Addendum Number 2 to
STORM WATER MANAGEMENT REPORT

The Town of York Police Department
New Public Safety Building and Connector Road
1051 US Route 1, York, Maine

Prepared by:
SMRT, Inc
144 Fore Street
Portland, ME

Original Report Issued: February 2012

Addendum 2: August 2012

STATE OF MAINE
AUG 29TH 2012
LICENSED
PROFESSIONAL ENGINEER

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1 ADDENDUM DESCRIPTION

This addendum covers minor revisions that have been made to the stormwater plan to accommodate runoff from an area of the site that was cleared, but was not shown on the original permitted plans. A decision has not been made on the long-term condition of this area, or whether it will be fully returned to the pre-development condition. Therefore, stormwater management BMPS have been designed that can be used to treat runoff from the contributing area should it be left as open land, or developed in the future. For the purposes of BMP design a conservative approach has been taken. It has been assumed that the cleared area will be developed with 25% of the area impervious and 75% of the area in a landscaped condition. This is thought to be a realistic representation of potential development of this land and does not account for any re-forestation. Any greater development of this area would require further stormwater analysis and permitting review.

During the construction period any materials stockpiled in this area will need to be stabilized in accordance with the approved soil erosion and sediment control plan. The proposed BMPs will be used as temporary sediment basins (without the filter material and with modified outlets) to treat runoff and prevent potential sediment transport to downstream areas.

This amendment only impacts flows to Design Point 4 under the original analysis and only the pertinent revised calculations are included with this addendum.

The modifications to the cover conditions are small in relation to the affected subcatchment areas, and the detention provided by the BMPs offsets the increase in runoff due to the changed cover conditions. Therefore, the predicted peak flows under design storm conditions at Design Point 4 remain below the pre-development values. The updated values are shown in the revised table on the following page. Minor revisions have also been made to the water quality calculations to reflect these changes and updated calculation tables and plan sheets are included with this submission.

2 STORM WATER QUANTITY ANALYSIS

The revisions assume the addition of approximately 20,000sf of impervious area and the addition of approximately 60,000sf of landscaping in the cleared area. These areas are split between new Subcatchments 204E and 204F, and the corresponding areas have been subtracted from the woodland totals in the previously larger Subcatchment 204A and 204B. Runoff from the new subcatchment areas is routed through the new BMPs, B-100 and B-101 and on to Design Point 4. The peak runoff values for the design storm events have been updated to reflect the revised areas, and cover conditions in this area of the site. The calculations demonstrate that there will be no increase in peak runoff for any of the design storm events at Design Point 4.

Revised Table 3.4d Peak Runoff Values - Design Point 4

Design Storm	Peak Runoff (cfs)	
	Pre-Development	Post-Development
2-Year	25.64	25.04
10-Year	57.25	55.43
25-Year	74.31	73.50
50-Year	83.02	81.65
100-Year	100.68	99.00

3 STORM WATER QUALITY ANAYLSIS

Water quality treatment for runoff from the potential development of the cleared area is provided by two Bioretention cells located at the downstream sides of the area. These have been designed in accordance with State of Maine Chapter 500 Stormwater regulations and Stormwater Management for Maine - BMP Technical Design Manual. The two new Bioretention cells have been added to the overall water quality treatment table for the non-linear portions of the project. The Chapter 500 Stormwater General Standards require treatment of greater than 95% of contributing impervious area greater than 80% of the developed area of this part of the project. The calculations demonstrate that the project continues to meet the required standards.

The changes are reflected in the table shown below, and in the calculations included in revised Appendix-2

NON-LINEAR PORTION OF PROJECT

York Police Department New Public Safety Building, Maine
Site Development Areas
Water Quality Volume Summary

Subcatchment Area	Impervious	Landscaped	Developed	WQV required	WQV Provided	BMP
204E	6775	20325	27100	1863	**2912**	B-100
204F	12805	38415	51220	3521	**3584**	B-101
211	1520	4280	5800	404	**880**	B-14
212	5800	10340	16140	828	**904**	B-12
213	8060	11740	19800	1063	**1591**	B-6
214	225	5575	5800	205	**680**	B-10
215	45600	26800	72400	4693	**5300**	B-11
216	19200	0	19200	1600	**1832**	DRIP STRIP
202C	10240	4400	14640	1000	**1670**	B-9
Untreated	4580	6440	11020			Untreated
TOTAL TREATED	**90645**	**63135**	**153780**			

BMP General Standard Calculation			
	Impervious	Landscaped	Developed
NEW DEVELOPED AREA	95225	69575	164800
TREATED AREAS	90645	63135	153780
PERCENT TREATED	**95.2%**	**90.7%**	**93.3%**

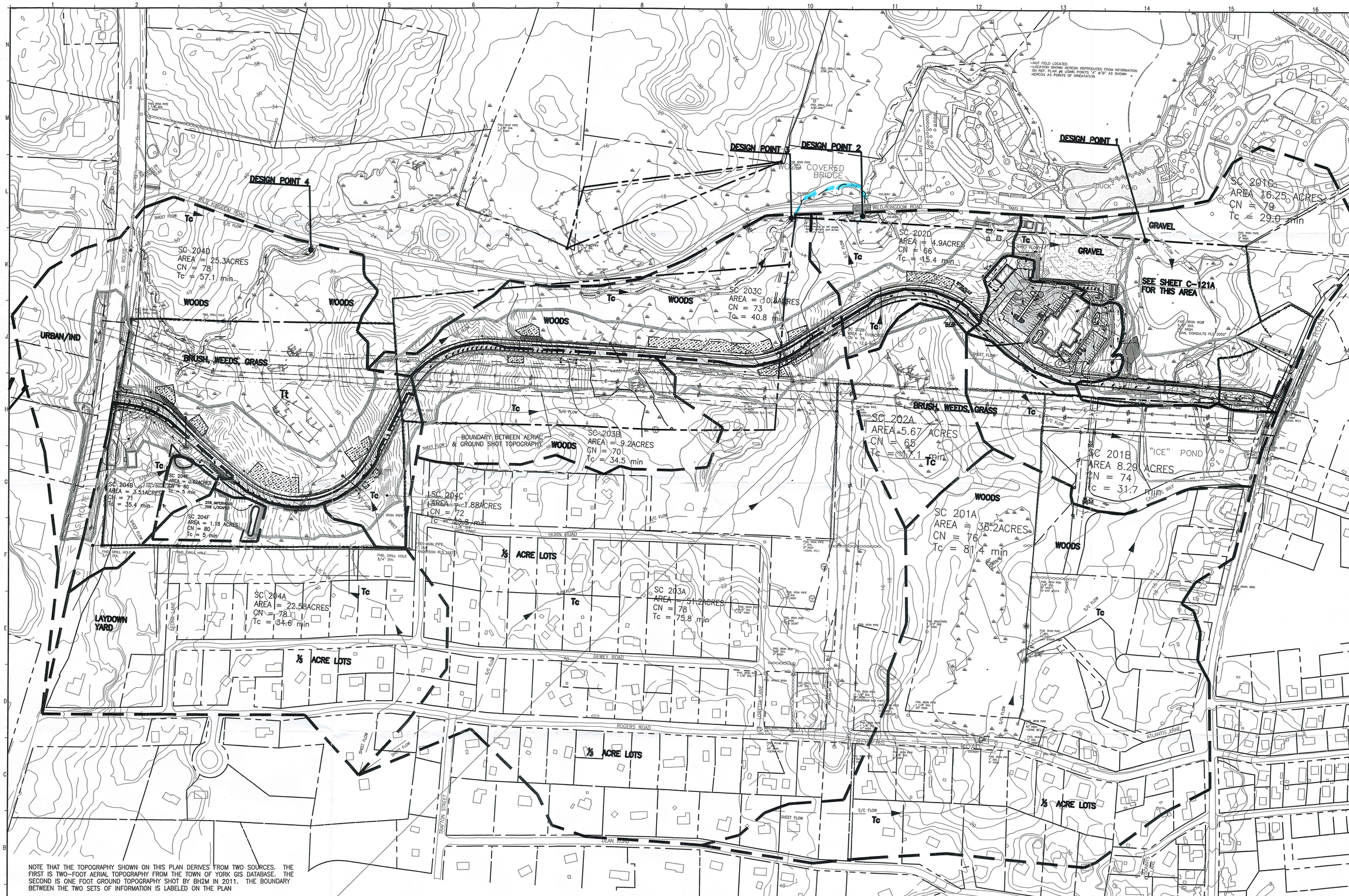
4 CONCLUSIONS

The modifications to the originally permitted project will have no significant impact on the water quality or water quantity analyses presented in the original stormwater report. The stormwater management system for the project will not result in an increase in peak runoff from the site under design storm conditions. Water quality treatment is provided in accordance with current local and state standards.

5 REFERENCES

- Stormwater Management for Maine: (MEDEP, January 2006, and as amended)
- The Soil Survey of Cumberland County, Maine
- Maine Erosion and Sediment Control Handbook for Construction: Best Management Practices (CCSWCD/MEDEP)
- NRCS Technical Release 378
- NRCS Web Soil Survey

Updated Figures



NOTE THAT THE TOPOGRAPHY SHOWN ON THIS PLAN DERIVES FROM TWO SOURCES. THE FIRST IS TWO-FOOT AERIAL TOPOGRAPHY FROM THE TOWN OF YORK GIS DATABASE. THE SECOND IS ONE FOOT GROUND TOPOGRAPHY SHOT BY BH2M IN 2011. THE BOUNDARY BETWEEN THE TWO SETS OF INFORMATION IS LABELED ON THE PLAN

A1 POST-DEVELOPMENT WATERSHED PLAN

SCALE 1" = 120'

144 Fore Street/P.O. Box 618
Portland, Maine 04104
tel. (207) 772-3846
fax. (207) 772-1070
www.smrtinc.com

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INTERIOR DESIGN
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SMRT

TRUE NORTH

STATE OF MAINE
8-21-12
MICHAEL D. DUBOIS
LICENSED
PROFESSIONAL ENGINEER
No. 9577

YORK POLICE DEPARTMENT
YORK, MAINE

ISSUED FOR SLODA AMENDMENT
8-30-12

REV	DESCRIPTION	DATE
2	REVISED FOR ADDITIONAL CLEARING	8-30-12
1	ISSUED FOR FINAL APPROVAL	6-12-12
0	ISSUED FOR PERMITTING	5-03-12

CURRENT ISSUE STATUS:

GRAPHIC SCALE: 0" 1"

SCALE:	1" = 150'
PROJECT MANAGER:	DRL
JC/DRAWN BY:	WSM
A/E OF RECORD:	ADJ
CAD FILE:	C-121-06122
PROJECT NO:	06122
DATE:	

SHEET TITLE:
POST-DEVELOPMENT WATERSHED PLAN

SHEET No.
C-121

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York Police Department New Public Safety Building, Maine
Site Development Areas
Water Quality Volume Summary

Subcatchment Area	Impervious	Landscaped	Developed	WQV required	WQV Provided	BMP
204E	6775	20325	27100	1863	**2912**	B-100
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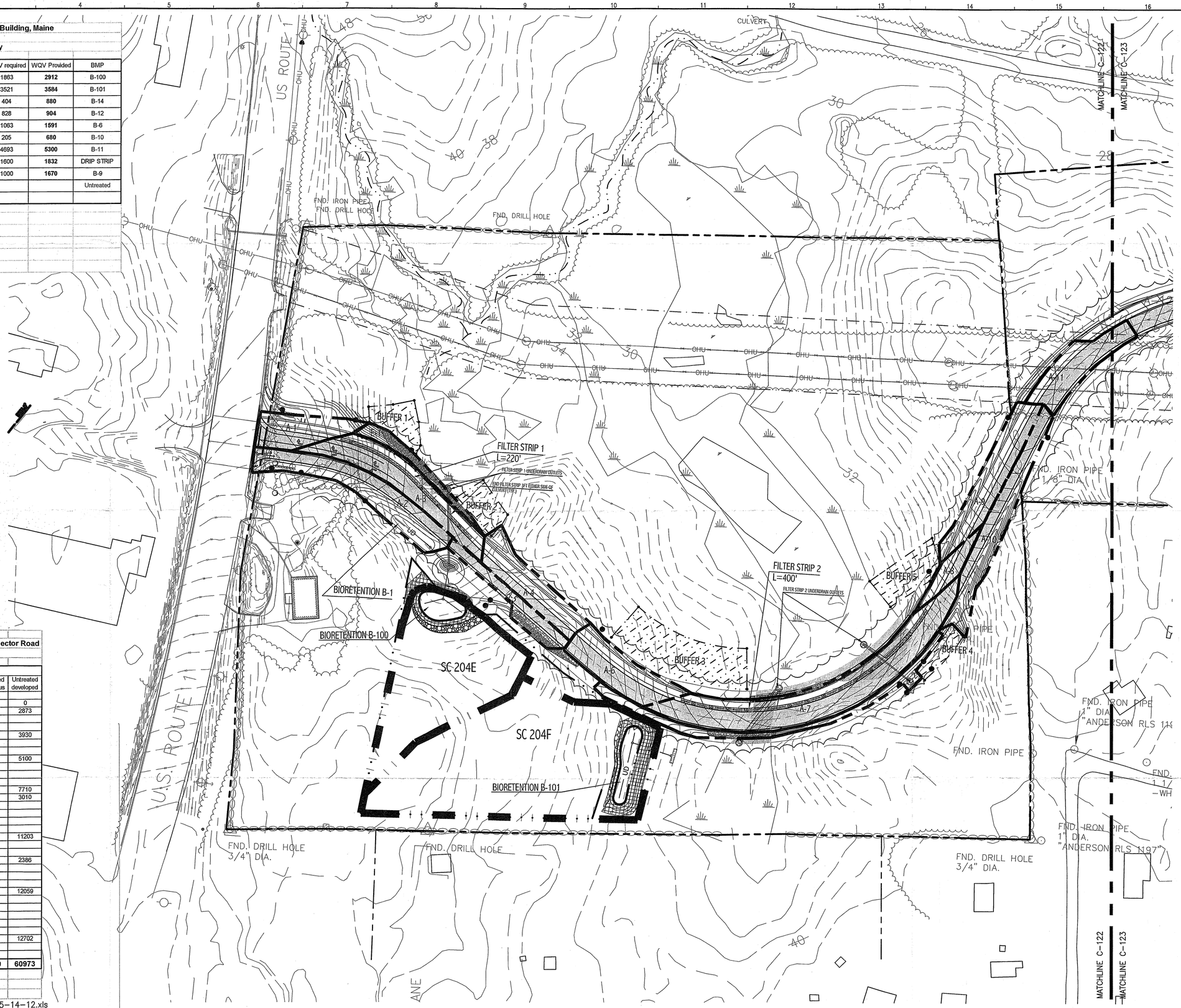
214	225	5575	5800	205	**680**	B-10
215	45600	26800	72400	4693	**5300**	B-11
216	19200	0	19200	1600	**1832**	DRIP STRIP
202C	10240	4400	14640	1000	**1670**	B-9
Untreated	4580	6440	11020			Untreated
TOTAL TREATED	**110225**	**121875**	**232100**			

BMP General Standard Calculation

	Impervious	Landscaped	Developed
NEW DEVELOPED AREA	114805	128315	243120
TREATED AREAS	110225	121875	232100
PERCENT TREATED	**96.0%**	**95.0%**	**95.5%**



York Police Department - New Public Safety Facility and Connector Road
Stormwater General Standard Calculation

Road Treatment Areas

Area	Treated impervious	Treated developed	BMP	Untreated impervious	Untreated developed
A-1	4600	5855	B-3		
A-2	6200	10089	Bioretention B-1	0	0
E-1	0	0			2873
A-3	10800	10800	Filter Strip 1		
A-4	5300	7065	B-2		
A-5	0	0		2730	3930
A-6	7900	8967	B-3		
A-7	19600	19600	Filter Strip 2		
E-2	0	0			5100
A-8	2200	0	B-3	0	
A-9	5900	8296	B-2		
A-10	5200	8458	B-2		
A-11	0	0		5720	7710
A-12	0	0		2470	3010
A-13	5400	7776	B-2		
A-14	3100	6400	B-2		
A-15	3900	6844	Bioretention B-4		
A-15A	7900	7900	Filter Strip 3		
A-16	0	0		8300	11203
A-17	13900	13900	B-3		
A-18	4700	12283	B-2		
E-3	0	0			2386
A-19	8600	0	Filter Strip 4	0	
A-20	3980	5790	B-2		
A-21	2650	5082	B-2		
A-22	0	0		7940	12059
A-23	2840	4340	B-3		
A-24	0	0	B-3	8540	
A-25	2900	2900	Bioretention B-11		
A-26	4220	4220	Bioretention B-12		
A-27	8100	8100	Bioretention B-6		
A-28	0	0		9040	12702
A-29	7800	7800	Filter Strip 5		
A-30	7160	9269	Bioretention B-8		
TOTAL	**154830**	**181714**		**44740**	**60973**

% TREATED	IMPERVIOUS	DEVELOPED
	77.58%	**74.88%**

WQVROAD-REV 3 05-14-12.xls

144 Fore Street/P.O. Box 618
Portland, Maine 04104
tel. (207) 772-3846
fax. (207) 772-1070
www.smrtinc.com

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COMMISSIONING

SMRT

NATIVE NORTH

STATE OF MAINE
ANDREW J. JANSSEN
No. 9904
LICENSED
PROFESSIONAL ENGINEER
8-29-12

YORK POLICE DEPARTMENT

YORK, MAINE

ISSUED SLODA AMENDMENT 8-30-12

CURRENT ISSUE STATUS:

REV	DESCRIPTION	DATE
4	REVISED FOR ADDITIONAL CLEARING	8-30-12
3	REVISED PER REVIEW COMMENTS	5-14-12
2	REVISED PER REVIEW COMMENTS	5-03-12
1	REVISED PER MEP REVIEW COMMENTS	4-25-12
0	ISSUED FOR DEP PERMITTING	2-03-12

GRAPHIC SCALE: 0" 1"

SCALE:	1" = 60'
PROJECT MANAGER:	DRL
JC/DRAWN BY:	WSM
A/E OF RECORD:	ADJ
CAD FILE:	C-122-06122
PROJECT NO:	06122
DATE:	2-03-12

SHEET TITLE:

WATER QUALITY PLAN

SHEET No.

C-122

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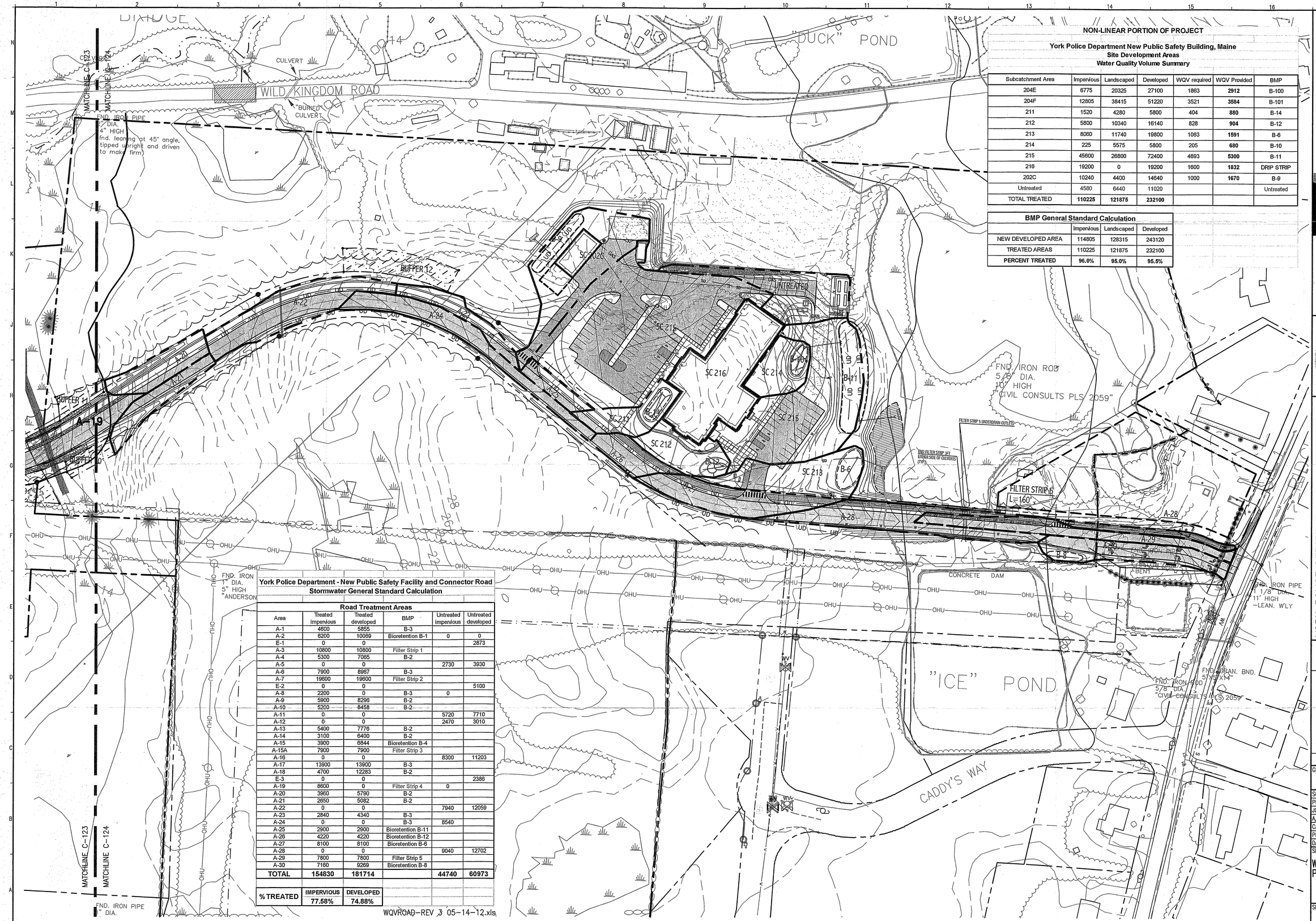

NON-LINEAR PORTION OF PROJECT

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A-4	5300	7065	B-2		
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A-7	19600	19600	Filter Strip 2		
E-2	0	0			5100
A-8	2200	0	B-3	0	
A-9	5900	8296	B-2		
A-10	5200	8458	B-2		
A-11	0	0		5720	7710
A-12	0	0		2470	3010
A-13	5400	7776	B-2		
A-14	3100	5400	B-2		
A-15	3900	6844	Bioretention B-4		
A-15A	7900	7900	Filter Strip 3		
A-16	0	0		8300	11203
A-17	13900	13900	B-3		
A-18	4700	12283	B-2		
E-3	0	0			2386
A-19	8600	0	Filter Strip 4	0	
A-20	3960	5790	B-2		
A-21	2650	5082	B-2		
A-22	0	0		7940	12059
A-23	2840	4340	B-3		
A-24	0	0	B-3	8540	
A-25	2900	2900	Bioretention B-11		
A-26	4220	4220	Bioretention B-12		
A-27	8100	8100	Bioretention B-6		
A-28	0	0		9040	12702
A-29	7800	7800	Filter Strip 5		
A-30	7160	9269	Bioretention B-8		
TOTAL	**154830**	**181714**		**44740**	**60973**

% TREATED	IMPERVIOUS	DEVELOPED
	77.58%	**74.88%**

WQVROAD-REV 3 05-14-12.xls

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www.smrtinc.com

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SMRT

TRUE NORTH

STATE OF MAINE
B-25-16
DAVID R. ROBERTSON
LICENSED
PROFESSIONAL ENGINEER
FIRST NAME LAST NAME

YORK POLICE DEPARTMENT

YORK, MAINE

ISSUED FOR SLODA AMENDMENT 8-30-12

CURRENT ISSUE STATUS:

REV	DESCRIPTION	DATE
2	REVISED FOR ADDITIONAL CLEARING	8-30-12
1	REVISED PER REVIEW COMMENTS	5-03-12
0	ISSUED FOR PERMITTING	3-29-12

GRAPHIC SCALE: 0" 1"

SCALE:	1" = 60'
PROJECT MANAGER:	DRL
JC/DRAWN BY:	WSM
A/E OF RECORD:	ADJ
CAD FILE:	C-124-06122
PROJECT NO:	06122
DATE:	2-03-12

SHEET TITLE:
WATER QUALITY PLAN

SHEET No.
C-124

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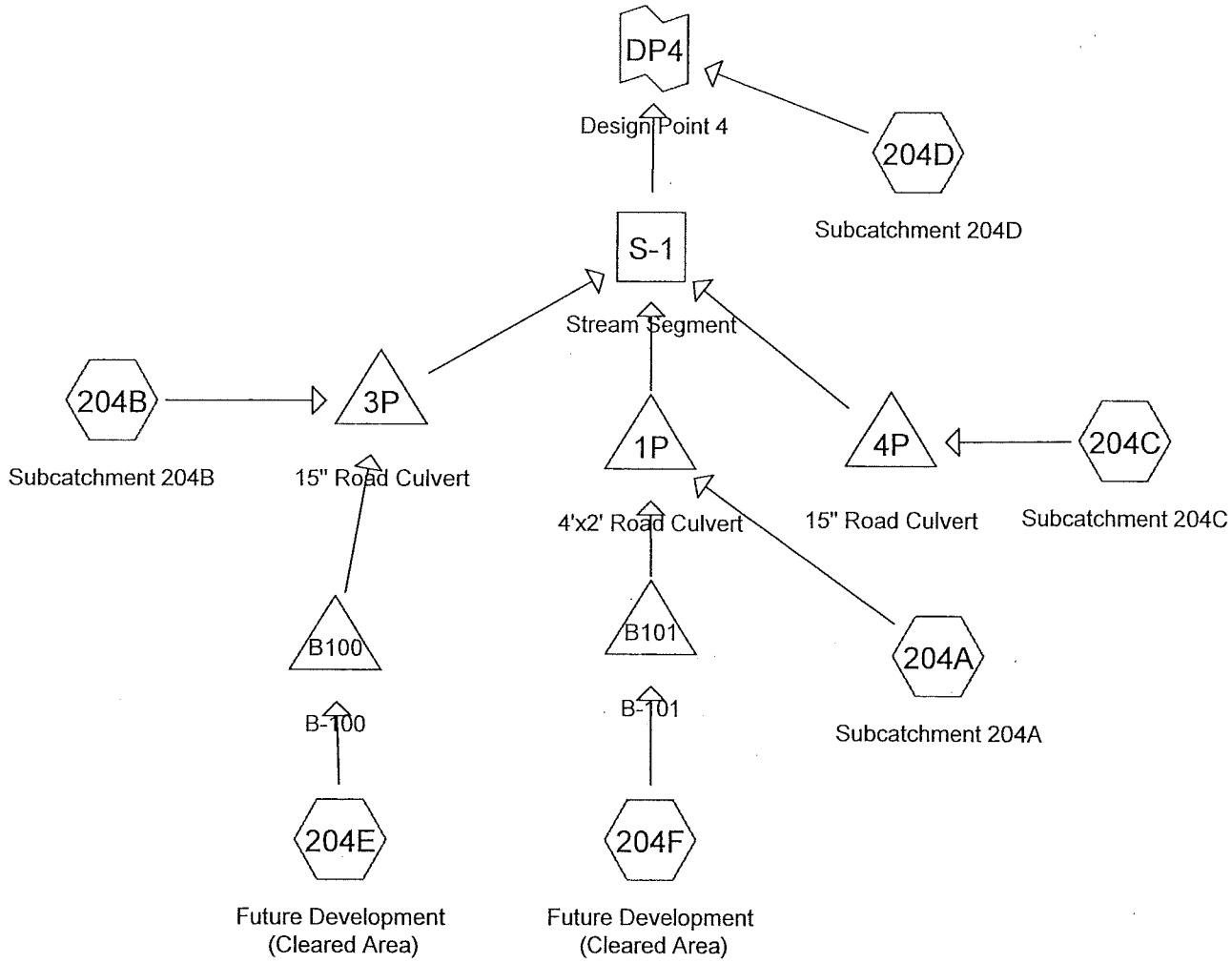
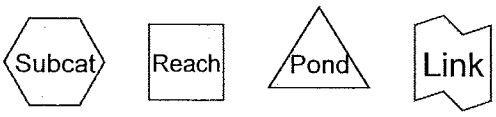
HydroCAD Runoff and Routing Calculations

Appendix A-1





Drainage Diagram for York PD-Post-Dev-Additional Clearing
Prepared by SMRT Inc., Printed 8/29/2012
HydroCAD® 9.00 s/n 00729 © 2009 HydroCAD Software Solutions LLC

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 204A: Subcatchment 204A Runoff Area=983,780 sf 12.80% Impervious Runoff Depth=1.13"
Flow Length=995' Tc=34.6 min CN=78 Runoff=15.34 cfs 2.125 af

Subcatchment 204B: Subcatchment 204B Runoff Area=153,000 sf 2.42% Impervious Runoff Depth=0.76"
Flow Length=525' Tc=36.2 min CN=71 Runoff=1.44 cfs 0.223 af

Subcatchment 204C: Subcatchment 204C Runoff Area=81,800 sf 4.24% Impervious Runoff Depth=0.81"
Flow Length=280' Tc=28.9 min CN=72 Runoff=0.92 cfs 0.126 af

Subcatchment 204D: Subcatchment Runoff Area=1,102,000 sf 27.56% Impervious Runoff Depth=1.13"
Flow Length=580' Tc=57.1 min CN=78 Runoff=13.08 cfs 2.380 af

Subcatchment 204E: Future Development Runoff Area=27,100 sf 25.00% Impervious Runoff Depth=1.25"
Tc=5.0 min CN=80 Runoff=0.93 cfs 0.065 af

Subcatchment 204F: Future Development Runoff Area=51,220 sf 25.00% Impervious Runoff Depth=1.25"
Tc=5.0 min CN=80 Runoff=1.76 cfs 0.122 af

Reach S-1: Stream Segment Avg. Depth=1.29' Max Vel=1.69 fps Inflow=17.69 cfs 5.712 af
L=1,100.0' S=0.0031 '/' Capacity=25.78 cfs Outflow=11.99 cfs 5.686 af

Pond 1P: 4'x2' Road Culvert Peak Elev=33.03' Storage=1,061 cf Inflow=15.46 cfs 2.241 af
48.0" x 24.0" Box Culvert n=0.013 L=105.0' S=0.0019 '/' Outflow=15.27 cfs 5.306 af

Pond 3P: 15" Road Culvert Peak Elev=36.31' Storage=273 cf Inflow=1.55 cfs 0.282 af
15.0" Round Culvert n=0.012 L=105.0' S=0.0038 '/' Outflow=1.55 cfs 0.280 af

Pond 4P: 15" Road Culvert Peak Elev=33.45' Storage=31 cf Inflow=0.92 cfs 0.126 af
15.0" Round Culvert n=0.012 L=85.0' S=0.0176 '/' Outflow=0.92 cfs 0.126 af

Pond B100: B-100 Peak Elev=41.11' Storage=1,178 cf Inflow=0.93 cfs 0.065 af
Outflow=0.11 cfs 0.059 af

Pond B101: B-101 Peak Elev=39.76' Storage=2,569 cf Inflow=1.76 cfs 0.122 af
Outflow=0.13 cfs 0.117 af

Link DP4: Design Point 4 Inflow=25.04 cfs 8.064 af
Primary=25.04 cfs 8.064 af

Total Runoff Area = 55.071 ac Runoff Volume = 5.041 af Average Runoff Depth = 1.10"
80.98% Pervious = 44.595 ac 19.02% Impervious = 10.477 ac

Summary for Subcatchment 204A: Subcatchment 204A

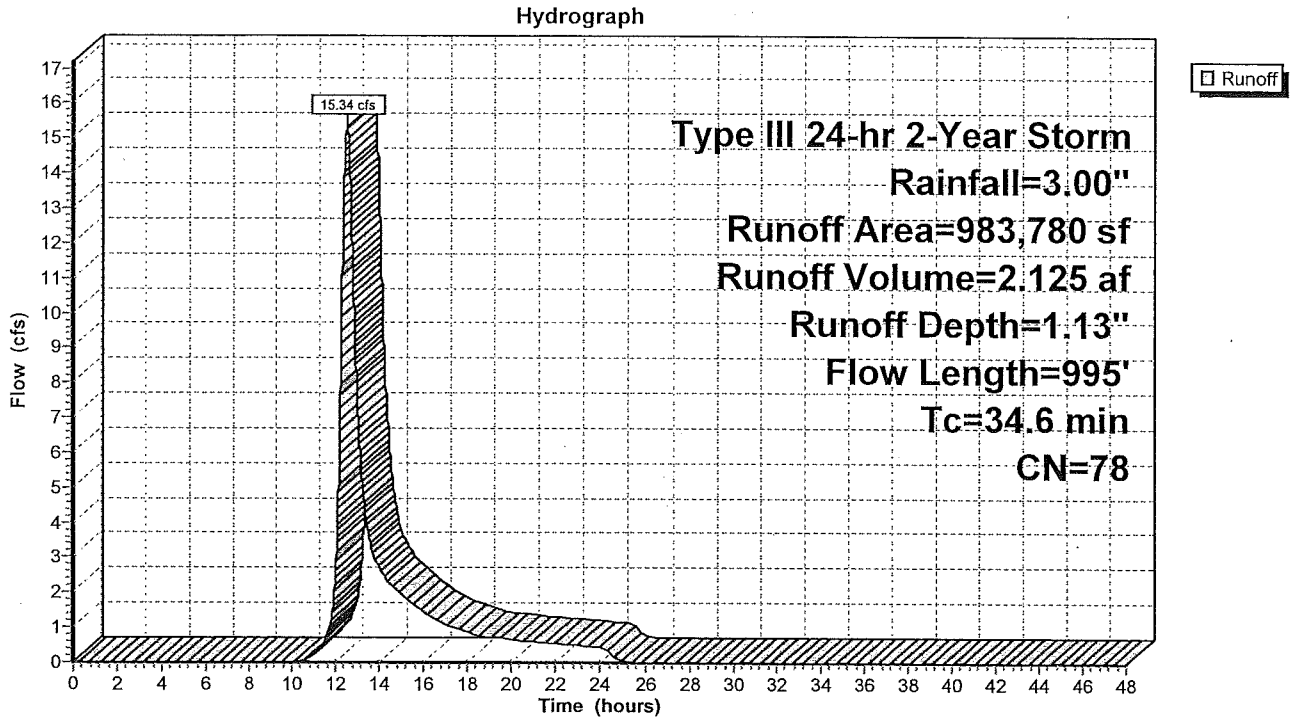
Runoff = 15.34 cfs @ 12.50 hrs, Volume= 2.125 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Storm Rainfall=3.00"

Area (sf)	CN	Description
419,800	81	1/3 acre lots, 30% imp, HSG C
152,200	91	Newly graded area, HSG C
85,000	65	Brush, Good, HSG C
320,780	70	Woods, Good, HSG C
6,000	74	>75% Grass cover, Good, HSG C
983,780	78	Weighted Average
857,840		87.20% Pervious Area
125,940		12.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4	60	0.0100	0.05		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
15.2	935	0.0420	1.02		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
34.6	995	Total			

Subcatchment 204A: Subcatchment 204A



Summary for Subcatchment 204B: Subcatchment 204B

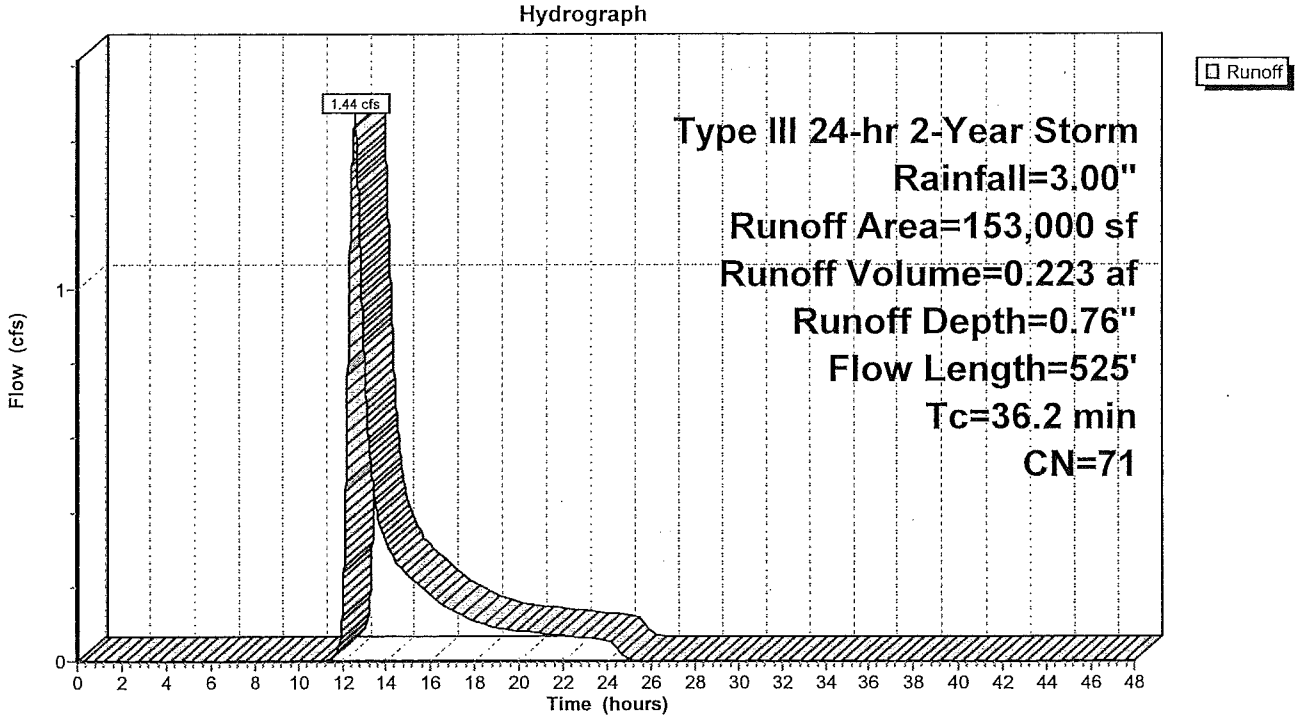
Runoff = 1.44 cfs @ 12.58 hrs, Volume= 0.223 af, Depth= 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Storm Rainfall=3.00"

Area (sf)	CN	Description
7,400	92	Paved roads w/open ditches, 50% imp, HSG C
9,000	74	>75% Grass cover, Good, HSG C
136,600	70	Woods, Good, HSG C
153,000	71	Weighted Average
149,300		97.58% Pervious Area
3,700		2.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	60	0.0050	0.04		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
10.5	465	0.0220	0.74		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
36.2	525	Total			

Subcatchment 204B: Subcatchment 204B



Summary for Subcatchment 204C: Subcatchment 204C

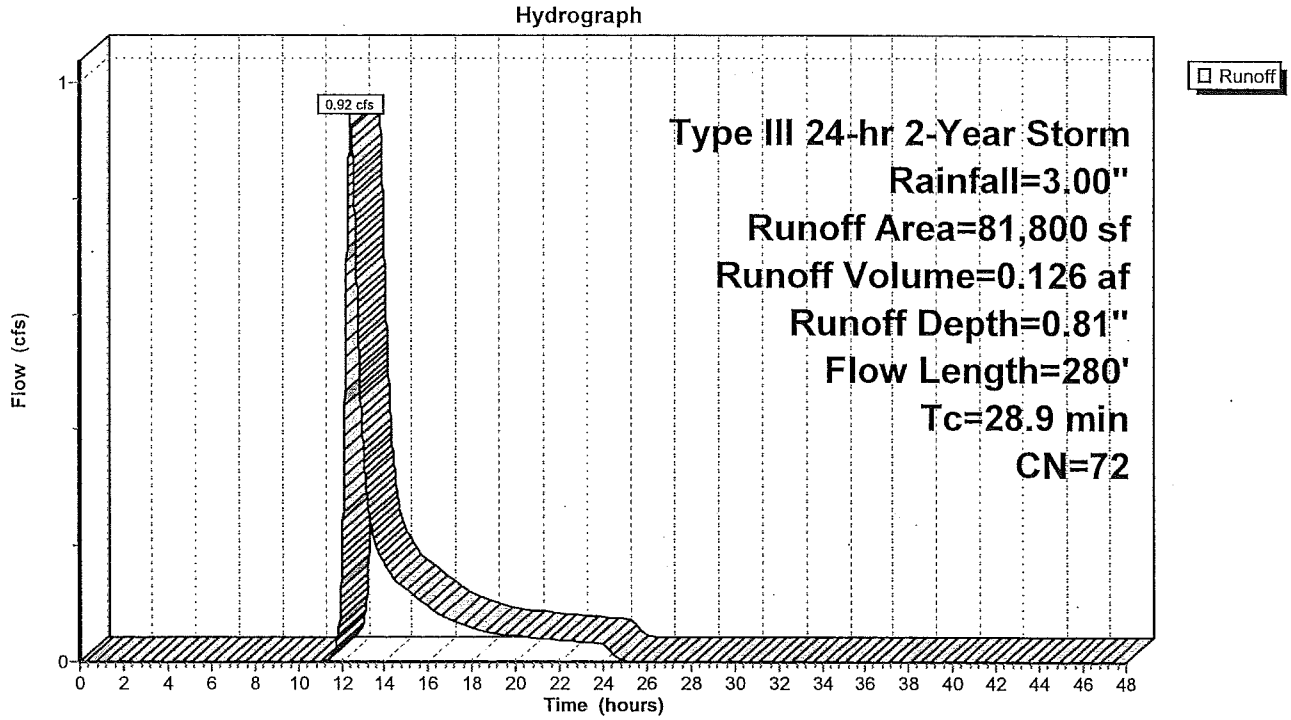
Runoff = 0.92 cfs @ 12.46 hrs, Volume= 0.126 af, Depth= 0.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Storm Rainfall=3.00"

Area (sf)	CN	Description
6,940	92	Paved roads w/open ditches, 50% imp, HSG C
3,200	74	>75% Grass cover, Good, HSG C
71,660	70	Woods, Good, HSG C
81,800	72	Weighted Average
78,330		95.76% Pervious Area
3,470		4.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	60	0.0050	0.04		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
3.2	220	0.0270	1.15		**Shallow Concentrated Flow, Woods** Short Grass Pasture Kv= 7.0 fps
28.9	280	Total			

Subcatchment 204C: Subcatchment 204C



Summary for Subcatchment 204D: Subcatchment 204D

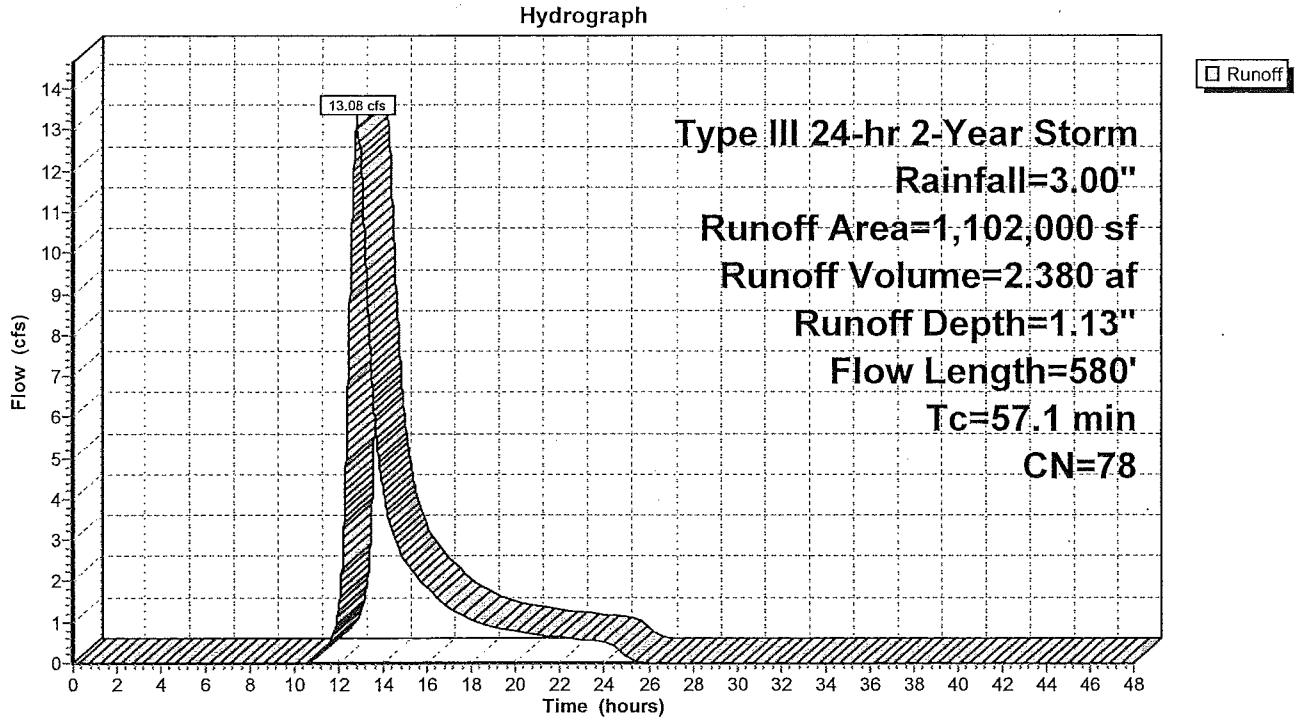
Runoff = 13.08 cfs @ 12.82 hrs, Volume= 2.380 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Storm Rainfall=3.00"

Area (sf)	CN	Description
67,600	92	Paved roads w/open ditches, 50% imp, HSG C
85,000	65	Brush, Good, HSG C
97,500	98	Paved roads w/curbs & sewers, HSG C
239,400	91	Urban industrial, 72% imp, HSG C
612,500	70	Woods, Good, HSG C
1,102,000	78	Weighted Average
798,332		72.44% Pervious Area
303,668		27.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
48.8	60	0.0010	0.02		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
8.3	520	0.0440	1.05		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
57.1	580	Total			

Subcatchment 204D: Subcatchment 204D



Summary for Subcatchment 204E: Future Development (Cleared Area)

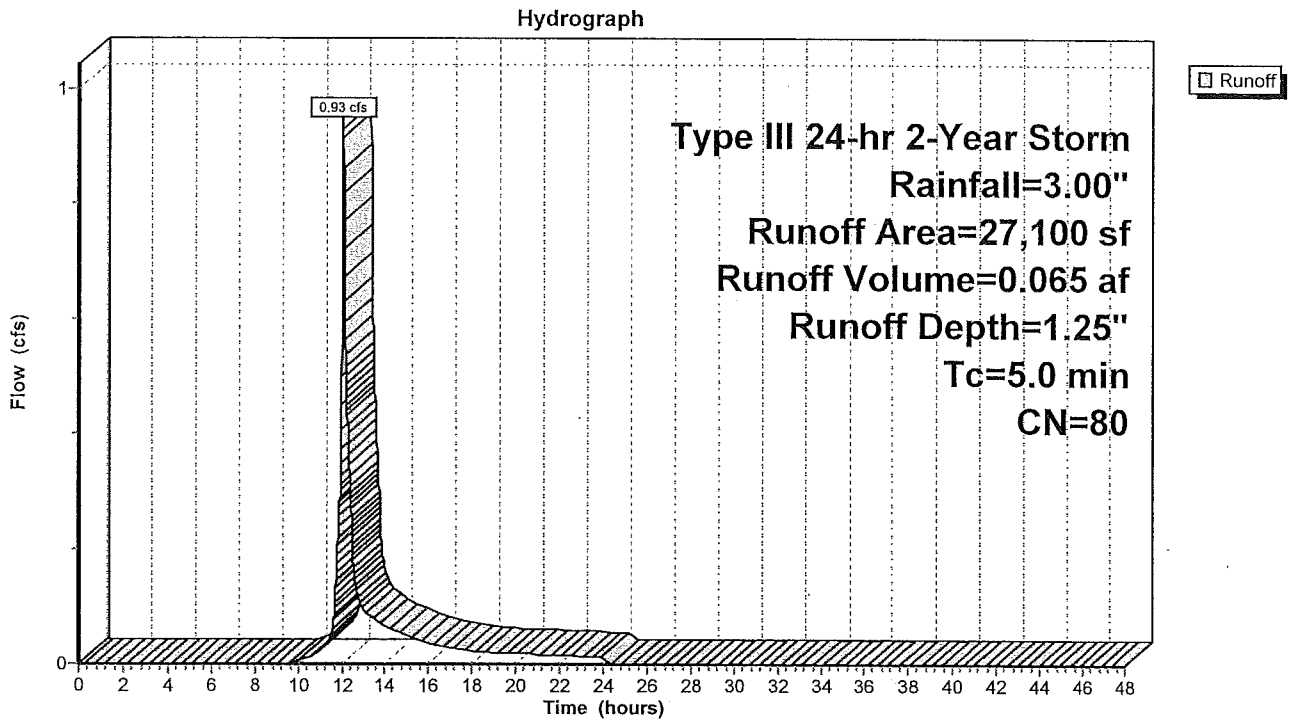
Runoff = 0.93 cfs @ 12.08 hrs, Volume= 0.065 af, Depth= 1.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Storm Rainfall=3.00"

	Area (sf)	CN	Description
*	6,775	98	Future Impervious
*	20,325	74	Future landscaped
	27,100	80	Weighted Average
	20,325		75.00% Pervious Area
	6,775		25.00% Impervious Area

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

Subcatchment 204E: Future Development (Cleared Area)



Summary for Subcatchment 204F: Future Development (Cleared Area)

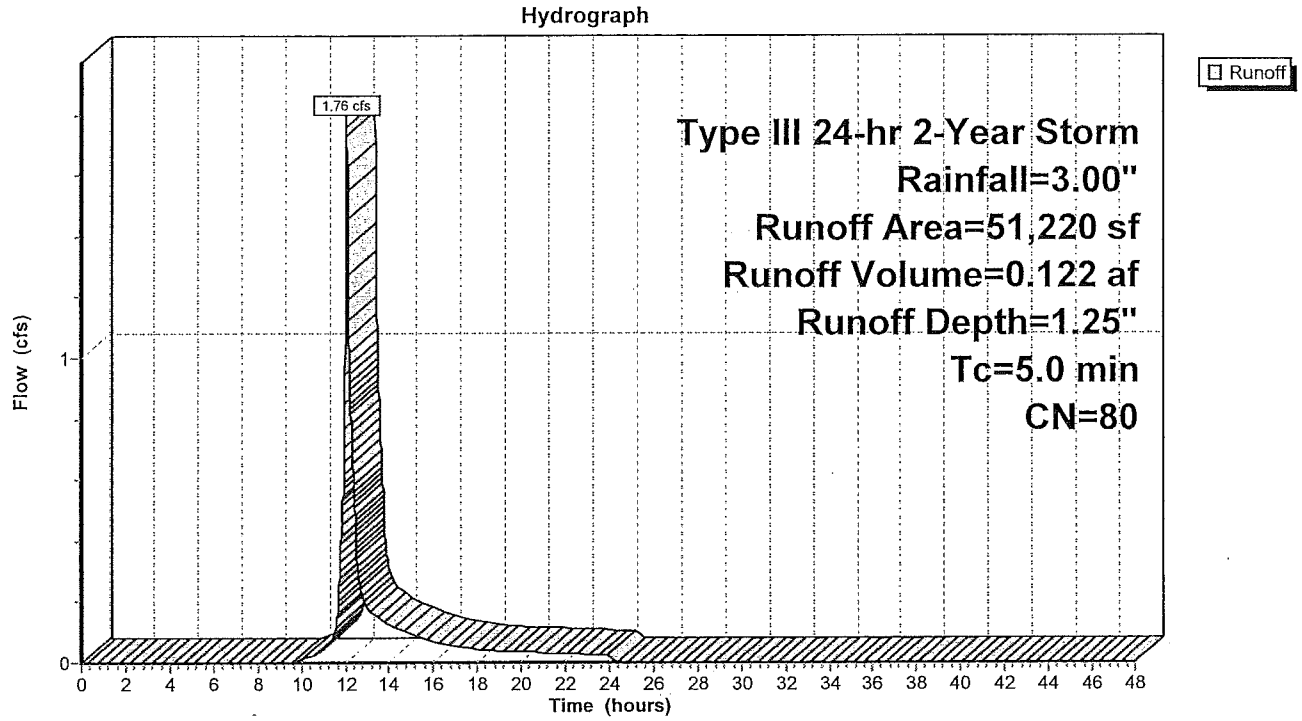
Runoff = 1.76 cfs @ 12.08 hrs, Volume= 0.122 af, Depth= 1.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Storm Rainfall=3.00"

	Area (sf)	CN	Description
*	12,805	98	Future Impervious
*	38,415	74	Future landscaped
	51,220	80	Weighted Average
	38,415		75.00% Pervious Area
	12,805		25.00% Impervious Area

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

Subcatchment 204F: Future Development (Cleared Area)



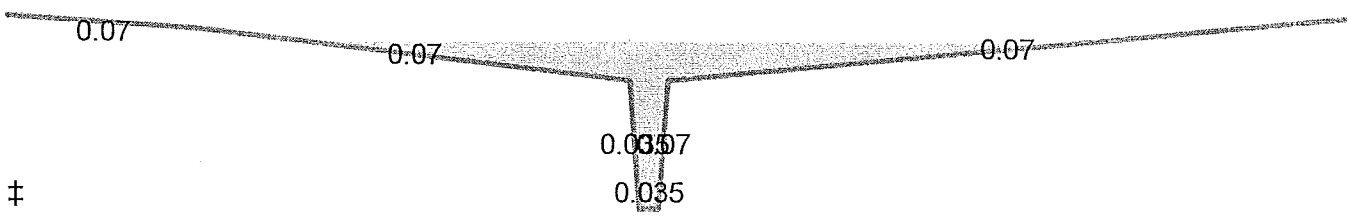
Summary for Reach S-1: Stream Segment

Inflow Area = 29.773 ac, 11.77% Impervious, Inflow Depth > 2.30" for 2-Year Storm event
Inflow = 17.69 cfs @ 12.52 hrs, Volume= 5.712 af
Outflow = 11.99 cfs @ 12.86 hrs, Volume= 5.686 af, Atten= 32%, Lag= 20.1 min

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.69 fps, Min. Travel Time= 10.8 min
Avg. Velocity = 1.18 fps, Avg. Travel Time= 15.5 min

Peak Storage= 16,782 cf @ 12.86 hrs, Average Depth at Peak Storage= 1.29'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 25.78 cfs

Custom cross-section, Length= 1,100.0' Slope= 0.0031 '/'
Flow calculated by Manning's Subdivision method
Inlet Invert= 31.40', Outlet Invert= 28.00'

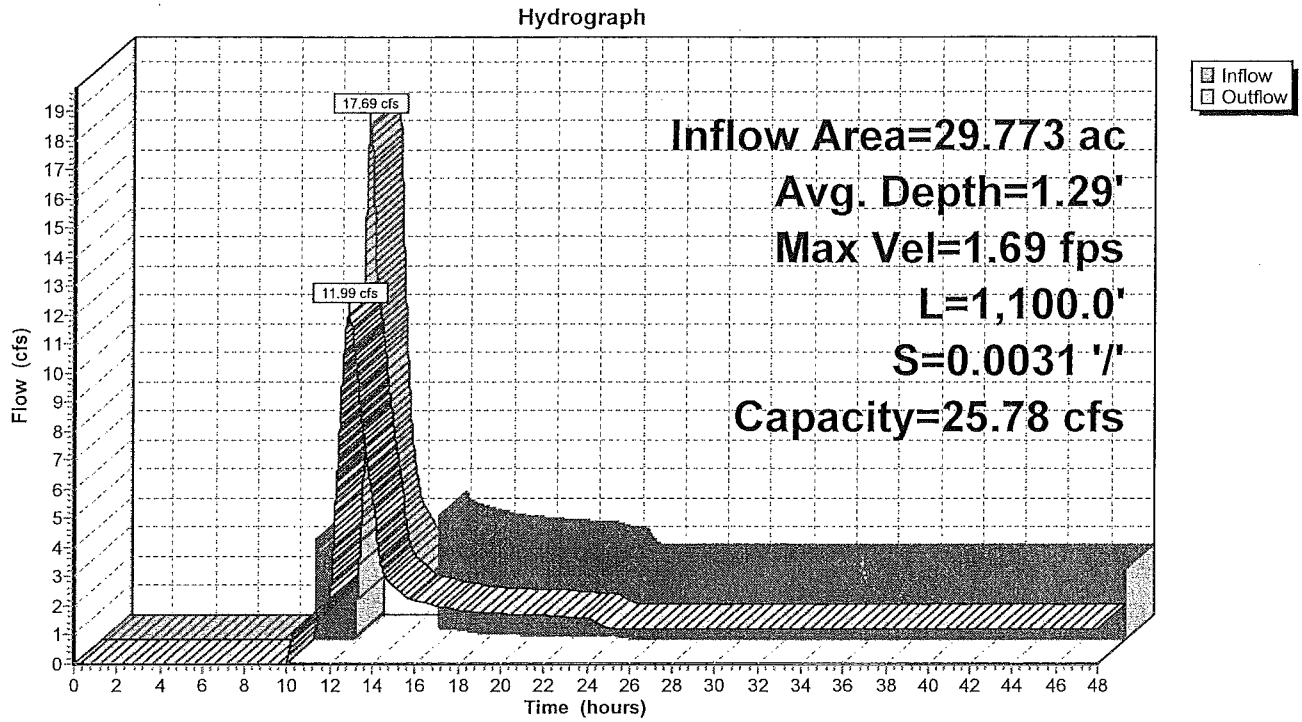


‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	31.00	0.00		
20.00	30.90	0.10	0.070	
65.00	30.50	0.50	0.070	
66.00	29.50	1.50	0.035	
68.00	29.50	1.50	0.035	
69.00	30.50	0.50	0.070	
140.00	31.00	0.00	0.070	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	2.0	0	0.00
1.00	3.0	4.8	3,302	5.05
1.40	25.0	106.6	27,465	17.96
1.50	37.3	140.8	40,975	25.78

Reach S-1: Stream Segment



Summary for Pond 1P: 4'x2' Road Culvert

Inflow Area = 23.760 ac, 13.41% Impervious, Inflow Depth = 1.13" for 2-Year Storm event
Inflow = 15.46 cfs @ 12.50 hrs, Volume= 2.241 af
Outflow = 15.27 cfs @ 12.52 hrs, Volume= 5.306 af, Atten= 1%, Lag= 1.2 min
Primary = 15.27 cfs @ 12.52 hrs, Volume= 5.306 af

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 33.03' @ 12.58 hrs Surf.Area= 2,303 sf Storage= 1,061 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 596.7 min (1,485.2 - 888.6)

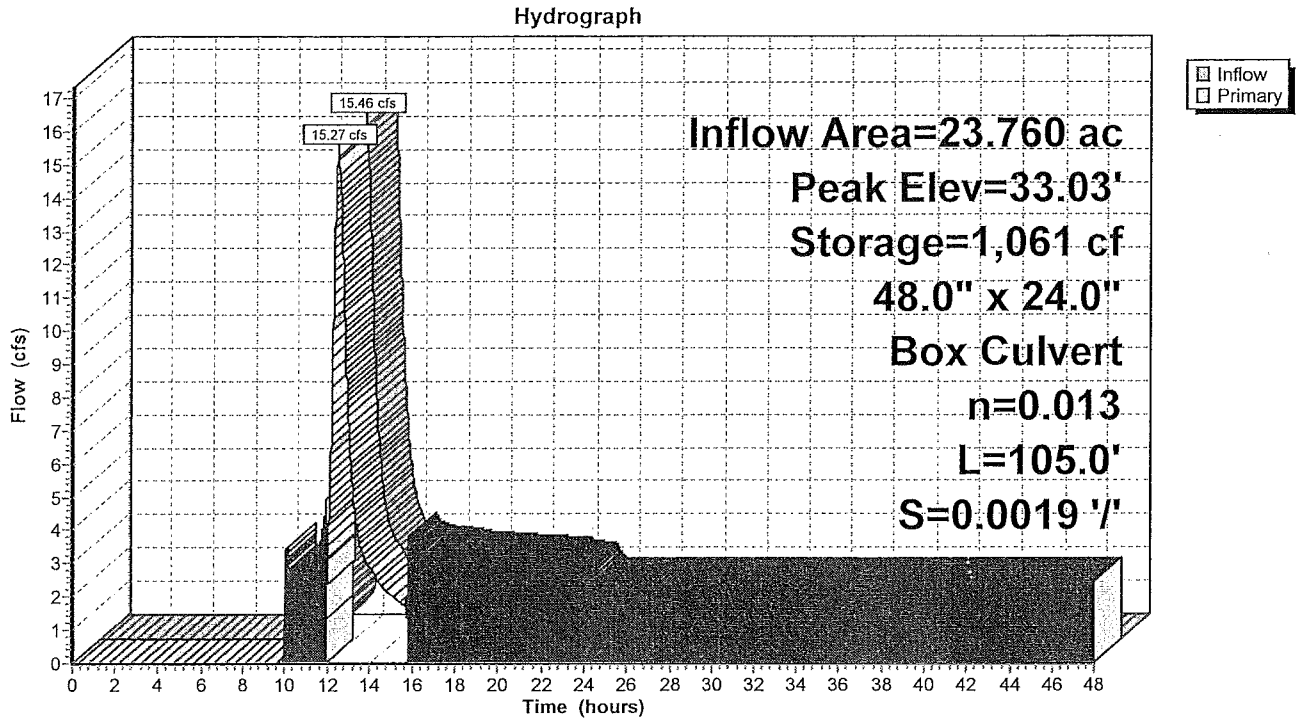
Volume	Invert	Avail.Storage	Storage Description
#1	32.00'	33,820 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.00	160	0	0
33.00	1,840	1,000	1,000
34.00	17,600	9,720	10,720
35.00	28,600	23,100	33,820

Device	Routing	Invert	Outlet Devices
#1	Primary	31.50'	**48.0" W x 24.0" H Box Culvert** L= 105.0' Ke= 0.500 Outlet Invert= 31.30' S= 0.0019 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=15.18 cfs @ 12.52 hrs HW=33.02' TW=32.62' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 15.18 cfs @ 3.33 fps)

Pond 1P: 4'x2' Road Culvert



Summary for Pond 3P: 15" Road Culvert

Inflow Area = 4.135 ac, 5.82% Impervious, Inflow Depth = 0.82" for 2-Year Storm event
Inflow = 1.55 cfs @ 12.58 hrs, Volume= 0.282 af
Outflow = 1.55 cfs @ 12.60 hrs, Volume= 0.280 af, Atten= 0%, Lag= 0.9 min
Primary = 1.55 cfs @ 12.60 hrs, Volume= 0.280 af

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 36.31' @ 12.60 hrs Surf.Area= 259 sf Storage= 273 cf

Plug-Flow detention time= 10.5 min calculated for 0.280 af (99% of inflow)
Center-of-Mass det. time= 5.3 min (919.1 - 913.7)

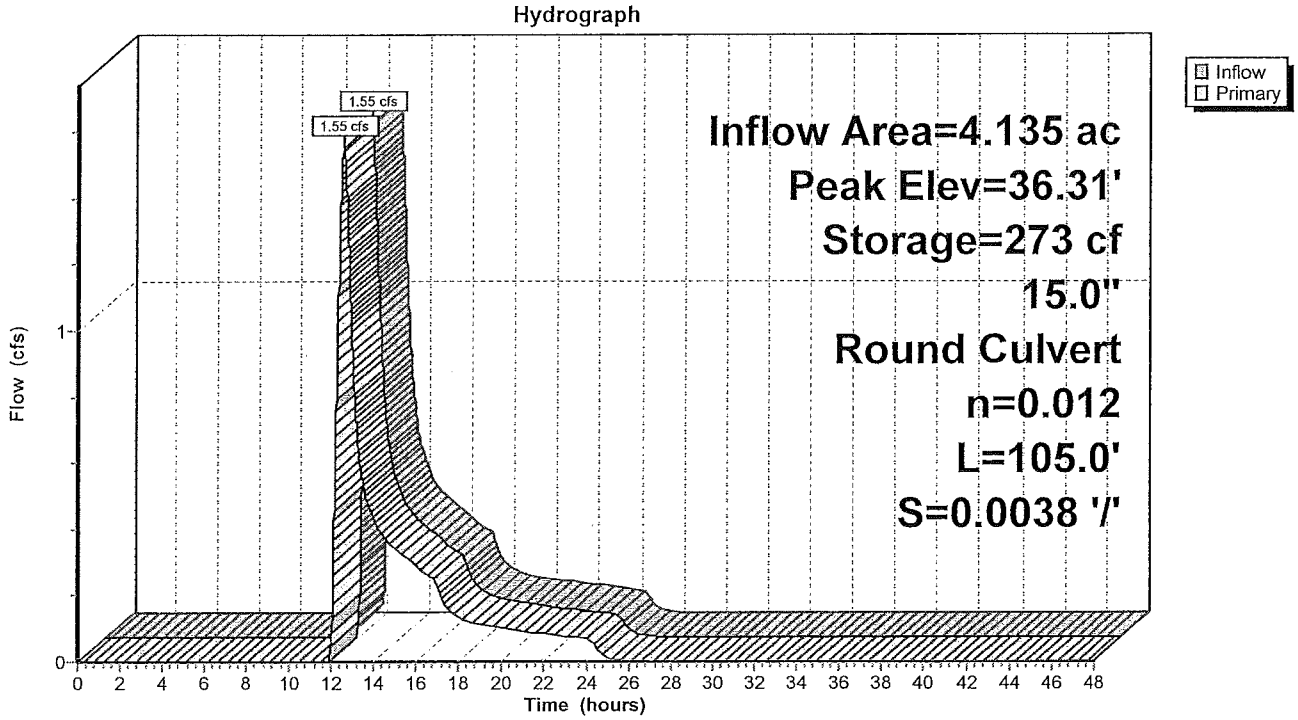
Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	3,855 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
35.00	150	0	0
36.00	240	195	195
37.00	300	270	465
38.00	360	330	795
39.00	420	390	1,185
40.00	740	580	1,765
41.00	3,440	2,090	3,855

Device	Routing	Invert	Outlet Devices
#1	Primary	35.60'	**15.0" Round Culvert** L= 105.0' Ke= 0.500 Outlet Invert= 35.20' S= 0.0038 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=1.55 cfs @ 12.60 hrs HW=36.31' TW=32.65' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 1.55 cfs @ 3.09 fps)

Pond 3P: 15" Road Culvert



Summary for Pond 4P: 15" Road Culvert

Inflow Area = 1.878 ac, 4.24% Impervious, Inflow Depth = 0.81" for 2-Year Storm event
Inflow = 0.92 cfs @ 12.46 hrs, Volume= 0.126 af
Outflow = 0.92 cfs @ 12.46 hrs, Volume= 0.126 af, Atten= 0%, Lag= 0.3 min
Primary = 0.92 cfs @ 12.46 hrs, Volume= 0.126 af

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 33.45' @ 12.46 hrs Surf.Area= 78 sf Storage= 31 cf

Plug-Flow detention time= 1.4 min calculated for 0.126 af (100% of inflow)
Center-of-Mass det. time= 1.3 min (895.8 - 894.6)

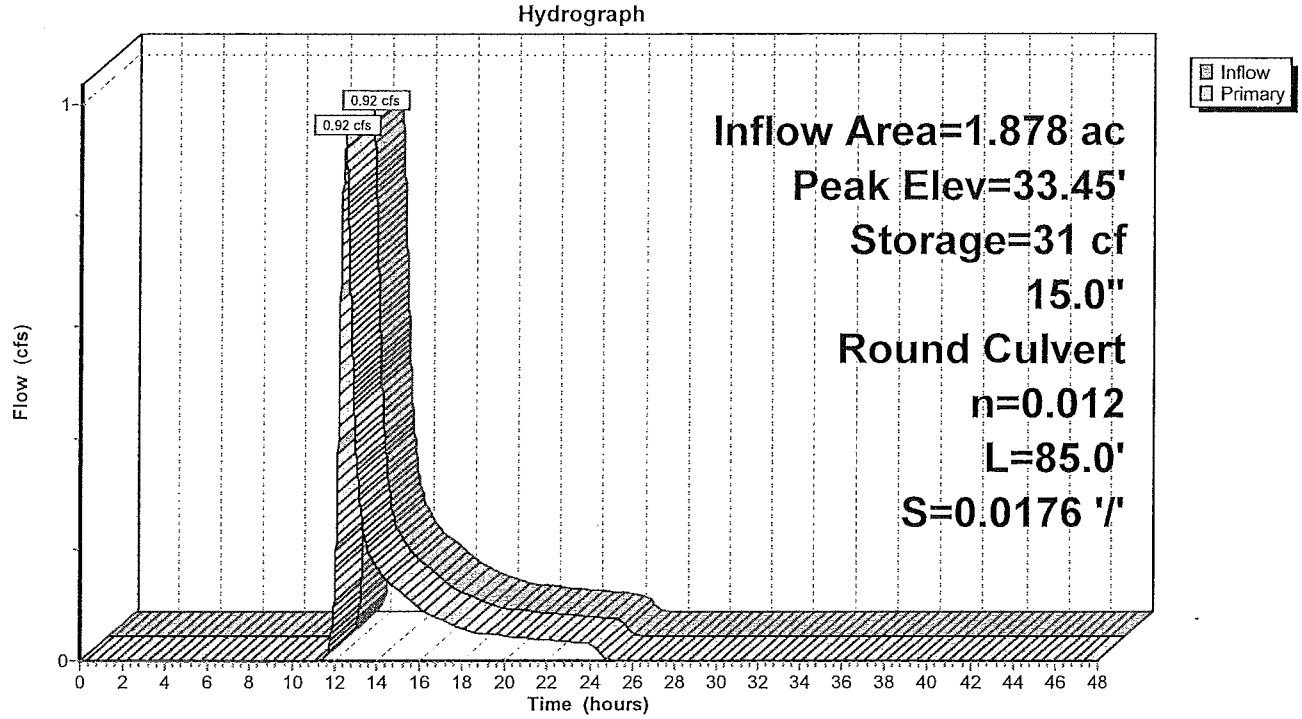
Volume	Invert	Avail.Storage	Storage Description
#1	33.00'	4,580 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
33.00	60	0	0
34.00	100	80	80
35.00	2,100	1,100	1,180
36.00	4,700	3,400	4,580

Device	Routing	Invert	Outlet Devices
#1	Primary	33.00'	**15.0" Round Culvert** L= 85.0' Ke= 0.500 Outlet Invert= 31.50' S= 0.0176 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=0.92 cfs @ 12.46 hrs HW=33.45' TW=32.59' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.92 cfs @ 2.29 fps)

Pond 4P: 15" Road Culvert



Summary for Pond B100: B-100

Inflow Area = 0.622 ac, 25.00% Impervious, Inflow Depth = 1.25" for 2-Year Storm event
Inflow = 0.93 cfs @ 12.08 hrs, Volume= 0.065 af
Outflow = 0.11 cfs @ 11.98 hrs, Volume= 0.059 af, Atten= 88%, Lag= 0.0 min
Primary = 0.11 cfs @ 11.98 hrs, Volume= 0.059 af

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 41.11' @ 12.89 hrs Surf.Area= 1,868 sf Storage= 1,178 cf

Plug-Flow detention time= 142.5 min calculated for 0.059 af (92% of inflow)
Center-of-Mass det. time= 101.2 min (946.5 - 845.2)

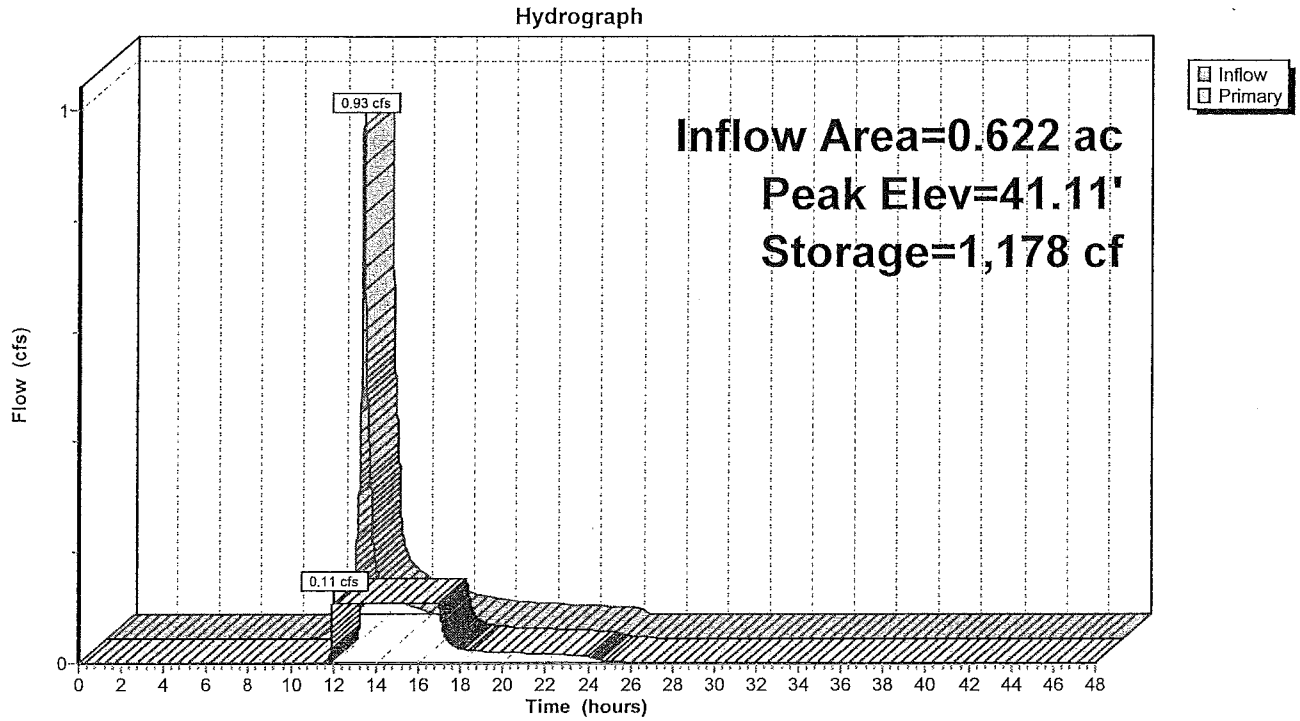
Volume	Invert	Avail.Storage	Storage Description
#1	39.00'	5,309 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
39.00	1,868	0.0	0	0
39.50	1,868	15.0	140	140
40.00	1,868	30.0	280	420
40.50	1,868	30.0	280	701
41.00	1,868	30.0	280	981
41.50	1,868	100.0	934	1,915
42.00	2,122	100.0	998	2,912
42.50	2,398	100.0	1,130	4,042
43.00	2,670	100.0	1,267	5,309

Device	Routing	Invert	Outlet Devices
#1	Device 2	39.66'	**6.0" Round Culvert** L= 80.0' Ke= 0.500 Outlet Invert= 39.33' S= 0.0041 '/' Cc= 0.900 n= 0.012
#2	Primary	39.33'	**12.0" Round Culvert** L= 60.0' Ke= 0.500 Outlet Invert= 38.67' S= 0.0110 '/' Cc= 0.900 n= 0.012
#3	Device 1	39.00'	**2.540 in/hr Exfiltration over Surface area**
#4	Device 2	42.00'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.11 cfs @ 11.98 hrs HW=39.92' TW=35.37' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.11 cfs of 1.25 cfs potential flow)
  ├─**1=Culvert** (Passes 0.11 cfs of 0.12 cfs potential flow)
  │ └─**3=Exfiltration** (Exfiltration Controls 0.11 cfs)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Pond B100: B-100



Summary for Pond B101: B-101

Inflow Area =	1.176 ac, 25.00% Impervious, Inflow Depth = 1.25" for 2-Year Storm event				
Inflow =	1.76 cfs @ 12.08 hrs, Volume=	0.122 af			
Outflow =	0.13 cfs @ 13.93 hrs, Volume=	0.117 af, Atten= 93%, Lag= 110.8 min			
Primary =	0.13 cfs @ 13.93 hrs, Volume=	0.117 af			

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 39.76' @ 13.93 hrs Surf.Area= 2,166 sf Storage= 2,569 cf

Plug-Flow detention time= 236.7 min calculated for 0.117 af (95% of inflow)
Center-of-Mass det. time= 211.9 min (1,057.2 - 845.2)

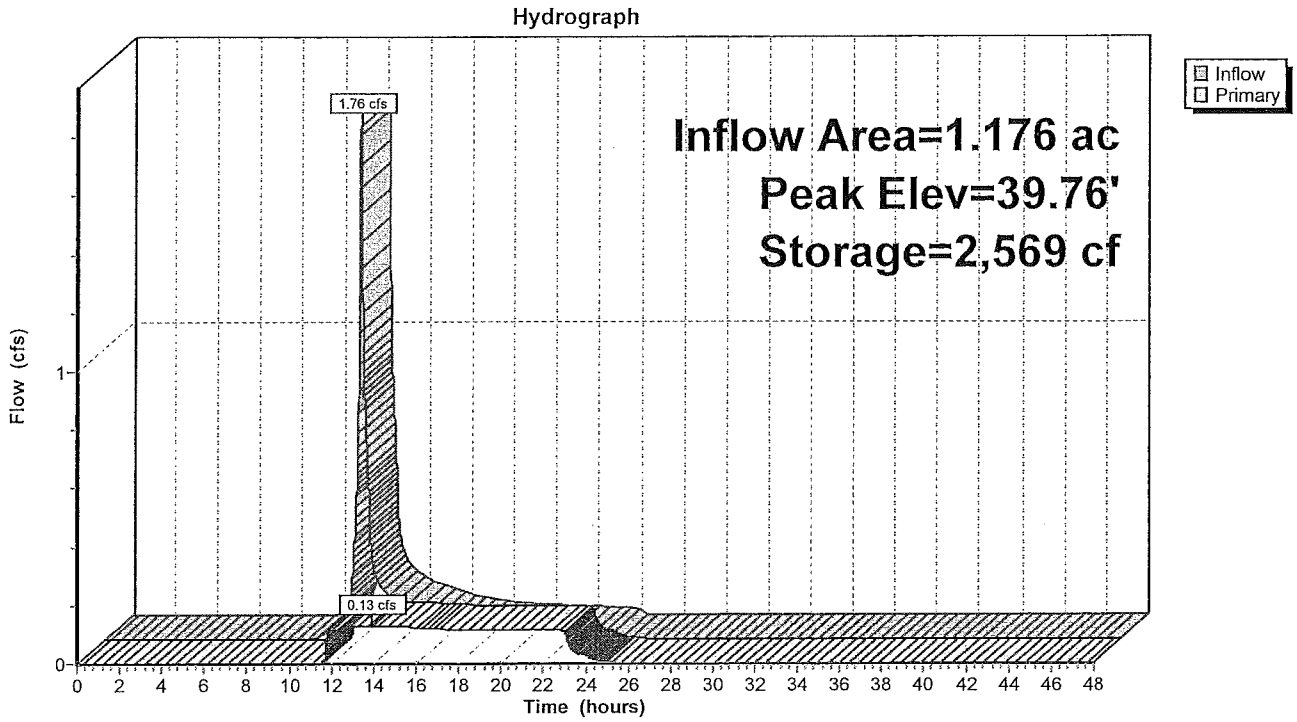
Volume	Invert	Avail.Storage	Storage Description
#1	37.00'	5,822 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
37.00	1,974	0.0	0	0
37.50	1,974	15.0	148	148
38.00	1,974	30.0	296	444
38.50	1,974	30.0	296	740
39.00	1,974	30.0	296	1,036
39.50	1,974	100.0	987	2,023
40.00	2,338	100.0	1,078	3,101
40.50	2,717	100.0	1,264	4,365
41.00	3,110	100.0	1,457	5,822

Device	Routing	Invert	Outlet Devices
#1	Device 2	37.66'	**6.0" Round Culvert** L= 80.0' Ke= 0.500 Outlet Invert= 37.33' S= 0.0041 '/' Cc= 0.900 n= 0.012
#2	Primary	37.00'	**12.0" Round Culvert** L= 60.0' Ke= 0.500 Outlet Invert= 36.50' S= 0.0083 '/' Cc= 0.900 n= 0.012
#3	Device 1	37.00'	**2.540 in/hr Exfiltration over Surface area**
#4	Device 2	40.20'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.13 cfs @ 13.93 hrs HW=39.76' TW=32.53' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.13 cfs of 5.38 cfs potential flow)
  ├─**1=Culvert** (Passes 0.13 cfs of 0.83 cfs potential flow)
  │ └─**3=Exfiltration** (Exfiltration Controls 0.13 cfs)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Pond B101: B-101

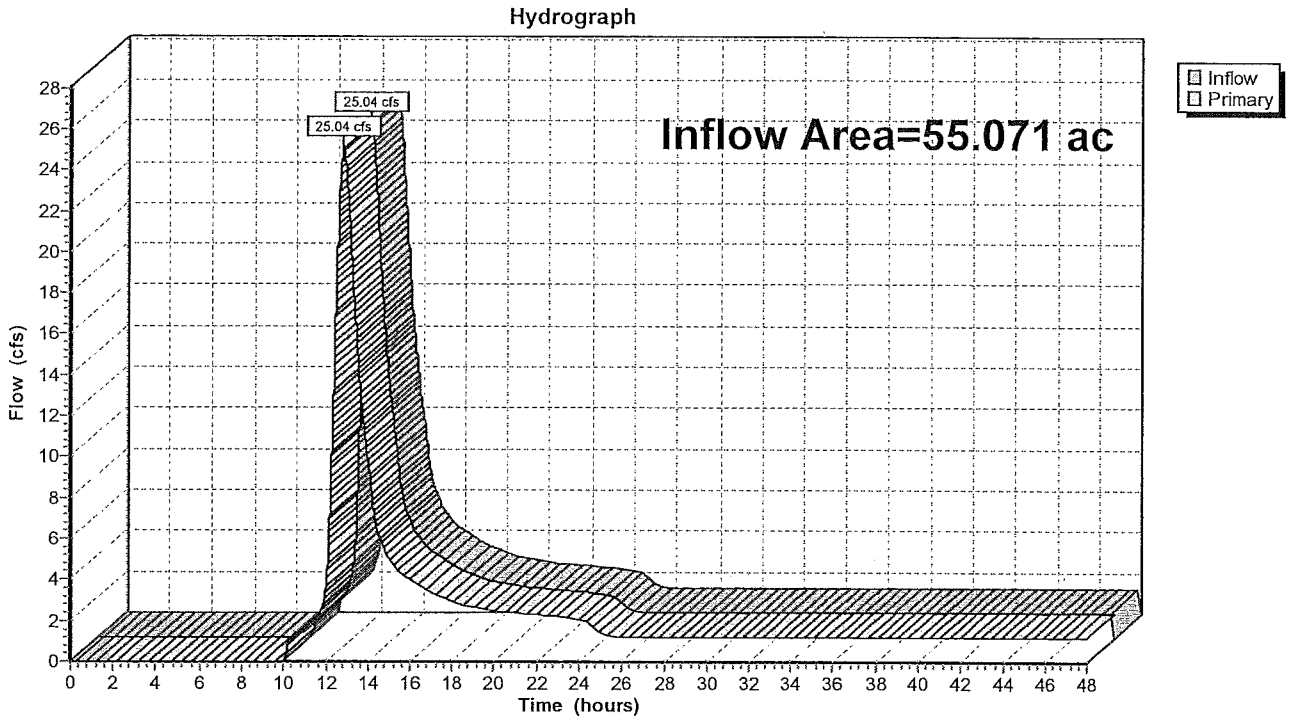


Summary for Link DP4: Design Point 4

Inflow Area = 55.071 ac, 19.02% Impervious, Inflow Depth > 1.76" for 2-Year Storm event
Inflow = 25.04 cfs @ 12.82 hrs, Volume= 8.064 af
Primary = 25.04 cfs @ 12.83 hrs, Volume= 8.064 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link DP4: Design Point 4



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 204A: Subcatchment 204A Runoff Area=983,780 sf 12.80% Impervious Runoff Depth=2.38"
Flow Length=995' Tc=34.6 min CN=78 Runoff=33.26 cfs 4.471 af

Subcatchment 204B: Subcatchment 204B Runoff Area=153,000 sf 2.42% Impervious Runoff Depth=1.82"
Flow Length=525' Tc=36.2 min CN=71 Runoff=3.79 cfs 0.532 af

Subcatchment 204C: Subcatchment 204C Runoff Area=81,800 sf 4.24% Impervious Runoff Depth=1.89"
Flow Length=280' Tc=28.9 min CN=72 Runoff=2.35 cfs 0.296 af

Subcatchment 204D: Subcatchment Runoff Area=1,102,000 sf 27.56% Impervious Runoff Depth=2.38"
Flow Length=580' Tc=57.1 min CN=78 Runoff=28.49 cfs 5.008 af

Subcatchment 204E: Future Development Runoff Area=27,100 sf 25.00% Impervious Runoff Depth=2.55"
Tc=5.0 min CN=80 Runoff=1.93 cfs 0.132 af

Subcatchment 204F: Future Development Runoff Area=51,220 sf 25.00% Impervious Runoff Depth=2.55"
Tc=5.0 min CN=80 Runoff=3.64 cfs 0.250 af

Reach S-1: Stream Segment Avg. Depth=1.51' Max Vel=1.70 fps Inflow=37.88 cfs 8.488 af
L=1,100.0' S=0.0031 '/' Capacity=25.78 cfs Outflow=27.28 cfs 8.461 af

Pond 1P: 4'x2' Road Culvert Peak Elev=33.71' Storage=6,331 cf Inflow=34.32 cfs 4.715 af
48.0" x 24.0" Box Culvert n=0.013 L=105.0' S=0.0019 '/' Outflow=31.99 cfs 7.534 af

Pond 3P: 15" Road Culvert Peak Elev=36.88' Storage=429 cf Inflow=3.91 cfs 0.659 af
15.0" Round Culvert n=0.012 L=105.0' S=0.0038 '/' Outflow=3.90 cfs 0.657 af

Pond 4P: 15" Road Culvert Peak Elev=33.77' Storage=58 cf Inflow=2.35 cfs 0.296 af
15.0" Round Culvert n=0.012 L=85.0' S=0.0176 '/' Outflow=2.36 cfs 0.296 af

Pond B100: B-100 Peak Elev=42.00' Storage=2,907 cf Inflow=1.93 cfs 0.132 af
Outflow=0.12 cfs 0.127 af

Pond B101: B-101 Peak Elev=40.38' Storage=4,053 cf Inflow=3.64 cfs 0.250 af
Outflow=1.36 cfs 0.244 af

Link DP4: Design Point 4 Inflow=55.43 cfs 13.469 af
Primary=55.43 cfs 13.469 af

Total Runoff Area = 55.071 ac Runoff Volume = 10.690 af Average Runoff Depth = 2.33"
80.98% Pervious = 44.595 ac 19.02% Impervious = 10.477 ac

Summary for Subcatchment 204A: Subcatchment 204A

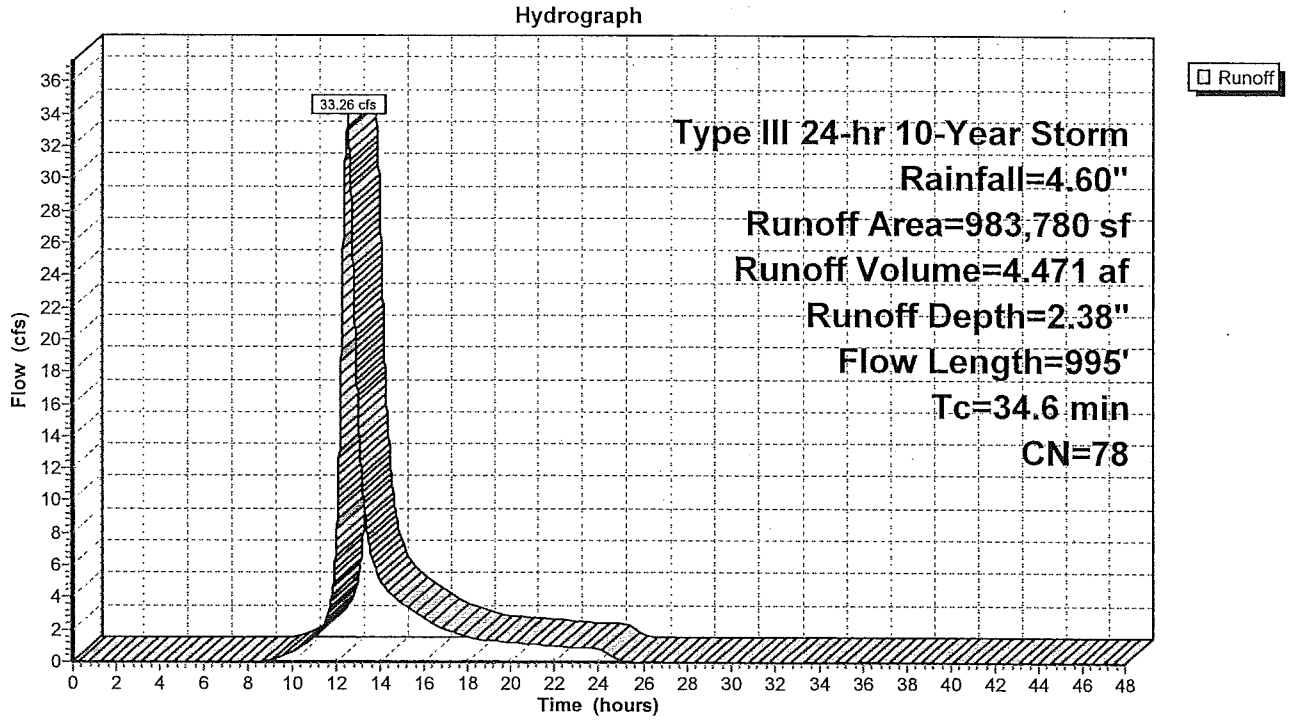
Runoff = 33.26 cfs @ 12.49 hrs, Volume= 4.471 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Storm Rainfall=4.60"

Area (sf)	CN	Description
419,800	81	1/3 acre lots, 30% imp, HSG C
152,200	91	Newly graded area, HSG C
85,000	65	Brush, Good, HSG C
320,780	70	Woods, Good, HSG C
6,000	74	>75% Grass cover, Good, HSG C
983,780	78	Weighted Average
857,840		87.20% Pervious Area
125,940		12.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4	60	0.0100	0.05		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
15.2	935	0.0420	1.02		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
34.6	995	Total			

Subcatchment 204A: Subcatchment 204A



Summary for Subcatchment 204B: Subcatchment 204B

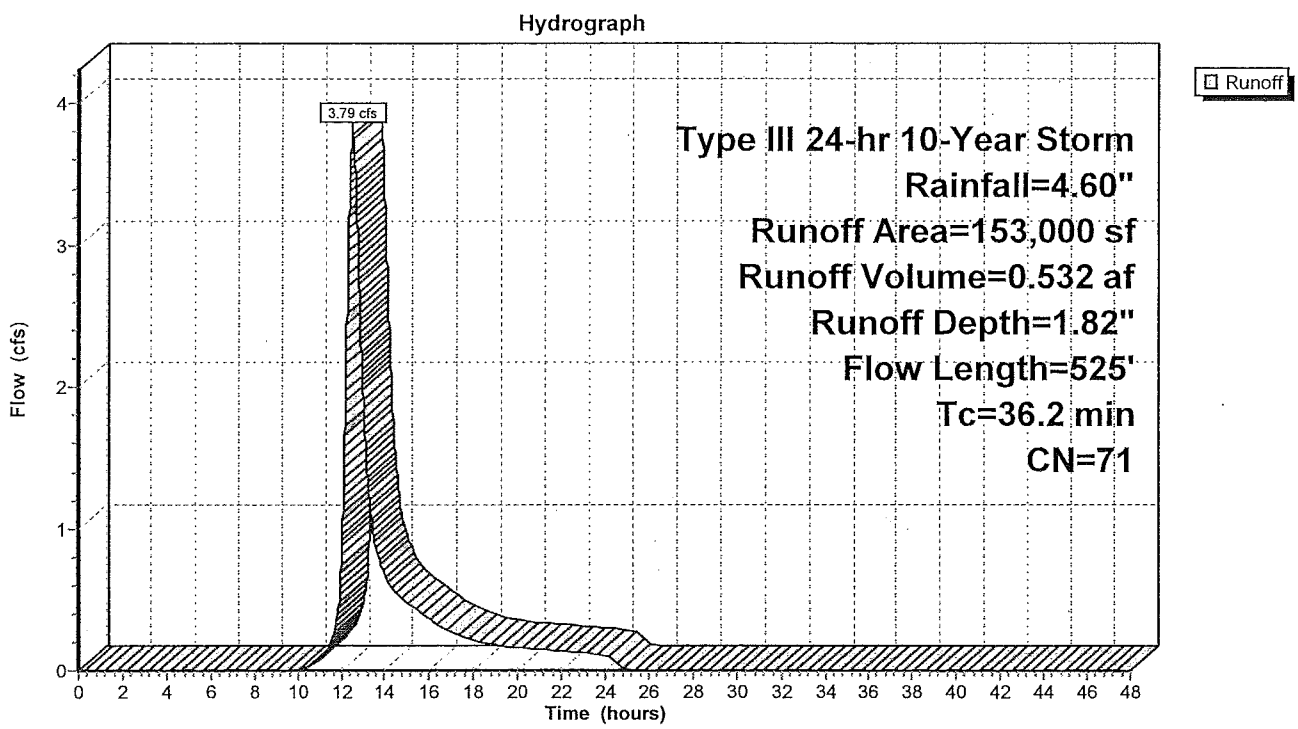
Runoff = 3.79 cfs @ 12.51 hrs, Volume= 0.532 af, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Storm Rainfall=4.60"

Area (sf)	CN	Description
7,400	92	Paved roads w/open ditches, 50% imp, HSG C
9,000	74	>75% Grass cover, Good, HSG C
136,600	70	Woods, Good, HSG C
153,000	71	Weighted Average
149,300		97.58% Pervious Area
3,700		2.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	60	0.0050	0.04		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
10.5	465	0.0220	0.74		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
36.2	525	Total			

Subcatchment 204B: Subcatchment 204B



Summary for Subcatchment 204C: Subcatchment 204C

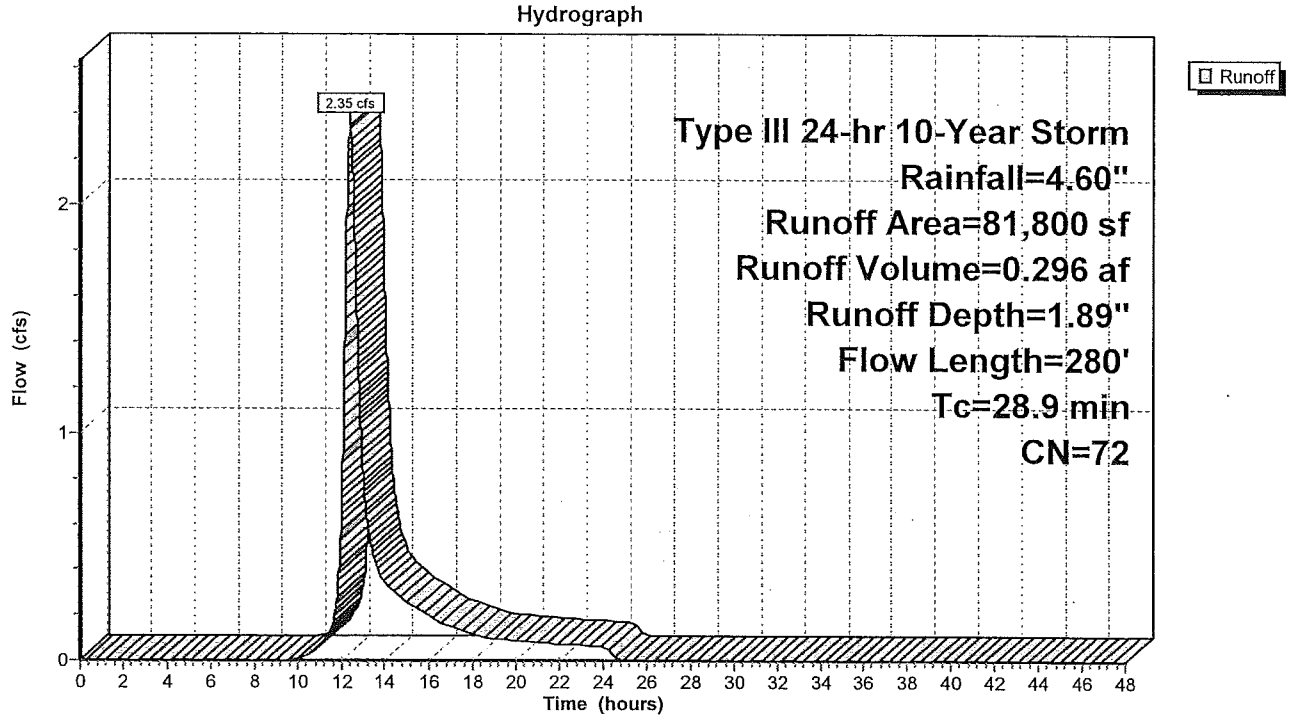
Runoff = 2.35 cfs @ 12.43 hrs, Volume= 0.296 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Storm Rainfall=4.60"

Area (sf)	CN	Description
6,940	92	Paved roads w/open ditches, 50% imp, HSG C
3,200	74	>75% Grass cover, Good, HSG C
71,660	70	Woods, Good, HSG C
81,800	72	Weighted Average
78,330		95.76% Pervious Area
3,470		4.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	60	0.0050	0.04		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
3.2	220	0.0270	1.15		**Shallow Concentrated Flow, Woods** Short Grass Pasture Kv= 7.0 fps
28.9	280	Total			

Subcatchment 204C: Subcatchment 204C



Summary for Subcatchment 204D: Subcatchment 204D

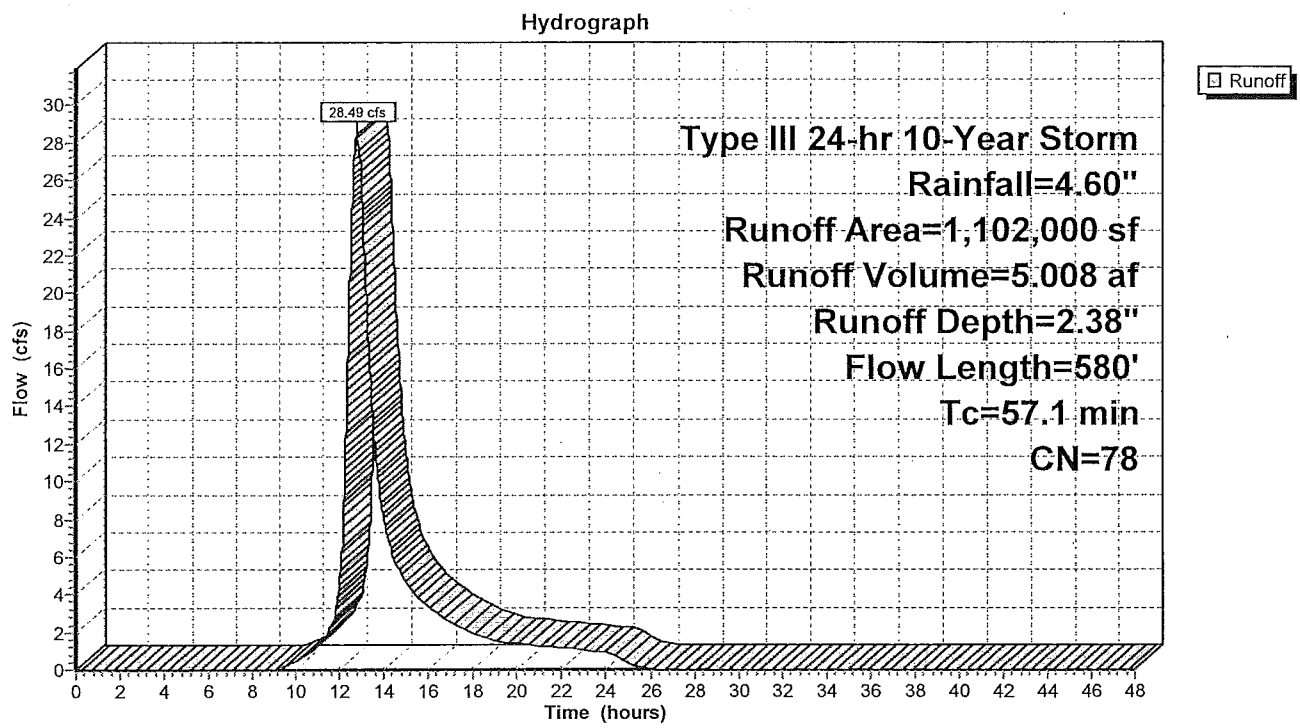
Runoff = 28.49 cfs @ 12.76 hrs, Volume= 5.008 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Storm Rainfall=4.60"

Area (sf)	CN	Description
67,600	92	Paved roads w/open ditches, 50% imp, HSG C
85,000	65	Brush, Good, HSG C
97,500	98	Paved roads w/curbs & sewers, HSG C
239,400	91	Urban industrial, 72% imp, HSG C
612,500	70	Woods, Good, HSG C
1,102,000	78	Weighted Average
798,332		72.44% Pervious Area
303,668		27.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
48.8	60	0.0010	0.02		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
8.3	520	0.0440	1.05		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
57.1	580	Total			

Subcatchment 204D: Subcatchment 204D



Summary for Subcatchment 204E: Future Development (Cleared Area)

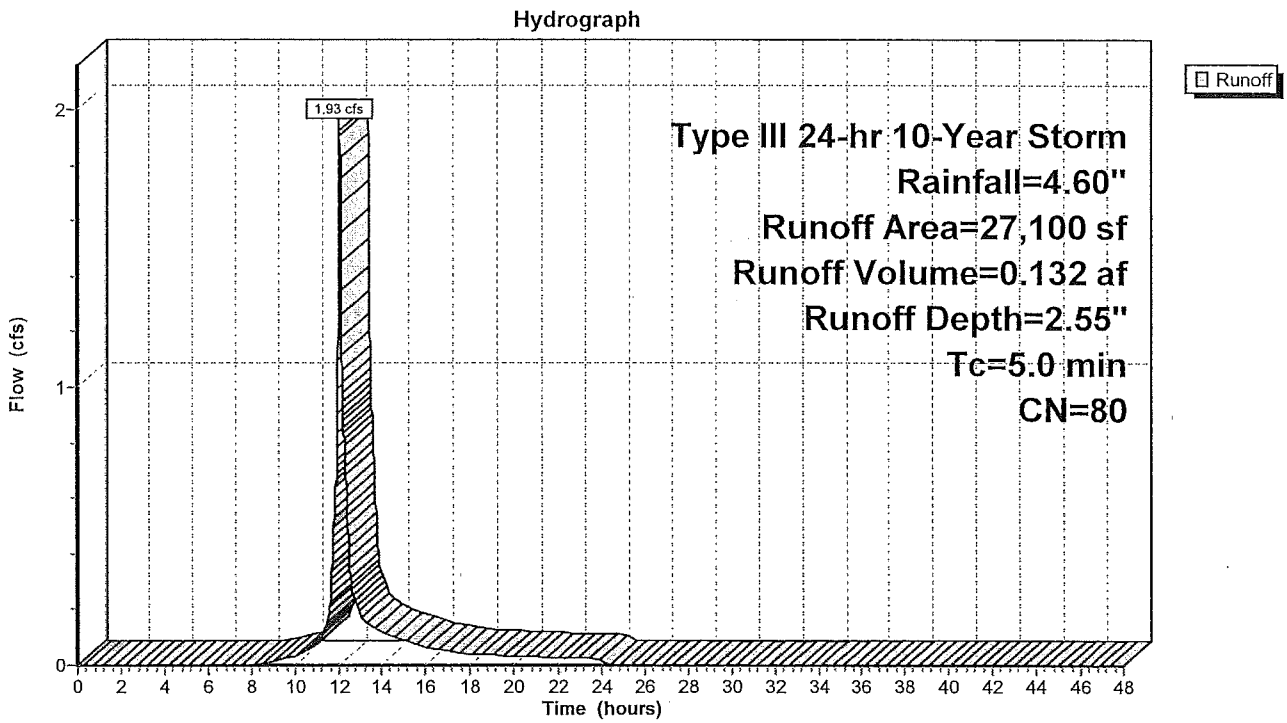
Runoff = 1.93 cfs @ 12.07 hrs, Volume= 0.132 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	6,775	98	Future Impervious
*	20,325	74	Future landscaped
	27,100	80	Weighted Average
	20,325		75.00% Pervious Area
	6,775		25.00% Impervious Area

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

Subcatchment 204E: Future Development (Cleared Area)



Summary for Subcatchment 204F: Future Development (Cleared Area)

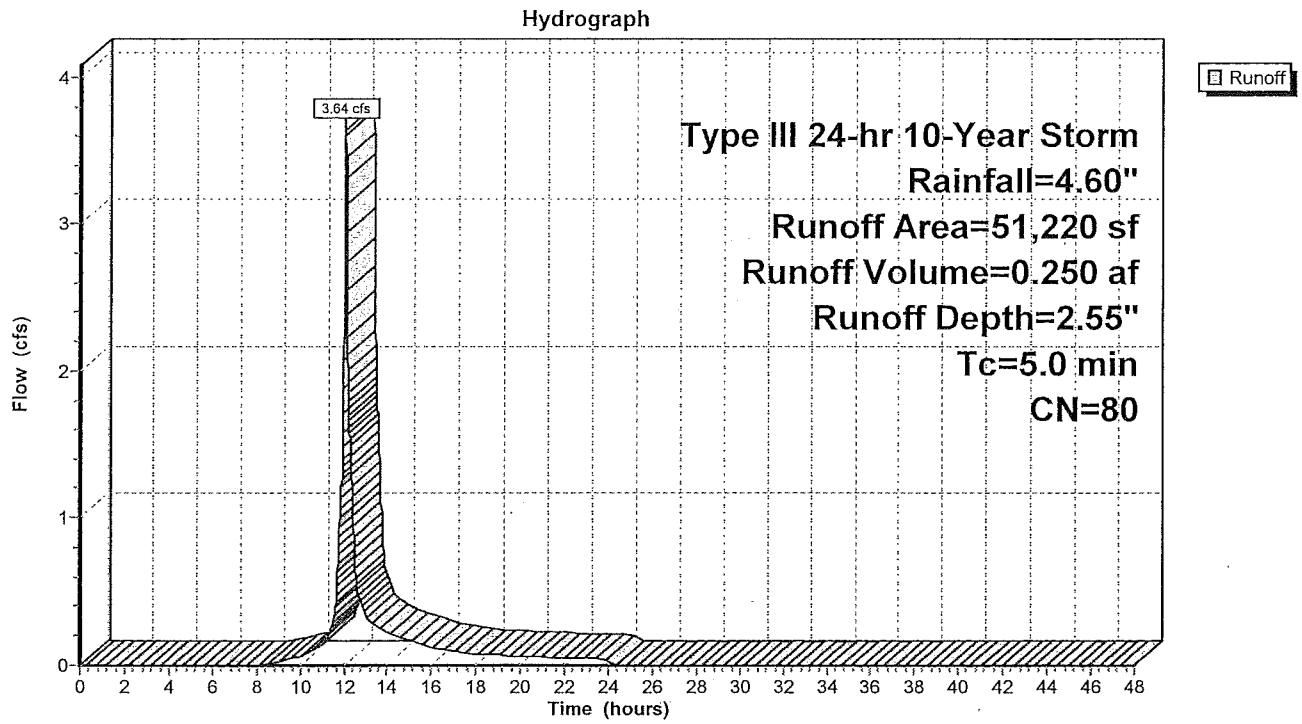
Runoff = 3.64 cfs @ 12.07 hrs, Volume= 0.250 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Storm Rainfall=4.60"

	Area (sf)	CN	Description
*	12,805	98	Future Impervious
*	38,415	74	Future landscaped
	51,220	80	Weighted Average
	38,415		75.00% Pervious Area
	12,805		25.00% Impervious Area

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

Subcatchment 204F: Future Development (Cleared Area)



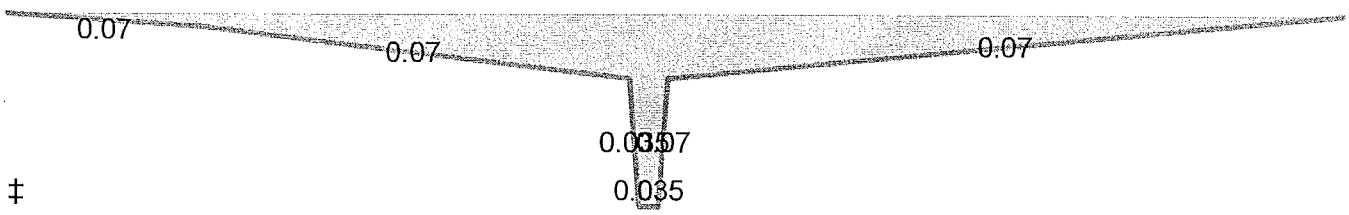
Summary for Reach S-1: Stream Segment

Inflow Area = 29.773 ac, 11.77% Impervious, Inflow Depth > 3.42" for 10-Year Storm event
Inflow = 37.88 cfs @ 12.59 hrs, Volume= 8.488 af
Outflow = 27.28 cfs @ 12.88 hrs, Volume= 8.461 af, Atten= 28%, Lag= 17.5 min

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.70 fps, Min. Travel Time= 10.8 min
Avg. Velocity = 1.19 fps, Avg. Travel Time= 15.4 min

Peak Storage= 42,880 cf @ 12.88 hrs, Average Depth at Peak Storage= 1.51'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 25.78 cfs

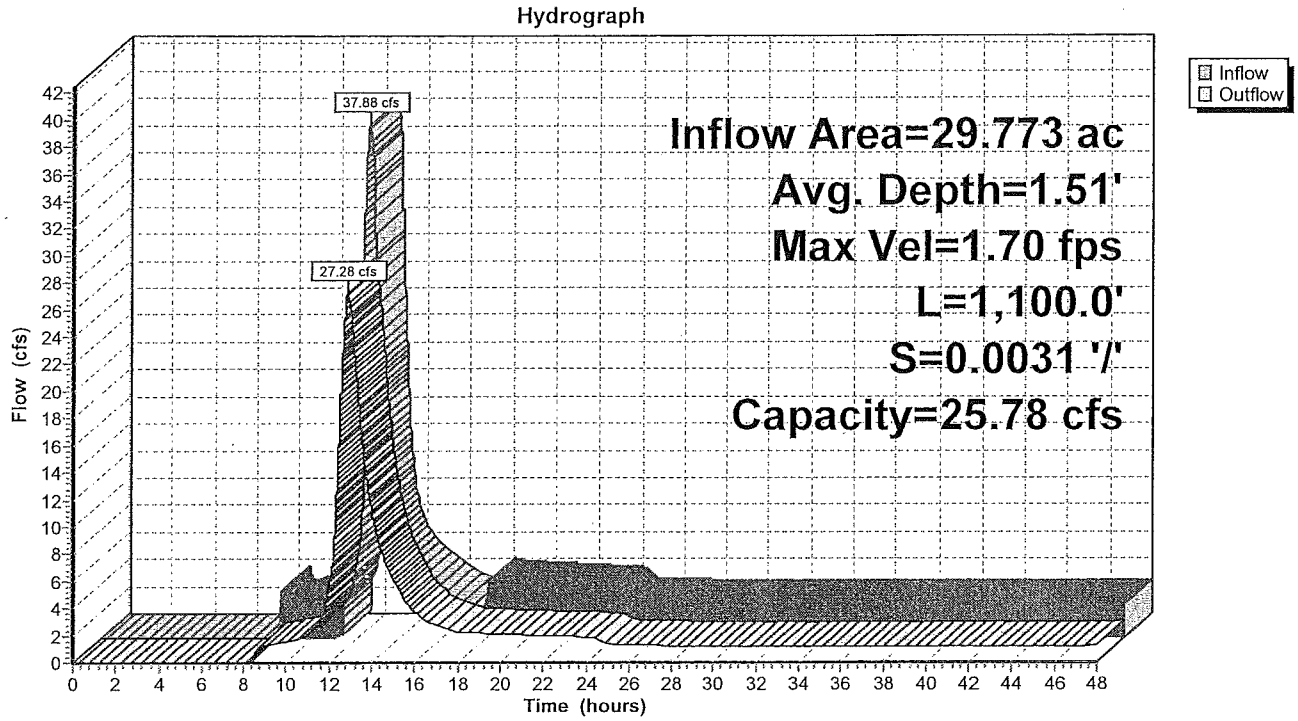
Custom cross-section, Length= 1,100.0' Slope= 0.0031 '/'
Flow calculated by Manning's Subdivision method
Inlet Invert= 31.40', Outlet Invert= 28.00'



Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	31.00	0.00		
20.00	30.90	0.10	0.070	
65.00	30.50	0.50	0.070	
66.00	29.50	1.50	0.035	
68.00	29.50	1.50	0.035	
69.00	30.50	0.50	0.070	
140.00	31.00	0.00	0.070	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	2.0	0	0.00
1.00	3.0	4.8	3,302	5.05
1.40	25.0	106.6	27,465	17.96
1.50	37.3	140.8	40,975	25.78

Reach S-1: Stream Segment



Summary for Pond 1P: 4'x2' Road Culvert

Inflow Area = 23.760 ac, 13.41% Impervious, Inflow Depth = 2.38" for 10-Year Storm event
Inflow = 34.32 cfs @ 12.49 hrs, Volume= 4.715 af
Outflow = 31.99 cfs @ 12.60 hrs, Volume= 7.534 af, Atten= 7%, Lag= 6.8 min
Primary = 31.99 cfs @ 12.60 hrs, Volume= 7.534 af

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 33.71' @ 12.60 hrs Surf.Area= 13,092 sf Storage= 6,331 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 412.6 min (1,279.4 - 866.8)

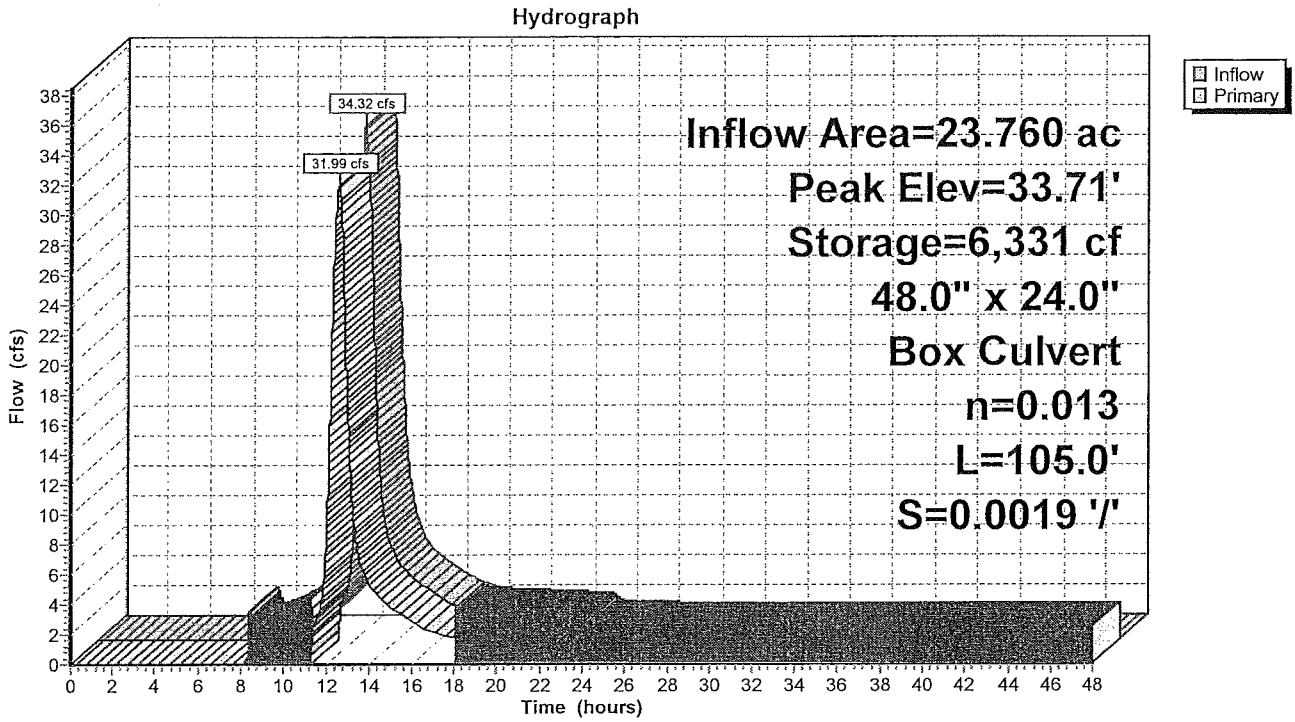
Volume	Invert	Avail.Storage	Storage Description
#1	32.00'	33,820 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.00	160	0	0
33.00	1,840	1,000	1,000
34.00	17,600	9,720	10,720
35.00	28,600	23,100	33,820

Device	Routing	Invert	Outlet Devices
#1	Primary	31.50'	**48.0" W x 24.0" H Box Culvert** L= 105.0' Ke= 0.500 Outlet Invert= 31.30' S= 0.0019 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=31.99 cfs @ 12.60 hrs HW=33.71' TW=32.85' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 31.99 cfs @ 4.82 fps)

Pond 1P: 4'x2' Road Culvert



Summary for Pond 3P: 15" Road Culvert

Inflow Area = 4.135 ac, 5.82% Impervious, Inflow Depth = 1.91" for 10-Year Storm event
Inflow = 3.91 cfs @ 12.51 hrs, Volume= 0.659 af
Outflow = 3.90 cfs @ 12.55 hrs, Volume= 0.657 af, Atten= 0%, Lag= 2.0 min
Primary = 3.90 cfs @ 12.55 hrs, Volume= 0.657 af

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 36.88' @ 12.55 hrs Surf.Area= 293 sf Storage= 429 cf

Plug-Flow detention time= 6.0 min calculated for 0.657 af (100% of inflow)
Center-of-Mass det. time= 3.6 min (917.7 - 914.1)

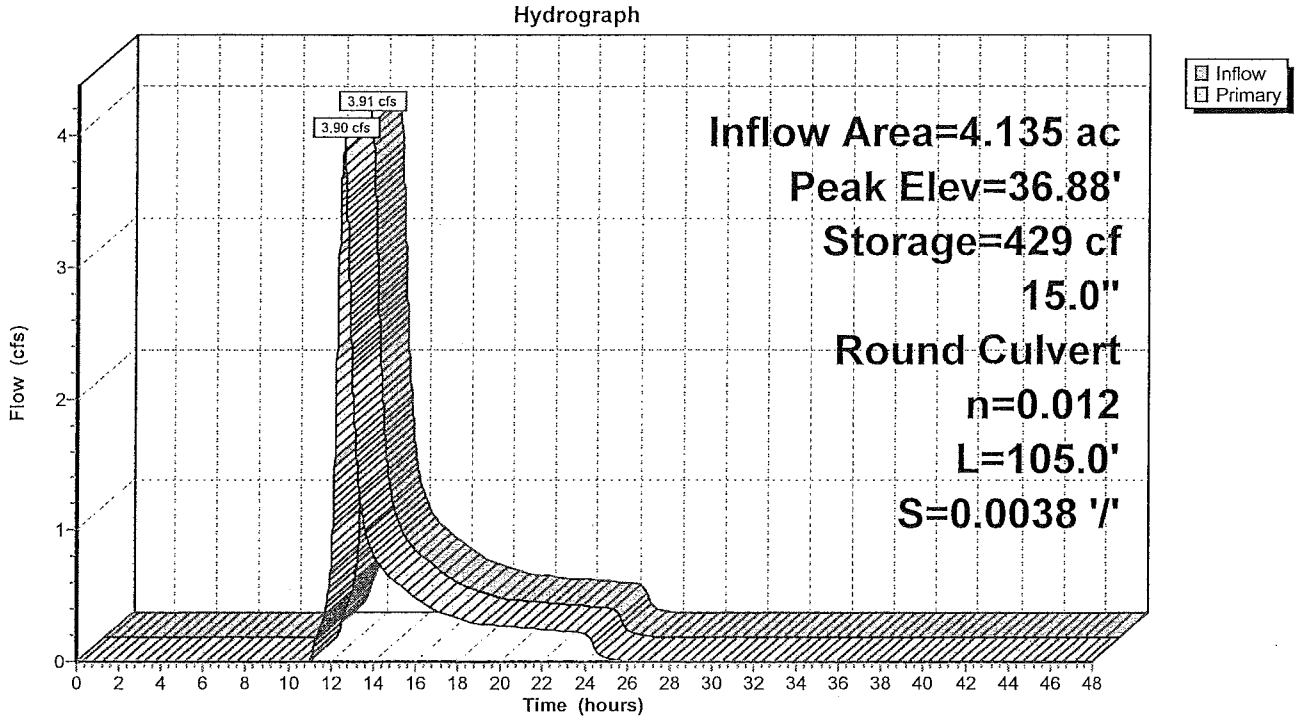
Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	3,855 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
35.00	150	0	0
36.00	240	195	195
37.00	300	270	465
38.00	360	330	795
39.00	420	390	1,185
40.00	740	580	1,765
41.00	3,440	2,090	3,855

Device	Routing	Invert	Outlet Devices
#1	Primary	35.60'	**15.0" Round Culvert** L= 105.0' Ke= 0.500 Outlet Invert= 35.20' S= 0.0038 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=3.90 cfs @ 12.55 hrs HW=36.88' TW=32.83' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 3.90 cfs @ 3.86 fps)

Pond 3P: 15" Road Culvert



Summary for Pond 4P: 15" Road Culvert

Inflow Area =	1.878 ac,	4.24% Impervious,	Inflow Depth =	1.89"	for 10-Year Storm event
Inflow =	2.35 cfs @	12.43 hrs,	Volume=	0.296 af	
Outflow =	2.36 cfs @	12.43 hrs,	Volume=	0.296 af,	Atten= 0%, Lag= 0.3 min
Primary =	2.36 cfs @	12.43 hrs,	Volume=	0.296 af	

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 33.77' @ 12.43 hrs Surf.Area= 91 sf Storage= 58 cf

Plug-Flow detention time= 1.0 min calculated for 0.296 af (100% of inflow)
Center-of-Mass det. time= 0.9 min (869.0 - 868.1)

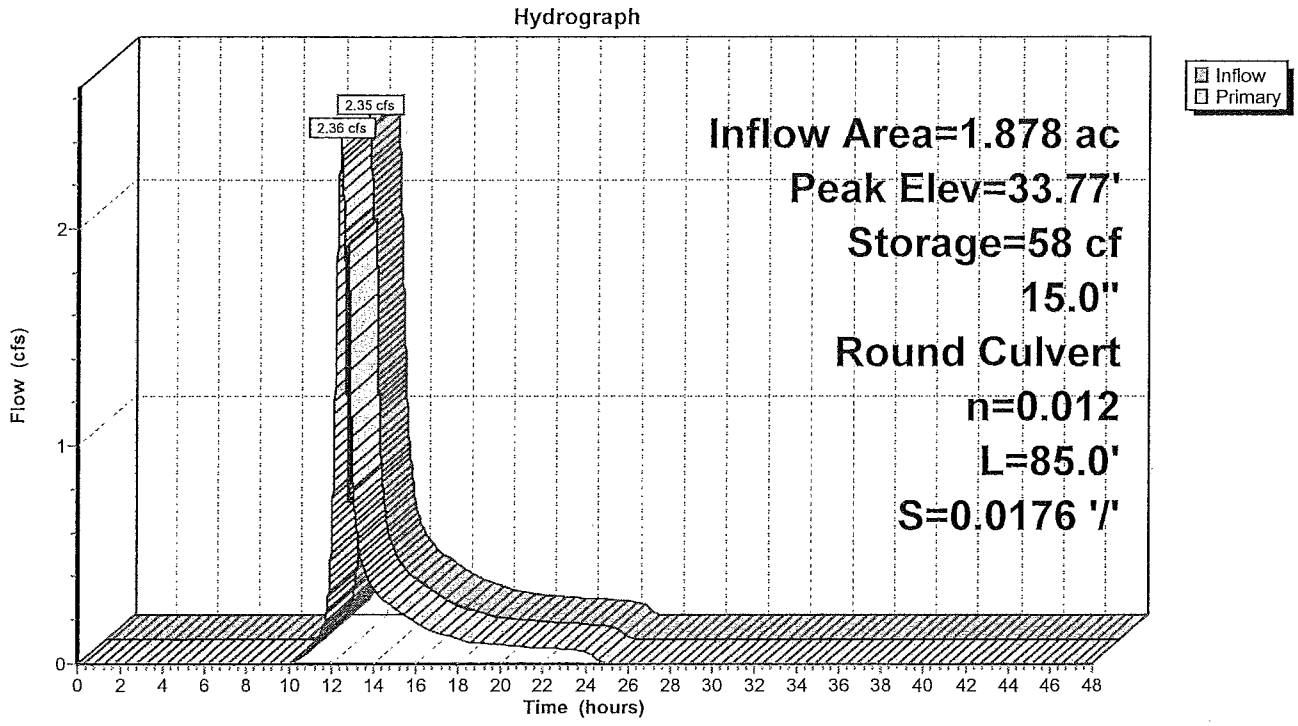
Volume	Invert	Avail.Storage	Storage Description
#1	33.00'	4,580 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
33.00	60	0	0
34.00	100	80	80
35.00	2,100	1,100	1,180
36.00	4,700	3,400	4,580

Device	Routing	Invert	Outlet Devices
#1	Primary	33.00'	**15.0" Round Culvert** L= 85.0' Ke= 0.500 Outlet Invert= 31.50' S= 0.0176 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=2.36 cfs @ 12.43 hrs HW=33.77' TW=32.76' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 2.36 cfs @ 2.98 fps)

Pond 4P: 15" Road Culvert



Summary for Pond B100: B-100

Inflow Area = 0.622 ac, 25.00% Impervious, Inflow Depth = 2.55" for 10-Year Storm event
Inflow = 1.93 cfs @ 12.07 hrs, Volume= 0.132 af
Outflow = 0.12 cfs @ 13.89 hrs, Volume= 0.127 af, Atten= 94%, Lag= 109.0 min
Primary = 0.12 cfs @ 13.89 hrs, Volume= 0.127 af

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 42.00' @ 13.89 hrs Surf.Area= 2,121 sf Storage= 2,907 cf

Plug-Flow detention time= 265.5 min calculated for 0.127 af (96% of inflow)
Center-of-Mass det. time= 243.1 min (1,067.6 - 824.5)

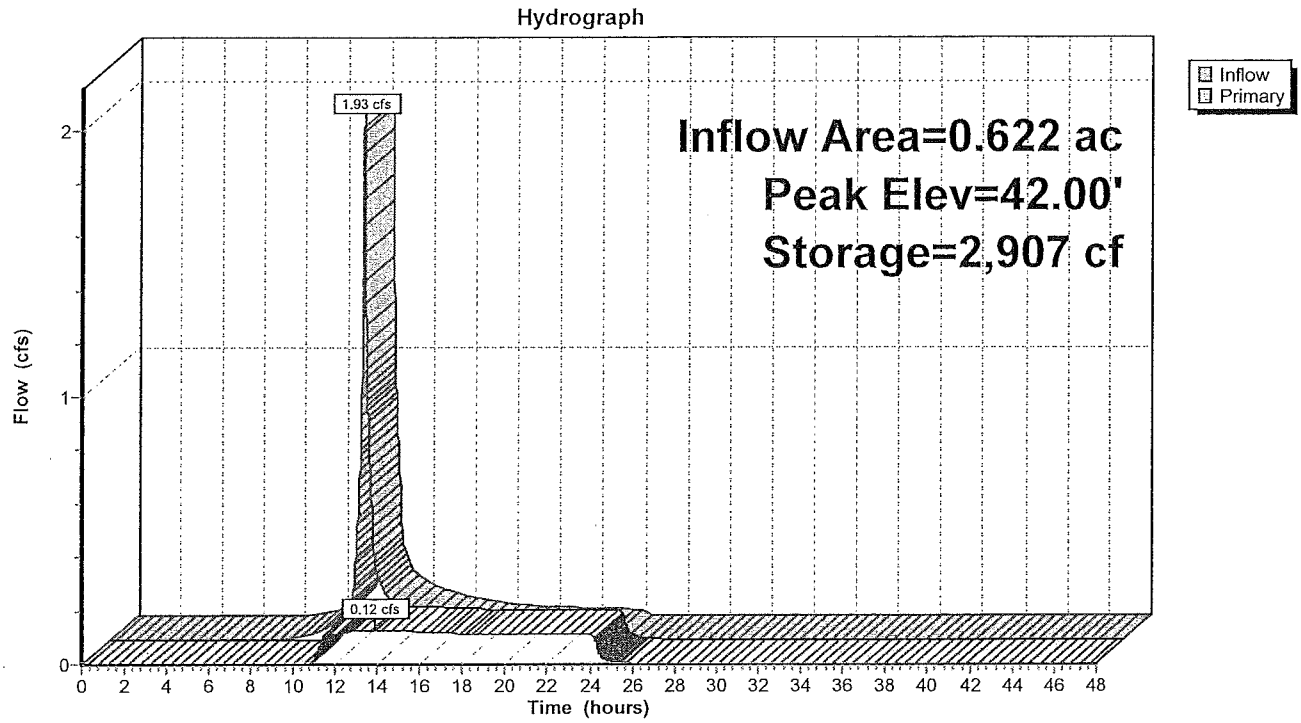
Volume	Invert	Avail.Storage	Storage Description
#1	39.00'	5,309 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
39.00	1,868	0.0	0	0
39.50	1,868	15.0	140	140
40.00	1,868	30.0	280	420
40.50	1,868	30.0	280	701
41.00	1,868	30.0	280	981
41.50	1,868	100.0	934	1,915
42.00	2,122	100.0	998	2,912
42.50	2,398	100.0	1,130	4,042
43.00	2,670	100.0	1,267	5,309

Device	Routing	Invert	Outlet Devices
#1	Device 2	39.66'	**6.0" Round Culvert** L= 80.0' Ke= 0.500 Outlet Invert= 39.33' S= 0.0041 '/' Cc= 0.900 n= 0.012
#2	Primary	39.33'	**12.0" Round Culvert** L= 60.0' Ke= 0.500 Outlet Invert= 38.67' S= 0.0110 '/' Cc= 0.900 n= 0.012
#3	Device 1	39.00'	**2.540 in/hr Exfiltration over Surface area**
#4	Device 2	42.00'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.12 cfs @ 13.89 hrs HW=42.00' TW=36.11' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.12 cfs of 5.46 cfs potential flow)
  ├─**1=Culvert** (Passes 0.12 cfs of 0.88 cfs potential flow)
  │ └─**3=Exfiltration** (Exfiltration Controls 0.12 cfs)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Pond B100: B-100



Summary for Pond B101: B-101

Inflow Area = 1.176 ac, 25.00% Impervious, Inflow Depth = 2.55" for 10-Year Storm event
Inflow = 3.64 cfs @ 12.07 hrs, Volume= 0.250 af
Outflow = 1.36 cfs @ 12.34 hrs, Volume= 0.244 af, Atten= 63%, Lag= 15.8 min
Primary = 1.36 cfs @ 12.34 hrs, Volume= 0.244 af

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 40.38' @ 12.34 hrs Surf.Area= 2,628 sf Storage= 4,053 cf

Plug-Flow detention time= 226.8 min calculated for 0.244 af (98% of inflow)
Center-of-Mass det. time= 213.8 min (1,038.3 - 824.5)

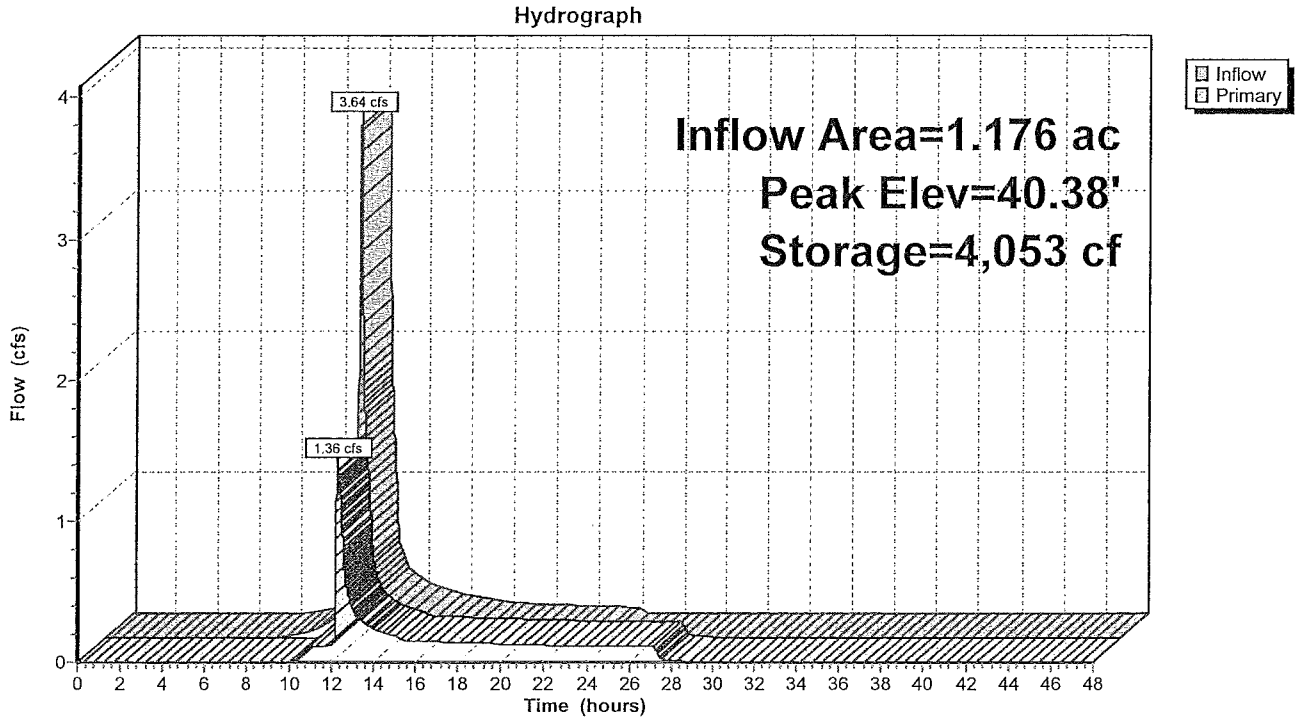
Volume	Invert	Avail.Storage	Storage Description
#1	37.00'	5,822 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
37.00	1,974	0.0	0	0
37.50	1,974	15.0	148	148
38.00	1,974	30.0	296	444
38.50	1,974	30.0	296	740
39.00	1,974	30.0	296	1,036
39.50	1,974	100.0	987	2,023
40.00	2,338	100.0	1,078	3,101
40.50	2,717	100.0	1,264	4,365
41.00	3,110	100.0	1,457	5,822

Device	Routing	Invert	Outlet Devices
#1	Device 2	37.66'	**6.0" Round Culvert** L= 80.0' Ke= 0.500 Outlet Invert= 37.33' S= 0.0041 '/' Cc= 0.900 n= 0.012
#2	Primary	37.00'	**12.0" Round Culvert** L= 60.0' Ke= 0.500 Outlet Invert= 36.50' S= 0.0083 '/' Cc= 0.900 n= 0.012
#3	Device 1	37.00'	**2.540 in/hr Exfiltration over Surface area**
#4	Device 2	40.20'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.36 cfs @ 12.34 hrs HW=40.38' TW=33.38' (Dynamic Tailwater)
└─**2=Culvert** (Passes 1.36 cfs of 6.07 cfs potential flow)
  ├─**1=Culvert** (Passes 0.15 cfs of 0.96 cfs potential flow)
  │ └─**3=Exfiltration** (Exfiltration Controls 0.15 cfs)
  └─**4=Orifice/Grate** (Weir Controls 1.21 cfs @ 1.40 fps)

Pond B101: B-101

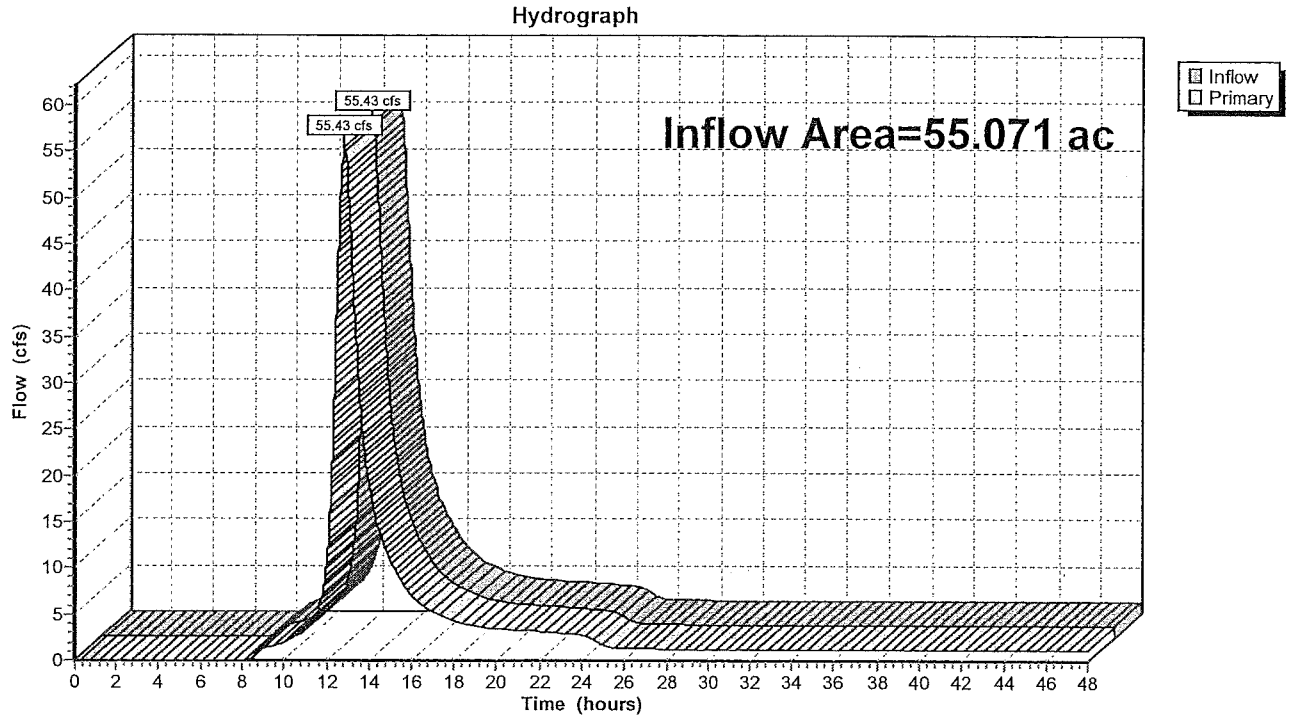


Summary for Link DP4: Design Point 4

Inflow Area = 55.071 ac, 19.02% Impervious, Inflow Depth > 2.93" for 10-Year Storm event
Inflow = 55.43 cfs @ 12.82 hrs, Volume= 13.469 af
Primary = 55.43 cfs @ 12.83 hrs, Volume= 13.469 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link DP4: Design Point 4



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 204A: Subcatchment 204A Runoff Area=983,780 sf 12.80% Impervious Runoff Depth=3.05"
Flow Length=995' Tc=34.6 min CN=78 Runoff=42.84 cfs 5.749 af

Subcatchment 204B: Subcatchment 204B Runoff Area=153,000 sf 2.42% Impervious Runoff Depth=2.42"
Flow Length=525' Tc=36.2 min CN=71 Runoff=5.12 cfs 0.709 af

Subcatchment 204C: Subcatchment 204C Runoff Area=81,800 sf 4.24% Impervious Runoff Depth=2.51"
Flow Length=280' Tc=28.9 min CN=72 Runoff=3.15 cfs 0.393 af

Subcatchment 204D: Subcatchment Runoff Area=1,102,000 sf 27.56% Impervious Runoff Depth=3.05"
Flow Length=580' Tc=57.1 min CN=78 Runoff=36.78 cfs 6.439 af

Subcatchment 204E: Future Development Runoff Area=27,100 sf 25.00% Impervious Runoff Depth=3.24"
Tc=5.0 min CN=80 Runoff=2.45 cfs 0.168 af

Subcatchment 204F: Future Development Runoff Area=51,220 sf 25.00% Impervious Runoff Depth=3.24"
Tc=5.0 min CN=80 Runoff=4.63 cfs 0.318 af

Reach S-1: Stream Segment Avg. Depth=1.59' Max Vel=1.69 fps Inflow=47.77 cfs 10.056 af
L=1,100.0' S=0.0031 '/' Capacity=25.78 cfs Outflow=37.50 cfs 10.029 af

Pond 1P: 4'x2' Road Culvert Peak Elev=34.07' Storage=11,912 cf Inflow=44.17 cfs 6.061 af
48.0" x 24.0" Box Culvert n=0.013 L=105.0' S=0.0019 '/' Outflow=39.50 cfs 8.793 af

Pond 3P: 15" Road Culvert Peak Elev=37.64' Storage=668 cf Inflow=5.71 cfs 0.872 af
15.0" Round Culvert n=0.012 L=105.0' S=0.0038 '/' Outflow=5.66 cfs 0.870 af

Pond 4P: 15" Road Culvert Peak Elev=33.92' Storage=72 cf Inflow=3.15 cfs 0.393 af
15.0" Round Culvert n=0.012 L=85.0' S=0.0176 '/' Outflow=3.16 cfs 0.393 af

Pond B100: B-100 Peak Elev=42.10' Storage=3,132 cf Inflow=2.45 cfs 0.168 af
Outflow=0.63 cfs 0.163 af

Pond B101: B-101 Peak Elev=40.50' Storage=4,356 cf Inflow=4.63 cfs 0.318 af
Outflow=2.65 cfs 0.312 af

Link DP4: Design Point 4 Inflow=73.50 cfs 16.468 af
Primary=73.50 cfs 16.468 af

Total Runoff Area = 55.071 ac Runoff Volume = 13.776 af Average Runoff Depth = 3.00"
80.98% Pervious = 44.595 ac 19.02% Impervious = 10.477 ac

Summary for Subcatchment 204A: Subcatchment 204A

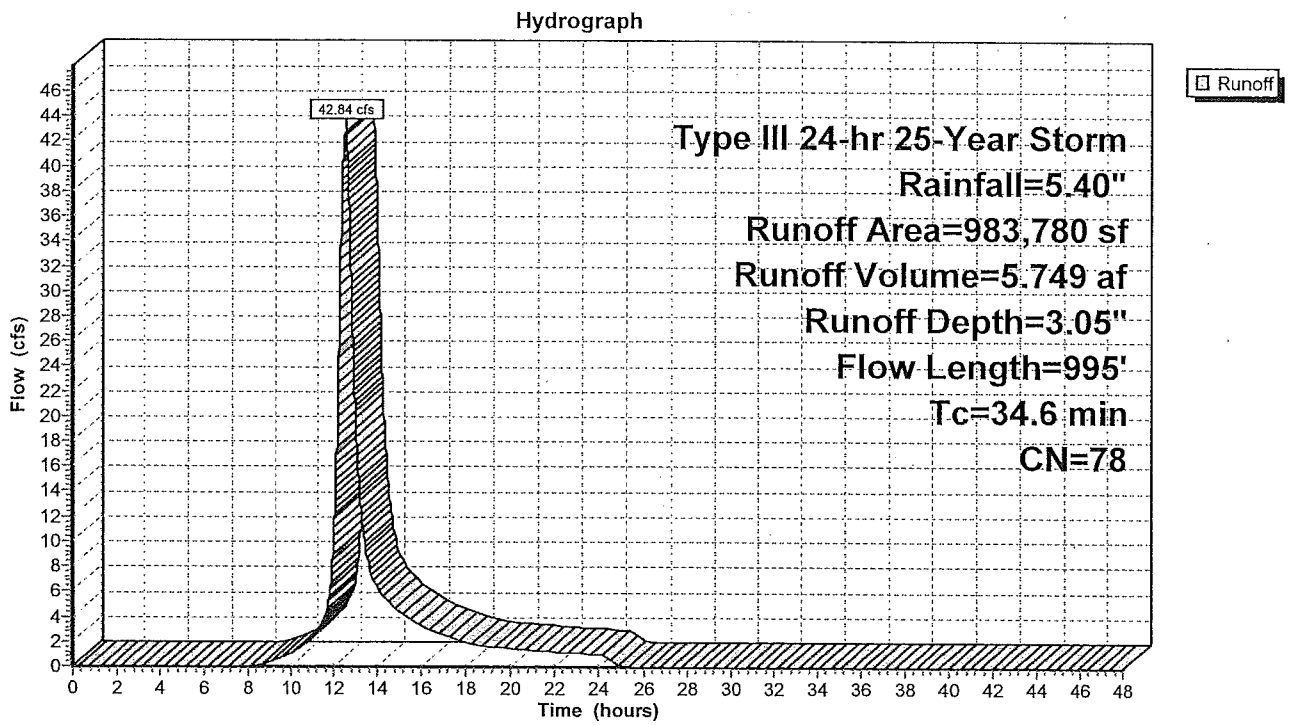
Runoff = 42.84 cfs @ 12.49 hrs, Volume= 5.749 af, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Storm Rainfall=5.40"

Area (sf)	CN	Description
419,800	81	1/3 acre lots, 30% imp, HSG C
152,200	91	Newly graded area, HSG C
85,000	65	Brush, Good, HSG C
320,780	70	Woods, Good, HSG C
6,000	74	>75% Grass cover, Good, HSG C
983,780	78	Weighted Average
857,840		87.20% Pervious Area
125,940		12.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4	60	0.0100	0.05		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
15.2	935	0.0420	1.02		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
34.6	995	Total			

Subcatchment 204A: Subcatchment 204A



Summary for Subcatchment 204B: Subcatchment 204B

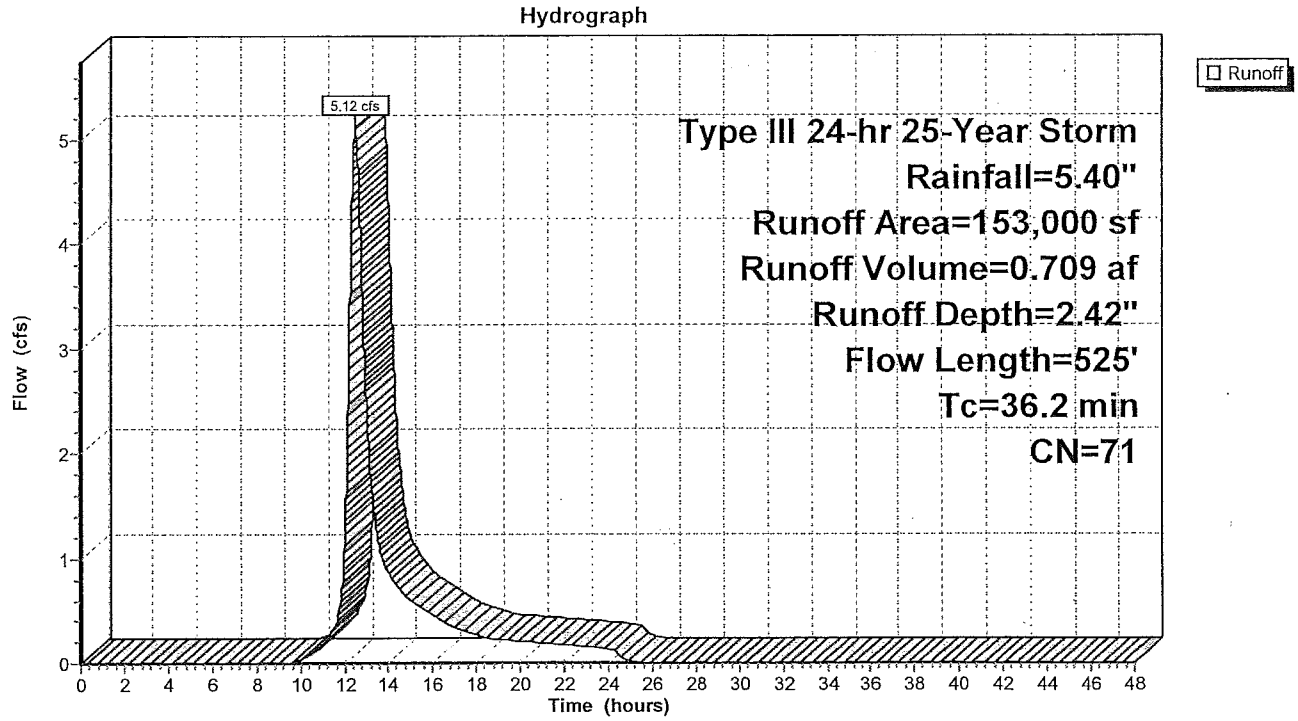
Runoff = 5.12 cfs @ 12.51 hrs, Volume= 0.709 af, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Storm Rainfall=5.40"

Area (sf)	CN	Description
7,400	92	Paved roads w/open ditches, 50% imp, HSG C
9,000	74	>75% Grass cover, Good, HSG C
136,600	70	Woods, Good, HSG C
153,000	71	Weighted Average
149,300		97.58% Pervious Area
3,700		2.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	60	0.0050	0.04		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
10.5	465	0.0220	0.74		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
36.2	525	Total			

Subcatchment 204B: Subcatchment 204B



Summary for Subcatchment 204C: Subcatchment 204C

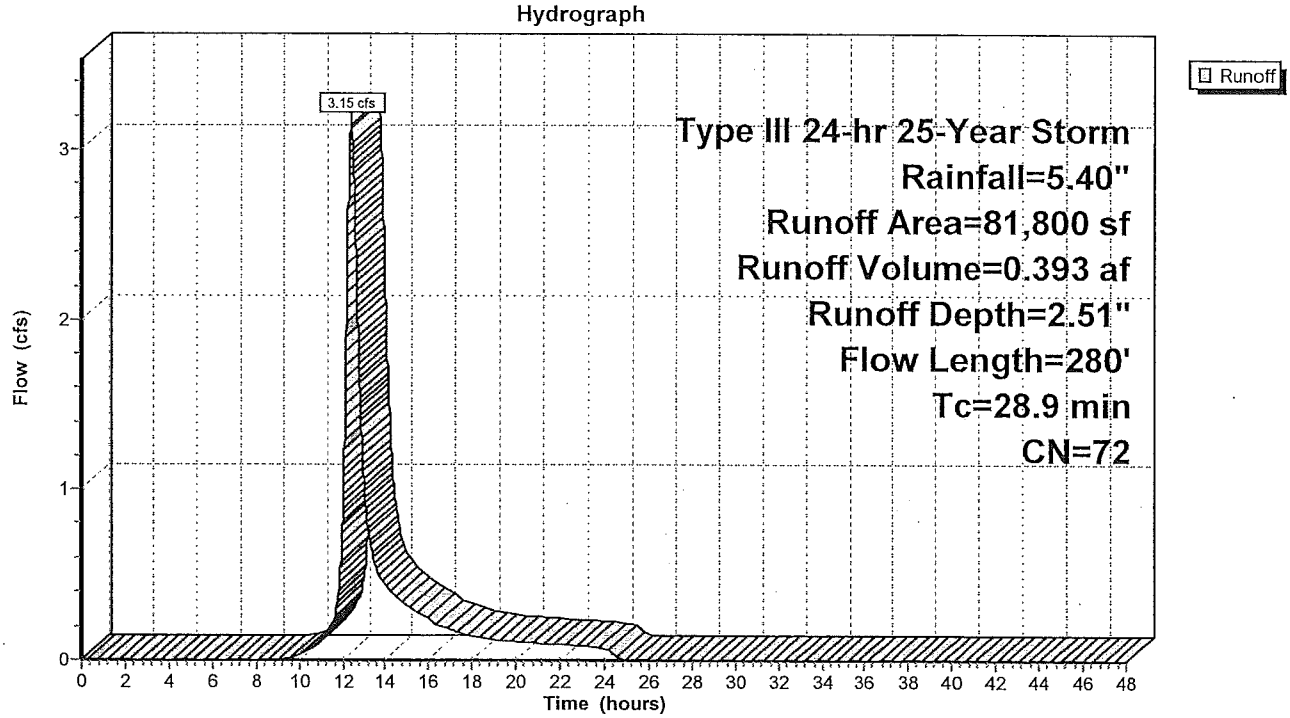
Runoff = 3.15 cfs @ 12.42 hrs, Volume= 0.393 af, Depth= 2.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Storm Rainfall=5.40"

Area (sf)	CN	Description
6,940	92	Paved roads w/open ditches, 50% imp, HSG C
3,200	74	>75% Grass cover, Good, HSG C
71,660	70	Woods, Good, HSG C
81,800	72	Weighted Average
78,330		95.76% Pervious Area
3,470		4.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	60	0.0050	0.04		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
3.2	220	0.0270	1.15		**Shallow Concentrated Flow, Woods** Short Grass Pasture Kv= 7.0 fps
28.9	280	Total			

Subcatchment 204C: Subcatchment 204C



Summary for Subcatchment 204D: Subcatchment 204D

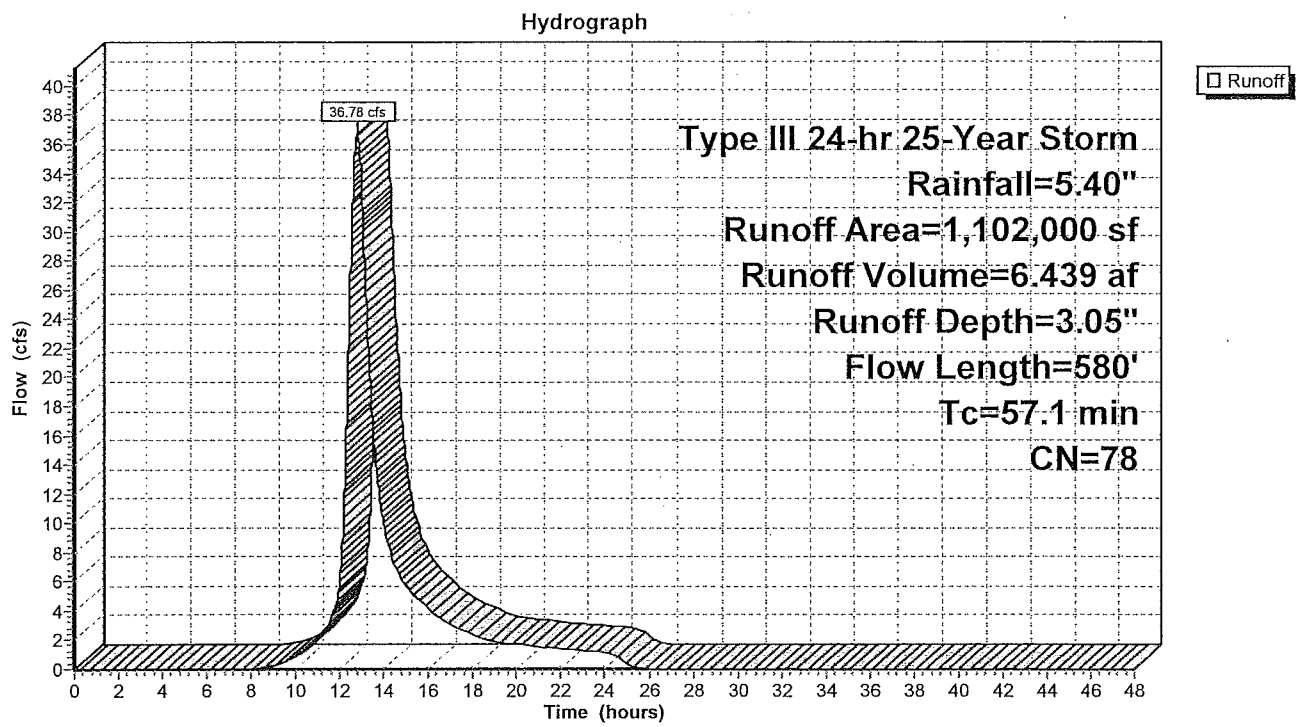
Runoff = 36.78 cfs @ 12.76 hrs, Volume= 6.439 af, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Storm Rainfall=5.40"

Area (sf)	CN	Description
67,600	92	Paved roads w/open ditches, 50% imp, HSG C
85,000	65	Brush, Good, HSG C
97,500	98	Paved roads w/curbs & sewers, HSG C
239,400	91	Urban industrial, 72% imp, HSG C
612,500	70	Woods, Good, HSG C
1,102,000	78	Weighted Average
798,332		72.44% Pervious Area
303,668		27.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
48.8	60	0.0010	0.02		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
8.3	520	0.0440	1.05		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
57.1	580	Total			

Subcatchment 204D: Subcatchment 204D



Summary for Subcatchment 204E: Future Development (Cleared Area)

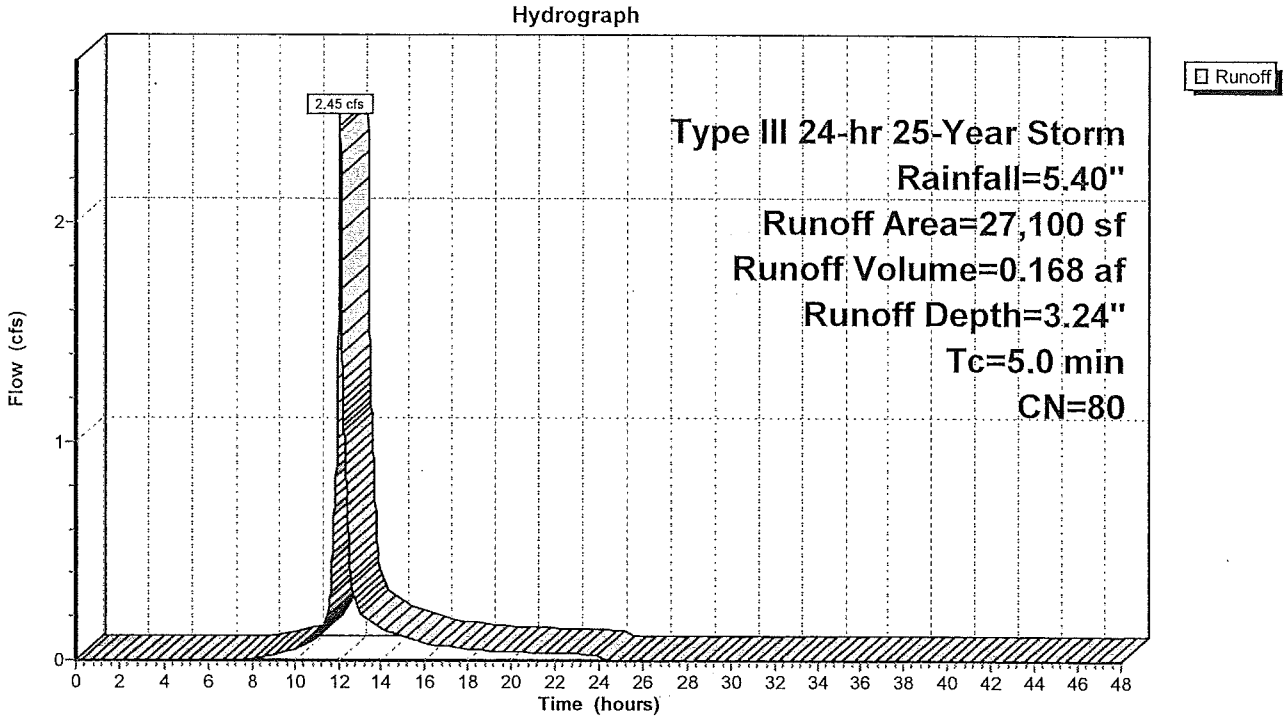
Runoff = 2.45 cfs @ 12.07 hrs, Volume= 0.168 af, Depth= 3.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Storm Rainfall=5.40"

	Area (sf)	CN	Description
*	6,775	98	Future Impervious
*	20,325	74	Future landscaped
	27,100	80	Weighted Average
	20,325		75.00% Pervious Area
	6,775		25.00% Impervious Area

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

Subcatchment 204E: Future Development (Cleared Area)



Summary for Subcatchment 204F: Future Development (Cleared Area)

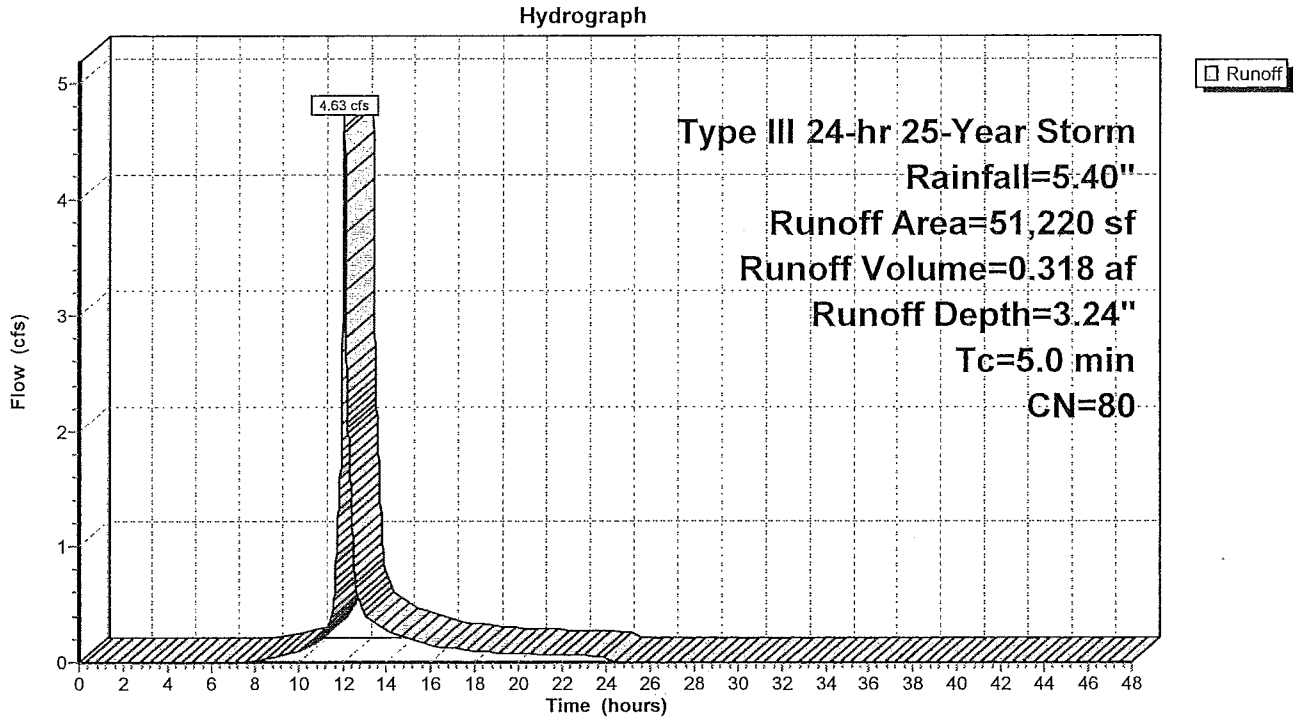
Runoff = 4.63 cfs @ 12.07 hrs, Volume= 0.318 af, Depth= 3.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Storm Rainfall=5.40"

	Area (sf)	CN	Description
*	12,805	98	Future Impervious
*	38,415	74	Future landscaped
	51,220	80	Weighted Average
	38,415		75.00% Pervious Area
	12,805		25.00% Impervious Area

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

Subcatchment 204F: Future Development (Cleared Area)



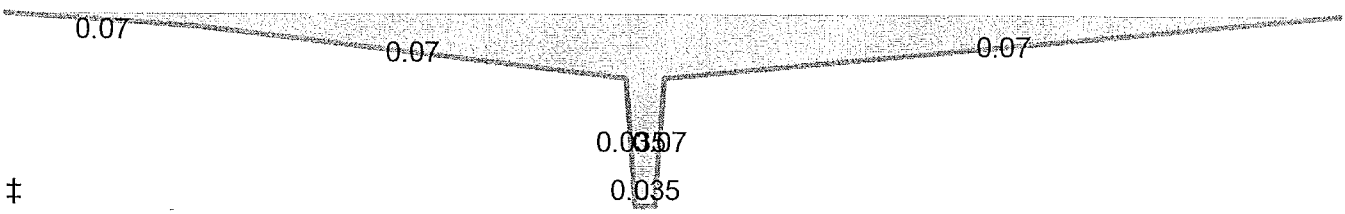
Summary for Reach S-1: Stream Segment

Inflow Area = 29.773 ac, 11.77% Impervious, Inflow Depth > 4.05" for 25-Year Storm event
Inflow = 47.77 cfs @ 12.58 hrs, Volume= 10.056 af
Outflow = 37.50 cfs @ 12.90 hrs, Volume= 10.029 af, Atten= 22%, Lag= 19.0 min

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.69 fps, Min. Travel Time= 10.8 min
Avg. Velocity = 1.19 fps, Avg. Travel Time= 15.4 min

Peak Storage= 54,562 cf @ 12.90 hrs, Average Depth at Peak Storage= 1.59'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 25.78 cfs

Custom cross-section, Length= 1,100.0' Slope= 0.0031 '/'
Flow calculated by Manning's Subdivision method
Inlet Invert= 31.40', Outlet Invert= 28.00'

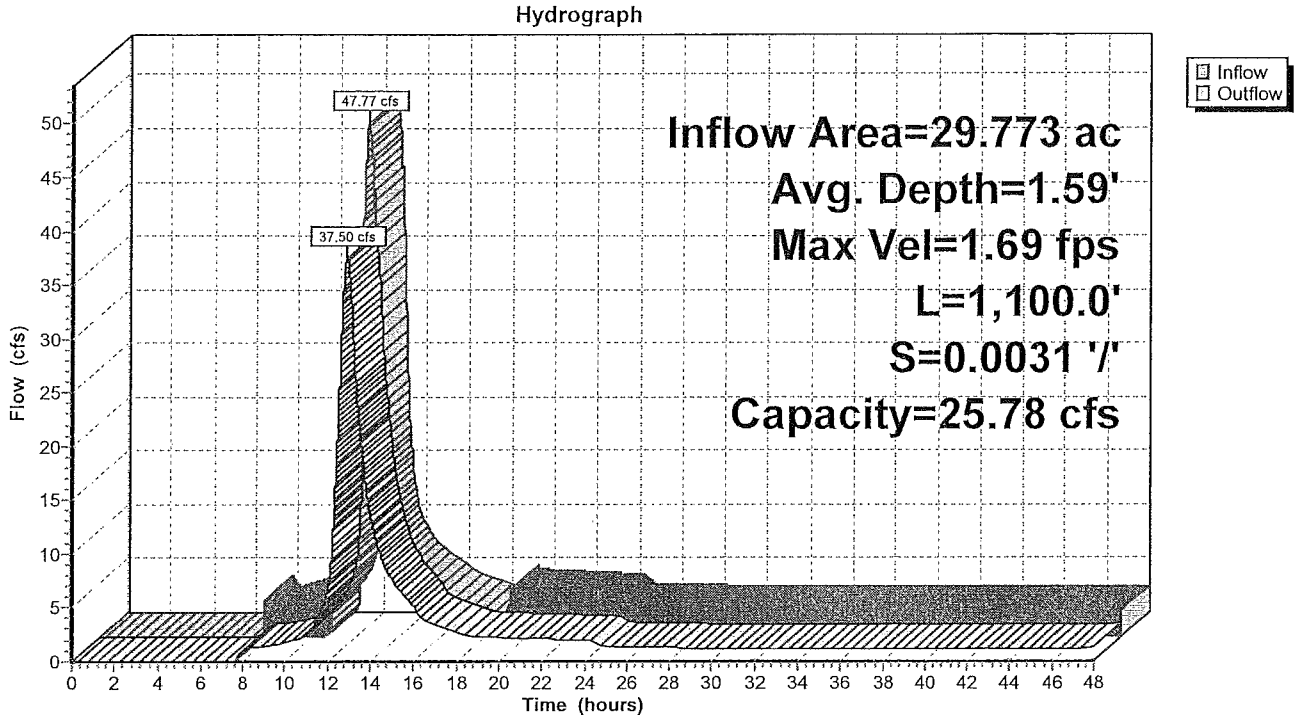


‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	31.00	0.00		
20.00	30.90	0.10	0.070	
65.00	30.50	0.50	0.070	
66.00	29.50	1.50	0.035	
68.00	29.50	1.50	0.035	
69.00	30.50	0.50	0.070	
140.00	31.00	0.00	0.070	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	2.0	0	0.00
1.00	3.0	4.8	3,302	5.05
1.40	25.0	106.6	27,465	17.96
1.50	37.3	140.8	40,975	25.78

Reach S-1: Stream Segment



Summary for Pond 1P: 4'x2' Road Culvert

Inflow Area = 23.760 ac, 13.41% Impervious, Inflow Depth = 3.06" for 25-Year Storm event
Inflow = 44.17 cfs @ 12.49 hrs, Volume= 6.061 af
Outflow = 39.50 cfs @ 12.60 hrs, Volume= 8.793 af, Atten= 11%, Lag= 6.6 min
Primary = 39.50 cfs @ 12.60 hrs, Volume= 8.793 af

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 34.07' @ 12.63 hrs Surf.Area= 18,330 sf Storage= 11,912 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 350.8 min (1,208.8 - 858.0)

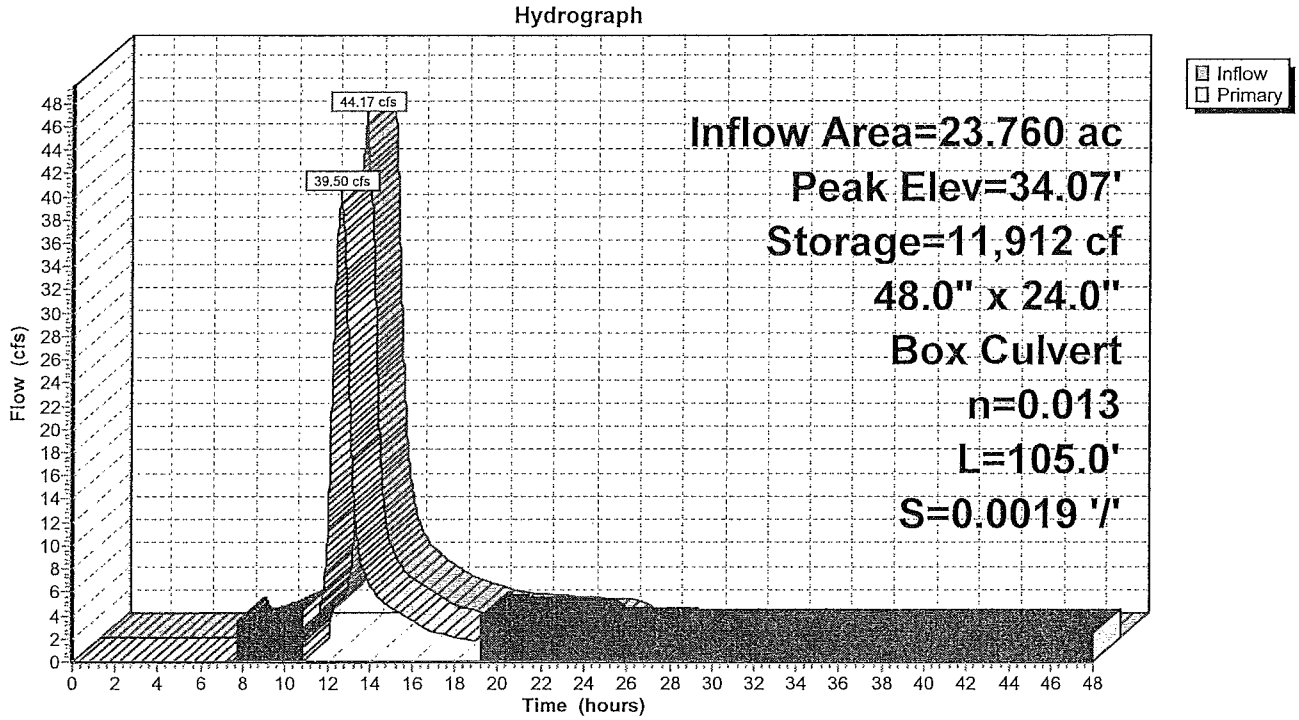
Volume	Invert	Avail.Storage	Storage Description
#1	32.00'	33,820 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.00	160	0	0
33.00	1,840	1,000	1,000
34.00	17,600	9,720	10,720
35.00	28,600	23,100	33,820

Device	Routing	Invert	Outlet Devices
#1	Primary	31.50'	**48.0" W x 24.0" H Box Culvert** L= 105.0' Ke= 0.500 Outlet Invert= 31.30' S= 0.0019 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=39.44 cfs @ 12.60 hrs HW=34.06' TW=32.92' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 39.44 cfs @ 4.93 fps)

Pond 1P: 4'x2' Road Culvert



Summary for Pond 3P: 15" Road Culvert

Inflow Area = 4.135 ac, 5.82% Impervious, Inflow Depth = 2.53" for 25-Year Storm event
Inflow = 5.71 cfs @ 12.51 hrs, Volume= 0.872 af
Outflow = 5.66 cfs @ 12.54 hrs, Volume= 0.870 af, Atten= 1%, Lag= 2.0 min
Primary = 5.66 cfs @ 12.54 hrs, Volume= 0.870 af

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 37.64' @ 12.54 hrs Surf.Area= 338 sf Storage= 668 cf

Plug-Flow detention time= 5.2 min calculated for 0.870 af (100% of inflow)
Center-of-Mass det. time= 3.2 min (903.0 - 899.8)

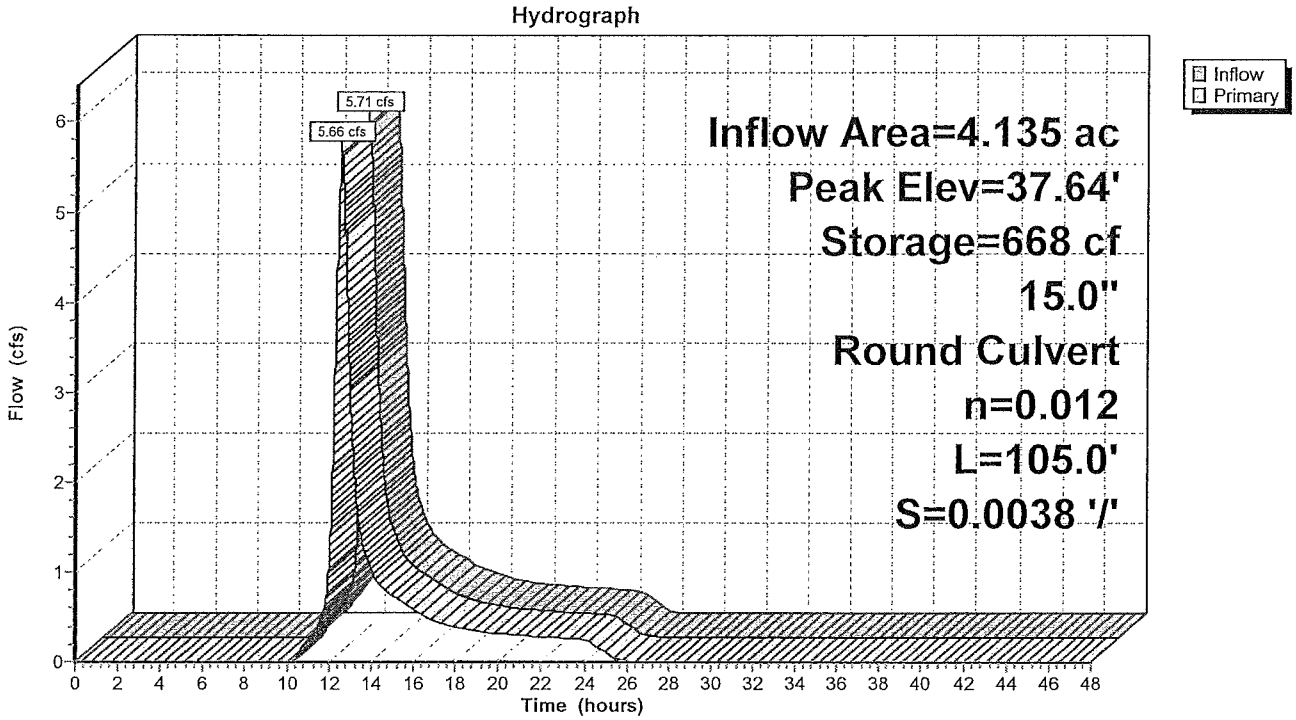
Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	3,855 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
35.00	150	0	0
36.00	240	195	195
37.00	300	270	465
38.00	360	330	795
39.00	420	390	1,185
40.00	740	580	1,765
41.00	3,440	2,090	3,855

Device	Routing	Invert	Outlet Devices
#1	Primary	35.60'	**15.0" Round Culvert** L= 105.0' Ke= 0.500 Outlet Invert= 35.20' S= 0.0038 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=5.66 cfs @ 12.54 hrs HW=37.64' TW=32.89' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 5.66 cfs @ 4.61 fps)

Pond 3P: 15" Road Culvert



Summary for Pond 4P: 15" Road Culvert

Inflow Area = 1.878 ac, 4.24% Impervious, Inflow Depth = 2.51" for 25-Year Storm event
Inflow = 3.15 cfs @ 12.42 hrs, Volume= 0.393 af
Outflow = 3.16 cfs @ 12.43 hrs, Volume= 0.393 af, Atten= 0%, Lag= 0.5 min
Primary = 3.16 cfs @ 12.43 hrs, Volume= 0.393 af

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 33.92' @ 12.43 hrs Surf.Area= 97 sf Storage= 72 cf

Plug-Flow detention time= 0.8 min calculated for 0.393 af (100% of inflow)
Center-of-Mass det. time= 0.8 min (860.7 - 859.9)

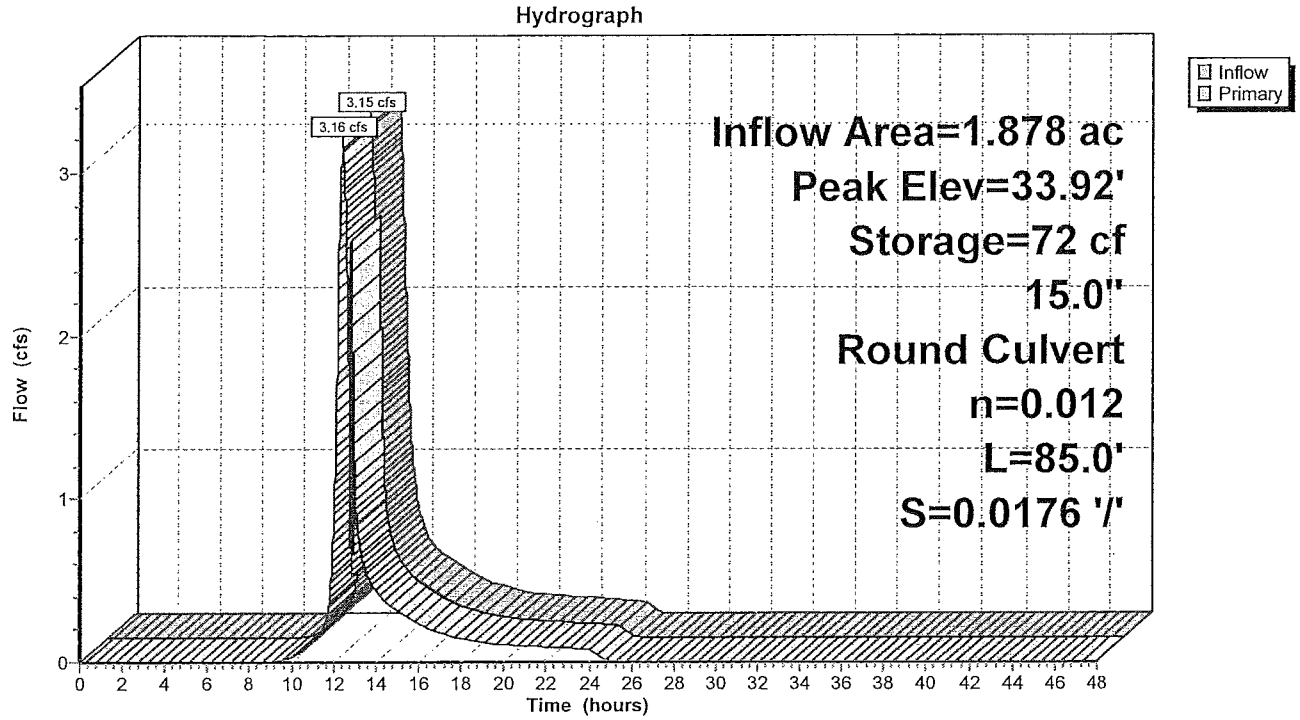
Volume	Invert	Avail.Storage	Storage Description
#1	33.00'	4,580 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
33.00	60	0	0
34.00	100	80	80
35.00	2,100	1,100	1,180
36.00	4,700	3,400	4,580

Device	Routing	Invert	Outlet Devices
#1	Primary	33.00'	**15.0" Round Culvert** L= 85.0' Ke= 0.500 Outlet Invert= 31.50' S= 0.0176 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=3.15 cfs @ 12.43 hrs HW=33.92' TW=32.83' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 3.15 cfs @ 3.26 fps)

Pond 4P: 15" Road Culvert



Summary for Pond B100: B-100

Inflow Area = 0.622 ac, 25.00% Impervious, Inflow Depth = 3.24" for 25-Year Storm event
Inflow = 2.45 cfs @ 12.07 hrs, Volume= 0.168 af
Outflow = 0.63 cfs @ 12.45 hrs, Volume= 0.163 af, Atten= 74%, Lag= 22.8 min
Primary = 0.63 cfs @ 12.45 hrs, Volume= 0.163 af

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 42.10' @ 12.45 hrs Surf.Area= 2,179 sf Storage= 3,132 cf

Plug-Flow detention time= 233.9 min calculated for 0.163 af (97% of inflow)
Center-of-Mass det. time= 215.8 min (1,033.4 - 817.6)

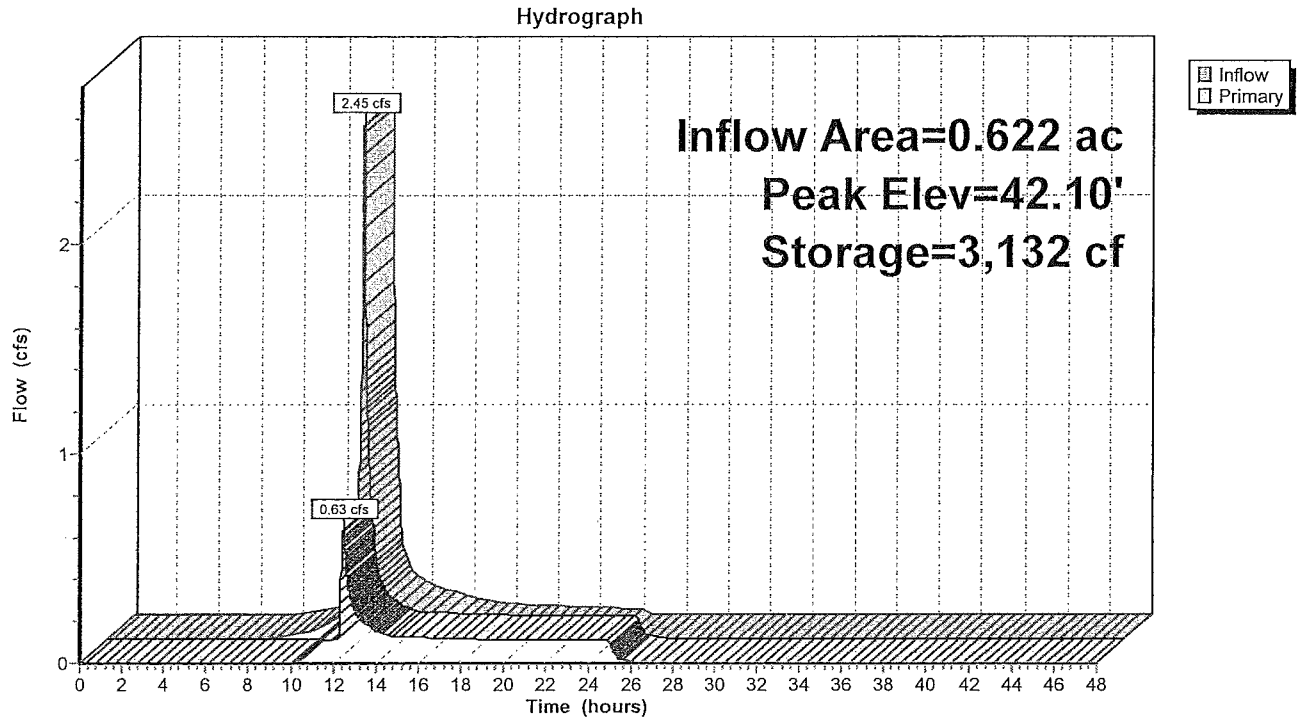
Volume	Invert	Avail.Storage	Storage Description
#1	39.00'	5,309 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
39.00	1,868	0.0	0	0
39.50	1,868	15.0	140	140
40.00	1,868	30.0	280	420
40.50	1,868	30.0	280	701
41.00	1,868	30.0	280	981
41.50	1,868	100.0	934	1,915
42.00	2,122	100.0	998	2,912
42.50	2,398	100.0	1,130	4,042
43.00	2,670	100.0	1,267	5,309

Device	Routing	Invert	Outlet Devices
#1	Device 2	39.66'	**6.0" Round Culvert** L= 80.0' Ke= 0.500 Outlet Invert= 39.33' S= 0.0041 '/' Cc= 0.900 n= 0.012
#2	Primary	39.33'	**12.0" Round Culvert** L= 60.0' Ke= 0.500 Outlet Invert= 38.67' S= 0.0110 '/' Cc= 0.900 n= 0.012
#3	Device 1	39.00'	**2.540 in/hr Exfiltration over Surface area**
#4	Device 2	42.00'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.63 cfs @ 12.45 hrs HW=42.10' TW=37.51' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.63 cfs of 5.58 cfs potential flow)
  ├─**1=Culvert** (Passes 0.13 cfs of 0.90 cfs potential flow)
  │ └─**3=Exfiltration** (Exfiltration Controls 0.13 cfs)
  └─**4=Orifice/Grate** (Weir Controls 0.50 cfs @ 1.05 fps)

Pond B100: B-100



Summary for Pond B101: B-101

Inflow Area = 1.176 ac, 25.00% Impervious, Inflow Depth = 3.24" for 25-Year Storm event
Inflow = 4.63 cfs @ 12.07 hrs, Volume= 0.318 af
Outflow = 2.65 cfs @ 12.19 hrs, Volume= 0.312 af, Atten= 43%, Lag= 6.7 min
Primary = 2.65 cfs @ 12.19 hrs, Volume= 0.312 af

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 40.50' @ 12.19 hrs Surf.Area= 2,715 sf Storage= 4,356 cf

Plug-Flow detention time= 194.8 min calculated for 0.312 af (98% of inflow)
Center-of-Mass det. time= 184.2 min (1,001.7 - 817.6)

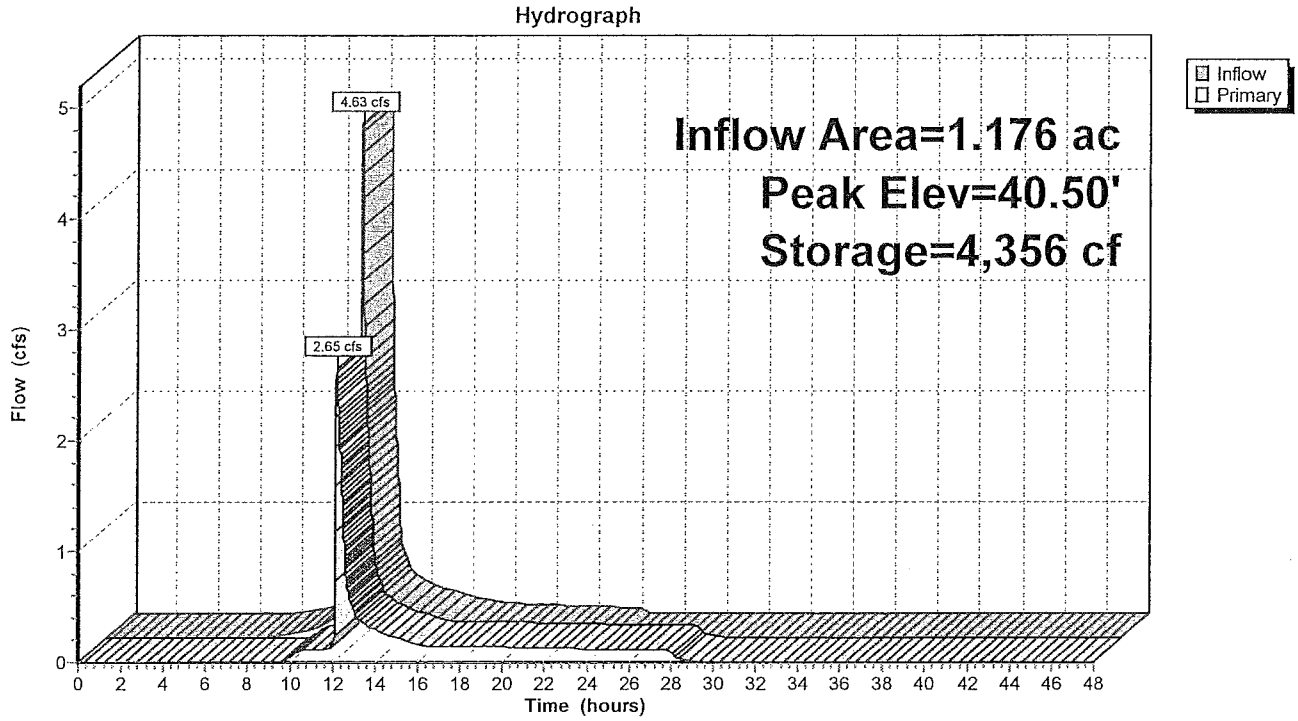
Volume	Invert	Avail.Storage	Storage Description
#1	37.00'	5,822 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
37.00	1,974	0.0	0	0
37.50	1,974	15.0	148	148
38.00	1,974	30.0	296	444
38.50	1,974	30.0	296	740
39.00	1,974	30.0	296	1,036
39.50	1,974	100.0	987	2,023
40.00	2,338	100.0	1,078	3,101
40.50	2,717	100.0	1,264	4,365
41.00	3,110	100.0	1,457	5,822

Device	Routing	Invert	Outlet Devices
#1	Device 2	37.66'	**6.0" Round Culvert** L= 80.0' Ke= 0.500 Outlet Invert= 37.33' S= 0.0041 '/' Cc= 0.900 n= 0.012
#2	Primary	37.00'	**12.0" Round Culvert** L= 60.0' Ke= 0.500 Outlet Invert= 36.50' S= 0.0083 '/' Cc= 0.900 n= 0.012
#3	Device 1	37.00'	**2.540 in/hr Exfiltration over Surface area**
#4	Device 2	40.20'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.65 cfs @ 12.19 hrs HW=40.50' TW=33.23' (Dynamic Tailwater)
└─**2=Culvert** (Passes 2.65 cfs of 6.19 cfs potential flow)
  ├─**1=Culvert** (Passes 0.16 cfs of 0.98 cfs potential flow)
  │ └─**3=Exfiltration** (Exfiltration Controls 0.16 cfs)
  └─**4=Orifice/Grate** (Weir Controls 2.49 cfs @ 1.78 fps)

Pond B101: B-101

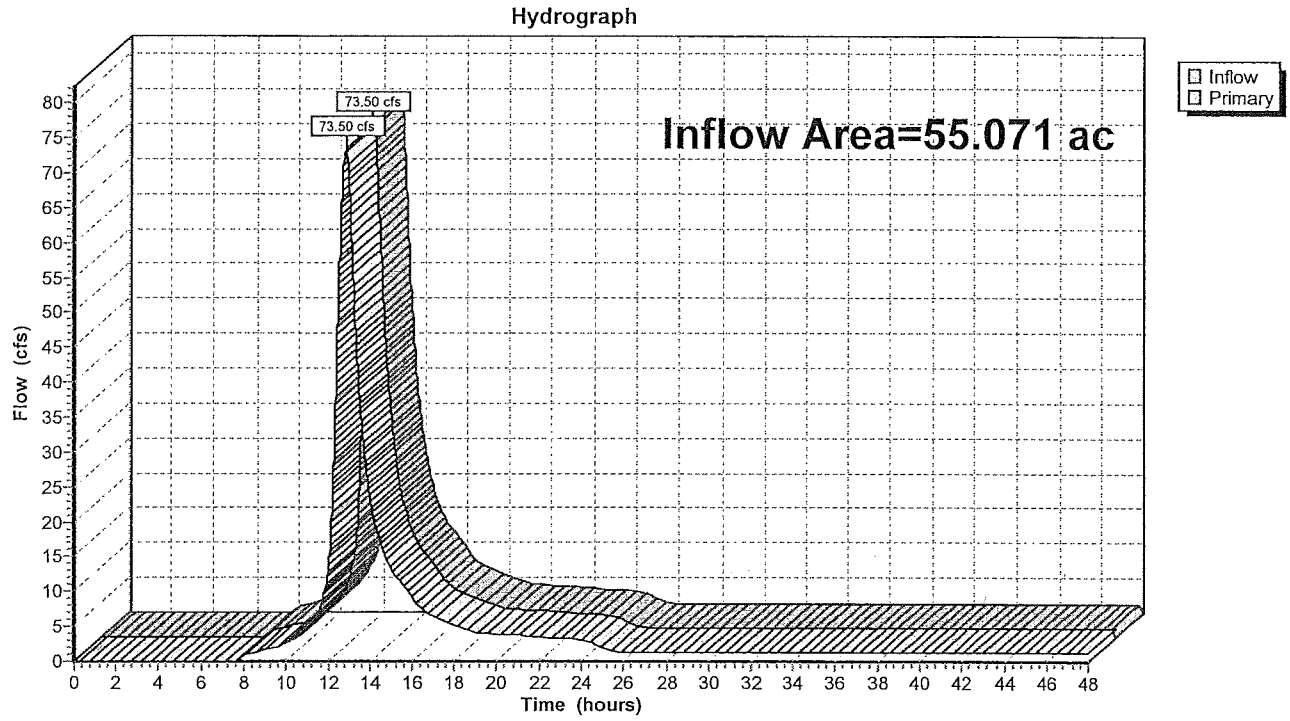


Summary for Link DP4: Design Point 4

Inflow Area = 55.071 ac, 19.02% Impervious, Inflow Depth > 3.59" for 25-Year Storm event
Inflow = 73.50 cfs @ 12.84 hrs, Volume= 16.468 af
Primary = 73.50 cfs @ 12.85 hrs, Volume= 16.468 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link DP4: Design Point 4



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 204A: Subcatchment 204A Runoff Area=983,780 sf 12.80% Impervious Runoff Depth=3.40"
Flow Length=995' Tc=34.6 min CN=78 Runoff=47.71 cfs 6.404 af

Subcatchment 204B: Subcatchment 204B Runoff Area=153,000 sf 2.42% Impervious Runoff Depth=2.74"
Flow Length=525' Tc=36.2 min CN=71 Runoff=5.81 cfs 0.802 af

Subcatchment 204C: Subcatchment 204C Runoff Area=81,800 sf 4.24% Impervious Runoff Depth=2.83"
Flow Length=280' Tc=28.9 min CN=72 Runoff=3.56 cfs 0.443 af

Subcatchment 204D: Subcatchment Runoff Area=1,102,000 sf 27.56% Impervious Runoff Depth=3.40"
Flow Length=580' Tc=57.1 min CN=78 Runoff=41.00 cfs 7.174 af

Subcatchment 204E: Future Development Runoff Area=27,100 sf 25.00% Impervious Runoff Depth=3.60"
Tc=5.0 min CN=80 Runoff=2.71 cfs 0.187 af

Subcatchment 204F: Future Development Runoff Area=51,220 sf 25.00% Impervious Runoff Depth=3.60"
Tc=5.0 min CN=80 Runoff=5.13 cfs 0.353 af

Reach S-1: Stream Segment Avg. Depth=1.62' Max Vel=1.70 fps Inflow=51.52 cfs 10.871 af
L=1,100.0' S=0.0031 '/' Capacity=25.78 cfs Outflow=41.94 cfs 10.844 af

Pond 1P: 4'x2' Road Culvert Peak Elev=34.29' Storage=16,364 cf Inflow=49.16 cfs 6.751 af
48.0" x 24.0" Box Culvert n=0.013 L=105.0' S=0.0019 '/' Outflow=41.71 cfs 9.447 af

Pond 3P: 15" Road Culvert Peak Elev=38.00' Storage=794 cf Inflow=6.52 cfs 0.983 af
15.0" Round Culvert n=0.012 L=105.0' S=0.0038 '/' Outflow=6.47 cfs 0.980 af

Pond 4P: 15" Road Culvert Peak Elev=34.01' Storage=81 cf Inflow=3.56 cfs 0.443 af
15.0" Round Culvert n=0.012 L=85.0' S=0.0176 '/' Outflow=3.64 cfs 0.443 af

Pond B100: B-100 Peak Elev=42.14' Storage=3,209 cf Inflow=2.71 cfs 0.187 af
Outflow=0.92 cfs 0.181 af

Pond B101: B-101 Peak Elev=40.56' Storage=4,536 cf Inflow=5.13 cfs 0.353 af
Outflow=3.52 cfs 0.347 af

Link DP4: Design Point 4 Inflow=81.65 cfs 18.017 af
Primary=81.65 cfs 18.017 af

Total Runoff Area = 55.071 ac Runoff Volume = 15.362 af Average Runoff Depth = 3.35"
80.98% Pervious = 44.595 ac 19.02% Impervious = 10.477 ac

Summary for Subcatchment 204A: Subcatchment 204A

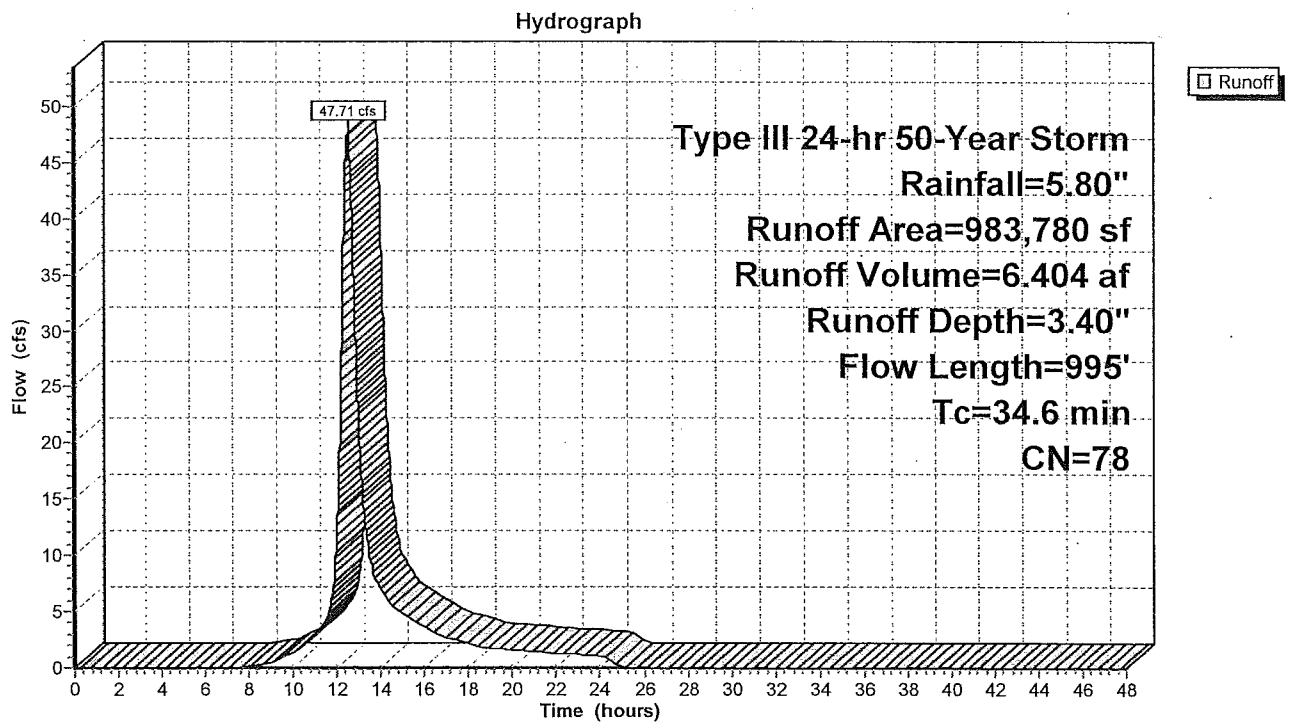
Runoff = 47.71 cfs @ 12.49 hrs, Volume= 6.404 af, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Storm Rainfall=5.80"

Area (sf)	CN	Description
419,800	81	1/3 acre lots, 30% imp, HSG C
152,200	91	Newly graded area, HSG C
85,000	65	Brush, Good, HSG C
320,780	70	Woods, Good, HSG C
6,000	74	>75% Grass cover, Good, HSG C
983,780	78	Weighted Average
857,840		87.20% Pervious Area
125,940		12.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4	60	0.0100	0.05		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
15.2	935	0.0420	1.02		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
34.6	995	Total			

Subcatchment 204A: Subcatchment 204A



Summary for Subcatchment 204B: Subcatchment 204B

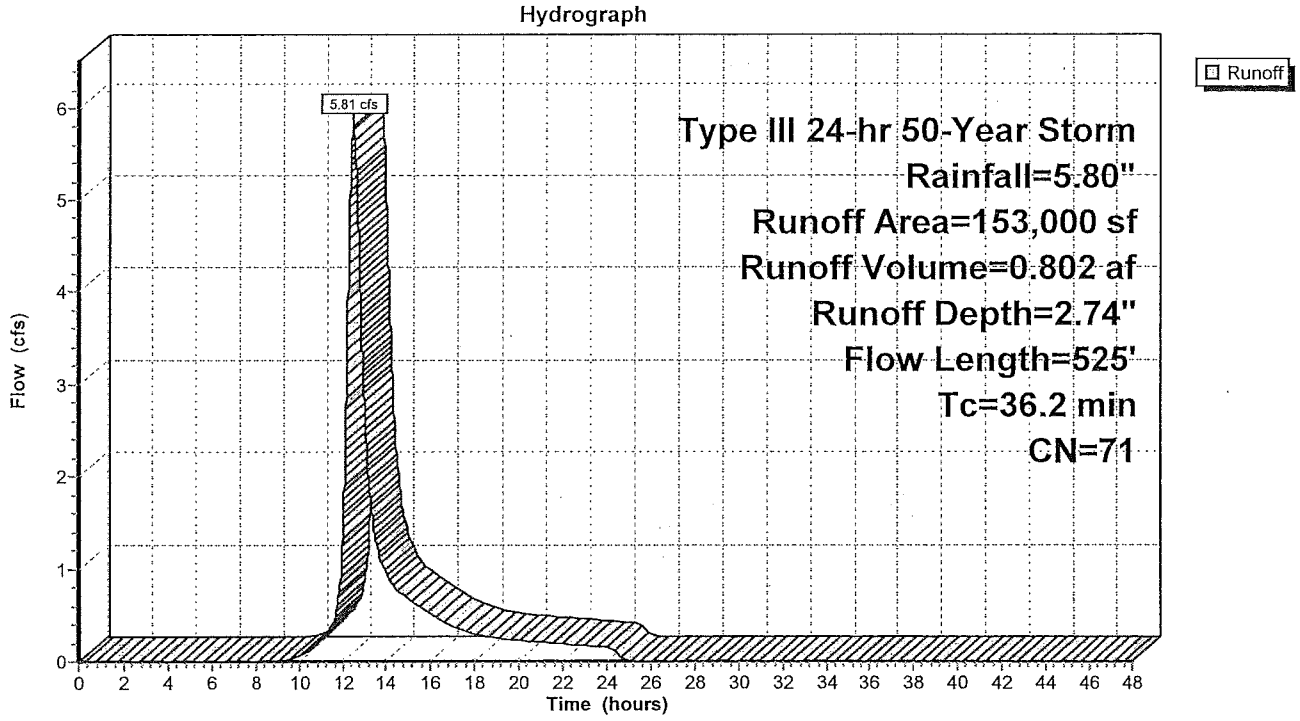
Runoff = 5.81 cfs @ 12.51 hrs, Volume= 0.802 af, Depth= 2.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Storm Rainfall=5.80"

Area (sf)	CN	Description
7,400	92	Paved roads w/open ditches, 50% imp, HSG C
9,000	74	>75% Grass cover, Good, HSG C
136,600	70	Woods, Good, HSG C
153,000	71	Weighted Average
149,300		97.58% Pervious Area
3,700		2.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	60	0.0050	0.04		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
10.5	465	0.0220	0.74		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
36.2	525	Total			

Subcatchment 204B: Subcatchment 204B



Summary for Subcatchment 204C: Subcatchment 204C

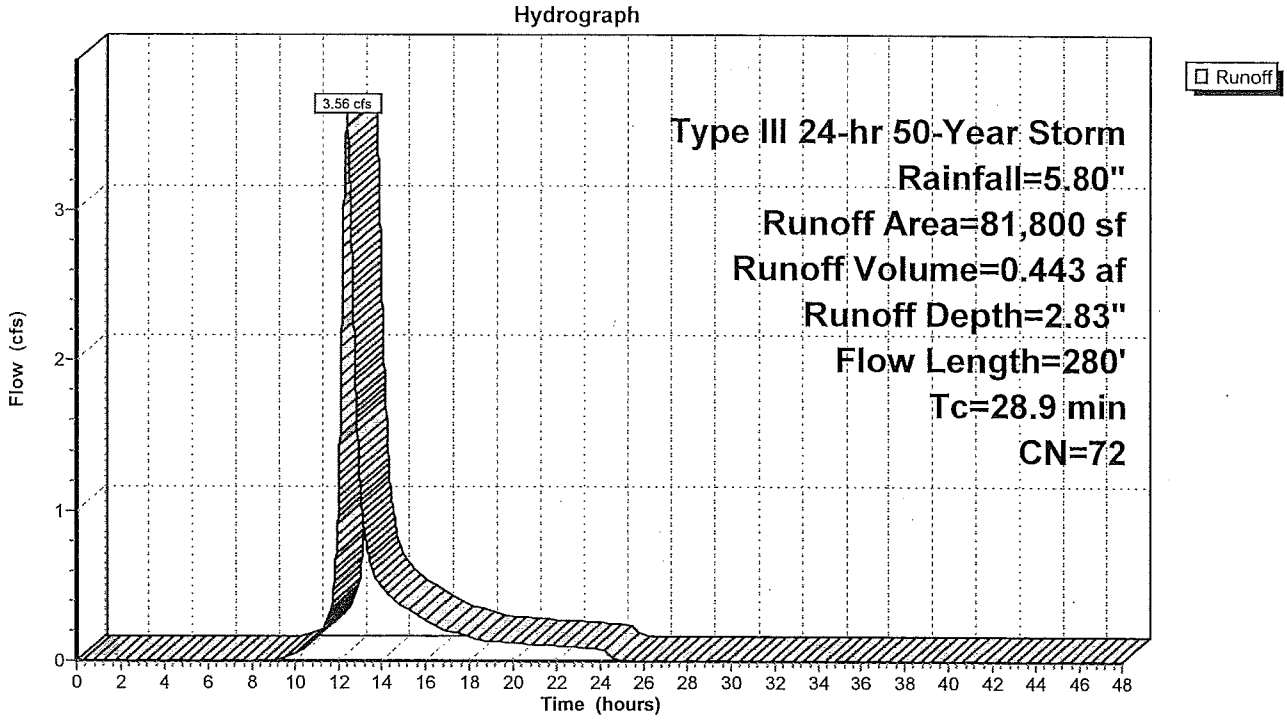
Runoff = 3.56 cfs @ 12.42 hrs, Volume= 0.443 af, Depth= 2.83"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Storm Rainfall=5.80"

Area (sf)	CN	Description
6,940	92	Paved roads w/open ditches, 50% imp, HSG C
3,200	74	>75% Grass cover, Good, HSG C
71,660	70	Woods, Good, HSG C
81,800	72	Weighted Average
78,330		95.76% Pervious Area
3,470		4.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	60	0.0050	0.04		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
3.2	220	0.0270	1.15		**Shallow Concentrated Flow, Woods** Short Grass Pasture Kv= 7.0 fps
28.9	280	Total			

Subcatchment 204C: Subcatchment 204C



Summary for Subcatchment 204D: Subcatchment 204D

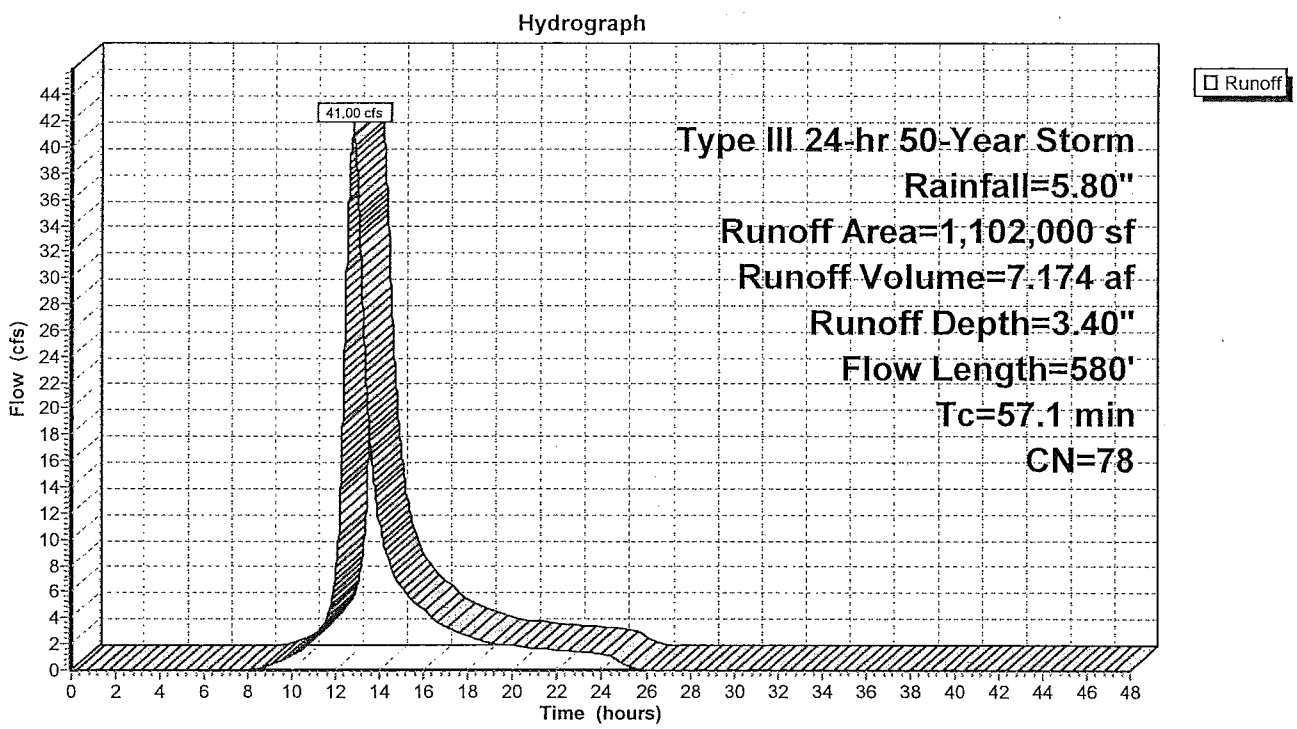
Runoff = 41.00 cfs @ 12.76 hrs, Volume= 7.174 af, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Storm Rainfall=5.80"

Area (sf)	CN	Description
67,600	92	Paved roads w/open ditches, 50% imp, HSG C
85,000	65	Brush, Good, HSG C
97,500	98	Paved roads w/curbs & sewers, HSG C
239,400	91	Urban industrial, 72% imp, HSG C
612,500	70	Woods, Good, HSG C
1,102,000	78	Weighted Average
798,332		72.44% Pervious Area
303,668		27.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
48.8	60	0.0010	0.02		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
8.3	520	0.0440	1.05		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
57.1	580	Total			

Subcatchment 204D: Subcatchment 204D



Summary for Subcatchment 204E: Future Development (Cleared Area)

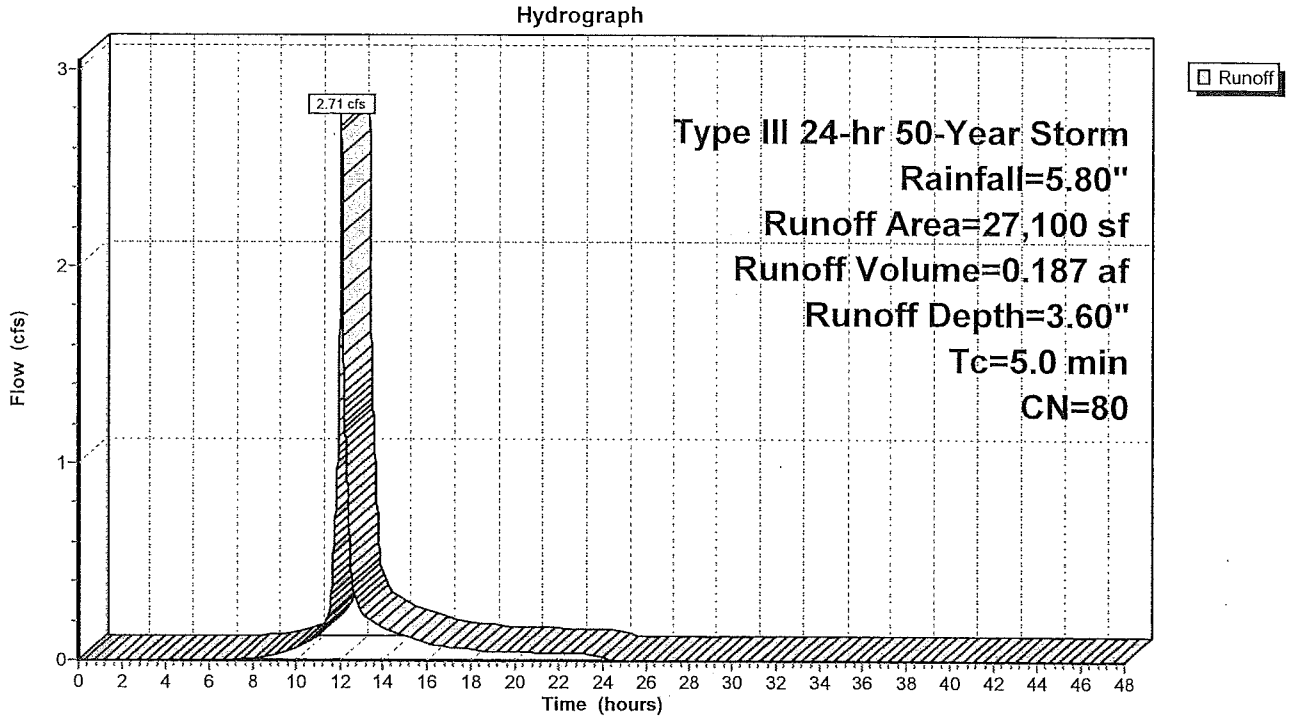
Runoff = 2.71 cfs @ 12.07 hrs, Volume= 0.187 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	6,775	98	Future Impervious
*	20,325	74	Future landscaped
	27,100	80	Weighted Average
	20,325		75.00% Pervious Area
	6,775		25.00% Impervious Area

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

Subcatchment 204E: Future Development (Cleared Area)



Summary for Subcatchment 204F: Future Development (Cleared Area)

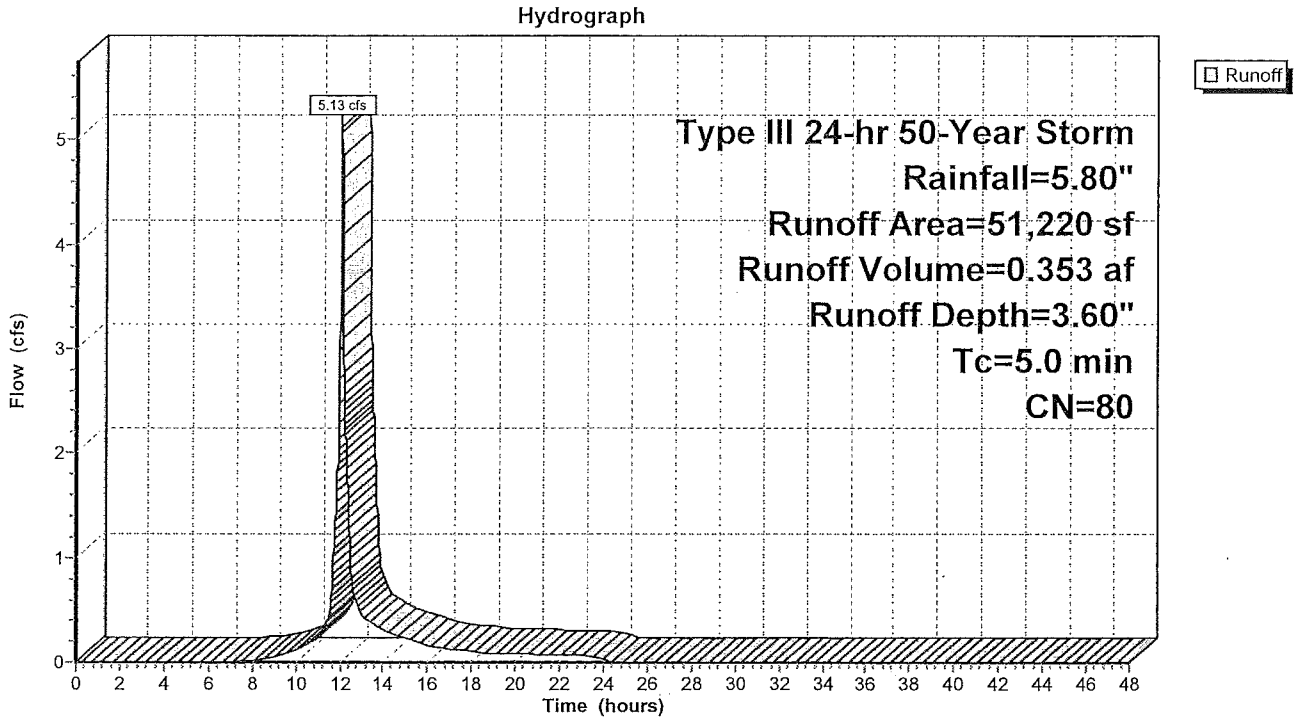
Runoff = 5.13 cfs @ 12.07 hrs, Volume= 0.353 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	12,805	98	Future Impervious
*	38,415	74	Future landscaped
	51,220	80	Weighted Average
	38,415		75.00% Pervious Area
	12,805		25.00% Impervious Area

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

Subcatchment 204F: Future Development (Cleared Area)



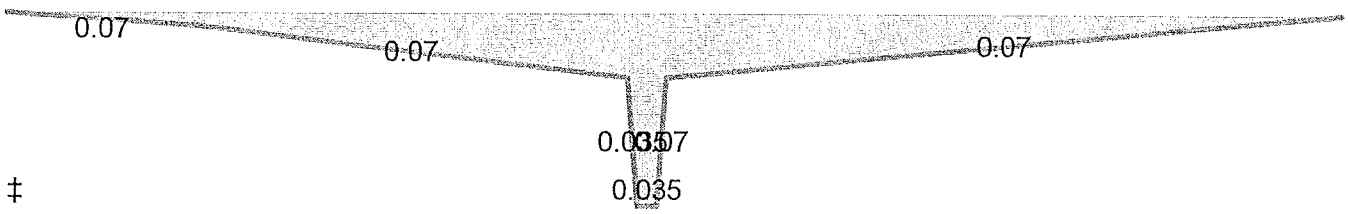
Summary for Reach S-1: Stream Segment

Inflow Area = 29.773 ac, 11.77% Impervious, Inflow Depth > 4.38" for 50-Year Storm event
Inflow = 51.52 cfs @ 12.52 hrs, Volume= 10.871 af
Outflow = 41.94 cfs @ 12.91 hrs, Volume= 10.844 af, Atten= 19%, Lag= 23.8 min

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.70 fps, Min. Travel Time= 10.8 min
Avg. Velocity = 1.19 fps, Avg. Travel Time= 15.4 min

Peak Storage= 59,139 cf @ 12.91 hrs, Average Depth at Peak Storage= 1.62'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 25.78 cfs

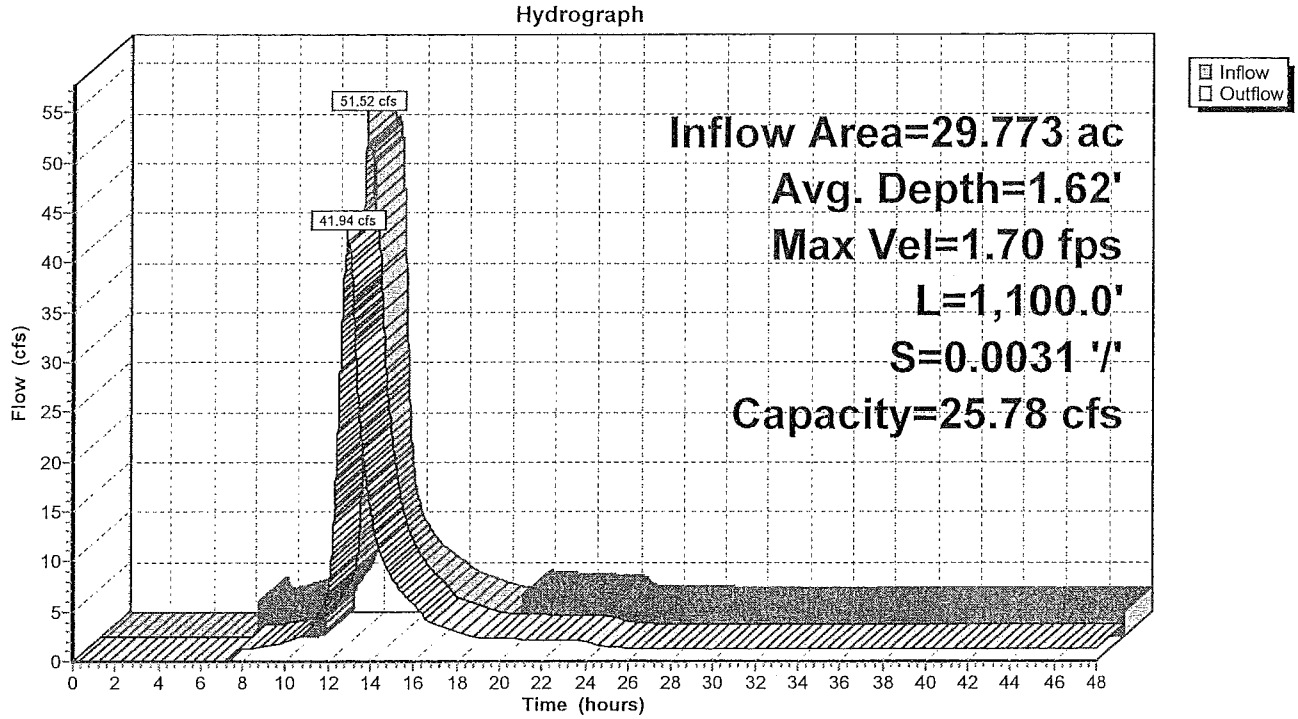
Custom cross-section, Length= 1,100.0' Slope= 0.0031 '/'
Flow calculated by Manning's Subdivision method
Inlet Invert= 31.40', Outlet Invert= 28.00'



Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	31.00	0.00		
20.00	30.90	0.10	0.070	
65.00	30.50	0.50	0.070	
66.00	29.50	1.50	0.035	
68.00	29.50	1.50	0.035	
69.00	30.50	0.50	0.070	
140.00	31.00	0.00	0.070	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	2.0	0	0.00
1.00	3.0	4.8	3,302	5.05
1.40	25.0	106.6	27,465	17.96
1.50	37.3	140.8	40,975	25.78

Reach S-1: Stream Segment



Summary for Pond 1P: 4'x2' Road Culvert

Inflow Area = 23.760 ac, 13.41% Impervious, Inflow Depth = 3.41" for 50-Year Storm event
Inflow = 49.16 cfs @ 12.49 hrs, Volume= 6.751 af
Outflow = 41.71 cfs @ 12.52 hrs, Volume= 9.447 af, Atten= 15%, Lag= 1.8 min
Primary = 41.71 cfs @ 12.52 hrs, Volume= 9.447 af

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 34.29' @ 12.67 hrs Surf.Area= 20,831 sf Storage= 16,364 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 325.5 min (1,179.8 - 854.3)

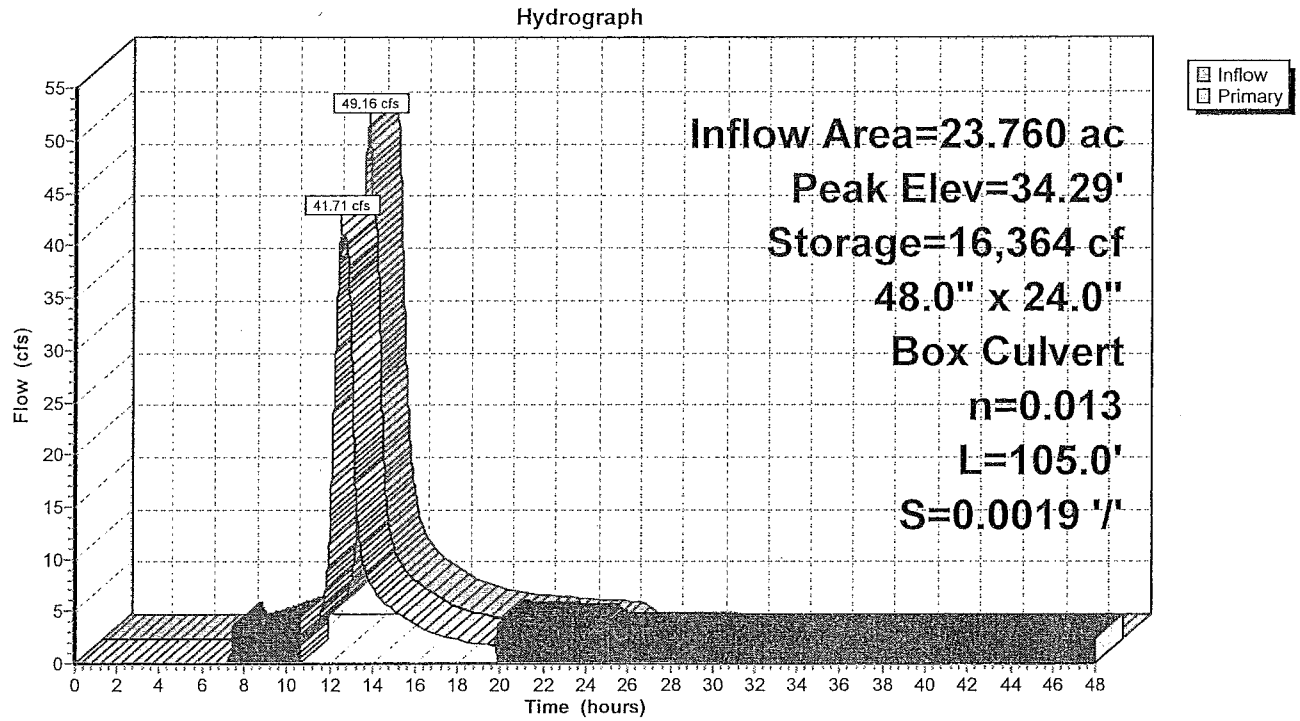
Volume	Invert	Avail.Storage	Storage Description
#1	32.00'	33,820 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.00	160	0	0
33.00	1,840	1,000	1,000
34.00	17,600	9,720	10,720
35.00	28,600	23,100	33,820

Device	Routing	Invert	Outlet Devices
#1	Primary	31.50'	**48.0" W x 24.0" H Box Culvert** L= 105.0' Ke= 0.500 Outlet Invert= 31.30' S= 0.0019 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=41.29 cfs @ 12.52 hrs HW=34.15' TW=32.91' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 41.29 cfs @ 5.16 fps)

Pond 1P: 4'x2' Road Culvert



Summary for Pond 3P: 15" Road Culvert

Inflow Area =	4.135 ac,	5.82% Impervious,	Inflow Depth =	2.85"	for 50-Year Storm event
Inflow =	6.52 cfs @	12.49 hrs, Volume=	0.983 af		
Outflow =	6.47 cfs @	12.53 hrs, Volume=	0.980 af,	Atten= 1%,	Lag= 2.2 min
Primary =	6.47 cfs @	12.53 hrs, Volume=	0.980 af		

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 38.00' @ 12.53 hrs Surf.Area= 360 sf Storage= 794 cf

Plug-Flow detention time= 4.7 min calculated for 0.980 af (100% of inflow)
Center-of-Mass det. time= 3.1 min (896.7 - 893.7)

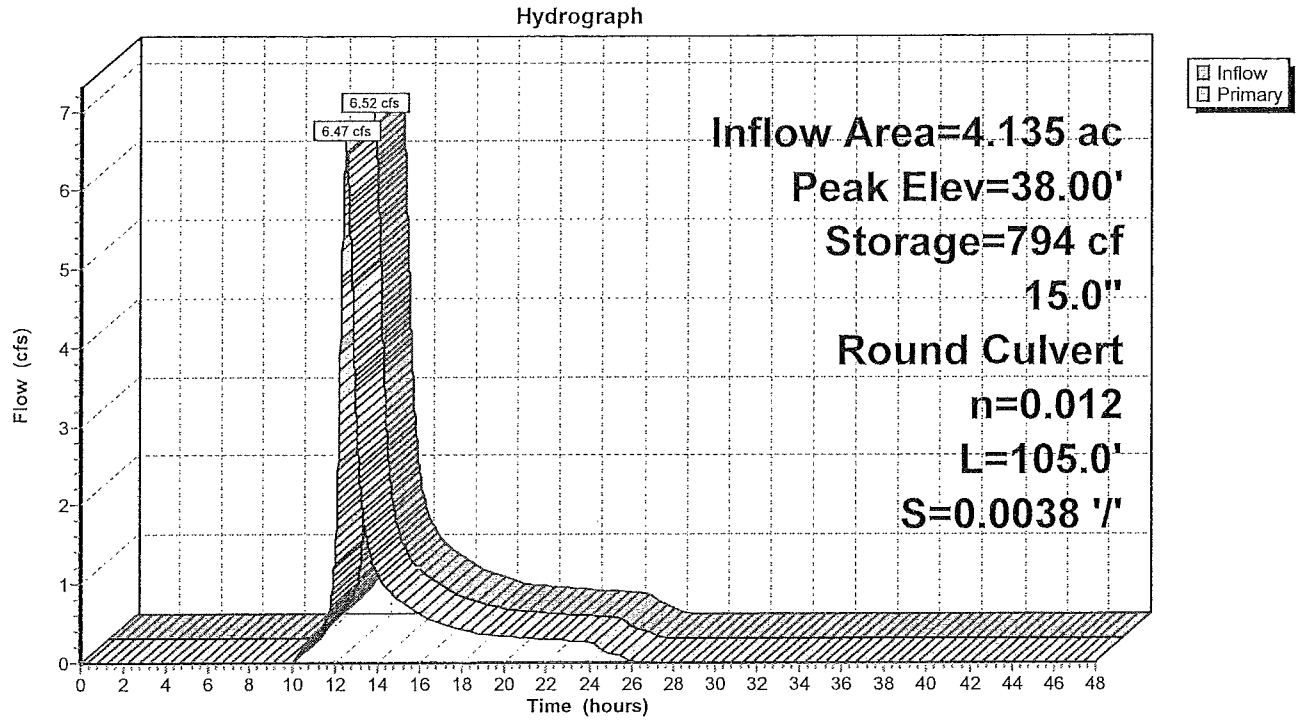
Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	3,855 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
35.00	150	0	0
36.00	240	195	195
37.00	300	270	465
38.00	360	330	795
39.00	420	390	1,185
40.00	740	580	1,765
41.00	3,440	2,090	3,855

Device	Routing	Invert	Outlet Devices
#1	Primary	35.60'	**15.0" Round Culvert** L= 105.0' Ke= 0.500 Outlet Invert= 35.20' S= 0.0038 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=6.47 cfs @ 12.53 hrs HW=38.00' TW=32.92' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 6.47 cfs @ 5.27 fps)

Pond 3P: 15" Road Culvert



Summary for Pond 4P: 15" Road Culvert

Inflow Area =	1.878 ac,	4.24% Impervious,	Inflow Depth =	2.83"	for 50-Year Storm event
Inflow =	3.56 cfs @	12.42 hrs,	Volume=	0.443 af	
Outflow =	3.64 cfs @	12.78 hrs,	Volume=	0.443 af,	Atten= 0%, Lag= 21.7 min
Primary =	3.64 cfs @	12.78 hrs,	Volume=	0.443 af	

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 34.01' @ 12.78 hrs Surf.Area= 122 sf Storage= 81 cf

Plug-Flow detention time= 0.9 min calculated for 0.443 af (100% of inflow)
Center-of-Mass det. time= 0.8 min (857.1 - 856.4)

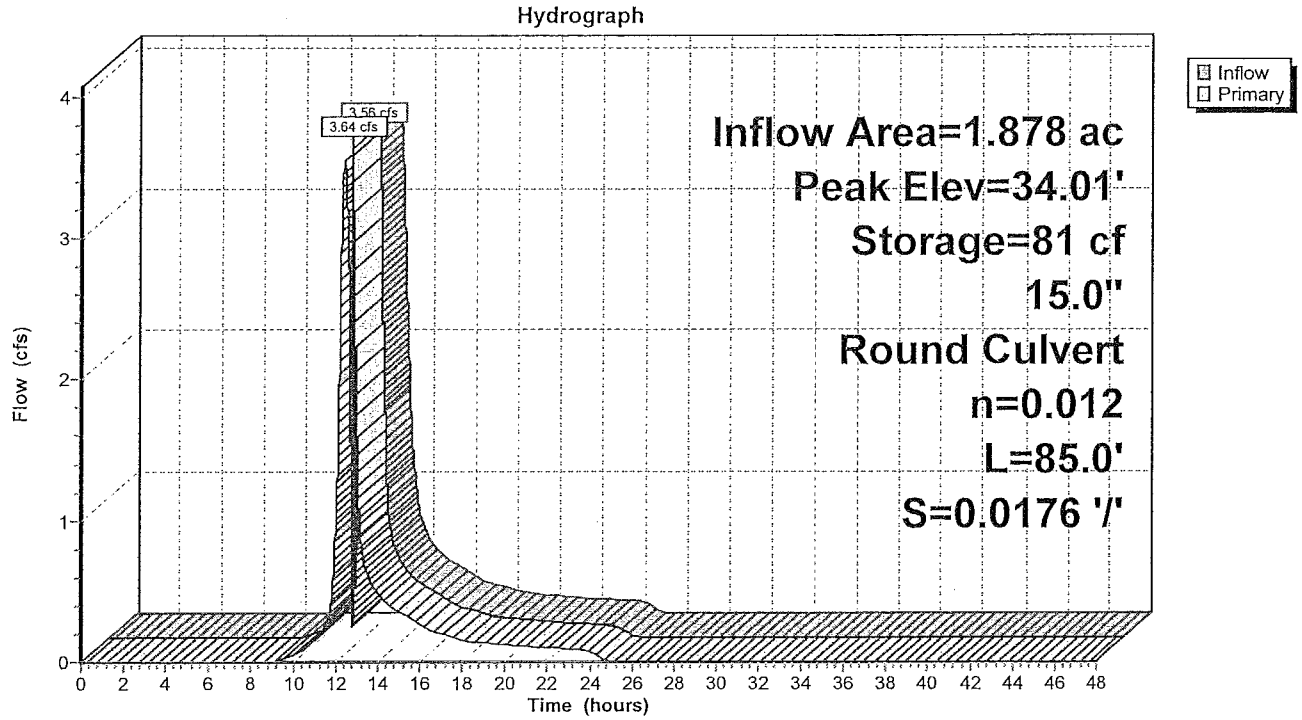
Volume	Invert	Avail.Storage	Storage Description
#1	33.00'	4,580 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
33.00	60	0	0
34.00	100	80	80
35.00	2,100	1,100	1,180
36.00	4,700	3,400	4,580

Device	Routing	Invert	Outlet Devices
#1	Primary	33.00'	**15.0" Round Culvert** L= 85.0' Ke= 0.500 Outlet Invert= 31.50' S= 0.0176 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=3.55 cfs @ 12.78 hrs HW=34.00' TW=33.01' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 3.55 cfs @ 4.63 fps)

Pond 4P: 15" Road Culvert



Summary for Pond B100: B-100

Inflow Area = 0.622 ac, 25.00% Impervious, Inflow Depth = 3.60" for 50-Year Storm event
Inflow = 2.71 cfs @ 12.07 hrs, Volume= 0.187 af
Outflow = 0.92 cfs @ 12.37 hrs, Volume= 0.181 af, Atten= 66%, Lag= 17.6 min
Primary = 0.92 cfs @ 12.37 hrs, Volume= 0.181 af

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 42.14' @ 12.37 hrs Surf.Area= 2,198 sf Storage= 3,209 cf

Plug-Flow detention time= 219.9 min calculated for 0.181 af (97% of inflow)
Center-of-Mass det. time= 203.3 min (1,017.9 - 814.6)

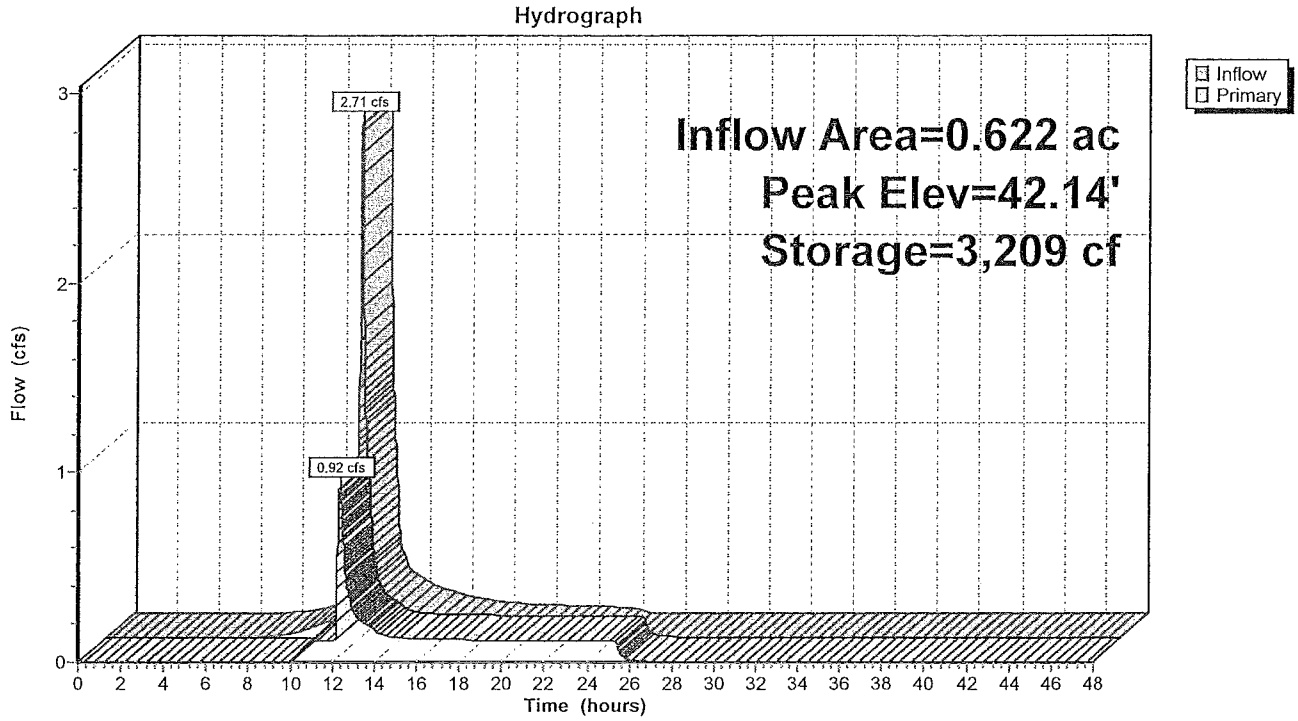
Volume	Invert	Avail.Storage	Storage Description
#1	39.00'	5,309 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
39.00	1,868	0.0	0	0
39.50	1,868	15.0	140	140
40.00	1,868	30.0	280	420
40.50	1,868	30.0	280	701
41.00	1,868	30.0	280	981
41.50	1,868	100.0	934	1,915
42.00	2,122	100.0	998	2,912
42.50	2,398	100.0	1,130	4,042
43.00	2,670	100.0	1,267	5,309

Device	Routing	Invert	Outlet Devices
#1	Device 2	39.66'	**6.0" Round Culvert** L= 80.0' Ke= 0.500 Outlet Invert= 39.33' S= 0.0041 '/' Cc= 0.900 n= 0.012
#2	Primary	39.33'	**12.0" Round Culvert** L= 60.0' Ke= 0.500 Outlet Invert= 38.67' S= 0.0110 '/' Cc= 0.900 n= 0.012
#3	Device 1	39.00'	**2.540 in/hr Exfiltration over Surface area**
#4	Device 2	42.00'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.91 cfs @ 12.37 hrs HW=42.14' TW=37.56' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.91 cfs of 5.62 cfs potential flow)
  ├─**1=Culvert** (Passes 0.13 cfs of 0.91 cfs potential flow)
  │ └─**3=Exfiltration** (Exfiltration Controls 0.13 cfs)
  └─**4=Orifice/Grate** (Weir Controls 0.79 cfs @ 1.21 fps)

Pond B100: B-100



Summary for Pond B101: B-101

Inflow Area =	1.176 ac, 25.00% Impervious, Inflow Depth = 3.60" for 50-Year Storm event				
Inflow =	5.13 cfs @ 12.07 hrs, Volume=	0.353 af			
Outflow =	3.52 cfs @ 12.16 hrs, Volume=	0.347 af, Atten= 31%, Lag= 5.0 min			
Primary =	3.52 cfs @ 12.16 hrs, Volume=	0.347 af			

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 40.56' @ 12.16 hrs Surf.Area= 2,766 sf Storage= 4,536 cf

Plug-Flow detention time= 182.2 min calculated for 0.347 af (98% of inflow)
Center-of-Mass det. time= 172.8 min (987.4 - 814.6)

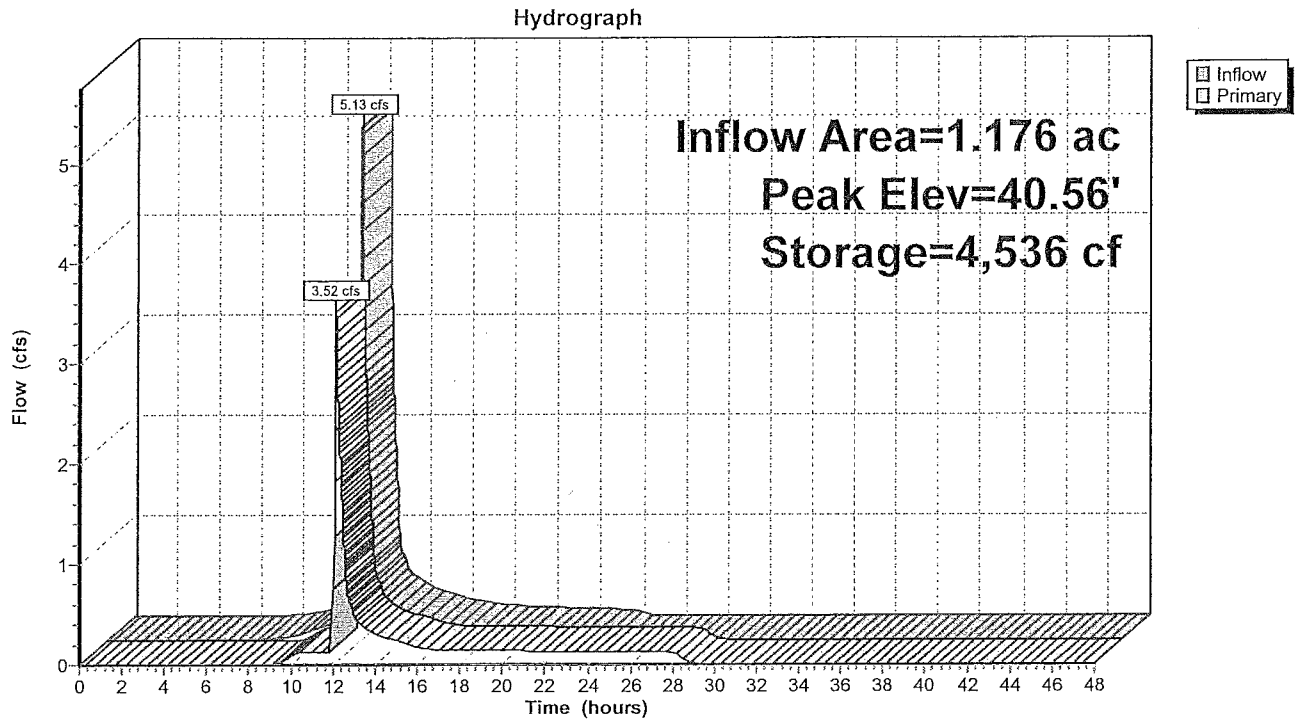
Volume	Invert	Avail.Storage	Storage Description
#1	37.00'	5,822 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
37.00	1,974	0.0	0	0
37.50	1,974	15.0	148	148
38.00	1,974	30.0	296	444
38.50	1,974	30.0	296	740
39.00	1,974	30.0	296	1,036
39.50	1,974	100.0	987	2,023
40.00	2,338	100.0	1,078	3,101
40.50	2,717	100.0	1,264	4,365
41.00	3,110	100.0	1,457	5,822

Device	Routing	Invert	Outlet Devices
#1	Device 2	37.66'	**6.0" Round Culvert** L= 80.0' Ke= 0.500 Outlet Invert= 37.33' S= 0.0041 '/' Cc= 0.900 n= 0.012
#2	Primary	37.00'	**12.0" Round Culvert** L= 60.0' Ke= 0.500 Outlet Invert= 36.50' S= 0.0083 '/' Cc= 0.900 n= 0.012
#3	Device 1	37.00'	**2.540 in/hr Exfiltration over Surface area**
#4	Device 2	40.20'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.52 cfs @ 12.16 hrs HW=40.56' TW=33.25' (Dynamic Tailwater)
└─**2=Culvert** (Passes 3.52 cfs of 6.26 cfs potential flow)
  ├─**1=Culvert** (Passes 0.16 cfs of 0.99 cfs potential flow)
  │ └─**3=Exfiltration** (Exfiltration Controls 0.16 cfs)
  └─**4=Orifice/Grate** (Weir Controls 3.35 cfs @ 1.97 fps)

Pond B101: B-101

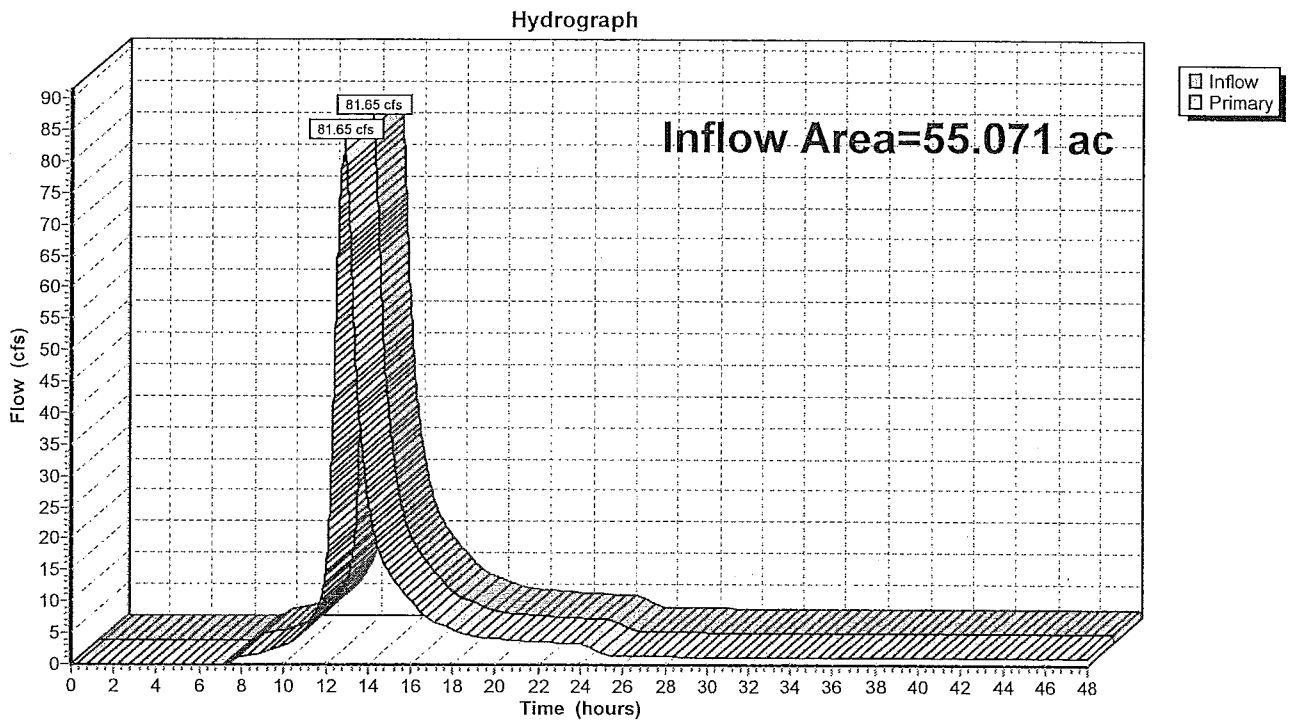


Summary for Link DP4: Design Point 4

Inflow Area = 55.071 ac, 19.02% Impervious, Inflow Depth > 3.93" for 50-Year Storm event
Inflow = 81.65 cfs @ 12.87 hrs, Volume= 18.017 af
Primary = 81.65 cfs @ 12.88 hrs, Volume= 18.017 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link DP4: Design Point 4



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 204A: Subcatchment 204A Runoff Area=983,780 sf 12.80% Impervious Runoff Depth=4.11"
Flow Length=995' Tc=34.6 min CN=78 Runoff=57.55 cfs 7.742 af

Subcatchment 204B: Subcatchment 204B Runoff Area=153,000 sf 2.42% Impervious Runoff Depth=3.39"
Flow Length=525' Tc=36.2 min CN=71 Runoff=7.22 cfs 0.992 af

Subcatchment 204C: Subcatchment 204C Runoff Area=81,800 sf 4.24% Impervious Runoff Depth=3.49"
Flow Length=280' Tc=28.9 min CN=72 Runoff=4.41 cfs 0.546 af

Subcatchment 204D: Subcatchment Runoff Area=1,102,000 sf 27.56% Impervious Runoff Depth=4.11"
Flow Length=580' Tc=57.1 min CN=78 Runoff=49.56 cfs 8.672 af

Subcatchment 204E: Future Development Runoff Area=27,100 sf 25.00% Impervious Runoff Depth=4.33"
Tc=5.0 min CN=80 Runoff=3.25 cfs 0.224 af

Subcatchment 204F: Future Development Runoff Area=51,220 sf 25.00% Impervious Runoff Depth=4.33"
Tc=5.0 min CN=80 Runoff=6.14 cfs 0.424 af

Reach S-1: Stream Segment Avg. Depth=1.68' Max Vel=1.69 fps Inflow=59.49 cfs 12.559 af
L=1,100.0' S=0.0031 '/' Capacity=25.78 cfs Outflow=50.78 cfs 12.532 af

Pond 1P: 4'x2' Road Culvert Peak Elev=34.68' Storage=25,114 cf Inflow=59.27 cfs 8.160 af
48.0" x 24.0" Box Culvert n=0.013 L=105.0' S=0.0019 '/' Outflow=48.51 cfs 10.804 af

Pond 3P: 15" Road Culvert Peak Elev=38.81' Storage=1,105 cf Inflow=8.10 cfs 1.211 af
15.0" Round Culvert n=0.012 L=105.0' S=0.0038 '/' Outflow=7.98 cfs 1.209 af

Pond 4P: 15" Road Culvert Peak Elev=34.17' Storage=126 cf Inflow=4.41 cfs 0.546 af
15.0" Round Culvert n=0.012 L=85.0' S=0.0176 '/' Outflow=4.40 cfs 0.546 af

Pond B100: B-100 Peak Elev=42.20' Storage=3,352 cf Inflow=3.25 cfs 0.224 af
Outflow=1.53 cfs 0.219 af

Pond B101: B-101 Peak Elev=40.67' Storage=4,837 cf Inflow=6.14 cfs 0.424 af
Outflow=5.12 cfs 0.418 af

Link DP4: Design Point 4 Inflow=99.00 cfs 21.204 af
Primary=99.00 cfs 21.204 af

Total Runoff Area = 55.071 ac Runoff Volume = 18.601 af Average Runoff Depth = 4.05"
80.98% Pervious = 44.595 ac 19.02% Impervious = 10.477 ac

Summary for Subcatchment 204A: Subcatchment 204A

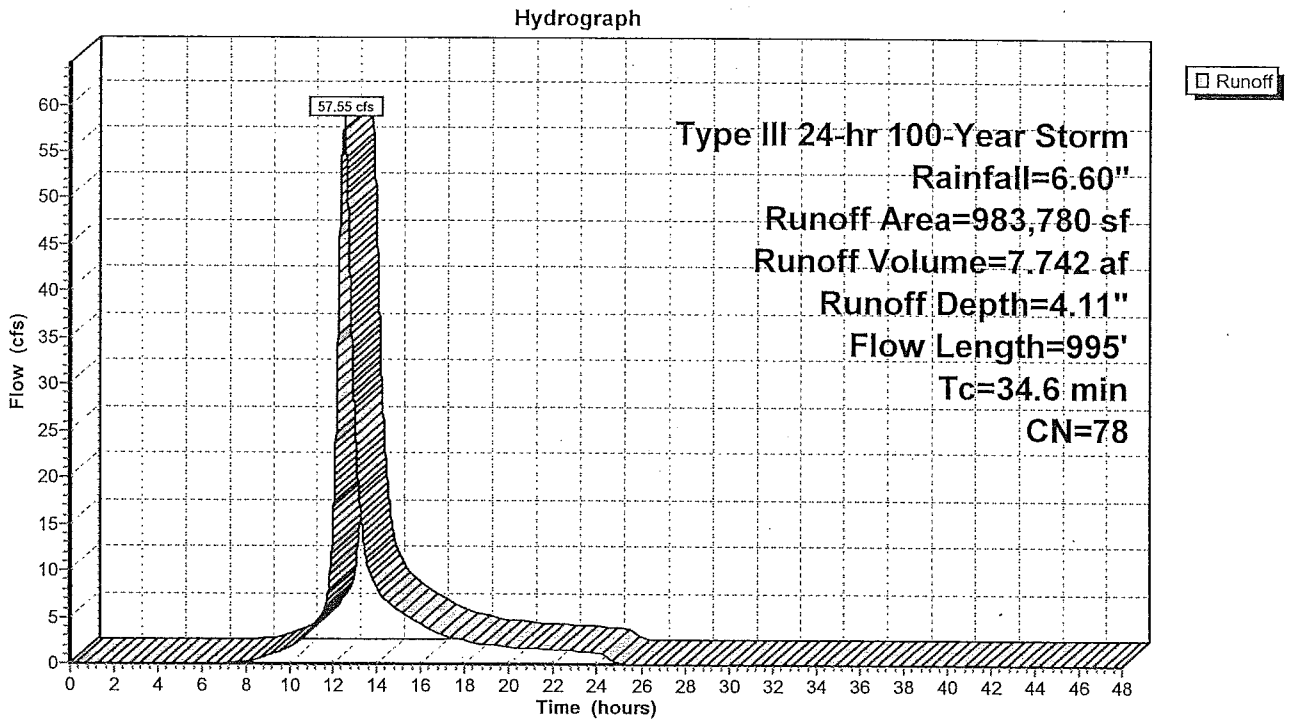
Runoff = 57.55 cfs @ 12.49 hrs, Volume= 7.742 af, Depth= 4.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Storm Rainfall=6.60"

Area (sf)	CN	Description
419,800	81	1/3 acre lots, 30% imp, HSG C
152,200	91	Newly graded area, HSG C
85,000	65	Brush, Good, HSG C
320,780	70	Woods, Good, HSG C
6,000	74	>75% Grass cover, Good, HSG C
983,780	78	Weighted Average
857,840		87.20% Pervious Area
125,940		12.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4	60	0.0100	0.05		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
15.2	935	0.0420	1.02		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
34.6	995	Total			

Subcatchment 204A: Subcatchment 204A



Summary for Subcatchment 204B: Subcatchment 204B

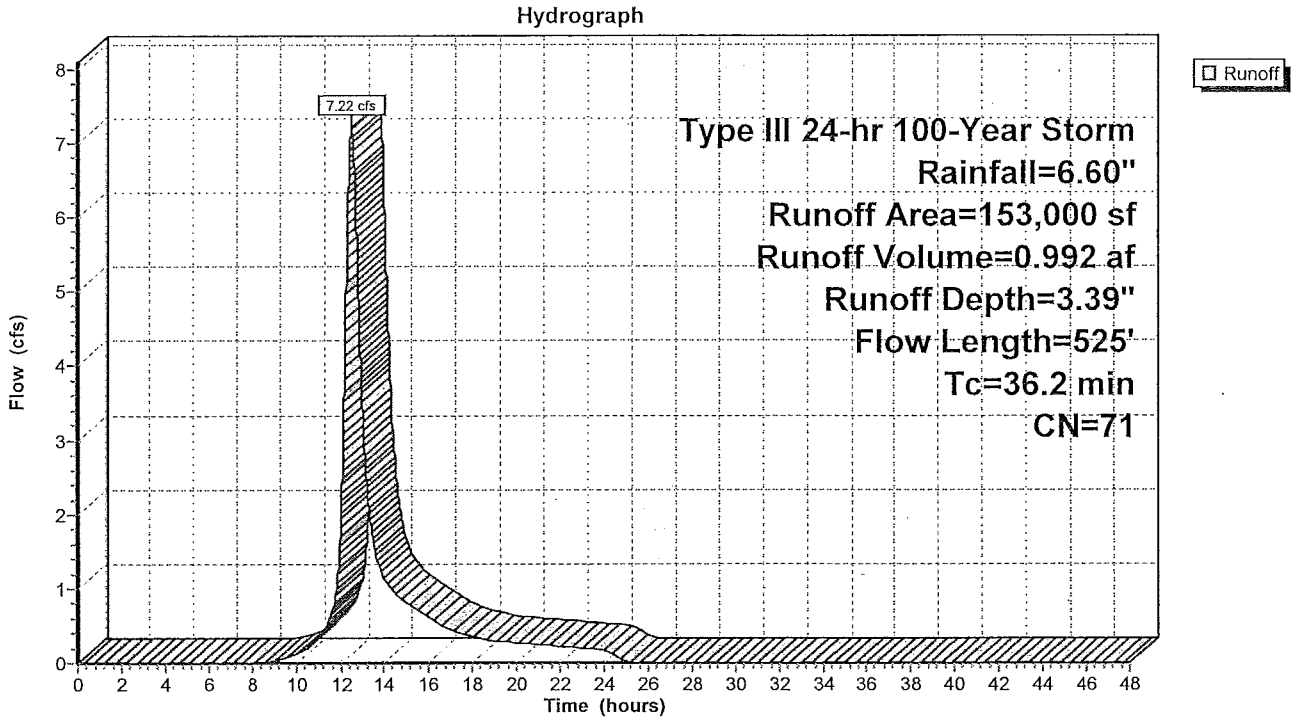
Runoff = 7.22 cfs @ 12.51 hrs, Volume= 0.992 af, Depth= 3.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Storm Rainfall=6.60"

Area (sf)	CN	Description
7,400	92	Paved roads w/open ditches, 50% imp, HSG C
9,000	74	>75% Grass cover, Good, HSG C
136,600	70	Woods, Good, HSG C
153,000	71	Weighted Average
149,300		97.58% Pervious Area
3,700		2.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	60	0.0050	0.04		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
10.5	465	0.0220	0.74		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
36.2	525	Total			

Subcatchment 204B: Subcatchment 204B



Summary for Subcatchment 204C: Subcatchment 204C

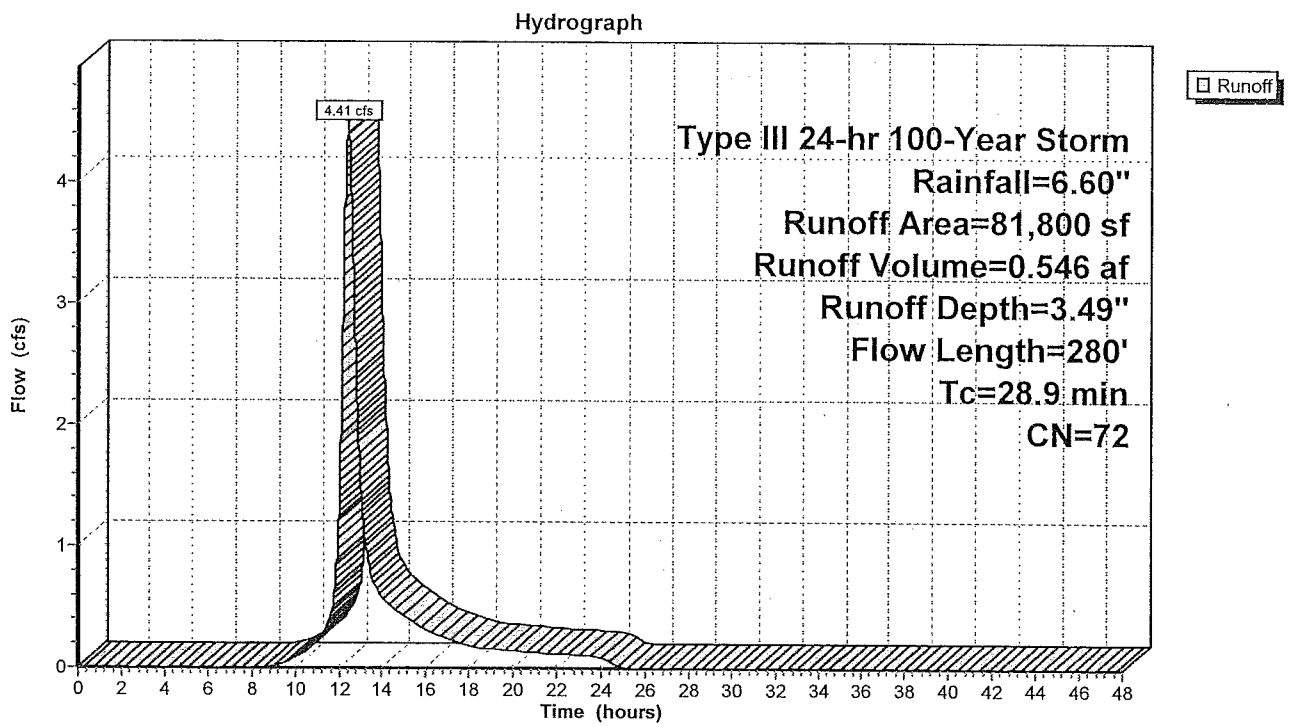
Runoff = 4.41 cfs @ 12.42 hrs, Volume= 0.546 af, Depth= 3.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Storm Rainfall=6.60"

Area (sf)	CN	Description
6,940	92	Paved roads w/open ditches, 50% imp, HSG C
3,200	74	>75% Grass cover, Good, HSG C
71,660	70	Woods, Good, HSG C
81,800	72	Weighted Average
78,330		95.76% Pervious Area
3,470		4.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	60	0.0050	0.04		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
3.2	220	0.0270	1.15		**Shallow Concentrated Flow, Woods** Short Grass Pasture Kv= 7.0 fps
28.9	280	Total			

Subcatchment 204C: Subcatchment 204C



Summary for Subcatchment 204D: Subcatchment 204D

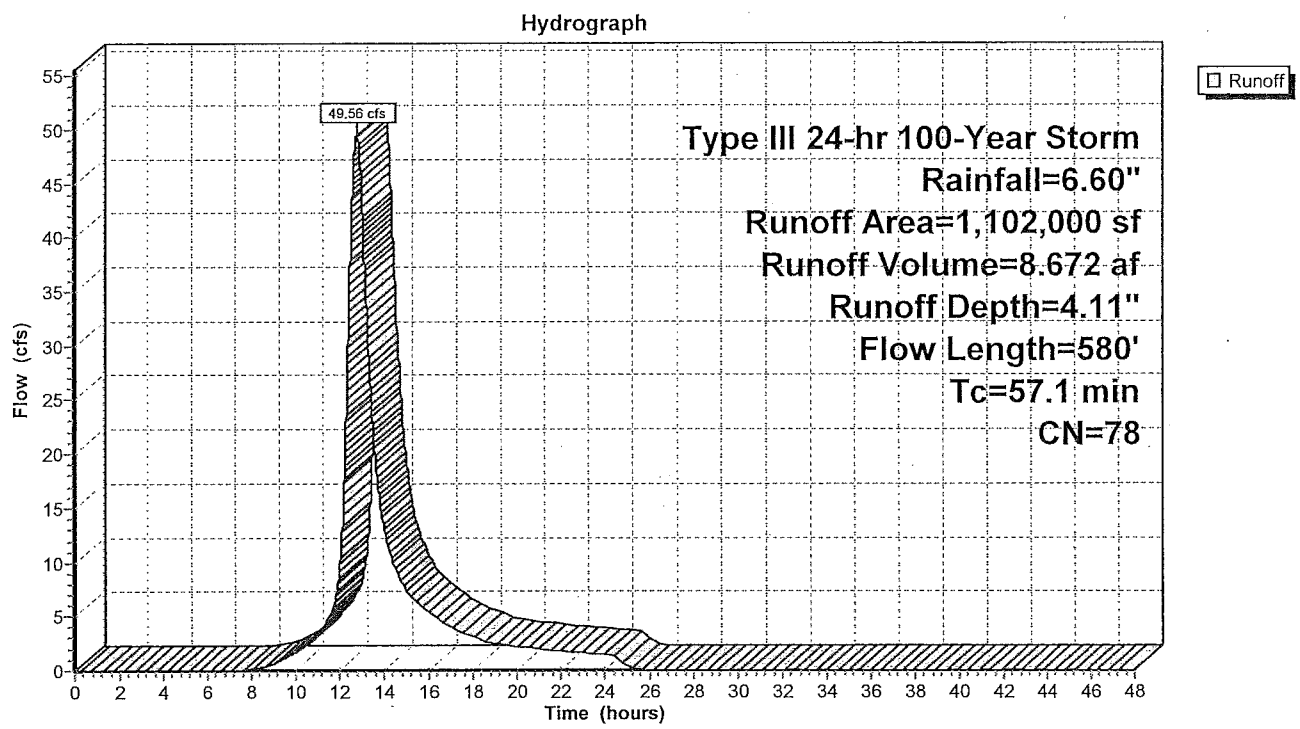
Runoff = 49.56 cfs @ 12.75 hrs, Volume= 8.672 af, Depth= 4.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Storm Rainfall=6.60"

Area (sf)	CN	Description
67,600	92	Paved roads w/open ditches, 50% imp, HSG C
85,000	65	Brush, Good, HSG C
97,500	98	Paved roads w/curbs & sewers, HSG C
239,400	91	Urban industrial, 72% imp, HSG C
612,500	70	Woods, Good, HSG C
1,102,000	78	Weighted Average
798,332		72.44% Pervious Area
303,668		27.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
48.8	60	0.0010	0.02		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
8.3	520	0.0440	1.05		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
57.1	580	Total			

Subcatchment 204D: Subcatchment 204D



Summary for Subcatchment 204E: Future Development (Cleared Area)

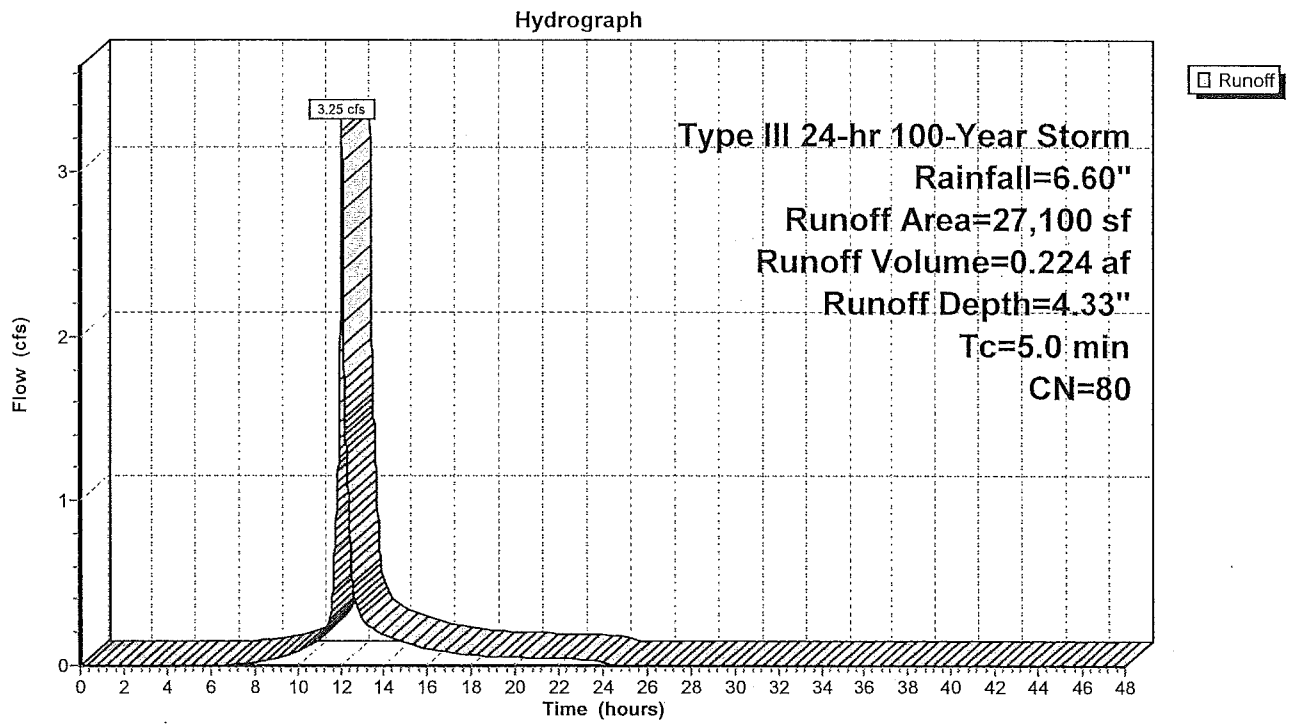
Runoff = 3.25 cfs @ 12.07 hrs, Volume= 0.224 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Storm Rainfall=6.60"

	Area (sf)	CN	Description
*	6,775	98	Future Impervious
*	20,325	74	Future landscaped
	27,100	80	Weighted Average
	20,325		75.00% Pervious Area
	6,775		25.00% Impervious Area

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

Subcatchment 204E: Future Development (Cleared Area)



Summary for Subcatchment 204F: Future Development (Cleared Area)

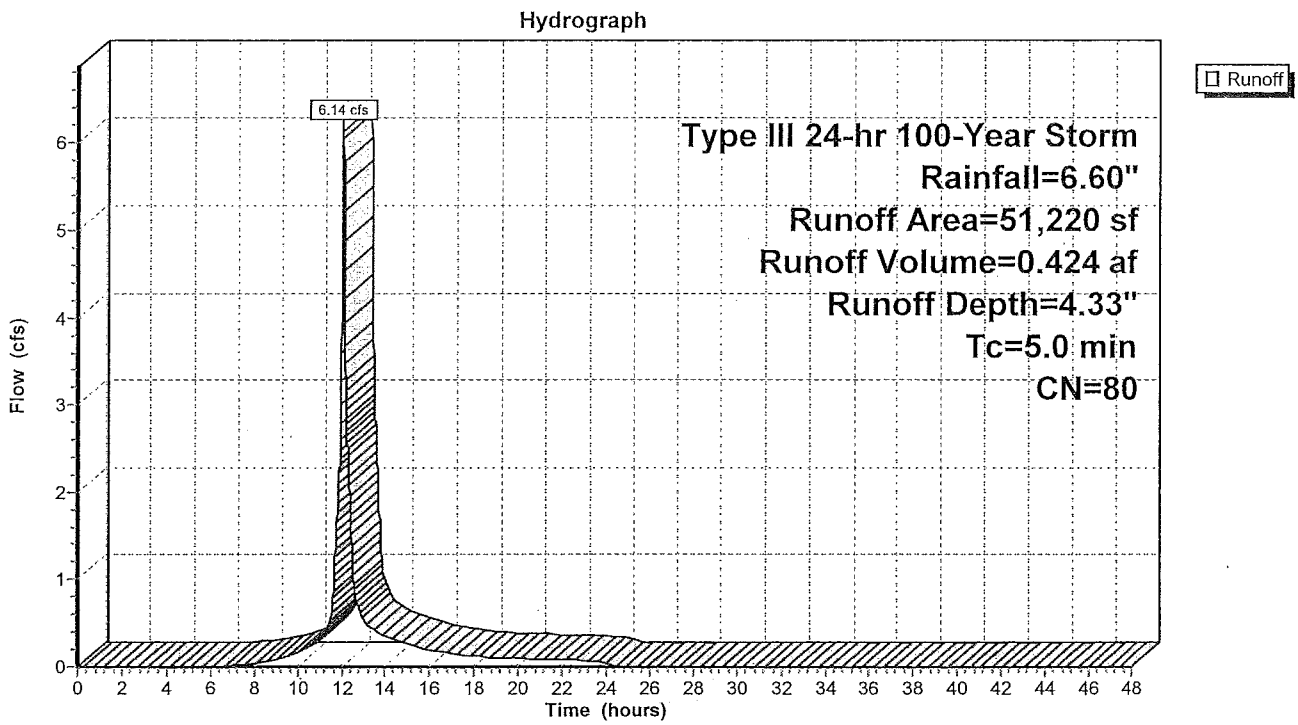
Runoff = 6.14 cfs @ 12.07 hrs, Volume= 0.424 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Storm Rainfall=6.60"

	Area (sf)	CN	Description
*	12,805	98	Future Impervious
*	38,415	74	Future landscaped
	51,220	80	Weighted Average
	38,415		75.00% Pervious Area
	12,805		25.00% Impervious Area

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

Subcatchment 204F: Future Development (Cleared Area)



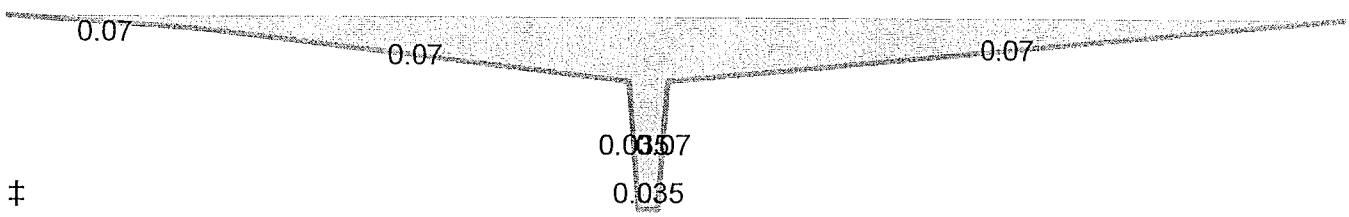
Summary for Reach S-1: Stream Segment

Inflow Area = 29.773 ac, 11.77% Impervious, Inflow Depth > 5.06" for 100-Year Storm event
Inflow = 59.49 cfs @ 12.62 hrs, Volume= 12.559 af
Outflow = 50.78 cfs @ 12.91 hrs, Volume= 12.532 af, Atten= 15%, Lag= 17.3 min

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.69 fps, Min. Travel Time= 10.8 min
Avg. Velocity = 1.19 fps, Avg. Travel Time= 15.4 min

Peak Storage= 67,609 cf @ 12.91 hrs, Average Depth at Peak Storage= 1.68'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 25.78 cfs

Custom cross-section, Length= 1,100.0' Slope= 0.0031 '/'
Flow calculated by Manning's Subdivision method
Inlet Invert= 31.40', Outlet Invert= 28.00'



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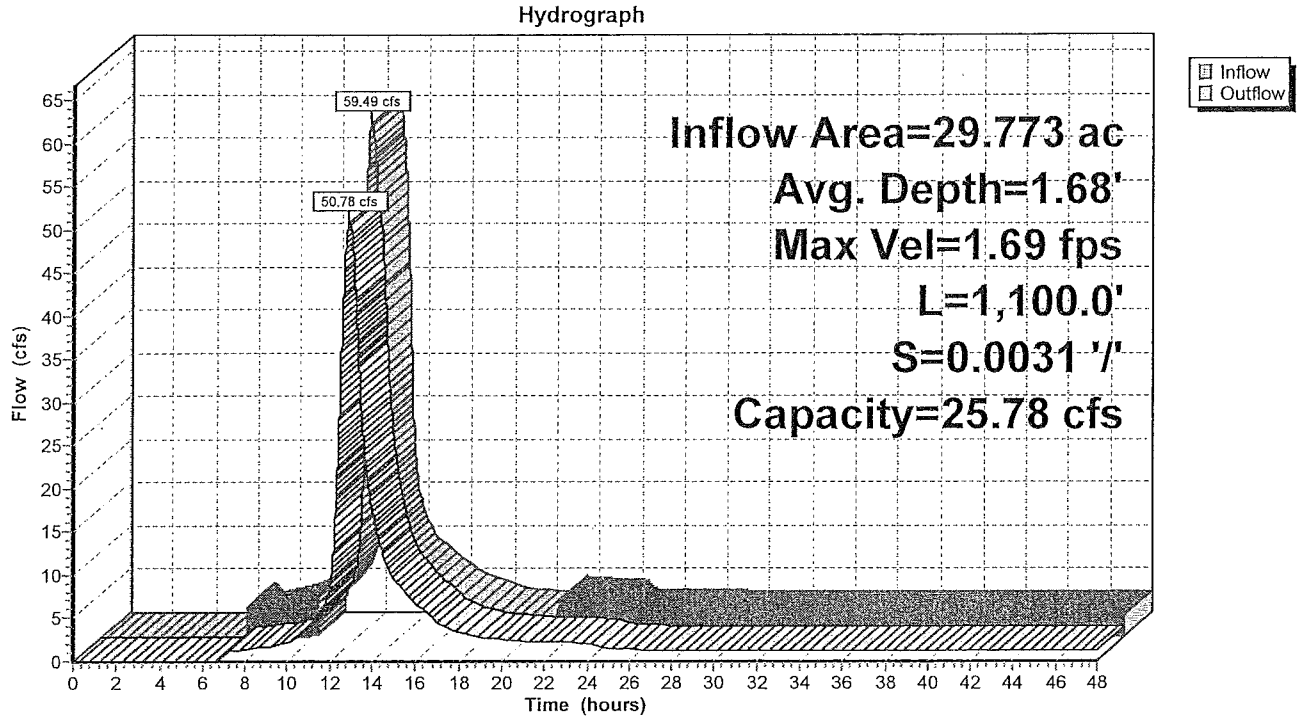
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	31.00	0.00		
20.00	30.90	0.10	0.070	
65.00	30.50	0.50	0.070	
66.00	29.50	1.50	0.035	
68.00	29.50	1.50	0.035	
69.00	30.50	0.50	0.070	
140.00	31.00	0.00	0.070	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	2.0	0	0.00
1.00	3.0	4.8	3,302	5.05
1.40	25.0	106.6	27,465	17.96
1.50	37.3	140.8	40,975	25.78

Reach S-1: Stream Segment



Summary for Pond 1P: 4'x2' Road Culvert

Inflow Area = 23.760 ac, 13.41% Impervious, Inflow Depth = 4.12" for 100-Year Storm event
Inflow = 59.27 cfs @ 12.46 hrs, Volume= 8.160 af
Outflow = 48.51 cfs @ 12.66 hrs, Volume= 10.804 af, Atten= 18%, Lag= 11.5 min
Primary = 48.51 cfs @ 12.66 hrs, Volume= 10.804 af

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 34.68' @ 12.68 hrs Surf.Area= 25,028 sf Storage= 25,114 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 283.0 min (1,131.0 - 848.0)

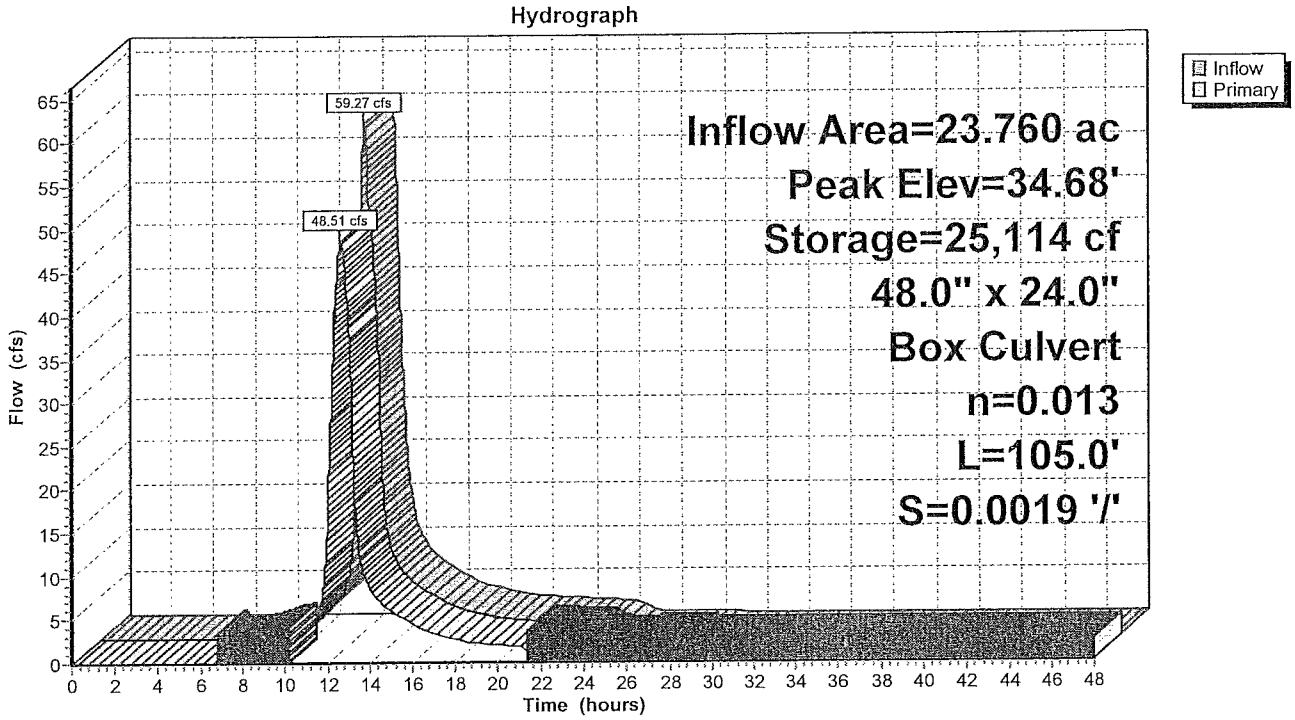
Volume	Invert	Avail.Storage	Storage Description
#1	32.00'	33,820 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.00	160	0	0
33.00	1,840	1,000	1,000
34.00	17,600	9,720	10,720
35.00	28,600	23,100	33,820

Device	Routing	Invert	Outlet Devices
#1	Primary	31.50'	**48.0" W x 24.0" H Box Culvert** L= 105.0' Ke= 0.500 Outlet Invert= 31.30' S= 0.0019 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=48.47 cfs @ 12.66 hrs HW=34.67' TW=33.03' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 48.47 cfs @ 6.06 fps)

Pond 1P: 4'x2' Road Culvert



Summary for Pond 3P: 15" Road Culvert

Inflow Area =	4.135 ac,	5.82% Impervious,	Inflow Depth =	3.51"	for 100-Year Storm event
Inflow =	8.10 cfs @	12.47 hrs, Volume=	1.211 af		
Outflow =	7.98 cfs @	12.53 hrs, Volume=	1.209 af,	Atten= 1%,	Lag= 3.7 min
Primary =	7.98 cfs @	12.53 hrs, Volume=	1.209 af		

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 38.81' @ 12.53 hrs Surf.Area= 408 sf Storage= 1,105 cf

Plug-Flow detention time= 4.5 min calculated for 1.209 af (100% of inflow)
Center-of-Mass det. time= 2.9 min (886.3 - 883.4)

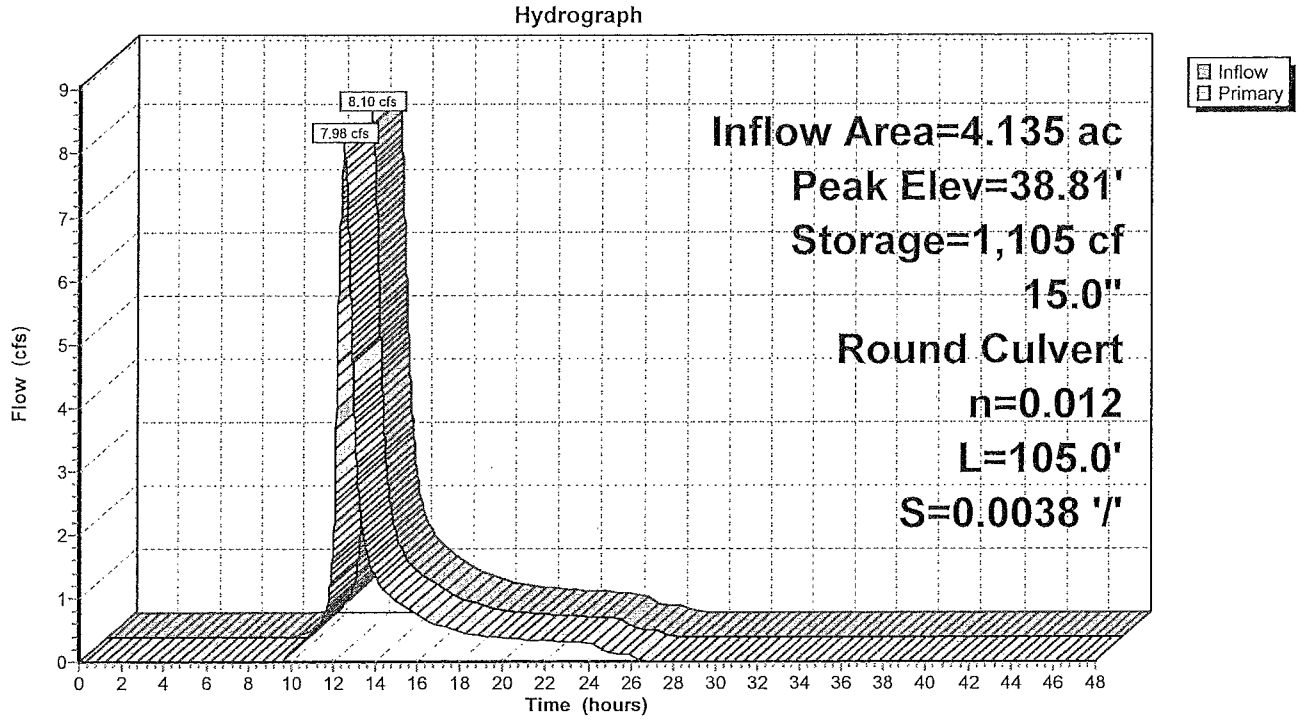
Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	3,855 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
35.00	150	0	0
36.00	240	195	195
37.00	300	270	465
38.00	360	330	795
39.00	420	390	1,185
40.00	740	580	1,765
41.00	3,440	2,090	3,855

Device	Routing	Invert	Outlet Devices
#1	Primary	35.60'	**15.0" Round Culvert** L= 105.0' Ke= 0.500 Outlet Invert= 35.20' S= 0.0038 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=7.98 cfs @ 12.53 hrs HW=38.81' TW=32.97' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 7.98 cfs @ 6.50 fps)

Pond 3P: 15" Road Culvert



Summary for Pond 4P: 15" Road Culvert

Inflow Area =	1.878 ac,	4.24% Impervious,	Inflow Depth =	3.49"	for 100-Year Storm event
Inflow =	4.41 cfs @	12.42 hrs,	Volume=	0.546 af	
Outflow =	4.40 cfs @	12.44 hrs,	Volume=	0.546 af,	Atten= 0%, Lag= 0.9 min
Primary =	4.40 cfs @	12.44 hrs,	Volume=	0.546 af	

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 34.17' @ 12.44 hrs Surf.Area= 441 sf Storage= 126 cf

Plug-Flow detention time= 0.9 min calculated for 0.546 af (100% of inflow)
Center-of-Mass det. time= 0.7 min (851.0 - 850.3)

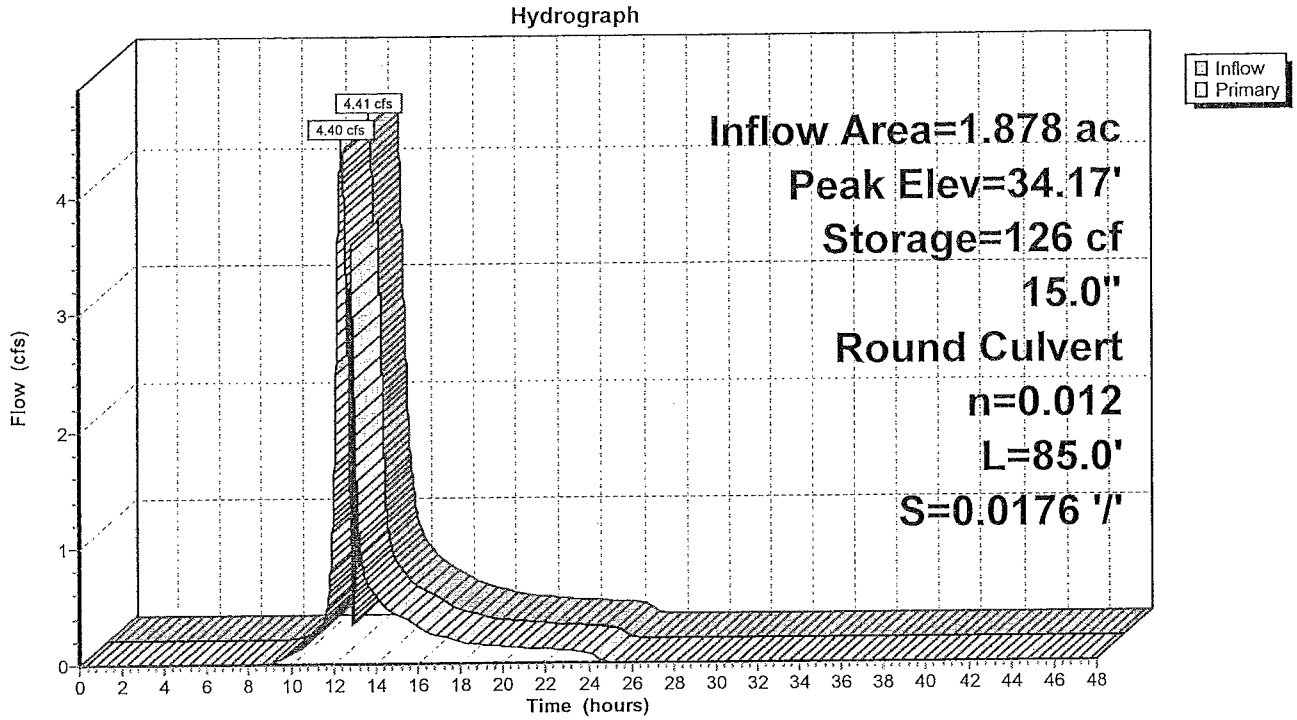
Volume	Invert	Avail.Storage	Storage Description
#1	33.00'	4,580 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
33.00	60	0	0
34.00	100	80	80
35.00	2,100	1,100	1,180
36.00	4,700	3,400	4,580

Device	Routing	Invert	Outlet Devices
#1	Primary	33.00'	**15.0" Round Culvert** L= 85.0' Ke= 0.500 Outlet Invert= 31.50' S= 0.0176 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=4.40 cfs @ 12.44 hrs HW=34.17' TW=32.91' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 4.40 cfs @ 3.68 fps)

Pond 4P: 15" Road Culvert



Summary for Pond B100: B-100

Inflow Area =	0.622 ac, 25.00% Impervious, Inflow Depth = 4.33" for 100-Year Storm event				
Inflow =	3.25 cfs @ 12.07 hrs, Volume=	0.224 af			
Outflow =	1.53 cfs @ 12.23 hrs, Volume=	0.219 af, Atten= 53%, Lag= 9.5 min			
Primary =	1.53 cfs @ 12.23 hrs, Volume=	0.219 af			

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 42.20' @ 12.23 hrs Surf.Area= 2,233 sf Storage= 3,352 cf

Plug-Flow detention time= 196.6 min calculated for 0.219 af (98% of inflow)
Center-of-Mass det. time= 182.7 min (992.0 - 809.4)

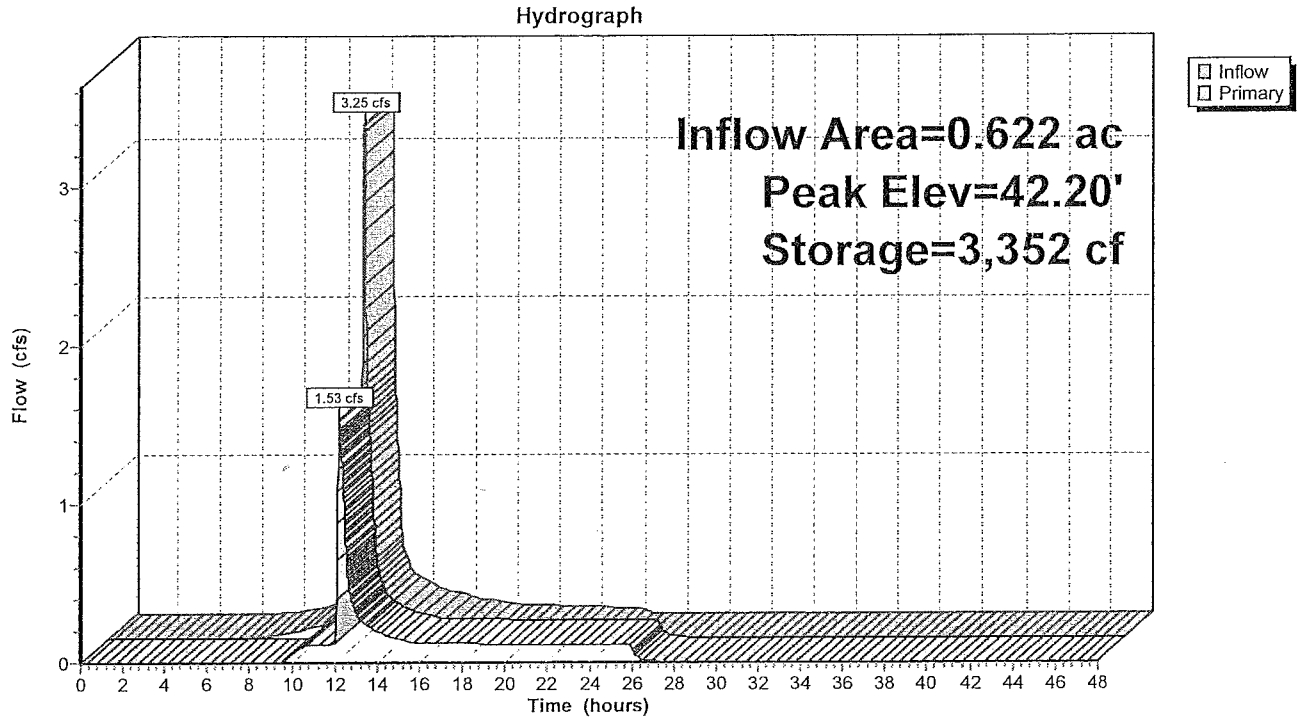
Volume	Invert	Avail.Storage	Storage Description
#1	39.00'	5,309 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
39.00	1,868	0.0	0	0
39.50	1,868	15.0	140	140
40.00	1,868	30.0	280	420
40.50	1,868	30.0	280	701
41.00	1,868	30.0	280	981
41.50	1,868	100.0	934	1,915
42.00	2,122	100.0	998	2,912
42.50	2,398	100.0	1,130	4,042
43.00	2,670	100.0	1,267	5,309

Device	Routing	Invert	Outlet Devices
#1	Device 2	39.66'	**6.0" Round Culvert** L= 80.0' Ke= 0.500 Outlet Invert= 39.33' S= 0.0041 '/' Cc= 0.900 n= 0.012
#2	Primary	39.33'	**12.0" Round Culvert** L= 60.0' Ke= 0.500 Outlet Invert= 38.67' S= 0.0110 '/' Cc= 0.900 n= 0.012
#3	Device 1	39.00'	**2.540 in/hr Exfiltration over Surface area**
#4	Device 2	42.00'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.53 cfs @ 12.23 hrs HW=42.20' TW=37.39' (Dynamic Tailwater)
- **2=Culvert** (Passes 1.53 cfs of 5.69 cfs potential flow)
  - **1=Culvert** (Passes 0.13 cfs of 0.92 cfs potential flow)
    - **3=Exfiltration** (Exfiltration Controls 0.13 cfs)
  - **4=Orifice/Grate** (Weir Controls 1.40 cfs @ 1.47 fps)

Pond B100: B-100



Summary for Pond B101: B-101

Inflow Area =	1.176 ac, 25.00% Impervious, Inflow Depth = 4.33" for 100-Year Storm event				
Inflow =	6.14 cfs @ 12.07 hrs, Volume=	0.424 af			
Outflow =	5.12 cfs @ 12.13 hrs, Volume=	0.418 af, Atten= 17%, Lag= 3.3 min			
Primary =	5.12 cfs @ 12.13 hrs, Volume=	0.418 af			

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 40.67' @ 12.13 hrs Surf.Area= 2,850 sf Storage= 4,837 cf

Plug-Flow detention time= 162.5 min calculated for 0.418 af (99% of inflow)
Center-of-Mass det. time= 154.6 min (963.9 - 809.4)

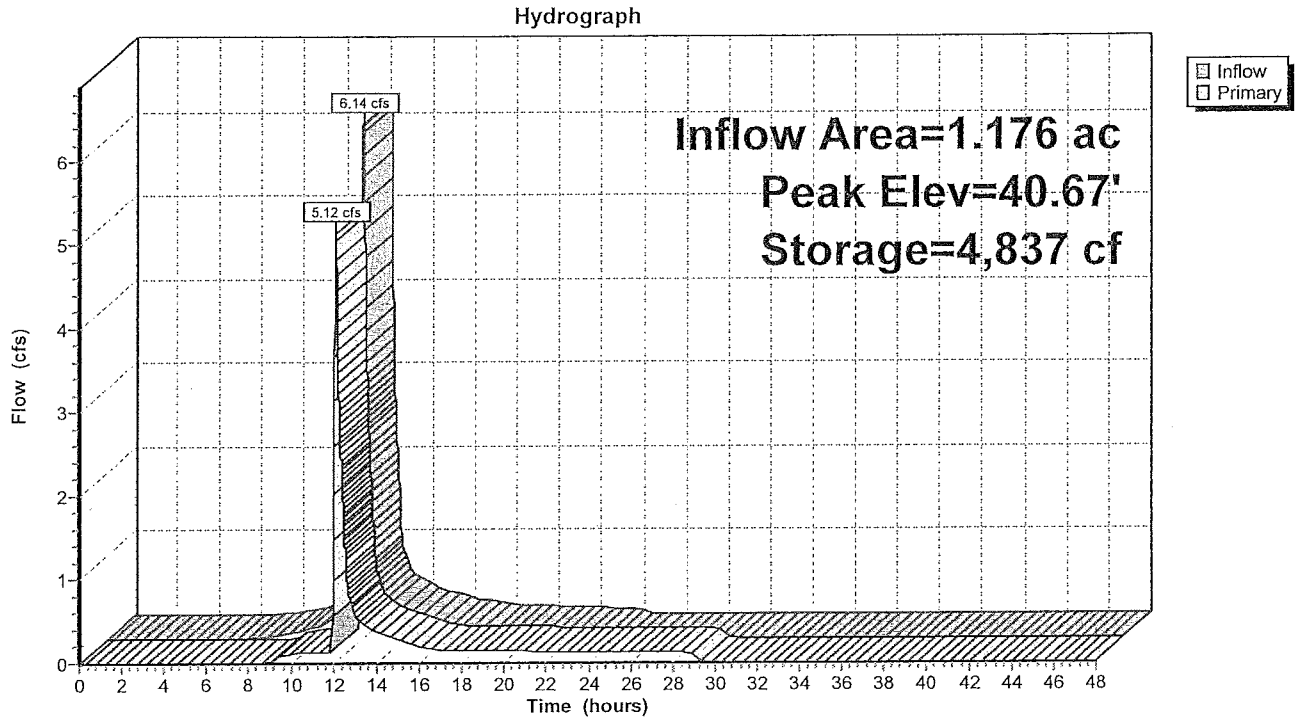
Volume	Invert	Avail.Storage	Storage Description
#1	37.00'	5,822 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
37.00	1,974	0.0	0	0
37.50	1,974	15.0	148	148
38.00	1,974	30.0	296	444
38.50	1,974	30.0	296	740
39.00	1,974	30.0	296	1,036
39.50	1,974	100.0	987	2,023
40.00	2,338	100.0	1,078	3,101
40.50	2,717	100.0	1,264	4,365
41.00	3,110	100.0	1,457	5,822

Device	Routing	Invert	Outlet Devices
#1	Device 2	37.66'	**6.0" Round Culvert** L= 80.0' Ke= 0.500 Outlet Invert= 37.33' S= 0.0041 '/' Cc= 0.900 n= 0.012
#2	Primary	37.00'	**12.0" Round Culvert** L= 60.0' Ke= 0.500 Outlet Invert= 36.50' S= 0.0083 '/' Cc= 0.900 n= 0.012
#3	Device 1	37.00'	**2.540 in/hr Exfiltration over Surface area**
#4	Device 2	40.20'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.12 cfs @ 12.13 hrs HW=40.67' TW=33.35' (Dynamic Tailwater)
└─**2=Culvert** (Passes 5.12 cfs of 6.37 cfs potential flow)
  ├─**1=Culvert** (Passes 0.17 cfs of 1.01 cfs potential flow)
  │ └─**3=Exfiltration** (Exfiltration Controls 0.17 cfs)
  └─**4=Orifice/Grate** (Weir Controls 4.95 cfs @ 2.24 fps)

Pond B101: B-101

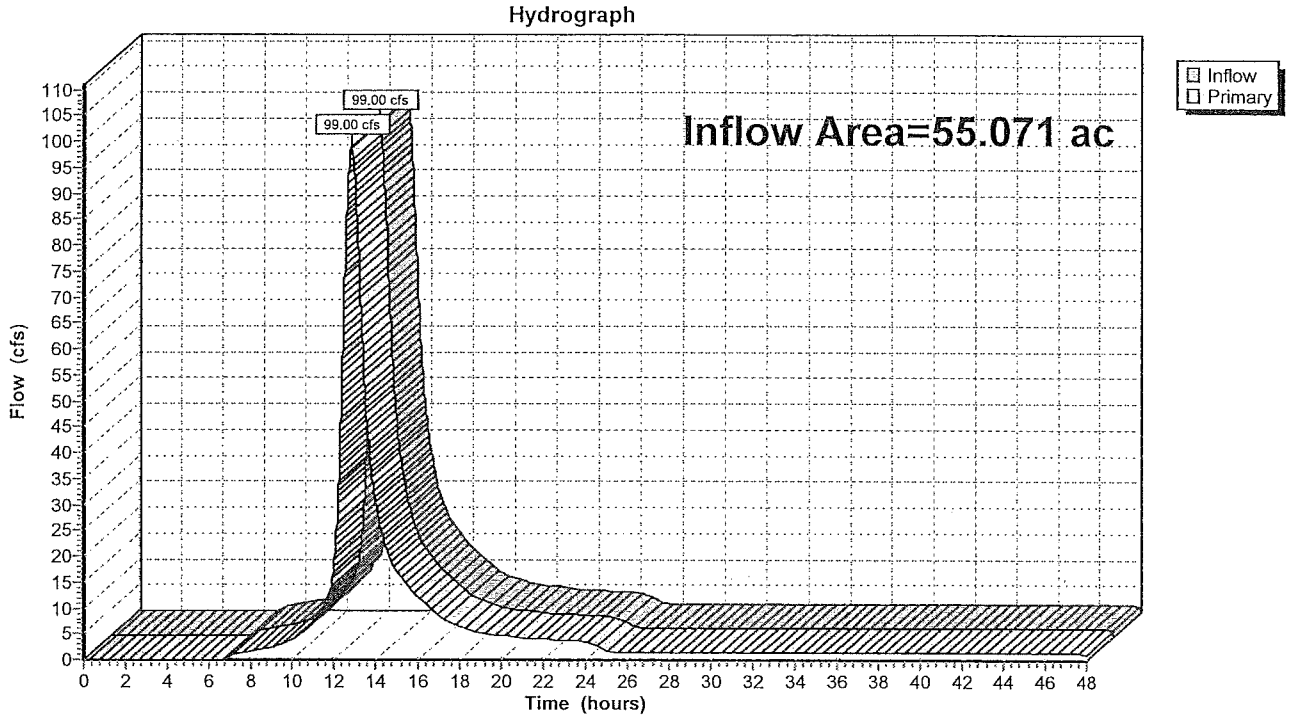


Summary for Link DP4: Design Point 4

Inflow Area = 55.071 ac, 19.02% Impervious, Inflow Depth > 4.62" for 100-Year Storm event
Inflow = 99.00 cfs @ 12.83 hrs, Volume= 21.204 af
Primary = 99.00 cfs @ 12.84 hrs, Volume= 21.204 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link DP4: Design Point 4



Stage-Area-Storage for Pond B100: B-100

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	
39.00	1,868	0	41.60	1,919	2,104	
39.05	1,868	14	41.65	1,944	2,201	
39.10	1,868	28	41.70	1,970	2,298	
39.15	1,868	42	41.75	1,995	2,398	
39.20	1,868	56	41.80	2,020	2,498	
39.25	1,868	70	41.85	2,046	2,600	
39.30	1,868	84	41.90	2,071	2,703	
39.35	1,868	98	41.95	2,097	2,807	
39.40	1,868	112	42.00	2,122	2,912	WQV
39.45	1,868	126	42.05	2,150	3,019	
39.50	1,868	140	42.10	2,177	3,127	
39.55	1,868	168	42.15	2,205	3,237	
39.60	1,868	196	42.20	2,232	3,348	
39.65	1,868	224	42.25	2,260	3,460	
39.70	1,868	252	42.30	2,288	3,574	
39.75	1,868	280	42.35	2,315	3,689	
39.80	1,868	308	42.40	2,343	3,805	
39.85	1,868	336	42.45	2,370	3,923	
39.90	1,868	364	42.50	2,398	4,042	
39.95	1,868	392	42.55	2,425	4,163	
40.00	1,868	420	42.60	2,452	4,285	
40.05	1,868	448	42.65	2,480	4,408	
40.10	1,868	476	42.70	2,507	4,533	
40.15	1,868	504	42.75	2,534	4,659	
40.20	1,868	532	42.80	2,561	4,786	
40.25	1,868	560	42.85	2,588	4,915	
40.30	1,868	588	42.90	2,616	5,045	
40.35	1,868	616	42.95	2,643	5,176	
40.40	1,868	644	43.00	**2,670**	**5,309**	
40.45	1,868	672				
40.50	1,868	701				
40.55	1,868	729				
40.60	1,868	757				
40.65	1,868	785				
40.70	1,868	813				
40.75	1,868	841				
40.80	1,868	869				
40.85	1,868	897				
40.90	1,868	925				
40.95	1,868	953				
41.00	1,868	981				
41.05	1,868	1,074				
41.10	1,868	1,168				
41.15	1,868	1,261				
41.20	1,868	1,354				
41.25	1,868	1,448				
41.30	1,868	1,541				
41.35	1,868	1,635				
41.40	1,868	1,728				
41.45	1,868	1,821				
41.50	1,868	1,915				
41.55	1,893	2,009				

Stage-Area-Storage for Pond B101: B-101

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
37.00	1,974	0
37.05	1,974	15
37.10	1,974	30
37.15	1,974	44
37.20	1,974	59
37.25	1,974	74
37.30	1,974	89
37.35	1,974	104
37.40	1,974	118
37.45	1,974	133
37.50	1,974	148
37.55	1,974	178
37.60	1,974	207
37.65	1,974	237
37.70	1,974	266
37.75	1,974	296
37.80	1,974	326
37.85	1,974	355
37.90	1,974	385
37.95	1,974	415
38.00	1,974	444
38.05	1,974	474
38.10	1,974	503
38.15	1,974	533
38.20	1,974	563
38.25	1,974	592
38.30	1,974	622
38.35	1,974	651
38.40	1,974	681
38.45	1,974	711
38.50	1,974	740
38.55	1,974	770
38.60	1,974	799
38.65	1,974	829
38.70	1,974	859
38.75	1,974	888
38.80	1,974	918
38.85	1,974	948
38.90	1,974	977
38.95	1,974	1,007
39.00	1,974	1,036
39.05	1,974	1,135
39.10	1,974	1,234
39.15	1,974	1,332
39.20	1,974	1,431
39.25	1,974	1,530
39.30	1,974	1,629
39.35	1,974	1,727
39.40	1,974	1,826
39.45	1,974	1,925
39.50	1,974	2,023
39.55	2,010	2,123
39.60	2,047	2,224
39.65	2,083	2,328
39.70	2,120	2,433
39.75	2,156	2,540
39.80	2,192	2,648
39.85	2,229	2,759
39.90	2,265	2,871
39.95	2,302	2,985
40.00	2,338	3,101
40.05	2,376	3,219
40.10	2,414	3,339
40.15	2,452	3,461
40.20	2,490	3,584 WQV
40.25	2,528	3,710
40.30	2,565	3,837
40.35	2,603	3,966
40.40	2,641	4,097
40.45	2,679	4,230
40.50	2,717	4,365
40.55	2,756	4,502
40.60	2,796	4,641
40.65	2,835	4,781
40.70	2,874	4,924
40.75	2,914	5,069
40.80	2,953	5,216
40.85	2,992	5,364
40.90	3,031	5,515
40.95	3,071	5,667
41.00	**3,110**	**5,822**

NON-LINEAR PORTION OF PROJECT

York Police Department New Public Safety Building, Maine
Site Development Areas
Water Quality Volume Summary

Subcatchment Area	Impervious	Landscaped	Developed	WQV required	WQV Provided	BMP
204E	6775	20325	27100	1863	**2912**	B-100
204F	12805	38415	51220	3521	**3584**	B-101
211	1520	4280	5800	404	**880**	B-14
212	5800	10340	16140	828	**904**	B-12
213	8060	11740	19800	1063	**1591**	B-6
214	225	5575	5800	205	**680**	B-10
215	45600	26800	72400	4693	**5300**	B-11
216	19200	0	19200	1600	**1832**	DRIP STRIP
202C	10240	4400	14640	1000	**1670**	B-9
Untreated	4580	6440	11020			Untreated
TOTAL TREATED	**110225**	**121875**	**232100**			

BMP General Standard Calculation			
	Impervious	Landscaped	Developed
NEW DEVELOPED AREA	114805	128315	243120
TREATED AREAS	110225	121875	232100
PERCENT TREATED	**96.0%**	**95.0%**	**95.5%**