ENVIRONMENTAL SERVICES

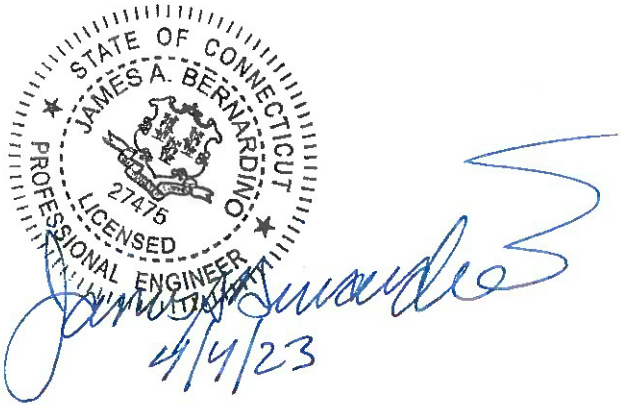
CMG EST. 2002

ENGINEERING SERVICES

STORMWATER REPORT

PROPOSED RETAIL & PICKUP WINDOW
#1014 SULLIVAN AVENUE (ROUTE 194)
SOUTH WINDSOR, CT

APRIL 4, 2023



PREPARED FOR:

MEGL
C/O SCOTT LEONARD
P.O. BOX 412
ROCKY HILL, CT 06067

PREPARED BY:

CMG ENVIRONMENTAL, INC.
CMG ID 2021-010

67 HALL ROAD
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TABLE OF CONTENTS

ATTACHMENTS

Stormwater Report
Proposed Retail & Pickup Window
#1014 Sullivan Avenue (Route 194)
South Windsor, CT
April 4, 2023

Introduction:

The project Applicant*, MEGL,* retained *CMG Engineering* to prepare this engineering analysis of pre- and post-development drainage runoff conditions for the proposed **Retail & Pickup Window.** The proposed site improvements are located on assessor's parcel 100-31 with a total lot area of 0.42 Acres, identified as #1014 Sullivan Street in South Windsor, CT (Site).

The site is currently an undeveloped parcel, consisting of a grassed lawn. The property is adjacent to an existing commercial development containing two commercial buildings which house a bank, fast food restaurant, and salon. Access & egress to the Site and abutting parcels utilize a mutual easement for driveways, utilities, and drainage. The abutting parcel contains an on-site stormwater management system which discharges to the CT DOT owned drainage system located within the Sullivan Avenue right-of-way. The approved stormwater management system (designed in 2005), accounted for a future development on the Site and was designed to collect and treat stormwater runoff for the proposed building and parking areas. CMG is including the 2005 Stormwater Report, prepared by Design Professionals Inc., revised date 1/11/2005 as **Appendix D.**

Proposed Development:

The applicant is proposing to construct a 2,520 s.f. commercial building with associated parking and utilities. The building will contain two (2) tenant spaces, one of which will contain a drive-up pickup window. The site will be serviced by municipal water and sewer utilities located onsite. The proposed parking area will be handled by a proposed catch basin located in the southwest corner of the site. Roof runoff will be captured and conveyed via underground roof drains which will discharge to the proposed catch basin. The proposed catch basin will utilize an existing 15" RCP drain stub which will convey stormwater to the existing drainage system located on the abutting parcel. The 2005 drainage report included a full analysis of the contribution in runoff by a future development. The proposed improvements contain slightly more impervious area than what was proposed in 2005. As a result, CMG is proposing minor changes to the existing outlet control structure located in the existing stormwater basin along the Site's frontage on Sullivan Avenue. Please see the "Peak Runoff Control" section of this report for more details on the minor changes to the existing outlet control structure.

Off-Site Analysis:

The approved 2005 stormwater management system was designed to discharge to an existing catch basin within the Sullivan Avenue right-of-way. As a result, the drainage system was designed to discharge at less than or equal to the existing peak runoff rates from the site. As stated previously, minor changes are proposed to the existing outlet control structure to achieve lower post - development peak runoff numbers.

Peak Runoff Control:

The intent of the stormwater management design is to provide sufficient detention on site to provide post development peak discharges at or below existing peak discharges. The 2005 site design called for approximately 1.09 Acres of impervious coverage, while the proposed site improvements will require approximately 3,500 s.f. of additional impervious coverage. The increase in impervious

coverage will also cause a deminimus increase of off-site peak runoff to the Sullivan Avenue drainage system.

To reduce post-construction runoff rates, CMG is proposing modifications to the existing concrete outlet control structure located within the site's existing stormwater basin. The proposed improvements are as follows:

1. Enlarge/ core existing low level outlet pipe to be 5" diameter with same invert. (Invert = 119.03)
2. Install stainless steel plate bolted over existing 8" orifice. Plate to provide 7" diameter round orifice and be installed over 8" opening with invert = 121.91.

The proposed modifications will result in compliant post-development runoff numbers in comparison to existing conditions. CMG is including a summary of Peak Flow Runoff data as **Table 1.** The summaries for the different HydroCAD models are included as **Attachments A, B, & C.**

Nonstructural Drainage Systems:
The site makes use of a detention basin to help control runoff from the site and help treat runoff prior to discharge per the previously approved stormwater management plan.

Riparian Buffers:
Existing vegetation along the perimeter of the property was maintained to the maximum extent practicable.

Erosion and Sedimentation Control Systems:
An extensive Soil Erosion and Sedimentation Control Plan is included in the plan set as Sheet C-7.0. Site specific BMP's are proposed to deter sedimentation to abutting parcels and the Sullivan Avenue right-of-way during construction. The following BMP's are implemented:

- Proposed straw wattle with silt fence backing located along the perimeter downhill of the proposed site disturbances.
- Proposed stone construction exit to deter sediment tracking onto the adjacent parcel and Sullivan Avenue.
- Proposed silt sacks within catch basins adjacent to the proposed disturbed areas.
- Proposed material storage & stockpile area with erosion control protection
- Sediment trap installation within limits of existing detention basin

A maintenance schedule of the proposed erosion control measures and proposed sequence of construction is included as part of the enclosed SESC Plan.

Stormwater Runoff Quality:
As part of the previously approved design, the stormwater management system utilizes the existing Baysaver unit which will treat runoff from the paved areas associated with the development. In addition, the existing and proposed catch basins utilize deep sumps to collect and treat stormwater runoff.

Conveyance System:
The stormwater management system conveyance system consists of underground drainage pipes ranging from 15" ~ 18" in diameter. The piping system was designed to accommodate runoff from a 10-year design storm.

Discharge at the Natural Location:
The discharge location will remain in the same place as the previously approved stormwater design. The current and proposed discharge location is within the CT DOT owned drainage system located in the Sullivan Avenue right-of-way.

Maintenance & Operation:

The stormwater management system will primarily remain as previously approved with the exception of an additional catch basin being proposed. As a result, the long-term operation and maintenance of the drainage system will remain the same as previously approved. The following maintenance schedule is intended to be a minimum guide. Additional inspections and maintenance measures may be required following large storm events that could cause the deposition of excess debris in the system.

Pipe Outlet Locations: The pipe outlets and associated riprap shall be inspected annually and cleaned of silt and/or debris.

Catch Basins: The catch basins shall be inspected annually. The sumps shall be cleaned when the depth of material within the sumps reach one foot.

Pavement Sweeping: The pavement areas shall be swept at a minimum of twice per year. Once in the spring shortly after the end of the snow season, and once in the fall after the leaves have fallen.

Detention Basin: The detention basin shall be inspected twice yearly. All large woody growth that may affect the flow of water or the stability of the basin shall be removed. The riprap shall be re-arranged and added to as required to maintain the design as per the design plans. Any erosion or other problems that may affect the proper operation of the basin shall be required promptly.

Baysaver Unit: The maintenance of the Baysaver unit shall be done in accordance with the manufacturers requirements.

Topographic Contour Map:

Topography and locations of proposed drainage structures are shown on the included Grading and Drainage Plan. Please see Sheet C-5.0.

Floodplain Boundaries:

The site is not located in a flood hazard zone.

Table 1

Stormwater Runoff Peak Flow Summary

TABLE NO. 1 4/4/2023

STORMWATER RUNOFF PEAK FLOW SUMMARY
PROPOSED RETAIL DRIVE-THRU
#1014 SULLIVAN AVENUE (ROUTE 194)
SOUTH WINDSOR, CT

Pre-Existing (2005) Site Development Conditions					
		2-Year	10-Year	25-Year	100-Year
1S -Sullivan Ave	*Pre-Development (2005 Report)*	*1*	*2*	*3*	*4*
	Remodel into Hydro CAD (2005 Data)	*0.6*	*2.0*	*2.8*	*4.4*

Pre-Development-2023--Post developed (2005) Site Development Conditions					
1S - Sullivan Ave	*Remodel into Hydro Cad (2023 as-built data)*	*1.1*	*2.4*	*2.9*	*4.0*

Proposed (2023) Site Development Conditions (additional impervious 3,500 Sf)					
1S - Sullivan Ave	*2023 Post-Dev. With Modified Outlets*	*1.1*	*2.4*	*2.8*	*4.0*

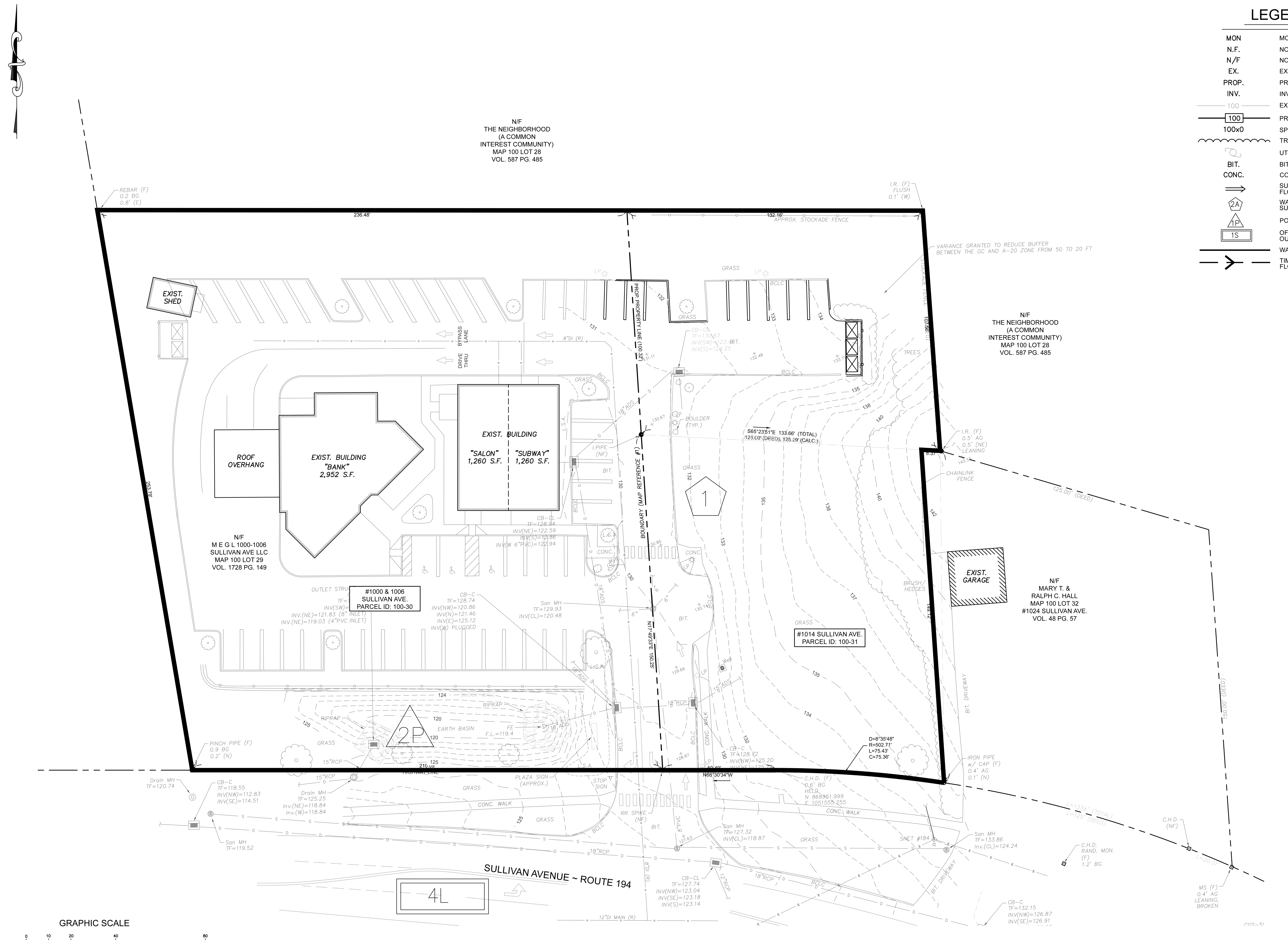
Appendix A

2005 Pre-Development Conditions
(Remodeled in HydroCAD)

Prepared by CMG

LEGEND

MON	MONUMENT
N.F.	NOT FOUND
N/F	NOW OR FORMERLY
EX.	EXISTING
PROP.	PROPOSED
INV.	INVERT
100	EXISTING CONTOURS
100	PROPOSED CONTOURS
100x0	SPOT GRADE
	TREELINE
	UTILITY POLE
BIT.	BITUMINOUS
CONC.	CONCRETE
⇒	SURFACE RUNOFF FLOW DIRECTION
2A	WATERSHED SUBCATCHMENT
1P	POND AREA
1S	OFF-SITE STORMWATER OUTFALL LOCATION
	WATERSHED BOUNDARY
	TIME OF CONCENTRATION FLOW PATH



N/F
THE NEIGHBORHOOD
(A COMMON
INTEREST COMMUNITY)
MAP 100 LOT 28
VOL. 587 PG. 485
REBAR (F)
0.2' BG
0.8' (E)
236.48'
132.16'
APPROX. STOCKADE FENCE
I.R. (F)
FLUSH
0.1' (W)
VARIANCE GRANTED TO REDUCE BUFFER BETWEEN THE GC AND A-20 ZONE FROM 50 TO 20 FT
EXIST. SHED
GRASS
DRIVE THRU
BYPASS LANE
ROOF OVERHANG
EXIST. BUILDING
"BANK"
2,952 S.F.
EXIST. BUILDING
"SALON"
1,260 S.F.
"SUBWAY"
1,260 S.F.
PROP PROPERTY LINE
BOUNDARY (MAP REFERENCE #1)
S65°23'51"E 133.66' (TOTAL)
123.00' (DEED); 125.29' (CALC.)
I.R. (F)
0.5' AG
0.5' (NE)
LEANING
CHAINLINK FENCE
125.00' (DEED)
N/F
THE NEIGHBORHOOD
(A COMMON
INTEREST COMMUNITY)
MAP 100 LOT 28
VOL. 587 PG. 485
N/F
M E G L 1000-1006
SULLIVAN AVE LLC
MAP 100 LOT 29
VOL. 1728 PG. 149
#1000 & 1006
SULLIVAN AVE.
PARCEL ID: 100-30
#1014 SULLIVAN AVE.
PARCEL ID: 100-31
EXIST. GARAGE
N/F
MARY T. &
RALPH C. HALL
MAP 100 LOT 32
#1024 SULLIVAN AVE.
VOL. 48 PG. 57
1
2P
EARTH BASIN
RIPRAP
BIT. DRIVEWAY
D=8°35'48"
R=502.71'
L=75.43'
C=75.36'
N68°30'34"W
PINCH PIPE (F)
0.9' BG
0.2' (N)
IRON PIPE
w/ CAP (F)
0.4' AG
0.1' (N)
CONC. WALK
SULLIVAN AVENUE ~ ROUTE 194
4L
1S

GRAPHIC SCALE

(IN FEET)
1 inch = 20 ft.

DIG SAFE NOTE (1-888-344-7233):
CONTRACTOR REQUIRED TO NOTIFY "DIG SAFE" 72 HOURS PRIOR TO ANY ON-SITE EXCAVATION OR CONSTRUCTION AT 1-888-344-7233. CONTRACTOR SHALL ALSO NOTIFY LOCAL WATER AND SEWER DEPARTMENTS TO MARK OUT THEIR UTILITIES.

REVISIONS

NO.	DATE	DESCRIPTION	BY	CK'D
1.	4/4/2023	PER PREAPPLICATION COMMENTS	RL	JAB

PROFESSIONAL SEAL

PROJECT:
PROPOSED RETAIL & DRIVE UP - PICKUP WINDOW
1014 SULLIVAN AVENUE
SOUTH WINDSOR, CT 06074

PREPARED FOR:
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P.O. BOX 412
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860-550-2323

CMG EST. 2002
ENGINEERING SERVICES
ENVIRONMENTAL SERVICES
67 Hall Road
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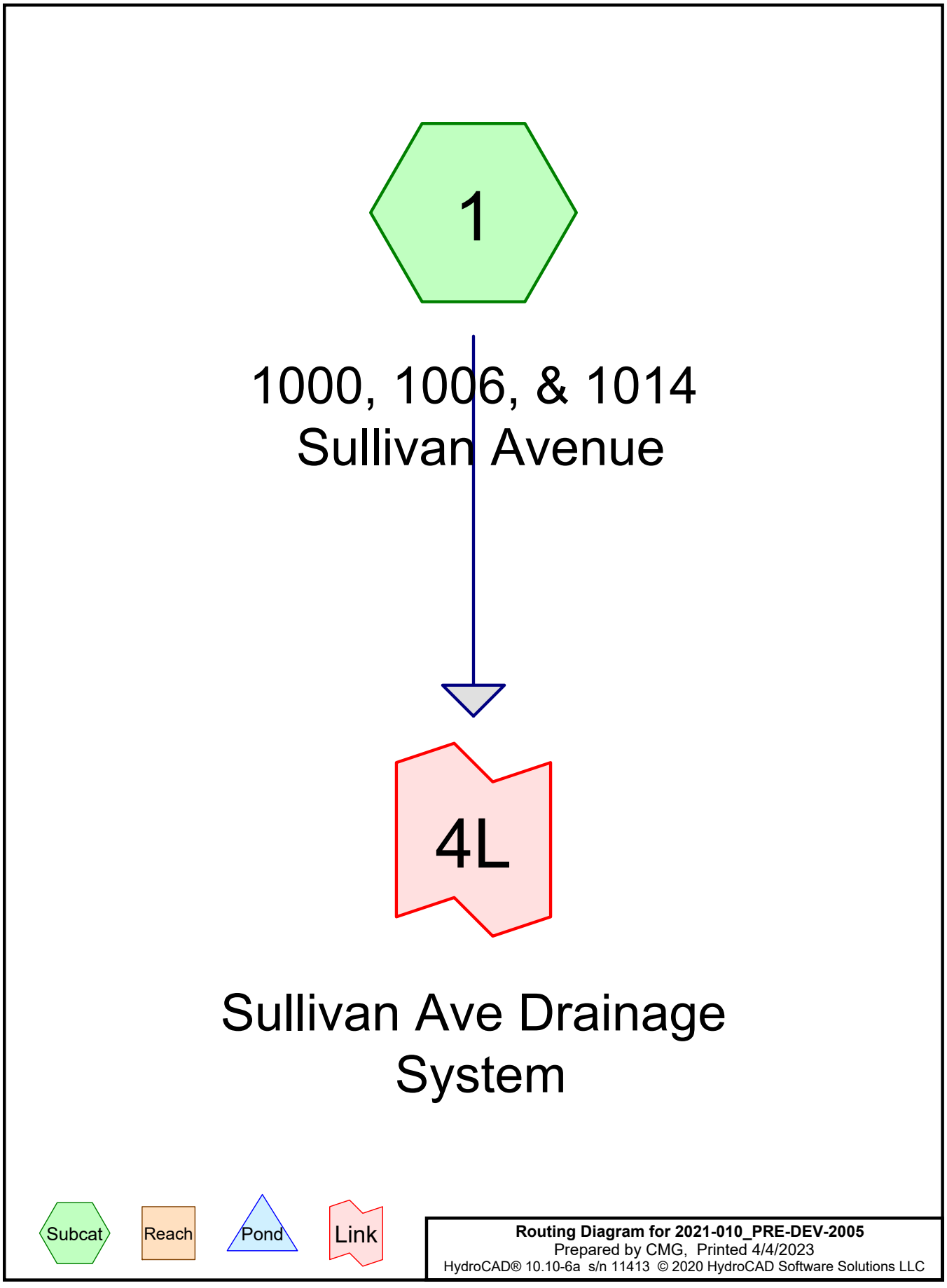
Phone: 774-241-0901
fax: 774-241-0906

ISSUE DATE: 2/23/2023	
DRAWN BY: MSM	CHECKED BY: JAB
SCALE: 1" = 20'	
PROJECT NO.: 2021-010	

2023 PRE-DEVELOPMENT DRAINAGE FIGURE

D-1.0



Routing Diagram for 2021-010_PRE-DEV-2005
Prepared by CMG, Printed 4/4/2023

Summary for Subcatchment 1: 1000, 1006, & 1014 Sullivan Avenue

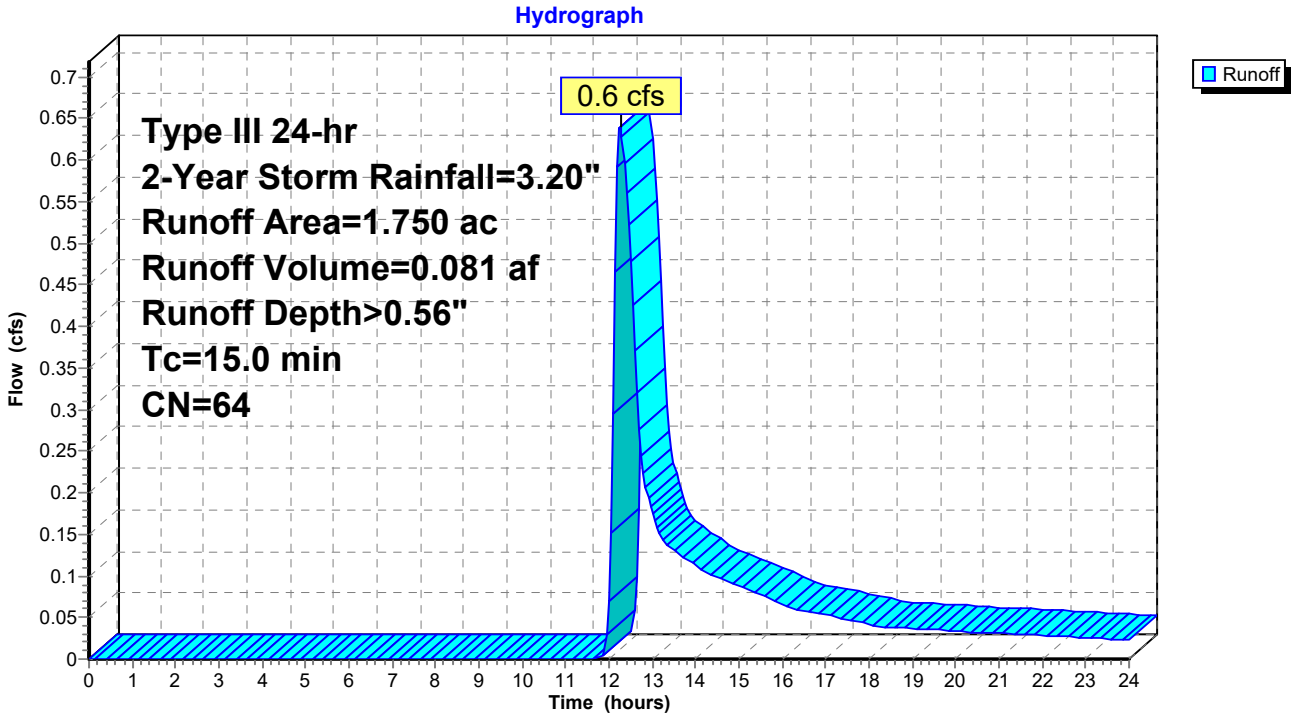
Runoff = 0.6 cfs @ 12.27 hrs, Volume= 0.081 af, Depth> 0.56"
Routed to Link 4L : Sullivan Ave Drainage System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.20"

Area (ac)	CN	Description
1.590	61	>75% Grass cover, Good, HSG B
0.160	98	Paved parking, HSG B
1.750	64	Weighted Average
1.590		90.86% Pervious Area
0.160		9.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Time of Concentration**

Subcatchment 1: 1000, 1006, & 1014 Sullivan Avenue

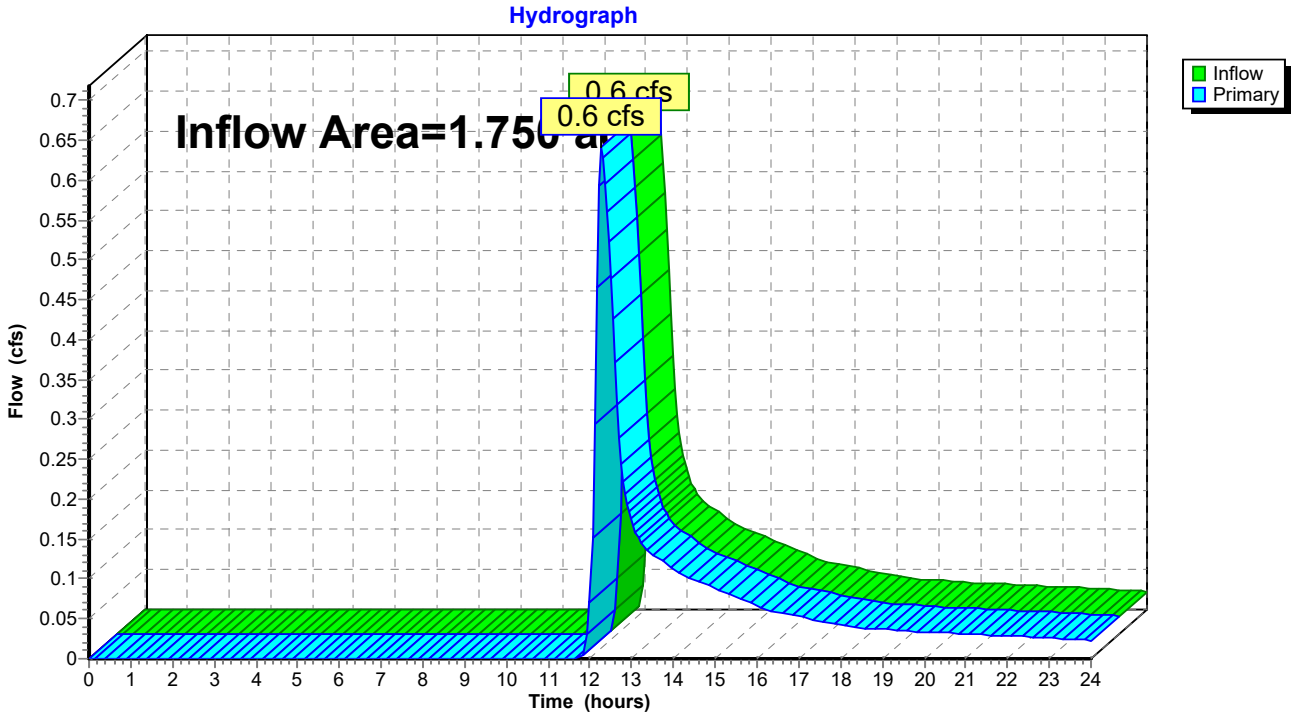


Summary for Link 4L: Sullivan Ave Drainage System

Inflow Area = 1.750 ac, 9.14% Impervious, Inflow Depth > 0.56" for 2-Year Storm event
Inflow = 0.6 cfs @ 12.27 hrs, Volume= 0.081 af
Primary = 0.6 cfs @ 12.27 hrs, Volume= 0.081 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 4L: Sullivan Ave Drainage System



Summary for Subcatchment 1: 1000, 1006, & 1014 Sullivan Avenue

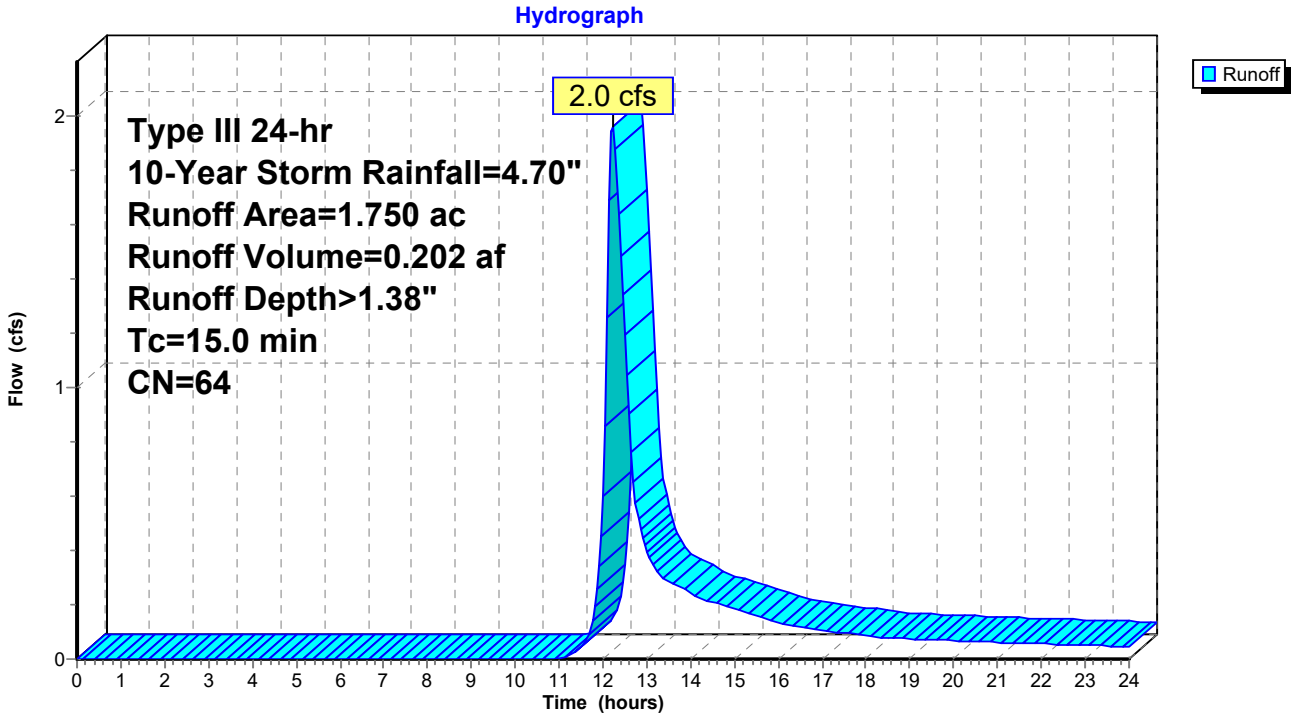
Runoff = 2.0 cfs @ 12.23 hrs, Volume= 0.202 af, Depth> 1.38"
Routed to Link 4L : Sullivan Ave Drainage System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=4.70"

Area (ac)	CN	Description
1.590	61	>75% Grass cover, Good, HSG B
0.160	98	Paved parking, HSG B
1.750	64	Weighted Average
1.590		90.86% Pervious Area
0.160		9.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Time of Concentration**

Subcatchment 1: 1000, 1006, & 1014 Sullivan Avenue

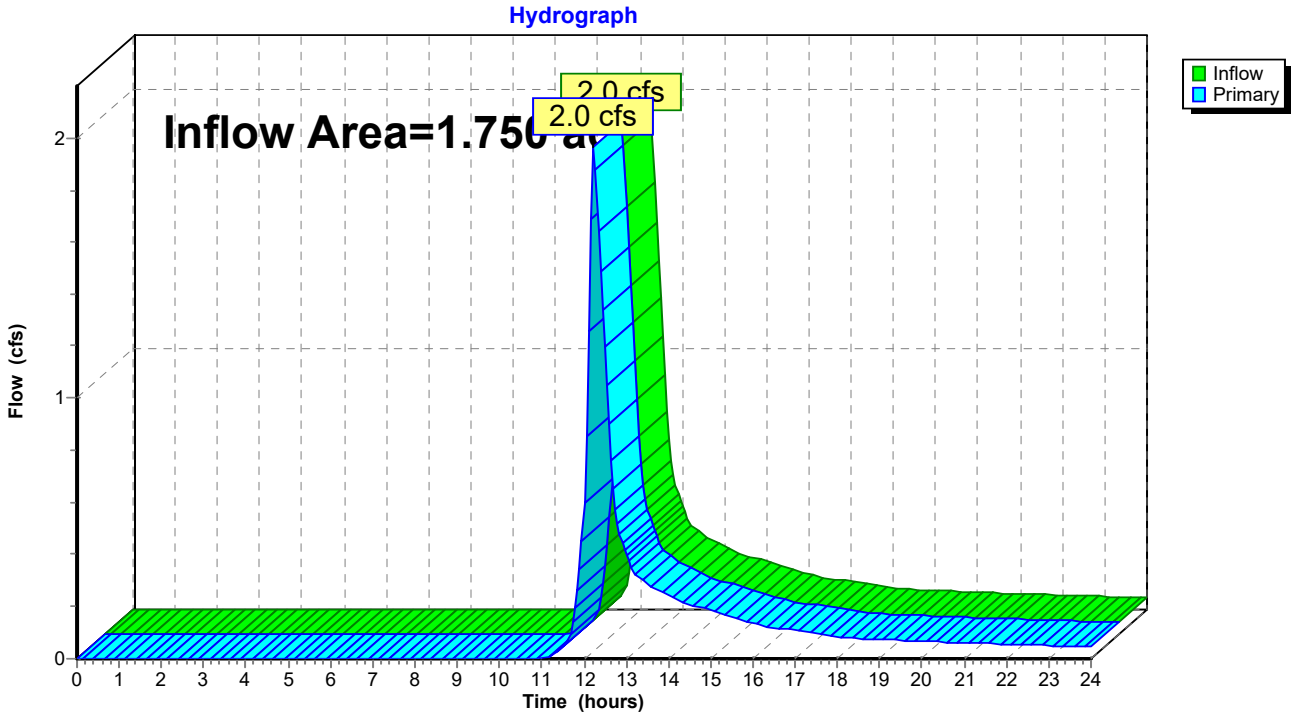


Summary for Link 4L: Sullivan Ave Drainage System

Inflow Area = 1.750 ac, 9.14% Impervious, Inflow Depth > 1.38" for 10-Year Storm event
Inflow = 2.0 cfs @ 12.23 hrs, Volume= 0.202 af
Primary = 2.0 cfs @ 12.23 hrs, Volume= 0.202 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 4L: Sullivan Ave Drainage System



Summary for Subcatchment 1: 1000, 1006, & 1014 Sullivan Avenue

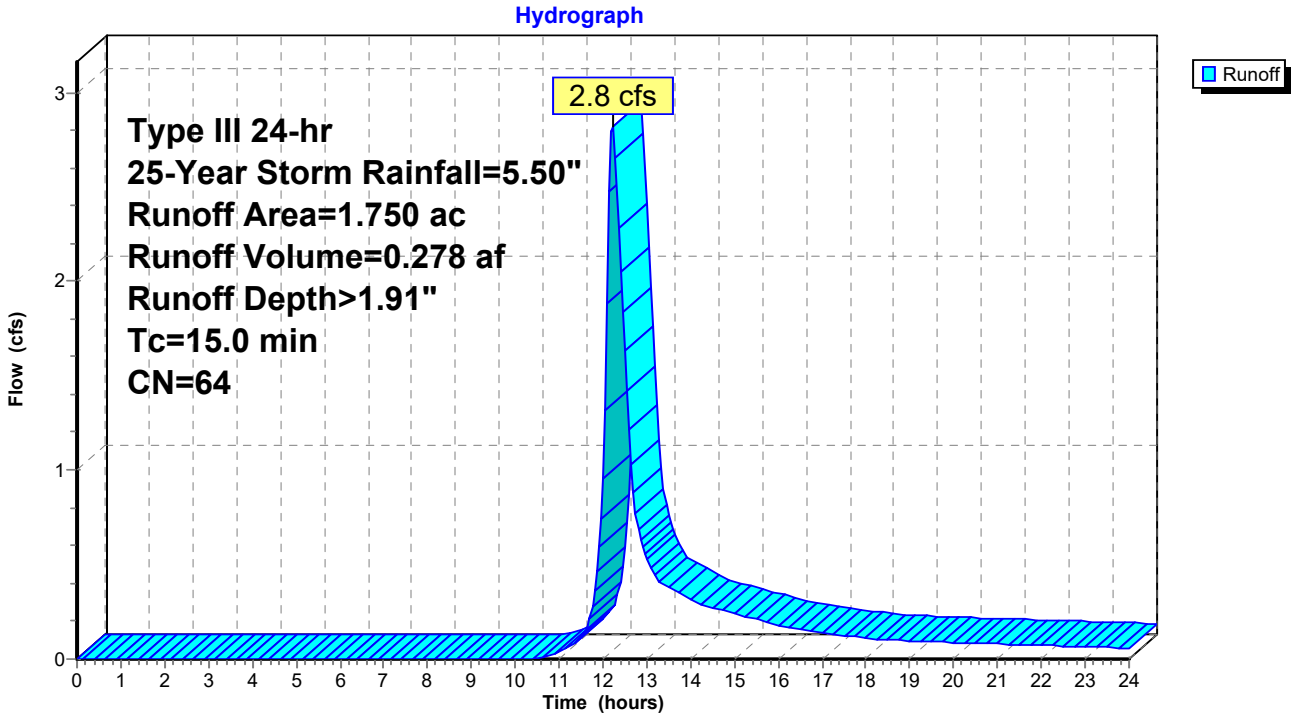
Runoff = 2.8 cfs @ 12.22 hrs, Volume= 0.278 af, Depth> 1.91"
Routed to Link 4L : Sullivan Ave Drainage System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=5.50"

Area (ac)	CN	Description
1.590	61	>75% Grass cover, Good, HSG B
0.160	98	Paved parking, HSG B
1.750	64	Weighted Average
1.590		90.86% Pervious Area
0.160		9.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Time of Concentration**

Subcatchment 1: 1000, 1006, & 1014 Sullivan Avenue

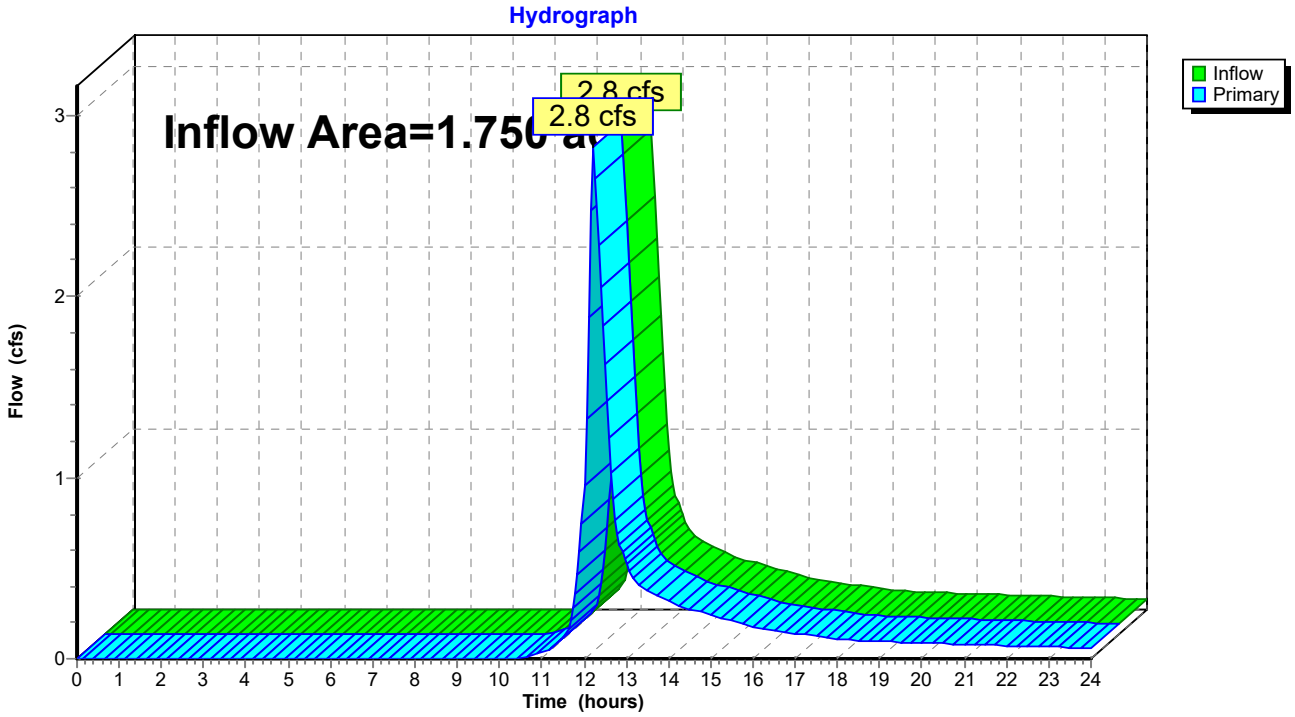


Summary for Link 4L: Sullivan Ave Drainage System

Inflow Area = 1.750 ac, 9.14% Impervious, Inflow Depth > 1.91" for 25-Year Storm event
Inflow = 2.8 cfs @ 12.22 hrs, Volume= 0.278 af
Primary = 2.8 cfs @ 12.22 hrs, Volume= 0.278 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 4L: Sullivan Ave Drainage System



Summary for Subcatchment 1: 1000, 1006, & 1014 Sullivan Avenue

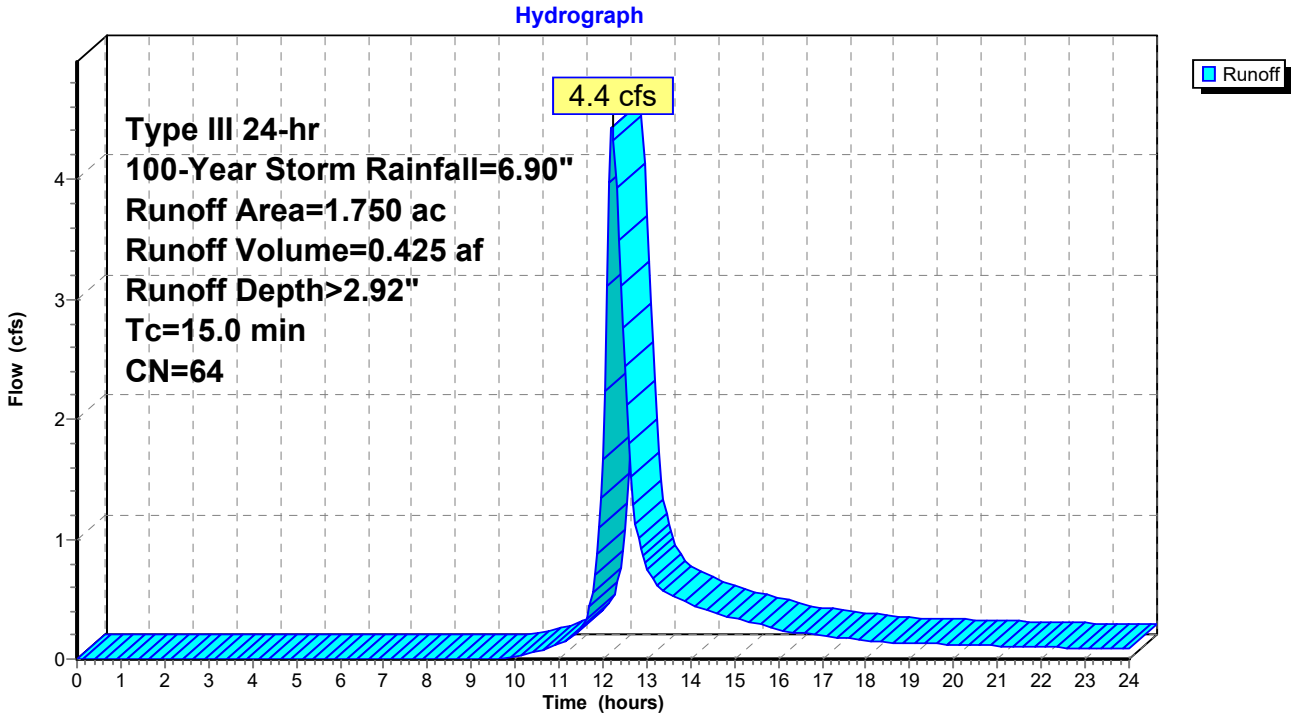
Runoff = 4.4 cfs @ 12.22 hrs, Volume= 0.425 af, Depth> 2.92"
Routed to Link 4L : Sullivan Ave Drainage System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Storm Rainfall=6.90"

Area (ac)	CN	Description
1.590	61	>75% Grass cover, Good, HSG B
0.160	98	Paved parking, HSG B
1.750	64	Weighted Average
1.590		90.86% Pervious Area
0.160		9.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Time of Concentration**

Subcatchment 1: 1000, 1006, & 1014 Sullivan Avenue

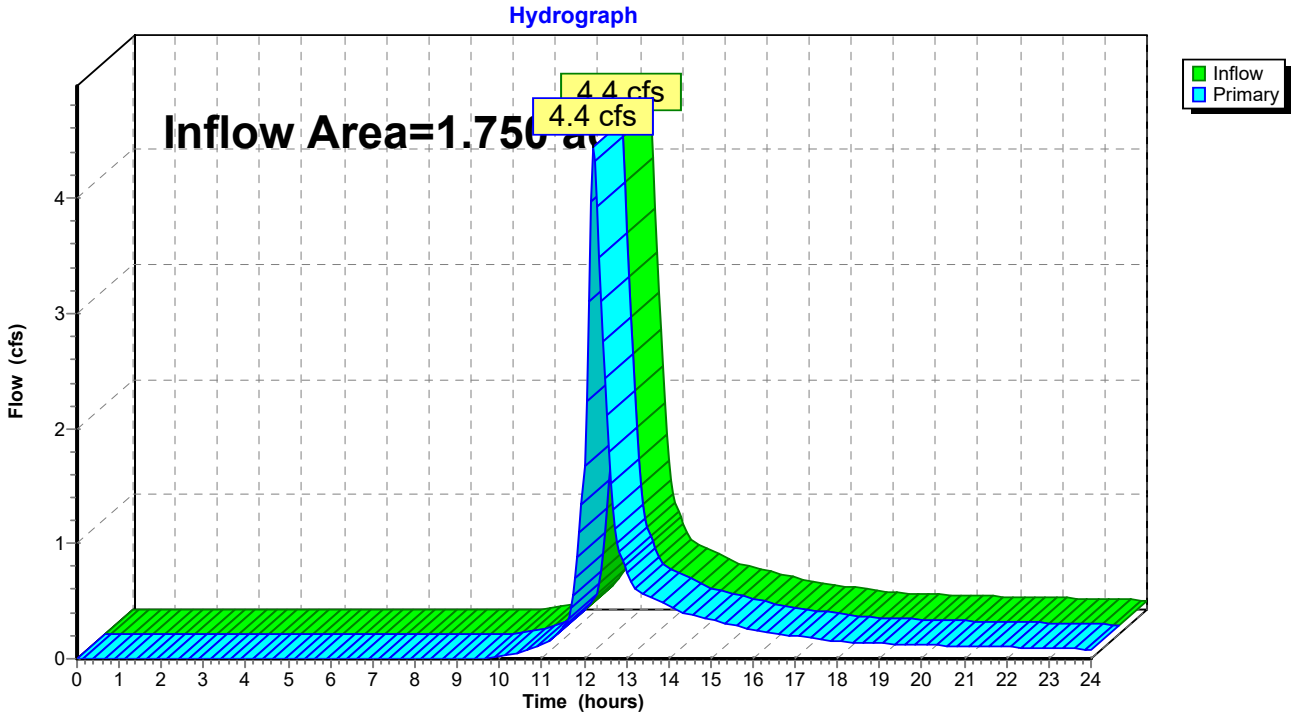


Summary for Link 4L: Sullivan Ave Drainage System

Inflow Area = 1.750 ac, 9.14% Impervious, Inflow Depth > 2.92" for 100-Year Storm event
Inflow = 4.4 cfs @ 12.22 hrs, Volume= 0.425 af
Primary = 4.4 cfs @ 12.22 hrs, Volume= 0.425 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

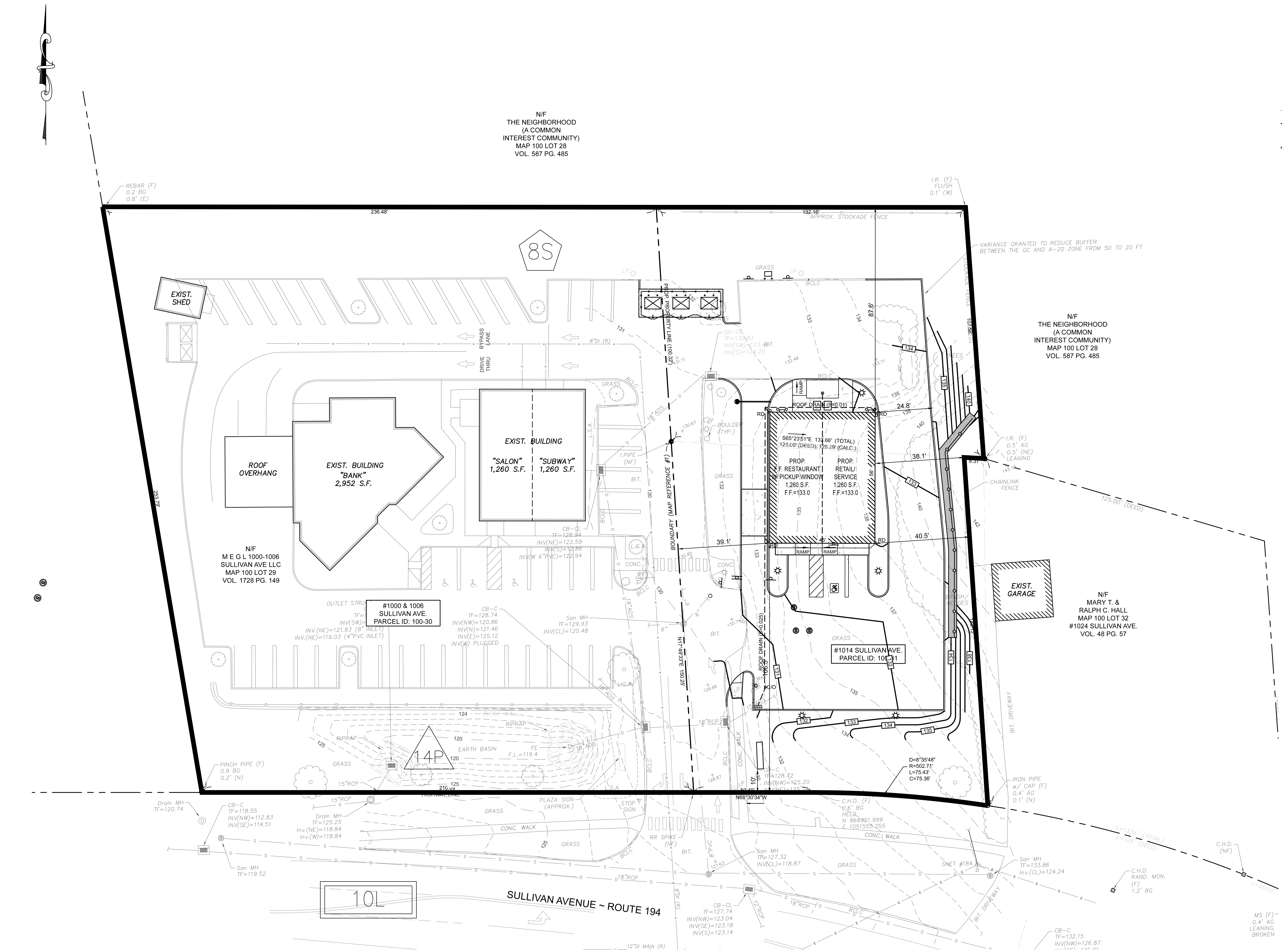
Link 4L: Sullivan Ave Drainage System



Appendix B

2023 Pre-Development Conditions or 2005 Post-Development Site Conditions (Remodeled in HydroCAD)

Prepared by CMG



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

DIG SAFE NOTE (1-888-344-7233):
CONTRACTOR REQUIRED TO NOTIFY "DIG SAFE" 72 HOURS PRIOR TO ANY ON-SITE EXCAVATION OR CONSTRUCTION AT 1-888-344-7233. CONTRACTOR SHALL ALSO NOTIFY LOCAL WATER AND SEWER DEPARTMENTS TO MARK OUT THEIR UTILITIES.

LEGEND

MON	MONUMENT
N.F.	NOT FOUND
N/F	NOW OR FORMERLY
EX.	EXISTING
PROP.	PROPOSED
INV.	INVERT
100	EXISTING CONTOURS
100	PROPOSED CONTOURS
100x0	SPOT GRADE
	TREELINE
	UTILITY POLE
BIT.	BITUMINOUS
CONC.	CONCRETE
⟹	SURFACE RUNOFF FLOW DIRECTION
2A	WATERSHED SUBCATCHMENT
1P	POND AREA
1S	OFF-SITE STORMWATER OUTFALL LOCATION
	WATERSHED BOUNDARY
	TIME OF CONCENTRATION FLOW PATH

REVISIONS

NO.	DATE	DESCRIPTION	BY	CK'D
1.	4/4/2023	PER PREAPPLICATION COMMENTS	RL	JAB

STATE OF CONNECTICUT
JAMES A. BERNARDINO
No. 27475
LICENSED
PROFESSIONAL ENGINEER
PROFESSIONAL SEAL

PROJECT:
PROPOSED RETAIL & DRIVE UP - PICKUP WINDOW
1014 SULLIVAN AVENUE
SOUTH WINDSOR, CT 06074

PREPARED FOR:
MEGL C/O SCOTT LEONARD
P.O. BOX 412
ROCK HILL, CT 06067
860-550-2323

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ENGINEERING SERVICES
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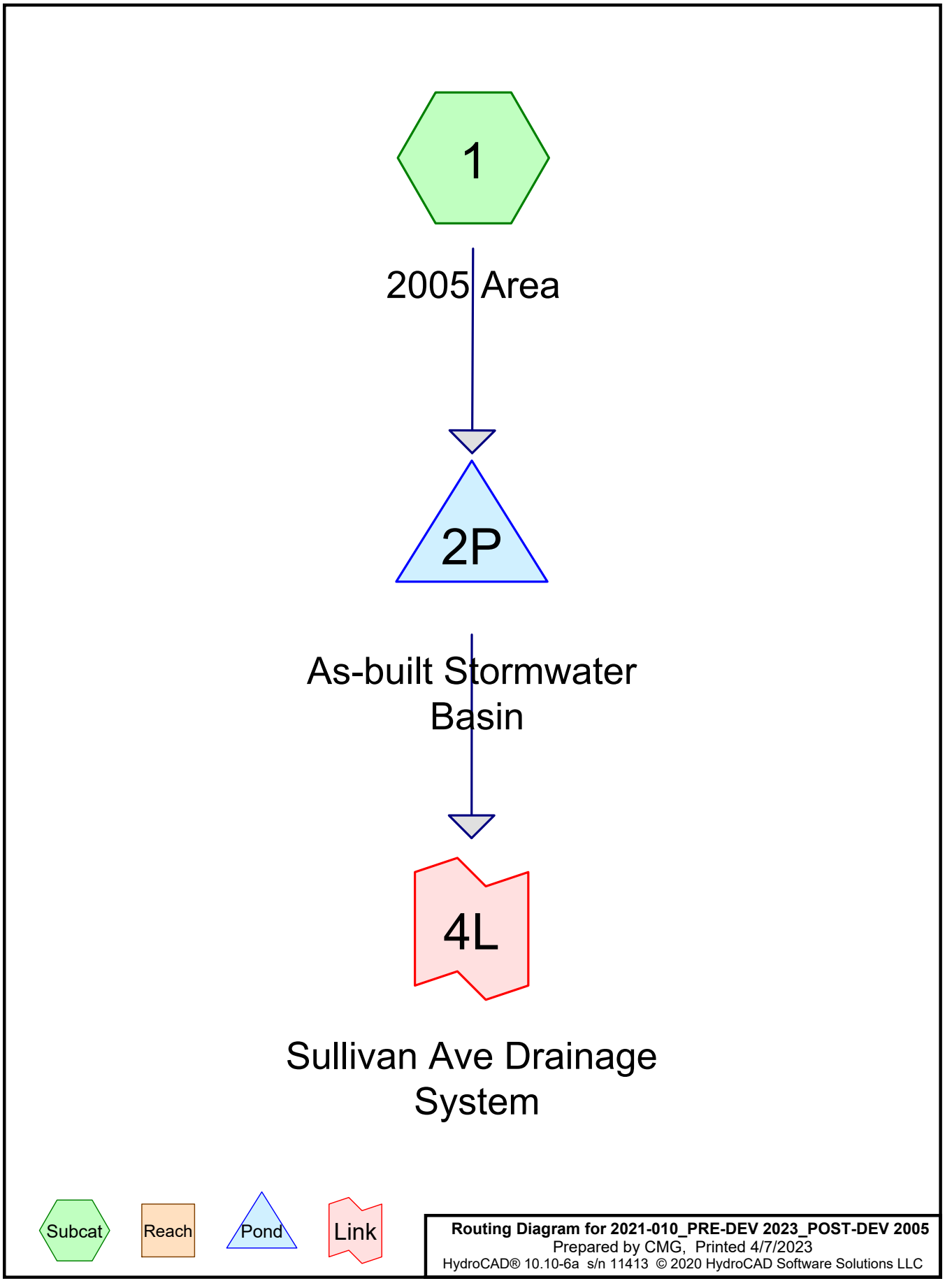
67 Hall Road
Sturbridge, MA 01566
Phone: 774-241-0901
fax: 774-241-0906

ISSUE DATE: 2/23/2023
DRAWN BY: MSM | CHECKED BY: JAB
SCALE: 1" = 20'
PROJECT NO.: 2021-010

2023 POST-DEVELOP.
DRAINAGE FIGURE

D-2.0



Routing Diagram for 2021-010_PRE-DEV 2023_POST-DEV 2005
Prepared by CMG, Printed 4/7/2023

Summary for Subcatchment 1: 2005 Area

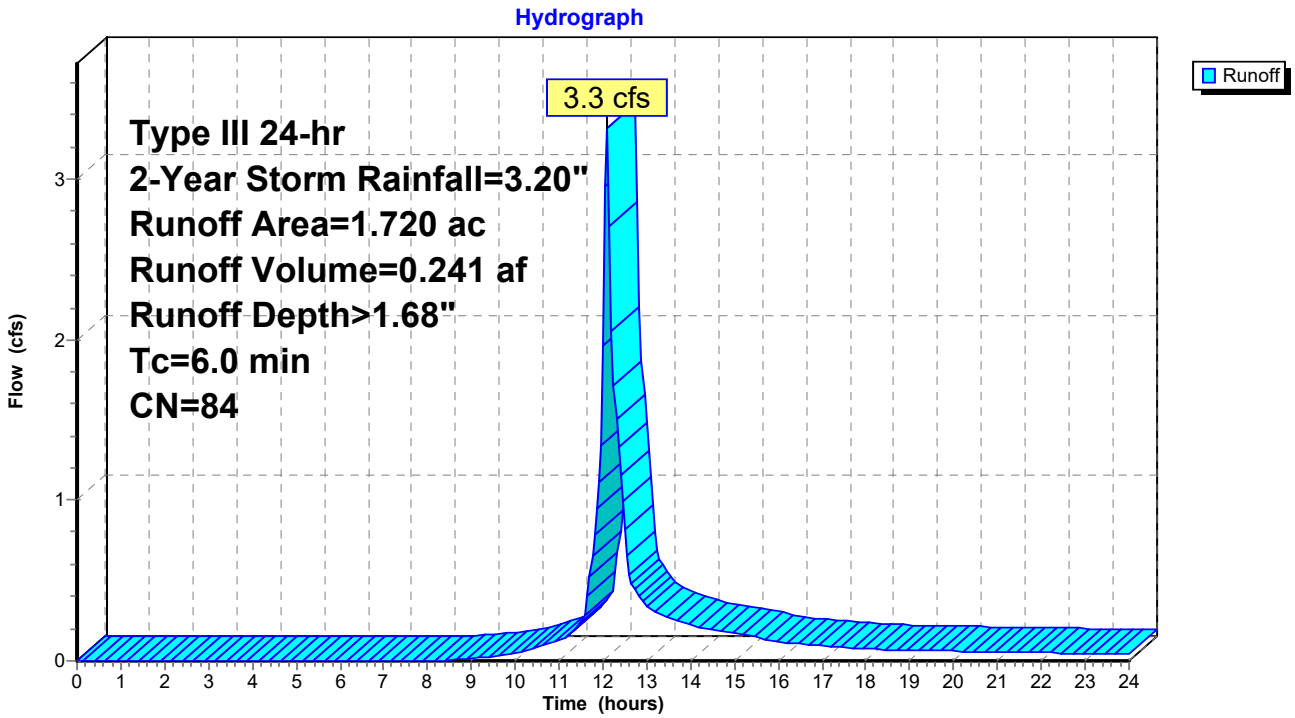
Runoff = 3.3 cfs @ 12.09 hrs, Volume= 0.241 af, Depth> 1.68"
Routed to Pond 2P : As-built Stormwater Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.20"

Area (ac)	CN	Description
0.630	61	>75% Grass cover, Good, HSG B
1.090	98	Paved parking, HSG B
1.720	84	Weighted Average
0.630		36.63% Pervious Area
1.090		63.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Direct**
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1: 2005 Area



Summary for Pond 2P: As-built Stormwater Basin

Inflow Area = 1.720 ac, 63.37% Impervious, Inflow Depth > 1.68" for 2-Year Storm event
Inflow = 3.3 cfs @ 12.09 hrs, Volume= 0.241 af
Outflow = 1.1 cfs @ 12.42 hrs, Volume= 0.241 af, Atten= 67%, Lag= 19.7 min
Primary = 1.1 cfs @ 12.42 hrs, Volume= 0.241 af
Routed to Link 4L : Sullivan Ave Drainage System

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 122.18' @ 12.42 hrs Surf.Area= 1,716 sf Storage= 2,735 cf

Plug-Flow detention time= 25.6 min calculated for 0.241 af (100% of inflow)
Center-of-Mass det. time= 25.2 min (854.1 - 829.0)

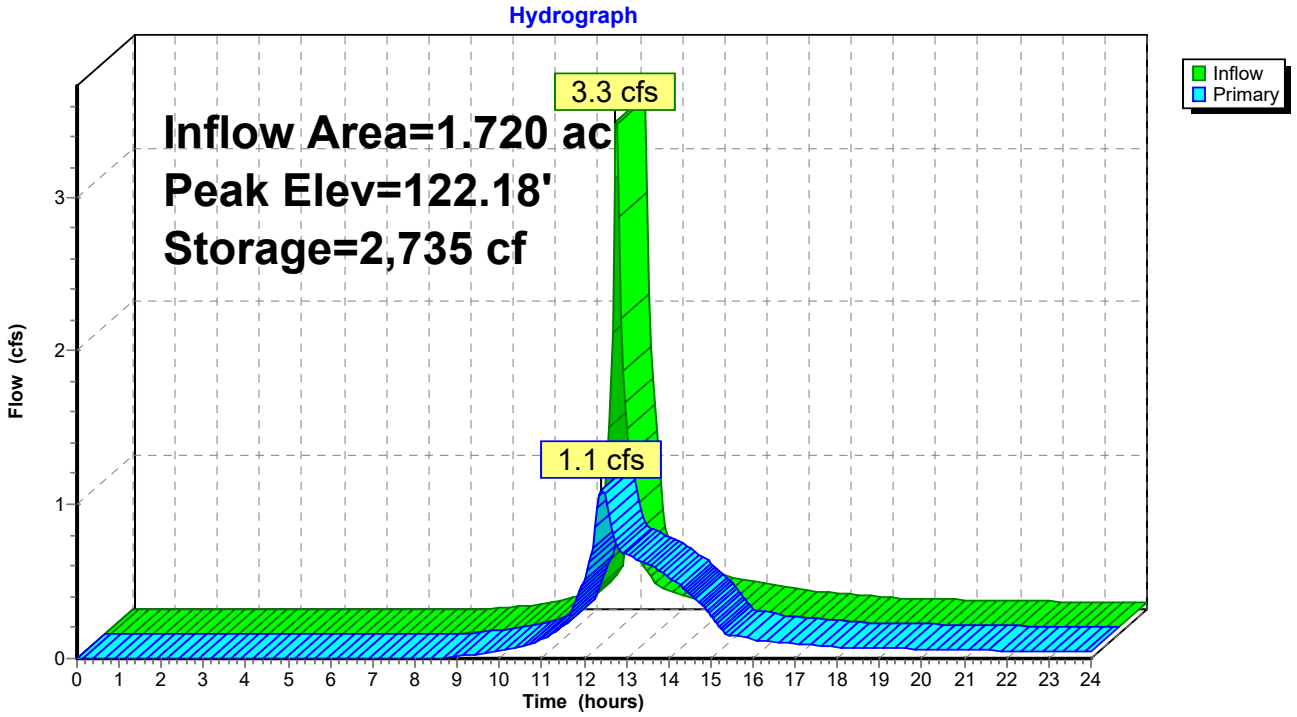
Volume	Invert	Avail.Storage	Storage Description
#1	119.10'	13,758 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
119.10	0	0	0
120.00	591	266	266
121.00	1,072	832	1,097
122.00	1,611	1,342	2,439
123.00	2,201	1,906	4,345
124.00	2,857	2,529	6,874
125.00	3,637	3,247	10,121
126.00	3,637	3,637	13,758

Device	Routing	Invert	Outlet Devices
#1	Primary	119.16'	**15.0" Round Culvert** L= 13.3' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 119.16' / 118.84' S= 0.0241 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#2	Device 1	124.32'	**24.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	121.83'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	119.03'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.1 cfs @ 12.42 hrs HW=122.18' (Free Discharge)
↑**1=Culvert** (Passes 1.1 cfs of 9.1 cfs potential flow)
↑**2=Orifice/Grate** (Controls 0.0 cfs)
3=Orifice/Grate (Orifice Controls 0.4 cfs @ 2.00 fps)
4=Orifice/Grate (Orifice Controls 0.7 cfs @ 8.31 fps)

Pond 2P: As-built Stormwater Basin

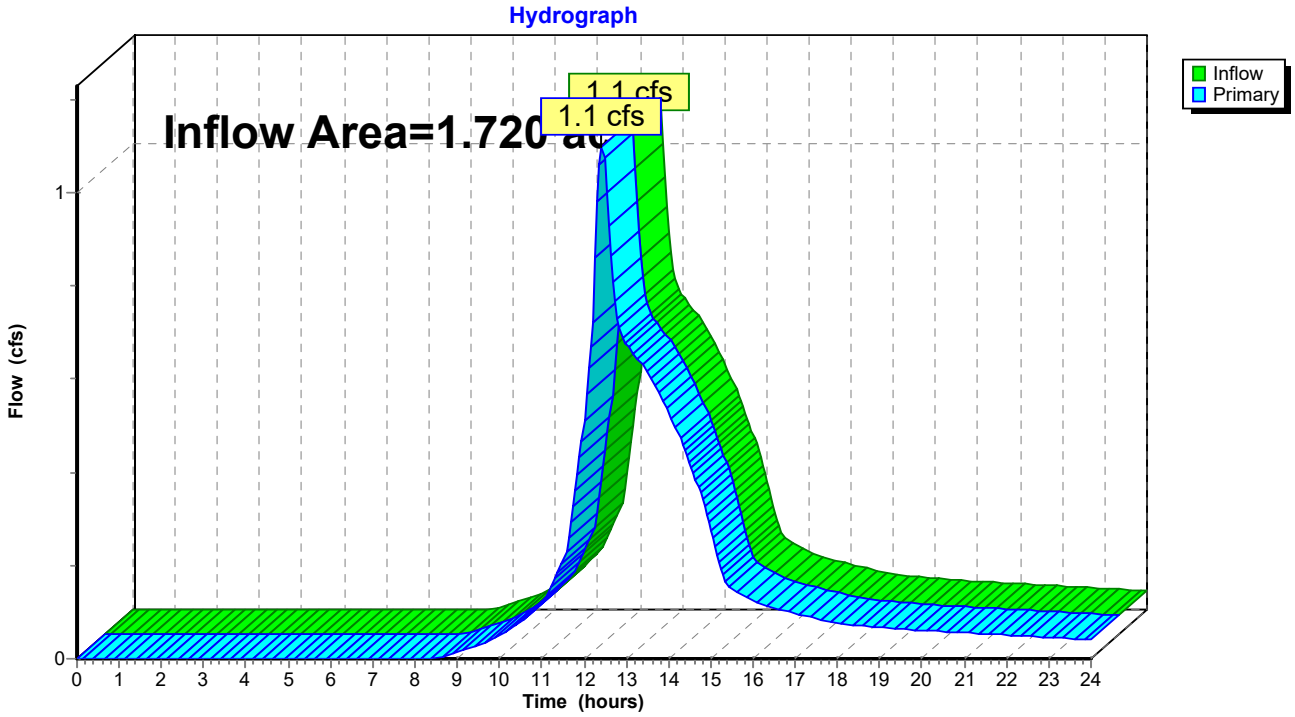


Summary for Link 4L: Sullivan Ave Drainage System

Inflow Area = 1.720 ac, 63.37% Impervious, Inflow Depth > 1.68" for 2-Year Storm event
Inflow = 1.1 cfs @ 12.42 hrs, Volume= 0.241 af
Primary = 1.1 cfs @ 12.42 hrs, Volume= 0.241 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 4L: Sullivan Ave Drainage System



Summary for Subcatchment 1: 2005 Area

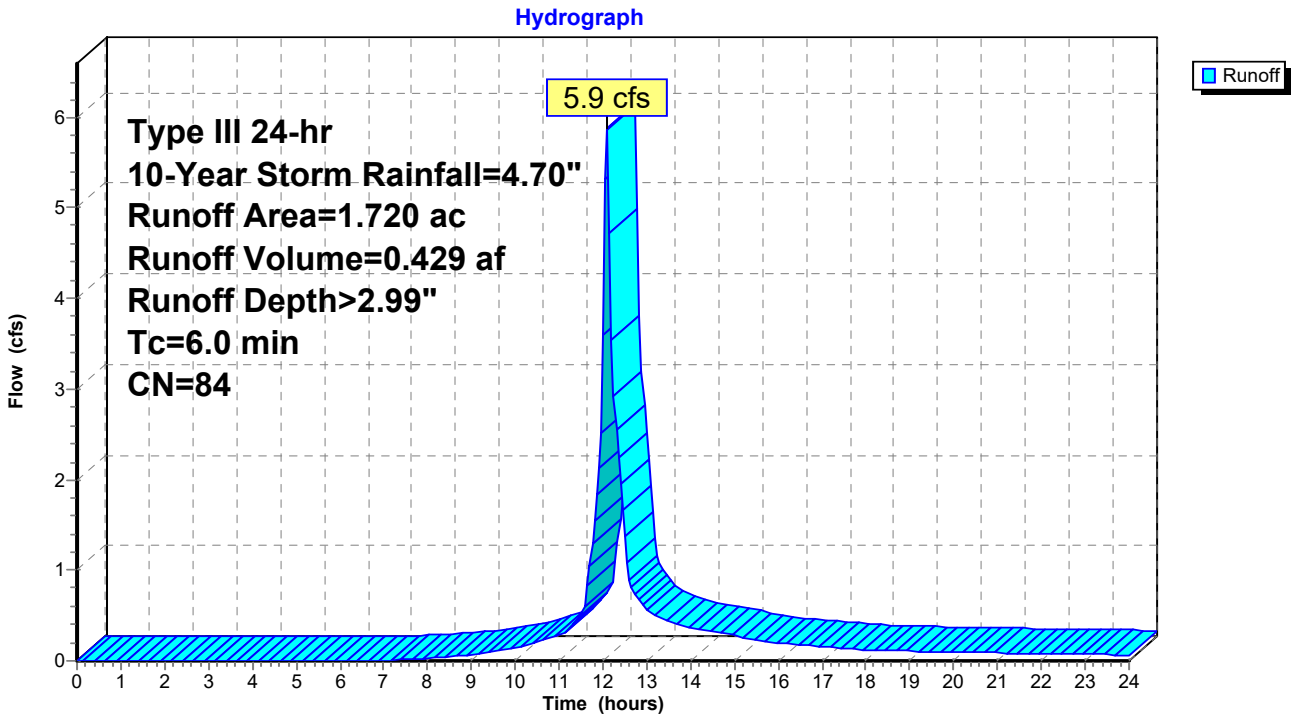
Runoff = 5.9 cfs @ 12.09 hrs, Volume= 0.429 af, Depth> 2.99"
Routed to Pond 2P : As-built Stormwater Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=4.70"

Area (ac)	CN	Description
0.630	61	>75% Grass cover, Good, HSG B
1.090	98	Paved parking, HSG B
1.720	84	Weighted Average
0.630		36.63% Pervious Area
1.090		63.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Direct**
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1: 2005 Area



Summary for Pond 2P: As-built Stormwater Basin

Inflow Area = 1.720 ac, 63.37% Impervious, Inflow Depth > 2.99" for 10-Year Storm event
Inflow = 5.9 cfs @ 12.09 hrs, Volume= 0.429 af
Outflow = 2.4 cfs @ 12.32 hrs, Volume= 0.429 af, Atten= 59%, Lag= 13.8 min
Primary = 2.4 cfs @ 12.32 hrs, Volume= 0.429 af
Routed to Link 4L : Sullivan Ave Drainage System

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 123.08' @ 12.32 hrs Surf.Area= 2,252 sf Storage= 4,519 cf

Plug-Flow detention time= 25.7 min calculated for 0.428 af (100% of inflow)
Center-of-Mass det. time= 25.3 min (837.8 - 812.5)

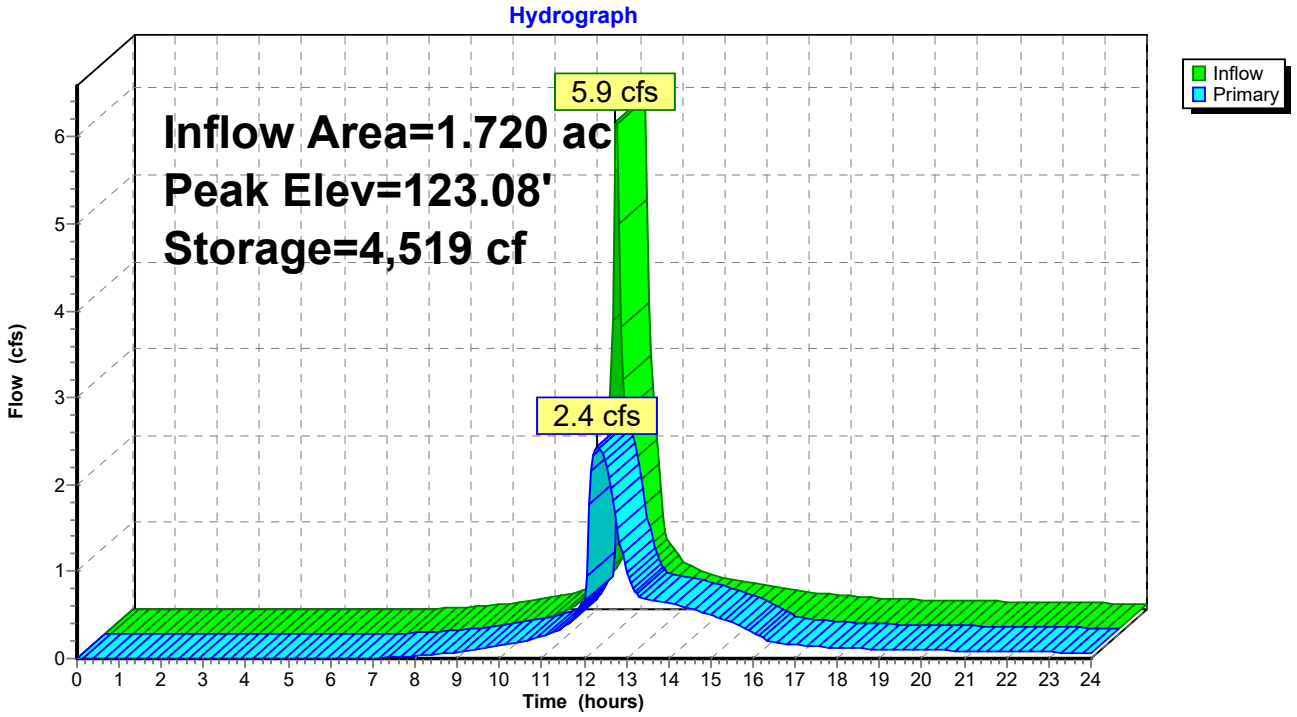
Volume	Invert	Avail.Storage	Storage Description
#1	119.10'	13,758 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
119.10	0	0	0
120.00	591	266	266
121.00	1,072	832	1,097
122.00	1,611	1,342	2,439
123.00	2,201	1,906	4,345
124.00	2,857	2,529	6,874
125.00	3,637	3,247	10,121
126.00	3,637	3,637	13,758

Device	Routing	Invert	Outlet Devices
#1	Primary	119.16'	**15.0" Round Culvert** L= 13.3' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 119.16' / 118.84' S= 0.0241 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#2	Device 1	124.32'	**24.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	121.83'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	119.03'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.4 cfs @ 12.32 hrs HW=123.07' (Free Discharge)
└**1=Culvert** (Passes 2.4 cfs of 10.7 cfs potential flow)
  ├**2=Orifice/Grate** (Controls 0.0 cfs)
  ├**3=Orifice/Grate** (Orifice Controls 1.6 cfs @ 4.60 fps)
  └**4=Orifice/Grate** (Orifice Controls 0.8 cfs @ 9.48 fps)

Pond 2P: As-built Stormwater Basin

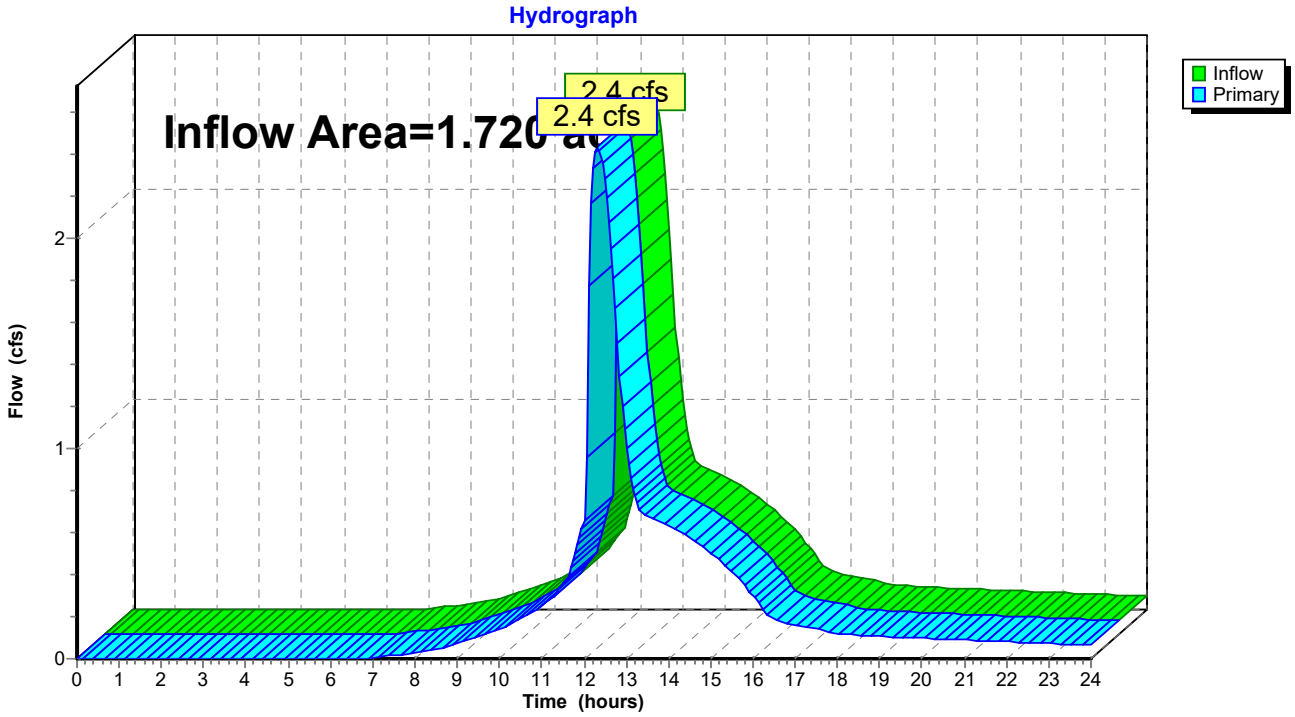


Summary for Link 4L: Sullivan Ave Drainage System

Inflow Area = 1.720 ac, 63.37% Impervious, Inflow Depth > 2.99" for 10-Year Storm event
Inflow = 2.4 cfs @ 12.32 hrs, Volume= 0.429 af
Primary = 2.4 cfs @ 12.32 hrs, Volume= 0.429 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 4L: Sullivan Ave Drainage System



Summary for Subcatchment 1: 2005 Area

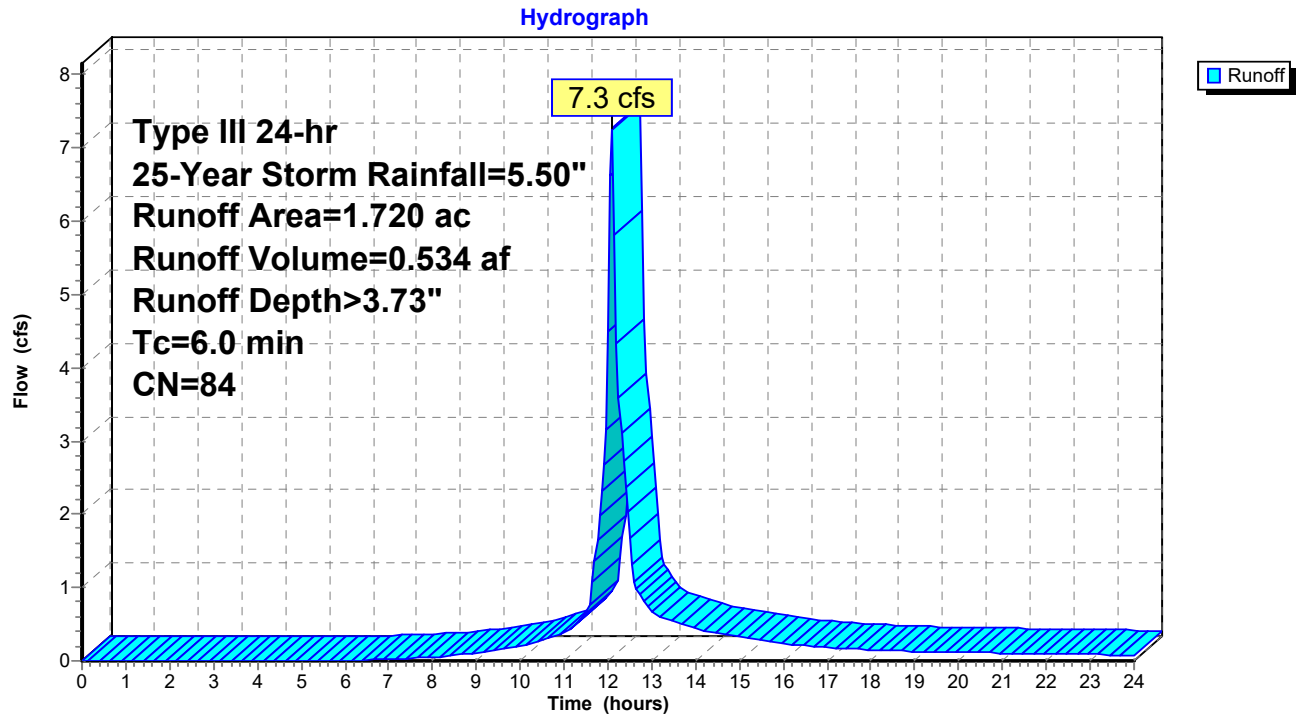
Runoff = 7.3 cfs @ 12.09 hrs, Volume= 0.534 af, Depth> 3.73"
Routed to Pond 2P : As-built Stormwater Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=5.50"

Area (ac)	CN	Description
0.630	61	>75% Grass cover, Good, HSG B
1.090	98	Paved parking, HSG B
1.720	84	Weighted Average
0.630		36.63% Pervious Area
1.090		63.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Direct**
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1: 2005 Area



Summary for Pond 2P: As-built Stormwater Basin

Inflow Area = 1.720 ac, 63.37% Impervious, Inflow Depth > 3.73" for 25-Year Storm event
Inflow = 7.3 cfs @ 12.09 hrs, Volume= 0.534 af
Outflow = 2.9 cfs @ 12.33 hrs, Volume= 0.534 af, Atten= 60%, Lag= 14.4 min
Primary = 2.9 cfs @ 12.33 hrs, Volume= 0.534 af
Routed to Link 4L : Sullivan Ave Drainage System

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 123.59' @ 12.33 hrs Surf.Area= 2,587 sf Storage= 5,753 cf

Plug-Flow detention time= 26.8 min calculated for 0.533 af (100% of inflow)
Center-of-Mass det. time= 26.4 min (832.7 - 806.3)

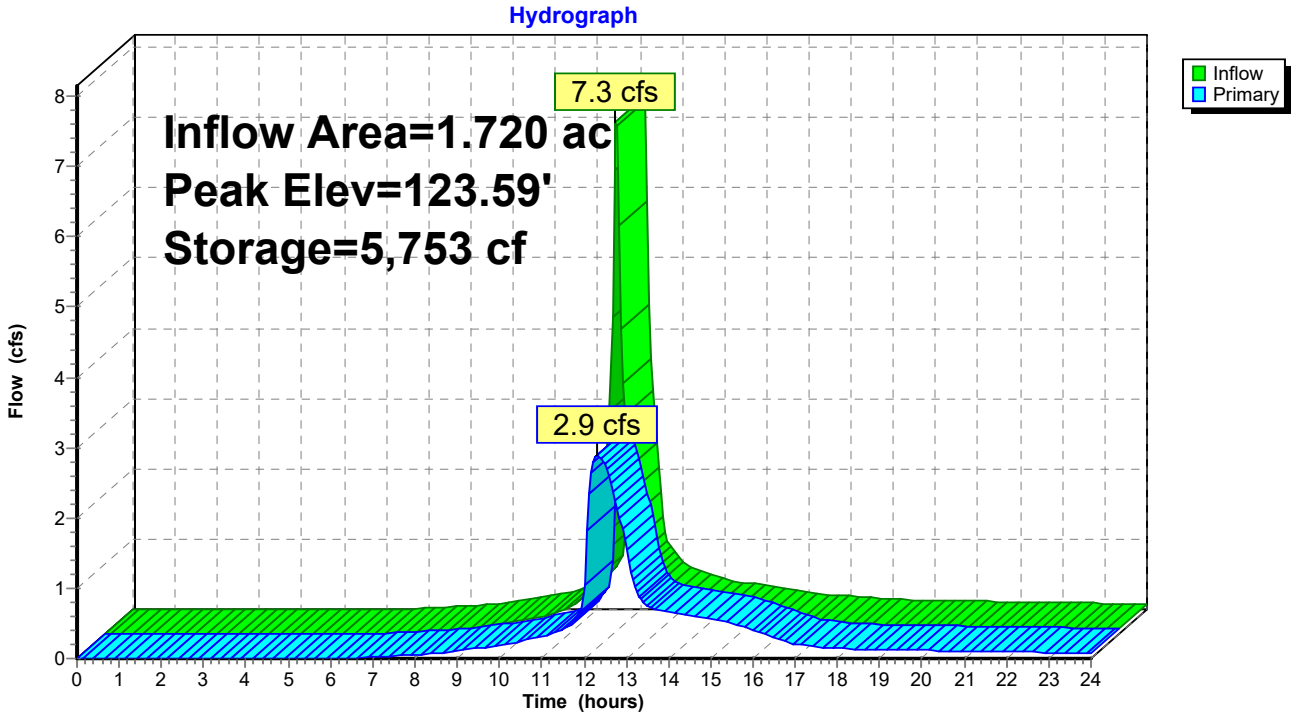
Volume	Invert	Avail.Storage	Storage Description
#1	119.10'	13,758 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
119.10	0	0	0
120.00	591	266	266
121.00	1,072	832	1,097
122.00	1,611	1,342	2,439
123.00	2,201	1,906	4,345
124.00	2,857	2,529	6,874
125.00	3,637	3,247	10,121
126.00	3,637	3,637	13,758

Device	Routing	Invert	Outlet Devices
#1	Primary	119.16'	**15.0" Round Culvert** L= 13.3' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 119.16' / 118.84' S= 0.0241 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#2	Device 1	124.32'	**24.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	121.83'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	119.03'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.9 cfs @ 12.33 hrs HW=123.59' (Free Discharge)
└**1=Culvert** (Passes 2.9 cfs of 11.5 cfs potential flow)
  ├**2=Orifice/Grate** (Controls 0.0 cfs)
  ├**3=Orifice/Grate** (Orifice Controls 2.0 cfs @ 5.74 fps)
  └**4=Orifice/Grate** (Orifice Controls 0.9 cfs @ 10.09 fps)

Pond 2P: As-built Stormwater Basin

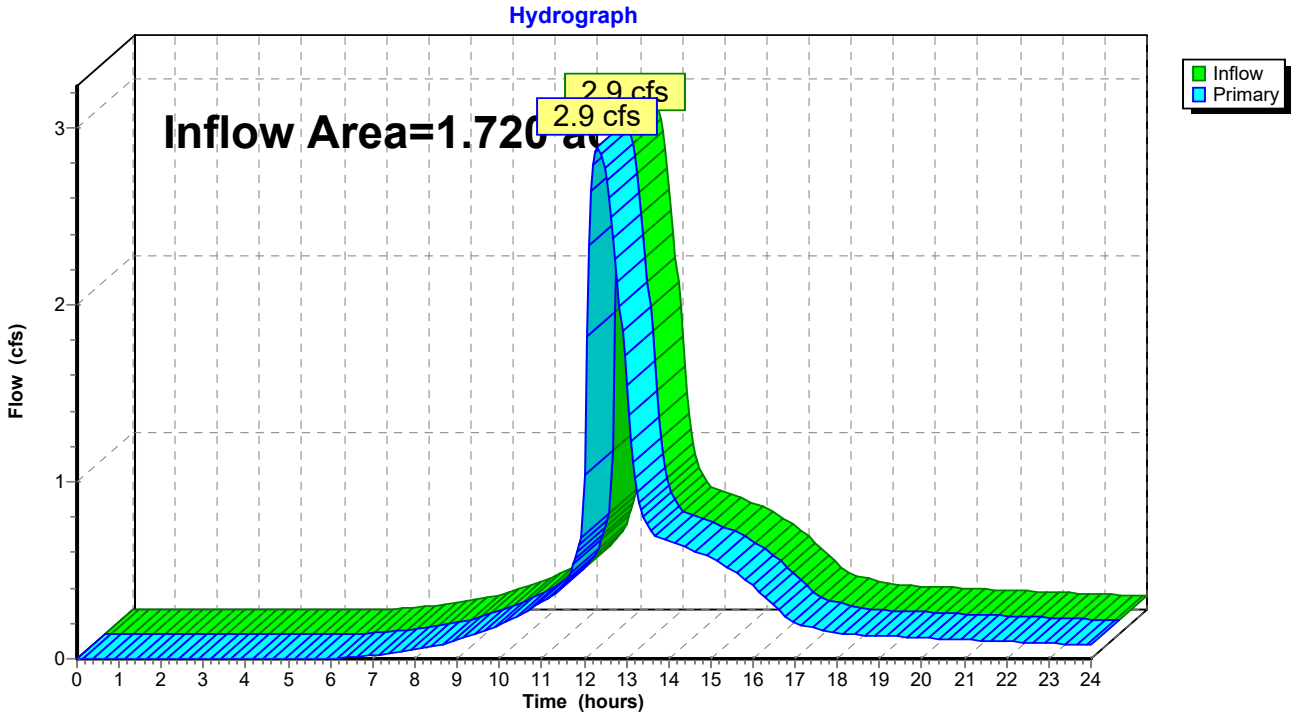


Summary for Link 4L: Sullivan Ave Drainage System

Inflow Area = 1.720 ac, 63.37% Impervious, Inflow Depth > 3.73" for 25-Year Storm event
Inflow = 2.9 cfs @ 12.33 hrs, Volume= 0.534 af
Primary = 2.9 cfs @ 12.33 hrs, Volume= 0.534 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 4L: Sullivan Ave Drainage System



Summary for Subcatchment 1: 2005 Area

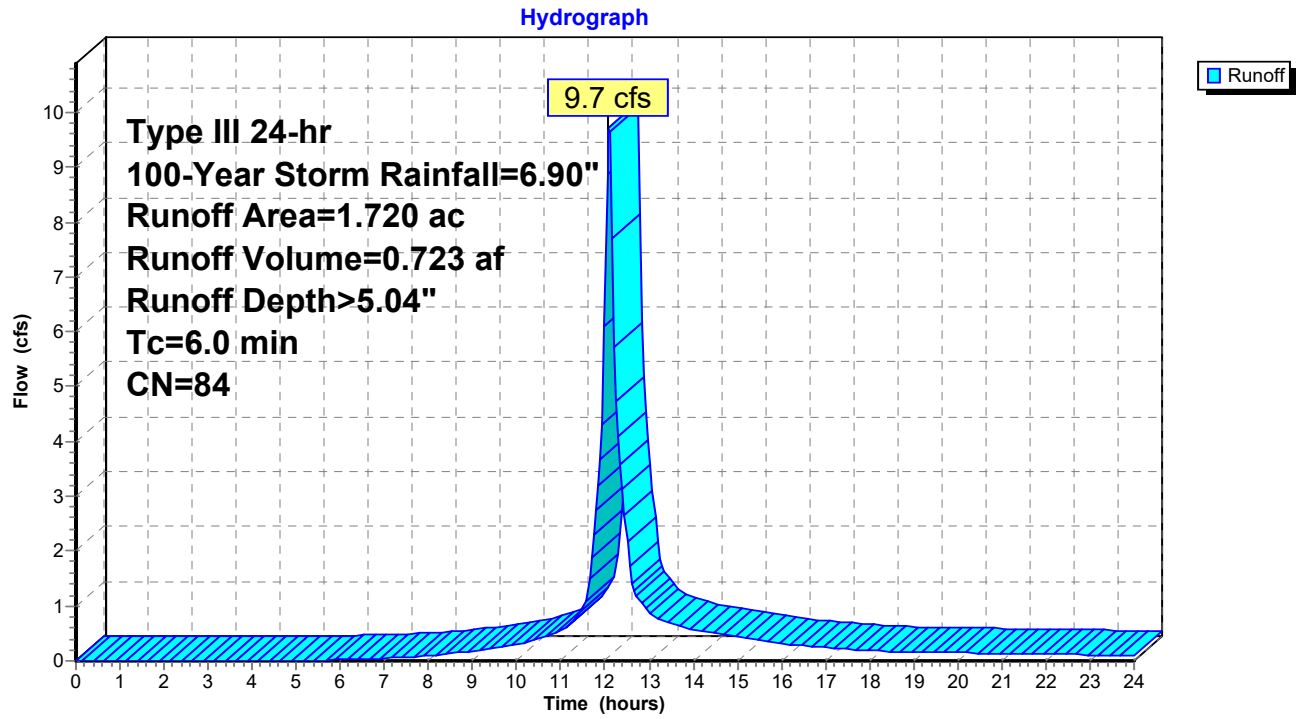
Runoff = 9.7 cfs @ 12.09 hrs, Volume= 0.723 af, Depth> 5.04"
Routed to Pond 2P : As-built Stormwater Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Storm Rainfall=6.90"

Area (ac)	CN	Description
0.630	61	>75% Grass cover, Good, HSG B
1.090	98	Paved parking, HSG B
1.720	84	Weighted Average
0.630		36.63% Pervious Area
1.090		63.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Direct**
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1: 2005 Area



Summary for Pond 2P: As-built Stormwater Basin

Inflow Area = 1.720 ac, 63.37% Impervious, Inflow Depth > 5.04" for 100-Year Storm event
Inflow = 9.7 cfs @ 12.09 hrs, Volume= 0.723 af
Outflow = 4.0 cfs @ 12.32 hrs, Volume= 0.722 af, Atten= 59%, Lag= 13.7 min
Primary = 4.0 cfs @ 12.32 hrs, Volume= 0.722 af
Routed to Link 4L : Sullivan Ave Drainage System

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 124.38' @ 12.32 hrs Surf.Area= 3,155 sf Storage= 8,024 cf

Plug-Flow detention time= 28.8 min calculated for 0.722 af (100% of inflow)
Center-of-Mass det. time= 28.6 min (826.4 - 797.8)

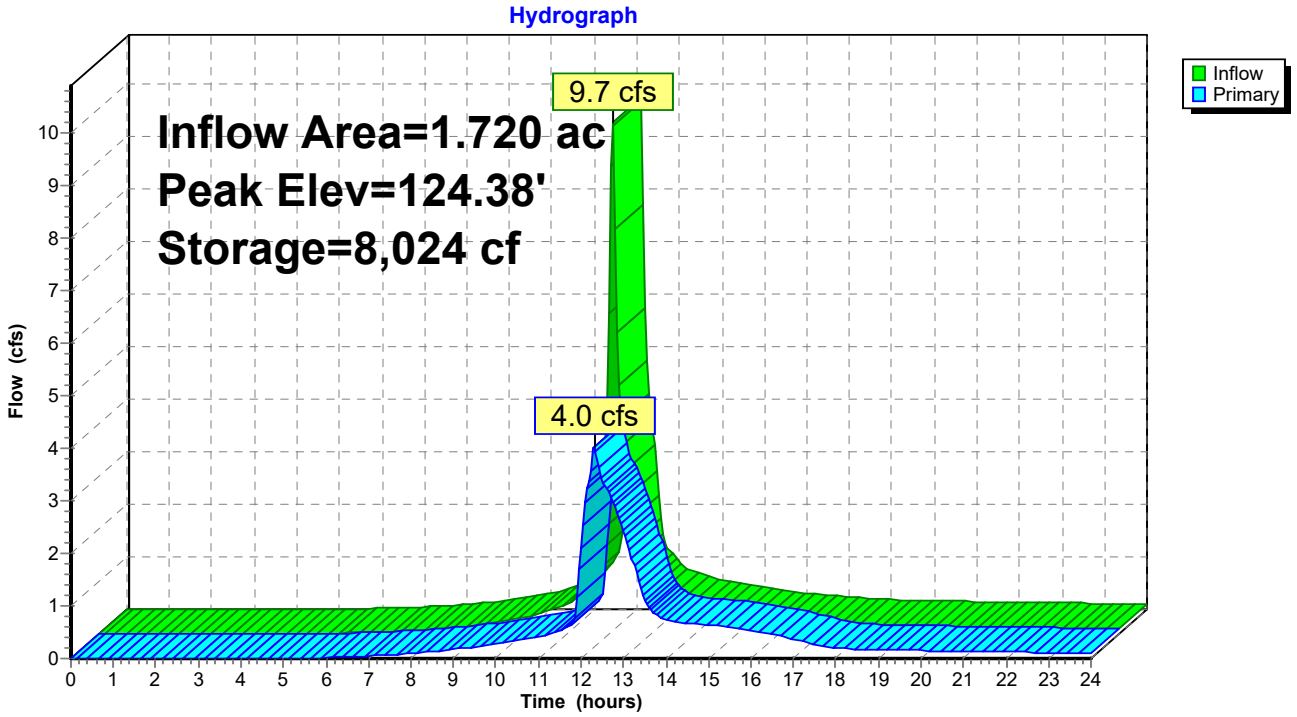
Volume	Invert	Avail.Storage	Storage Description
#1	119.10'	13,758 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
119.10	0	0	0
120.00	591	266	266
121.00	1,072	832	1,097
122.00	1,611	1,342	2,439
123.00	2,201	1,906	4,345
124.00	2,857	2,529	6,874
125.00	3,637	3,247	10,121
126.00	3,637	3,637	13,758

Device	Routing	Invert	Outlet Devices
#1	Primary	119.16'	**15.0" Round Culvert** L= 13.3' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 119.16' / 118.84' S= 0.0241 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#2	Device 1	124.32'	**24.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	121.83'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	119.03'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.9 cfs @ 12.32 hrs HW=124.38' (Free Discharge)
└**1=Culvert** (Passes 3.9 cfs of 12.7 cfs potential flow)
  ├**2=Orifice/Grate** (Weir Controls 0.5 cfs @ 0.79 fps)
  ├**3=Orifice/Grate** (Orifice Controls 2.5 cfs @ 7.17 fps)
  └**4=Orifice/Grate** (Orifice Controls 1.0 cfs @ 10.96 fps)

Pond 2P: As-built Stormwater Basin

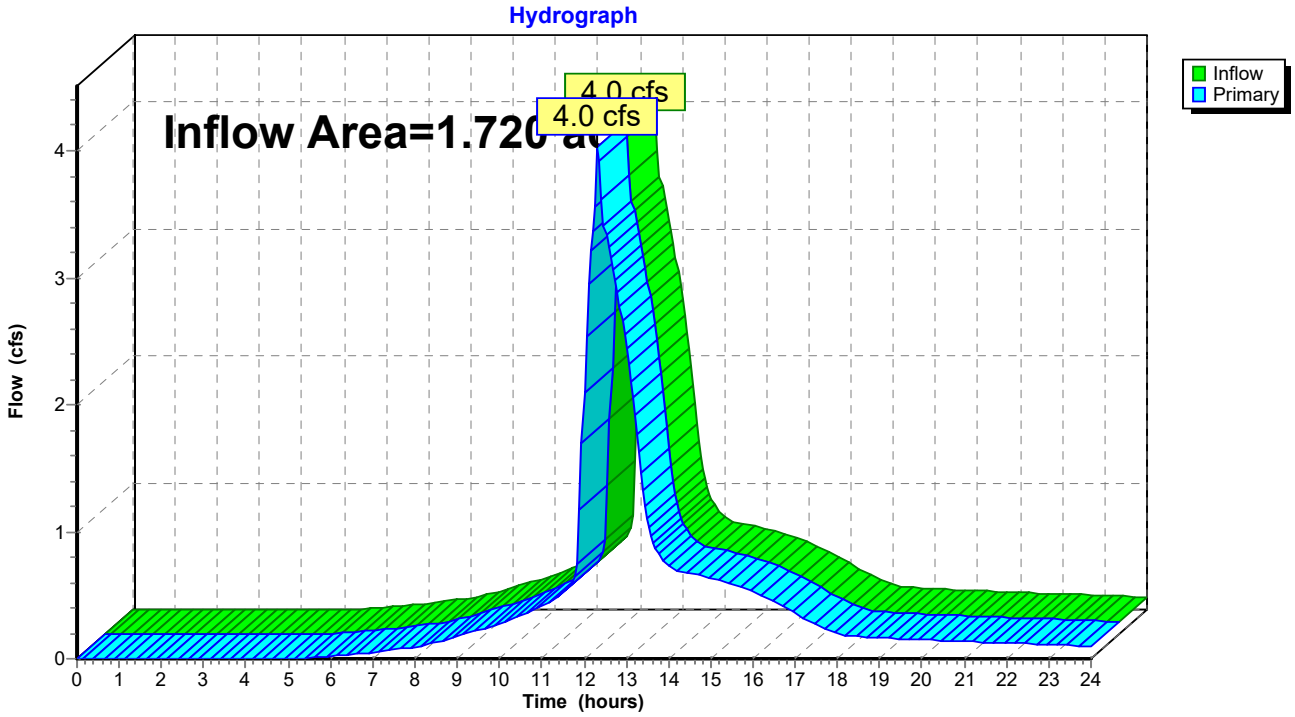


Summary for Link 4L: Sullivan Ave Drainage System

Inflow Area = 1.720 ac, 63.37% Impervious, Inflow Depth > 5.04" for 100-Year Storm event
Inflow = 4.0 cfs @ 12.32 hrs, Volume= 0.722 af
Primary = 4.0 cfs @ 12.32 hrs, Volume= 0.722 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

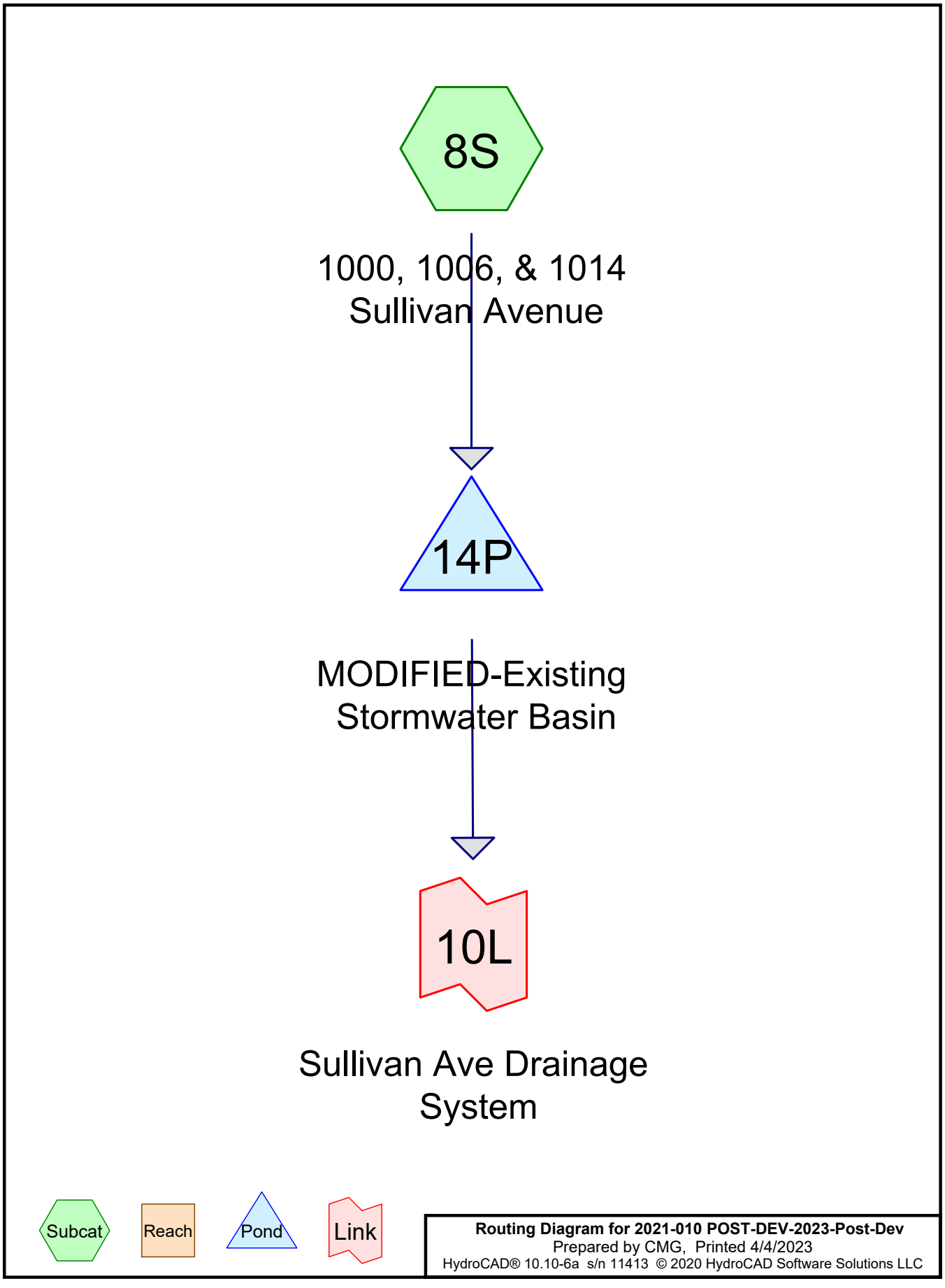
Link 4L: Sullivan Ave Drainage System



Appendix C

Proposed 2023 Post-Development Conditions

Prepared by CMG



Routing Diagram for 2021-010 POST-DEV-2023-Post-Dev
Prepared by CMG, Printed 4/4/2023

Summary for Subcatchment 8S: 1000, 1006, & 1014 Sullivan Avenue

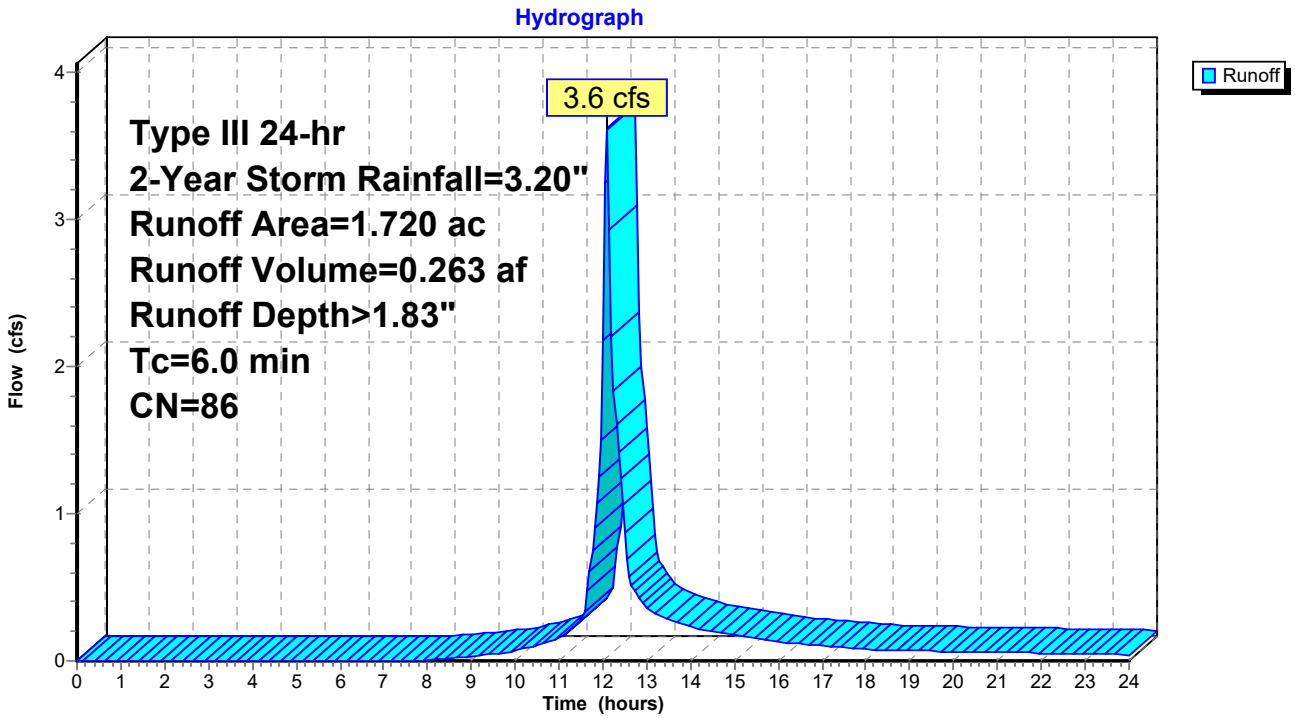
Runoff = 3.6 cfs @ 12.09 hrs, Volume= 0.263 af, Depth> 1.83"
Routed to Pond 14P : MODIFIED-Existing Stormwater Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.20"

Area (ac)	CN	Description
0.550	61	>75% Grass cover, Good, HSG B
1.170	98	Paved parking, HSG B
1.720	86	Weighted Average
0.550		31.98% Pervious Area
1.170		68.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Direct**
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 8S: 1000, 1006, & 1014 Sullivan Avenue



Summary for Pond 14P: MODIFIED-Existing Stormwater Basin

Inflow Area = 1.720 ac, 68.02% Impervious, Inflow Depth > 1.83" for 2-Year Storm event
Inflow = 3.6 cfs @ 12.09 hrs, Volume= 0.263 af
Outflow = 1.1 cfs @ 12.43 hrs, Volume= 0.263 af, Atten= 69%, Lag= 20.3 min
Primary = 1.1 cfs @ 12.43 hrs, Volume= 0.263 af
Routed to Link 10L : Sullivan Ave Drainage System

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 122.11' @ 12.43 hrs Surf.Area= 1,673 sf Storage= 2,534 cf

Plug-Flow detention time= 14.7 min calculated for 0.262 af (100% of inflow)
Center-of-Mass det. time= 14.5 min (836.5 - 822.0)

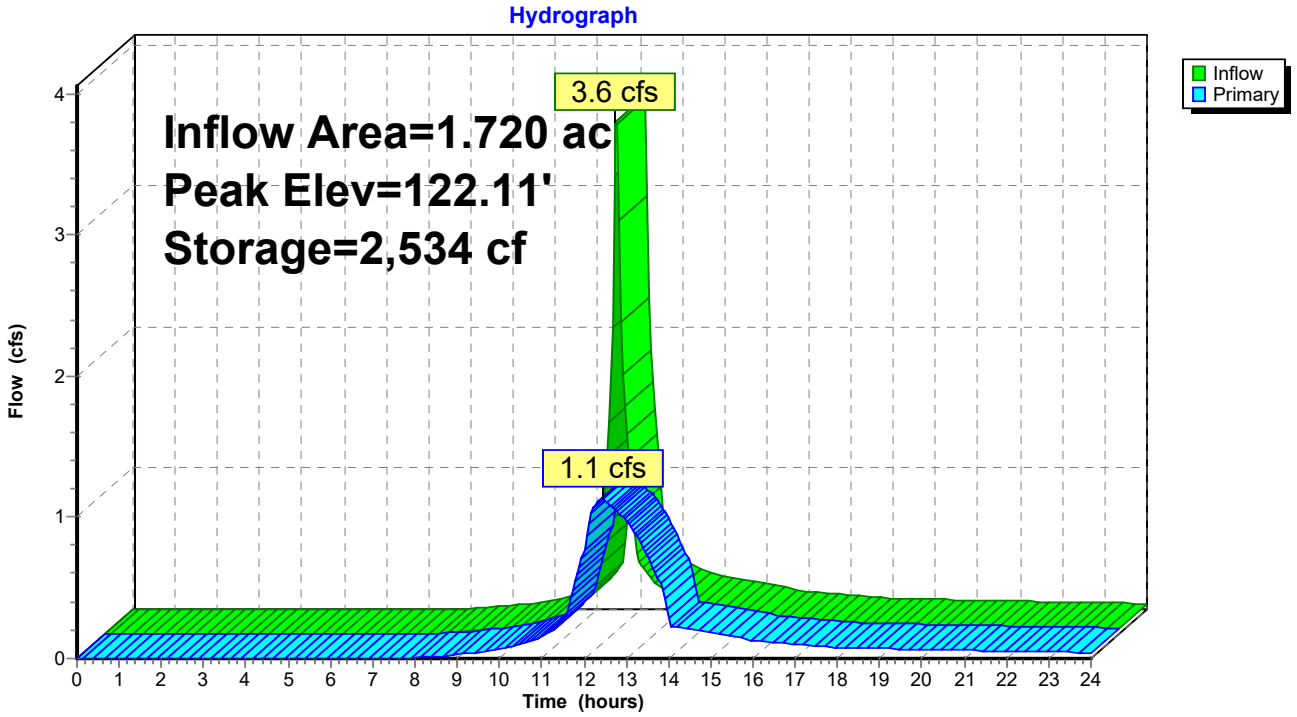
Volume	Invert	Avail.Storage	Storage Description
#1	119.00'	10,008 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
119.00	0	0.0	0	0	0
120.00	591	170.6	197	197	2,318
121.00	1,072	195.0	820	1,017	3,051
122.00	1,611	220.0	1,332	2,349	3,902
123.00	2,201	244.0	1,898	4,247	4,818
124.00	2,857	268.9	2,522	6,769	5,866
125.00	3,637	294.2	3,239	10,008	7,034

Device	Routing	Invert	Outlet Devices
#1	Primary	119.16'	**15.0" Round Culvert** L= 13.3' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 119.16' / 118.84' S= 0.0241 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#2	Device 1	124.35'	**24.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	119.03'	**5.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	122.05'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.1 cfs @ 12.43 hrs HW=122.11' (Free Discharge)
└**1=Culvert** (Passes 1.1 cfs of 9.0 cfs potential flow)
  ├**2=Orifice/Grate** (Controls 0.0 cfs)
  ├**3=Orifice/Grate** (Orifice Controls 1.1 cfs @ 8.16 fps)
  └**4=Orifice/Grate** (Orifice Controls 0.0 cfs @ 0.84 fps)

Pond 14P: MODIFIED-Existing Stormwater Basin

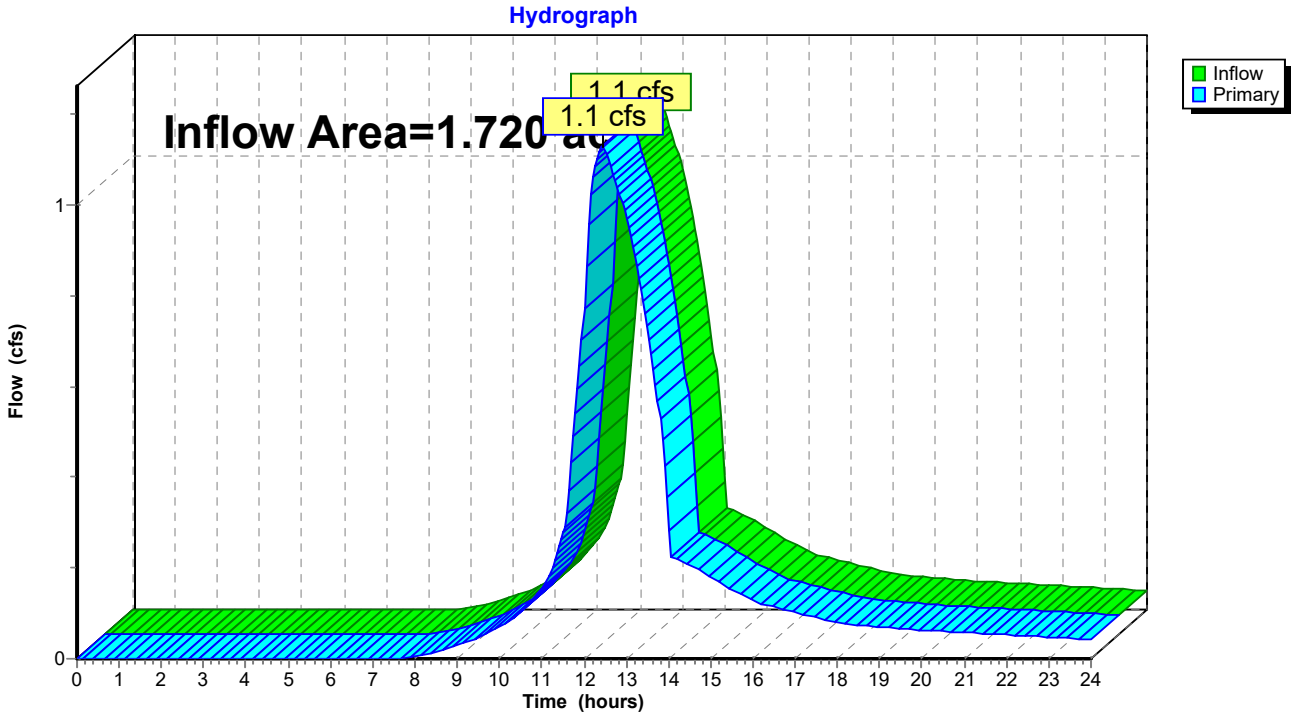


Summary for Link 10L: Sullivan Ave Drainage System

Inflow Area = 1.720 ac, 68.02% Impervious, Inflow Depth > 1.83" for 2-Year Storm event
Inflow = 1.1 cfs @ 12.43 hrs, Volume= 0.263 af
Primary = 1.1 cfs @ 12.43 hrs, Volume= 0.263 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 10L: Sullivan Ave Drainage System



Summary for Subcatchment 8S: 1000, 1006, & 1014 Sullivan Avenue

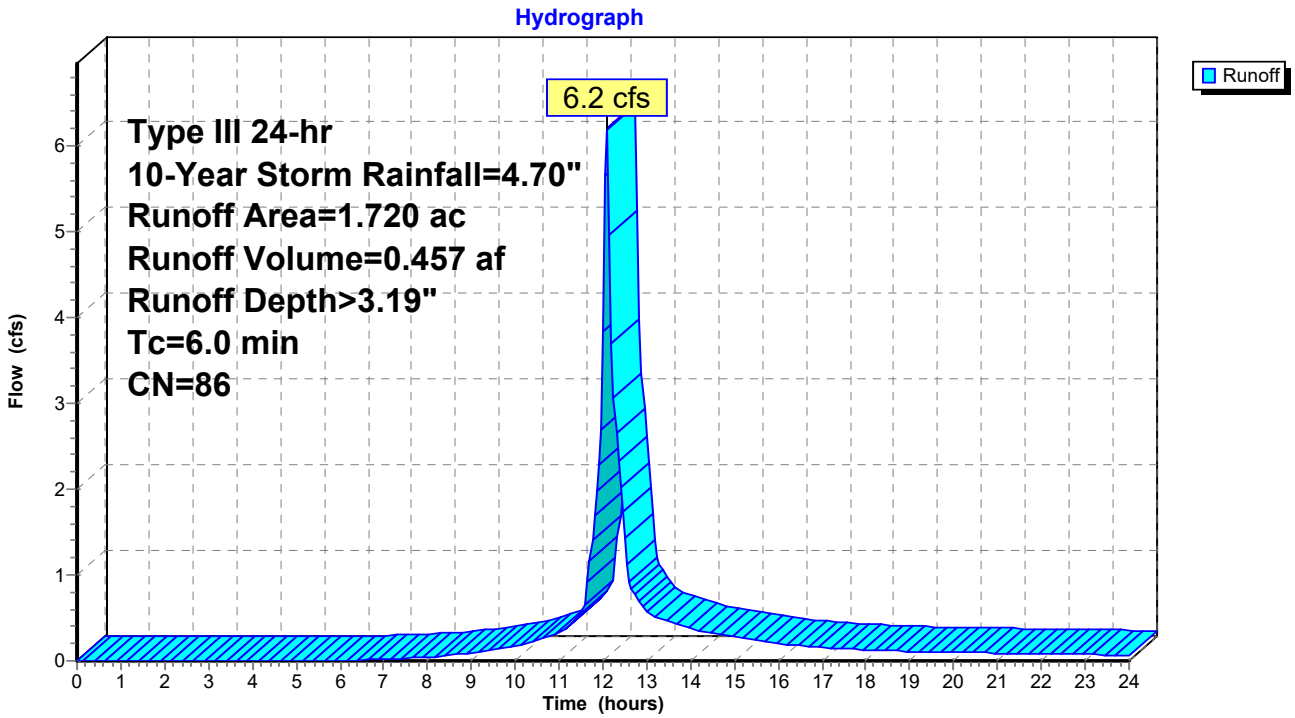
Runoff = 6.2 cfs @ 12.09 hrs, Volume= 0.457 af, Depth> 3.19"
Routed to Pond 14P : MODIFIED-Existing Stormwater Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=4.70"

Area (ac)	CN	Description
0.550	61	>75% Grass cover, Good, HSG B
1.170	98	Paved parking, HSG B
1.720	86	Weighted Average
0.550		31.98% Pervious Area
1.170		68.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Direct**
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 8S: 1000, 1006, & 1014 Sullivan Avenue



Summary for Pond 14P: MODIFIED-Existing Stormwater Basin

Inflow Area = 1.720 ac, 68.02% Impervious, Inflow Depth > 3.19" for 10-Year Storm event
Inflow = 6.2 cfs @ 12.09 hrs, Volume= 0.457 af
Outflow = 2.4 cfs @ 12.34 hrs, Volume= 0.456 af, Atten= 61%, Lag= 14.9 min
Primary = 2.4 cfs @ 12.34 hrs, Volume= 0.456 af
Routed to Link 10L : Sullivan Ave Drainage System

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 123.11' @ 12.34 hrs Surf.Area= 2,269 sf Storage= 4,494 cf

Plug-Flow detention time= 17.6 min calculated for 0.456 af (100% of inflow)
Center-of-Mass det. time= 17.5 min (823.8 - 806.3)

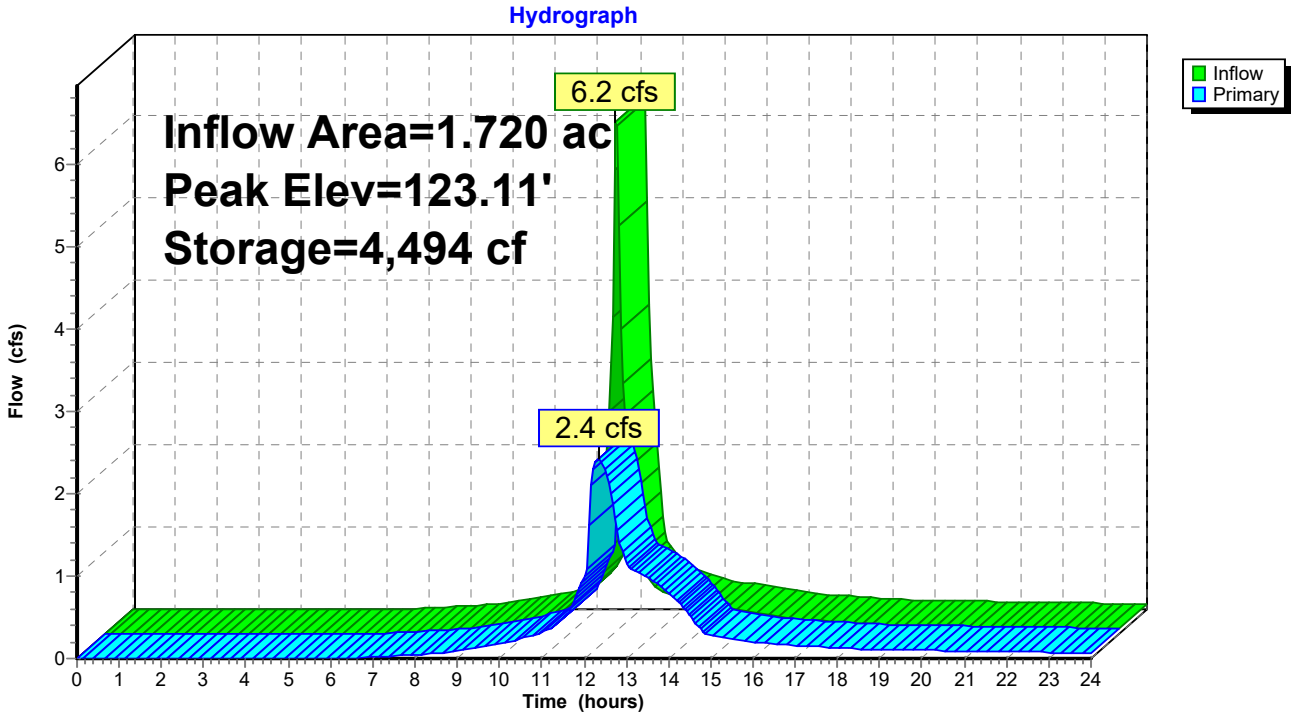
Volume	Invert	Avail.Storage	Storage Description
#1	119.00'	10,008 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
119.00	0	0.0	0	0	0
120.00	591	170.6	197	197	2,318
121.00	1,072	195.0	820	1,017	3,051
122.00	1,611	220.0	1,332	2,349	3,902
123.00	2,201	244.0	1,898	4,247	4,818
124.00	2,857	268.9	2,522	6,769	5,866
125.00	3,637	294.2	3,239	10,008	7,034

Device	Routing	Invert	Outlet Devices
#1	Primary	119.16'	**15.0" Round Culvert** L= 13.3' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 119.16' / 118.84' S= 0.0241 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#2	Device 1	124.35'	**24.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	119.03'	**5.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	122.05'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.4 cfs @ 12.34 hrs HW=123.11' (Free Discharge)
└**1=Culvert** (Passes 2.4 cfs of 10.8 cfs potential flow)
  ├**2=Orifice/Grate** (Controls 0.0 cfs)
  ├**3=Orifice/Grate** (Orifice Controls 1.3 cfs @ 9.47 fps)
  └**4=Orifice/Grate** (Orifice Controls 1.1 cfs @ 4.22 fps)

Pond 14P: MODIFIED-Existing Stormwater Basin

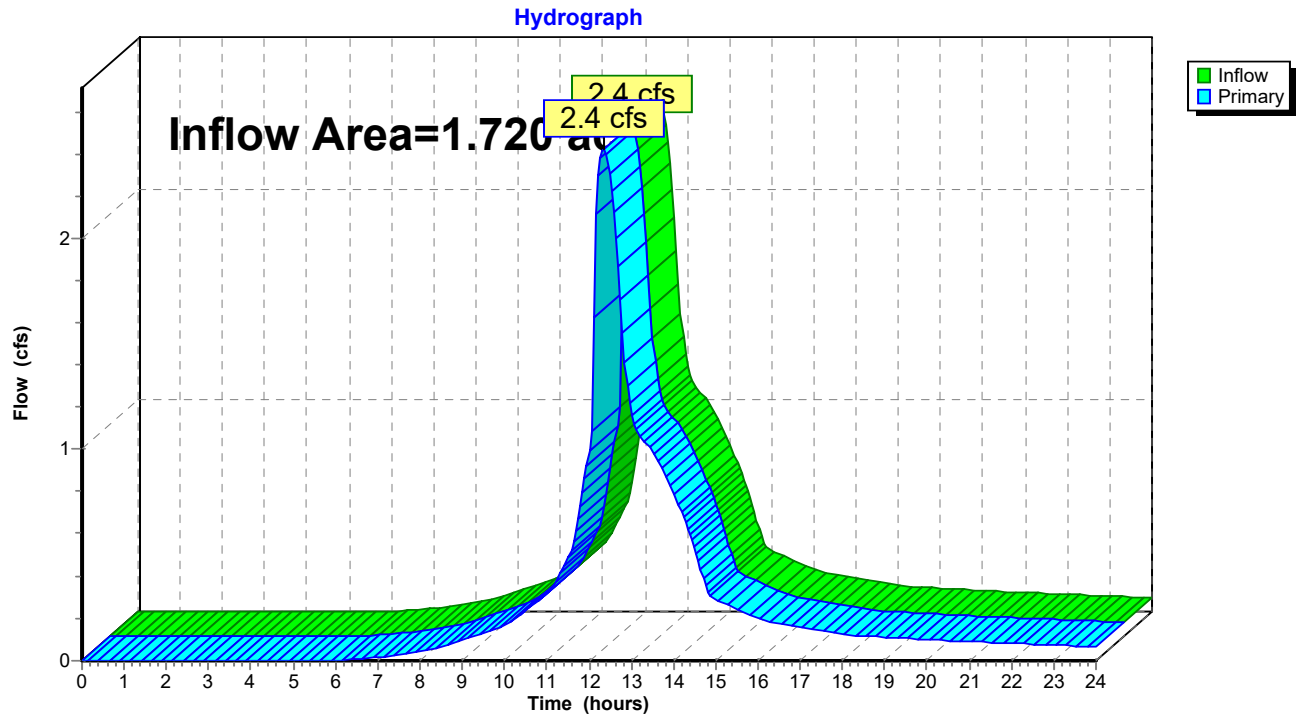


Summary for Link 10L: Sullivan Ave Drainage System

Inflow Area = 1.720 ac, 68.02% Impervious, Inflow Depth > 3.18" for 10-Year Storm event
Inflow = 2.4 cfs @ 12.34 hrs, Volume= 0.456 af
Primary = 2.4 cfs @ 12.34 hrs, Volume= 0.456 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 10L: Sullivan Ave Drainage System



Summary for Subcatchment 8S: 1000, 1006, & 1014 Sullivan Avenue

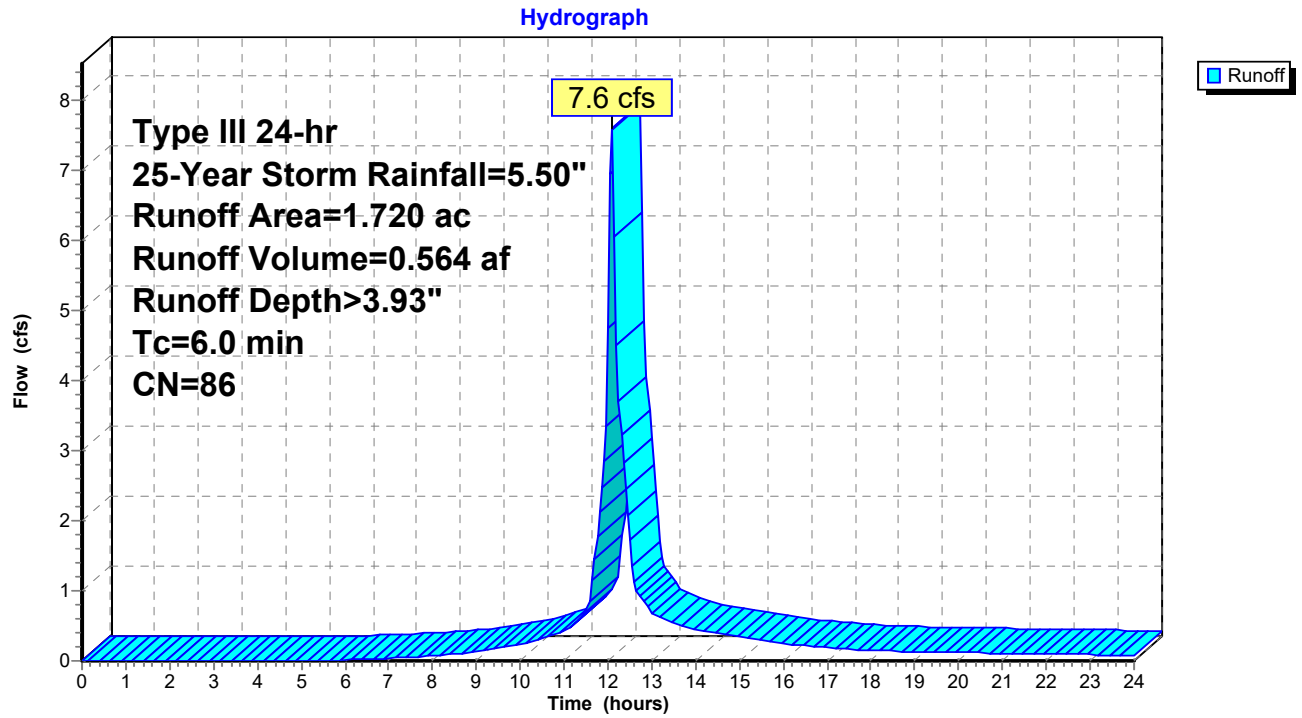
Runoff = 7.6 cfs @ 12.09 hrs, Volume= 0.564 af, Depth> 3.93"
Routed to Pond 14P : MODIFIED-Existing Stormwater Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=5.50"

Area (ac)	CN	Description
0.550	61	>75% Grass cover, Good, HSG B
1.170	98	Paved parking, HSG B
1.720	86	Weighted Average
0.550		31.98% Pervious Area
1.170		68.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Direct**
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 8S: 1000, 1006, & 1014 Sullivan Avenue



Summary for Pond 14P: MODIFIED-Existing Stormwater Basin

Inflow Area = 1.720 ac, 68.02% Impervious, Inflow Depth > 3.93" for 25-Year Storm event
Inflow = 7.6 cfs @ 12.09 hrs, Volume= 0.564 af
Outflow = 2.8 cfs @ 12.35 hrs, Volume= 0.564 af, Atten= 63%, Lag= 15.7 min
Primary = 2.8 cfs @ 12.35 hrs, Volume= 0.564 af
Routed to Link 10L : Sullivan Ave Drainage System

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 123.63' @ 12.35 hrs Surf.Area= 2,603 sf Storage= 5,755 cf

Plug-Flow detention time= 19.1 min calculated for 0.564 af (100% of inflow)
Center-of-Mass det. time= 19.0 min (819.4 - 800.4)

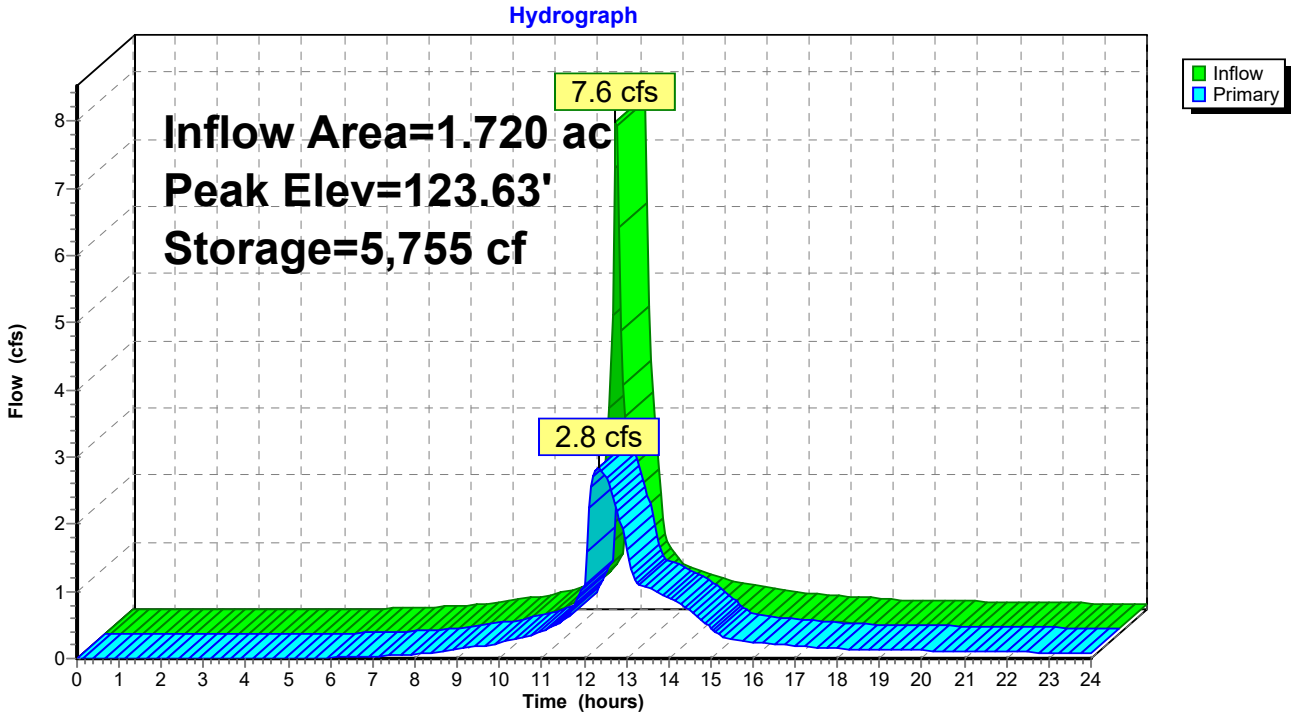
Volume	Invert	Avail.Storage	Storage Description
#1	119.00'	10,008 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
119.00	0	0.0	0	0	0
120.00	591	170.6	197	197	2,318
121.00	1,072	195.0	820	1,017	3,051
122.00	1,611	220.0	1,332	2,349	3,902
123.00	2,201	244.0	1,898	4,247	4,818
124.00	2,857	268.9	2,522	6,769	5,866
125.00	3,637	294.2	3,239	10,008	7,034

Device	Routing	Invert	Outlet Devices
#1	Primary	119.16'	**15.0" Round Culvert** L= 13.3' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 119.16' / 118.84' S= 0.0241 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#2	Device 1	124.35'	**24.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	119.03'	**5.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	122.05'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.8 cfs @ 12.35 hrs HW=123.63' (Free Discharge)
└**1=Culvert** (Passes 2.8 cfs of 11.6 cfs potential flow)
  ├**2=Orifice/Grate** (Controls 0.0 cfs)
  ├**3=Orifice/Grate** (Orifice Controls 1.4 cfs @ 10.09 fps)
  └**4=Orifice/Grate** (Orifice Controls 1.5 cfs @ 5.46 fps)

Pond 14P: MODIFIED-Existing Stormwater Basin

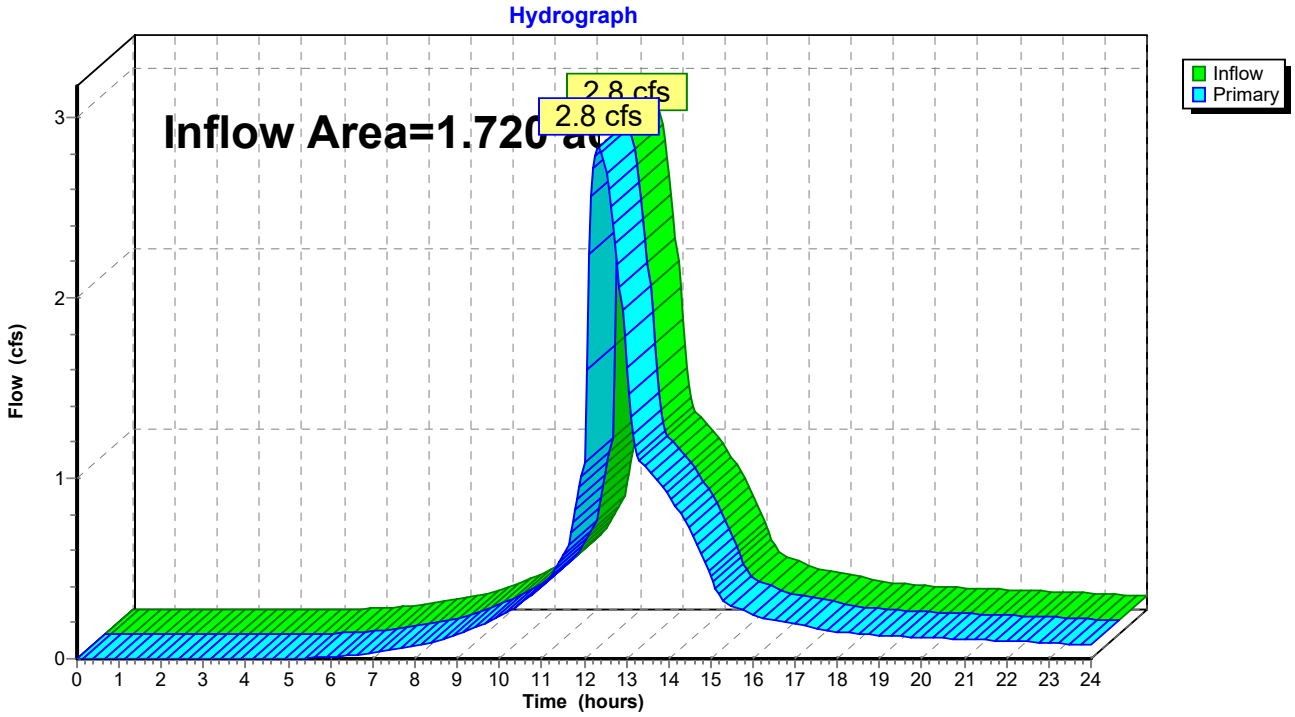


Summary for Link 10L: Sullivan Ave Drainage System

Inflow Area = 1.720 ac, 68.02% Impervious, Inflow Depth > 3.93" for 25-Year Storm event
Inflow = 2.8 cfs @ 12.35 hrs, Volume= 0.564 af
Primary = 2.8 cfs @ 12.35 hrs, Volume= 0.564 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 10L: Sullivan Ave Drainage System



Summary for Subcatchment 8S: 1000, 1006, & 1014 Sullivan Avenue

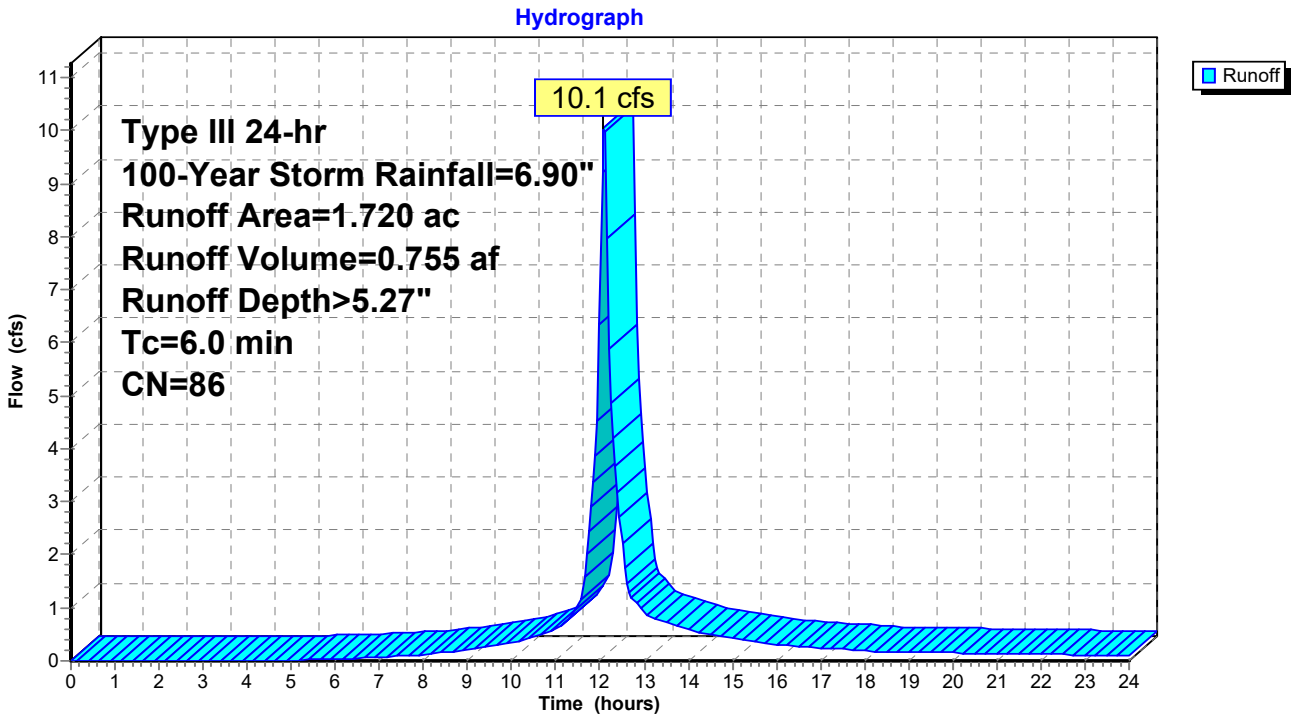
Runoff = 10.1 cfs @ 12.09 hrs, Volume= 0.755 af, Depth> 5.27"
Routed to Pond 14P : MODIFIED-Existing Stormwater Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Storm Rainfall=6.90"

Area (ac)	CN	Description
0.550	61	>75% Grass cover, Good, HSG B
1.170	98	Paved parking, HSG B
1.720	86	Weighted Average
0.550		31.98% Pervious Area
1.170		68.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Direct**
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 8S: 1000, 1006, & 1014 Sullivan Avenue



Summary for Pond 14P: MODIFIED-Existing Stormwater Basin

Inflow Area = 1.720 ac, 68.02% Impervious, Inflow Depth > 5.27" for 100-Year Storm event
Inflow = 10.1 cfs @ 12.09 hrs, Volume= 0.755 af
Outflow = 4.0 cfs @ 12.32 hrs, Volume= 0.755 af, Atten= 60%, Lag= 14.1 min
Primary = 4.0 cfs @ 12.32 hrs, Volume= 0.755 af
Routed to Link 10L : Sullivan Ave Drainage System

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 124.42' @ 12.32 hrs Surf.Area= 3,176 sf Storage= 8,045 cf

Plug-Flow detention time= 21.7 min calculated for 0.753 af (100% of inflow)
Center-of-Mass det. time= 21.6 min (813.9 - 792.3)

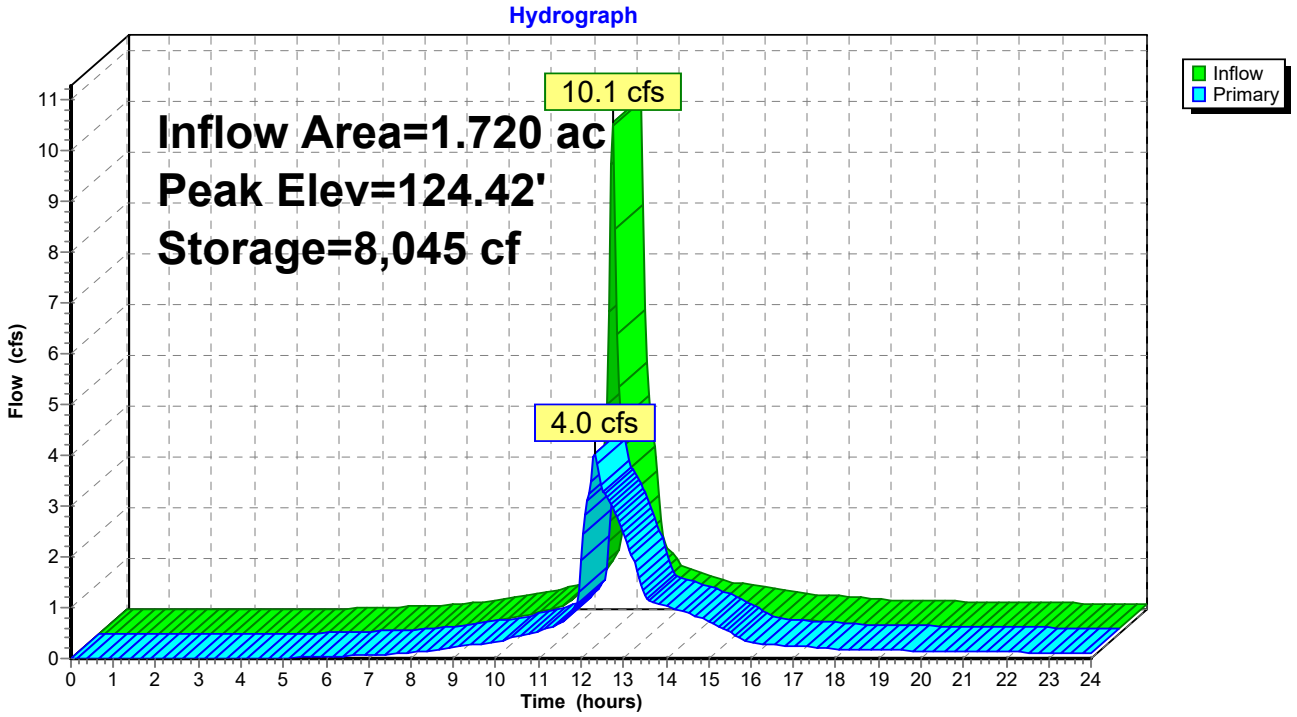
Volume	Invert	Avail.Storage	Storage Description
#1	119.00'	10,008 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
119.00	0	0.0	0	0	0
120.00	591	170.6	197	197	2,318
121.00	1,072	195.0	820	1,017	3,051
122.00	1,611	220.0	1,332	2,349	3,902
123.00	2,201	244.0	1,898	4,247	4,818
124.00	2,857	268.9	2,522	6,769	5,866
125.00	3,637	294.2	3,239	10,008	7,034

Device	Routing	Invert	Outlet Devices
#1	Primary	119.16'	**15.0" Round Culvert** L= 13.3' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 119.16' / 118.84' S= 0.0241 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#2	Device 1	124.35'	**24.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	119.03'	**5.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	122.05'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.9 cfs @ 12.32 hrs HW=124.42' (Free Discharge)
└**1=Culvert** (Passes 3.9 cfs of 12.7 cfs potential flow)
  ├**2=Orifice/Grate** (Weir Controls 0.6 cfs @ 0.85 fps)
  ├**3=Orifice/Grate** (Orifice Controls 1.5 cfs @ 10.96 fps)
  └**4=Orifice/Grate** (Orifice Controls 1.9 cfs @ 6.94 fps)

Pond 14P: MODIFIED-Existing Stormwater Basin

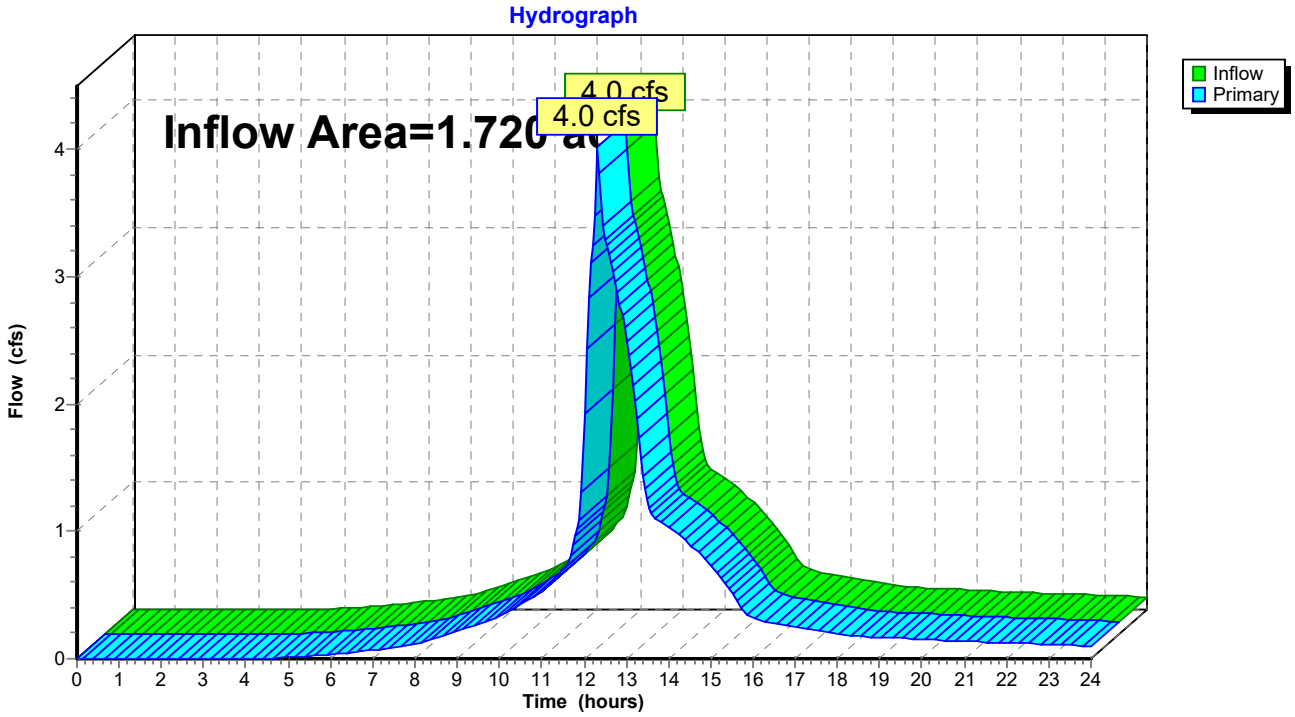


Summary for Link 10L: Sullivan Ave Drainage System

Inflow Area = 1.720 ac, 68.02% Impervious, Inflow Depth > 5.26" for 100-Year Storm event
Inflow = 4.0 cfs @ 12.32 hrs, Volume= 0.755 af
Primary = 4.0 cfs @ 12.32 hrs, Volume= 0.755 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 10L: Sullivan Ave Drainage System

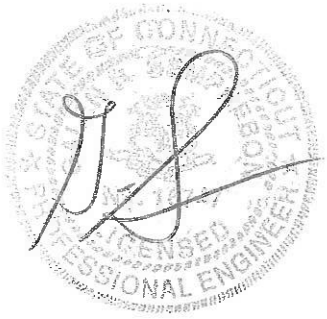


Appendix D

Stormwater Management Plan
Site Plan Modification
1000, 1006, 1014 Sullivan Avenue
South Windsor, CT

Prepared by Design Professionals, Inc.
Revised Date 1/11/2005

Stormwater Management Plan
Site Plan Modification
1000, 1006, 1014 Sullivan Avenue
South Windsor, Connecticut



Prepared by

Design Professionals, Inc.
165 South Satellite Road
South Windsor, CT 06074
DPI Project No. 1585

Revised: January 11, 2005
September 29, 2004

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Appendices

Introduction: The site is located on the north side of Sullivan Avenue in South Windsor, Connecticut and contains a total of 1.59 acres of land. The site is bordered by the Colony Shops and the Sullivan Avenue Plaza to the west, a residential neighborhood to the north and at the northeast corner, a commercial building directly east, and Sullivan Avenue to the south. There is presently a vacant building located on the southeast corner of the site. There are no wetlands on the property and the site generally slopes down from northeast to southwest.

Proposed Development: The proposed development consists of the construction of two commercial buildings with 70 parking spaces and an access drive off of Sullivan Avenue to be shared with the abutter to the east (N/F Timothy Moriarty). The two commercial buildings include: (1) a 2,955 SF bank building with drive-thru service and (2) a 2,520 SF building that includes 1,260 SF of retail and 1,260 SF of a restaurant/fast food store. The proposed access drive will straddle the eastern property line and is partially located on the abutting property (of N/F Moriarty). The storm water management plan and design includes a full analysis of the contribution in runoff from the future development of the N/F Moriarty property. The site will be serviced by public sanitary sewer and water. The existing structures on the Leonard site will be demolished.

The storm drainage system proposed for the development includes the installation of storm-sewers within the parking areas, a piped storm drainage system, a Baysaver Unit, and a detention basin. The drainage discharge from the development will be to a detention basin that will discharge into the State drainage system via an existing catch basin located within Sullivan Avenue near the southwest corner of the site.

Off-Site Analysis: The site presently drains overland to Sullivan Avenue to the existing catch basin on Sullivan Avenue near the southwest corner of the site. The catch basin is part of the State drainage system. The detention basin has been designed to discharge at less than or equal to the existing peak runoff rates from the site.

Peak Runoff Control: The intent of the design is to provide sufficient detention on site to provide post development peak discharges at or below existing peak discharges.

Nonstructural Drainage Systems: The site will make use of a detention basin to help control the runoff from the site and help treat the runoff prior to discharge.

Riparian Buffers: Existing vegetation along the perimeter of the property was maintained to the maximum extent feasible.

Erosion/Sedimentation Control Systems: An extensive erosion/sedimentation control plan has been developed as part of the site design. These measures include the following:

1. Installation of silt fence down-slope of disturbed areas.
2. Installation of silt fence around stockpiled materials.
3. Installation of silt fence around the yard drain and catch basins.
4. Seeding and mulching disturbed areas as soon as practical during construction.
5. Limiting the areas of disturbance during construction.
6. Installation of construction entrance pads.
7. Maintenance of the above measures.

Stormwater Runoff Quality: A Baysaver unit will treat runoff from the paved areas associated with the development. In addition, the customary measures will be utilized, including providing sumps within the catch basins.

Conveyance System: The on-site conveyance system consists of a piped stormwater system discharging to the detention basin. The piped drainage system has been designed to accommodate the runoff from a 10-year design storm.

Discharge at the Natural Location: The site presently drains to the State drainage system located within Sullivan Avenue. Under developed conditions, the site will continue to drain into the State drainage system.

Maintenance and Operation: The following maintenance operations will be required to ensure the proper and efficient operation of the Storm Water System and Detention Basin. The following maintenance schedule is intended to be a minimum guide. Additional inspections and maintenance measures may be required following large storm events that could cause the deposition of excess debris in the system.

> **Pipe Outlet Locations**: The pipe outlets and associated riprap shall be inspected annually and cleaned of silt and/or debris. The riprap shall be re-shaped and replenished as required.
>
> **Catch Basins:** The catch basins shall be inspected annually. The sumps shall be cleaned when the depth of material within the sumps reach one foot.
>
> **Pavement Sweeping:** The pavement areas shall be swept at a minimum of twice per year. Once in the spring shortly after the end of the snow season, and once in the fall after the leaves have fallen.
>
> **Detention Basin**: The detention basin shall be inspected twice yearly. All large woody growth that may affect the flow of water or the stability of the basin shall be removed. The riprap shall be re-arranged and added to as required to maintain the design as per the design plans. Any erosion or other problems that may affect the proper operation of the basin shall be repaired promptly.

Baysaver Unit: The maintenance of the Baysaver unit shall be done in accordance with the manufacturers requirements.

Topographic Contour Map: A topographic contour map has been provided showing the drainage areas for the site at a scale of 1"=20'. Maps showing the existing and developed conditions are included at the rear of this report.

Floodplain Boundaries: The site is not located in a flood hazard zone.

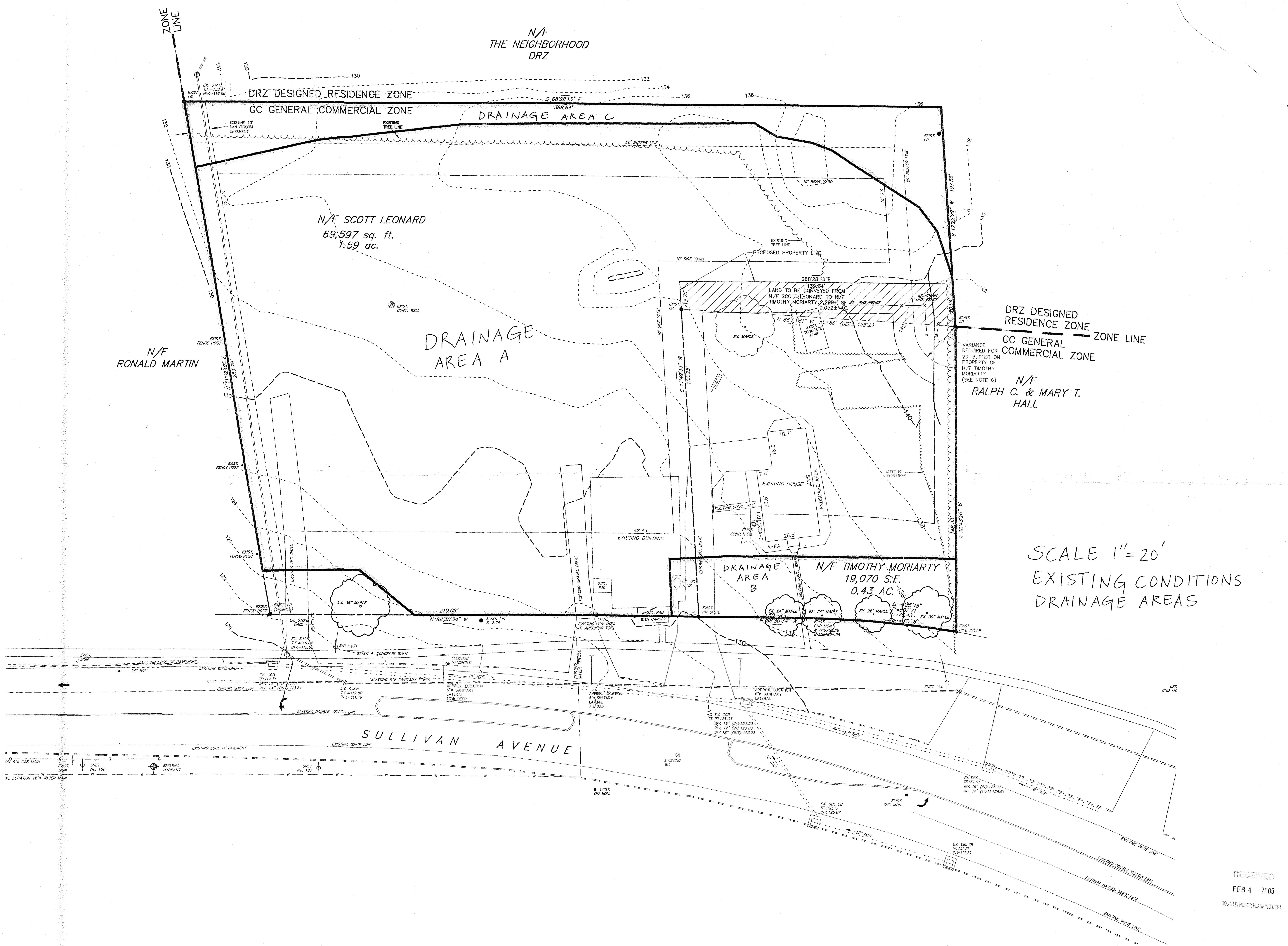
Drainage Design: The drainage design of the site has been completed utilizing a number of computer programs and generally accepted design methods. The runoff from the site under existing and developed conditions was developed utilizing the TR-55 computer program. The flood routing and basin modeling was completed utilizing the Hydroflow Hydrographs for Windows computer program by Intelisolve. The drainage piping on site was designed using the Rational Formula.

Under existing conditions, the site is divided into three drainage areas: Drainage Area A, B, and C. Drainage Area A consists of the portion of the site that will be improved as part of the proposed development and routed through the detention basin. Under existing conditions, stormwater runoff from the site flows overland to the catch basin near the southwest corner of the site on Sullivan Avenue. Under developed conditions, stormwater runoff from the site will be routed through the proposed detention basin before being discharged to the existing catch basin within Sullivan Avenue. The results of the TR-55 analysis for existing conditions are included in Appendix A.

Drainage Area B contains a portion of the proposed access drive that will not be routed through the basin. The area of proposed impervious coverage is offset by existing impervious areas within the Right-of-Way that will be converted to lawn under development conditions. Drainage Area B also contains the southern portion of the N/F Moriarty property (approximately 0.097 acres). This area is lawn presently and will remain lawn after development. Drainage Area B presently drains and will continue to drain overland into the State drainage system via an existing catch basin on Sullivan Avenue near the southwest corner of the N/F Moriarty property. Area B under developed conditions will not contribute additional peak flow to the State drainage system; therefore, no further analysis of drainage of Drainage Area B was required.

The third drainage area (Area C) is located on the north side of the property (approximately 0.16 acres). Drainage Area C is generally wooded and presently drains to the north, away from our detention basin and the State drainage system. Some re-grading is proposed within Drainage Area C; however, this will have negligible impact on the drainage patterns and peak flows draining from the site to the north. Therefore, no further analysis of Drainage Area C was required.

The site (Area A) was analyzed under developed conditions using the TR-55 computer program. The results of the TR-55 analysis for developed conditions are included in



ZONE LINE
N/F
THE NEIGHBORHOOD
DRZ
DRZ DESIGNED RESIDENCE ZONE
GC GENERAL COMMERCIAL ZONE
DRAINAGE AREA C
N/F SCOTT LEONARD
69,597 sq. ft.
1.59 ac.
DRAINAGE
AREA A
N/F
RONALD MARTIN
EXISTING BUILDING
EXISTING HOUSE
DRAINAGE
AREA
B
N/F TIMOTHY MORIARTY
19,070 S.F.
0.43 AC.
LAND TO BE CONVEYED FROM N/F SCOTT LEONARD TO N/F TIMOTHY MORIARTY
PROPOSED PROPERTY LINE
DRZ DESIGNED
RESIDENCE ZONE
ZONE LINE
GC GENERAL
COMMERCIAL ZONE
N/F
RALPH C. & MARY T.
HALL
SULLIVAN AVENUE
SCALE 1"=20'
EXISTING CONDITIONS
DRAINAGE AREAS
RECEIVED
FEB 4 2005
SOUTH WINDSOR PLANNING DEPT.