = 0.201 ac, 13.76% Impervious, Inflow Depth > 6.14" for 50 Year event
Inflow = 1.32 cfs @ 12.09 hrs, Volume= 0.103 af
Primary = 1.32 cfs @ 12.09 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Link 1L: Combined Hydrograph





Summary for Subcatchment 4S: Areas not Routed to Retention (Lawn)

Runoff = 0.26 cfs @ 12.19 hrs, Volume= 0.024 af, Depth> 5.64"

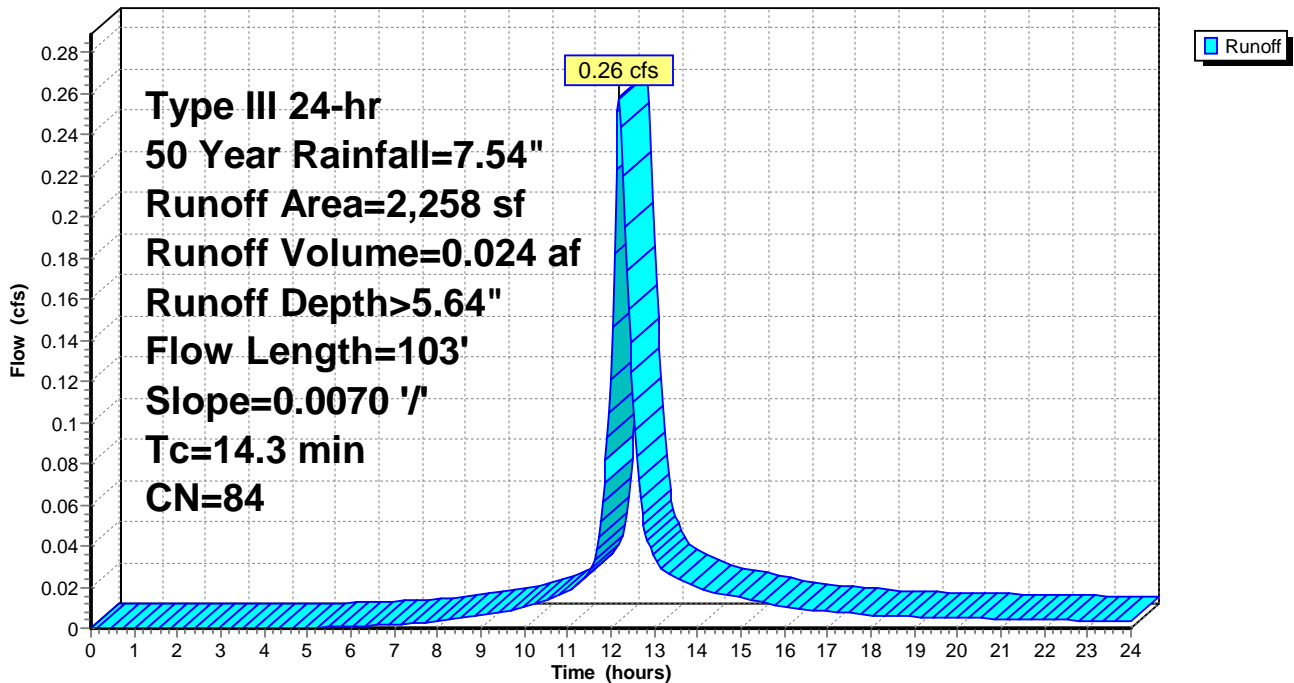
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Type III 24-hr 50 Year Rainfall=7.54"

Area (sf)	CN	Description
2,258	84	50-75% Grass cover, Fair, HSG D
2,258		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.3	103	0.0070	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 3.64"

Subcatchment 4S: Areas not Routed to Retention (Lawn)

Hydrograph



Summary for Subcatchment 5S: Areas Routed to Retention

Runoff = 0.75 cfs @ 12.07 hrs, Volume= 0.060 af, Depth> 7.30"

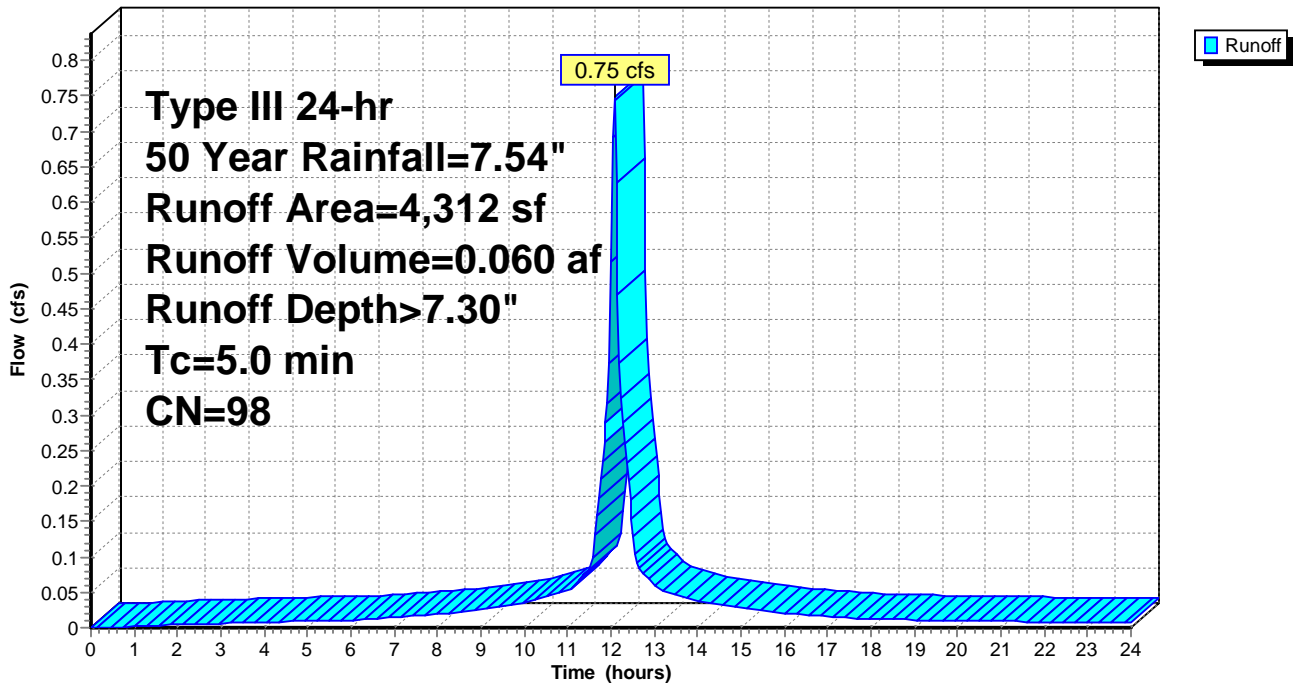
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Type III 24-hr 50 Year Rainfall=7.54"

	Area (sf)	CN	Description
*	1,673	98	portion of Building roof
*	2,639	98	Driveway
	4,312	98	Weighted Average
	4,312		100.00% Impervious Area

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

Subcatchment 5S: Areas Routed to Retention

Hydrograph



Summary for Subcatchment 6S: Areas not Routed to Retention (Impervious)

Runoff = 0.35 cfs @ 12.07 hrs, Volume= 0.028 af, Depth> 7.18"

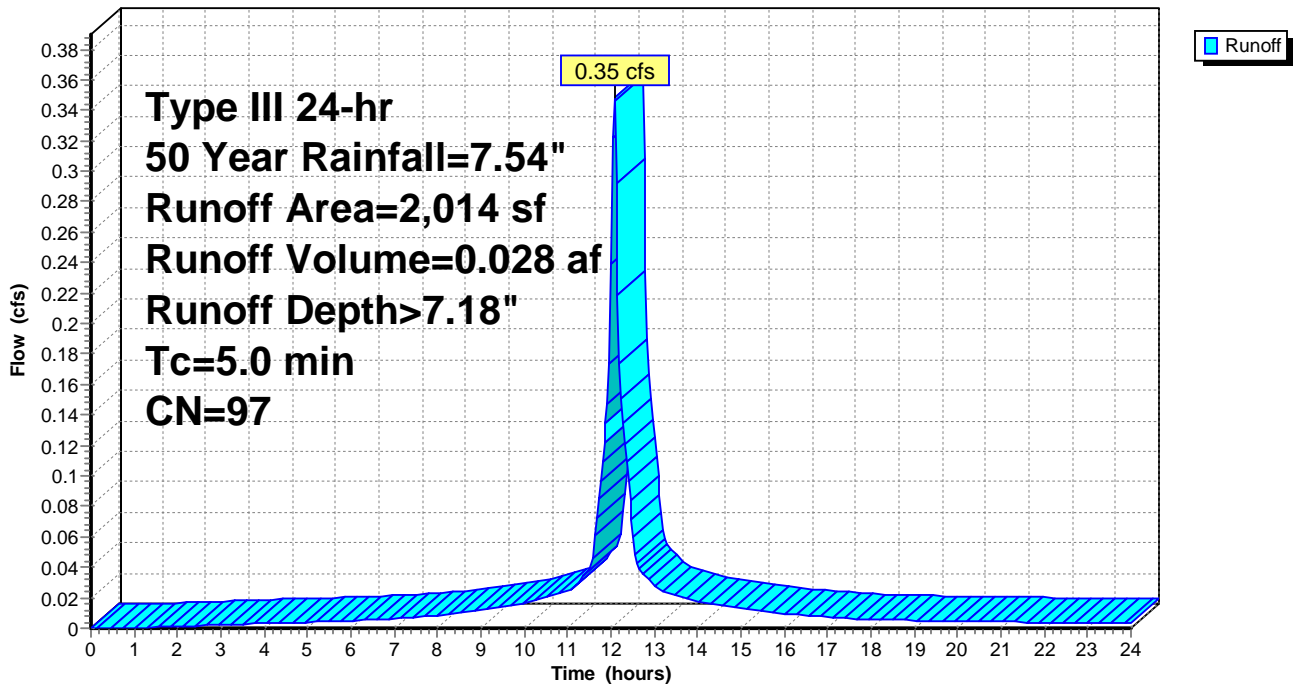
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Type III 24-hr 50 Year Rainfall=7.54"

	Area (sf)	CN	Description
*	1,789	98	Building
*	225	91	Decks/stairs
	2,014	97	Weighted Average
	225		11.17% Pervious Area
	1,789		88.83% Impervious Area

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

Subcatchment 6S: Areas not Routed to Retention (Impervious)

Hydrograph



Summary for Pond 1P: 24" Concrete Galleries

Inflow Area = 0.099 ac, 100.00% Impervious, Inflow Depth > 7.30" for 50 Year event
 Inflow = 0.75 cfs @ 12.07 hrs, Volume= 0.060 af
 Outflow = 0.72 cfs @ 12.13 hrs, Volume= 0.030 af, Atten= 4%, Lag= 3.3 min
 Primary = 0.72 cfs @ 12.13 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs / 3
 Peak Elev= 4.55' @ 12.12 hrs Surf.Area= 820 sf Storage= 1,297 cf

Plug-Flow detention time= 268.5 min calculated for 0.030 af (49% of inflow)
 Center-of-Mass det. time= 135.1 min (875.7 - 740.7)

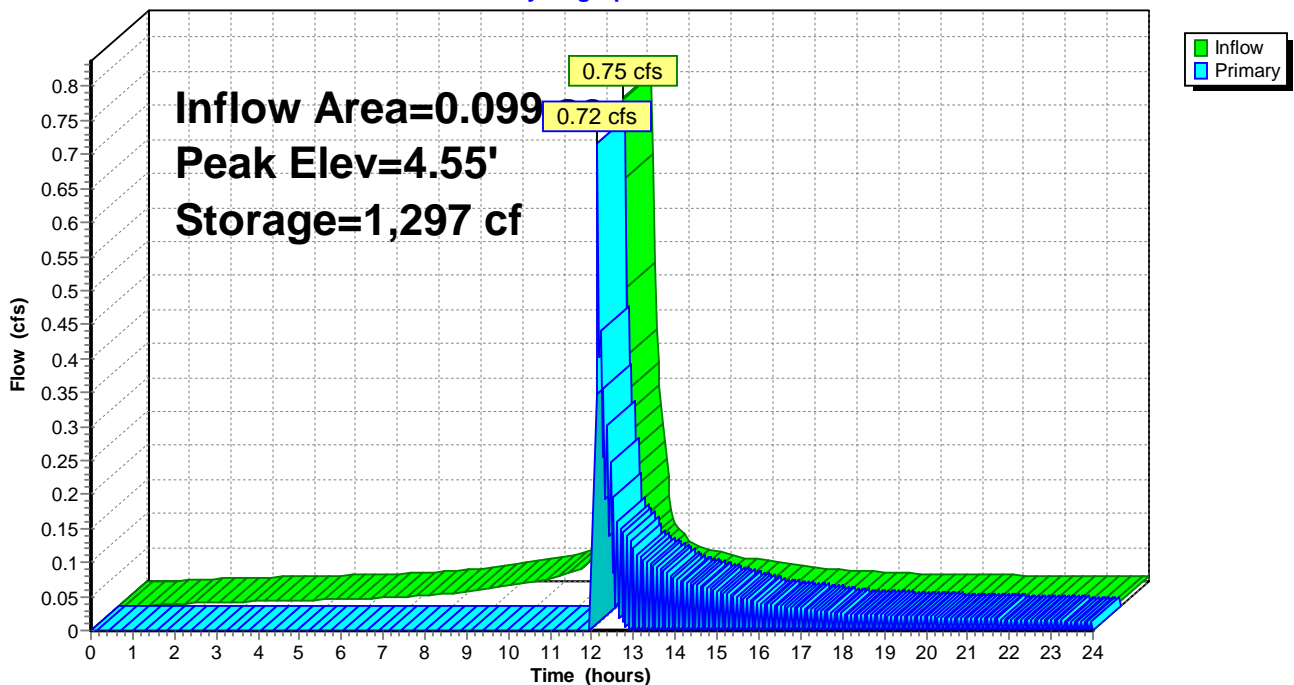
Volume	Invert	Avail.Storage	Storage Description
#1	2.00'	228 cf	10.00'W x 82.00'L x 2.00'H Stone 1,640 cf Overall - 1,069 cf Embedded = 571 cf x 40.0% Voids
#2	2.00'	1,069 cf	8.00'W x 80.00'L x 1.67'H 24" Concrete Galleries Inside #1
		1,297 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	4.00'	6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.65 cfs @ 12.13 hrs HW=4.47' (Free Discharge)
 ↑ **1=Orifice/Grate** (Orifice Controls 0.65 cfs @ 3.30 fps)

Pond 1P: 24" Concrete Galleries

Hydrograph

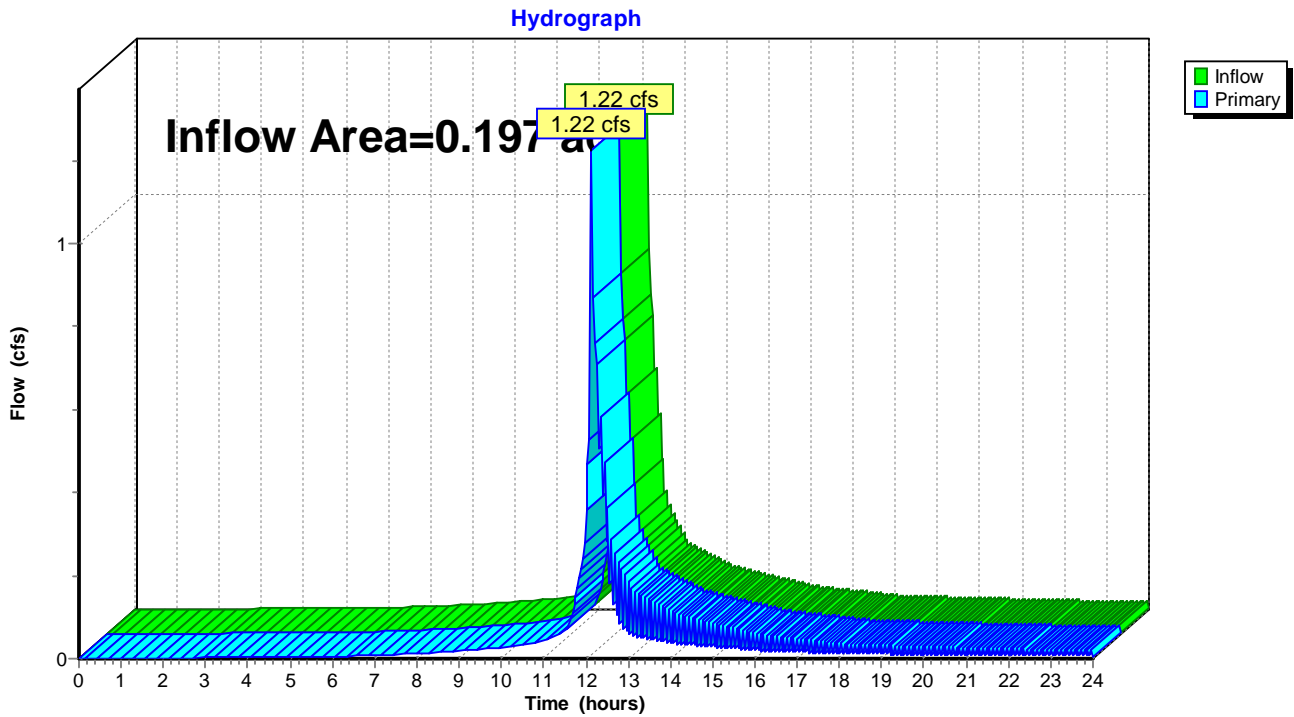


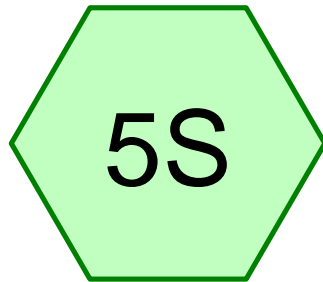
Summary for Link 4L: Combined Hydrograph

Inflow Area = 0.197 ac, 71.07% Impervious, Inflow Depth > 4.98" for 50 Year event
Inflow = 1.22 cfs @ 12.13 hrs, Volume= 0.082 af
Primary = 1.22 cfs @ 12.13 hrs, Volume= 0.082 af, Atten= 0%, Lag= 0.0 min

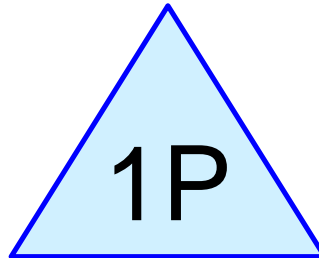
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Link 4L: Combined Hydrograph

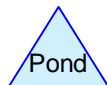
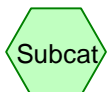




Areas Routed to
Retention



24" Concrete Galleries



Routing Diagram for 1673DischargeBasin2Rev1
Prepared by Fairfield County Engineering LLC, Printed 3/25/2021
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1673DischargeBasin2Rev1

Type III 24-hr 50 Year Rainfall=7.54"

Prepared by Fairfield County Engineering LLC

Printed 3/25/2021

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Page 34

Summary for Subcatchment 5S: Areas Routed to Retention

Runoff = 0.75 cfs @ 12.07 hrs, Volume= 0.060 af, Depth= 7.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.04 hrs
Type III 24-hr 50 Year Rainfall=7.54"

	Area (sf)	CN	Description
*	1,673	98	portion of Building roof
*	2,639	98	Driveway
	4,312	98	Weighted Average
	4,312		100.00% Impervious Area

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

1673DischargeBasin2Rev1

Prepared by Fairfield County Engineering LLC

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Type III 24-hr 50 Year Rainfall=7.54"

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Page 35

Hydrograph for Subcatchment 5S: Areas Routed to Retention

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	43.20	7.54	7.30	0.00
0.80	0.06	0.00	0.00	44.00	7.54	7.30	0.00
1.60	0.12	0.02	0.00	44.80	7.54	7.30	0.00
2.40	0.18	0.06	0.01	45.60	7.54	7.30	0.00
3.20	0.25	0.11	0.01	46.40	7.54	7.30	0.00
4.00	0.32	0.16	0.01	47.20	7.54	7.30	0.00
4.80	0.41	0.23	0.01	48.00	7.54	7.30	0.00
5.60	0.50	0.31	0.01	48.80	7.54	7.30	0.00
6.40	0.59	0.40	0.01	49.60	7.54	7.30	0.00
7.20	0.71	0.52	0.02	50.40	7.54	7.30	0.00
8.00	0.86	0.66	0.02	51.20	7.54	7.30	0.00
8.80	1.04	0.83	0.03	52.00	7.54	7.30	0.00
9.60	1.28	1.07	0.03	52.80	7.54	7.30	0.00
10.40	1.59	1.37	0.04	53.60	7.54	7.30	0.00
11.20	2.01	1.78	0.06	54.40	7.54	7.30	0.00
12.00	3.77	3.54	0.52	55.20	7.54	7.30	0.00
12.80	5.53	5.29	0.07	56.00	7.54	7.30	0.00
13.60	5.95	5.71	0.05	56.80	7.54	7.30	0.00
14.40	6.26	6.02	0.03	57.60	7.54	7.30	0.00
15.20	6.50	6.26	0.03	58.40	7.54	7.30	0.00
16.00	6.68	6.44	0.02	59.20	7.54	7.30	0.00
16.80	6.83	6.59	0.02	60.00	7.54	7.30	0.00
17.60	6.95	6.71	0.01				
18.40	7.04	6.81	0.01				
19.20	7.13	6.89	0.01				
20.00	7.22	6.98	0.01				
20.80	7.29	7.05	0.01				
21.60	7.36	7.12	0.01				
22.40	7.43	7.19	0.01				
23.20	7.49	7.25	0.01				
24.00	7.54	7.30	0.01				
24.80	7.54	7.30	0.00				
25.60	7.54	7.30	0.00				
26.40	7.54	7.30	0.00				
27.20	7.54	7.30	0.00				
28.00	7.54	7.30	0.00				
28.80	7.54	7.30	0.00				
29.60	7.54	7.30	0.00				
30.40	7.54	7.30	0.00				
31.20	7.54	7.30	0.00				
32.00	7.54	7.30	0.00				
32.80	7.54	7.30	0.00				
33.60	7.54	7.30	0.00				
34.40	7.54	7.30	0.00				
35.20	7.54	7.30	0.00				
36.00	7.54	7.30	0.00				
36.80	7.54	7.30	0.00				
37.60	7.54	7.30	0.00				
38.40	7.54	7.30	0.00				
39.20	7.54	7.30	0.00				
40.00	7.54	7.30	0.00				
40.80	7.54	7.30	0.00				
41.60	7.54	7.30	0.00				
42.40	7.54	7.30	0.00				

1673DischargeBasin2Rev1

Type III 24-hr 50 Year Rainfall=7.54"

Prepared by Fairfield County Engineering LLC

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Page 36

Summary for Pond 1P: 24" Concrete Galleries

Inflow Area = 0.099 ac, 100.00% Impervious, Inflow Depth = 7.30" for 50 Year event
 Inflow = 0.75 cfs @ 12.07 hrs, Volume= 0.060 af
 Outflow = 0.03 cfs @ 9.76 hrs, Volume= 0.060 af, Atten= 96%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 9.76 hrs, Volume= 0.060 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.04 hrs / 3
 Peak Elev= 3.81' @ 14.61 hrs Surf.Area= 820 sf Storage= 1,235 cf

Plug-Flow detention time= 315.5 min calculated for 0.060 af (100% of inflow)
 Center-of-Mass det. time= 315.5 min (1,056.5 - 741.0)

Volume	Invert	Avail.Storage	Storage Description
#1	2.00'	228 cf	10.00'W x 82.00'L x 2.00'H Stone 1,640 cf Overall - 1,069 cf Embedded = 571 cf x 40.0% Voids
#2	2.00'	1,069 cf	8.00'W x 80.00'L x 1.67'H 24" Concrete Galleries Inside #1
		1,297 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	4.00'	6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Discarded	2.00'	1.700 in/hr Exfiltration over Horizontal area

Discarded OutFlow Max=0.03 cfs @ 9.76 hrs HW=2.02' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=2.00' (Free Discharge)
 ↑**1=Orifice/Grate** (Controls 0.00 cfs)

1673DischargeBasin2Rev1

Type III 24-hr 50 Year Rainfall=7.54"

Prepared by Fairfield County Engineering LLC

Printed 3/25/2021

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Page 37

Hydrograph for Pond 1P: 24" Concrete Galleries

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	2.00	0.00	0.00	0.00
2.00	0.00	2	2.00	0.00	0.00	0.00
4.00	0.01	3	2.00	0.01	0.01	0.00
6.00	0.01	5	2.01	0.01	0.01	0.00
8.00	0.02	8	2.01	0.02	0.02	0.00
10.00	0.04	16	2.02	0.03	0.03	0.00
12.00	0.52	451	2.63	0.03	0.03	0.00
14.00	0.04	1,229	3.79	0.03	0.03	0.00
16.00	0.02	1,205	3.72	0.03	0.03	0.00
18.00	0.01	1,088	3.53	0.03	0.03	0.00
20.00	0.01	935	3.31	0.03	0.03	0.00
22.00	0.01	768	3.08	0.03	0.03	0.00
24.00	0.01	588	2.83	0.03	0.03	0.00
26.00	0.00	357	2.50	0.03	0.03	0.00
28.00	0.00	125	2.18	0.03	0.03	0.00
30.00	0.00	0	2.00	0.00	0.00	0.00
32.00	0.00	0	2.00	0.00	0.00	0.00
34.00	0.00	0	2.00	0.00	0.00	0.00
36.00	0.00	0	2.00	0.00	0.00	0.00
38.00	0.00	0	2.00	0.00	0.00	0.00
40.00	0.00	0	2.00	0.00	0.00	0.00
42.00	0.00	0	2.00	0.00	0.00	0.00
44.00	0.00	0	2.00	0.00	0.00	0.00
46.00	0.00	0	2.00	0.00	0.00	0.00
48.00	0.00	0	2.00	0.00	0.00	0.00
50.00	0.00	0	2.00	0.00	0.00	0.00
52.00	0.00	0	2.00	0.00	0.00	0.00
54.00	0.00	0	2.00	0.00	0.00	0.00
56.00	0.00	0	2.00	0.00	0.00	0.00
58.00	0.00	0	2.00	0.00	0.00	0.00
60.00	0.00	0	2.00	0.00	0.00	0.00

FAIRFIELD COUNTY ENGINEERING, LLC
CIVIL ENGINEERS
60 WINFIELD ST.
NORWALK, CONNECTICUT 06855
(203) 831-8005

March 24, 2021

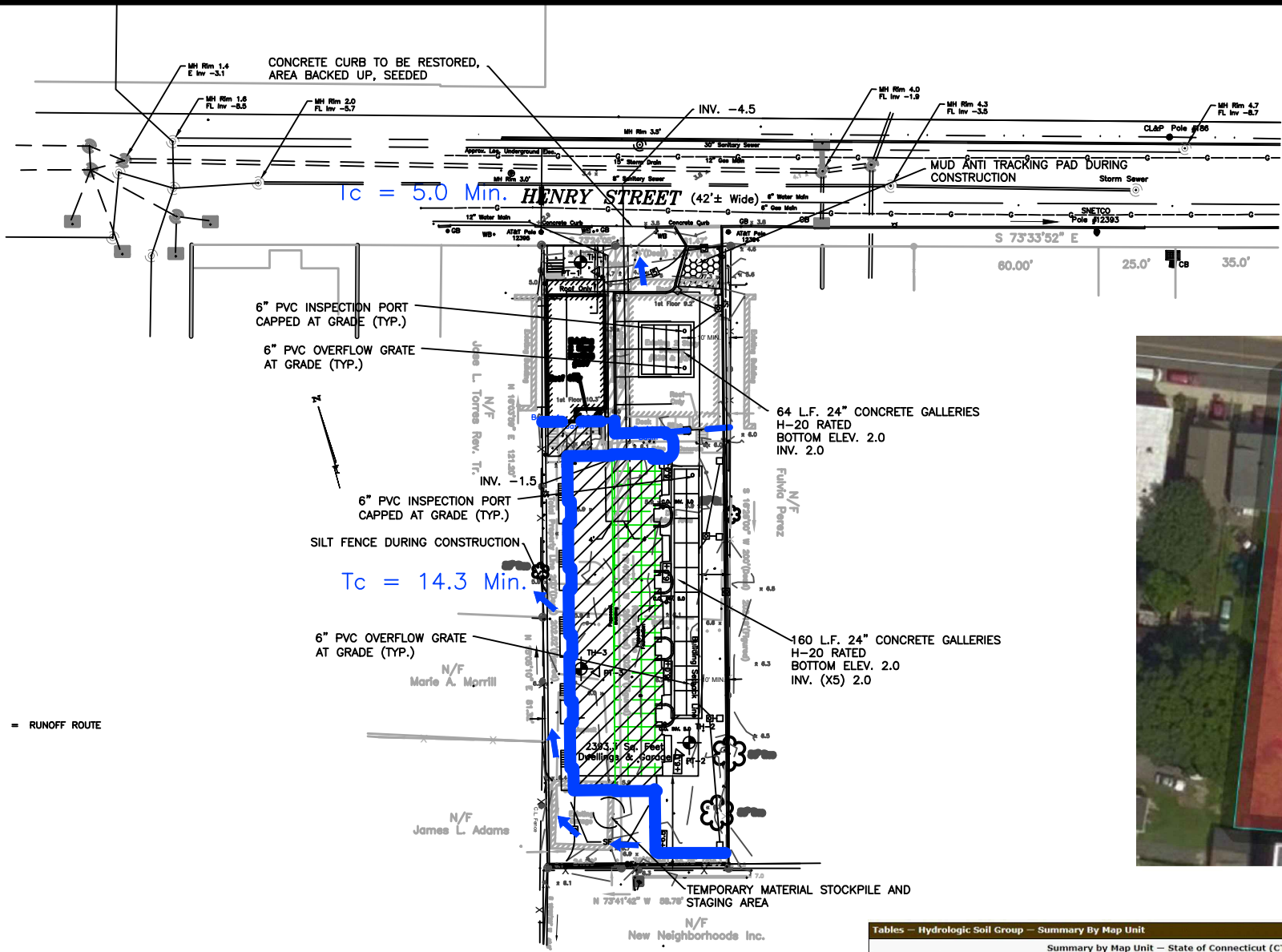
Re: 239-241 Henry Street

The Tcs in each Basin change value from existing to proposed conditions, as the proposed structure alters the length of the runoff routes.

The time to draw down the retention basins is calculated in HydroCad, and enumerated in the table on the last page for each Basin. The time that the elevation drops back down to the empty level (2.0 in both cases here) is taken from the table; there is no manual calculation. This has been the accepted submittal process historically.

Respectfully submitted,

Wayne D'Avanzo, P.E.



Tables - Hydrologic Soil Group - Summary By Map Unit

Summary by Map Unit - State of Connecticut (CT600)

Summary by Map Unit - State of Connecticut (CT600)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
307	Urban land	D	0.4	100.0%
Totals for Area of Interest			0.4	100.0%

239-241 HENRY STREET ASSOCIATES LLC
239-241 HENRY STREET STAMFORD, CONNECTICUT

PROPOSED BASIN

CONSULTING CIVIL ENGINEERS

1673 project

FAIRFIELD COUNTY ENGINEERING L.L.C.

1 OF 1 sheet

8-13-20 date

FAIRFIELD STREET, STAMFORD, CONNECTICUT 06905 PH (203) 831-8000 FAX (203) 831-8000