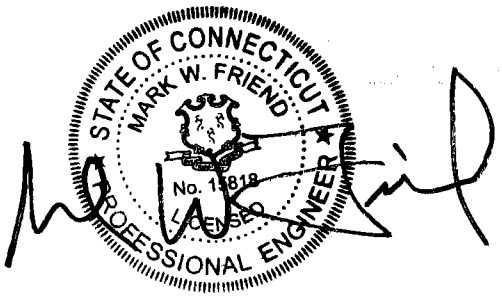
MEGSON, HEAGLE & FRIEND
CIVIL ENGINEERS & LAND SURVEYORS, LLC
81 RANKIN ROAD
GLASTONBURY, CONNECTICUT 06033
PHONE (860) 659-0587
FAX (860) 657-4429

HYDROLOGY AND HYDRAULICS ENGINEERING REPORT

The Community of Saints Isodore and Maria
at St. Paul Church
#2557 & Lot W-38A Main Street
Glastonbury, CT

December, 2022



Prepared By:

Mark W. Friend, PE
Soil Scientist, LEED AP

Saint Paul Church
Main Street
Parking Lot Expansion
Glastonbury, CT

TABLE OF CONTENTS

APPENDICES

Saint Paul Church
Main Street
Parking Lot Expansion
Glastonbury, CT

PROJECT DESCRIPTION

The project that is the subject of this report is located on a parcel of land with an address of 2577 Main Street in Glastonbury, CT. The property has 363.44 feet of frontage on the west side of Main Street and 154.44 feet on the north side of Welles Street. It is 7.246 acres in size. Four existing buildings are located on the property which consist of a church, rectory, garage for the rectory, and residential style building used as the Knights of Columbus Hall. Several paved access drives and parking lots are located on the site. The main parking lot is west of the church in the middle portion of the site. A large cell phone tower exists on the westerly most portion of the property on a 100 x 100 foot leased area.

In recent years the congregation utilizing the Church's Main Street campus has grown due to local Church consolidation and general growth within the community, with the existing Parish Center and parking facilities no longer meet the needs of the congregation. The Applicant is therefore proposing a 2-story, 15,341 s.f. (main level: 8,355 s.f., lower level: 6,986 s.f.) building addition to the rear of the existing Church building. Approximately 1,020 s.f. of the existing structure will be demolished in order to make the building connection. The new addition will include new offices, classrooms, an assembly hall with kitchen, together with new bathroom facilities and a glass vestibule entry with elevator access to modernize and upgrade the facility. The Site is currently under parked by 39 parking spaces (192 parking spaces required per the Building-Zone Regulations, and 153 parking spaces existing on Site). The Applicant is proposing to reconfigure and expand the existing parking lot along Main Street, and towards the west with the new construction of 106 additional parking spaces, for a total of 259 on-site parking spaces (please note that a 10.1% parking waiver will be requested from the Town Plan and Zoning Commission). Other proposed site improvements include a stormwater management basin, rain garden, parking lot islands with shade trees and the installation of full-cut off 16 ft. light poles mounted to a 2 ft. concrete base.

STORMWATER MANAGEMENT DESIGN GOALS AND PRACTICES

The design goals of the stormwater management system are as follow:

General

- Design to be consistent with the Town of Glastonbury Standards for Public Improvements Section 4.0 Stormwater Management Design Standards.
- Design to be consistent with National Pollutant Discharge Elimination System (NPDES).
- Design to be consistent with the 2004 Connecticut Stormwater Quality Manual
- Design to be consistent with the 2002 Connecticut Guidelines For Soil Erosion and Sediment Control
- Design to be consistent with the Town's MS4 Permit.
- Design to be functional, environmentally sensitive & aesthetically compatible with the surrounding development.
- Incorporate Low Impact Development (LID) practices.
- Incorporate Best Management Practices (BMP's).
- Remove at least 80% of the total suspended solids & floatable pollutants before discharge to a surface water or wetland.
- Minimize loss of long term recharge during low flow periods.
- Retain 50% of the Water Quality Volume for the site in conformance with the Town of Glastonbury MS4 Permit.
- Mitigate peak runoffs to prevent any increases for storm frequency events from 2 to 100 years.

Treatment Controls

Filtering Practices

- Utilize sheet flow to parking lot islands (micro-scale control)
- Utilize stormwater management areas utilizing created wetlands & wet basins
- Utilize linear bio-swales

Infiltration/Recharge Practices

- Utilize sheet flow to parking islands (micro-scale control)
- Utilize sheet flow to road shoulders (micro-scale control)
- Utilize stormwater management areas utilizing created wetlands & wet basins
- Utilize linear bio-swales
- Utilize Stormwater Management Basin to retain 50% Water Quality Volume for the site consistent with the Town's MS4 Permit.

Settling Practices

- Design lot grading to create ponding areas in islands & shoulders (micro-scale control)
- Utilize stormwater management basins

Detention Practices for Mitigation of Peak Runoff Increase

- Design a Stormwater Management Basin (SWMB) with an Outlet Control Weir to provide detention of peak flow increases.

End of Pipe Controls

- Incorporate a Sediment Forebay
- Utilize 2' sumps in catchbasins
- Design outlet protection @ discharge points

To achieve the above enumerated goals a stormwater treatment train is incorporated into the design, including a linear raingarden to treat the runoff prior to collection in traditional catchbasins with 2' sumps. The discharge from this system is then directed to a SWMB with a wet bottom. This feature is specified to be planted with both wetland and upland plants to provide a bio-retention environment. A sediment forebay is proposed in the SWMB to isolate and contain any incoming sediments not filtered out in the linear raingarden or settled out in the catchbasin sumps.

A critical element of the stormwater management plan is the ability to capture 93% of the existing pavement and direct it into the treatment train. This provides the advantage of managing the existing runoff currently being discharged directly into the adjacent wetland system and achieve the above enumerated goals. **This is a substantial improvement in stormwater quality treatment for runoff from the site.**

METHODOLOGY

Peak rates of runoff and runoff volumes, for the purpose of determining the detention required for mitigating increases, are computed utilizing the TR-55 method according to the Town requirements. HydroCAD Stormwater Modeling software was used for these calculations.

Peak rates of surface runoffs, for the purpose of culvert sizing, are computed utilizing the Rational Method. The pipes were designed to convey flows from up to a 10 yr frequency storm event. Hydraflow Storm Sewers by inteliSOLVE was used to compute the hydraulic grade lines for the system using the runoffs computed. The Water Quality Volume is computed per the 2004 Connecticut Stormwater Quality Manual. The results are included in the appendices.

SUMMARY

- The entire proposed parking lot as well as the runoff from 93% of the existing parking lot is directed to the Treatment Train.
- The SWMB is designed to prevent any increases in peak runoffs for all storm frequency events from 2 to 100 years. The actual peak flows are as follows:

Storm Frequency Events

	2 yr	10 yr	25 yr	50 yr	100yr
Pre-Developed	5.27 cfs	13.18 cfs	18.64 cfs	23.02 cfs	27.42 cfs
Post-Developed	5.08 cfs	12.68 cfs	17.94 cfs	22.15 cfs	26.39 cfs
SWMB Outflow	4.58 cfs	12.56 cfs	16.23 cfs	18.98 cfs	21.71 cfs
Reduction	0.19 cfs	0.50 cfs	0.70 cfs	0.87 cfs	1.03 cfs

- The outlet weir of the SWMB is designed at elevation 28.6 to retain 50% of the Stormwater Quality Volume for the site as required for a Re-development site per the MS4 Permit.

Saint Paul Church
Main Street
Parking Lot Expansion
Glastonbury, CT

APPENDIX A

TR-55 PRE/POST DRAINAGE AREA MAPS

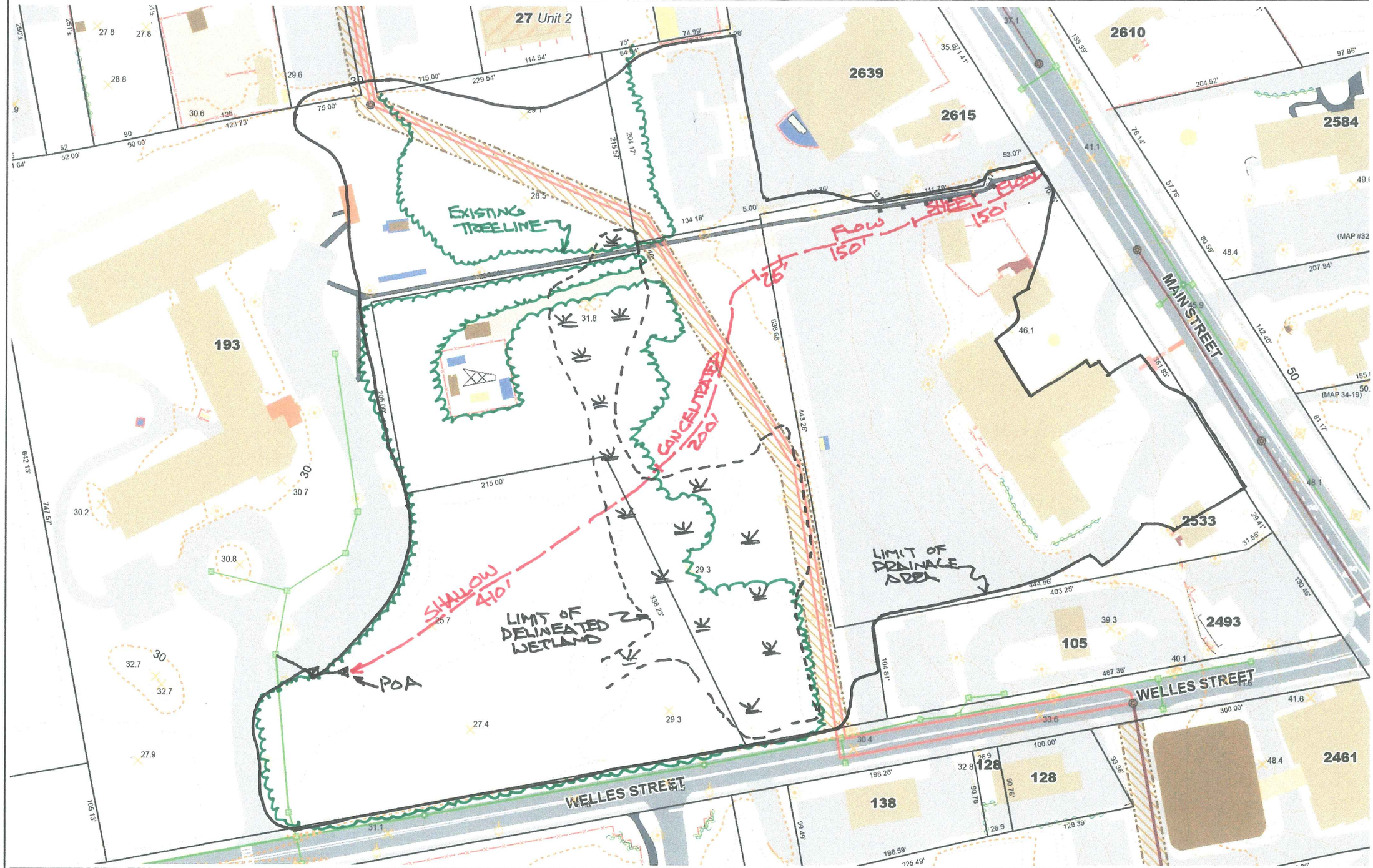
Town of Glastonbury GIS

THE COMMUNITY OF SAINTS ISADORE & MARIA AT ST. PAUL

PRE-DEVELOPED DRAINAGE AREA TO POA

11-22,

1" = 100'



Legend

- Storm Under Drain Lines
- Property Line
- Address Points
- Sanitary Pump Stations
- Sanitary Manhole
  - Active,Gravity
  - Active,Pressure
  - Capped,Gravity
- Sanitary Gravity Main
  - Active,6" - 8"
  - Active, 10 - 18"
  - Active,24" - 36"
  - Capped,8"
- Sanitary Force Main
  - 2" - 4"
  - 10" - 18"
- Storm Inlet Structures
  - Catch Basin
  - Flared End
  - Headwall
  - Overflow
  - Pipe End
  - Yard Drain
- Storm Outlet Structures
  - End Wall
  - Flared End
  - Pipe End
- Storm Manhole
- Storm Gravity Lines
  - Culvert, 42" - Larger
  - Culvert, 15" - 36"
  - Collector, 54" - 84"
  - Collector, 30" - 48"
  - Collector, 18" - 27"
  - Collector, 1" - 15"
- Storm Open Channel
- Storm Gravity Lines - (Abandoned)
- Storm Detention Ponds
- Dams
- Glastonbury Fire Hydrants
- Manchester Fire Hydrants
- MDC Fire Hydrants
- Sewer Easement
- Drainage Easement
- Street Centerlines
  - State Highway
  - Secondary Roads
- Walls
  - Headwall
  - Retaining wall
  - Stone Wall (not retaining)
  - Wall
  - Wall in urban area for sitting
  - Wingwall
- Fence
  - Fences
  - Guardrail along road
  - Hedges
  - Jersey Barrier along roads
- Utility Poles, Towers and Lights
  - Utility poles without street light
  - Utility pole with street light
  - Light Pole
  - Transmission or Cellphone Tower
  - Electric Box for traffic signals
- Buildings
  - Building
  - Out building
  - Area under constuction
  - Building foundation
  - Mobile home, trailer
  - Ruined building or structure
- Ancillary Structures
  - Solar Panels on ground

1: 1,200

200 0 100 200 Feet

NAD_1983_StatePlane_Connecticut_FIPS_0600_Feet

86-16

Notes

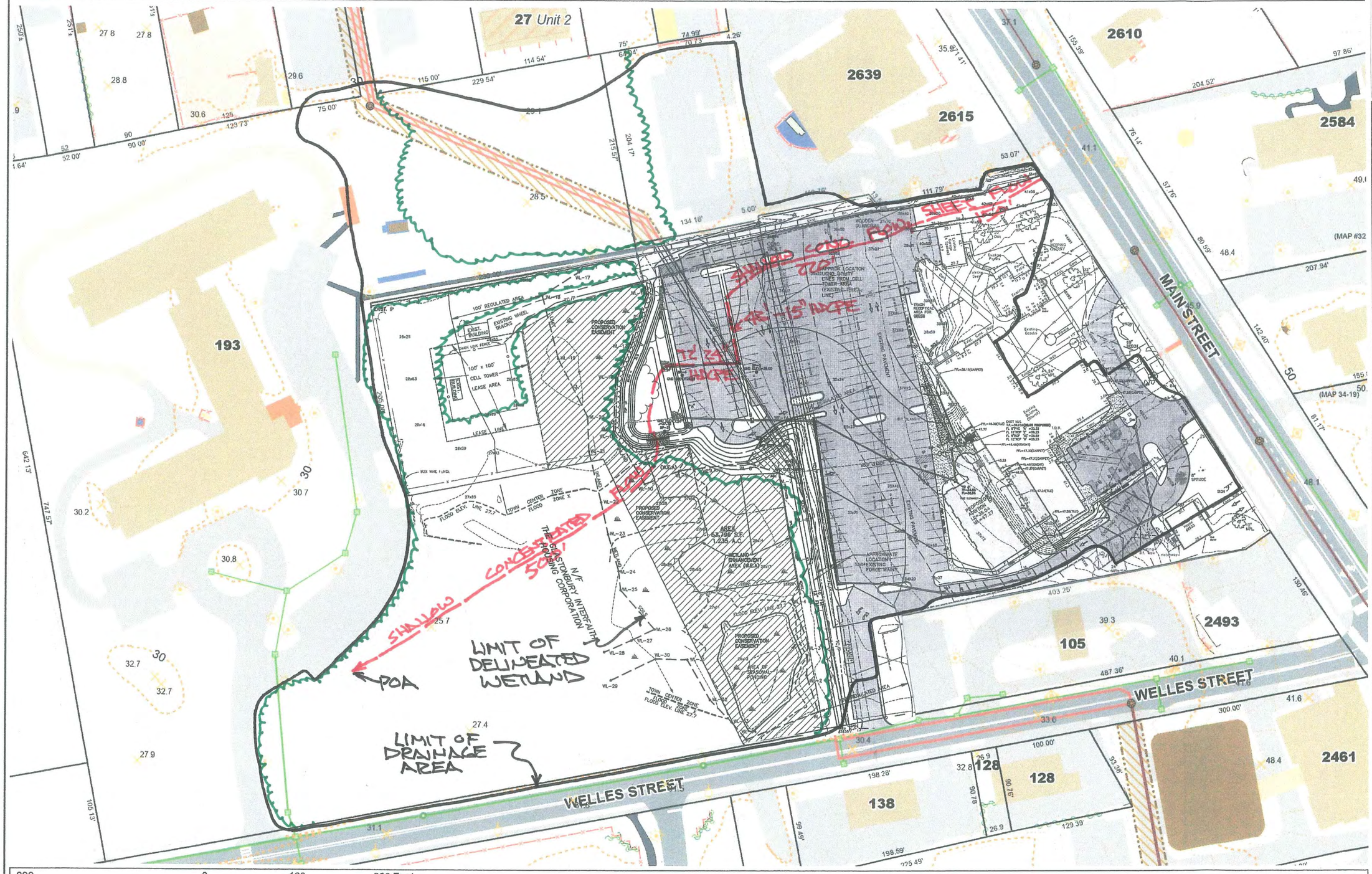
Enter Map Description

Town of Glastonbury

Town of Glastonbury GIS

THE COMMUNITY OF
SAINTS ISODORE &
MARIA AT ST. PAUL
POST-DEVELOPED
DRAINAGE AREA
TO POA

10-22
1" = 100'



Legend

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- Ancillary Structures
  - Solar Panels on ground

1: 1,200

200 0 100 200 Feet

NAD_1983_StatePlane_Connecticut_FIPS_0600_Feet

Notes

Enter Map Description

Saint Paul Church
Main Street
Parking Lot Expansion
Glastonbury, CT

APPENDIX B

TR-55 PRE/POST COVERAGE & HYDROLOGIC SOIL GROUPS

MEGSON, HEAGLE & FRIEND
Civil Engineers & Land Surveyors, LLC
81 Rankin Road
Glastonbury, Connecticut 06033
(860) 659-0587

JOB 816-16 ST. PAUL

SHEET NO. 1 OF 2

CALCULATED BY MWF DATE 10-22

CHECKED BY _____ DATE _____

SCALE _____

PRE-DEVELOPED CONDITIONS

TOTAL DRAINAGE AREA - 11.71 AC

TOTAL PAVED AREA - 2.28 AC

TOTAL BUILDING AREA - 0.44 AC

TOTAL GRASS AREA - 1.88 AC

TOTAL BRUSH-FAIR AREA - 1.24 AC

TOTAL WOODED AREA - 5.87 AC

HYDROLOGIC SOIL GROUPS

NINIGRET / TISBURY, HAVEN, ENFIELD, AGAWAM
- SOIL GROUP B

WOODED - 4.71 AC
GRASS - 1.88 AC
BRUSH-FAIR - 0.85 AC

RAYNHOLM - SOIL GROUP C

WOODED - 1.16 AC
BRUSH FAIR 0.39 AC

MEGSON, HEAGLE & FRIEND
Civil Engineers & Land Surveyors, LLC
81 Rankin Road
Glastonbury, Connecticut 06033
(860) 659-0587

JOB 86-16 ST. PAUL
SHEET NO. 2 OF 7
CALCULATED BY MWF DATE 10-22
CHECKED BY _____ DATE _____
SCALE _____

POST-DEVELOPED CONDITIONS

TOTAL DRAINAGE AREA - 11.71 AC

TOTAL PAVED AREA - 2.27 AC

TOTAL BUILDING AREA - 0.60 AC

TOTAL GRASS AREA - 2.70 AC

TOTAL WOODED AREA - 6.14 AC

HYDROLOGIC SOIL GROUPS

NINIGRET / TISBURY, HAVEN, ENFIELD, AGAWAM
- SOIL GROUP B
WOODED - 4.64 AC
GRASS - 2.84 AC

RAYNHAM - SOIL GROUP C
WOODED - 1.50 AC

Saint Paul Church
Main Street
Parking Lot Expansion
Glastonbury, CT

APPENDIX C

HydroCAD TR-55 SUMMARY REPORT

Subcat Reach Pond Link

Routing Diagram for 86-16 - St Pauls Church
Prepared by Microsoft, Printed 12/1/2022

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	NRCC 24-hr	C	Default	24.00	1	3.08	2
2	10-yr	NRCC 24-hr	C	Default	24.00	1	4.86	2
3	25-yr	NRCC 24-hr	C	Default	24.00	1	5.97	2
4	50-yr	NRCC 24-hr	C	Default	24.00	1	6.83	2
5	100-yr	NRCC 24-hr	C	Default	24.00	1	7.68	2

Summary for Subcatchment 1S: Pre - Developed to POA

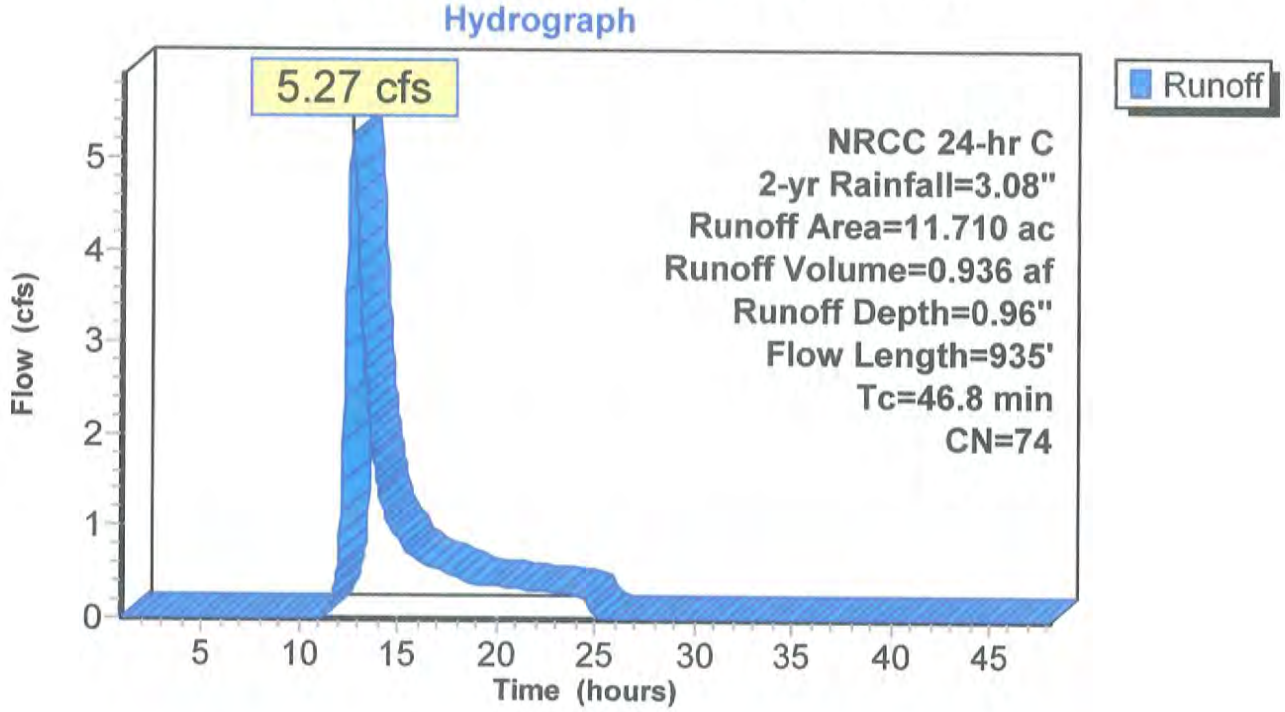
Runoff = 5.27 cfs @ 12.68 hrs, Volume= 0.936 af, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 2-yr Rainfall=3.08"

Area (ac)	CN	Description
2.280	98	Paved parking, HSG B
0.440	98	Roofs, HSG B
4.710	66	Woods, Poor, HSG B
1.880	61	>75% Grass cover, Good, HSG B
0.850	67	Brush, Poor, HSG B
1.160	77	Woods, Poor, HSG C
0.390	77	Brush, Poor, HSG C
11.710	74	Weighted Average
8.990		76.77% Pervious Area
2.720		23.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	150	0.0200	1.46		**Sheet Flow, Sheet flow over paved area** Smooth surfaces n= 0.011 P2= 3.07"
0.8	150	0.0260	3.27		**Shallow Concentrated Flow, Shallow Concentrated Flow over pa** Paved Kv= 20.3 fps
0.2	25	0.1600	2.00		**Shallow Concentrated Flow, Shallow concentrated flow** Woodland Kv= 5.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, Shallow Conc - Knotweed** Woodland Kv= 5.0 fps
38.7	410	0.0050	0.18		**Shallow Concentrated Flow, Shallow Conc - Dense woods** Forest w/Heavy Litter Kv= 2.5 fps
46.8	935	Total			

Subcatchment 1S: Pre - Developed to POA



Summary for Subcatchment 2S: Post - Developed to POA

Runoff = 5.08 cfs @ 12.74 hrs, Volume= 0.936 af, Depth= 0.96"
Routed to nonexistent node 3P

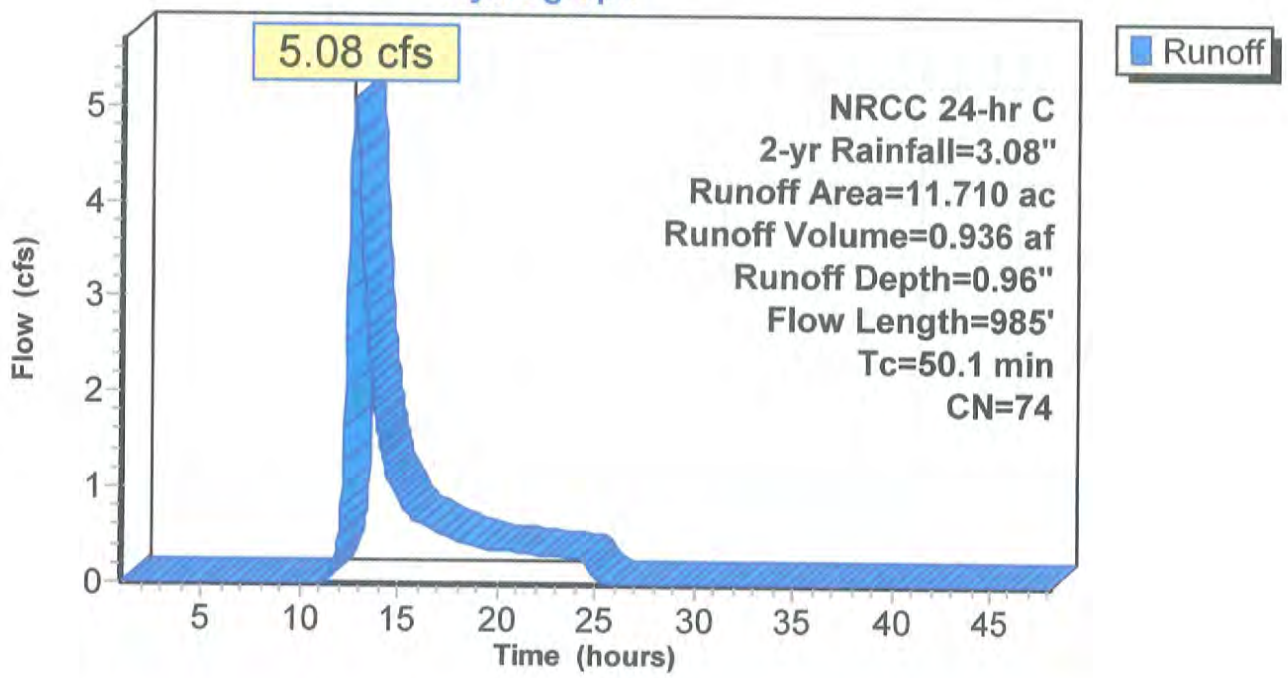
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 2-yr Rainfall=3.08"

Area (ac)	CN	Description
2.270	98	Paved parking, HSG B
2.700	61	>75% Grass cover, Good, HSG B
4.640	66	Woods, Poor, HSG B
1.500	77	Woods, Poor, HSG C
0.600	98	Roofs, HSG B
11.710	74	Weighted Average
8.840		75.49% Pervious Area
2.870		24.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	150	0.0200	1.46		**Sheet Flow, Sheet Flow over pavement** Smooth surfaces n= 0.011 P2= 3.07"
1.0	220	0.0300	3.52		**Shallow Concentrated Flow, Shallow Concentrated Flow over pa** Paved Kv= 20.3 fps
0.1	43	0.0100	5.70	7.00	**Pipe Channel, 15" HDCPE** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Corrugated PP, smooth interior
0.2	72	0.0100	7.80	24.51	**Pipe Channel, 24" HDCPE** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Corrugated PP, smooth interior
47.1	500	0.0050	0.18		**Shallow Concentrated Flow, Shallow Concentrated Heavy woods** Forest w/Heavy Litter Kv= 2.5 fps
50.1	985	Total			

Subcatchment 2S: Post - Developed to POA

Hydrograph



Summary for Subcatchment 5S: Discharge Area to SWMB

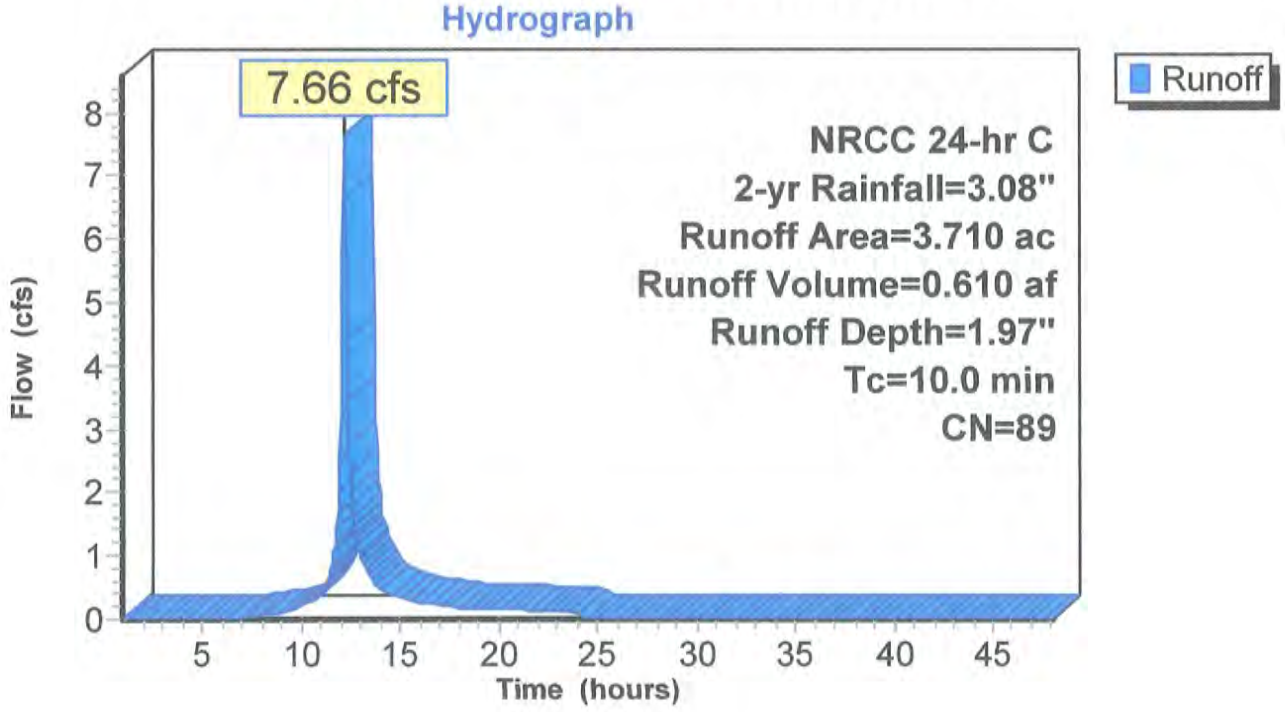
Runoff = 7.66 cfs @ 12.17 hrs, Volume= 0.610 af, Depth= 1.97"
Routed to Pond 4P : SWMB

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 2-yr Rainfall=3.08"

Area (ac)	CN	Description
2.180	98	Paved parking, HSG B
0.930	61	>75% Grass cover, Good, HSG B
0.600	98	Roofs, HSG B
3.710	89	Weighted Average
0.930		25.07% Pervious Area
2.780		74.93% Impervious Area

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

Subcatchment 5S: Discharge Area to SWMB



Summary for Pond 4P: SWMB

Inflow Area = 3.710 ac, 74.93% Impervious, Inflow Depth = 1.97" for 2-yr event
Inflow = 7.66 cfs @ 12.17 hrs, Volume= 0.610 af
Outflow = 4.58 cfs @ 12.31 hrs, Volume= 0.476 af, Atten= 40%, Lag= 8.1 min
Primary = 4.58 cfs @ 12.31 hrs, Volume= 0.476 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 29.55' @ 12.31 hrs Surf.Area= 5,152 sf Storage= 10,410 cf

Plug-Flow detention time= 198.5 min calculated for 0.476 af (78% of inflow)
Center-of-Mass det. time= 110.5 min (934.9 - 824.4)

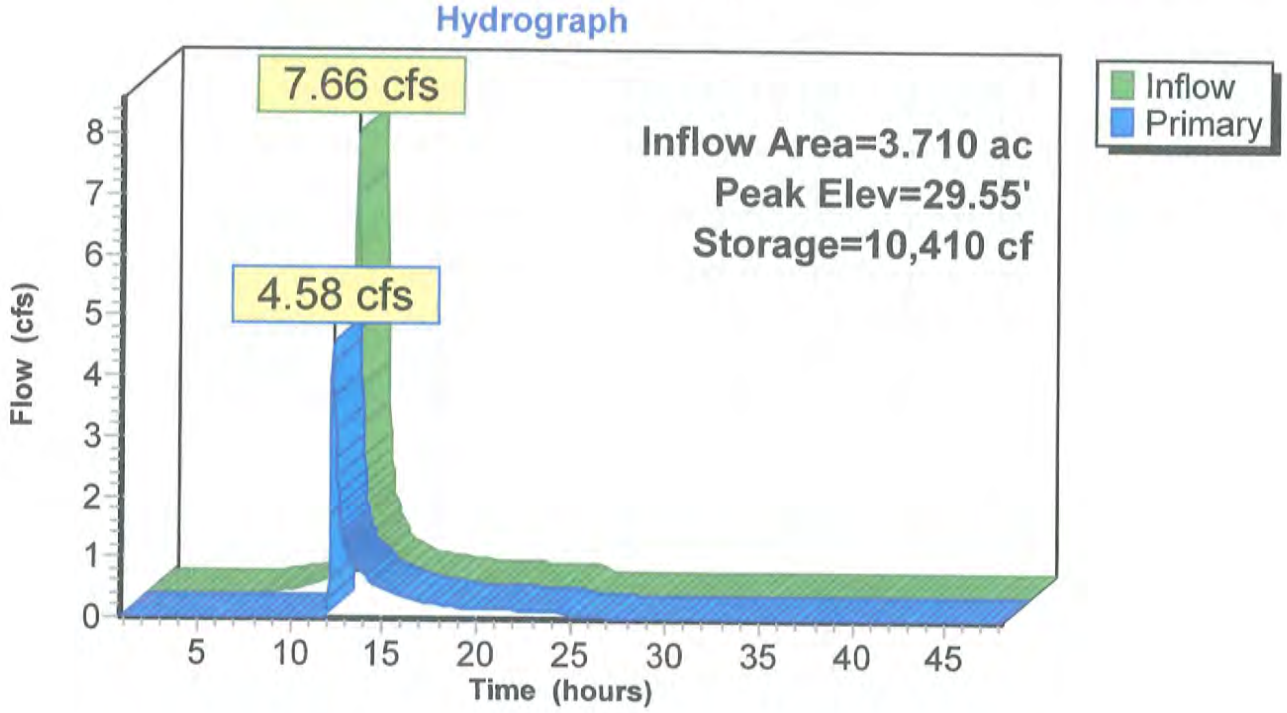
Volume	Invert	Avail.Storage	Storage Description
#1	27.00'	18,710 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
27.00	2,800	0	0
27.50	3,220	1,505	1,505
28.00	3,880	1,775	3,280
28.50	4,440	2,080	5,360
29.00	4,800	2,310	7,670
29.50	5,120	2,480	10,150
30.00	5,440	2,640	12,790
30.50	5,920	2,840	15,630
31.00	6,400	3,080	18,710

Device	Routing	Invert	Outlet Devices
#1	Primary	28.60'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.70 0.70 2.00 2.00 3.00 Width (feet) 0.50 0.50 8.00 8.00 12.00 12.00

Primary OutFlow Max=4.51 cfs @ 12.31 hrs HW=29.55' (Free Discharge)
↑—**1=Custom Weir/Orifice** (Weir Controls 4.51 cfs @ 1.94 fps)

Pond 4P: SWMB


Hydrograph
7.66 cfs
4.58 cfs
Inflow Area=3.710 ac
Peak Elev=29.55'
Storage=10,410 cf
Inflow
Primary
Flow (cfs)
0
1
2
3
4
5
6
7
8
5
10
15
20
25
30
35
40
45
Time (hours)

Summary for Subcatchment 1S: Pre - Developed to POA

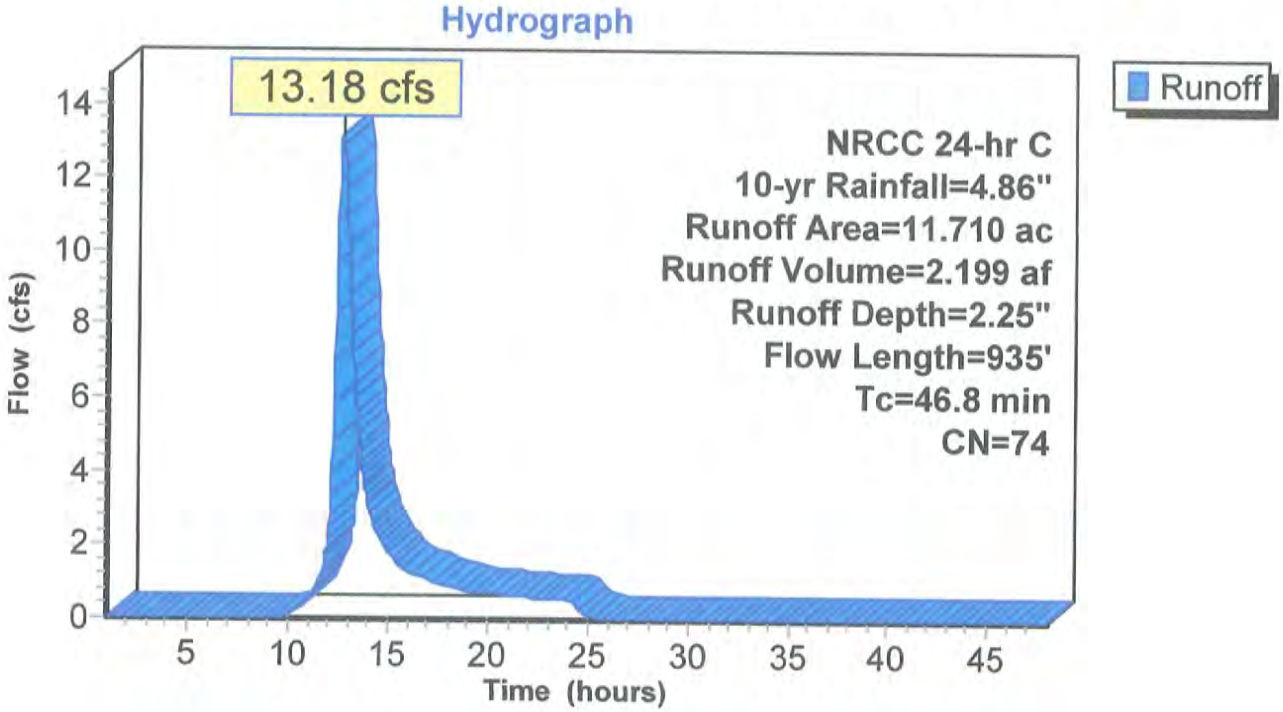
Runoff = 13.18 cfs @ 12.65 hrs, Volume= 2.199 af, Depth= 2.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-yr Rainfall=4.86"

Area (ac)	CN	Description
2.280	98	Paved parking, HSG B
0.440	98	Roofs, HSG B
4.710	66	Woods, Poor, HSG B
1.880	61	>75% Grass cover, Good, HSG B
0.850	67	Brush, Poor, HSG B
1.160	77	Woods, Poor, HSG C
0.390	77	Brush, Poor, HSG C
11.710	74	Weighted Average
8.990		76.77% Pervious Area
2.720		23.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	150	0.0200	1.46		**Sheet Flow, Sheet flow over paved area** Smooth surfaces n= 0.011 P2= 3.07"
0.8	150	0.0260	3.27		**Shallow Concentrated Flow, Shallow Concentrated Flow over pa** Paved Kv= 20.3 fps
0.2	25	0.1600	2.00		**Shallow Concentrated Flow, Shallow concentrated flow** Woodland Kv= 5.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, Shallow Conc - Knotweed** Woodland Kv= 5.0 fps
38.7	410	0.0050	0.18		**Shallow Concentrated Flow, Shallow Conc - Dense woods** Forest w/Heavy Litter Kv= 2.5 fps
46.8	935	Total			

Subcatchment 1S: Pre - Developed to POA



Summary for Subcatchment 2S: Post - Developed to POA

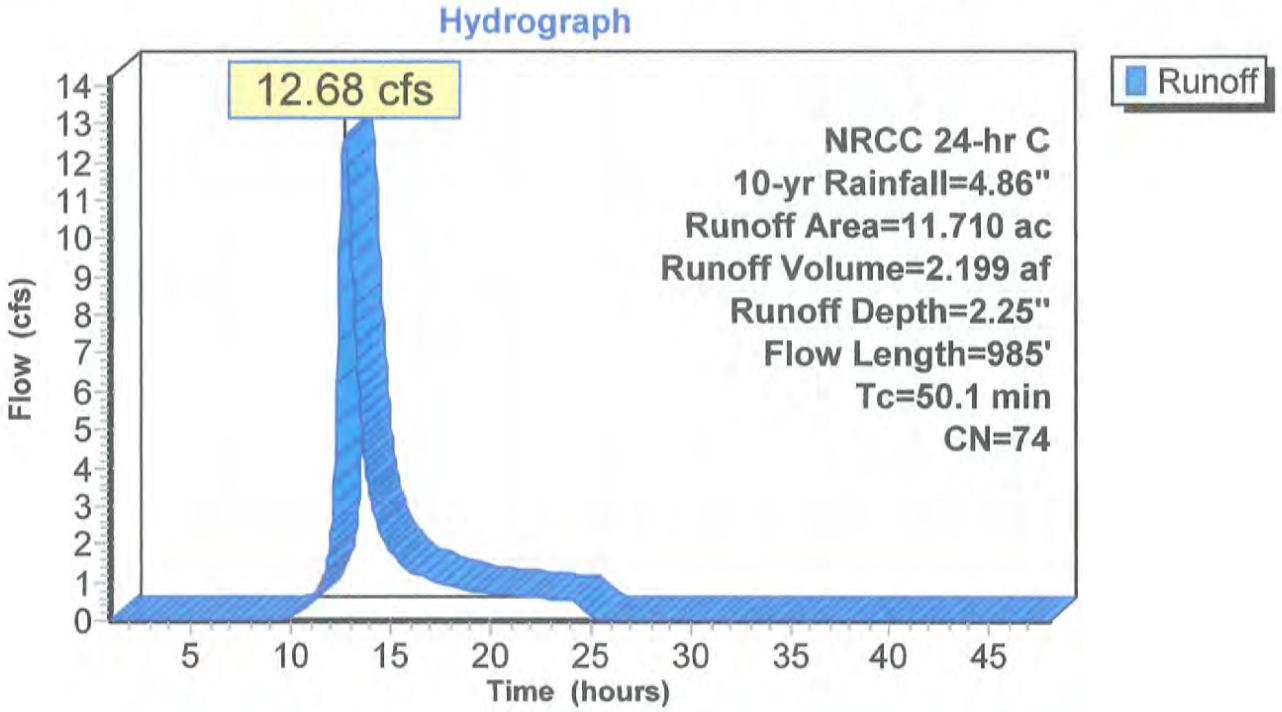
Runoff = 12.68 cfs @ 12.70 hrs, Volume= 2.199 af, Depth= 2.25"
Routed to nonexistent node 3P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-yr Rainfall=4.86"

Area (ac)	CN	Description
2.270	98	Paved parking, HSG B
2.700	61	>75% Grass cover, Good, HSG B
4.640	66	Woods, Poor, HSG B
1.500	77	Woods, Poor, HSG C
0.600	98	Roofs, HSG B
11.710	74	Weighted Average
8.840		75.49% Pervious Area
2.870		24.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	150	0.0200	1.46		**Sheet Flow, Sheet Flow over pavement** Smooth surfaces n= 0.011 P2= 3.07"
1.0	220	0.0300	3.52		**Shallow Concentrated Flow, Shallow Concentrated Flow over pa** Paved Kv= 20.3 fps
0.1	43	0.0100	5.70	7.00	**Pipe Channel, 15" HDCPE** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Corrugated PP, smooth interior
0.2	72	0.0100	7.80	24.51	**Pipe Channel, 24" HDCPE** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Corrugated PP, smooth interior
47.1	500	0.0050	0.18		**Shallow Concentrated Flow, Shallow Concentrated Heavy woods** Forest w/Heavy Litter Kv= 2.5 fps
50.1	985	Total			

Subcatchment 2S: Post - Developed to POA



Summary for Subcatchment 5S: Discharge Area to SWMB

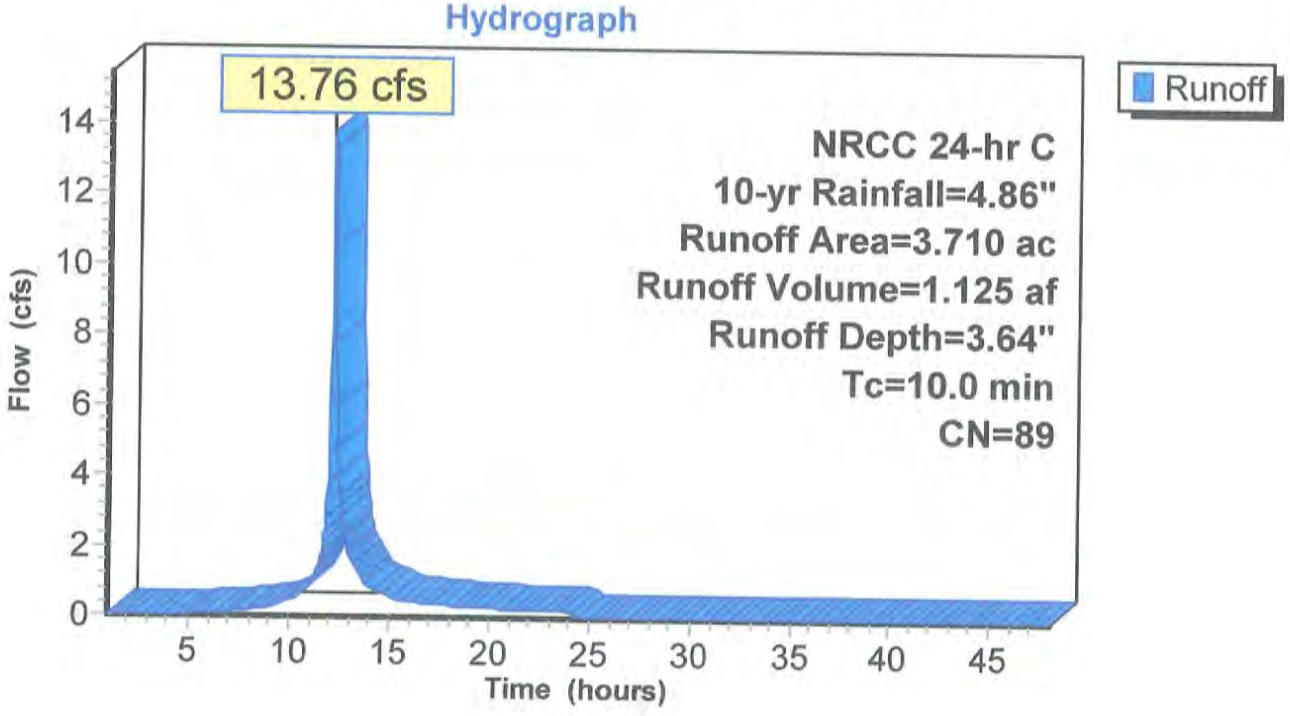
Runoff = 13.76 cfs @ 12.17 hrs, Volume= 1.125 af, Depth= 3.64"
Routed to Pond 4P : SWMB

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-yr Rainfall=4.86"

Area (ac)	CN	Description
2.180	98	Paved parking, HSG B
0.930	61	>75% Grass cover, Good, HSG B
0.600	98	Roofs, HSG B
3.710	89	Weighted Average
0.930		25.07% Pervious Area
2.780		74.93% Impervious Area

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

Subcatchment 5S: Discharge Area to SWMB



Summary for Pond 4P: SWMB

Inflow Area = 3.710 ac, 74.93% Impervious, Inflow Depth = 3.64" for 10-yr event
Inflow = 13.76 cfs @ 12.17 hrs, Volume= 1.125 af
Outflow = 12.56 cfs @ 12.22 hrs, Volume= 0.991 af, Atten= 9%, Lag= 2.7 min
Primary = 12.56 cfs @ 12.22 hrs, Volume= 0.991 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 29.86' @ 12.22 hrs Surf.Area= 5,349 sf Storage= 12,043 cf

Plug-Flow detention time= 133.7 min calculated for 0.990 af (88% of inflow)
Center-of-Mass det. time= 76.2 min (881.5 - 805.3)

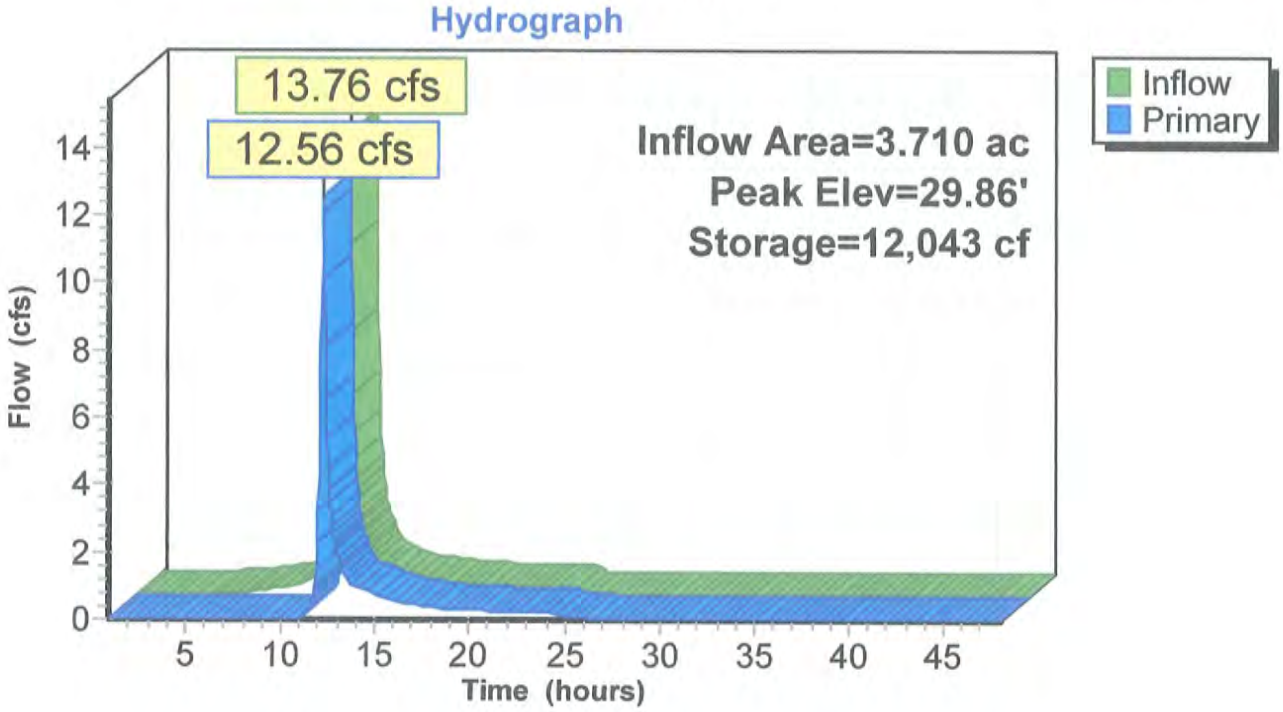
Volume	Invert	Avail.Storage	Storage Description
#1	27.00'	18,710 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
27.00	2,800	0	0
27.50	3,220	1,505	1,505
28.00	3,880	1,775	3,280
28.50	4,440	2,080	5,360
29.00	4,800	2,310	7,670
29.50	5,120	2,480	10,150
30.00	5,440	2,640	12,790
30.50	5,920	2,840	15,630
31.00	6,400	3,080	18,710

Device	Routing	Invert	Outlet Devices
#1	Primary	28.60'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.70 0.70 2.00 2.00 3.00 Width (feet) 0.50 0.50 8.00 8.00 12.00 12.00

Primary OutFlow Max=12.31 cfs @ 12.22 hrs HW=29.85' (Free Discharge)
↑**1=Custom Weir/Orifice** (Weir Controls 12.31 cfs @ 2.59 fps)

Pond 4P: SWMB


Hydrograph
13.76 cfs
12.56 cfs
Inflow Area=3.710 ac
Peak Elev=29.86'
Storage=12,043 cf
Inflow
Primary
Flow (cfs)
0
2
4
6
8
10
12
14
5
10
15
20
25
30
35
40
45
Time (hours)

Summary for Subcatchment 1S: Pre - Developed to POA

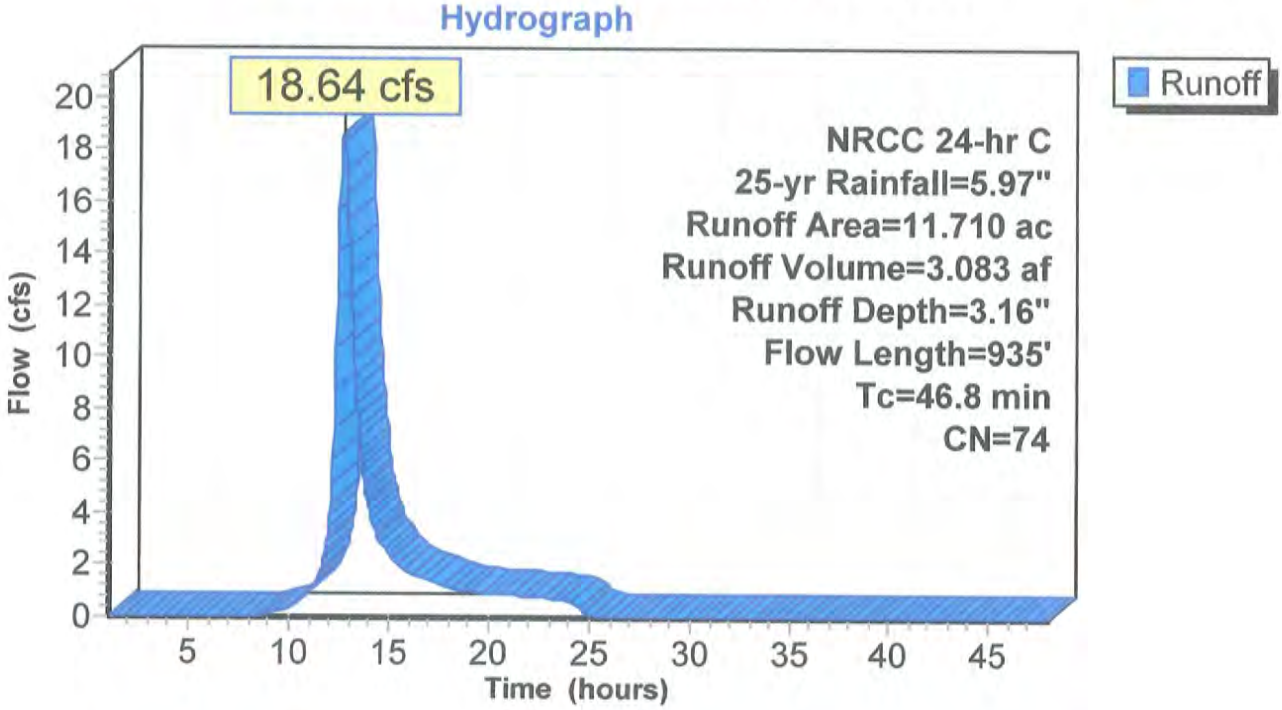
Runoff = 18.64 cfs @ 12.65 hrs, Volume= 3.083 af, Depth= 3.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 25-yr Rainfall=5.97"

Area (ac)	CN	Description
2.280	98	Paved parking, HSG B
0.440	98	Roofs, HSG B
4.710	66	Woods, Poor, HSG B
1.880	61	>75% Grass cover, Good, HSG B
0.850	67	Brush, Poor, HSG B
1.160	77	Woods, Poor, HSG C
0.390	77	Brush, Poor, HSG C
11.710	74	Weighted Average
8.990		76.77% Pervious Area
2.720		23.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	150	0.0200	1.46		**Sheet Flow, Sheet flow over paved area** Smooth surfaces n= 0.011 P2= 3.07"
0.8	150	0.0260	3.27		**Shallow Concentrated Flow, Shallow Concentrated Flow over pa** Paved Kv= 20.3 fps
0.2	25	0.1600	2.00		**Shallow Concentrated Flow, Shallow concentrated flow** Woodland Kv= 5.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, Shallow Conc - Knotweed** Woodland Kv= 5.0 fps
38.7	410	0.0050	0.18		**Shallow Concentrated Flow, Shallow Conc - Dense woods** Forest w/Heavy Litter Kv= 2.5 fps
46.8	935	Total			

Subcatchment 1S: Pre - Developed to POA



Summary for Subcatchment 2S: Post - Developed to POA

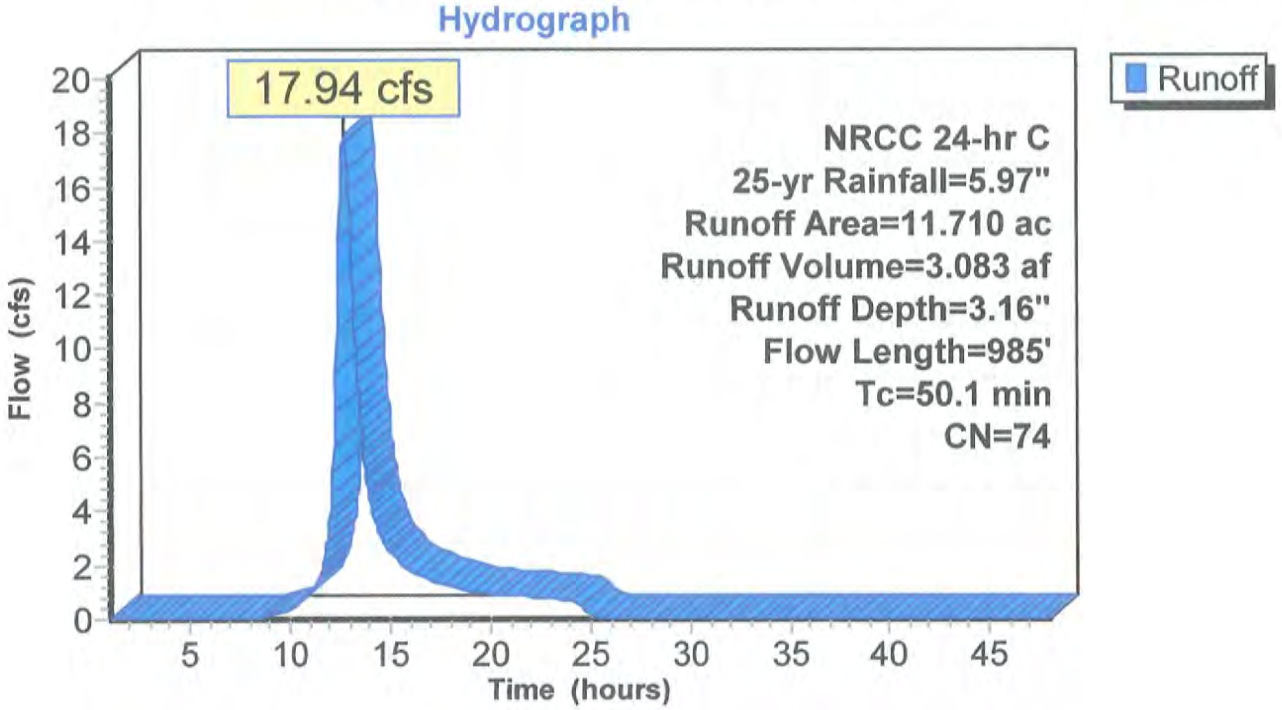
Runoff = 17.94 cfs @ 12.69 hrs, Volume= 3.083 af, Depth= 3.16"
Routed to nonexistent node 3P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 25-yr Rainfall=5.97"

Area (ac)	CN	Description
2.270	98	Paved parking, HSG B
2.700	61	>75% Grass cover, Good, HSG B
4.640	66	Woods, Poor, HSG B
1.500	77	Woods, Poor, HSG C
0.600	98	Roofs, HSG B
11.710	74	Weighted Average
8.840		75.49% Pervious Area
2.870		24.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	150	0.0200	1.46		**Sheet Flow, Sheet Flow over pavement** Smooth surfaces n= 0.011 P2= 3.07"
1.0	220	0.0300	3.52		**Shallow Concentrated Flow, Shallow Concentrated Flow over pa** Paved Kv= 20.3 fps
0.1	43	0.0100	5.70	7.00	**Pipe Channel, 15" HDCPE** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Corrugated PP, smooth interior
0.2	72	0.0100	7.80	24.51	**Pipe Channel, 24" HDCPE** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Corrugated PP, smooth interior
47.1	500	0.0050	0.18		**Shallow Concentrated Flow, Shallow Concentrated Heavy woods** Forest w/Heavy Litter Kv= 2.5 fps
50.1	985	Total			

Subcatchment 2S: Post - Developed to POA



Summary for Subcatchment 5S: Discharge Area to SWMB

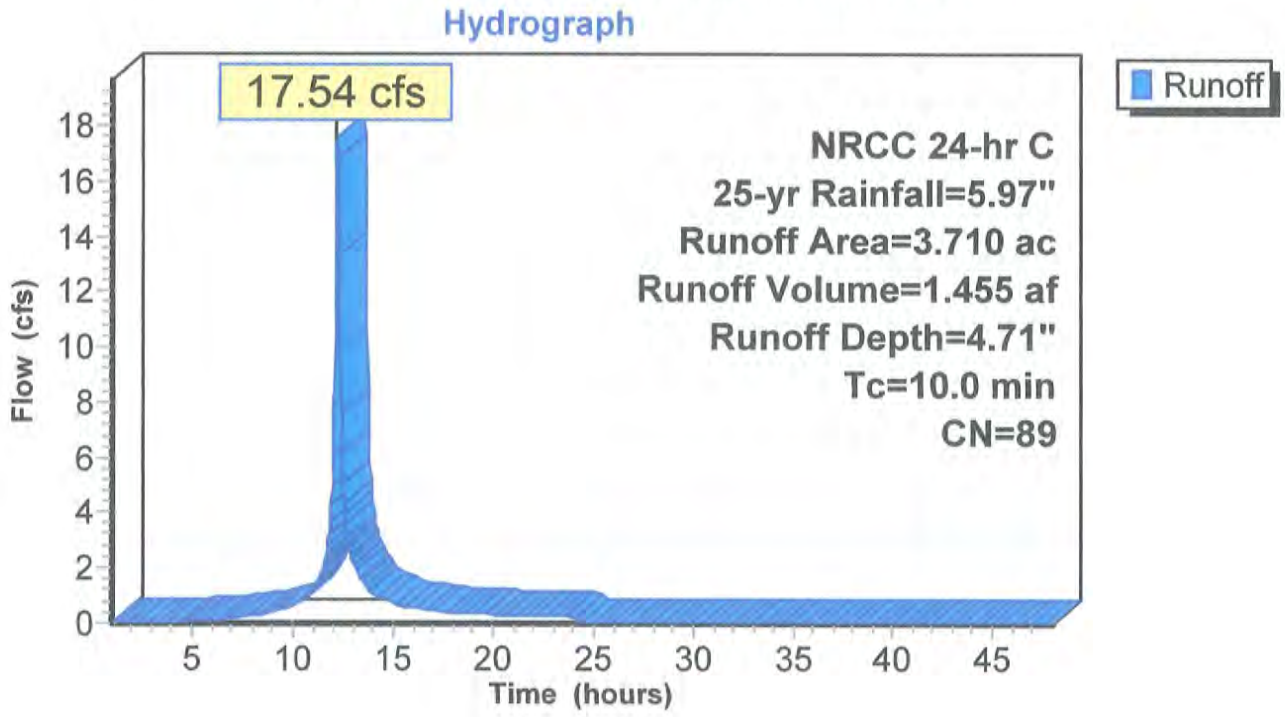
Runoff = 17.54 cfs @ 12.17 hrs, Volume= 1.455 af, Depth= 4.71"
Routed to Pond 4P : SWMB

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 25-yr Rainfall=5.97"

Area (ac)	CN	Description
2.180	98	Paved parking, HSG B
0.930	61	>75% Grass cover, Good, HSG B
0.600	98	Roofs, HSG B
3.710	89	Weighted Average
0.930		25.07% Pervious Area
2.780		74.93% Impervious Area

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

Subcatchment 5S: Discharge Area to SWMB



Summary for Pond 4P: SWMB

Inflow Area = 3.710 ac, 74.93% Impervious, Inflow Depth = 4.71" for 25-yr event
Inflow = 17.54 cfs @ 12.17 hrs, Volume= 1.455 af
Outflow = 16.23 cfs @ 12.21 hrs, Volume= 1.321 af, Atten= 7%, Lag= 2.5 min
Primary = 16.23 cfs @ 12.21 hrs, Volume= 1.321 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 29.97' @ 12.21 hrs Surf.Area= 5,423 sf Storage= 12,653 cf

Plug-Flow detention time= 115.0 min calculated for 1.320 af (91% of inflow)
Center-of-Mass det. time= 67.7 min (865.2 - 797.4)

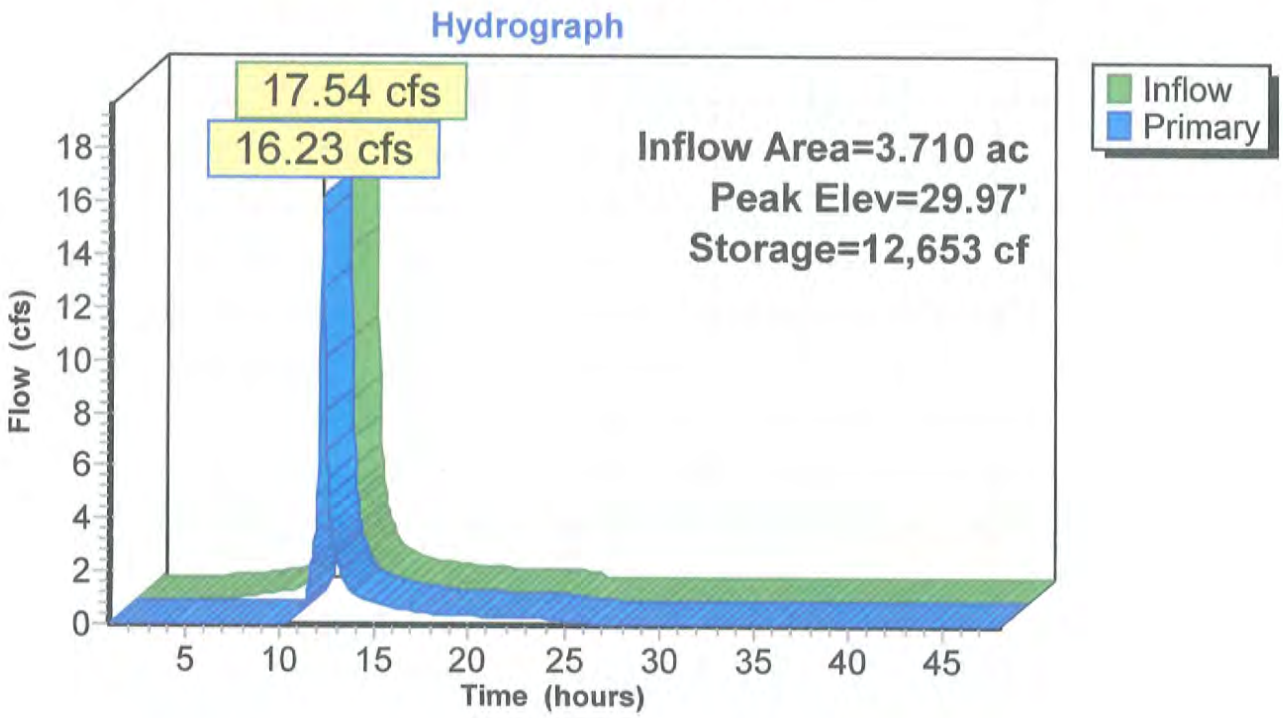
Volume	Invert	Avail.Storage	Storage Description
#1	27.00'	18,710 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
27.00	2,800	0	0
27.50	3,220	1,505	1,505
28.00	3,880	1,775	3,280
28.50	4,440	2,080	5,360
29.00	4,800	2,310	7,670
29.50	5,120	2,480	10,150
30.00	5,440	2,640	12,790
30.50	5,920	2,840	15,630
31.00	6,400	3,080	18,710

Device	Routing	Invert	Outlet Devices
#1	Primary	28.60'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.70 0.70 2.00 2.00 3.00 Width (feet) 0.50 0.50 8.00 8.00 12.00 12.00

Primary OutFlow Max=15.94 cfs @ 12.21 hrs HW=29.97' (Free Discharge)
↑—**1=Custom Weir/Orifice** (Weir Controls 15.94 cfs @ 2.81 fps)

Pond 4P: SWMB


Hydrograph
17.54 cfs
16.23 cfs
Inflow Area=3.710 ac
Peak Elev=29.97'
Storage=12,653 cf
Inflow
Primary
Flow (cfs)
0
2
4
6
8
10
12
14
16
18
5
10
15
20
25
30
35
40
45
Time (hours)

Summary for Subcatchment 1S: Pre - Developed to POA

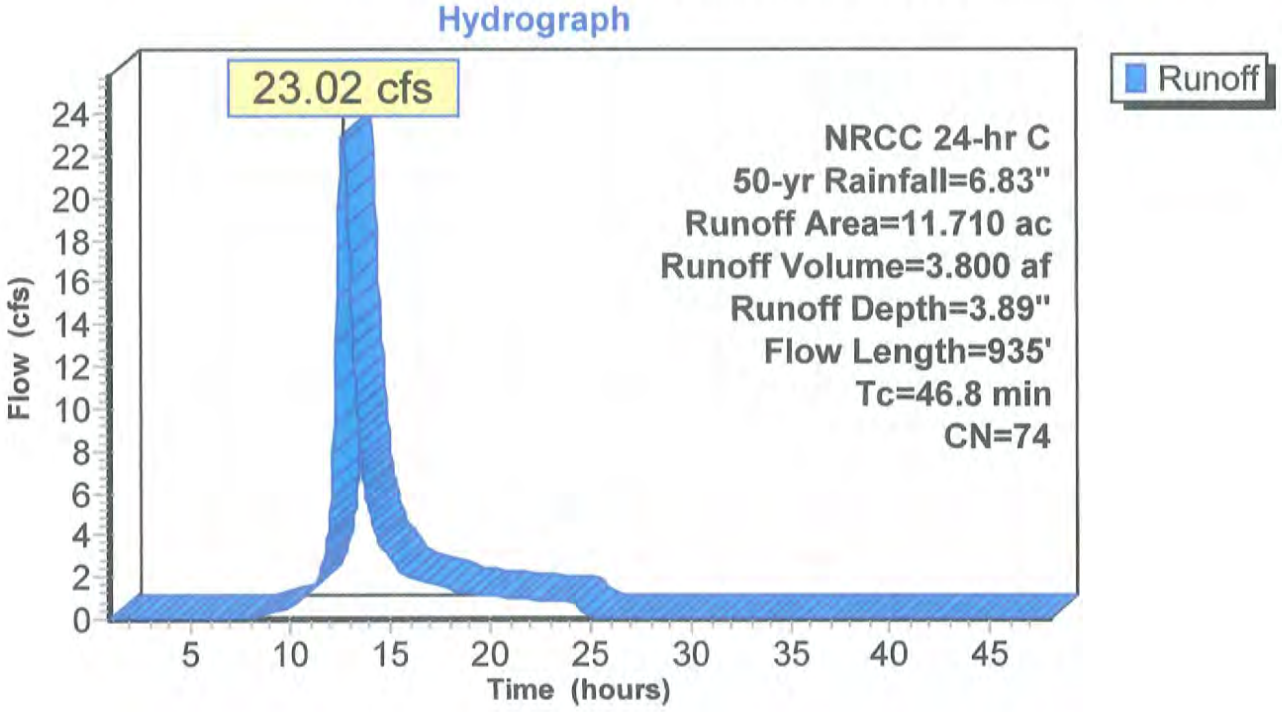
Runoff = 23.02 cfs @ 12.64 hrs, Volume= 3.800 af, Depth= 3.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 50-yr Rainfall=6.83"

Area (ac)	CN	Description
2.280	98	Paved parking, HSG B
0.440	98	Roofs, HSG B
4.710	66	Woods, Poor, HSG B
1.880	61	>75% Grass cover, Good, HSG B
0.850	67	Brush, Poor, HSG B
1.160	77	Woods, Poor, HSG C
0.390	77	Brush, Poor, HSG C
11.710	74	Weighted Average
8.990		76.77% Pervious Area
2.720		23.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	150	0.0200	1.46		**Sheet Flow, Sheet flow over paved area** Smooth surfaces n= 0.011 P2= 3.07"
0.8	150	0.0260	3.27		**Shallow Concentrated Flow, Shallow Concentrated Flow over pa** Paved Kv= 20.3 fps
0.2	25	0.1600	2.00		**Shallow Concentrated Flow, Shallow concentrated flow** Woodland Kv= 5.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, Shallow Conc - Knotweed** Woodland Kv= 5.0 fps
38.7	410	0.0050	0.18		**Shallow Concentrated Flow, Shallow Conc - Dense woods** Forest w/Heavy Litter Kv= 2.5 fps
46.8	935	Total			

Subcatchment 1S: Pre - Developed to POA



Summary for Subcatchment 2S: Post - Developed to POA

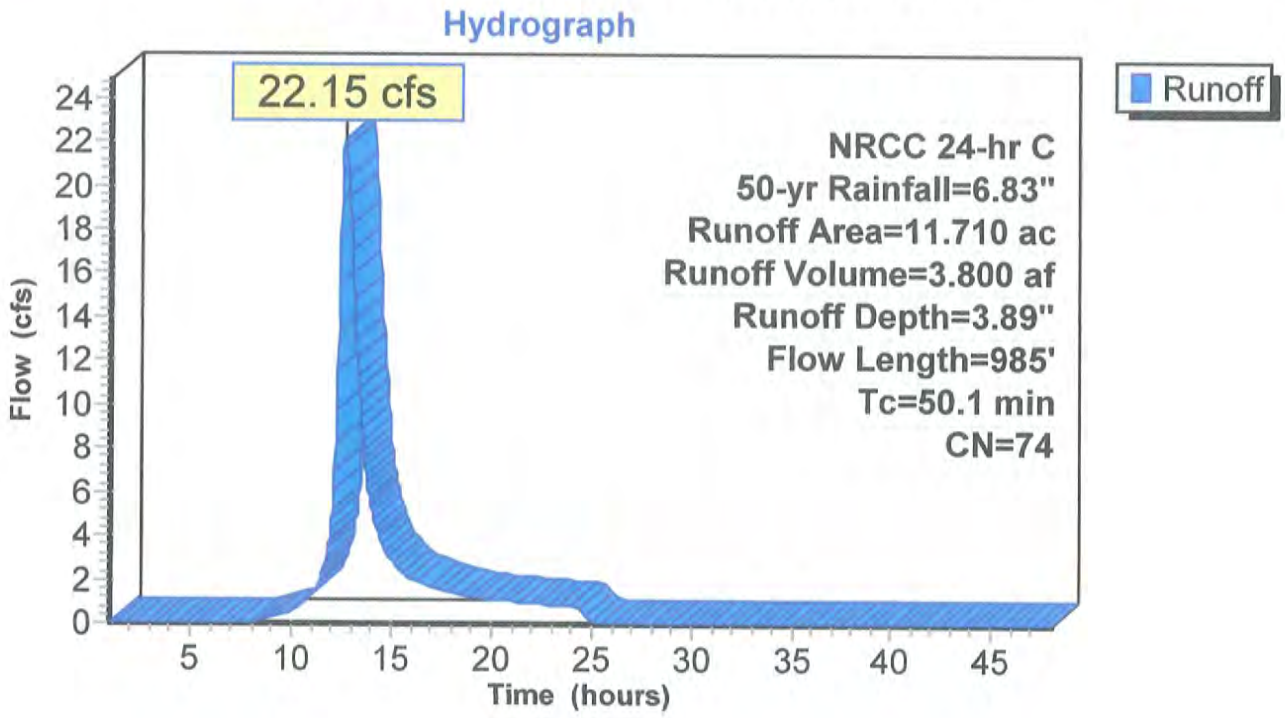
Runoff = 22.15 cfs @ 12.68 hrs, Volume= 3.800 af, Depth= 3.89"
Routed to nonexistent node 3P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 50-yr Rainfall=6.83"

Area (ac)	CN	Description
2.270	98	Paved parking, HSG B
2.700	61	>75% Grass cover, Good, HSG B
4.640	66	Woods, Poor, HSG B
1.500	77	Woods, Poor, HSG C
0.600	98	Roofs, HSG B
11.710	74	Weighted Average
8.840		75.49% Pervious Area
2.870		24.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	150	0.0200	1.46		**Sheet Flow, Sheet Flow over pavement** Smooth surfaces n= 0.011 P2= 3.07"
1.0	220	0.0300	3.52		**Shallow Concentrated Flow, Shallow Concentrated Flow over pa** Paved Kv= 20.3 fps
0.1	43	0.0100	5.70	7.00	**Pipe Channel, 15" HDCPE** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Corrugated PP, smooth interior
0.2	72	0.0100	7.80	24.51	**Pipe Channel, 24" HDCPE** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Corrugated PP, smooth interior
47.1	500	0.0050	0.18		**Shallow Concentrated Flow, Shallow Concentrated Heavy woods** Forest w/Heavy Litter Kv= 2.5 fps
50.1	985	Total			

Subcatchment 2S: Post - Developed to POA



Summary for Subcatchment 5S: Discharge Area to SWMB

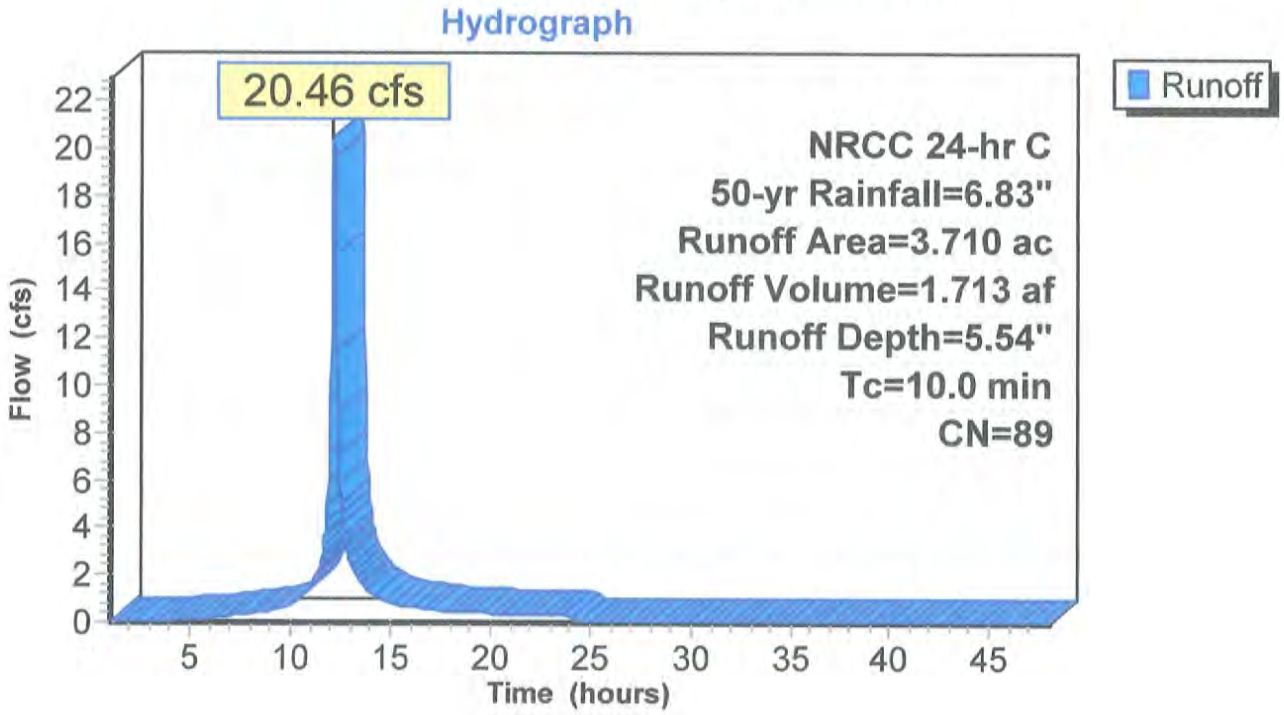
Runoff = 20.46 cfs @ 12.17 hrs, Volume= 1.713 af, Depth= 5.54"
Routed to Pond 4P : SWMB

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 50-yr Rainfall=6.83"

Area (ac)	CN	Description
2.180	98	Paved parking, HSG B
0.930	61	>75% Grass cover, Good, HSG B
0.600	98	Roofs, HSG B
3.710	89	Weighted Average
0.930		25.07% Pervious Area
2.780		74.93% Impervious Area

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

Subcatchment 5S: Discharge Area to SWMB



Summary for Pond 4P: SWMB

Inflow Area = 3.710 ac, 74.93% Impervious, Inflow Depth = 5.54" for 50-yr event
Inflow = 20.46 cfs @ 12.17 hrs, Volume= 1.713 af
Outflow = 18.98 cfs @ 12.21 hrs, Volume= 1.580 af, Atten= 7%, Lag= 2.5 min
Primary = 18.98 cfs @ 12.21 hrs, Volume= 1.580 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 30.05' @ 12.21 hrs Surf.Area= 5,493 sf Storage= 13,101 cf

Plug-Flow detention time= 104.5 min calculated for 1.578 af (92% of inflow)
Center-of-Mass det. time= 63.0 min (855.5 - 792.5)

Volume	Invert	Avail.Storage	Storage Description
#1	27.00'	18,710 cf	**Custom Stage Data (Prismatic)** Listed below

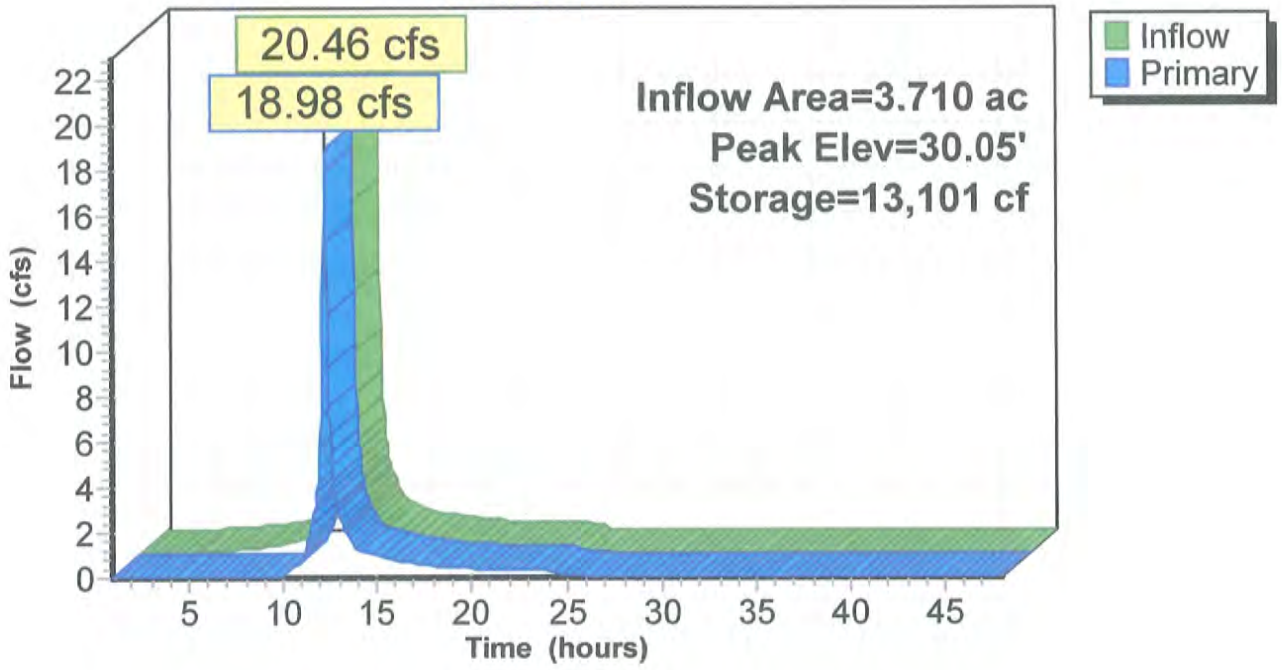
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
27.00	2,800	0	0
27.50	3,220	1,505	1,505
28.00	3,880	1,775	3,280
28.50	4,440	2,080	5,360
29.00	4,800	2,310	7,670
29.50	5,120	2,480	10,150
30.00	5,440	2,640	12,790
30.50	5,920	2,840	15,630
31.00	6,400	3,080	18,710

Device	Routing	Invert	Outlet Devices
#1	Primary	28.60'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.70 0.70 2.00 2.00 3.00 Width (feet) 0.50 0.50 8.00 8.00 12.00 12.00

Primary OutFlow Max=18.68 cfs @ 12.21 hrs HW=30.05' (Free Discharge)
↑**1=Custom Weir/Orifice** (Weir Controls 18.68 cfs @ 2.96 fps)

Pond 4P: SWMB

Hydrograph



Summary for Subcatchment 1S: Pre - Developed to POA

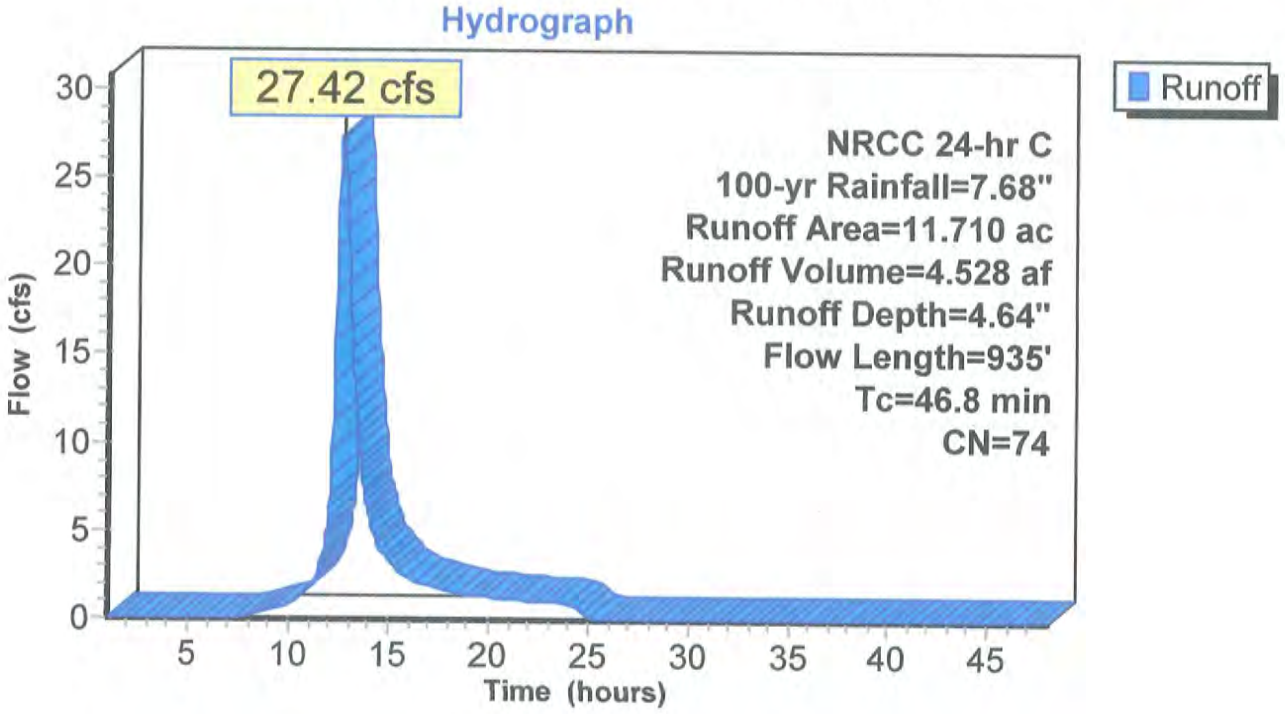
Runoff = 27.42 cfs @ 12.64 hrs, Volume= 4.528 af, Depth= 4.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-yr Rainfall=7.68"

Area (ac)	CN	Description
2.280	98	Paved parking, HSG B
0.440	98	Roofs, HSG B
4.710	66	Woods, Poor, HSG B
1.880	61	>75% Grass cover, Good, HSG B
0.850	67	Brush, Poor, HSG B
1.160	77	Woods, Poor, HSG C
0.390	77	Brush, Poor, HSG C
11.710	74	Weighted Average
8.990		76.77% Pervious Area
2.720		23.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	150	0.0200	1.46		**Sheet Flow, Sheet flow over paved area** Smooth surfaces n= 0.011 P2= 3.07"
0.8	150	0.0260	3.27		**Shallow Concentrated Flow, Shallow Concentrated Flow over pa** Paved Kv= 20.3 fps
0.2	25	0.1600	2.00		**Shallow Concentrated Flow, Shallow concentrated flow** Woodland Kv= 5.0 fps
5.4	200	0.0150	0.61		**Shallow Concentrated Flow, Shallow Conc - Knotweed** Woodland Kv= 5.0 fps
38.7	410	0.0050	0.18		**Shallow Concentrated Flow, Shallow Conc - Dense woods** Forest w/Heavy Litter Kv= 2.5 fps
46.8	935	Total			

Subcatchment 1S: Pre - Developed to POA



Summary for Subcatchment 2S: Post - Developed to POA

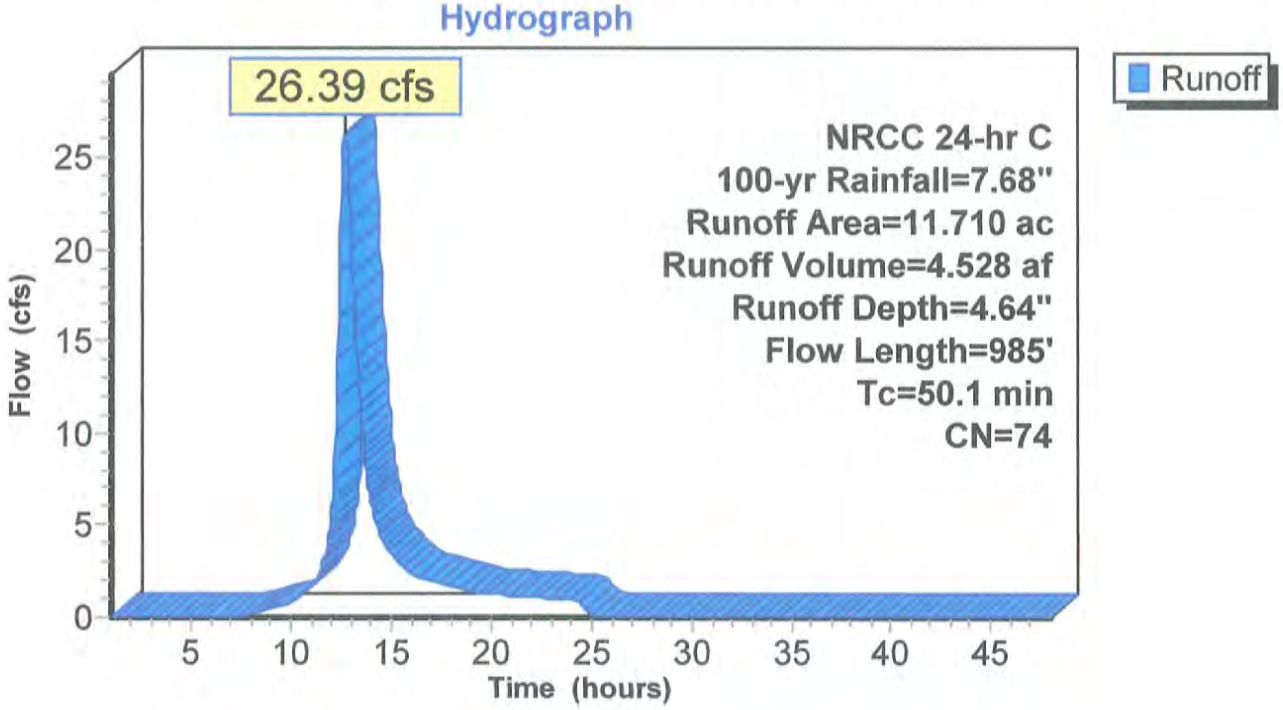
Runoff = 26.39 cfs @ 12.68 hrs, Volume= 4.528 af, Depth= 4.64"
Routed to nonexistent node 3P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-yr Rainfall=7.68"

Area (ac)	CN	Description
2.270	98	Paved parking, HSG B
2.700	61	>75% Grass cover, Good, HSG B
4.640	66	Woods, Poor, HSG B
1.500	77	Woods, Poor, HSG C
0.600	98	Roofs, HSG B
11.710	74	Weighted Average
8.840		75.49% Pervious Area
2.870		24.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	150	0.0200	1.46		**Sheet Flow, Sheet Flow over pavement** Smooth surfaces n= 0.011 P2= 3.07"
1.0	220	0.0300	3.52		**Shallow Concentrated Flow, Shallow Concentrated Flow over pa** Paved Kv= 20.3 fps
0.1	43	0.0100	5.70	7.00	**Pipe Channel, 15" HDCPE** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Corrugated PP, smooth interior
0.2	72	0.0100	7.80	24.51	**Pipe Channel, 24" HDCPE** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Corrugated PP, smooth interior
47.1	500	0.0050	0.18		**Shallow Concentrated Flow, Shallow Concentrated Heavy woods** Forest w/Heavy Litter Kv= 2.5 fps
50.1	985	Total			

Subcatchment 2S: Post - Developed to POA



Summary for Subcatchment 5S: Discharge Area to SWMB

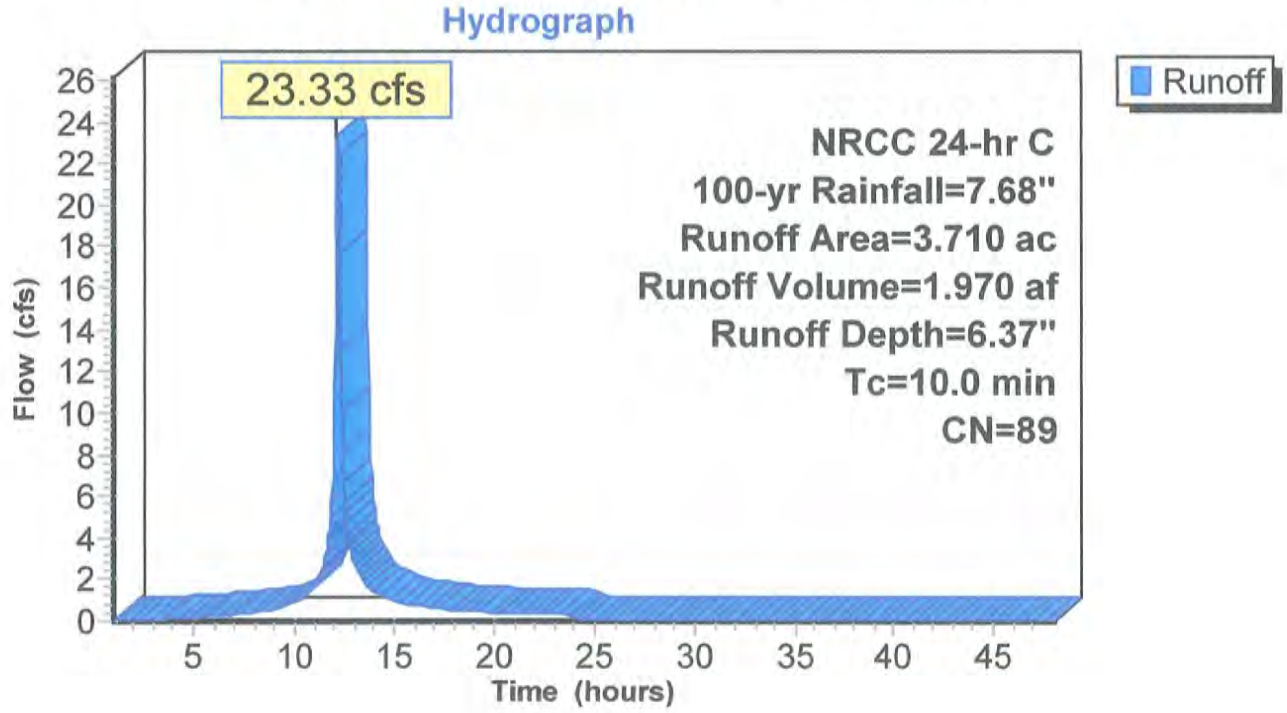
Runoff = 23.33 cfs @ 12.17 hrs, Volume= 1.970 af, Depth= 6.37"
Routed to Pond 4P : SWMB

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-yr Rainfall=7.68"

Area (ac)	CN	Description
2.180	98	Paved parking, HSG B
0.930	61	>75% Grass cover, Good, HSG B
0.600	98	Roofs, HSG B
3.710	89	Weighted Average
0.930		25.07% Pervious Area
2.780		74.93% Impervious Area

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

Subcatchment 5S: Discharge Area to SWMB



Summary for Pond 4P: SWMB

Inflow Area = 3.710 ac, 74.93% Impervious, Inflow Depth = 6.37" for 100-yr event
Inflow = 23.33 cfs @ 12.17 hrs, Volume= 1.970 af
Outflow = 21.71 cfs @ 12.21 hrs, Volume= 1.836 af, Atten= 7%, Lag= 2.4 min
Primary = 21.71 cfs @ 12.21 hrs, Volume= 1.836 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 30.13' @ 12.21 hrs Surf.Area= 5,566 sf Storage= 13,535 cf

Plug-Flow detention time= 96.3 min calculated for 1.835 af (93% of inflow)
Center-of-Mass det. time= 59.2 min (847.7 - 788.5)

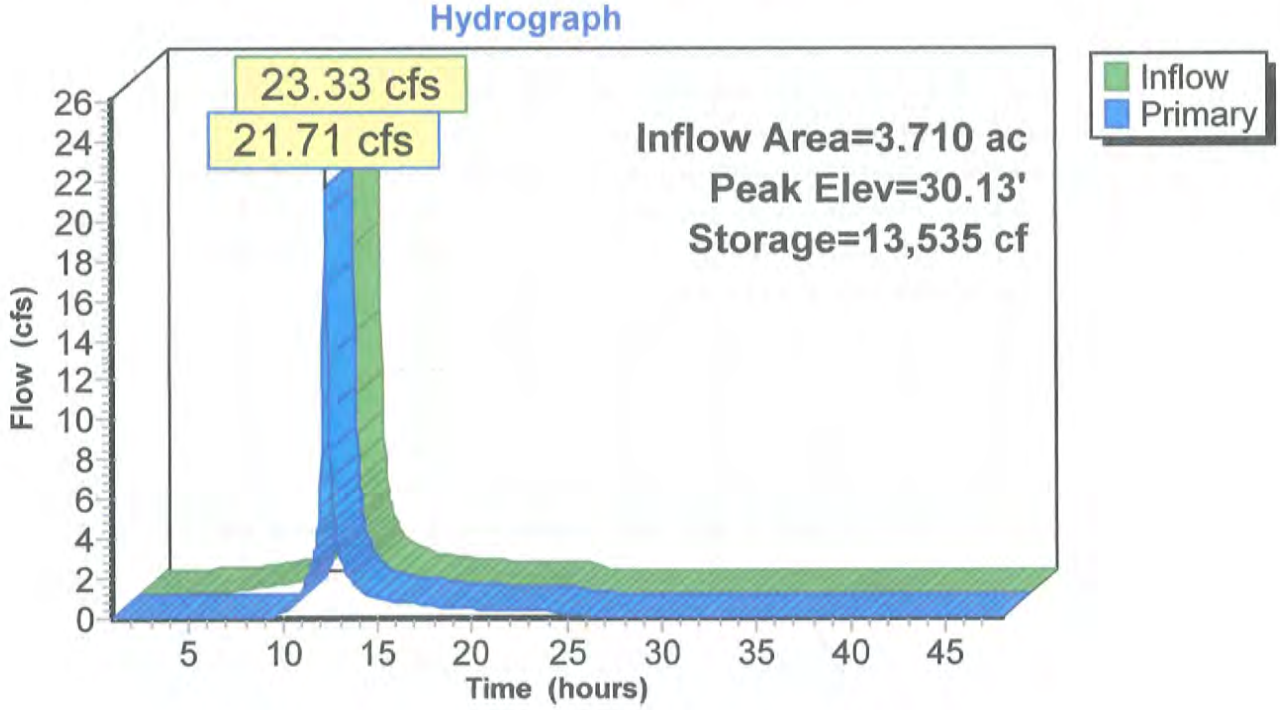
Volume	Invert	Avail.Storage	Storage Description
#1	27.00'	18,710 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
27.00	2,800	0	0
27.50	3,220	1,505	1,505
28.00	3,880	1,775	3,280
28.50	4,440	2,080	5,360
29.00	4,800	2,310	7,670
29.50	5,120	2,480	10,150
30.00	5,440	2,640	12,790
30.50	5,920	2,840	15,630
31.00	6,400	3,080	18,710

Device	Routing	Invert	Outlet Devices
#1	Primary	28.60'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.70 0.70 2.00 2.00 3.00 Width (feet) 0.50 0.50 8.00 8.00 12.00 12.00

Primary OutFlow Max=21.39 cfs @ 12.21 hrs HW=30.12' (Free Discharge)
↑—**1=Custom Weir/Orifice** (Weir Controls 21.39 cfs @ 3.09 fps)

Pond 4P: SWMB


Hydrograph
23.33 cfs
21.71 cfs
Inflow Area=3.710 ac
Peak Elev=30.13'
Storage=13,535 cf
Inflow
Primary
Flow (cfs)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
5
10
15
20
25
30
35
40
45
Time (hours)

Saint Paul Church
Main Street
Parking Lot Expansion
Glastonbury, CT

APPENDIX D

RUNOFF AND VOLUME CALCULATIONS
RATIONAL METHOD

Saint Paul Church
Main Street
Parking Lot Expansion
Glastonbury, CT

DRAINAGE AREAS

DA 1
Total Area = 0.56
Impervious Area = 0.48
Grass Area = 0.08
Weighted Cimp = $\frac{(0.48)(0.90) + (0.08)(0.3)}{0.56} = 0.81$
Tc = 5 min AI = (0.56)(0.81) = **0.45**

DA 3
Total Area = 0.06
Impervious Area = 0.04
Grass Area = 0.02
Weighted Cimp = $\frac{(0.04)(0.90) + (0.02)(0.3)}{0.06} = 0.70$
Tc = 5 min AI = (0.06)(0.70) = **0.04**

DA 5
Total Area = 0.38
Impervious Area = 0.24
Grass Area = 0.14
Weighted Cimp = $\frac{(0.24)(0.90) + (0.14)(0.3)}{0.38} = 0.68$
Tc = 5 min AI = (0.38)(0.68) = **0.26**

DA 6
Total Area = 0.87
Impervious Area = 0.60
Grass Area = 0.27
Weighted Cimp = $\frac{(0.60)(0.90) + (0.27)(0.3)}{0.87} = 0.71$
Tc = 5 min AI = (0.87)(0.71) = **0.62**

Saint Paul Church
Main Street
Parking Lot Expansion
Glastonbury, CT

DRAINAGE AREAS

DA B
Total Area = 0.50
Impervious Area = 0.33
Grass Area = 0.17
Weighted Cimp = $\frac{(0.33)(0.90) + (0.17)(0.3)}{0.50} = 0.70$
Tc = 5 min AI = (0.50)(0.70) = **0.35**

DA 9
Total Area = 0.05
Impervious Area = 0.04
Grass Area = 0.01
Weighted Cimp = $\frac{(0.04)(0.90) + (0.01)(0.3)}{0.05} = 0.78$
Tc = 5 min AI = (0.05)(0.78) = **0.04**

DA 10
Total Area = 0.08
Impervious Area = 0.07
Grass Area = 0.01
Weighted Cimp = $\frac{(0.07)(0.90) + (0.01)(0.3)}{0.08} = 0.83$
Tc = 5 min AI = (0.08)(0.83) = **0.07**

DA 11
Total Area = 0.32
Impervious Area = 0.20
Grass Area = 0.12
Weighted Cimp = $\frac{(0.20)(0.90) + (0.12)(0.3)}{0.32} = 0.68$
Tc = 5 min AI = (0.32)(0.68) = **0.22**

Saint Paul Church
Main Street
Parking Lot Expansion
Glastonbury, CT

DRAINAGE AREAS

DA 12
Total Area = 0.09
Impervious Area = 0.03
Grass Area = 0.06
Weighted Cimp = $\frac{(0.03)(0.90) + (0.06)(0.3)}{0.09} = 0.50$
Tc = 5 min AI = (0.09)(0.50) = **0.05**

DA 13
Total Area = 0.15
Impervious Area = 0.12
Grass Area = 0.03
Weighted Cimp = $\frac{(0.12)(0.90) + (0.03)(0.3)}{0.15} = 0.78$
Tc = 5 min AI = (0.15)(0.78) = **0.12**

DA YD 1
Total Area = 0.02
Impervious Area = 0.01
Grass Area = 0.01
Weighted Cimp = $\frac{(0.01)(0.90) + (0.01)(0.3)}{0.02} = 0.60$
Tc = 5 min AI = (0.02)(0.6) = **0.01**

DA YD 2
Total Area = 0.03
Impervious Area = 0.02
Grass Area = 0.01
Weighted Cimp = $\frac{(0.02)(0.90) + (0.01)(0.3)}{0.03} = 0.70$
Tc = 5 min AI = (0.03)(0.70) = **0.02**

STMH 8
Total Area from roof drains = 0.55
Tc = 6 min AI = (0.9)(0.55) = 0.50

MEGSON, HEAGLE & FRIEND
Civil Engineers & Land Surveyors, LLC
81 Rankin Road
Glastonbury, Connecticut 06033
(860) 659-0587

JOB 86-16 ST PAULS CHURCH
SHEET NO. _____ OF _____
CALCULATED BY MWF DATE 11-29-22
CHECKED BY _____ DATE _____
SCALE _____

RUNOFFS TO FINAL CATCHMENTS
FROM 10 YR FREQUENCY STORM

RAINFALL INTENSITY FOR 10 YR STORM
(NOAA ATLAS 14 - VOL 10, V 3)

5 MIN = 7.4 6 MIN = 7.0 7 MIN = 6.6

Q_{10} TO CB 1 = (0.45)(7.4) = 3.33 CFS
Q_{10} TO CB 3 = (0.04)(7.4) = 0.29 CFS
Q_{10} TO CB 5 = (0.26)(7.0) = 1.82 CFS
Q_{10} TO CB 6 = (0.62)(6.6) = 4.09 CFS
Q_{10} TO YD 1 = (0.01)(7.4) = 0.07 CFS
Q_{10} TO YD 2 = (0.02)(7.4) = 0.15 CFS
Q_{10} TO SMH 8 = (0.50)(7.0) = 3.50 CFS FROM ROOF DRAINS
Q_{10} TO CB 9 = (0.04)(7.4) = 0.30 CFS
Q_{10} TO CB 10 = (0.07)(7.4) = 0.52 CFS
Q_{10} TO CB 11 = (0.22)(7.4) = 1.63 CFS
Q_{10} TO CB 12 = (0.05)(7.4) = 0.37 CFS
Q_{10} TO CB 13 = (0.12)(7.4) = 0.89 CFS

Saint Paul Church
Main Street
Parking Lot Expansion
Glastonbury, CT

APPENDIX E

GLATONBURY/HARTFORD, CT
NOAA ATLAS 14 PRECIPITATION ESTIMATES

NOAA Atlas 14, Volume 10, Version 2
Location name: Glastonbury Town of, Connecticut, USA*
Latitude: 41.7208°, Longitude: -72.6166°
Elevation: 28.37 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_&_aerials

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	0.331 (0.264-0.414)	0.404 (0.321-0.505)	0.522 (0.414-0.656)	0.621 (0.489-0.785)	0.757 (0.575-1.00)	0.861 (0.639-1.17)	0.966 (0.694-1.37)	1.10 (0.743-1.59)	1.27 (0.824-1.91)	1.40 (0.885-2.15)
10-min	0.469 (0.374-0.586)	0.572 (0.455-0.715)	0.740 (0.587-0.929)	0.880 (0.693-1.11)	1.07 (0.814-1.42)	1.22 (0.906-1.66)	1.37 (0.983-1.93)	1.55 (1.05-2.25)	1.80 (1.17-2.71)	1.98 (1.25-3.05)
15-min	0.552 (0.440-0.689)	0.673 (0.535-0.842)	0.871 (0.690-1.09)	1.03 (0.815-1.31)	1.26 (0.958-1.67)	1.44 (1.07-1.95)	1.61 (1.16-2.27)	1.83 (1.24-2.65)	2.11 (1.37-3.18)	2.33 (1.48-3.59)
30-min	0.741 (0.591-0.926)	0.904 (0.719-1.13)	1.17 (0.928-1.47)	1.39 (1.10-1.76)	1.70 (1.29-2.25)	1.93 (1.43-2.62)	2.17 (1.56-3.06)	2.46 (1.67-3.56)	2.84 (1.85-4.28)	3.14 (1.98-4.83)
60-min	0.931 (0.742-1.16)	1.14 (0.904-1.42)	1.47 (1.17-1.85)	1.75 (1.38-2.21)	2.13 (1.62-2.83)	2.43 (1.80-3.29)	2.72 (1.96-3.84)	3.09 (2.09-4.48)	3.57 (2.32-5.38)	3.94 (2.49-6.06)
2-hr	1.22 (0.976-1.51)	1.48 (1.18-1.83)	1.90 (1.51-2.37)	2.25 (1.78-2.82)	2.73 (2.09-3.61)	3.10 (2.32-4.20)	3.48 (2.52-4.91)	3.99 (2.71-5.74)	4.66 (3.03-6.97)	5.17 (3.28-7.90)
3-hr	1.41 (1.13-1.74)	1.70 (1.37-2.11)	2.19 (1.75-2.72)	2.59 (2.06-3.24)	3.14 (2.41-4.14)	3.57 (2.68-4.82)	3.99 (2.92-5.64)	4.60 (3.14-6.61)	5.40 (3.53-8.06)	6.01 (3.82-9.15)
6-hr	1.76 (1.42-2.16)	2.13 (1.72-2.62)	2.74 (2.21-3.39)	3.25 (2.60-4.04)	3.95 (3.06-5.18)	4.49 (3.40-6.04)	5.03 (3.70-7.08)	5.82 (3.98-8.31)	6.87 (4.50-10.2)	7.67 (4.89-11.6)
12-hr	2.13 (1.73-2.60)	2.60 (2.12-3.18)	3.37 (2.73-4.14)	4.01 (3.22-4.96)	4.90 (3.91-6.28)	5.58 (4.35-7.46)	6.26 (4.83-8.77)	7.28 (4.99-10.3)	8.62 (5.66-12.7)	9.64 (6.17-14.5)
24-hr	2.48 (2.03-3.01)	3.08 (2.52-3.74)	4.05 (3.30-4.94)	4.86 (3.94-5.96)	5.97 (4.68-7.75)	6.83 (5.24-9.11)	7.68 (5.74-10.8)	9.04 (6.23-12.7)	10.8 (7.14-15.9)	12.2 (7.83-18.2)
2-day	2.82 (2.33-3.40)	3.56 (2.93-4.29)	4.70 (3.91-5.76)	5.73 (4.69-7.01)	7.15 (5.63-9.23)	8.16 (6.34-10.9)	9.24 (6.99-13.0)	11.1 (7.65-15.5)	13.5 (8.92-19.6)	15.3 (9.88-22.7)
3-day	3.07 (2.55-3.69)	3.88 (3.21-4.66)	5.20 (4.29-6.28)	6.30 (5.18-7.65)	7.81 (6.20-10.1)	8.97 (6.98-11.9)	10.1 (7.70-14.2)	12.2 (8.44-17.0)	14.9 (9.88-21.6)	17.0 (11.0-25.1)
4-day	3.28 (2.73-3.93)	4.14 (3.44-4.97)	5.55 (4.58-6.67)	6.71 (5.51-8.12)	8.31 (6.61-10.7)	9.55 (7.45-12.7)	10.8 (8.21-15.1)	13.0 (9.00-18.1)	15.9 (10.5-22.9)	18.1 (11.7-26.6)
7-day	3.86 (3.22-4.59)	4.80 (4.01-5.73)	6.36 (5.28-7.61)	7.65 (6.31-9.21)	9.43 (7.52-12.1)	10.8 (8.44-14.2)	12.2 (9.26-16.9)	14.5 (10.1-20.1)	17.6 (11.7-25.3)	20.0 (12.9-29.3)
10-day	4.44 (3.72-5.27)	5.44 (4.56-6.47)	7.08 (5.90-8.44)	8.43 (6.98-10.1)	10.3 (8.23-13.1)	11.7 (9.18-15.3)	13.2 (10.0-18.1)	15.5 (10.8-21.4)	18.7 (12.4-26.7)	21.0 (13.6-30.7)
20-day	6.38 (5.39-7.52)	7.44 (6.27-8.78)	9.17 (7.70-10.9)	10.6 (8.84-12.6)	12.6 (10.1-15.7)	14.1 (11.0-18.1)	15.6 (11.8-20.9)	17.8 (12.5-24.3)	20.6 (13.8-29.2)	22.8 (14.8-33.0)
30-day	8.06 (6.83-9.47)	9.15 (7.74-10.8)	10.9 (9.20-12.9)	12.4 (10.4-14.7)	14.4 (11.6-17.9)	16.0 (12.5-20.3)	17.6 (13.2-23.2)	19.5 (13.7-26.5)	22.0 (14.8-31.1)	24.0 (15.6-34.6)
45-day	10.2 (8.66-11.9)	11.3 (9.60-13.2)	13.1 (11.1-15.5)	14.7 (12.3-17.4)	16.8 (13.5-20.6)	18.4 (14.4-23.1)	20.0 (15.0-26.0)	21.7 (15.4-29.3)	23.9 (16.1-33.6)	25.6 (16.7-36.8)
60-day	12.0 (10.2-13.9)	13.1 (11.2-15.3)	15.0 (12.8-17.6)	16.6 (14.0-19.6)	18.8 (15.1-23.0)	20.5 (16.0-25.6)	22.2 (16.5-28.6)	23.7 (16.8-31.8)	25.7 (17.4-35.8)	27.2 (17.8-38.9)

[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

NOAA Atlas 14, Volume 10, Version 3
Location name: Hartford, Connecticut, USA*
Latitude: 41.7333°, Longitude: -72.65°
Elevation: 11.11 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_&_aerials

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	3.97 (3.18-4.96)	4.85 (3.86-6.05)	6.26 (4.98-7.86)	7.44 (5.88-9.38)	9.06 (6.90-12.0)	10.3 (7.64-14.0)	11.6 (8.32-16.3)	13.0 (8.81-18.8)	15.0 (9.78-22.7)	16.7 (10.6-25.8)
10-min	2.81 (2.25-3.51)	3.43 (2.74-4.28)	4.44 (3.53-5.57)	5.27 (4.17-6.65)	6.42 (4.89-8.50)	7.28 (5.42-9.88)	8.19 (5.89-11.6)	9.20 (6.25-13.4)	10.7 (6.92-16.1)	11.8 (7.50-18.3)
15-min	2.21 (1.76-2.75)	2.69 (2.15-3.36)	3.48 (2.77-4.36)	4.14 (3.27-5.22)	5.04 (3.84-6.67)	5.72 (4.25-7.75)	6.42 (4.62-9.07)	7.22 (4.90-10.5)	8.36 (5.43-12.6)	9.29 (5.88-14.3)
30-min	1.48 (1.19-1.85)	1.81 (1.44-2.26)	2.34 (1.86-2.93)	2.78 (2.20-3.51)	3.39 (2.58-4.49)	3.85 (2.86-5.22)	4.32 (3.11-6.11)	4.86 (3.30-7.05)	5.63 (3.66-8.49)	6.26 (3.96-9.65)
60-min	0.931 (0.744-1.16)	1.14 (0.907-1.42)	1.47 (1.17-1.84)	1.75 (1.38-2.20)	2.13 (1.62-2.82)	2.42 (1.80-3.28)	2.72 (1.96-3.84)	3.06 (2.07-4.43)	3.54 (2.30-5.34)	3.93 (2.49-6.07)
2-hr	0.608 (0.490-0.754)	0.738 (0.593-0.915)	0.949 (0.760-1.18)	1.12 (0.894-1.41)	1.37 (1.05-1.80)	1.55 (1.16-2.09)	1.74 (1.26-2.46)	1.97 (1.34-2.83)	2.30 (1.50-3.45)	2.58 (1.64-3.96)
3-hr	0.468 (0.378-0.577)	0.567 (0.457-0.700)	0.728 (0.585-0.903)	0.862 (0.688-1.08)	1.05 (0.807-1.38)	1.18 (0.893-1.60)	1.33 (0.974-1.88)	1.51 (1.03-2.17)	1.78 (1.16-2.65)	2.01 (1.27-3.06)
6-hr	0.293 (0.238-0.359)	0.356 (0.289-0.437)	0.458 (0.371-0.565)	0.543 (0.437-0.674)	0.661 (0.513-0.865)	0.747 (0.567-1.00)	0.841 (0.620-1.19)	0.956 (0.655-1.37)	1.13 (0.742-1.68)	1.29 (0.820-1.95)
12-hr	0.176 (0.144-0.214)	0.215 (0.176-0.263)	0.280 (0.228-0.343)	0.334 (0.270-0.411)	0.408 (0.318-0.531)	0.462 (0.353-0.618)	0.521 (0.386-0.731)	0.595 (0.408-0.844)	0.708 (0.465-1.04)	0.805 (0.515-1.21)
24-hr	0.103 (0.085-0.124)	0.128 (0.105-0.155)	0.169 (0.138-0.205)	0.203 (0.165-0.248)	0.250 (0.196-0.324)	0.284 (0.219-0.379)	0.322 (0.241-0.451)	0.370 (0.255-0.522)	0.447 (0.294-0.655)	0.514 (0.330-0.769)
2-day	0.058 (0.048-0.070)	0.074 (0.061-0.089)	0.099 (0.082-0.120)	0.120 (0.098-0.146)	0.149 (0.118-0.193)	0.170 (0.132-0.227)	0.194 (0.147-0.273)	0.225 (0.156-0.316)	0.277 (0.183-0.404)	0.324 (0.209-0.482)
3-day	0.042 (0.035-0.051)	0.054 (0.045-0.064)	0.072 (0.060-0.087)	0.088 (0.072-0.106)	0.109 (0.087-0.141)	0.124 (0.097-0.166)	0.142 (0.108-0.199)	0.165 (0.114-0.231)	0.205 (0.135-0.297)	0.240 (0.155-0.355)
4-day	0.034 (0.028-0.041)	0.043 (0.036-0.051)	0.058 (0.048-0.069)	0.070 (0.058-0.085)	0.087 (0.069-0.112)	0.099 (0.078-0.132)	0.113 (0.086-0.159)	0.132 (0.091-0.184)	0.163 (0.108-0.236)	0.191 (0.124-0.283)
7-day	0.023 (0.019-0.027)	0.029 (0.024-0.034)	0.038 (0.032-0.045)	0.046 (0.038-0.055)	0.056 (0.045-0.072)	0.064 (0.050-0.084)	0.073 (0.056-0.101)	0.085 (0.059-0.117)	0.104 (0.069-0.149)	0.121 (0.078-0.177)
10-day	0.018 (0.016-0.022)	0.023 (0.019-0.027)	0.030 (0.025-0.035)	0.035 (0.029-0.042)	0.043 (0.035-0.055)	0.049 (0.038-0.064)	0.055 (0.042-0.076)	0.064 (0.044-0.088)	0.077 (0.051-0.110)	0.089 (0.058-0.130)
20-day	0.013 (0.011-0.016)	0.015 (0.013-0.018)	0.019 (0.016-0.023)	0.022 (0.019-0.026)	0.026 (0.021-0.033)	0.029 (0.023-0.038)	0.033 (0.025-0.044)	0.037 (0.026-0.050)	0.043 (0.029-0.061)	0.048 (0.031-0.070)
30-day	0.011 (0.009-0.013)	0.013 (0.011-0.015)	0.015 (0.013-0.018)	0.017 (0.014-0.020)	0.020 (0.016-0.025)	0.022 (0.017-0.028)	0.024 (0.018-0.032)	0.027 (0.019-0.037)	0.031 (0.021-0.043)	0.034 (0.022-0.049)
45-day	0.009 (0.008-0.011)	0.010 (0.009-0.012)	0.012 (0.010-0.014)	0.014 (0.011-0.016)	0.016 (0.013-0.019)	0.017 (0.013-0.021)	0.019 (0.014-0.024)	0.020 (0.014-0.027)	0.022 (0.015-0.031)	0.024 (0.016-0.035)
60-day	0.008 (0.007-0.010)	0.009 (0.008-0.011)	0.010 (0.009-0.012)	0.012 (0.010-0.014)	0.013 (0.011-0.016)	0.014 (0.011-0.018)	0.015 (0.012-0.020)	0.017 (0.012-0.022)	0.018 (0.012-0.025)	0.019 (0.012-0.027)

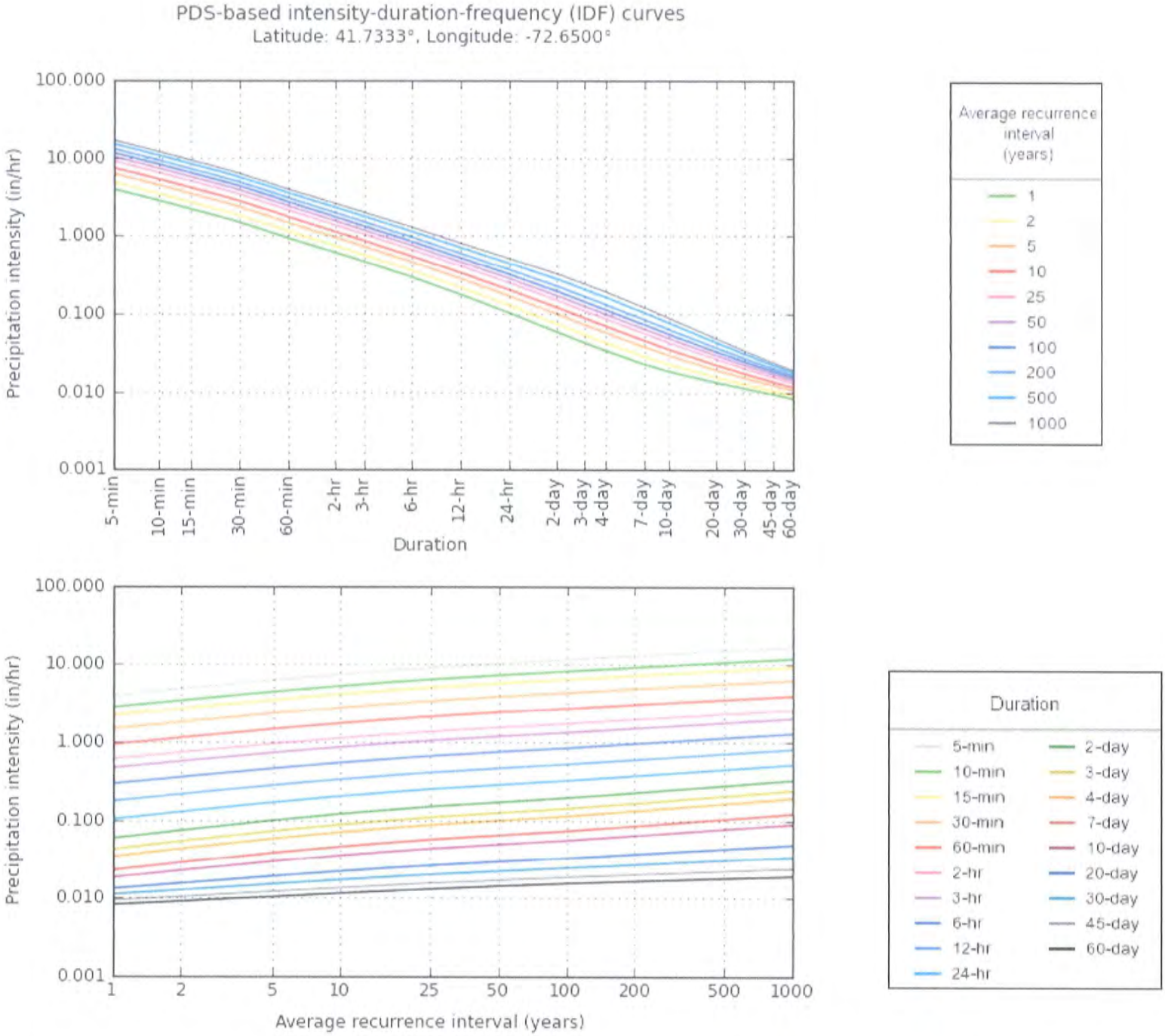
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

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

Created (GMT): Tue Nov 29 17:33:26 2022

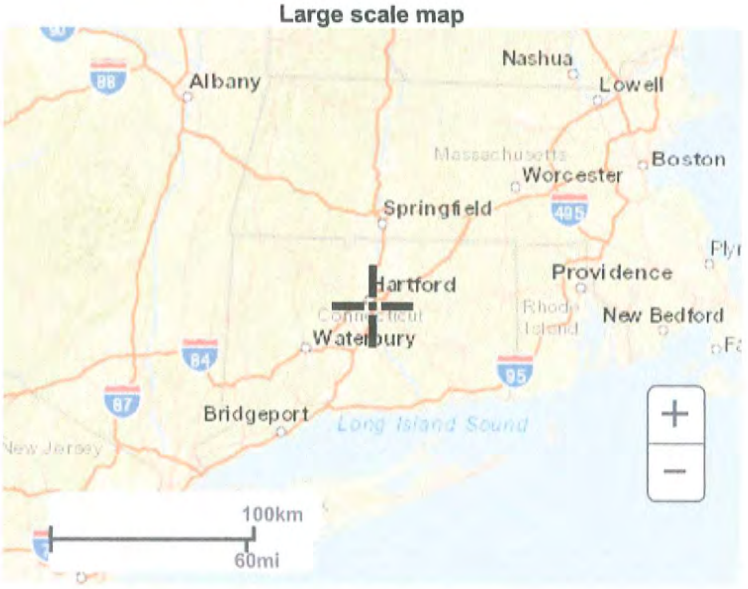
Back to Top

Maps & aerials

Small scale terrain

Large scale terrain

Large scale map



Large scale aerial

Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

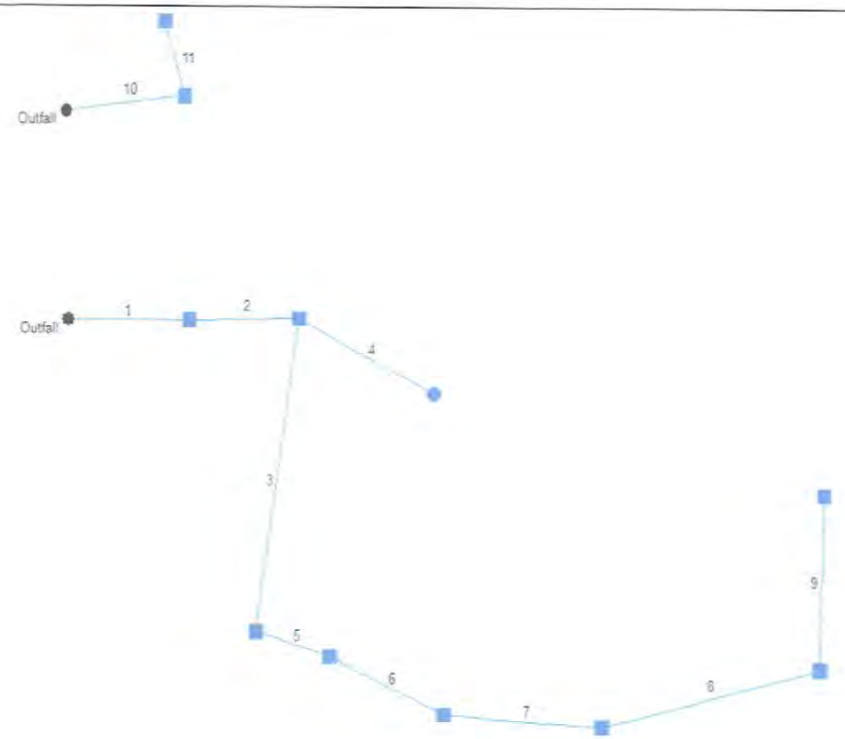
Disclaimer

Saint Paul Church
Main Street
Parking Lot Expansion
Glastonbury, CT

APPENDIX F

Hydroflow REPORT FOR PIPE SIZING

Hydraflow Plan View



86-16 St Pauls Church	No. Lines: 11	12-01-2022

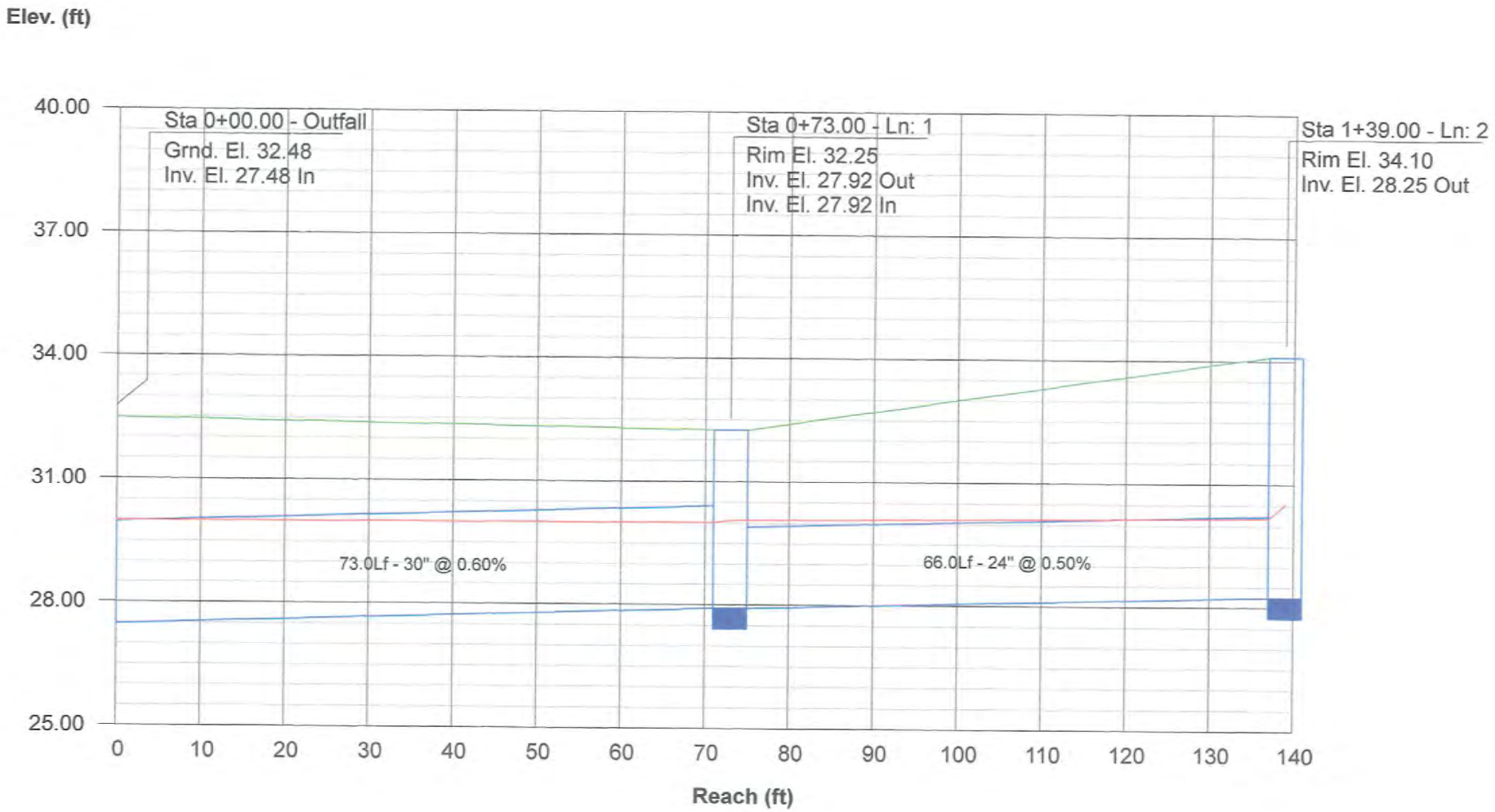
Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	73.0	0.0	Grate	0.29	0.00	0.00	0.0	27.48	0.60	27.92	30	Cir	0.012	0.50	32.25	FL End 4 to CB 3
2	1	66.0	-1.0	Curb	0.00	0.00	0.00	0.0	27.92	0.50	28.25	24	Cir	0.012	1.77	34.10	CB 3 to CB 2
3	2	176.0	99.0	Curb	3.33	0.00	0.00	0.0	28.25	0.50	29.13	18	Cir	0.012	1.49	33.00	CB 2 to CB 1
4	2	92.0	28.0	MH	3.72	0.00	0.00	0.0	28.25	0.50	28.71	15	Cir	0.012	1.00	36.00	CB 2 to MH 8
5	3	47.0	-81.0	Curb	0.52	0.00	0.00	0.0	29.13	0.51	29.37	15	Cir	0.012	0.50	33.50	CB1 to CB 10
6	5	76.0	8.0	Curb	0.30	0.00	0.00	0.0	29.37	1.20	30.28	15	Cir	0.012	0.62	33.00	CB 10 to CB 9
7	6	96.0	-21.0	Curb	0.89	0.00	0.00	0.0	30.28	5.60	35.66	15	Cir	0.012	0.54	0.00	CB 9 to CB 13
8	7	135.0	-18.0	Curb	0.37	0.00	0.00	0.0	35.66	4.30	41.47	15	Cir	0.012	1.46	0.00	CB 13 to CB 12

86-16 St Pauls Church | Number of lines: 8 | Date: 12-01-2022

Storm Sewer Profile

Proj. file: 86-16 St Pauls Church.stm



Storm Sewer Profile

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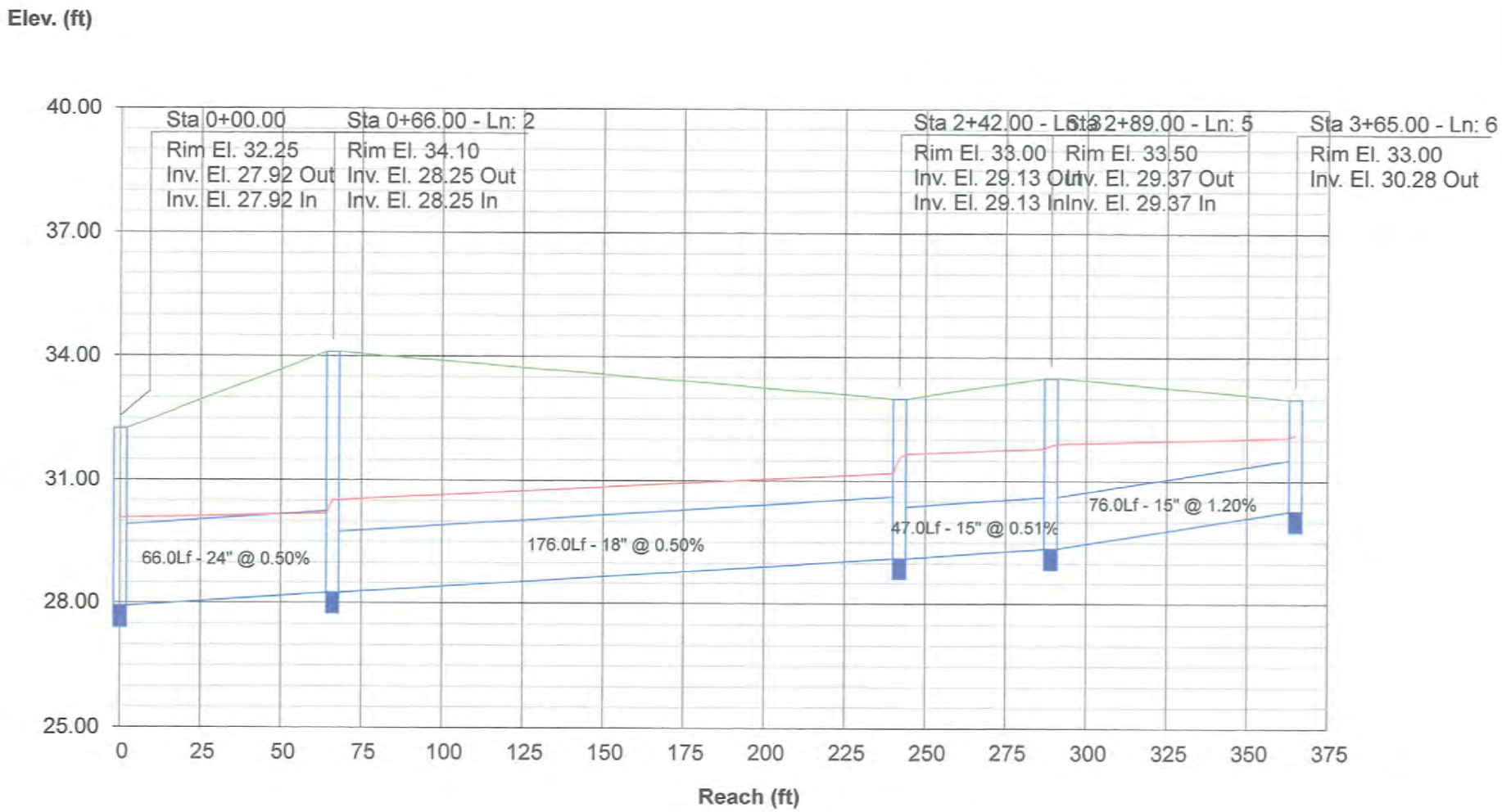
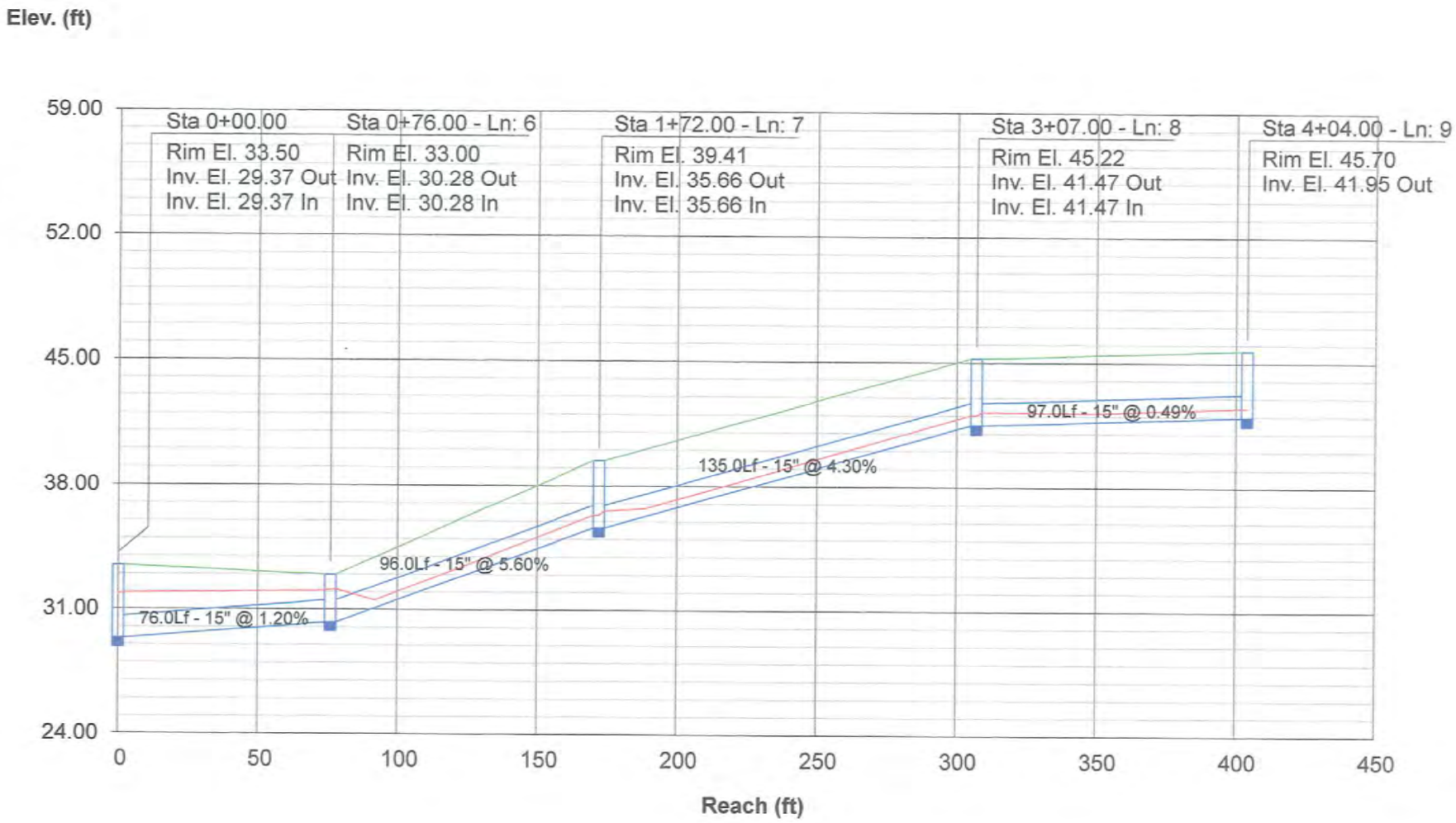


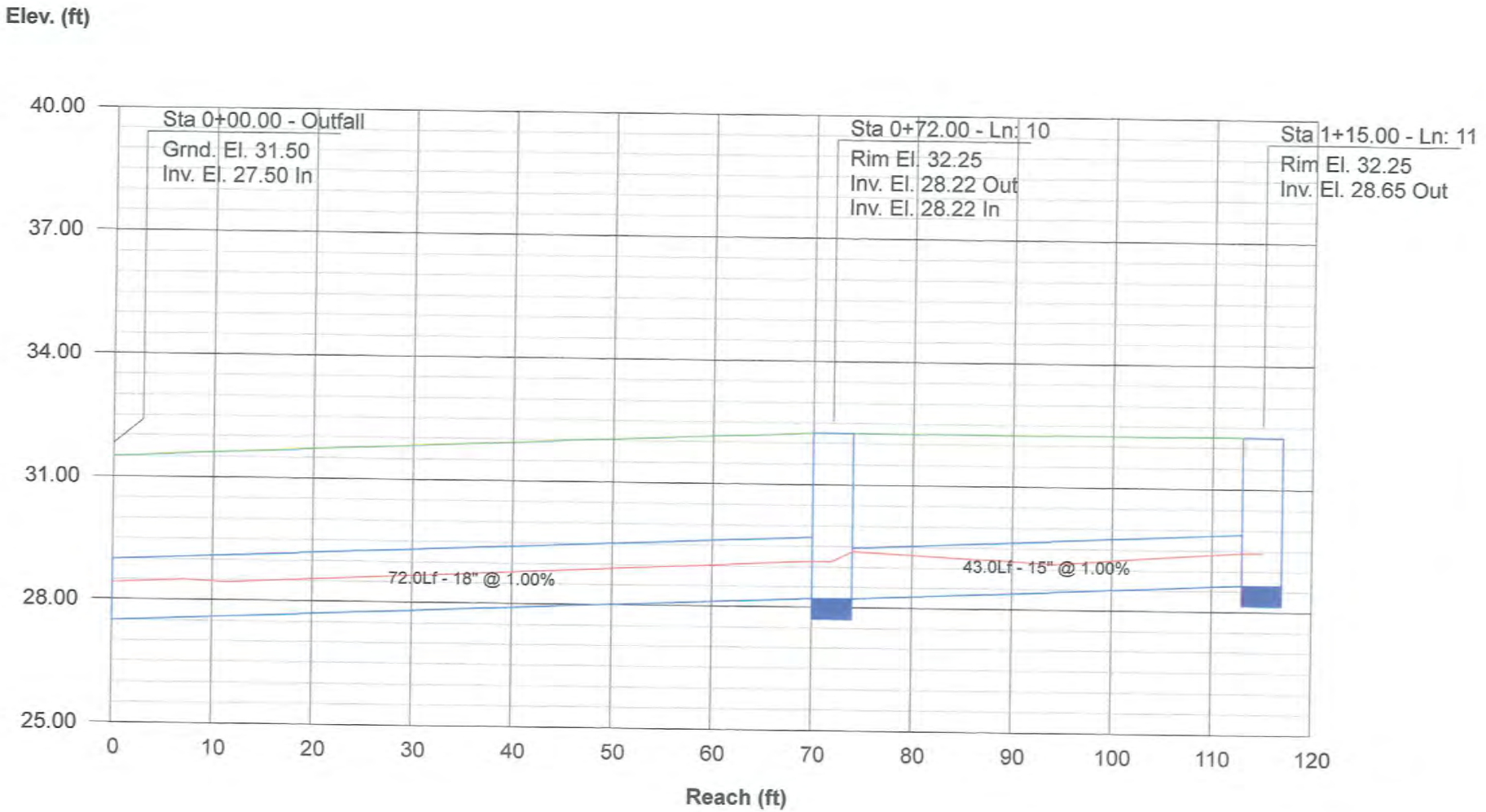
Storm Sewer Profile

Proj. file: 86-16 St Pauls Church.stm



Storm Sewer Profile

Proj. file: 86-16 St Pauls Church.stm



Saint Paul Church
Main Street
Parking Lot Expansion
Glastonbury, CT

APPENDIX G

WATER QUALITY VOLUME CALCULATIONS

Saint Paul Church
Main Street
Parking Lot Expansion
Glastonbury, CT

WQV CALCULATIONS

The WQV for the SWMB is calculated as follows:

WGV = (1")(R)(A)/12 Where: R = 0.05 + 0.009(I)
I = % Impervious Cover
A = Area in Acres

A = 11.71 AC

Impervious area = 2.87 AC

I = 2.87/11.71 = 24.5%

R = 0.05 + 0.009(24.5) = 0.271

WQV = (1")(11.71)(0.271)/12 = 0.264 ac-ft = **11,500 CF**

Existing site is > 40% impervious so qualifies under redevelopment. Therefore, system is designed to retain 50% of the WQV.

(11,500 CF)(0.5) = 5750 CF

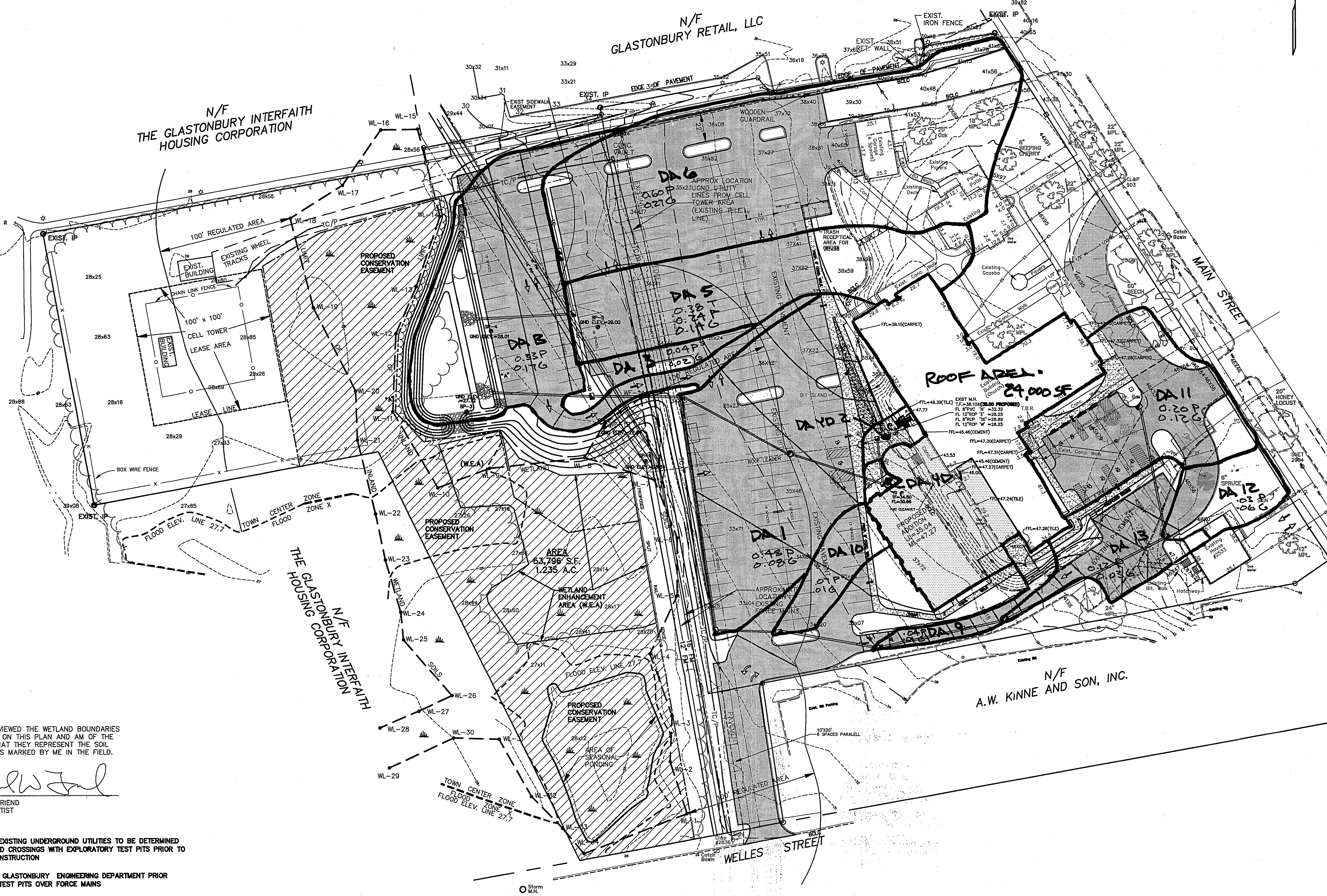
This volume is achieved at elevation 28.6

Saint Paul Church
Main Street
Parking Lot Expansion
Glastonbury, CT

APPENDIX H

DRAINAGE AREAS MAP – PROPOSED INLET AREAS

MS4 INFORMATION
DIRECTLY CONNECTED IMPERVIOUS COVER COVER
PRE-DEVELOPMENT – 1600 SF
POST-DEVELOPMENT – 1600 SF



LEGEND

EXISTING TELECOMMUNICATION /PRIMARY ELECTRIC	TC/P
EXISTING LIGHT POLE	
EXISTING FORCE MAIN	12" FM
PROPOSED BIT/CONC CURBING	
PROPOSED TREELINE	
POROPOSED H.C. PARKING SIGN	
PROPOSED UNDERDRAIN	UD
PROPOSED EXPLORATORY	
PROPOSED BIKE RACK	
PROPOSED SPOT ELEV.	32.75
PROPOSED AREA OF REPAVING	
PROPOSED NEW PAVEMENT	
PROPOSED CONCRETE	
PROPOSED CONS. EASE.	

I HAVE REVIEWED THE WETLAND BOUNDARIES AS SHOWN ON THIS PLAN AND AM OF THE OPINION THAT THEY REPRESENT THE SOIL BOUNDARIES MARKED BY ME IN THE FIELD.

MARK W. FRIEND
SOIL SCIENTIST

DEPTHS OF ALL EXISTING UNDERGROUND UTILITIES TO BE DETERMINED AT ALL PROPOSED CROSSINGS WITH EXPLORATORY TEST PITS PRIOR TO INITIATION OF CONSTRUCTION

NOTIFY TOWN OF GLASTONBURY ENGINEERING DEPARTMENT PRIOR TO EXCAVATING TEST PITS OVER FORCE MAINS

NOTE: VERIFY ALL UTILITY LOCATIONS IN THE FIELD PRIOR TO START OF ANY WORK (SEE NOTE BELOW).

ALL CONSTRUCTION METHODS TO CONFORM TO CONN. D.O.T. FORM 818 AND/OR THE TOWN STANDARDS SPECIFICATIONS.

THE LOCATION OF ALL EXISTING UTILITIES SHOWN IS APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING THE LOCATIONS OF EXISTING UTILITIES IN THE FIELD PRIOR TO CONSTRUCTION AND FOR COORDINATING ANY CONFLICTS WITH EXISTING UTILITIES

WARNING: THESE PLANS NOT TO BE USED FOR LOCATION OF UNDERGROUND UTILITIES – CALL BEFORE YOU DIG 1-800-922-4455 TWO WORKING DAYS BEFORE YOU DIG.

CONTOURS TAKEN FROM ACTUAL FIELD SURVEY AND TOWN OF GLASTONBURY AERIAL TOPOGRAPHIC MAPS.

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

SAINTS ISODIRE AND MARIA PARISH CORPORATION	TOWN CENTER ZONE / FLOOD ZONE X
PROJECT/APPLICANT	
#2577 MAIN ST. & LOT W-38A MAIN STREET	
PROJECT ADDRESS	
SPECIAL PERMIT SECTION	TPZ CHAIRMAN
DATE SPECIAL PERMIT APP'D	DIRECTOR OF COMMUNITY DEVELOPMENT
NOTE: ALL SHEETS OF THIS PLAN SET ARE LOCATED IN THE OFFICE OF COMMUNITY DEVELOPMENT FILE NO.	

THIS MAP IS NOT VALID IF MODIFIED IN ANY WAY AND/OR DOES NOT BEAR THE EMBOSSED SEAL OF THE UNDERSIGNED

I HEREBY DECLARE TO THE BEST OF MY KNOWLEDGE AND BELIEF THAT THIS PLAN IS SUBSTANTIALLY CORRECT.
MARK W. FRIEND P.E. # 15818

MEGSON, HEAGLE & FRIEND
CIVIL ENGINEERS & LAND SURVEYORS, LLC
81 RANKIN ROAD
GLASTONBURY, CONN. 06033
PHONE (860)-659-0587

DRAINAGE AREA MAP

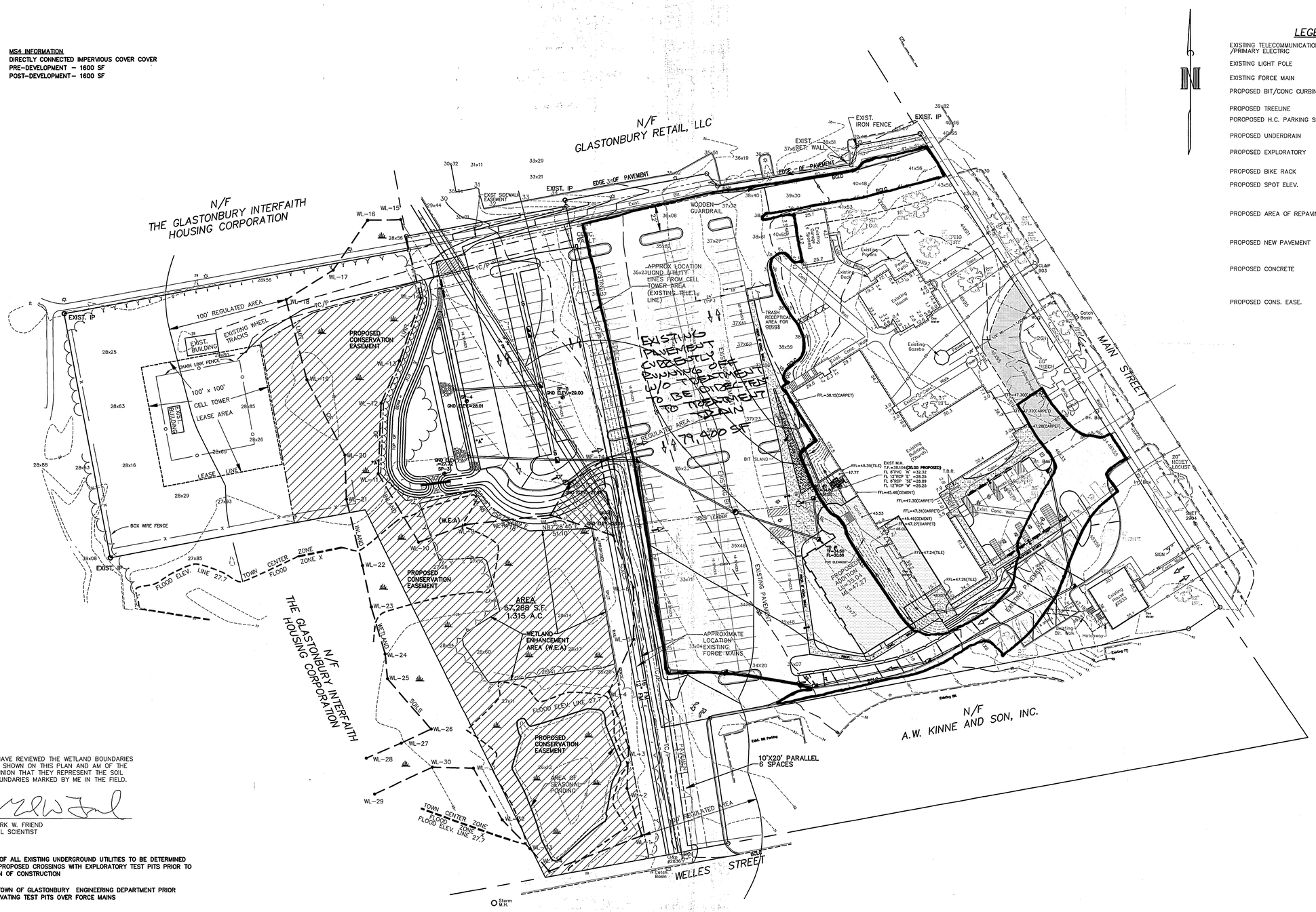
GENERAL OVERALL PLAN
#2577 & LOT W-38A MAIN STREET
PREPARED FOR
SAINTS ISIDORE AND MARIA PARISH CORPORATION
GLASTONBURY, CONN.

CK. BY:	MWF
DRW. BY:	BTC
DATE:	11-1-22
SCALE:	1"=40'
SHEET	2 OF 18
MAP NO. 86-16-10A	

Saint Paul Church
Main Street
Parking Lot Expansion
Glastonbury, CT

APPENDIX I

DRAINAGE AREAS MAP - EXISTING PAVEMENT AREA DIRECTED TO WETLAND W/O TREATMENT



MS4 INFORMATION
DIRECTLY CONNECTED IMPERVIOUS COVER COVER
PRE-DEVELOPMENT – 1600 SF
POST-DEVELOPMENT– 1600 SF

EXISTING PAVEMENT CURRENTLY RUNNING OFF W/O TREATMENT TO BE DIRECTED TO TREATMENT DRAIN
79,400 SF

LEGEND

EXISTING TELECOMMUNICATION /PRIMARY ELECTRIC	——TC/P——
EXISTING LIGHT POLE	☼
EXISTING FORCE MAIN	——12' FM——
PROPOSED BIT/CONC CURBING	═══
PROPOSED TREELINE	⌒⌒⌒⌒
POROPOSED H.C. PARKING SIGN	‐
PROPOSED UNDERDRAIN	——UD——
PROPOSED EXPLORATORY	⧓
PROPOSED BIKE RACK	o—o
PROPOSED SPOT ELEV.	32.75
PROPOSED AREA OF REPAVING	░
PROPOSED NEW PAVEMENT	☐
PROPOSED CONCRETE	▒
PROPOSED CONS. EASE.	▨

THIS MAP IS NOT VALID IF MODIFIED IN ANY WAY AND/OR DOES NOT BEAR THE EMBOSSED SEAL OF THE UNDERSIGNED

I HEREBY DECLARE TO THE BEST OF MY KNOWLEDGE AND BELIEF THAT THIS PLAN IS SUBSTANTIALLY CORRECT.

MARK W. FRIEND P.E. # 15818

MEGSON, HEAGLE & FRIEND
CIVIL ENGINEERS & LAND SURVEYORS, LLC
81 RANKIN ROAD
GLASTONBURY, CONN. 06033
PHONE (860)-659-0587

EXISTING PAVEMENT RUNNING OFF W/O TREATMENT PROPOSED TO BE DIRECTED TO TREATMENT DRAIN

GENERAL OVERALL PLAN
#2577 & LOT W-38A MAIN STREET
PREPARED FOR
SAINTS ISIDORE AND MARIA PARISH CORPORATION
GLASTONBURY, CONN.

CK. BY:	MWF
DRW. BY:	BTC
DATE:	11-1-22
SCALE:	1"=40'
SHEET	2 OF 18
MAP NO. 86-16-10A	

I HAVE REVIEWED THE WETLAND BOUNDARIES AS SHOWN ON THIS PLAN AND AM OF THE OPINION THAT THEY REPRESENT THE SOIL BOUNDARIES MARKED BY ME IN THE FIELD.

MARK W. FRIEND
SOIL SCIENTIST

DEPTHS OF ALL EXISTING UNDERGROUND UTILITIES TO BE DETERMINED AT ALL PROPOSED CROSSINGS WITH EXPLORATORY TEST PITS PRIOR TO INITIATION OF CONSTRUCTION

NOTIFY TOWN OF GLASTONBURY ENGINEERING DEPARTMENT PRIOR TO EXCAVATING TEST PITS OVER FORCE MAINS

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ALL CONSTRUCTION METHODS TO CONFORM TO CONN. D.O.T. FORM 818 AND/OR THE TOWN STANDARDS SPECIFICATIONS.

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CONTOURS TAKEN FROM ACTUAL FIELD SURVEY AND TOWN OF GLASTONBURY AERIAL TOPOGRAPHIC MAPS.

GRAPHIC SCALE

(IN FEET)
1 inch = 40 ft.

SAINTS ISODIRE AND MARIA PARISH CORPORATION   TOWN CENTER ZONE / FLOOD ZONE X
PROJECT/APPLICANT

#2577 MAIN ST. & LOT W-38A MAIN STREET
PROJECT ADDRESS

SPECIAL PERMIT SECTION   TPZ CHAIRMAN

DATE SPECIAL PERMIT APP'D   DIRECTOR OF COMMUNITY DEVELOPMENT

NOTE: ALL SHEETS OF THIS PLAN SET ARE LOCATED IN THE OFFICE OF COMMUNITY DEVELOPMENT FILE NO.

Saint Paul Church
Main Street
Parking Lot Expansion
Glastonbury, CT

APPENDIX J

STANPIPE READINGS

Saint Paul Church
Main Street
Parking Lot Expansion
Glastonbury, CT

STANDPIPE READINGS

	Depth Below Surface to Static Water Table (Positive number = Standing water)				
Date	SP-1	SP-2	SP-3	SP-4	SP-5
5-6-19	-2"	5"	1"	-5"	-4"
5-13-19	-2"	3"	1"	0	0
5-20-19	-3"	1"	-2"	-6"	-6"
5-28-19	-2"	0"	-16"	-14" est*	-17"
6-3-19	-2"	1"	-11"	filled	-16"
6-10-19	-8"	-10"	filled	filled	-20"
6-10-19	**Reinstall SP's 3,4 & 5 which filled with silt during high GW**				
6-17-19	-4"	2"	-20"	-24"	-23.5"
6-24-19	-4"	0"	-15"	-20"	-19"
7-1-19	-5"	-11"	-27" dry	-28" dry	-28"

The results of the standpipe readings indicate potential hydric conditions in SP-1 & SP-2. Both of these are within a sanitary sewer easement and bank of communications lines and were found to contain disturbed soils.