Appendix D

Citygate
Westfall Road

Rochester, New York
Monroe County

WATER REPORT

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WATER REPORT
CITYGATE – ROCHESTER, NY

Table of Contents

1.0 Introduction

1.1 PROJECT DESCRIPTION

Project Location and Setting

The project site is located at the southeast corner of the intersection of East Henrietta Road and Westfall Road. The subject site is located in two municipalities, the City of Rochester and Town of Brighton, Monroe County, New York. The property is bounded by Westfall Road to the north, Brighton Meadows Office Park to the east, the Erie Canal to the south, and East Henrietta Road to the west. Interstate 390, a major north-south expressway through the Rochester region, is located south of the site, beyond the southern edge of the Erie Canal.

Project Description

The proposed Citygate project will be a diverse but complementary mix of residential and non-residential uses, including a variety of multi-family housing options, retail, office, hotels, and recreational and open space opportunities located in close proximity to a number of large community service uses, including University of Rochester, Monroe Community Hospital and the Monroe Community College. Incorporating sustainable land use initiatives, the proposed development encourages pedestrian activity and interactions by functioning as a mixed-used center of activity, with live-work units and more typical residential townhouse space; balanced with pedestrian friendly mix of consumer oriented spaces for retail, offices, hotels and services. The development will create pockets of living and office space over first story retail, with structured parking in multiple locations throughout the development. Public amenities include open space and direct connections to the Erie Canal with trails, sidewalks and an overlook.

Vehicular access to the site is provided from East Henrietta and Westfall Roads. Three vehicular access points are identified off of Westfall Road, none of which currently exist. The easternmost access point filters traffic directly into the residential area, with the other driveways providing access to Main Street and a surface parking lot in the Mixed Use district. There are also two access points identified from East Henrietta Road into the site, both of which are existing. The northernmost intersection, which lines up with the hospital access on the west side of the road, is improved with a traffic signal.

Internally, a system of roadways will be developed on the site. The majority of proposed roadways do not currently exist, with the exception of the road that currently extends north-south connecting the access drives from East Henrietta Road. Existing roadways within the site will be reconfigured and redeveloped. Pedestrian linkages and a sidewalk network will provide internal pedestrian connections to and from all development areas internal to the site. Pedestrian connections will also extend externally to East Henrietta Road and south to the canal front, where people will also have the opportunity to connect to the Town of Brighton trail system.

Parking facilities are proposed throughout the site in the form of surface lots and a multi-level parking structure. The parking structure, located in the center of the site, will be available for

visitors to Citygate with some parking spaces designated to the University of Rochester as part of their off-site parking program. A University shuttle service will provide transportation from the parking garage to the campus at regular intervals throughout the day. Surface lots on the site, located along Westfall Road, internal on-street parking, and individual development sites, such as the hotel, provide additional parking spaces.

The proposed Citygate project will be comprised of four design and land use districts – Neighborhood Mixed-Use, Canal Front Mixed-Use, Commercial, and Residential. The total project site is approximately 63 acres and lies within both the City of Rochester (approximately 44 acres) and Town of Brighton (approximately 19 acres).

2.0 Proposed Facilities

2.1 WATER SYSTEM

There are two water mains located adjacent to the proposed site both are under the city of Rochester jurisdiction. There is a 24" water main that runs along East Henrietta Rd and a 12" water main that runs along west fall road. Hydrant flow data has been obtained for each of these lines. These two lines provide connection points the first of two connection options. There is also an 8" water main further east of the site that is under the Town of Brighton's jurisdiction, this line combined with the 24" water main on East Henrietta Rd would provide connection points for second option. Hydrant Flow data was obtained for this line as well

The proposed on site water main network consists of 12 inch water main. There are two separate onsite loops which can be seen on the diagrams in appendix A. In Option #1 the main loop connects to both the 24" and 12" water main as shown on the Diagram. In this option the second loop also connects to the 12" water main. In Option #2 the main loop remain unchanged and the secondary loop connect to the Town of Brighton water main that is located approximately 1400 feet east of the development.

Domestic demands where calculated using (Design Stds for Wastewater Treatment Works, Intermediate Sized Facilities, 1988, NYSDEC) a 4.0 peaking factor was applied to these numbers as well as a 0.8 factor for water savings fixtures. The overall site domestic demand was then divided between 4 separate areas for analysis purposes. Refer to Appendix A for tables. Fire demand was assumed to be 1500 GPM conservatively and was applied to each of the 4 areas identified for domestic demand.

Hydrant Flow Test Data (24")	78 psi Static 4834 gpm @20 psi
Hydrant Flow Test Data (12")	62 psi Static 4141 gpm @20 psi
Hydrant Flow Test Data (8")	75 psi Static 50 psi Residual Observed @ 1132 gpm 1733 gpm @20 psi

Option #1 – 100% Served by City CP-27	
Fire Service Available @ Worst case Area J-27	1500 gpm @ 39.34 psi
Domestic Water Available @ Worst case Area J-27	196 gpm @ 73.76 psi
Option #2 – Served by City and MCWA CP-27	
Fire Service Available @ Worst case Area J-44	1500 gpm @ -277.81 psi
Domestic Water Available @ Worst case Area J-46	159 gpm @ 66.78 psi

3.0 Conclusion

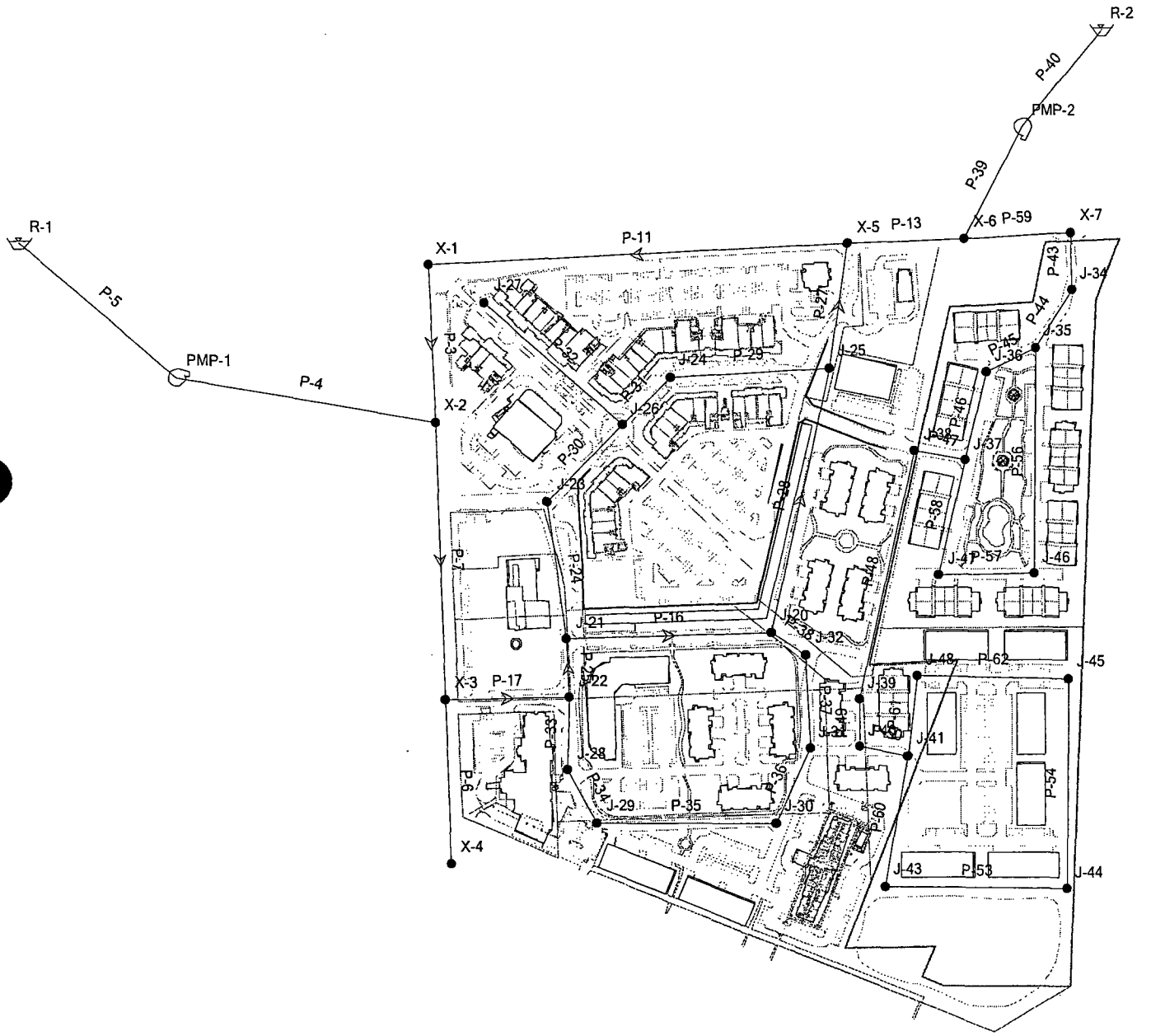
The Water Report summarizes the engineering methodologies and criteria used in the design of the water supply systems. These utilities have been designed utilizing standard engineering practices and demonstrate that adequate services are available for the development.

APPENDIX 1

WATER SYSTEM CALCULATIONS

OPTION # 1

Scenario: Base



Scenario: Domestic 650 Split
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-44	515.00	Zone	Demand	159.00	Fixed	159.00	741.90	98.17
J-45	519.00	Zone	Demand	0.00	Fixed	0.00	741.92	96.45
J-46	523.00	Zone	Demand	159.00	Fixed	159.00	742.08	94.79
J-43	525.00	Zone	Demand	0.00	Fixed	0.00	741.93	93.85
J-47	527.00	Zone	Demand	0.00	Fixed	0.00	742.08	93.05
J-41	527.00	Zone	Demand	0.00	Fixed	0.00	741.94	92.99
J-30	528.00	Zone	Demand	0.00	Fixed	0.00	742.64	92.86
J-31	528.00	Zone	Demand	0.00	Fixed	0.00	742.64	92.86
J-39	528.00	Zone	Demand	0.00	Fixed	0.00	741.97	92.58
J-40	528.00	Zone	Demand	0.00	Fixed	0.00	741.96	92.57
J-48	528.00	Zone	Demand	0.00	Fixed	0.00	741.93	92.56
J-32	530.00	Zone	Demand	0.00	Fixed	0.00	742.64	92.00
J-20	531.00	Zone	Demand	0.00	Fixed	0.00	742.63	91.56
J-38	532.00	Zone	Demand	0.00	Fixed	0.00	742.06	90.88
J-29	534.00	Zone	Demand	134.00	Fixed	134.00	742.64	90.27
J-37	534.00	Zone	Demand	0.00	Fixed	0.00	742.08	90.03
J-28	537.00	Zone	Demand	0.00	Fixed	0.00	742.66	88.98
J-36	538.00	Zone	Demand	0.00	Fixed	0.00	742.12	88.31
J-35	540.00	Zone	Demand	0.00	Fixed	0.00	742.14	87.46
J-22	541.00	Zone	Demand	0.00	Fixed	0.00	742.69	87.26
J-21	544.00	Zone	Demand	0.00	Fixed	0.00	742.65	85.95
J-25	545.00	Zone	Demand	0.00	Fixed	0.00	742.59	85.49
J-34	545.00	Zone	Demand	0.00	Fixed	0.00	742.23	85.33
X-4	549.00	Zone	Demand	0.00	Fixed	0.00	742.92	83.90
-3	551.00	Zone	Demand	0.00	Fixed	0.00	742.92	83.03
J-23	556.00	Zone	Demand	0.00	Fixed	0.00	742.61	80.74
J-26	559.00	Zone	Demand	0.00	Fixed	0.00	742.58	79.43
X-7	560.00	Zone	Demand	0.00	Fixed	0.00	742.30	78.87
X-2	566.00	Zone	Demand	0.00	Fixed	0.00	742.94	76.55
X-6	566.00	Zone	Demand	0.00	Fixed	0.00	742.43	76.33
J-24	567.00	Zone	Demand	0.00	Fixed	0.00	742.58	75.97
J-27	572.00	Zone	Demand	196.00	Fixed	196.00	742.48	73.76
X-1	573.00	Zone	Demand	0.00	Fixed	0.00	742.93	73.52
X-5	574.50	Zone	Demand	0.00	Fixed	0.00	742.58	72.72

Scenario: Domestic 650 Split
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Check Valve?	Minor Loss Coefficient	Control Status	Discharge (gpm)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	Velocity (ft/s)
P-3	401.00	24.0	Ductile Iro	100.0	false	0.00	Open	256.97	742.94	742.93	0.00	0.01	0.18
P-4	1.00	24.0	Ductile Iro	100.0	false	0.00	Open	-648.00	742.94	742.94	0.00	0.06	0.46
P-5	1.00	24.0	Ductile Iro	100.0	false	0.00	Open	-648.00	566.00	566.00	0.00	0.06	0.46
P-6	421.00	24.0	Ductile Iro	100.0	false	0.00	Open	-0.00	742.92	742.92	0.00	0.00	0.00
P-7	711.00	24.0	Ductile Iro	100.0	false	0.00	Open	-391.03	742.92	742.94	0.02	0.02	0.28
P-11	1,062.00	12.0	Ductile Iro	100.0	false	0.00	Open	256.97	742.93	742.58	0.35	0.33	0.73
P-13	294.00	12.0	Ductile Iro	100.0	false	0.00	Open	318.00	742.58	742.43	0.15	0.49	0.90
P-16	515.00	12.0	Ductile Iro	100.0	false	0.00	Open	-77.34	742.63	742.65	0.02	0.04	0.22
P-17	315.00	12.0	Ductile Iro	100.0	false	0.00	Open	391.03	742.92	742.69	0.23	0.72	1.11
P-24	356.00	12.0	Ductile Iro	100.0	false	0.00	Open	147.53	742.65	742.61	0.04	0.12	0.42
P-25	149.00	12.0	Ductile Iro	100.0	false	0.00	Open	224.87	742.69	742.65	0.04	0.26	0.64
P-27	319.00	12.0	Ductile Iro	100.0	false	0.00	Open	-61.03	742.58	742.59	0.01	0.02	0.17
P-28	694.00	12.0	Ductile Iro	100.0	false	0.00	Open	-109.50	742.59	742.63	0.05	0.07	0.31
P-29	400.00	12.0	Ductile Iro	100.0	false	0.00	Open	48.47	742.59	742.58	0.01	0.02	0.14
P-30	272.00	12.0	Ductile Iro	100.0	false	0.00	Open	147.53	742.61	742.58	0.03	0.12	0.42
P-31	171.00	12.0	Ductile Iro	100.0	false	0.00	Open	-48.47	742.58	742.58	0.00	0.01	0.14
P-32	468.00	12.0	Ductile Iro	100.0	false	0.00	Open	196.00	742.58	742.48	0.09	0.20	0.56
P-33	186.00	12.0	Ductile Iro	100.0	false	0.00	Open	166.16	742.69	742.66	0.03	0.15	0.47
P-34	152.00	12.0	Ductile Iro	100.0	false	0.00	Open	166.16	742.66	742.64	0.02	0.15	0.47
P-35	450.00	12.0	Ductile Iro	100.0	false	0.00	Open	32.16	742.64	742.64	0.00	0.01	0.09
P-36	209.00	12.0	Ductile Iro	100.0	false	0.00	Open	32.16	742.64	742.64	0.00	0.01	0.09
P-37	240.00	12.0	Ductile Iro	100.0	false	0.00	Open	32.16	742.64	742.64	0.00	0.01	0.09
P-38	104.00	12.0	Ductile Iro	100.0	false	0.00	Open	32.16	742.64	742.63	0.00	0.01	0.09
P-39	1.00	24.0	Ductile Iro	100.0	false	0.00	Open	0.00	742.43	742.43	0.00	0.00	0.00
P-40	1.00	24.0	Ductile Iro	100.0	false	0.00	Open	0.00	566.00	566.00	0.00	0.00	0.00
P-43	147.00	12.0	Ductile Iro	100.0	false	0.00	Open	318.00	742.30	742.23	0.07	0.49	0.90
P-44	174.00	12.0	Ductile Iro	100.0	false	0.00	Open	318.00	742.23	742.14	0.09	0.49	0.90
P-45	141.00	12.0	Ductile Iro	100.0	false	0.00	Open	176.91	742.14	742.12	0.02	0.17	0.50
P-46	232.00	12.0	Ductile Iro	100.0	false	0.00	Open	176.91	742.12	742.08	0.04	0.17	0.50
P-47	128.00	12.0	Ductile Iro	100.0	false	0.00	Open	159.00	742.08	742.06	0.02	0.14	0.45
P-48	652.00	12.0	Ductile Iro	100.0	false	0.00	Open	159.00	742.06	741.97	0.09	0.14	0.45
P-49	122.00	12.0	Ductile Iro	100.0	false	0.00	Open	159.00	741.97	741.96	0.02	0.14	0.45
P-50	122.00	12.0	Ductile Iro	100.0	false	0.00	Open	159.00	741.96	741.94	0.02	0.14	0.45
P-53	460.00	12.0	Ductile Iro	100.0	false	0.00	Open	86.85	741.93	741.90	0.02	0.04	0.25
P-54	539.00	12.0	Ductile Iro	100.0	false	0.00	Open	-72.15	741.90	741.92	0.02	0.03	0.20
P-56	579.00	12.0	Ductile Iro	100.0	false	0.00	Open	141.09	742.14	742.08	0.06	0.11	0.40
P-57	240.00	12.0	Ductile Iro	100.0	false	0.00	Open	-17.91	742.08	742.08	0.00	0.00	0.05
P-58	302.00	12.0	Ductile Iro	100.0	false	0.00	Open	-17.91	742.08	742.08	0.00	0.00	0.05
P-59	270.00	12.0	Ductile Iro	100.0	false	0.00	Open	318.00	742.43	742.30	0.13	0.49	0.90
P-60	340.00	12.0	Ductile Iro	100.0	false	0.00	Open	-86.85	741.93	741.94	0.02	0.04	0.25
P-61	205.00	12.0	Ductile Iro	100.0	false	0.00	Open	72.15	741.94	741.93	0.01	0.03	0.20
P-62	384.00	12.0	Ductile Iro	100.0	false	0.00	Open	72.15	741.93	741.92	0.01	0.03	0.20

Scenario: Fire Flow
Steady State Analysis
Junction Report

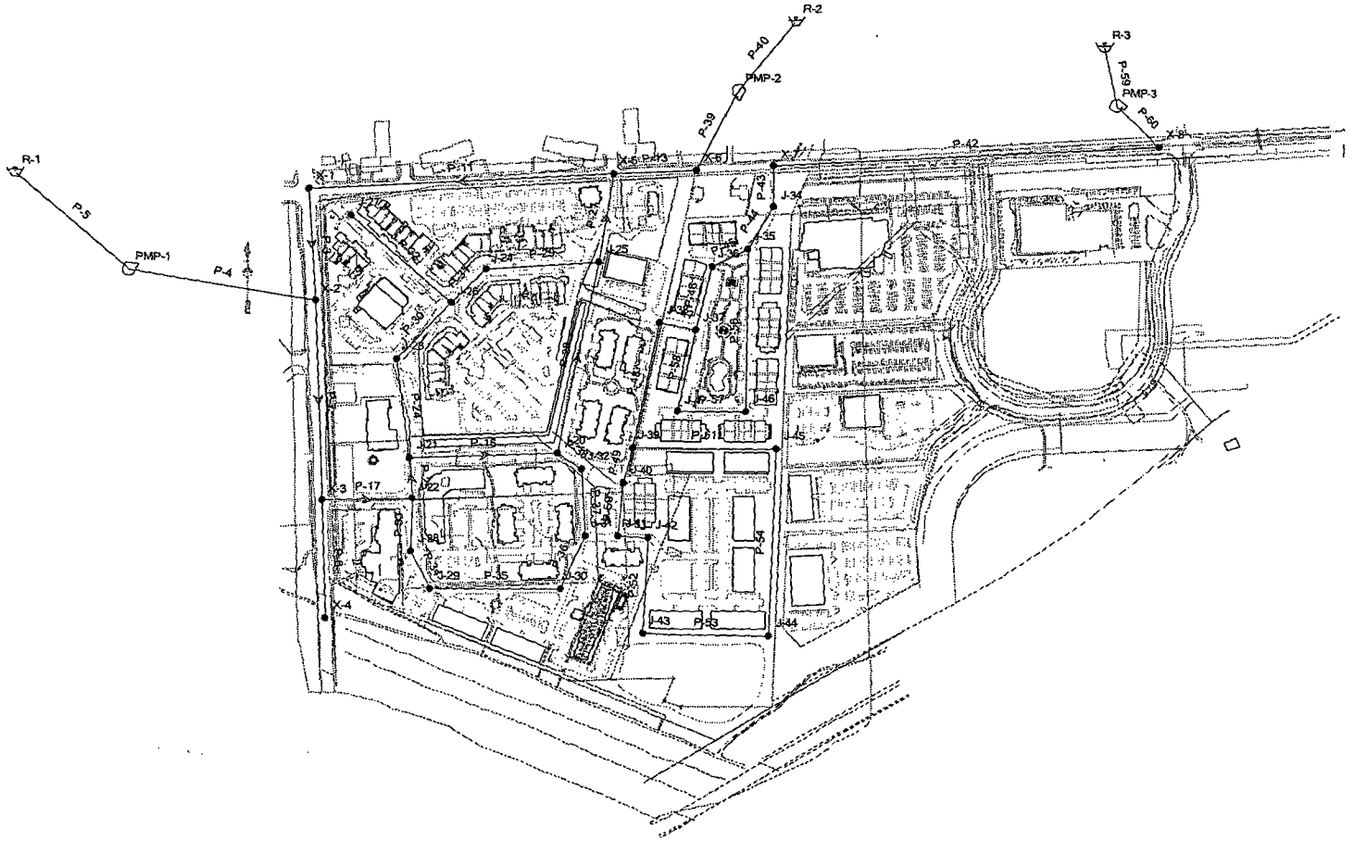
Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-31	528.00	Zone	Demand	0.00	Fixed	0.00	668.09	60.61
J-30	528.00	Zone	Demand	0.00	Fixed	0.00	667.94	60.55
J-32	530.00	Zone	Demand	0.00	Fixed	0.00	668.26	59.82
J-20	531.00	Zone	Demand	0.00	Fixed	0.00	668.33	59.42
J-29	534.00	Zone	Demand	1,500.00	Fixed	1,500.00	667.63	57.82
J-28	537.00	Zone	Demand	0.00	Fixed	0.00	668.40	56.85
J-22	541.00	Zone	Demand	0.00	Fixed	0.00	669.34	55.53
X-4	549.00	Zone	Demand	0.00	Fixed	0.00	675.01	54.52
J-21	544.00	Zone	Demand	0.00	Fixed	0.00	668.61	53.91
X-3	551.00	Zone	Demand	0.00	Fixed	0.00	675.01	53.65
J-25	545.00	Zone	Demand	0.00	Fixed	0.00	668.34	53.36
J-46	523.00	Zone	Demand	1,500.00	Fixed	1,500.00	646.25	53.32
J-44	515.00	Zone	Demand	1,500.00	Fixed	1,500.00	635.11	51.97
J-47	527.00	Zone	Demand	0.00	Fixed	0.00	646.29	51.61
J-45	519.00	Zone	Demand	0.00	Fixed	0.00	636.20	50.71
J-38	532.00	Zone	Demand	0.00	Fixed	0.00	645.22	48.98
J-37	534.00	Zone	Demand	0.00	Fixed	0.00	646.33	48.60
J-23	556.00	Zone	Demand	0.00	Fixed	0.00	667.71	48.33
J-39	528.00	Zone	Demand	0.00	Fixed	0.00	639.52	48.25
J-43	525.00	Zone	Demand	0.00	Fixed	0.00	636.42	48.21
J-36	538.00	Zone	Demand	0.00	Fixed	0.00	648.80	47.94
J-34	545.00	Zone	Demand	0.00	Fixed	0.00	655.79	47.93
J-40	528.00	Zone	Demand	0.00	Fixed	0.00	638.46	47.79
J-41	527.00	Zone	Demand	0.00	Fixed	0.00	637.39	47.76
J-35	540.00	Zone	Demand	0.00	Fixed	0.00	650.30	47.72
X-2	566.00	Zone	Demand	0.00	Fixed	0.00	675.45	47.35
J-48	528.00	Zone	Demand	0.00	Fixed	0.00	636.98	47.15
J-26	559.00	Zone	Demand	0.00	Fixed	0.00	667.02	46.73
X-6	566.00	Zone	Demand	0.00	Fixed	0.00	668.93	44.53
X-1	573.00	Zone	Demand	0.00	Fixed	0.00	675.37	44.29
X-7	560.00	Zone	Demand	0.00	Fixed	0.00	660.42	43.45
J-24	567.00	Zone	Demand	0.00	Fixed	0.00	667.42	43.44
X-5	574.50	Zone	Demand	0.00	Fixed	0.00	669.18	40.96
J-27	572.00	Zone	Demand	1,500.00	Fixed	1,500.00	662.93	39.34

Scenario: Fire Flow
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Check Valve?	Minor Loss Coefficient	Control Status	Discharge (gpm)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	Velocity (ft/s)
P-3	401.00	24.0	Ductile Iro	100.0	false	0.00	Open	1,206.28	675.45	675.37	0.08	0.20	0.86
P-4	1.00	24.0	Ductile Iro	100.0	false	0.00	Open	-3,423.64	675.45	675.45	0.00	1.40	2.43
P-5	1.00	24.0	Ductile Iro	100.0	false	0.00	Open	-3,423.64	566.00	566.00	0.00	1.40	2.43
P-6	421.00	24.0	Ductile Iro	100.0	false	0.00	Open	-0.00	675.01	675.01	0.00	0.00	0.00
P-7	711.00	24.0	Ductile Iro	100.0	false	0.00	Open	-2,217.36	675.01	675.45	0.44	0.62	1.57
P-11	1,062.00	12.0	Ductile Iro	100.0	false	0.00	Open	1,206.28	675.37	669.18	6.19	5.83	3.42
P-13	294.00	12.0	Ductile Iro	100.0	false	0.00	Open	423.64	669.18	668.93	0.25	0.84	1.20
P-16	515.00	12.0	Ductile Iro	100.0	false	0.00	Open	-332.75	668.33	668.61	0.28	0.54	0.94
P-17	315.00	12.0	Ductile Iro	100.0	false	0.00	Open	2,217.36	675.01	669.34	5.67	18.01	6.29
P-24	356.00	12.0	Ductile Iro	100.0	false	0.00	Open	767.78	668.61	667.71	0.90	2.53	2.18
P-25	149.00	12.0	Ductile Iro	100.0	false	0.00	Open	1,100.53	669.34	668.61	0.73	4.92	3.12
P-27	319.00	12.0	Ductile Iro	100.0	false	0.00	Open	782.64	669.18	668.34	0.83	2.62	2.22
P-28	694.00	12.0	Ductile Iro	100.0	false	0.00	Open	50.42	668.34	668.33	0.01	0.02	0.14
P-29	400.00	12.0	Ductile Iro	100.0	false	0.00	Open	732.22	668.34	667.42	0.93	2.31	2.08
P-30	272.00	12.0	Ductile Iro	100.0	false	0.00	Open	767.78	667.71	667.02	0.69	2.53	2.18
P-31	171.00	12.0	Ductile Iro	100.0	false	0.00	Open	-732.22	667.02	667.42	0.40	2.31	2.08
P-32	468.00	12.0	Ductile Iro	100.0	false	0.00	Open	1,500.00	667.02	662.93	4.09	8.73	4.26
P-33	186.00	12.0	Ductile Iro	100.0	false	0.00	Open	1,116.83	669.34	668.40	0.94	5.06	3.17
P-34	152.00	12.0	Ductile Iro	100.0	false	0.00	Open	1,116.83	668.40	667.63	0.77	5.06	3.17
P-35	450.00	12.0	Ductile Iro	100.0	false	0.00	Open	-383.17	667.63	667.94	0.31	0.70	1.09
P-36	209.00	12.0	Ductile Iro	100.0	false	0.00	Open	-383.17	667.94	668.09	0.15	0.70	1.09
P-37	240.00	12.0	Ductile Iro	100.0	false	0.00	Open	-383.17	668.09	668.26	0.17	0.70	1.09
P-38	104.00	12.0	Ductile Iro	100.0	false	0.00	Open	-383.17	668.26	668.33	0.07	0.70	1.09
P-39	1.00	24.0	Ductile Iro	100.0	false	0.00	Open	-2,576.36	668.93	668.93	0.00	0.85	1.83
P-40	1.00	24.0	Ductile Iro	100.0	false	0.00	Open	-2,576.36	566.00	566.00	0.00	0.79	1.83
P-43	147.00	12.0	Ductile Iro	100.0	false	0.00	Open	3,000.00	660.42	655.79	4.63	31.52	8.51
P-44	174.00	12.0	Ductile Iro	100.0	false	0.00	Open	3,000.00	655.79	650.30	5.48	31.52	8.51
P-45	141.00	12.0	Ductile Iro	100.0	false	0.00	Open	1,668.98	650.30	648.80	1.50	10.64	4.73
P-46	232.00	12.0	Ductile Iro	100.0	false	0.00	Open	1,668.98	648.80	646.33	2.47	10.64	4.73
P-47	128.00	12.0	Ductile Iro	100.0	false	0.00	Open	1,500.00	646.33	645.22	1.12	8.73	4.26
P-48	652.00	12.0	Ductile Iro	100.0	false	0.00	Open	1,500.00	645.22	639.52	5.69	8.73	4.26
P-49	122.00	12.0	Ductile Iro	100.0	false	0.00	Open	1,500.00	639.52	638.46	1.07	8.73	4.26
P-50	122.00	12.0	Ductile Iro	100.0	false	0.00	Open	1,500.00	638.46	637.39	1.07	8.73	4.26
P-53	460.00	12.0	Ductile Iro	100.0	false	0.00	Open	819.37	636.42	635.11	1.31	2.85	2.32
P-54	539.00	12.0	Ductile Iro	100.0	false	0.00	Open	-680.63	635.11	636.20	1.09	2.02	1.93
P-56	579.00	12.0	Ductile Iro	100.0	false	0.00	Open	1,331.02	650.30	646.25	4.05	7.00	3.78
P-57	240.00	12.0	Ductile Iro	100.0	false	0.00	Open	-168.98	646.25	646.29	0.04	0.15	0.48
P-58	302.00	12.0	Ductile Iro	100.0	false	0.00	Open	-168.98	646.29	646.33	0.05	0.15	0.48
P-59	270.00	12.0	Ductile Iro	100.0	false	0.00	Open	3,000.00	668.93	660.42	8.51	31.52	8.51
P-60	340.00	12.0	Ductile Iro	100.0	false	0.00	Open	-819.37	636.42	637.39	0.97	2.85	2.32
P-61	205.00	12.0	Ductile Iro	100.0	false	0.00	Open	680.63	637.39	636.98	0.41	2.02	1.93
P-62	384.00	12.0	Ductile Iro	100.0	false	0.00	Open	680.63	636.98	636.20	0.78	2.02	1.93

OPTION # 2

Scenario: Base



Scenario: Domestic 650 Split
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-31	528.00	Zone	Demand	0.00	Fixed	0.00	745.15	93.95
J-30	528.00	Zone	Demand	0.00	Fixed	0.00	745.15	93.95
J-32	530.00	Zone	Demand	0.00	Fixed	0.00	745.15	93.09
J-20	531.00	Zone	Demand	0.00	Fixed	0.00	745.15	92.65
J-29	534.00	Zone	Demand	134.00	Fixed	134.00	745.15	91.35
J-28	537.00	Zone	Demand	0.00	Fixed	0.00	745.16	90.06
J-22	541.00	Zone	Demand	0.00	Fixed	0.00	745.17	88.33
J-21	544.00	Zone	Demand	0.00	Fixed	0.00	745.15	87.03
J-25	545.00	Zone	Demand	0.00	Fixed	0.00	745.15	86.60
X-4	549.00	Zone	Demand	0.00	Fixed	0.00	745.24	84.91
X-3	551.00	Zone	Demand	0.00	Fixed	0.00	745.24	84.04
J-23	556.00	Zone	Demand	0.00	Fixed	0.00	745.14	81.83
J-26	559.00	Zone	Demand	0.00	Fixed	0.00	745.12	80.53
X-2	566.00	Zone	Demand	0.00	Fixed	0.00	745.25	77.55
X-6	566.00	Zone	Demand	0.00	Fixed	0.00	745.18	77.52
J-24	567.00	Zone	Demand	0.00	Fixed	0.00	745.13	77.07
J-27	572.00	Zone	Demand	196.00	Fixed	196.00	745.03	74.86
X-1	573.00	Zone	Demand	0.00	Fixed	0.00	745.25	74.52
X-5	574.50	Zone	Demand	0.00	Fixed	0.00	745.18	73.84
X-8	516.00	Zone	Demand	0.00	Fixed	0.00	683.75	72.58
J-44	515.00	Zone	Demand	159.00	Fixed	159.00	676.46	69.86
J-45	522.00	Zone	Demand	0.00	Fixed	0.00	676.65	66.91
J-46	523.00	Zone	Demand	159.00	Fixed	159.00	677.35	66.78
J-43	525.00	Zone	Demand	0.00	Fixed	0.00	676.58	65.58
J-47	527.00	Zone	Demand	0.00	Fixed	0.00	677.36	65.05
J-42	527.00	Zone	Demand	0.00	Fixed	0.00	676.67	64.76
J-39	528.00	Zone	Demand	0.00	Fixed	0.00	676.79	64.37
J-40	528.00	Zone	Demand	0.00	Fixed	0.00	676.75	64.36
J-41	528.00	Zone	Demand	0.00	Fixed	0.00	676.70	64.34
J-38	532.00	Zone	Demand	0.00	Fixed	0.00	677.24	62.84
J-37	534.00	Zone	Demand	0.00	Fixed	0.00	677.36	62.03
J-36	538.00	Zone	Demand	0.00	Fixed	0.00	677.64	60.42
J-35	540.00	Zone	Demand	0.00	Fixed	0.00	677.81	59.62
J-34	545.00	Zone	Demand	0.00	Fixed	0.00	678.43	57.73
X-7	560.00	Zone	Demand	0.00	Fixed	0.00	678.95	51.47

Scenario: Domestic 650 Split
Steady State Analysis
Pipe Report

bel	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Check Valve?	Minor Loss Coefficient	Control Status	Discharge (gpm)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	Velocity (ft/s)
P-3	401.00	24.0	Ductile Iro	100.0	false	0.00	Open	110.41	745.25	745.25	0.00	0.00	0.08
P-4	1.00	24.0	Ductile Iro	100.0	false	0.00	Open	-330.00	745.25	745.25	0.00	0.06	0.23
P-5	1.00	24.0	Ductile Iro	100.0	false	0.00	Open	-330.00	566.00	566.00	0.00	0.00	0.23
P-6	421.00	24.0	Ductile Iro	100.0	false	0.00	Open	0.00	745.24	745.24	0.00	0.00	0.00
P-7	711.00	24.0	Ductile Iro	100.0	false	0.00	Open	-219.60	745.24	745.25	0.01	0.01	0.16
P-11	1,062.00	12.0	Ductile Iro	100.0	false	0.00	Open	110.41	745.25	745.18	0.07	0.07	0.31
P-13	294.00	12.0	Ductile Iro	100.0	false	0.00	Open	0.00	745.18	745.18	0.00	0.00	0.00
P-16	515.00	12.0	Ductile Iro	100.0	false	0.00	Open	-21.21	745.15	745.15	0.00	0.00	0.06
P-17	315.00	12.0	Ductile Iro	100.0	false	0.00	Open	219.60	745.24	745.17	0.08	0.25	0.62
P-24	356.00	12.0	Ductile Iro	100.0	false	0.00	Open	96.31	745.15	745.14	0.02	0.05	0.27
P-25	149.00	12.0	Ductile Iro	100.0	false	0.00	Open	117.52	745.17	745.15	0.01	0.08	0.33
P-27	319.00	12.0	Ductile Iro	100.0	false	0.00	Open	110.40	745.18	745.15	0.02	0.07	0.31
P-28	694.00	12.0	Ductile Iro	100.0	false	0.00	Open	10.72	745.15	745.15	0.00	0.00	0.03
P-29	400.00	12.0	Ductile Iro	100.0	false	0.00	Open	99.69	745.15	745.13	0.02	0.06	0.28
P-30	272.00	12.0	Ductile Iro	100.0	false	0.00	Open	96.31	745.14	745.12	0.01	0.05	0.27
P-31	171.00	12.0	Ductile Iro	100.0	false	0.00	Open	-99.69	745.12	745.13	0.01	0.06	0.28
P-32	468.00	12.0	Ductile Iro	100.0	false	0.00	Open	196.00	745.12	745.03	0.09	0.20	0.56
P-33	186.00	12.0	Ductile Iro	100.0	false	0.00	Open	102.08	745.17	745.16	0.01	0.06	0.29
P-34	152.00	12.0	Ductile Iro	100.0	false	0.00	Open	102.08	745.16	745.15	0.01	0.06	0.29
P-35	450.00	12.0	Ductile Iro	100.0	false	0.00	Open	-31.92	745.15	745.15	0.00	0.01	0.09
P-36	209.00	12.0	Ductile Iro	100.0	false	0.00	Open	-31.92	745.15	745.15	0.00	0.01	0.09
P-37	240.00	12.0	Ductile Iro	100.0	false	0.00	Open	-31.92	745.15	745.15	0.00	0.01	0.09
P-38	104.00	12.0	Ductile Iro	100.0	false	0.00	Open	-31.92	745.15	745.15	0.00	0.01	0.09
39	1.00	24.0	Ductile Iro	100.0	false	0.00	Open	0.00	745.18	745.18	0.00	0.00	0.00
40	1.00	24.0	Ductile Iro	100.0	false	0.00	Open	0.00	566.00	566.00	0.00	0.00	0.00
P-42	1,348.00	8.0	Ductile Iro	100.0	false	0.00	Open	-318.00	678.95	683.75	4.80	3.56	2.03
P-43	147.00	8.0	Ductile Iro	100.0	false	0.00	Open	318.00	678.95	678.43	0.52	3.56	2.03
P-44	174.00	8.0	Ductile Iro	100.0	false	0.00	Open	318.00	678.43	677.81	0.62	3.56	2.03
P-45	141.00	8.0	Ductile Iro	100.0	false	0.00	Open	176.91	677.81	677.64	0.17	1.20	1.13
P-46	232.00	8.0	Ductile Iro	100.0	false	0.00	Open	176.91	677.64	677.36	0.28	1.20	1.13
P-47	128.00	8.0	Ductile Iro	100.0	false	0.00	Open	159.00	677.36	677.24	0.13	0.99	1.01
P-48	457.00	8.0	Ductile Iro	100.0	false	0.00	Open	159.00	677.24	676.79	0.45	0.99	1.01
P-49	131.00	8.0	Ductile Iro	100.0	false	0.00	Open	78.82	676.79	676.75	0.04	0.27	0.50
P-50	189.00	8.0	Ductile Iro	100.0	false	0.00	Open	78.82	676.75	676.70	0.05	0.27	0.50
P-51	106.00	8.0	Ductile Iro	100.0	false	0.00	Open	78.82	676.70	676.67	0.03	0.27	0.50
P-52	343.00	8.0	Ductile Iro	100.0	false	0.00	Open	78.82	676.67	676.58	0.09	0.27	0.50
P-53	442.00	8.0	Ductile Iro	100.0	false	0.00	Open	78.82	676.58	676.46	0.12	0.27	0.50
P-54	667.00	8.0	Ductile Iro	100.0	false	0.00	Open	-80.18	676.46	676.65	0.18	0.28	0.51
P-56	579.00	8.0	Ductile Iro	100.0	false	0.00	Open	141.09	677.81	677.35	0.46	0.79	0.90
P-57	240.00	8.0	Ductile Iro	100.0	false	0.00	Open	-17.91	677.35	677.36	0.00	0.02	0.11
P-58	302.00	8.0	Ductile Iro	100.0	false	0.00	Open	-17.91	677.36	677.36	0.01	0.02	0.11
P-59	1.00	24.0	Ductile Iro	130.0	false	0.00	Open	318.00	516.00	516.00	0.00	0.00	0.23
P-60	1.00	24.0	Ductile Iro	130.0	false	0.00	Open	318.00	683.75	683.75	0.00	0.00	0.23
P-61	506.00	8.0	Ductile Iro	100.0	false	0.00	Open	80.18	676.79	676.65	0.14	0.28	0.51

Scenario: Fire Flow
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-31	528.00	Zone	Demand	0.00	Fixed	0.00	703.64	75.99
J-30	528.00	Zone	Demand	0.00	Fixed	0.00	703.42	75.90
J-32	530.00	Zone	Demand	0.00	Fixed	0.00	703.90	75.24
J-20	531.00	Zone	Demand	0.00	Fixed	0.00	704.00	74.85
J-29	534.00	Zone	Demand	1,500.00	Fixed	1,500.00	702.95	73.10
J-28	537.00	Zone	Demand	0.00	Fixed	0.00	703.60	72.08
J-22	541.00	Zone	Demand	0.00	Fixed	0.00	704.40	70.69
J-21	544.00	Zone	Demand	0.00	Fixed	0.00	704.03	69.24
J-25	545.00	Zone	Demand	0.00	Fixed	0.00	704.50	69.01
X-4	549.00	Zone	Demand	0.00	Fixed	0.00	708.17	68.86
X-3	551.00	Zone	Demand	0.00	Fixed	0.00	708.17	68.00
J-23	556.00	Zone	Demand	0.00	Fixed	0.00	703.34	63.75
J-26	559.00	Zone	Demand	0.00	Fixed	0.00	702.81	62.22
X-2	566.00	Zone	Demand	0.00	Fixed	0.00	708.46	61.63
X-6	566.00	Zone	Demand	0.00	Fixed	0.00	706.82	60.93
J-24	567.00	Zone	Demand	0.00	Fixed	0.00	703.32	58.98
X-1	573.00	Zone	Demand	0.00	Fixed	0.00	708.43	58.59
X-5	574.50	Zone	Demand	0.00	Fixed	0.00	706.40	57.07
J-27	572.00	Zone	Demand	1,500.00	Fixed	1,500.00	698.73	54.83
X-8	516.00	Zone	Demand	0.00	Fixed	0.00	338.17	-76.94
X-7	560.00	Zone	Demand	0.00	Fixed	0.00	31.99	-228.45
J-34	545.00	Zone	Demand	0.00	Fixed	0.00	-1.40	-236.40
J-35	540.00	Zone	Demand	0.00	Fixed	0.00	-40.93	-251.34
J-36	538.00	Zone	Demand	0.00	Fixed	0.00	-51.74	-255.15
J-46	523.00	Zone	Demand	1,500.00	Fixed	1,500.00	-70.12	-256.62
J-47	527.00	Zone	Demand	0.00	Fixed	0.00	-69.86	-258.23
J-37	534.00	Zone	Demand	0.00	Fixed	0.00	-69.52	-261.12
J-38	532.00	Zone	Demand	0.00	Fixed	0.00	-77.58	-263.74
J-39	528.00	Zone	Demand	0.00	Fixed	0.00	-106.33	-274.45
J-40	528.00	Zone	Demand	0.00	Fixed	0.00	-108.58	-275.42
J-45	522.00	Zone	Demand	0.00	Fixed	0.00	-115.29	-275.73
J-41	528.00	Zone	Demand	0.00	Fixed	0.00	-111.82	-276.82
J-42	527.00	Zone	Demand	0.00	Fixed	0.00	-113.64	-277.17
J-44	515.00	Zone	Demand	1,500.00	Fixed	1,500.00	-127.10	-277.81
J-43	525.00	Zone	Demand	0.00	Fixed	0.00	-119.52	-278.85

Scenario: Fire Flow
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Check Valve?	Minor Loss Coefficient	Control Status	Discharge (gpm)	Upstream Structure Hydraulic Grade (ft)	Downstream Structure Hydraulic Grade (ft)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	Velocity (ft/s)
P-3	401.00	24.0	Ductile Iro	100.0	false	0.00	Open	660.04	708.46	708.43	0.03	0.07	0.47
P-4	1.00	24.0	Ductile Iro	100.0	false	0.00	Open	-2,438.20	708.46	708.46	0.00	0.73	1.73
P-5	1.00	24.0	Ductile Iro	100.0	false	0.00	Open	-2,438.20	566.00	566.00	0.00	0.73	1.73
P-6	421.00	24.0	Ductile Iro	100.0	false	0.00	Open	-0.00	708.17	708.17	0.00	0.00	0.00
P-7	711.00	24.0	Ductile Iro	100.0	false	0.00	Open	-1,778.16	708.17	708.46	0.29	0.41	1.26
P-11	1,062.00	12.0	Ductile Iro	100.0	false	0.00	Open	660.04	708.43	706.40	2.03	1.91	1.87
P-13	294.00	12.0	Ductile Iro	100.0	false	0.00	Open	-561.80	706.40	706.82	0.42	1.42	1.59
P-16	515.00	12.0	Ductile Iro	100.0	false	0.00	Open	-91.65	704.00	704.03	0.03	0.05	0.26
P-17	315.00	12.0	Ductile Iro	100.0	false	0.00	Open	1,778.16	708.17	704.40	3.77	11.96	5.04
P-24	356.00	12.0	Ductile Iro	100.0	false	0.00	Open	665.22	704.03	703.34	0.69	1.94	1.89
P-25	149.00	12.0	Ductile Iro	100.0	false	0.00	Open	756.88	704.40	704.03	0.37	2.46	2.15
P-27	319.00	12.0	Ductile Iro	100.0	false	0.00	Open	1,221.84	706.40	704.50	1.90	5.97	3.47
P-28	694.00	12.0	Ductile Iro	100.0	false	0.00	Open	387.06	704.50	704.00	0.49	0.71	1.10
P-29	400.00	12.0	Ductile Iro	100.0	false	0.00	Open	834.78	704.50	703.32	1.18	2.95	2.37
P-30	272.00	12.0	Ductile Iro	100.0	false	0.00	Open	665.22	703.34	702.81	0.53	1.94	1.89
P-31	171.00	12.0	Ductile Iro	100.0	false	0.00	Open	-834.78	702.81	703.32	0.50	2.95	2.37
P-32	468.00	12.0	Ductile Iro	100.0	false	0.00	Open	1,500.00	702.81	698.73	4.09	8.73	4.26
P-33	186.00	12.0	Ductile Iro	100.0	false	0.00	Open	1,021.28	704.40	703.60	0.80	4.28	2.90
P-34	152.00	12.0	Ductile Iro	100.0	false	0.00	Open	1,021.28	703.60	702.95	0.65	4.28	2.90
P-35	450.00	12.0	Ductile Iro	100.0	false	0.00	Open	-478.72	702.95	703.42	0.47	1.05	1.36
P-36	209.00	12.0	Ductile Iro	100.0	false	0.00	Open	-478.72	703.42	703.64	0.22	1.05	1.36
P-37	240.00	12.0	Ductile Iro	100.0	false	0.00	Open	-478.72	703.64	703.90	0.25	1.05	1.36
P-38	104.00	12.0	Ductile Iro	100.0	false	0.00	Open	-478.72	703.90	704.00	0.11	1.05	1.36
P-39	1.00	24.0	Ductile Iro	100.0	false	0.00	Open	-561.80	706.82	706.82	0.00	0.06	0.40
P-40	1.00	24.0	Ductile Iro	100.0	false	0.00	Open	-561.80	566.00	566.00	0.00	0.06	0.40
P-42	1,348.00	8.0	Ductile Iro	100.0	false	0.00	Open	-3,000.00	31.99	338.17	306.19	227.14	19.15
P-43	147.00	8.0	Ductile Iro	100.0	false	0.00	Open	3,000.00	31.99	-1.40	33.39	227.14	19.15
P-44	174.00	8.0	Ductile Iro	100.0	false	0.00	Open	3,000.00	-1.40	-40.93	39.52	227.14	19.15
P-45	141.00	8.0	Ductile Iro	100.0	false	0.00	Open	1,668.98	-40.93	-51.74	10.81	76.67	10.65
P-46	232.00	8.0	Ductile Iro	100.0	false	0.00	Open	1,668.98	-51.74	-69.52	17.79	76.67	10.65
P-47	128.00	8.0	Ductile Iro	100.0	false	0.00	Open	1,500.00	-69.52	-77.58	8.05	62.92	9.57
P-48	457.00	8.0	Ductile Iro	100.0	false	0.00	Open	1,500.00	-77.58	-106.33	28.75	62.92	9.57
P-49	131.00	8.0	Ductile Iro	100.0	false	0.00	Open	743.54	-106.33	-108.58	2.25	17.15	4.75
P-50	189.00	8.0	Ductile Iro	100.0	false	0.00	Open	743.54	-108.58	-111.82	3.24	17.15	4.75
P-51	106.00	8.0	Ductile Iro	100.0	false	0.00	Open	743.54	-111.82	-113.64	1.82	17.15	4.75
P-52	343.00	8.0	Ductile Iro	100.0	false	0.00	Open	743.54	-113.64	-119.52	5.88	17.15	4.75
P-53	442.00	8.0	Ductile Iro	100.0	false	0.00	Open	743.54	-119.52	-127.10	7.58	17.15	4.75
P-54	667.00	8.0	Ductile Iro	100.0	false	0.00	Open	-756.46	-127.10	-115.29	11.81	17.71	4.83
P-56	579.00	8.0	Ductile Iro	100.0	false	0.00	Open	1,331.02	-40.93	-70.12	29.20	50.43	8.50
P-57	240.00	8.0	Ductile Iro	100.0	false	0.00	Open	-168.98	-70.12	-69.86	0.26	1.10	1.08
P-58	302.00	8.0	Ductile Iro	100.0	false	0.00	Open	-168.98	-69.86	-69.52	0.33	1.10	1.08
P-59	1.00	24.0	Ductile Iro	130.0	false	0.00	Open	3,000.00	516.00	516.00	0.00	0.67	2.13
P-60	1.00	24.0	Ductile Iro	130.0	false	0.00	Open	3,000.00	338.17	338.17	0.00	0.67	2.13
P-61	506.00	8.0	Ductile Iro	100.0	false	0.00	Open	756.46	-106.33	-115.29	8.96	17.71	4.83

DEMANDS

Citygate Water Demands
Using CP-27
Dated 7/28/08

	DEMAND GPD	W/WATER SAVING	WPEAKING FACTOR	GPM (24HR DAY)
M BUILDINGS	91,466	73172.88	292691.52	203
APPARTMENTS	63,000	50400	201600	140
TOWNHOMES	32,000	25600	102400	71
LOFT	48,000	38400	153600	107
HOTEL	36,000	28800	115200	80
COMMERCIAL	5,000	4000	16000	11
LIVE/WORK	16,000	12800	51200	36
				648

	Water CAD NOTE	DOMESTIC DEMAND	FIRE DEMAND
AREA 1	J-27	196 GPM	1500 GPM
AREA 2	J-29	134 GPM	1500 GPM
AREA 3	J-46	159 GPM	1500 GPM
AREA 4	J-44	159 GPM	1500 GPM

Citygate W r Demands
Using CP-29
Dated 7/28/08

	DEMAND GPD	W/WATER SAVING	WPEAKING FACTOR	GPM (24HR DAY)
M BUILDINGS	91,466	73172.88	292691.52	203
APARTMENTS	7,000	5600	22400	16
OFFICES	18,400	14720	58880	41
TOWNHOMES	32,000	25600	102400	71
LOFT	24,000	19200	76800	53
HOTEL	36,000	28800	115200	80
COMMERCIAL	5,000	4000	16000	11
LIVE/WORK	0	0	0	0

475

	Water CAD NOTE	DOMESTIC DEMAND	FIRE DEMAND
AREA 1	J-27	196 GPM	1500 GPM
AREA 2	J-29	134 GPM	1500 GPM
AREA 3	J-45	55 GPM	1500 GPM
AREA 4	J-44	90 GPM	1500 GPM

STORMWATER MANAGEMENT REPORT

For

Citygate

Westfall Road
City of Rochester, Monroe County, NY

July 28th, 2008

Prepared For

ANTHONY J. COSTELLO & SON DEVELOPMENT

Prepared by:

Bergmann associates
585.232.5135 fax: 585.232.4652

Table of Contents

Section I General Information

A. PROJECT DESCRIPTION

This Stormwater Management Report is for the proposed Citygate development. The project site is located at the southeast corner of East Henrietta and Westfall Road, in the City of Rochester, and the Town of Brighton, NY.

This proposed design will mitigate the increase in peak flow created by the proposed development. This is done by reducing the undetained drainage area and through peak flow attenuation. This approach will alleviate impacts to existing downstream structures and properties from the proposed site improvements. The proposed stormwater management facility meets the SPDES Phase II requirements.

B. SOIL CLASSIFICATION

According to the Monroe Soil Survey, Natural Resources Conservation Service website (NRCS), there are seven (7) mapped soil units identified on the project property (see Appendix D). Hilton loam is the dominant soil type and is located on approximately 35 percent of the project area. This soil type slopes at approximately 3 to 8 percent. These Soils have a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

The complete list of soils found on the project site is identified in the table below (see Appendix D for soils map).

Table I- Monroe County Soils Summary

Unit	Name	Hydrologic Group
GaA	Galen very fine sandy loam, 0 to 2 percent slopes	B
HIB	Hilton loam, 3 to 8 percent slopes	B
Mb	Made land	D
Ng	Niagara silt loam	C
OnB	Ontario loam, 3 to 8 percent slopes	B
OnC	Ontario loam, 8 to 15 percent slopes	B
SeB	Schoharie silt loam, 2 to 6 percent slopes	C

Section II Hydrology

A. METHODOLOGY

Stormwater runoff rates discharged from the site under the existing conditions provide the basis on which to compare the impacts of the proposed site improvements. Analysis points are established where runoff exits the site to provide a fixed location at which existing and proposed stormwater quantities can be compared. The areas draining to each analysis point are delineated using topographic survey maps, grading plans and utility plans. HydroCAD 8.0 by HydroCAD Software Solutions LLC was used to model the existing and proposed condition. This program simulates the USDA Soil Conservations Service's TR-20 hydrologic model to analyze discharges from drainage areas and retention basins.

The parameters required to calculate stormwater runoff are area, curve number, and time of concentration. Each drainage area is evaluated using the guidelines described in USDA Soil Conservation Service's TR-55 to determine the curve number and time of concentration.

The runoff curve number (CN) is based on a weighted average of ground cover and soil type. The underlying soil types are described in county soil maps. Site and grading plans and survey maps outline existing and proposed ground cover. CN values for specific locations are determined from the tables presented in TR-55.

Time of concentration (Tc) represents the amount of time it takes for runoff to travel from the hydraulically most distant point of the watershed to the point of analysis. Surface roughness, slope, channel shape and flow patterns are the factors that affect the time of concentration. Stormwater runoff flows through the drainage area as sheet flow, shallow concentrated flow, open channel flow, or concentrated flow (such as in storm sewers). For this report sheet flow will become shallow concentrated flow after a maximum of 150 feet for the existing condition and 100 feet for the proposed condition. The sum of the travel times over the various surfaces within the assumed flow path for a specific drainage area determines that area's time of concentration. The figures and formulas in TR-55 are employed to compute travel times for sheet flow and shallow concentrated flow. Manning's equation is used to determine flow velocities through pipes.

The stage-storage-discharge relationship for the proposed detention area is determined from topographical data and outlet structure characteristics. Discharge rates and storage volumes at various elevations (stage) are represented by this relationship. The pond storage capacity is calculated by determining the surface area at various elevations.

B. EXISTING CONDITIONS

The existing drainage area comprises a total of ±65 acres. This includes a small portion of off site drainage along the south property line of the canal bank. The parcel to be developed consists of woods, underbrush, grass areas and multiple vacant and occupied building and their associated parking and utilities.

As described in Table II and Appendix A. The site consists or 4 drainage areas which ultimately drain to two locations. The largest area is located on the west side of the site is assumed to drain into three storm sewer networks, which discharge to a swale located at the south west corner of the site. This swale is then piped under the Canal way Trail and into the canal. This area consists of mostly existing development made up of building, asphalt, gravel, and some grassed areas.

The remaining three drainage areas drain towards the east property line. All three areas ultimately drain to the NYDOT pond located at the 390 interchange. Area DA-2 drains through the storm system located on the offsite development east of the property, Area DA-3 via overland flow and a swale, and Area DA-4 drains via wetlands. Since these areas all have the same destination the discharges will be combined for

analysis purposes. These three areas consist of mostly grass and woodlands; as well as a large gravel/asphalt stockpile area and some existing building and parking lots.

Existing Drainage Area DA-1, consisting of 29.38 acres, includes the western portion of the property, consists of mostly existing development made up of building, asphalt, gravel, and some grassed areas. This area drains south to the canal

Existing Drainage Area DA-2, consisting of 20.74 acres, includes the north eastern corner of the site, this area consists of mainly woodlands and grass area with some building and pavement area. This area drains east to the east property line via overland flow and a small storm sewer system. Runoff ultimately drains to the NYSDOT pond.

Existing Drainage Area DA-3, consisting of 4.85 acres, includes the eastern center of the site; this area consists of mainly gravel/asphalt area with some grass area and some building and pavement area. This area drains east to the east property line via overland flow and a small storm sewer system. Runoff ultimately drains to the NYSDOT pond.

Existing Drainage Area DA-4, consisting of 9.53 acres, includes the south eastern corner of the site; this area consists of mainly gravel/asphalt area with some grass area. This area drains east to the east property line via overland flow. Runoff ultimately drains to the NYSDOT pond.

Table II summarizes the hydrologic characteristics of the drainage areas described above. See Appendix A for computations for the existing drainage conditions.

Table II
Existing Conditions Summary

Drainage Area	Description	Size (ac)	Composite Cn	Tc (min)
Area DA-1	The western portion of the property, consists of mostly existing development made up of building, asphalt, gravel, and some grassed areas.	29.38	89	20.6
Area DA-2	The north eastern corner of the site, this area consists of mainly woodlands and grass area with some building and pavement area.	20.74	84	14.4
Area DA-3	The eastern center of the site; this area consists of mainly gravel/asphalt area with some grass area and some building and pavement area.	4.85	97	4.7
Area DA-4	The south eastern corner of the site; this area consists of mainly gravel/asphalt area with some grass area.	9.53	88	10.6

C. PROPOSED CONDITIONS

The overall drainage area for the proposed condition consists of ±65 acres and drains to proposed pond P-1 located at the east side of the site, refer to Appendix B for the proposed conditions drainage map. Pond P-1 contains two outfall structures which divert the pond outfall to two separate water bodies. Half of the discharge is piped to the canal while the other half drains to the wetlands at the east of the site. This is done in order to maintain similar drainage patterns to the existing conditions.

Proposed Drainage Area DB-1, consisting of 64.5 acres, is comprised of the western half of the site. Buildings, parking lots, and some lawn area makes up this portion of the site. Stormwater from this area will drain via the closed storm sewer system to Detention Pond P-1 prior to being outlet to the canal and wetland. For analysis purposes, the primary discharge from this pond was compared to Existing Drainage Area DA-1 and the secondary discharge was compared to Existing Drainage Area DA-2, DA-3, and DA-4.

Table III Summarized the hydrologic characteristics of the drainage areas described above.

Table III
Proposed Conditions Summary

Drainage Area	Description	Size (ac)	Composite Cn	Tc (min)
Area DB-1	The whole site area. Buildings, parking lots, and some lawn area makes up this portion of the site.	64.5	82	8

Section III Stormwater Management & SPDES Phase II Requirements

The amount of stormwater runoff generated under proposed conditions is increased due to the newly added impervious surfaces. To manage the increased runoff, a detention/retention pond is proposed.

As required by the SPDES Phase II Requirements, and the NYS DEC, the on-site SMP (Stormwater Management Practice) must be designed to meet pollutant removal goals, reduce channel erosion, prevent overbank flooding, and help control extreme floods. To do this, the design will incorporate many of the pond features shown in the NYSDEC Stormwater Design Manual. This design incorporates the ability to keep the ponds aesthetically pleasing and functionally sound.

A. WATER QUALITY VOLUME

The Water Quality Volume requirement is designed to improve the quality of stormwater leaving the site. To meet the Water Quality volume, you must capture and treat 90% of the average annual stormwater runoff volume. The Water Quality Volume (WQv) portion of the design standards (see Appendix C) permit the Water Quality Volume to be provided by retention. For this reason a large Wet Pond has been designed to detain stormwater runoff. Pond P-1 at the east side of the site, provides 240,139 ft^3 where 129,731 ft^3 is required. This required volume uses a P value of 1.0 for the 90% rainfall event.

B. CHANNEL PROTECTION VOLUME

The Channel Protection Volume stated in the NYS Stormwater Design Manual is used to reduce flow out of a storage facility so as to protect the outlet channel or stream from erosion. The Channel Protection Volume is met by providing the 24 hour extended detention of the post developed 1 year, 24 hour storm event. As shown in Appendix C, for Pond P-1, a 4.00 inch orifice would be required to provide a detention time of 24 hrs. Therefore a 4 inch orifice is being used in pond P-1 to provide the required Channel Protection Volume.

C. OVERBANK FLOOD

Overbank Flood protection is provided by controlling the peak discharge from the 10-year storm to 10-year predevelopment rates. This requirement is being satisfied as the proposed development is reducing the peak discharge from the 10 yr storm below pre-development rates. Refer to Table IV for details.

D. EXTREME STORM

Extreme Storm protection is provided by controlling the peak discharge from the 100-year storm to 100-year predevelopment rates. This requirement is being satisfied as the proposed development is reducing the peak discharge from the 100 yr storm below pre-development rates. Refer to Table V for details

Section IV Summary of Findings

A. Summary of Results

Table IV and Table V depict the peak discharges from the 10 and 100 year design storms for the existing and proposed conditions. Refer to Appendix A and B for peak discharges for the 1, 2, and 25 year storms

Table IV-Existing and Proposed Peak Discharge for the 10-Year Storm (cfs)

Drainage Area	10 yr Design Storm Discharge	
	Existing	Proposed
Existing-Area DA-1 Proposed-Area DB-1 Primary	77.50	12.13
Existing-Area DA-2,DA-3,DA-4 Proposed-Area DB-1 Secondary	100.21	12.13

Table V-Existing and Proposed Peak Discharge for the 100-Year Storm (cfs)

Drainage Area	100 yr Design Storm Discharge	
	Existing	Proposed
Existing-Area DA-1 Proposed-Area DB-1 Primary	114.66	58.69
Existing-Area DA-2,DA-3,DA-4 Proposed-Area DB-1 Secondary	151.43	58.69

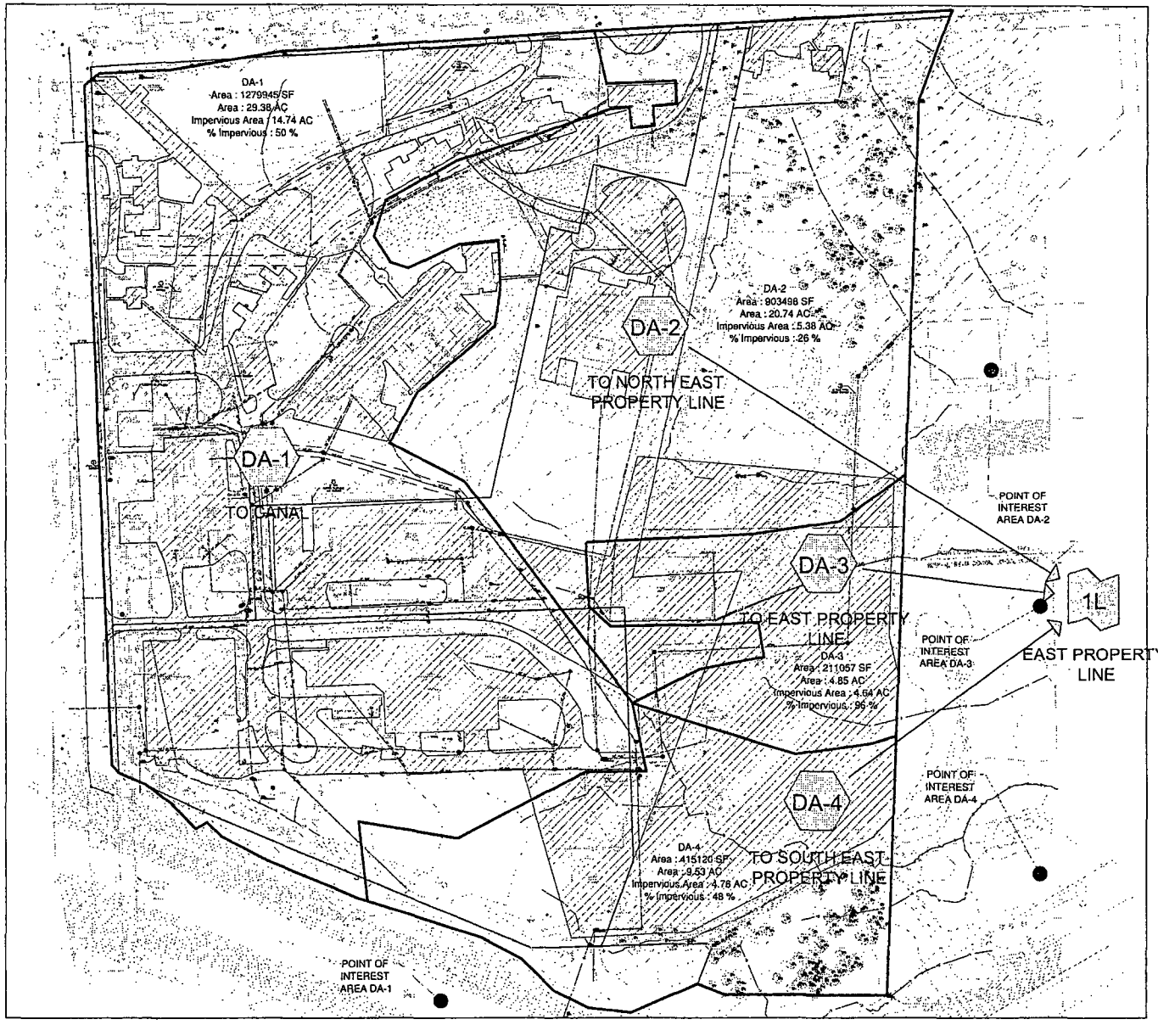
As depicted in the above tables, the peak discharge from the site for each of the design storms will be decreased after this project is constructed and the stormwater management plan is implemented.

B. Conclusion

Although existing conditions show multiple points of discharge along the east property line, all drainage collects and drains to the DOT pond near 390. Thus the three existing areas are compared to a portion of the one large post development area. Therefore, this project has provided sufficient mitigation to minimize any negative effect to downstream systems and properties.

Appendix A

Existing Drainage Conditions Map And Hydrograph Reports



E. Henrietta Road &
Westfall Road
City of Rochester
County of Monroe
State of New York

Anthony J. Costello & Sons Development

Bergmann associates

EXISTING CONDITIONS DRAINAGE MAP

DR-EX

Subcat Reach Pond Link

Drainage Diagram for EXISTING

Prepared by Bergmann Associates, Printed 7/1/2008

HydroCAD® 8.50 s/n 003498 © 2007 HydroCAD Software Solutions LLC

Summary for Subcatchment DA-1: TO CANAL

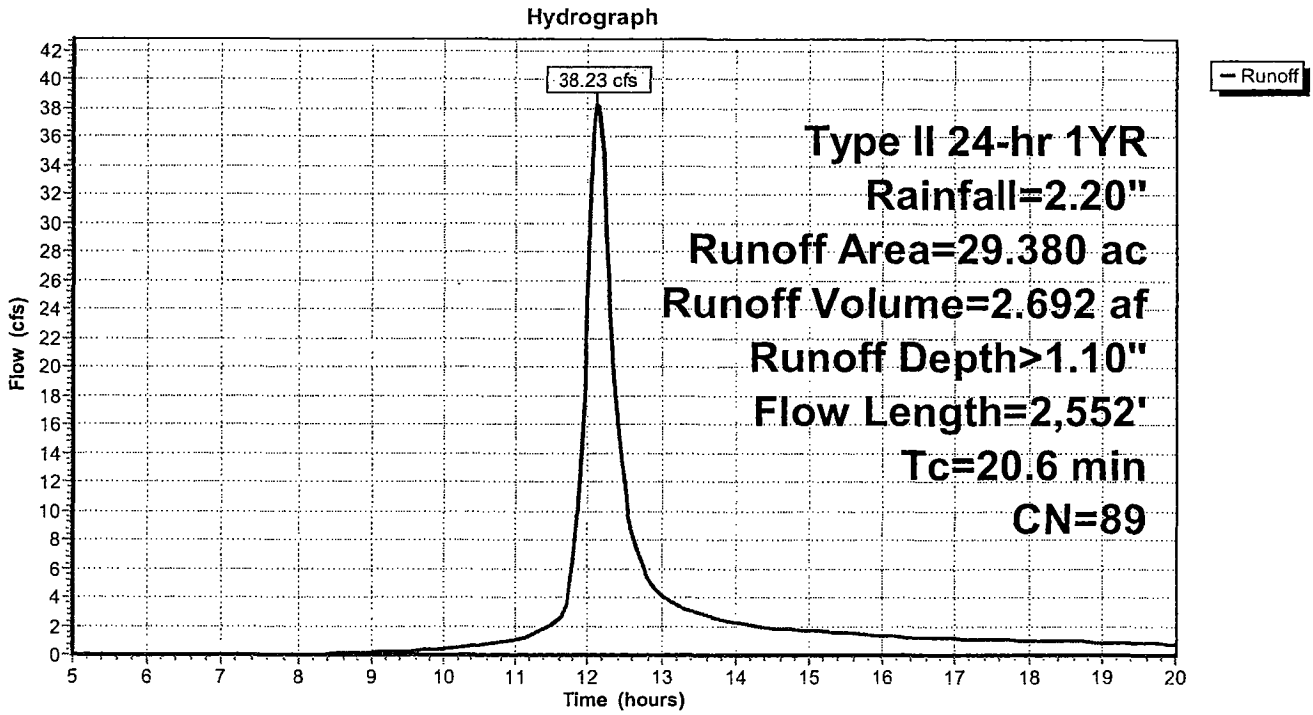
Runoff = 38.23 cfs @ 12.14 hrs, Volume= 2.692 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1YR Rainfall=2.20"

Area (ac)	CN	Description
14.640	79	50-75% Grass cover, Fair, HSG C
14.740	98	Water Surface, 0% imp
29.380	89	Weighted Average
29.380		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0110	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
2.7	567	0.0476	3.51		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.8	1,885	0.0196	8.32	14.71	**Circular Channel (pipe),** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
20.6	2,552	Total			

Subcatchment DA-1: TO CANAL



Hydrograph for Subcatchment DA-1: TO CANAL

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.14	0.00	0.00
5.25	0.15	0.00	0.00
5.50	0.16	0.00	0.00
5.75	0.17	0.00	0.00
6.00	0.18	0.00	0.00
6.25	0.19	0.00	0.00
6.50	0.20	0.00	0.00
6.75	0.21	0.00	0.00
7.00	0.22	0.00	0.00
7.25	0.23	0.00	0.00
7.50	0.24	0.00	0.00
7.75	0.25	0.00	0.00
8.00	0.26	0.00	0.01
8.25	0.28	0.00	0.03
8.50	0.29	0.00	0.06
8.75	0.31	0.00	0.11
9.00	0.32	0.00	0.16
9.25	0.34	0.01	0.22
9.50	0.36	0.01	0.27
9.75	0.38	0.01	0.32
10.00	0.40	0.02	0.40
10.25	0.42	0.02	0.51
10.50	0.45	0.03	0.66
10.75	0.48	0.04	0.84
11.00	0.52	0.05	1.11
11.25	0.56	0.06	1.47
11.50	0.62	0.09	2.11
11.75	0.85	0.20	4.71
12.00	1.46	0.60	**25.22**
12.25	1.55	0.67	**29.73**
12.50	1.62	0.72	11.26
12.75	1.66	0.75	5.95
13.00	1.70	0.78	4.14
13.25	1.73	0.81	3.36
13.50	1.76	0.83	2.90
13.75	1.78	0.85	2.55
14.00	1.80	0.87	2.27
14.25	1.82	0.88	2.03
14.50	1.84	0.90	1.89
14.75	1.86	0.91	1.79
15.00	1.88	0.93	1.70
15.25	1.89	0.94	1.62
15.50	1.91	0.95	1.53
15.75	1.92	0.96	1.44
16.00	1.94	0.98	1.35
16.25	1.95	0.99	1.26
16.50	1.96	1.00	1.21
16.75	1.97	1.01	1.18
17.00	1.98	1.01	1.15
17.25	1.99	1.02	1.11
17.50	2.01	1.03	1.08
17.75	2.02	1.04	1.05
18.00	2.03	1.05	1.02
18.25	2.04	1.06	0.98
18.50	2.05	1.07	0.95
18.75	2.05	1.07	0.92
19.00	2.06	1.08	0.89
19.25	2.07	1.09	0.85
19.50	2.08	1.09	0.82
19.75	2.09	1.10	0.79
20.00	**2.09**	**1.11**	0.75

Summary for Subcatchment DA-2: TO NORTH EAST PROPERTY LINE

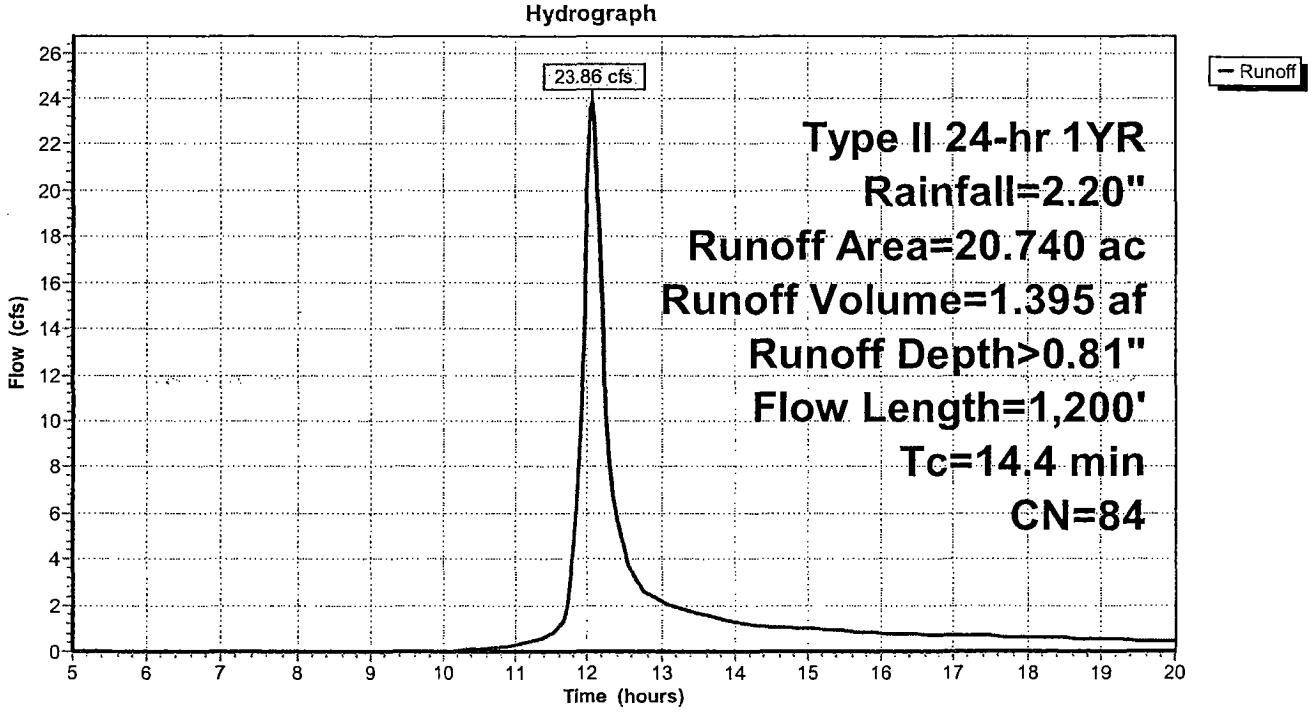
Runoff = 23.86 cfs @ 12.07 hrs, Volume= 1.395 af, Depth> 0.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1YR Rainfall=2.20"

Area (ac)	CN	Description
5.380	98	Paved parking & roofs
15.360	79	50-75% Grass cover, Fair, HSG C
20.740	84	Weighted Average
15.360		Pervious Area
5.380		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0700	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
7.7	1,100	0.0217	2.37		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.4	1,200	Total			

Subcatchment DA-2: TO NORTH EAST PROPERTY LINE



Hydrograph for Subcatchment DA-2: TO NORTH EAST PROPERTY LINE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.14	0.00	0.00
5.25	0.15	0.00	0.00
5.50	0.16	0.00	0.00
5.75	0.17	0.00	0.00
6.00	0.18	0.00	0.00
6.25	0.19	0.00	0.00
6.50	0.20	0.00	0.00
6.75	0.21	0.00	0.00
7.00	0.22	0.00	0.00
7.25	0.23	0.00	0.00
7.50	0.24	0.00	0.00
7.75	0.25	0.00	0.00
8.00	0.26	0.00	0.00
8.25	0.28	0.00	0.00
8.50	0.29	0.00	0.00
8.75	0.31	0.00	0.00
9.00	0.32	0.00	0.00
9.25	0.34	0.00	0.00
9.50	0.36	0.00	0.00
9.75	0.38	0.00	0.00
10.00	0.40	0.00	0.00
10.25	0.42	0.00	0.04
10.50	0.45	0.00	0.10
10.75	0.48	0.00	0.18
11.00	0.52	0.01	0.29
11.25	0.56	0.02	0.47
11.50	0.62	0.03	0.79
11.75	0.85	0.09	2.90
12.00	1.46	0.39	**19.64**
12.25	1.55	0.45	**10.57**
12.50	1.62	0.49	4.32
12.75	1.66	0.51	2.65
13.00	1.70	0.54	2.16
13.25	1.73	0.56	1.83
13.50	1.76	0.58	1.61
13.75	1.78	0.59	1.43
14.00	1.80	0.61	1.28
14.25	1.82	0.62	1.15
14.50	1.84	0.63	1.09
14.75	1.86	0.65	1.04
15.00	1.88	0.66	0.99
15.25	1.89	0.67	0.94
15.50	1.91	0.68	0.89
15.75	1.92	0.69	0.84
16.00	1.94	0.70	0.79
16.25	1.95	0.71	0.74
16.50	1.96	0.72	0.72
16.75	1.97	0.72	0.70
17.00	1.98	0.73	0.68
17.25	1.99	0.74	0.66
17.50	2.01	0.75	0.64
17.75	2.02	0.76	0.63
18.00	2.03	0.76	0.61
18.25	2.04	0.77	0.59
18.50	2.05	0.78	0.57
18.75	2.05	0.78	0.55
19.00	2.06	0.79	0.53
19.25	2.07	0.79	0.51
19.50	2.08	0.80	0.49
19.75	2.09	0.81	0.47
20.00	**2.09**	**0.81**	0.45

Summary for Subcatchment DA-3: TO EAST PROPERTY LINE

[49] Hint: Tc<2dt may require smaller dt

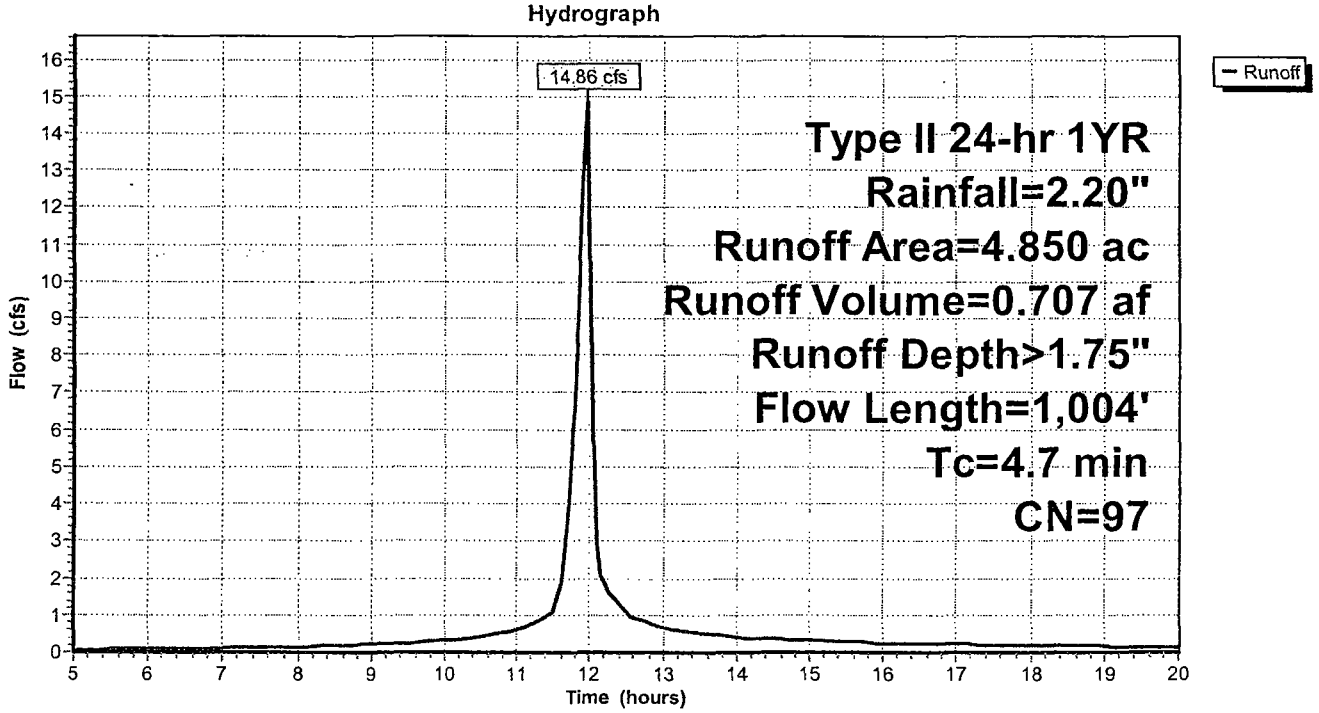
Runoff = 14.86 cfs @ 11.95 hrs, Volume= 0.707 af, Depth> 1.75"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1YR Rainfall=2.20"

Area (ac)	CN	Description
4.640	98	Paved roads w/curbs & sewers
0.210	79	50-75% Grass cover, Fair, HSG C
4.850	97	Weighted Average
0.210		Pervious Area
4.640		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	76	0.0158	1.05		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
1.5	648	0.0138	6.98	12.34	**Circular Channel (pipe),** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
2.0	280	0.0214	2.36		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.7	1,004	Total			

Subcatchment DA-3: TO EAST PROPERTY LINE



Hydrograph for Subcatchment DA-3: TO EAST PROPERTY LINE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.14	0.02	0.06
5.25	0.15	0.02	0.07
5.50	0.16	0.02	0.07
5.75	0.17	0.03	0.08
6.00	0.18	0.03	0.09
6.25	0.19	0.04	0.10
6.50	0.20	0.04	0.10
6.75	0.21	0.05	0.11
7.00	0.22	0.05	0.12
7.25	0.23	0.06	0.13
7.50	0.24	0.07	0.13
7.75	0.25	0.07	0.14
8.00	0.26	0.08	0.15
8.25	0.28	0.09	0.17
8.50	0.29	0.10	0.19
8.75	0.31	0.11	0.21
9.00	0.32	0.12	0.24
9.25	0.34	0.13	0.25
9.50	0.36	0.15	0.25
9.75	0.38	0.16	0.28
10.00	0.40	0.18	0.32
10.25	0.42	0.19	0.37
10.50	0.45	0.22	0.43
10.75	0.48	0.24	0.52
11.00	0.52	0.27	0.62
11.25	0.56	0.31	0.81
11.50	0.62	0.36	1.06
11.75	0.85	0.57	**5.26**
12.00	1.46	1.14	**11.98**
12.25	1.55	1.24	1.68
12.50	1.62	1.30	1.08
12.75	1.66	1.34	0.81
13.00	1.70	1.38	0.68
13.25	1.73	1.41	0.59
13.50	1.76	1.43	0.51
13.75	1.78	1.46	0.46
14.00	1.80	1.48	0.40
14.25	1.82	1.50	0.38
14.50	1.84	1.52	0.36
14.75	1.86	1.53	0.34
15.00	1.88	1.55	0.32
15.25	1.89	1.57	0.30
15.50	1.91	1.58	0.28
15.75	1.92	1.60	0.27
16.00	1.94	1.61	0.25
16.25	1.95	1.62	0.24
16.50	1.96	1.63	0.23
16.75	1.97	1.64	0.22
17.00	1.98	1.66	0.22
17.25	1.99	1.67	0.21
17.50	2.01	1.68	0.21
17.75	2.02	1.69	0.20
18.00	2.03	1.70	0.19
18.25	2.04	1.71	0.19
18.50	2.05	1.72	0.18
18.75	2.05	1.72	0.17
19.00	2.06	1.73	0.17
19.25	2.07	1.74	0.16
19.50	2.08	1.75	0.15
19.75	2.09	1.76	0.15
20.00	**2.09**	**1.76**	0.14

Summary for Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE

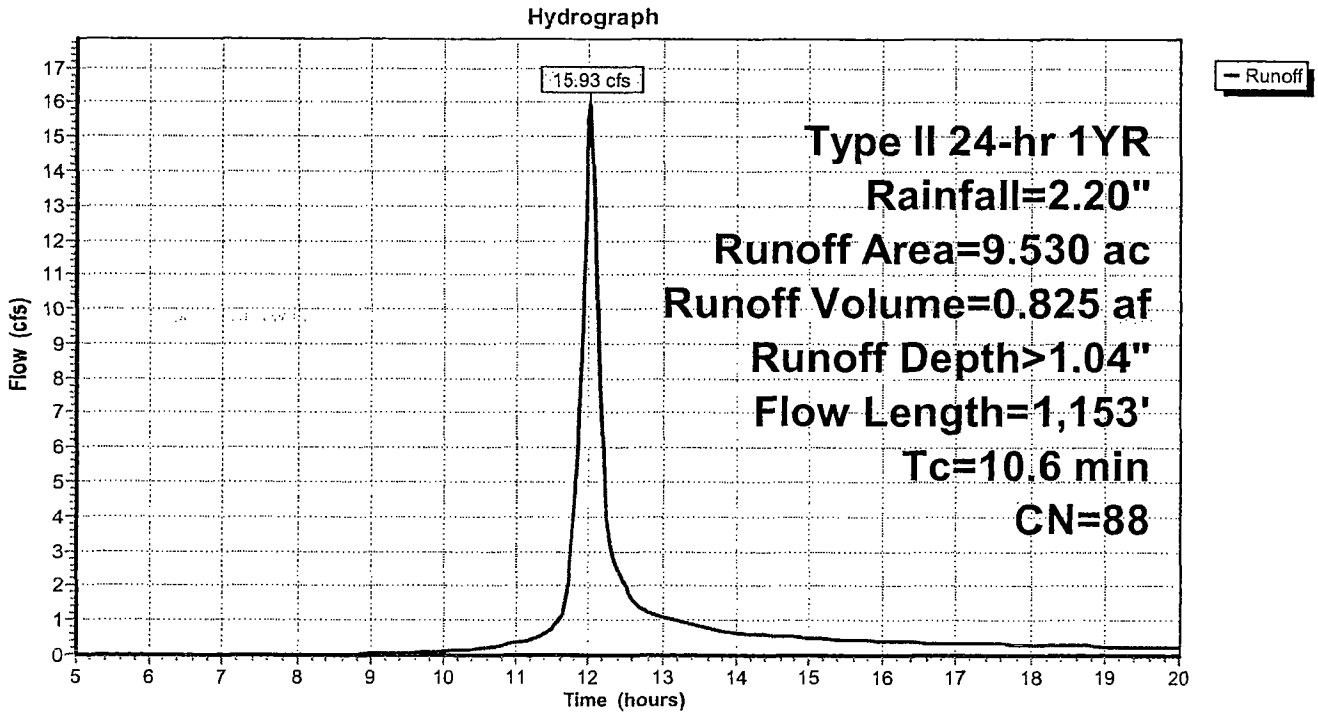
Runoff = 15.93 cfs @ 12.02 hrs, Volume= 0.825 af, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1YR Rainfall=2.20"

Area (ac)	CN	Description
4.760	98	Paved parking & roofs
4.770	79	50-75% Grass cover, Fair, HSG C
9.530	88	Weighted Average
4.770		Pervious Area
4.760		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0200	1.22		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
3.6	471	0.0114	2.17		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.6	582	0.0114	1.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.6	1,153	Total			

Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE



Hydrograph for Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE

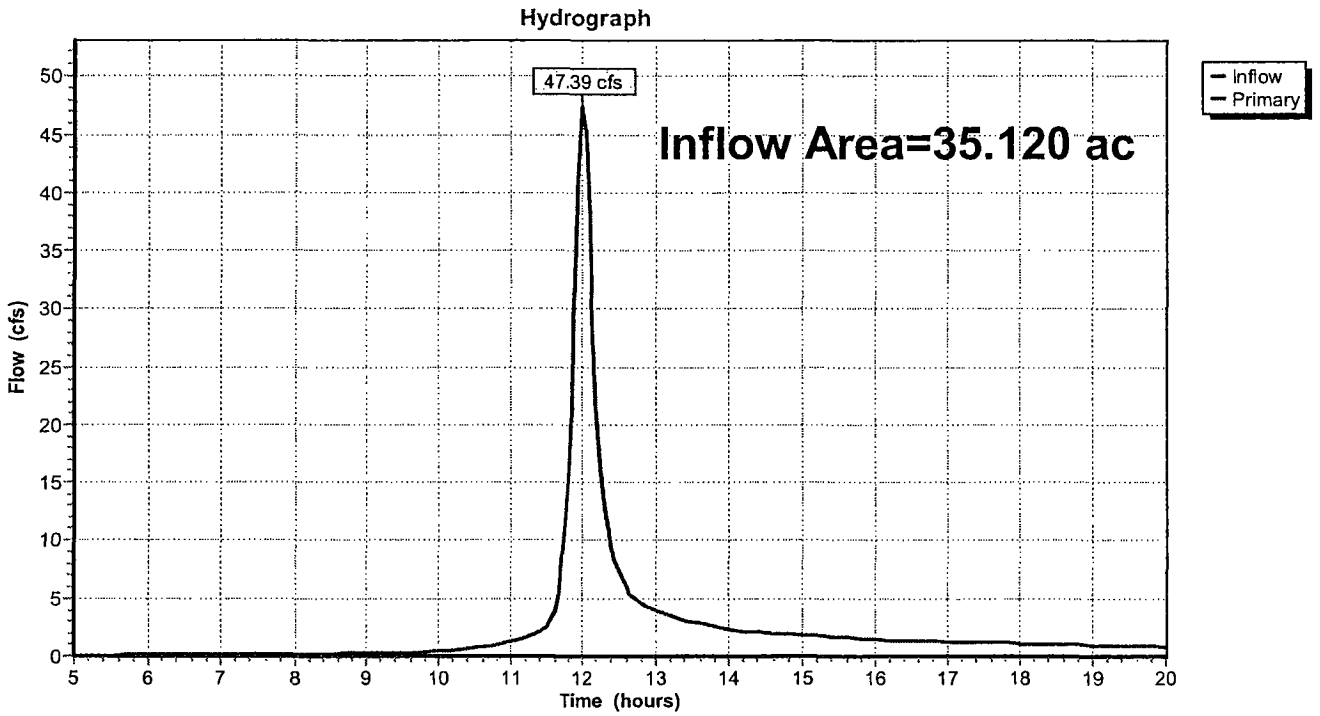
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.14	0.00	0.00
5.25	0.15	0.00	0.00
5.50	0.16	0.00	0.00
5.75	0.17	0.00	0.00
6.00	0.18	0.00	0.00
6.25	0.19	0.00	0.00
6.50	0.20	0.00	0.00
6.75	0.21	0.00	0.00
7.00	0.22	0.00	0.00
7.25	0.23	0.00	0.00
7.50	0.24	0.00	0.00
7.75	0.25	0.00	0.00
8.00	0.26	0.00	0.00
8.25	0.28	0.00	0.00
8.50	0.29	0.00	0.01
8.75	0.31	0.00	0.02
9.00	0.32	0.00	0.04
9.25	0.34	0.00	0.05
9.50	0.36	0.01	0.07
9.75	0.38	0.01	0.09
10.00	0.40	0.01	0.12
10.25	0.42	0.01	0.15
10.50	0.45	0.02	0.20
10.75	0.48	0.03	0.27
11.00	0.52	0.04	0.36
11.25	0.56	0.05	0.50
11.50	0.62	0.07	0.74
11.75	0.85	0.17	3.04
12.00	1.46	0.55	**15.54**
12.25	1.55	0.62	3.98
12.50	1.62	0.67	1.96
12.75	1.66	0.70	1.33
13.00	1.70	0.73	1.11
13.25	1.73	0.75	0.95
13.50	1.76	0.77	0.84
13.75	1.78	0.79	0.74
14.00	1.80	0.81	0.66
14.25	1.82	0.83	0.60
14.50	1.84	0.84	0.57
14.75	1.86	0.85	0.55
15.00	1.88	0.87	0.52
15.25	1.89	0.88	0.49
15.50	1.91	0.89	0.46
15.75	1.92	0.90	0.43
16.00	1.94	0.91	0.41
16.25	1.95	0.92	0.38
16.50	1.96	0.93	0.37
16.75	1.97	0.94	0.36
17.00	1.98	0.95	0.35
17.25	1.99	0.96	0.34
17.50	2.01	0.97	0.33
17.75	2.02	0.98	0.32
18.00	2.03	0.99	0.31
18.25	2.04	0.99	0.30
18.50	2.05	1.00	0.29
18.75	2.05	1.01	0.28
19.00	2.06	1.02	0.27
19.25	2.07	1.02	0.26
19.50	2.08	1.03	0.25
19.75	2.09	1.04	0.24
20.00	**2.09**	**1.04**	0.23

Summary for Link 1L: EAST PROPERTY LINE

Inflow Area = 35.120 ac, 42.08% Impervious, Inflow Depth > 1.00" for 1YR event
Inflow = 47.39 cfs @ 12.01 hrs, Volume= 2.927 af
Primary = 47.39 cfs @ 12.01 hrs, Volume= 2.927 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 1L: EAST PROPERTY LINE



Hydrograph for Link 1L: EAST PROPERTY LINE

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.06	**0.00**	0.06
5.25	0.07	0.00	0.07
5.50	0.07	0.00	0.07
5.75	0.08	0.00	0.08
6.00	0.09	0.00	0.09
6.25	0.10	0.00	0.10
6.50	0.10	0.00	0.10
6.75	0.11	0.00	0.11
7.00	0.12	0.00	0.12
7.25	0.13	0.00	0.13
7.50	0.13	0.00	0.13
7.75	0.14	0.00	0.14
8.00	0.15	0.00	0.15
8.25	0.17	0.00	0.17
8.50	0.19	0.00	0.19
8.75	0.23	0.00	0.23
9.00	0.27	0.00	0.27
9.25	0.30	0.00	0.30
9.50	0.32	0.00	0.32
9.75	0.37	0.00	0.37
10.00	0.44	0.00	0.44
10.25	0.56	0.00	0.56
10.50	0.73	0.00	0.73
10.75	0.96	0.00	0.96
11.00	1.27	0.00	1.27
11.25	1.79	0.00	1.79
11.50	2.59	0.00	2.59
11.75	11.20	0.00	11.20
12.00	**47.15**	0.00	**47.15**
12.25	16.22	0.00	16.22
12.50	7.37	0.00	7.37
12.75	4.80	0.00	4.80
13.00	3.95	0.00	3.95
13.25	3.36	0.00	3.36
13.50	2.96	0.00	2.96
13.75	2.62	0.00	2.62
14.00	2.34	0.00	2.34
14.25	2.13	0.00	2.13
14.50	2.02	0.00	2.02
14.75	1.93	0.00	1.93
15.00	1.83	0.00	1.83
15.25	1.74	0.00	1.74
15.50	1.64	0.00	1.64
15.75	1.54	0.00	1.54
16.00	1.44	0.00	1.44
16.25	1.36	0.00	1.36
16.50	1.32	0.00	1.32
16.75	1.29	0.00	1.29
17.00	1.25	0.00	1.25
17.25	1.22	0.00	1.22
17.50	1.18	0.00	1.18
17.75	1.15	0.00	1.15
18.00	1.11	0.00	1.11
18.25	1.08	0.00	1.08
18.50	1.04	0.00	1.04
18.75	1.00	0.00	1.00
19.00	0.97	0.00	0.97
19.25	0.93	0.00	0.93
19.50	0.89	0.00	0.89
19.75	0.86	0.00	0.86
20.00	0.82	0.00	0.82

Summary for Subcatchment DA-1: TO CANAL

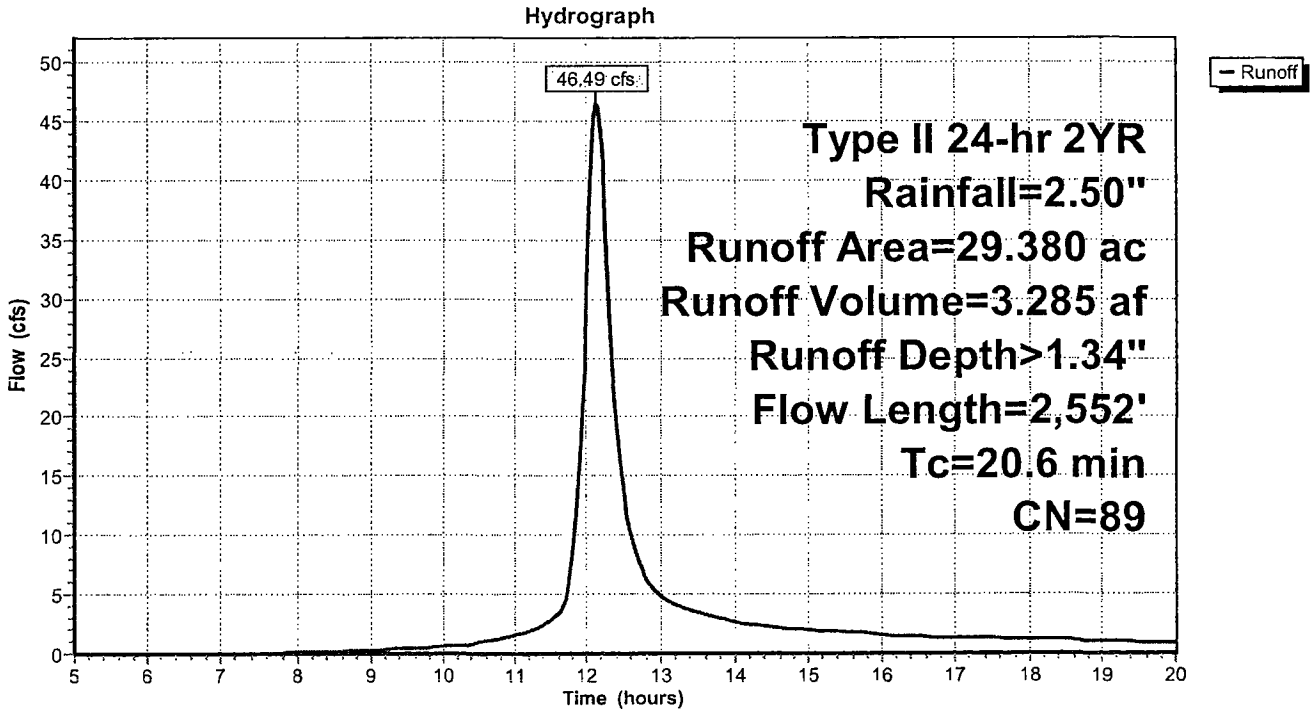
Runoff = 46.49 cfs @ 12.13 hrs, Volume= 3.285 af, Depth> 1.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2YR Rainfall=2.50"

Area (ac)	CN	Description
14.640	79	50-75% Grass cover, Fair, HSG C
14.740	98	Water Surface, 0% imp
29.380	89	Weighted Average
29.380		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0110	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
2.7	567	0.0476	3.51		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.8	1,885	0.0196	8.32	14.71	**Circular Channel (pipe),** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
20.6	2,552	Total			

Subcatchment DA-1: TO CANAL



Hydrograph for Subcatchment DA-1: TO CANAL

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.16	0.00	0.00
5.25	0.17	0.00	0.00
5.50	0.18	0.00	0.00
5.75	0.19	0.00	0.00
6.00	0.20	0.00	0.00
6.25	0.21	0.00	0.00
6.50	0.22	0.00	0.00
6.75	0.24	0.00	0.00
7.00	0.25	0.00	0.00
7.25	0.26	0.00	0.00
7.50	0.27	0.00	0.02
7.75	0.29	0.00	0.05
8.00	0.30	0.00	0.09
8.25	0.31	0.00	0.12
8.50	0.33	0.01	0.17
8.75	0.35	0.01	0.23
9.00	0.37	0.01	0.30
9.25	0.39	0.01	0.38
9.50	0.41	0.02	0.44
9.75	0.43	0.02	0.50
10.00	0.45	0.03	0.61
10.25	0.48	0.04	0.75
10.50	0.51	0.05	0.94
10.75	0.55	0.06	1.18
11.00	0.59	0.07	1.52
11.25	0.64	0.09	1.98
11.50	0.71	0.12	2.79
11.75	0.97	0.27	6.07
12.00	1.66	0.75	**31.17**
12.25	1.77	0.84	**35.93**
12.50	1.84	0.89	13.48
12.75	1.89	0.94	7.08
13.00	1.93	0.97	4.91
13.25	1.97	1.00	3.97
13.50	2.00	1.03	3.43
13.75	2.03	1.05	3.01
14.00	2.05	1.07	2.68
14.25	2.07	1.09	2.39
14.50	2.09	1.11	2.23
14.75	2.11	1.12	2.11
15.00	2.13	1.14	2.01
15.25	2.15	1.16	1.90
15.50	2.17	1.17	1.80
15.75	2.19	1.18	1.69
16.00	2.20	1.20	1.58
16.25	2.21	1.21	1.48
16.50	2.23	1.22	1.42
16.75	2.24	1.23	1.38
17.00	2.25	1.24	1.35
17.25	2.27	1.25	1.31
17.50	2.28	1.26	1.27
17.75	2.29	1.27	1.23
18.00	2.30	1.28	1.19
18.25	2.31	1.29	1.16
18.50	2.32	1.30	1.12
18.75	2.33	1.31	1.08
19.00	2.34	1.32	1.04
19.25	2.35	1.33	1.00
19.50	2.36	1.34	0.96
19.75	2.37	1.34	0.92
20.00	**2.38**	**1.35**	0.88

Summary for Subcatchment DA-2: TO NORTH EAST PROPERTY LINE

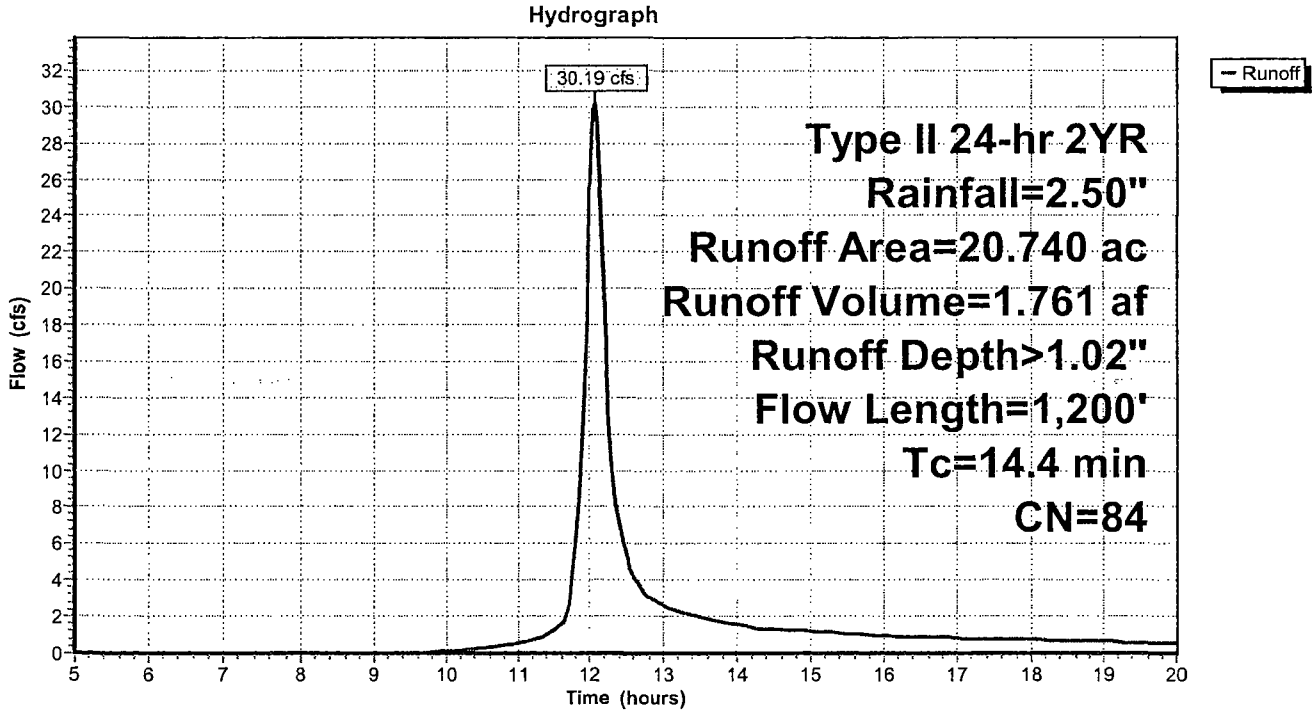
Runoff = 30.19 cfs @ 12.07 hrs, Volume= 1.761 af, Depth> 1.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2YR Rainfall=2.50"

Area (ac)	CN	Description
5.380	98	Paved parking & roofs
15.360	79	50-75% Grass cover, Fair, HSG C
20.740	84	Weighted Average
15.360		Pervious Area
5.380		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0700	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
7.7	1,100	0.0217	2.37		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.4	1,200	Total			

Subcatchment DA-2: TO NORTH EAST PROPERTY LINE



Hydrograph for Subcatchment DA-2: TO NORTH EAST PROPERTY LINE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.16	0.00	0.00
5.25	0.17	0.00	0.00
5.50	0.18	0.00	0.00
5.75	0.19	0.00	0.00
6.00	0.20	0.00	0.00
6.25	0.21	0.00	0.00
6.50	0.22	0.00	0.00
6.75	0.24	0.00	0.00
7.00	0.25	0.00	0.00
7.25	0.26	0.00	0.00
7.50	0.27	0.00	0.00
7.75	0.29	0.00	0.00
8.00	0.30	0.00	0.00
8.25	0.31	0.00	0.00
8.50	0.33	0.00	0.00
8.75	0.35	0.00	0.00
9.00	0.37	0.00	0.00
9.25	0.39	0.00	0.00
9.50	0.41	0.00	0.02
9.75	0.43	0.00	0.05
10.00	0.45	0.00	0.10
10.25	0.48	0.00	0.16
10.50	0.51	0.01	0.24
10.75	0.55	0.01	0.36
11.00	0.59	0.02	0.52
11.25	0.64	0.03	0.77
11.50	0.71	0.05	1.20
11.75	0.97	0.14	4.07
12.00	1.66	0.51	**25.20**
12.25	1.77	0.58	**13.16**
12.50	1.84	0.63	5.30
12.75	1.89	0.67	3.23
13.00	1.93	0.69	2.63
13.25	1.97	0.72	2.22
13.50	2.00	0.74	1.96
13.75	2.03	0.76	1.73
14.00	2.05	0.78	1.54
14.25	2.07	0.80	1.39
14.50	2.09	0.81	1.32
14.75	2.11	0.83	1.26
15.00	2.13	0.84	1.20
15.25	2.15	0.85	1.14
15.50	2.17	0.87	1.07
15.75	2.19	0.88	1.01
16.00	2.20	0.89	0.95
16.25	2.21	0.90	0.89
16.50	2.23	0.91	0.86
16.75	2.24	0.92	0.84
17.00	2.25	0.93	0.82
17.25	2.27	0.94	0.80
17.50	2.28	0.95	0.77
17.75	2.29	0.96	0.75
18.00	2.30	0.96	0.73
18.25	2.31	0.97	0.71
18.50	2.32	0.98	0.68
18.75	2.33	0.99	0.66
19.00	2.34	1.00	0.63
19.25	2.35	1.00	0.61
19.50	2.36	1.01	0.59
19.75	2.37	1.02	0.56
20.00	**2.38**	**1.02**	0.54

Summary for Subcatchment DA-3: TO EAST PROPERTY LINE

[49] Hint: Tc<2dt may require smaller dt

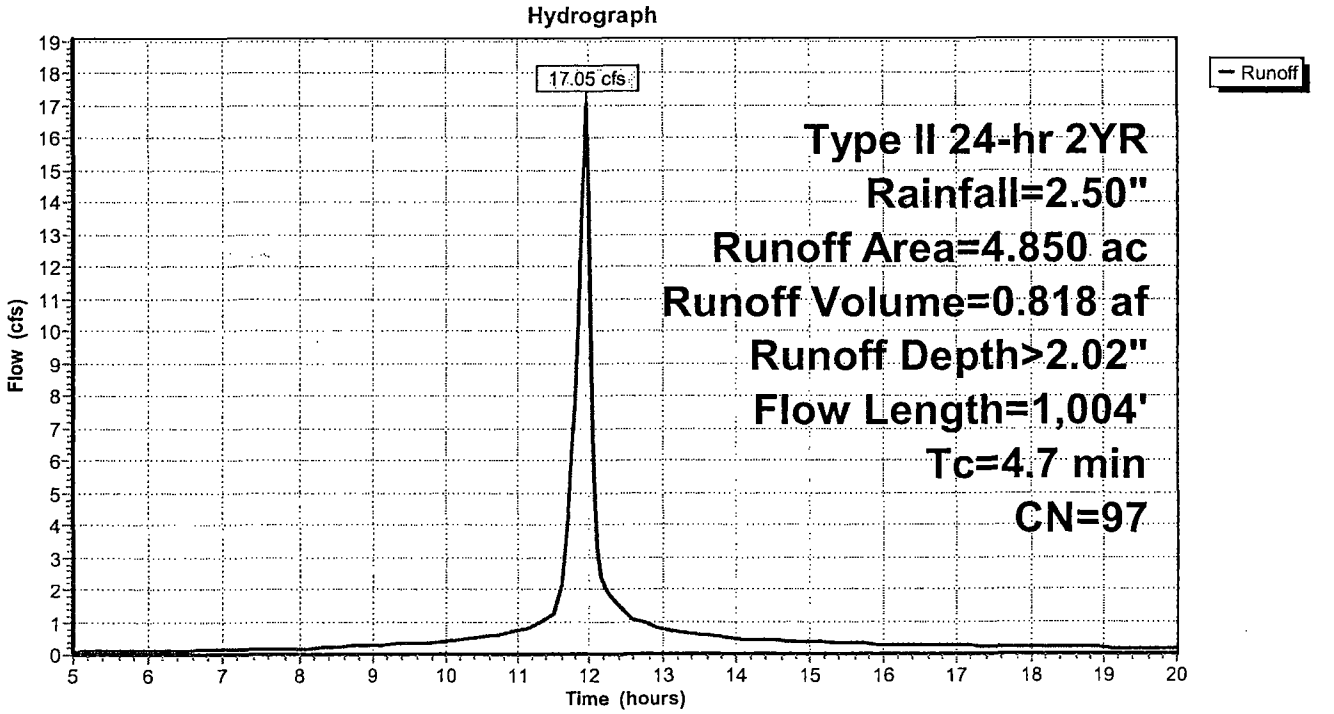
Runoff = 17.05 cfs @ 11.95 hrs, Volume= 0.818 af, Depth> 2.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2YR Rainfall=2.50"

Area (ac)	CN	Description
4.640	98	Paved roads w/curbs & sewers
0.210	79	50-75% Grass cover, Fair, HSG C
4.850	97	Weighted Average
0.210		Pervious Area
4.640		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	76	0.0158	1.05		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
1.5	648	0.0138	6.98	12.34	**Circular Channel (pipe),** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
2.0	280	0.0214	2.36		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.7	1,004	Total			

Subcatchment DA-3: TO EAST PROPERTY LINE



Hydrograph for Subcatchment DA-3: TO EAST PROPERTY LINE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.16	0.02	0.08
5.25	0.17	0.03	0.09
5.50	0.18	0.03	0.10
5.75	0.19	0.04	0.10
6.00	0.20	0.04	0.11
6.25	0.21	0.05	0.12
6.50	0.22	0.06	0.13
6.75	0.24	0.06	0.14
7.00	0.25	0.07	0.15
7.25	0.26	0.08	0.16
7.50	0.27	0.09	0.16
7.75	0.29	0.09	0.17
8.00	0.30	0.10	0.18
8.25	0.31	0.11	0.20
8.50	0.33	0.12	0.23
8.75	0.35	0.14	0.26
9.00	0.37	0.15	0.28
9.25	0.39	0.17	0.30
9.50	0.41	0.18	0.30
9.75	0.43	0.20	0.34
10.00	0.45	0.22	0.38
10.25	0.48	0.24	0.44
10.50	0.51	0.27	0.51
10.75	0.55	0.30	0.61
11.00	0.59	0.33	0.73
11.25	0.64	0.38	0.95
11.50	0.71	0.44	1.23
11.75	0.97	0.68	**6.09**
12.00	1.66	1.34	**13.72**
12.25	1.77	1.44	1.92
12.50	1.84	1.51	1.24
12.75	1.89	1.56	0.93
13.00	1.93	1.60	0.78
13.25	1.97	1.64	0.67
13.50	2.00	1.67	0.59
13.75	2.03	1.70	0.52
14.00	2.05	1.72	0.46
14.25	2.07	1.74	0.43
14.50	2.09	1.76	0.41
14.75	2.11	1.78	0.39
15.00	2.13	1.80	0.37
15.25	2.15	1.82	0.35
15.50	2.17	1.84	0.32
15.75	2.19	1.85	0.30
16.00	2.20	1.87	0.28
16.25	2.21	1.88	0.27
16.50	2.23	1.90	0.26
16.75	2.24	1.91	0.26
17.00	2.25	1.92	0.25
17.25	2.27	1.93	0.24
17.50	2.28	1.95	0.23
17.75	2.29	1.96	0.23
18.00	2.30	1.97	0.22
18.25	2.31	1.98	0.21
18.50	2.32	1.99	0.20
18.75	2.33	2.00	0.20
19.00	2.34	2.01	0.19
19.25	2.35	2.02	0.18
19.50	2.36	2.03	0.17
19.75	2.37	2.04	0.17
20.00	**2.38**	**2.05**	0.16

Summary for Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE

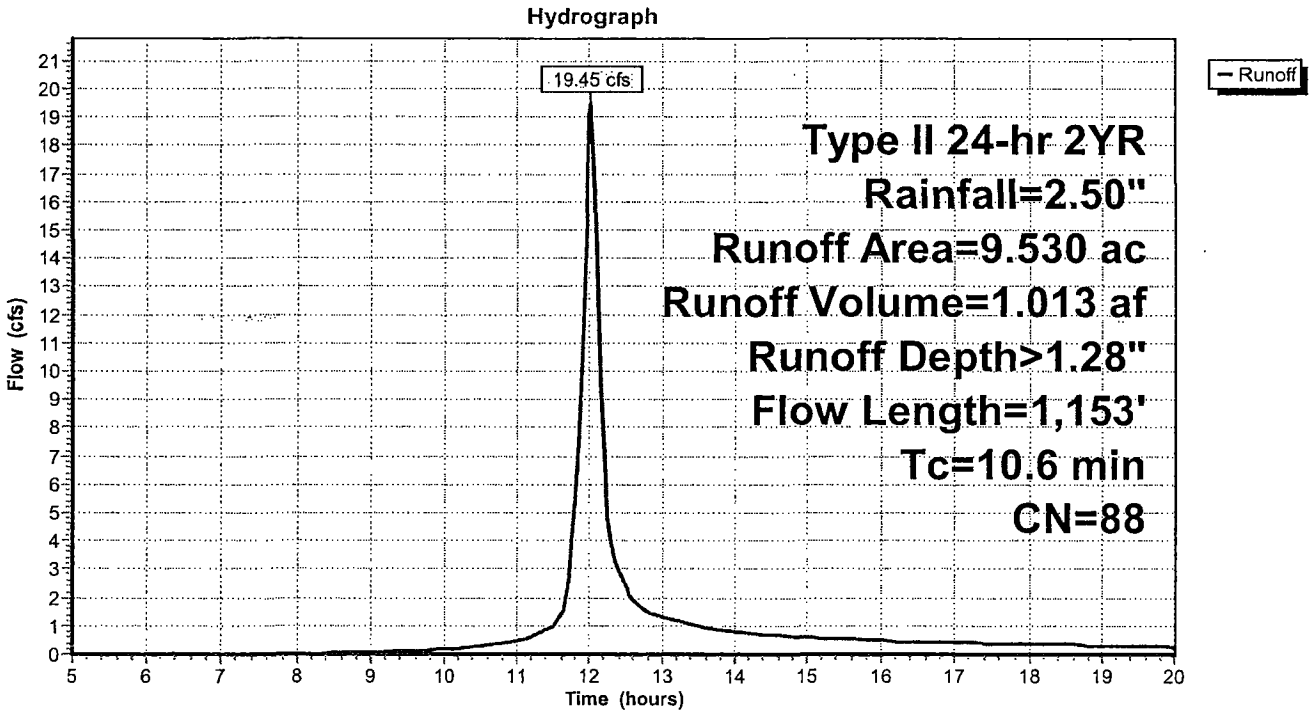
Runoff = 19.45 cfs @ 12.02 hrs, Volume= 1.013 af, Depth> 1.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2YR Rainfall=2.50"

Area (ac)	CN	Description
4.760	98	Paved parking & roofs
4.770	79	50-75% Grass cover, Fair, HSG C
9.530	88	Weighted Average
4.770		Pervious Area
4.760		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0200	1.22		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
3.6	471	0.0114	2.17		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.6	582	0.0114	1.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.6	1,153	Total			

Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE



Hydrograph for Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE

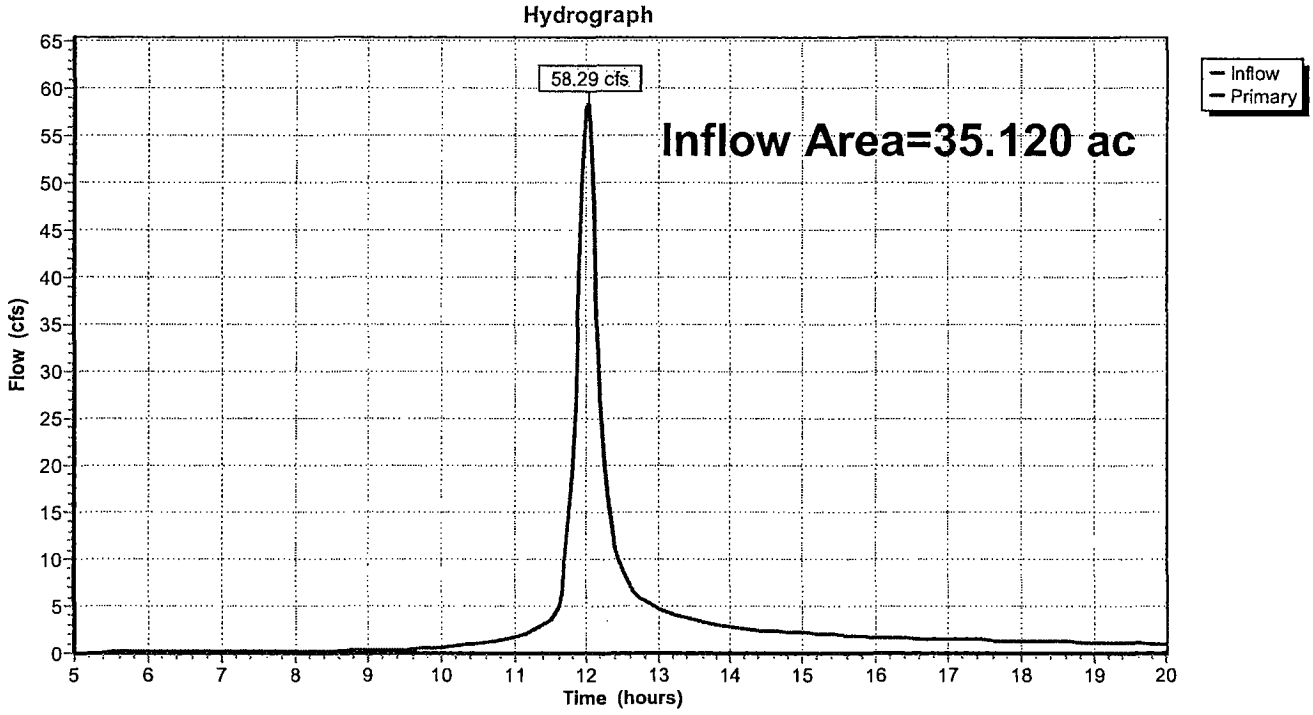
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.16	0.00	0.00
5.25	0.17	0.00	0.00
5.50	0.18	0.00	0.00
5.75	0.19	0.00	0.00
6.00	0.20	0.00	0.00
6.25	0.21	0.00	0.00
6.50	0.22	0.00	0.00
6.75	0.24	0.00	0.00
7.00	0.25	0.00	0.00
7.25	0.26	0.00	0.00
7.50	0.27	0.00	0.00
7.75	0.29	0.00	0.00
8.00	0.30	0.00	0.01
8.25	0.31	0.00	0.03
8.50	0.33	0.00	0.04
8.75	0.35	0.00	0.06
9.00	0.37	0.01	0.08
9.25	0.39	0.01	0.10
9.50	0.41	0.01	0.12
9.75	0.43	0.02	0.14
10.00	0.45	0.02	0.18
10.25	0.48	0.03	0.23
10.50	0.51	0.04	0.30
10.75	0.55	0.05	0.38
11.00	0.59	0.06	0.50
11.25	0.64	0.08	0.69
11.50	0.71	0.11	0.99
11.75	0.97	0.23	3.93
12.00	1.66	0.70	**19.03**
12.25	1.77	0.78	4.79
12.50	1.84	0.84	2.34
12.75	1.89	0.88	1.59
13.00	1.93	0.91	1.32
13.25	1.97	0.94	1.13
13.50	2.00	0.96	0.99
13.75	2.03	0.99	0.88
14.00	2.05	1.01	0.78
14.25	2.07	1.02	0.71
14.50	2.09	1.04	0.68
14.75	2.11	1.06	0.65
15.00	2.13	1.07	0.61
15.25	2.15	1.09	0.58
15.50	2.17	1.10	0.55
15.75	2.19	1.12	0.51
16.00	2.20	1.13	0.48
16.25	2.21	1.14	0.45
16.50	2.23	1.15	0.44
16.75	2.24	1.16	0.43
17.00	2.25	1.17	0.42
17.25	2.27	1.18	0.41
17.50	2.28	1.19	0.39
17.75	2.29	1.20	0.38
18.00	2.30	1.21	0.37
18.25	2.31	1.22	0.36
18.50	2.32	1.23	0.35
18.75	2.33	1.24	0.33
19.00	2.34	1.25	0.32
19.25	2.35	1.26	0.31
19.50	2.36	1.26	0.30
19.75	2.37	1.27	0.28
20.00	**2.38**	**1.28**	0.27

Summary for Link 1L: EAST PROPERTY LINE

Inflow Area = 35.120 ac, 42.08% Impervious, Inflow Depth > 1.23" for 2YR event
Inflow = 58.29 cfs @ 12.01 hrs, Volume= 3.591 af
Primary = 58.29 cfs @ 12.01 hrs, Volume= 3.591 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 1L: EAST PROPERTY LINE



Hydrograph for Link 1L: EAST PROPERTY LINE

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.08	**0.00**	0.08
5.25	0.09	0.00	0.09
5.50	0.10	0.00	0.10
5.75	0.10	0.00	0.10
6.00	0.11	0.00	0.11
6.25	0.12	0.00	0.12
6.50	0.13	0.00	0.13
6.75	0.14	0.00	0.14
7.00	0.15	0.00	0.15
7.25	0.16	0.00	0.16
7.50	0.16	0.00	0.16
7.75	0.18	0.00	0.18
8.00	0.19	0.00	0.19
8.25	0.23	0.00	0.23
8.50	0.27	0.00	0.27
8.75	0.31	0.00	0.31
9.00	0.36	0.00	0.36
9.25	0.40	0.00	0.40
9.50	0.44	0.00	0.44
9.75	0.53	0.00	0.53
10.00	0.66	0.00	0.66
10.25	0.83	0.00	0.83
10.50	1.05	0.00	1.05
10.75	1.35	0.00	1.35
11.00	1.74	0.00	1.74
11.25	2.40	0.00	2.40
11.50	3.42	0.00	3.42
11.75	14.09	0.00	14.09
12.00	**57.96**	0.00	**57.96**
12.25	19.87	0.00	19.87
12.50	8.88	0.00	8.88
12.75	5.75	0.00	5.75
13.00	4.72	0.00	4.72
13.25	4.02	0.00	4.02
13.50	3.54	0.00	3.54
13.75	3.13	0.00	3.13
14.00	2.79	0.00	2.79
14.25	2.54	0.00	2.54
14.50	2.41	0.00	2.41
14.75	2.29	0.00	2.29
15.00	2.18	0.00	2.18
15.25	2.06	0.00	2.06
15.50	1.95	0.00	1.95
15.75	1.83	0.00	1.83
16.00	1.71	0.00	1.71
16.25	1.62	0.00	1.62
16.50	1.57	0.00	1.57
16.75	1.53	0.00	1.53
17.00	1.49	0.00	1.49
17.25	1.45	0.00	1.45
17.50	1.40	0.00	1.40
17.75	1.36	0.00	1.36
18.00	1.32	0.00	1.32
18.25	1.28	0.00	1.28
18.50	1.23	0.00	1.23
18.75	1.19	0.00	1.19
19.00	1.15	0.00	1.15
19.25	1.10	0.00	1.10
19.50	1.06	0.00	1.06
19.75	1.01	0.00	1.01
20.00	0.97	0.00	0.97

Summary for Subcatchment DA-1: TO CANAL

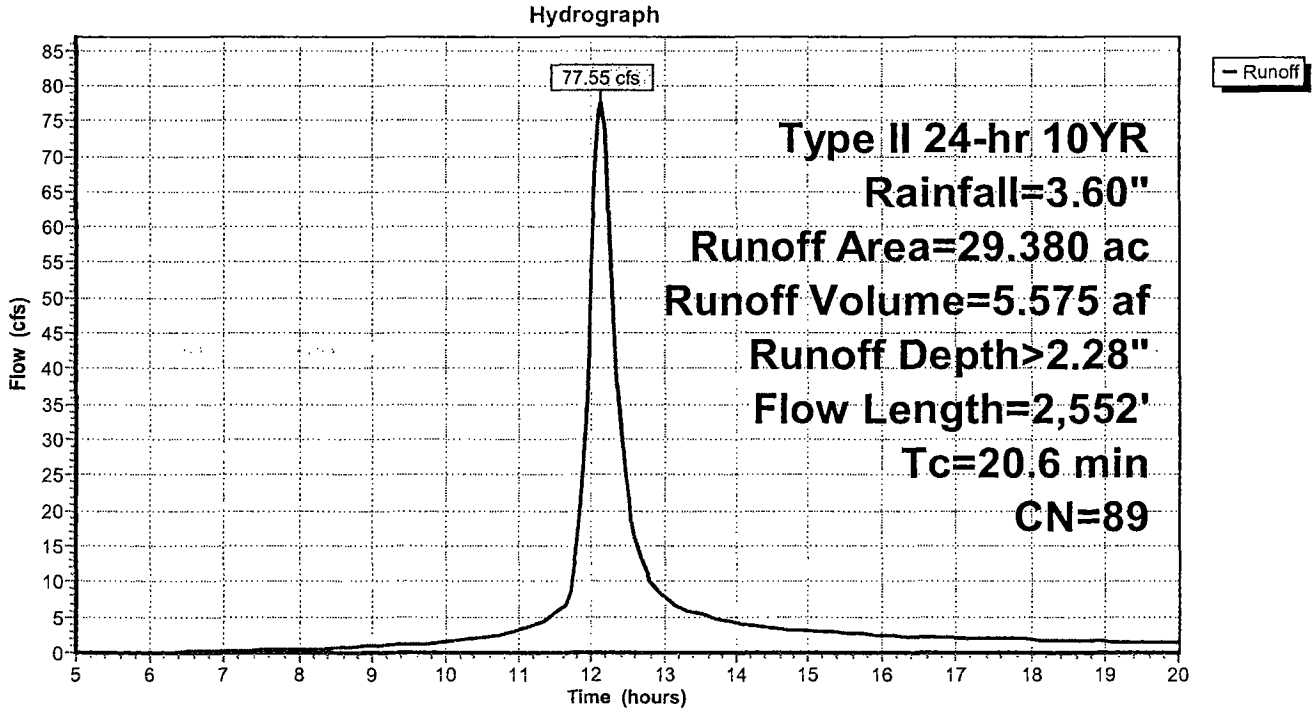
Runoff = 77.55 cfs @ 12.13 hrs, Volume= 5.575 af, Depth> 2.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10YR Rainfall=3.60"

Area (ac)	CN	Description
14.640	79	50-75% Grass cover, Fair, HSG C
14.740	98	Water Surface, 0% imp
29.380	89	Weighted Average
29.380		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0110	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
2.7	567	0.0476	3.51		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.8	1,885	0.0196	8.32	14.71	**Circular Channel (pipe),** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
20.6	2,552	Total			

Subcatchment DA-1: TO CANAL



Hydrograph for Subcatchment DA-1: TO CANAL

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.23	0.00	0.00
5.25	0.24	0.00	0.00
5.50	0.26	0.00	0.00
5.75	0.27	0.00	0.02
6.00	0.29	0.00	0.06
6.25	0.30	0.00	0.11
6.50	0.32	0.00	0.16
6.75	0.34	0.01	0.21
7.00	0.36	0.01	0.26
7.25	0.37	0.01	0.32
7.50	0.39	0.02	0.37
7.75	0.41	0.02	0.43
8.00	0.43	0.02	0.49
8.25	0.45	0.03	0.56
8.50	0.48	0.04	0.66
8.75	0.50	0.04	0.79
9.00	0.53	0.05	0.94
9.25	0.56	0.06	1.10
9.50	0.59	0.07	1.21
9.75	0.62	0.09	1.31
10.00	0.65	0.10	1.51
10.25	0.69	0.12	1.78
10.50	0.73	0.14	2.15
10.75	0.79	0.16	2.60
11.00	0.85	0.20	3.23
11.25	0.92	0.24	4.07
11.50	1.02	0.30	5.54
11.75	1.39	0.55	11.48
12.00	2.39	1.36	**53.85**
12.25	2.54	1.49	**59.06**
12.50	2.65	1.58	21.72
12.75	2.72	1.65	11.23
13.00	2.78	1.70	7.72
13.25	2.83	1.75	6.23
13.50	2.88	1.79	5.37
13.75	2.92	1.82	4.70
14.00	2.95	1.86	4.17
14.25	2.98	1.89	3.72
14.50	3.02	1.91	3.46
14.75	3.04	1.94	3.28
15.00	3.07	1.97	3.11
15.25	3.10	1.99	2.95
15.50	3.12	2.01	2.78
15.75	3.15	2.03	2.62
16.00	3.17	2.05	2.45
16.25	3.19	2.07	2.29
16.50	3.21	2.09	2.20
16.75	3.23	2.11	2.14
17.00	3.25	2.12	2.08
17.25	3.26	2.14	2.02
17.50	3.28	2.16	1.96
17.75	3.30	2.17	1.90
18.00	3.32	2.19	1.84
18.25	3.33	2.20	1.78
18.50	3.35	2.22	1.72
18.75	3.36	2.23	1.66
19.00	3.38	2.24	1.60
19.25	3.39	2.26	1.54
19.50	3.40	2.27	1.48
19.75	3.42	2.28	1.42
20.00	**3.43**	**2.29**	1.36

Summary for Subcatchment DA-2: TO NORTH EAST PROPERTY LINE

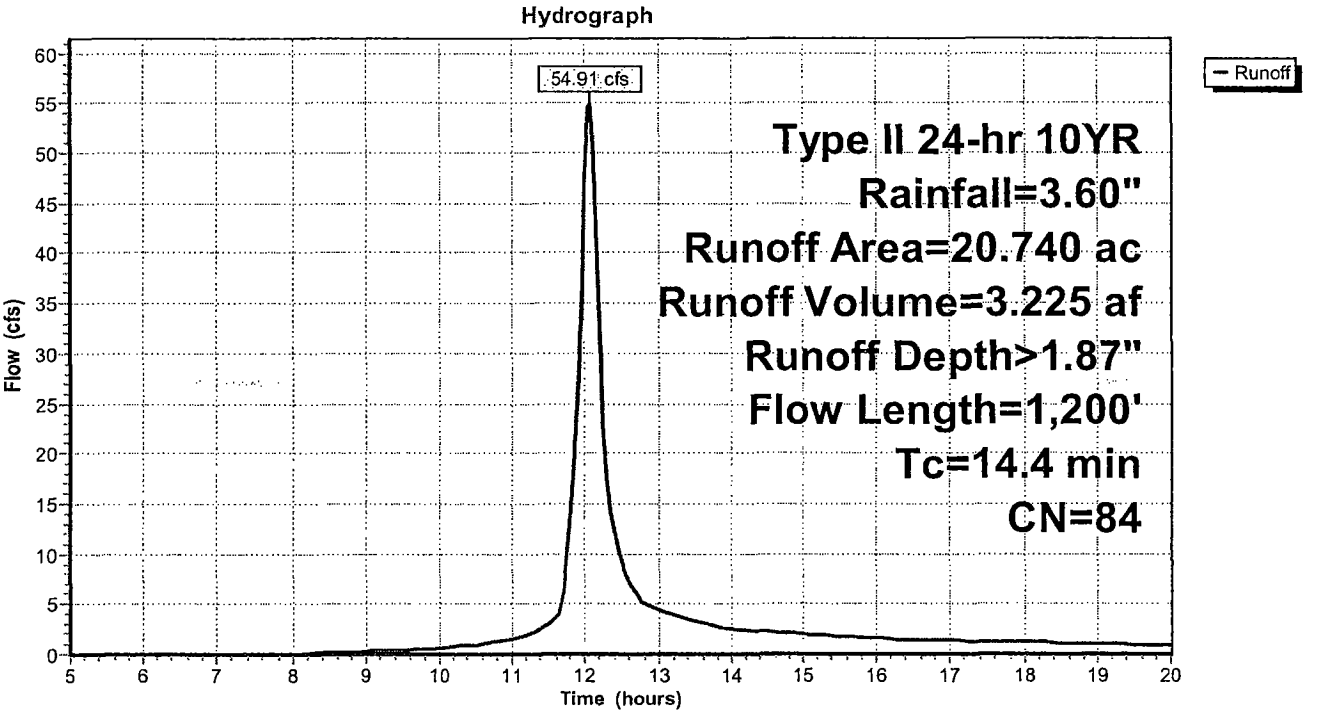
Runoff = 54.91 cfs @ 12.06 hrs, Volume= 3.225 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10YR Rainfall=3.60"

Area (ac)	CN	Description
5.380	98	Paved parking & roofs
15.360	79	50-75% Grass cover, Fair, HSG C
20.740	84	Weighted Average
15.360		Pervious Area
5.380		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0700	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
7.7	1,100	0.0217	2.37		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.4	1,200	Total			

Subcatchment DA-2: TO NORTH EAST PROPERTY LINE



Hydrograph for Subcatchment DA-2: TO NORTH EAST PROPERTY LINE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.23	0.00	0.00
5.25	0.24	0.00	0.00
5.50	0.26	0.00	0.00
5.75	0.27	0.00	0.00
6.00	0.29	0.00	0.00
6.25	0.30	0.00	0.00
6.50	0.32	0.00	0.00
6.75	0.34	0.00	0.00
7.00	0.36	0.00	0.00
7.25	0.37	0.00	0.00
7.50	0.39	0.00	0.00
7.75	0.41	0.00	0.02
8.00	0.43	0.00	0.06
8.25	0.45	0.00	0.09
8.50	0.48	0.00	0.14
8.75	0.50	0.01	0.20
9.00	0.53	0.01	0.27
9.25	0.56	0.02	0.34
9.50	0.59	0.02	0.40
9.75	0.62	0.03	0.47
10.00	0.65	0.03	0.58
10.25	0.69	0.04	0.73
10.50	0.73	0.06	0.93
10.75	0.79	0.07	1.18
11.00	0.85	0.09	1.54
11.25	0.92	0.12	2.07
11.50	1.02	0.16	2.98
11.75	1.39	0.35	9.04
12.00	2.39	1.03	**47.18**
12.25	2.54	1.15	**23.10**
12.50	2.65	1.23	9.02
12.75	2.72	1.29	5.43
13.00	2.78	1.34	4.38
13.25	2.83	1.38	3.69
13.50	2.88	1.42	3.25
13.75	2.92	1.45	2.86
14.00	2.95	1.48	2.55
14.25	2.98	1.50	2.29
14.50	3.02	1.53	2.17
14.75	3.04	1.55	2.07
15.00	3.07	1.58	1.96
15.25	3.10	1.60	1.86
15.50	3.12	1.62	1.75
15.75	3.15	1.64	1.65
16.00	3.17	1.66	1.54
16.25	3.19	1.67	1.45
16.50	3.21	1.69	1.41
16.75	3.23	1.71	1.37
17.00	3.25	1.72	1.33
17.25	3.26	1.74	1.29
17.50	3.28	1.75	1.26
17.75	3.30	1.77	1.22
18.00	3.32	1.78	1.18
18.25	3.33	1.79	1.14
18.50	3.35	1.81	1.10
18.75	3.36	1.82	1.06
19.00	3.38	1.83	1.03
19.25	3.39	1.84	0.99
19.50	3.40	1.85	0.95
19.75	3.42	1.86	0.91
20.00	**3.43**	**1.87**	0.87

Summary for Subcatchment DA-3: TO EAST PROPERTY LINE

[49] Hint: Tc<2dt may require smaller dt

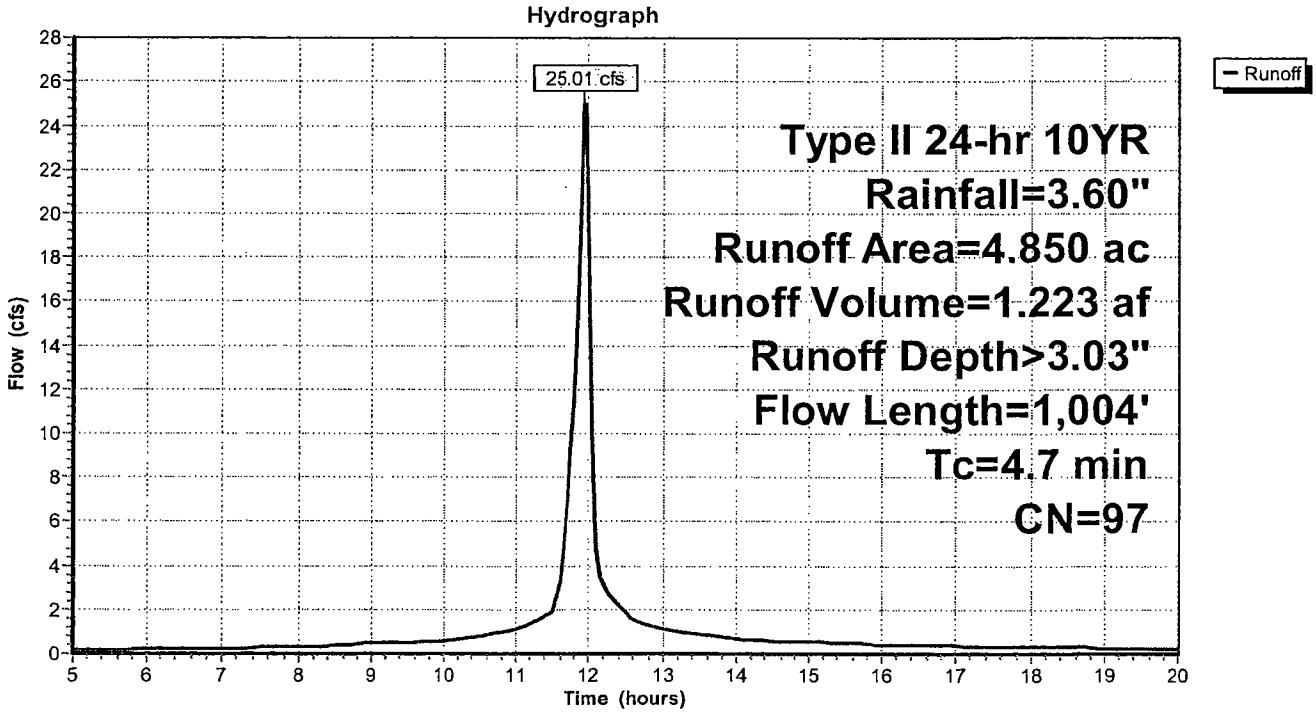
Runoff = 25.01 cfs @ 11.95 hrs, Volume= 1.223 af, Depth> 3.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10YR Rainfall=3.60"

Area (ac)	CN	Description
4.640	98	Paved roads w/curbs & sewers
0.210	79	50-75% Grass cover, Fair, HSG C
4.850	97	Weighted Average
0.210		Pervious Area
4.640		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	76	0.0158	1.05		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
1.5	648	0.0138	6.98	12.34	**Circular Channel (pipe),** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
2.0	280	0.0214	2.36		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.7	1,004	Total			

Subcatchment DA-3: TO EAST PROPERTY LINE



Hydrograph for Subcatchment DA-3: TO EAST PROPERTY LINE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.23	0.06	0.16
5.25	0.24	0.07	0.17
5.50	0.26	0.08	0.18
5.75	0.27	0.09	0.20
6.00	0.29	0.10	0.21
6.25	0.30	0.11	0.22
6.50	0.32	0.12	0.23
6.75	0.34	0.13	0.24
7.00	0.36	0.14	0.26
7.25	0.37	0.16	0.27
7.50	0.39	0.17	0.28
7.75	0.41	0.19	0.29
8.00	0.43	0.20	0.30
8.25	0.45	0.22	0.34
8.50	0.48	0.24	0.38
8.75	0.50	0.26	0.42
9.00	0.53	0.28	0.46
9.25	0.56	0.31	0.48
9.50	0.59	0.33	0.48
9.75	0.62	0.36	0.53
10.00	0.65	0.39	0.60
10.25	0.69	0.42	0.69
10.50	0.73	0.46	0.79
10.75	0.79	0.51	0.94
11.00	0.85	0.56	1.12
11.25	0.92	0.63	1.45
11.50	1.02	0.72	1.87
11.75	1.39	1.08	**9.10**
12.00	2.39	2.05	**20.07**
12.25	2.54	2.21	2.79
12.50	2.65	2.31	1.80
12.75	2.72	2.38	1.35
13.00	2.78	2.44	1.13
13.25	2.83	2.49	0.98
13.50	2.88	2.54	0.85
13.75	2.92	2.58	0.76
14.00	2.95	2.61	0.67
14.25	2.98	2.64	0.62
14.50	3.02	2.67	0.59
14.75	3.04	2.70	0.56
15.00	3.07	2.73	0.53
15.25	3.10	2.76	0.50
15.50	3.12	2.78	0.47
15.75	3.15	2.80	0.44
16.00	3.17	2.82	0.41
16.25	3.19	2.85	0.39
16.50	3.21	2.86	0.38
16.75	3.23	2.88	0.37
17.00	3.25	2.90	0.36
17.25	3.26	2.92	0.35
17.50	3.28	2.94	0.34
17.75	3.30	2.95	0.33
18.00	3.32	2.97	0.32
18.25	3.33	2.99	0.31
18.50	3.35	3.00	0.30
18.75	3.36	3.02	0.28
19.00	3.38	3.03	0.27
19.25	3.39	3.04	0.26
19.50	3.40	3.06	0.25
19.75	3.42	3.07	0.24
20.00	**3.43**	**3.08**	0.23

Summary for Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE

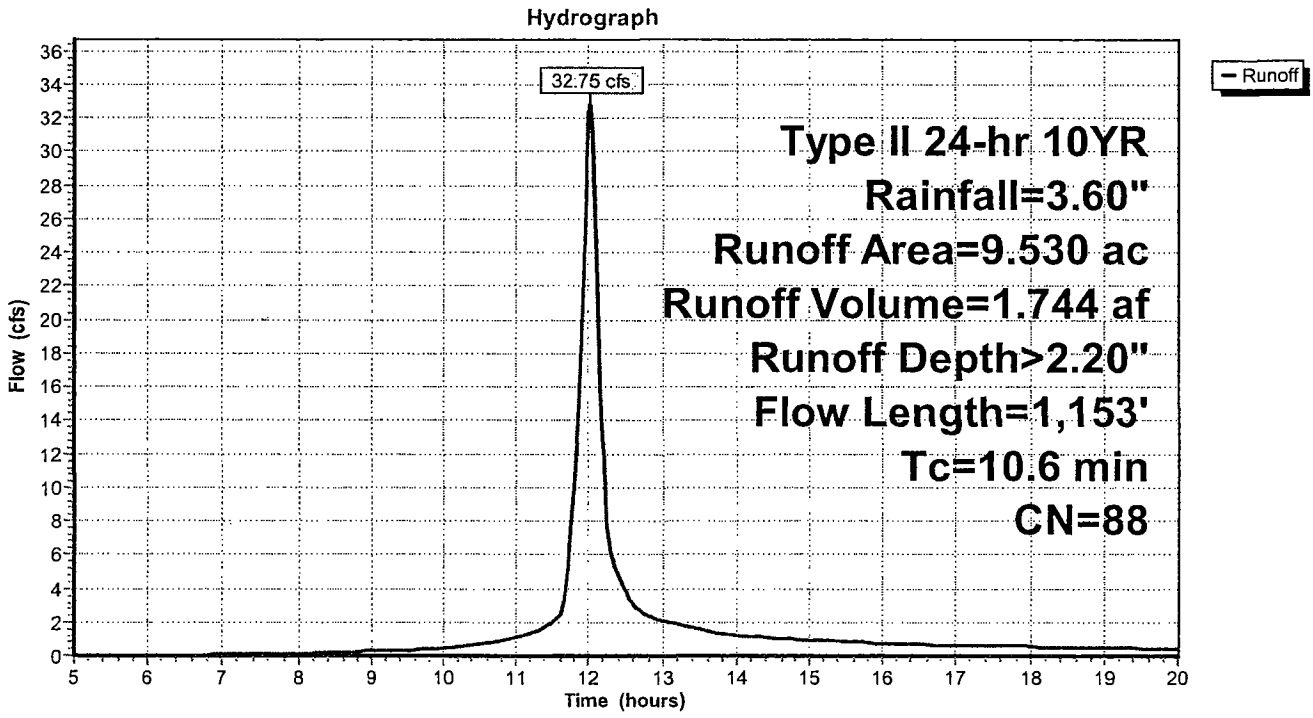
Runoff = 32.75 cfs @ 12.02 hrs, Volume= 1.744 af, Depth> 2.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10YR Rainfall=3.60"

Area (ac)	CN	Description
4.760	98	Paved parking & roofs
4.770	79	50-75% Grass cover, Fair, HSG C
9.530	88	Weighted Average
4.770		Pervious Area
4.760		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0200	1.22		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
3.6	471	0.0114	2.17		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.6	582	0.0114	1.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.6	1,153	Total			

Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE



Hydrograph for Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE

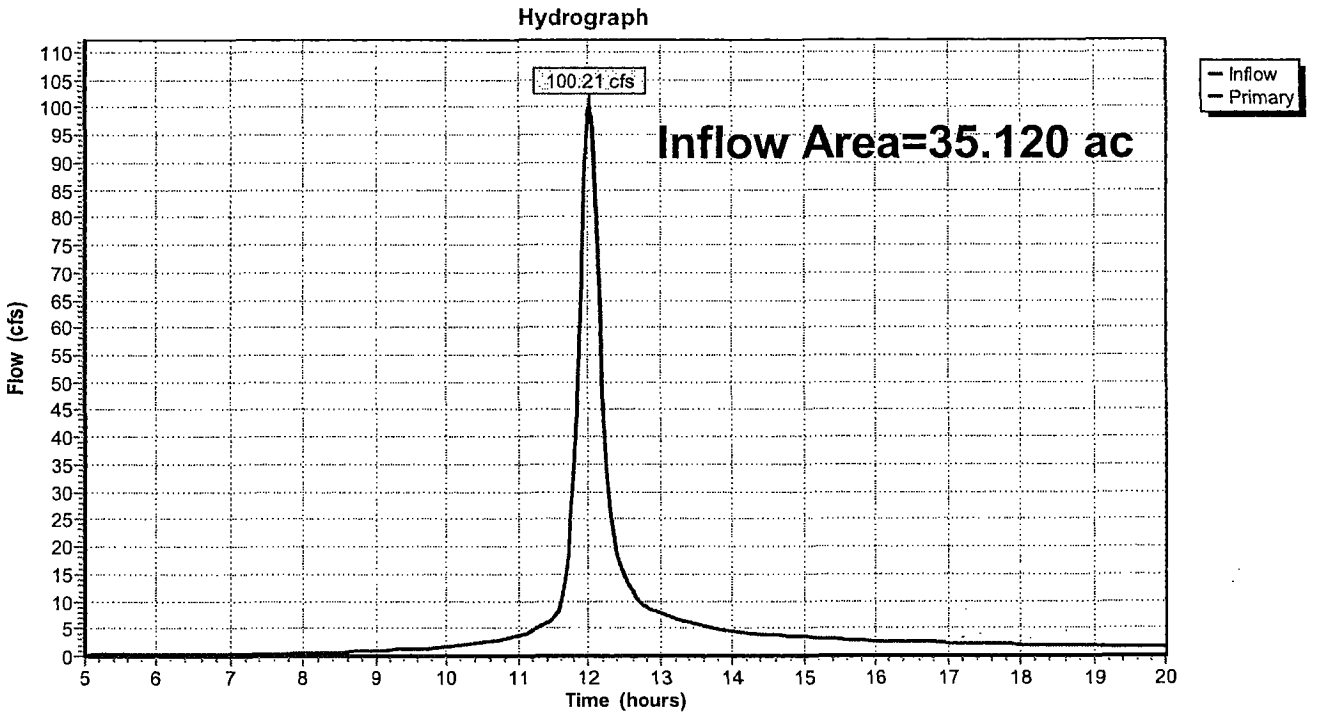
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.23	0.00	0.00
5.25	0.24	0.00	0.00
5.50	0.26	0.00	0.00
5.75	0.27	0.00	0.00
6.00	0.29	0.00	0.00
6.25	0.30	0.00	0.02
6.50	0.32	0.00	0.03
6.75	0.34	0.00	0.05
7.00	0.36	0.00	0.07
7.25	0.37	0.01	0.08
7.50	0.39	0.01	0.10
7.75	0.41	0.01	0.12
8.00	0.43	0.02	0.14
8.25	0.45	0.02	0.16
8.50	0.48	0.03	0.20
8.75	0.50	0.03	0.24
9.00	0.53	0.04	0.29
9.25	0.56	0.05	0.33
9.50	0.59	0.06	0.36
9.75	0.62	0.07	0.40
10.00	0.65	0.08	0.48
10.25	0.69	0.10	0.58
10.50	0.73	0.12	0.70
10.75	0.79	0.14	0.87
11.00	0.85	0.17	1.09
11.25	0.92	0.21	1.45
11.50	1.02	0.26	2.01
11.75	1.39	0.51	7.45
12.00	2.39	1.29	**32.25**
12.25	2.54	1.42	7.80
12.50	2.65	1.51	3.75
12.75	2.72	1.57	2.53
13.00	2.78	1.62	2.10
13.25	2.83	1.67	1.78
13.50	2.88	1.71	1.57
13.75	2.92	1.74	1.38
14.00	2.95	1.78	1.23
14.25	2.98	1.80	1.12
14.50	3.02	1.83	1.07
14.75	3.04	1.86	1.01
15.00	3.07	1.88	0.96
15.25	3.10	1.91	0.91
15.50	3.12	1.93	0.86
15.75	3.15	1.95	0.80
16.00	3.17	1.97	0.75
16.25	3.19	1.99	0.71
16.50	3.21	2.00	0.69
16.75	3.23	2.02	0.67
17.00	3.25	2.04	0.65
17.25	3.26	2.06	0.63
17.50	3.28	2.07	0.61
17.75	3.30	2.09	0.59
18.00	3.32	2.10	0.58
18.25	3.33	2.12	0.56
18.50	3.35	2.13	0.54
18.75	3.36	2.14	0.52
19.00	3.38	2.16	0.50
19.25	3.39	2.17	0.48
19.50	3.40	2.18	0.46
19.75	3.42	2.19	0.44
20.00	**3.43**	**2.20**	0.42

Summary for Link 1L: EAST PROPERTY LINE

Inflow Area = 35.120 ac, 42.08% Impervious, Inflow Depth > 2.12" for 10YR event
Inflow = 100.21 cfs @ 12.01 hrs, Volume= 6.193 af
Primary = 100.21 cfs @ 12.01 hrs, Volume= 6.193 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 1L: EAST PROPERTY LINE



Hydrograph for Link 1L: EAST PROPERTY LINE

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.16	**0.00**	0.16
5.25	0.17	0.00	0.17
5.50	0.18	0.00	0.18
5.75	0.20	0.00	0.20
6.00	0.21	0.00	0.21
6.25	0.24	0.00	0.24
6.50	0.27	0.00	0.27
6.75	0.29	0.00	0.29
7.00	0.32	0.00	0.32
7.25	0.35	0.00	0.35
7.50	0.38	0.00	0.38
7.75	0.44	0.00	0.44
8.00	0.50	0.00	0.50
8.25	0.59	0.00	0.59
8.50	0.71	0.00	0.71
8.75	0.86	0.00	0.86
9.00	1.02	0.00	1.02
9.25	1.15	0.00	1.15
9.50	1.24	0.00	1.24
9.75	1.40	0.00	1.40
10.00	1.66	0.00	1.66
10.25	2.00	0.00	2.00
10.50	2.43	0.00	2.43
10.75	3.00	0.00	3.00
11.00	3.75	0.00	3.75
11.25	4.97	0.00	4.97
11.50	6.85	0.00	6.85
11.75	25.60	0.00	25.60
12.00	**99.51**	0.00	**99.51**
12.25	33.69	0.00	33.69
12.50	14.58	0.00	14.58
12.75	9.31	0.00	9.31
13.00	7.61	0.00	7.61
13.25	6.45	0.00	6.45
13.50	5.67	0.00	5.67
13.75	5.00	0.00	5.00
14.00	4.45	0.00	4.45
14.25	4.04	0.00	4.04
14.50	3.83	0.00	3.83
14.75	3.64	0.00	3.64
15.00	3.46	0.00	3.46
15.25	3.27	0.00	3.27
15.50	3.08	0.00	3.08
15.75	2.89	0.00	2.89
16.00	2.70	0.00	2.70
16.25	2.55	0.00	2.55
16.50	2.48	0.00	2.48
16.75	2.41	0.00	2.41
17.00	2.34	0.00	2.34
17.25	2.28	0.00	2.28
17.50	2.21	0.00	2.21
17.75	2.14	0.00	2.14
18.00	2.07	0.00	2.07
18.25	2.00	0.00	2.00
18.50	1.94	0.00	1.94
18.75	1.87	0.00	1.87
19.00	1.80	0.00	1.80
19.25	1.73	0.00	1.73
19.50	1.66	0.00	1.66
19.75	1.59	0.00	1.59
20.00	1.52	0.00	1.52

Summary for Subcatchment DA-1: TO CANAL

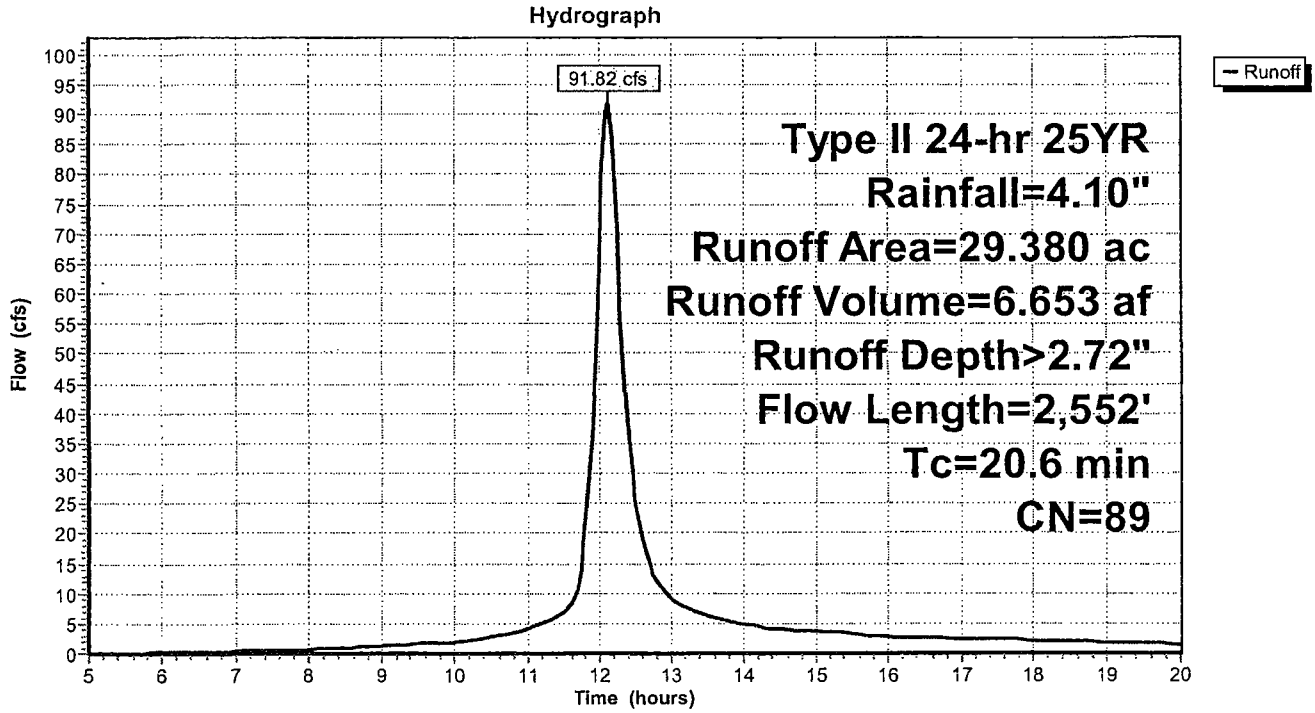
Runoff = 91.82 cfs @ 12.13 hrs, Volume= 6.653 af, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25YR Rainfall=4.10"

Area (ac)	CN	Description
14.640	79	50-75% Grass cover, Fair, HSG C
14.740	98	Water Surface, 0% imp
29.380	89	Weighted Average
29.380		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0110	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
2.7	567	0.0476	3.51		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.8	1,885	0.0196	8.32	14.71	**Circular Channel (pipe),** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
20.6	2,552	Total			

Subcatchment DA-1: TO CANAL



Hydrograph for Subcatchment DA-1: TO CANAL

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.26	0.00	0.00
5.25	0.27	0.00	0.03
5.50	0.29	0.00	0.07
5.75	0.31	0.00	0.13
6.00	0.33	0.00	0.18
6.25	0.35	0.01	0.24
6.50	0.37	0.01	0.31
6.75	0.39	0.01	0.37
7.00	0.41	0.02	0.44
7.25	0.43	0.02	0.50
7.50	0.45	0.03	0.57
7.75	0.47	0.03	0.64
8.00	0.49	0.04	0.72
8.25	0.52	0.05	0.80
8.50	0.54	0.06	0.93
8.75	0.57	0.07	1.10
9.00	0.60	0.08	1.28
9.25	0.64	0.09	1.47
9.50	0.67	0.11	1.60
9.75	0.70	0.12	1.72
10.00	0.74	0.14	1.97
10.25	0.79	0.16	2.30
10.50	0.84	0.19	2.75
10.75	0.89	0.22	3.30
11.00	0.96	0.26	4.07
11.25	1.05	0.32	5.10
11.50	1.16	0.39	6.87
11.75	1.59	0.70	14.06
12.00	2.72	1.65	**64.37**
12.25	2.90	1.81	**69.63**
12.50	3.01	1.91	25.46
12.75	3.10	1.99	13.11
13.00	3.17	2.05	9.00
13.25	3.22	2.10	7.24
13.50	3.28	2.15	6.24
13.75	3.32	2.19	5.47
14.00	3.36	2.23	4.85
14.25	3.40	2.26	4.32
14.50	3.43	2.30	4.02
14.75	3.47	2.33	3.81
15.00	3.50	2.36	3.61
15.25	3.53	2.38	3.42
15.50	3.56	2.41	3.23
15.75	3.58	2.43	3.03
16.00	3.61	2.46	2.84
16.25	3.63	2.48	2.66
16.50	3.65	2.50	2.55
16.75	3.68	2.52	2.47
17.00	3.70	2.54	2.40
17.25	3.72	2.56	2.34
17.50	3.74	2.58	2.27
17.75	3.76	2.60	2.20
18.00	3.78	2.61	2.13
18.25	3.79	2.63	2.06
18.50	3.81	2.65	1.99
18.75	3.83	2.66	1.92
19.00	3.84	2.68	1.85
19.25	3.86	2.69	1.78
19.50	3.88	2.71	1.71
19.75	3.89	2.72	1.64
20.00	**3.90**	**2.73**	1.57

Summary for Subcatchment DA-2: TO NORTH EAST PROPERTY LINE

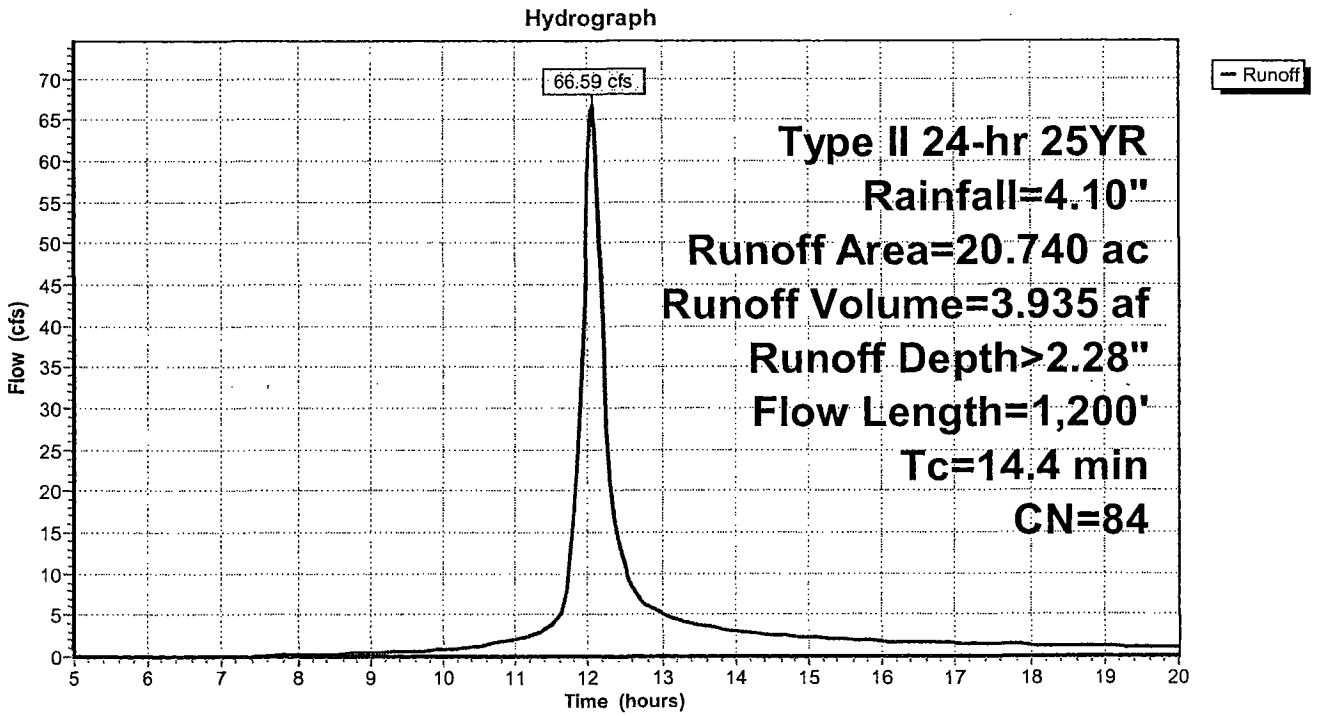
Runoff = 66.59 cfs @ 12.06 hrs, Volume= 3.935 af, Depth> 2.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25YR Rainfall=4.10"

Area (ac)	CN	Description
5.380	98	Paved parking & roofs
15.360	79	50-75% Grass cover, Fair, HSG C
20.740	84	Weighted Average
15.360		Pervious Area
5.380		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0700	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
7.7	1,100	0.0217	2.37		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.4	1,200	Total			

Subcatchment DA-2: TO NORTH EAST PROPERTY LINE



Hydrograph for Subcatchment DA-2: TO NORTH EAST PROPERTY LINE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.26	0.00	0.00
5.25	0.27	0.00	0.00
5.50	0.29	0.00	0.00
5.75	0.31	0.00	0.00
6.00	0.33	0.00	0.00
6.25	0.35	0.00	0.00
6.50	0.37	0.00	0.00
6.75	0.39	0.00	0.00
7.00	0.41	0.00	0.01
7.25	0.43	0.00	0.05
7.50	0.45	0.00	0.09
7.75	0.47	0.00	0.12
8.00	0.49	0.01	0.17
8.25	0.52	0.01	0.21
8.50	0.54	0.01	0.28
8.75	0.57	0.02	0.36
9.00	0.60	0.02	0.45
9.25	0.64	0.03	0.55
9.50	0.67	0.04	0.62
9.75	0.70	0.05	0.70
10.00	0.74	0.06	0.85
10.25	0.79	0.07	1.04
10.50	0.84	0.09	1.30
10.75	0.89	0.11	1.62
11.00	0.96	0.14	2.08
11.25	1.05	0.17	2.74
11.50	1.16	0.23	3.89
11.75	1.59	0.47	11.53
12.00	2.72	1.29	**57.65**
12.25	2.90	1.43	**27.74**
12.50	3.01	1.53	10.74
12.75	3.10	1.60	6.44
13.00	3.17	1.65	5.19
13.25	3.22	1.70	4.37
13.50	3.28	1.75	3.83
13.75	3.32	1.78	3.37
14.00	3.36	1.82	3.01
14.25	3.40	1.85	2.71
14.50	3.43	1.88	2.56
14.75	3.47	1.91	2.44
15.00	3.50	1.94	2.31
15.25	3.53	1.96	2.19
15.50	3.56	1.99	2.06
15.75	3.58	2.01	1.94
16.00	3.61	2.03	1.81
16.25	3.63	2.05	1.71
16.50	3.65	2.07	1.65
16.75	3.68	2.09	1.61
17.00	3.70	2.11	1.56
17.25	3.72	2.12	1.52
17.50	3.74	2.14	1.47
17.75	3.76	2.16	1.43
18.00	3.78	2.17	1.38
18.25	3.79	2.19	1.34
18.50	3.81	2.21	1.29
18.75	3.83	2.22	1.25
19.00	3.84	2.23	1.20
19.25	3.86	2.25	1.16
19.50	3.88	2.26	1.11
19.75	3.89	2.27	1.06
20.00	**3.90**	**2.29**	1.02

Summary for Subcatchment DA-3: TO EAST PROPERTY LINE

[49] Hint: Tc<2dt may require smaller dt

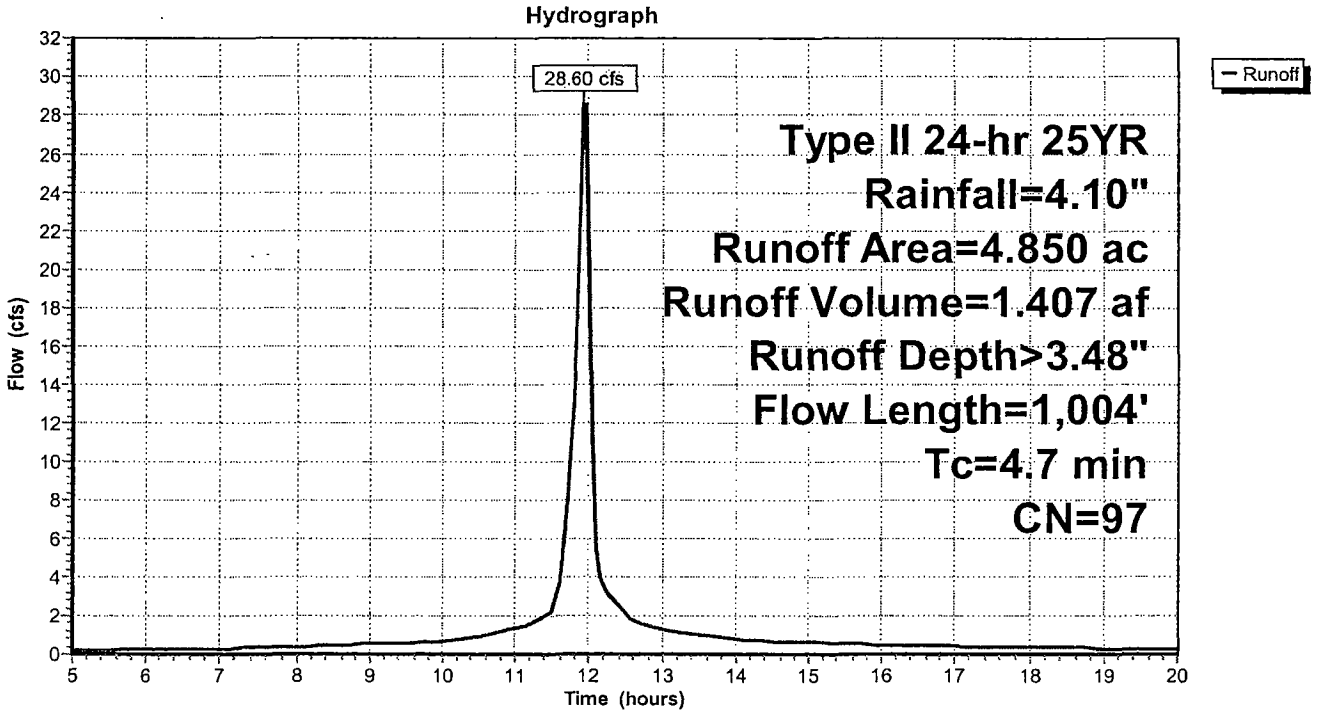
Runoff = 28.60 cfs @ 11.95 hrs, Volume= 1.407 af, Depth> 3.48"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25YR Rainfall=4.10"

Area (ac)	CN	Description
4.640	98	Paved roads w/curbs & sewers
0.210	79	50-75% Grass cover, Fair, HSG C
4.850	97	Weighted Average
0.210		Pervious Area
4.640		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	76	0.0158	1.05		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
1.5	648	0.0138	6.98	12.34	**Circular Channel (pipe),** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
2.0	280	0.0214	2.36		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.7	1,004	Total			

Subcatchment DA-3: TO EAST PROPERTY LINE



Hydrograph for Subcatchment DA-3: TO EAST PROPERTY LINE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.26	0.08	0.20
5.25	0.27	0.09	0.21
5.50	0.29	0.10	0.22
5.75	0.31	0.11	0.24
6.00	0.33	0.12	0.25
6.25	0.35	0.14	0.27
6.50	0.37	0.15	0.28
6.75	0.39	0.17	0.29
7.00	0.41	0.18	0.31
7.25	0.43	0.20	0.32
7.50	0.45	0.21	0.33
7.75	0.47	0.23	0.35
8.00	0.49	0.25	0.36
8.25	0.52	0.27	0.40
8.50	0.54	0.29	0.44
8.75	0.57	0.32	0.49
9.00	0.60	0.34	0.54
9.25	0.64	0.37	0.56
9.50	0.67	0.40	0.57
9.75	0.70	0.43	0.62
10.00	0.74	0.47	0.70
10.25	0.79	0.51	0.81
10.50	0.84	0.55	0.92
10.75	0.89	0.61	1.10
11.00	0.96	0.67	1.29
11.25	1.05	0.75	1.68
11.50	1.16	0.86	2.15
11.75	1.59	1.27	**10.45**
12.00	2.72	2.38	**22.95**
12.25	2.90	2.55	3.19
12.50	3.01	2.67	2.06
12.75	3.10	2.75	1.55
13.00	3.17	2.82	1.29
13.25	3.22	2.88	1.11
13.50	3.28	2.93	0.98
13.75	3.32	2.98	0.86
14.00	3.36	3.02	0.77
14.25	3.40	3.05	0.71
14.50	3.43	3.09	0.68
14.75	3.47	3.12	0.64
15.00	3.50	3.15	0.61
15.25	3.53	3.18	0.57
15.50	3.56	3.21	0.54
15.75	3.58	3.24	0.50
16.00	3.61	3.26	0.47
16.25	3.63	3.28	0.45
16.50	3.65	3.31	0.44
16.75	3.68	3.33	0.42
17.00	3.70	3.35	0.41
17.25	3.72	3.37	0.40
17.50	3.74	3.39	0.39
17.75	3.76	3.41	0.37
18.00	3.78	3.43	0.36
18.25	3.79	3.45	0.35
18.50	3.81	3.46	0.34
18.75	3.83	3.48	0.33
19.00	3.84	3.50	0.31
19.25	3.86	3.51	0.30
19.50	3.88	3.53	0.29
19.75	3.89	3.54	0.28
20.00	**3.90**	**3.56**	0.26

Summary for Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE

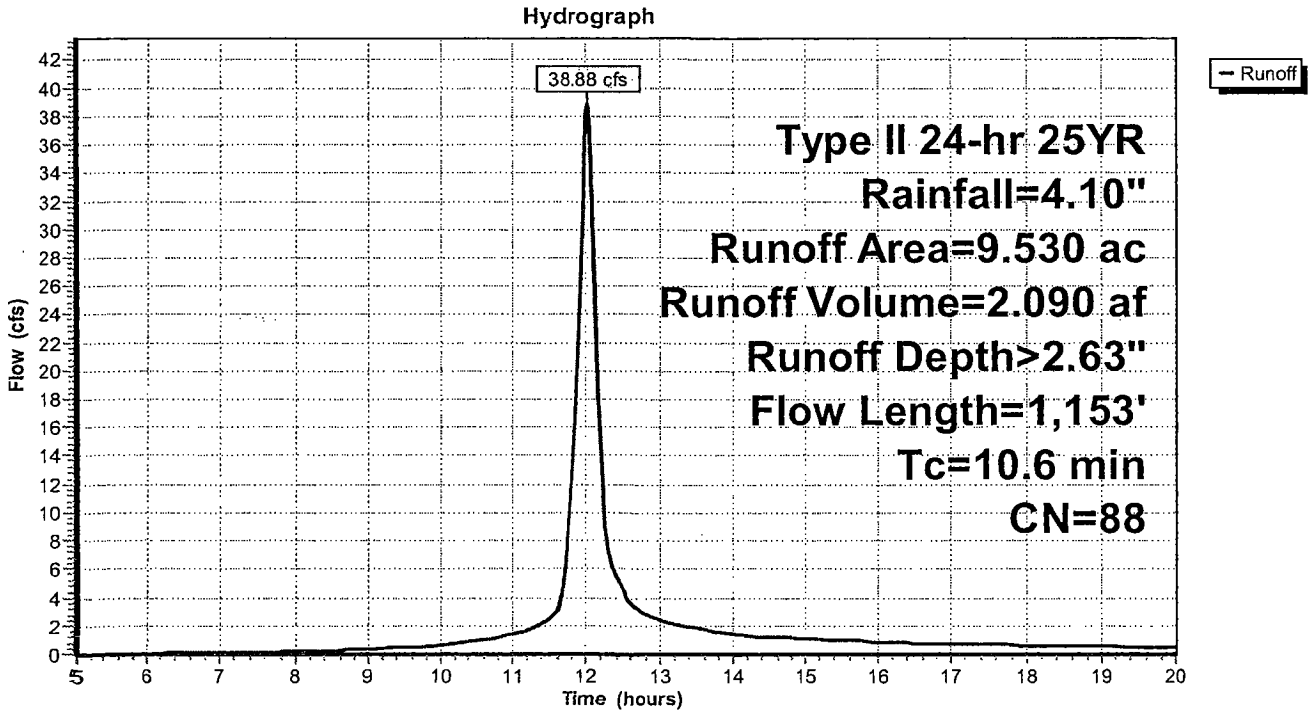
Runoff = 38.88 cfs @ 12.02 hrs, Volume= 2.090 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25YR Rainfall=4.10"

Area (ac)	CN	Description
4.760	98	Paved parking & roofs
4.770	79	50-75% Grass cover, Fair, HSG C
9.530	88	Weighted Average
4.770		Pervious Area
4.760		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0200	1.22		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
3.6	471	0.0114	2.17		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.6	582	0.0114	1.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.6	1,153	Total			

Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE



Hydrograph for Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE

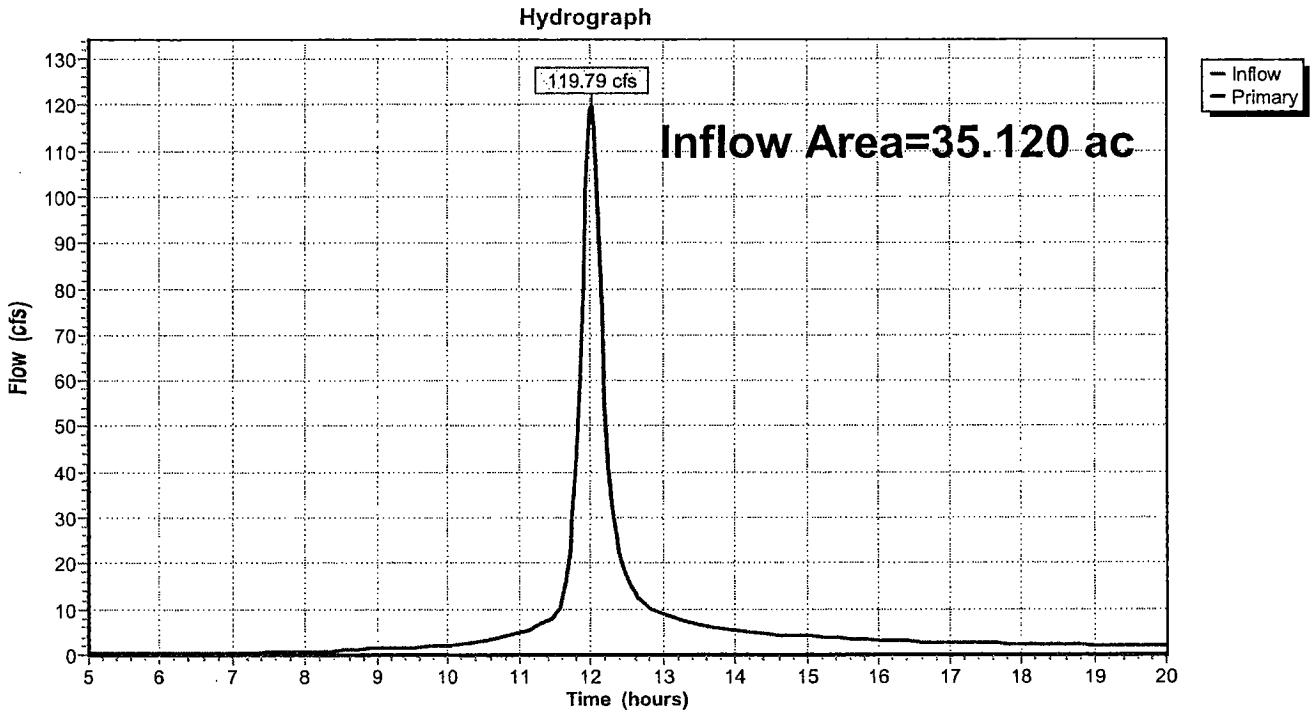
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.26	0.00	0.00
5.25	0.27	0.00	0.00
5.50	0.29	0.00	0.01
5.75	0.31	0.00	0.02
6.00	0.33	0.00	0.04
6.25	0.35	0.00	0.06
6.50	0.37	0.01	0.08
6.75	0.39	0.01	0.10
7.00	0.41	0.01	0.12
7.25	0.43	0.02	0.14
7.50	0.45	0.02	0.16
7.75	0.47	0.02	0.19
8.00	0.49	0.03	0.21
8.25	0.52	0.04	0.24
8.50	0.54	0.04	0.29
8.75	0.57	0.05	0.34
9.00	0.60	0.06	0.40
9.25	0.64	0.08	0.45
9.50	0.67	0.09	0.48
9.75	0.70	0.10	0.54
10.00	0.74	0.12	0.63
10.25	0.79	0.14	0.76
10.50	0.84	0.16	0.91
10.75	0.89	0.19	1.12
11.00	0.96	0.23	1.39
11.25	1.05	0.28	1.82
11.50	1.16	0.35	2.50
11.75	1.59	0.64	9.14
12.00	2.72	1.57	**38.33**
12.25	2.90	1.73	9.16
12.50	3.01	1.83	4.39
12.75	3.10	1.90	2.95
13.00	3.17	1.97	2.45
13.25	3.22	2.02	2.08
13.50	3.28	2.07	1.83
13.75	3.32	2.11	1.61
14.00	3.36	2.14	1.44
14.25	3.40	2.18	1.30
14.50	3.43	2.21	1.24
14.75	3.47	2.24	1.18
15.00	3.50	2.27	1.12
15.25	3.53	2.30	1.06
15.50	3.56	2.32	0.99
15.75	3.58	2.34	0.93
16.00	3.61	2.37	0.87
16.25	3.63	2.39	0.82
16.50	3.65	2.41	0.80
16.75	3.68	2.43	0.78
17.00	3.70	2.45	0.76
17.25	3.72	2.47	0.73
17.50	3.74	2.49	0.71
17.75	3.76	2.50	0.69
18.00	3.78	2.52	0.67
18.25	3.79	2.54	0.65
18.50	3.81	2.55	0.62
18.75	3.83	2.57	0.60
19.00	3.84	2.59	0.58
19.25	3.86	2.60	0.56
19.50	3.88	2.61	0.53
19.75	3.89	2.63	0.51
20.00	**3.90**	**2.64**	0.49

Summary for Link 1L: EAST PROPERTY LINE

Inflow Area = 35.120 ac, 42.08% Impervious, Inflow Depth > 2.54" for 25YR event
Inflow = 119.79 cfs @ 12.02 hrs, Volume= 7.432 af
Primary = 119.79 cfs @ 12.02 hrs, Volume= 7.432 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 1L: EAST PROPERTY LINE



Hydrograph for Link 1L: EAST PROPERTY LINE

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.20	**0.00**	0.20	18.50	2.25	0.00	2.25
5.25	0.21	0.00	0.21	18.75	2.17	0.00	2.17
5.50	0.23	0.00	0.23	19.00	2.09	0.00	2.09
5.75	0.26	0.00	0.26	19.25	2.01	0.00	2.01
6.00	0.29	0.00	0.29	19.50	1.93	0.00	1.93
6.25	0.33	0.00	0.33	19.75	1.85	0.00	1.85
6.50	0.36	0.00	0.36	20.00	1.77	0.00	1.77
6.75	0.39	0.00	0.39				
7.00	0.44	0.00	0.44				
7.25	0.51	0.00	0.51				
7.50	0.58	0.00	0.58				
7.75	0.66	0.00	0.66				
8.00	0.73	0.00	0.73				
8.25	0.85	0.00	0.85				
8.50	1.01	0.00	1.01				
8.75	1.19	0.00	1.19				
9.00	1.39	0.00	1.39				
9.25	1.56	0.00	1.56				
9.50	1.67	0.00	1.67				
9.75	1.86	0.00	1.86				
10.00	2.18	0.00	2.18				
10.25	2.60	0.00	2.60				
10.50	3.13	0.00	3.13				
10.75	3.83	0.00	3.83				
11.00	4.76	0.00	4.76				
11.25	6.24	0.00	6.24				
11.50	8.54	0.00	8.54				
11.75	31.12	0.00	31.12				
12.00	**118.93**	0.00	**118.93**				
12.25	40.09	0.00	40.09				
12.50	17.18	0.00	17.18				
12.75	10.94	0.00	10.94				
13.00	8.93	0.00	8.93				
13.25	7.56	0.00	7.56				
13.50	6.64	0.00	6.64				
13.75	5.85	0.00	5.85				
14.00	5.21	0.00	5.21				
14.25	4.72	0.00	4.72				
14.50	4.48	0.00	4.48				
14.75	4.26	0.00	4.26				
15.00	4.04	0.00	4.04				
15.25	3.82	0.00	3.82				
15.50	3.60	0.00	3.60				
15.75	3.38	0.00	3.38				
16.00	3.15	0.00	3.15				
16.25	2.98	0.00	2.98				
16.50	2.89	0.00	2.89				
16.75	2.81	0.00	2.81				
17.00	2.73	0.00	2.73				
17.25	2.65	0.00	2.65				
17.50	2.57	0.00	2.57				
17.75	2.49	0.00	2.49				
18.00	2.41	0.00	2.41				
18.25	2.33	0.00	2.33				

Summary for Subcatchment DA-1: TO CANAL

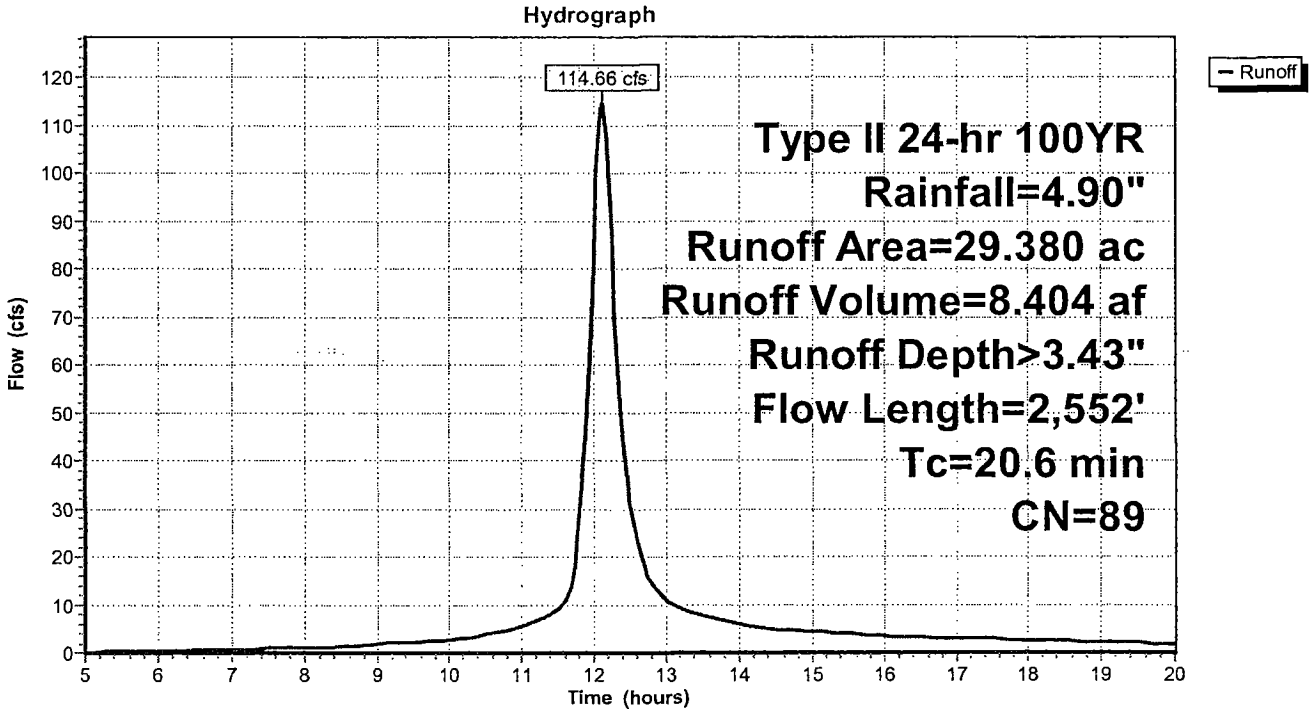
Runoff = 114.66 cfs @ 12.13 hrs, Volume= 8.404 af, Depth> 3.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR Rainfall=4.90"

Area (ac)	CN	Description
14.640	79	50-75% Grass cover, Fair, HSG C
14.740	98	Water Surface, 0% imp
29.380	89	Weighted Average
29.380		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0110	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
2.7	567	0.0476	3.51		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.8	1,885	0.0196	8.32	14.71	**Circular Channel (pipe),** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
20.6	2,552	Total			

Subcatchment DA-1: TO CANAL



Hydrograph for Subcatchment DA-1: TO CANAL

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.31	0.00	0.13
5.25	0.33	0.01	0.20
5.50	0.35	0.01	0.27
5.75	0.37	0.01	0.34
6.00	0.39	0.02	0.42
6.25	0.41	0.02	0.50
6.50	0.44	0.03	0.58
6.75	0.46	0.03	0.66
7.00	0.49	0.04	0.75
7.25	0.51	0.05	0.84
7.50	0.54	0.05	0.93
7.75	0.56	0.06	1.02
8.00	0.59	0.07	1.11
8.25	0.62	0.08	1.22
8.50	0.65	0.10	1.40
8.75	0.68	0.11	1.62
9.00	0.72	0.13	1.87
9.25	0.76	0.15	2.12
9.50	0.80	0.17	2.28
9.75	0.84	0.19	2.43
10.00	0.89	0.22	2.75
10.25	0.94	0.25	3.19
10.50	1.00	0.28	3.77
10.75	1.07	0.33	4.48
11.00	1.15	0.38	5.48
11.25	1.25	0.45	6.79
11.50	1.39	0.55	9.06
11.75	1.90	0.94	18.26
12.00	3.25	2.13	**81.29**
12.25	3.46	2.32	**86.52**
12.50	3.60	2.45	31.43
12.75	3.70	2.54	16.10
13.00	3.78	2.62	11.02
13.25	3.85	2.69	8.86
13.50	3.92	2.74	7.63
13.75	3.97	2.79	6.68
14.00	4.02	2.84	5.92
14.25	4.06	2.88	5.27
14.50	4.10	2.92	4.90
14.75	4.14	2.96	4.64
15.00	4.18	2.99	4.41
15.25	4.22	3.03	4.17
15.50	4.25	3.06	3.93
15.75	4.28	3.09	3.70
16.00	4.31	3.12	3.46
16.25	4.34	3.14	3.24
16.50	4.37	3.17	3.11
16.75	4.39	3.19	3.01
17.00	4.42	3.22	2.93
17.25	4.44	3.24	2.84
17.50	4.47	3.26	2.76
17.75	4.49	3.29	2.67
18.00	4.51	3.31	2.59
18.25	4.53	3.33	2.50
18.50	4.56	3.35	2.42
18.75	4.58	3.37	2.33
19.00	4.59	3.39	2.25
19.25	4.61	3.40	2.16
19.50	4.63	3.42	2.08
19.75	4.65	3.44	1.99
20.00	**4.66**	**3.45**	1.91

Summary for Subcatchment DA-2: TO NORTH EAST PROPERTY LINE

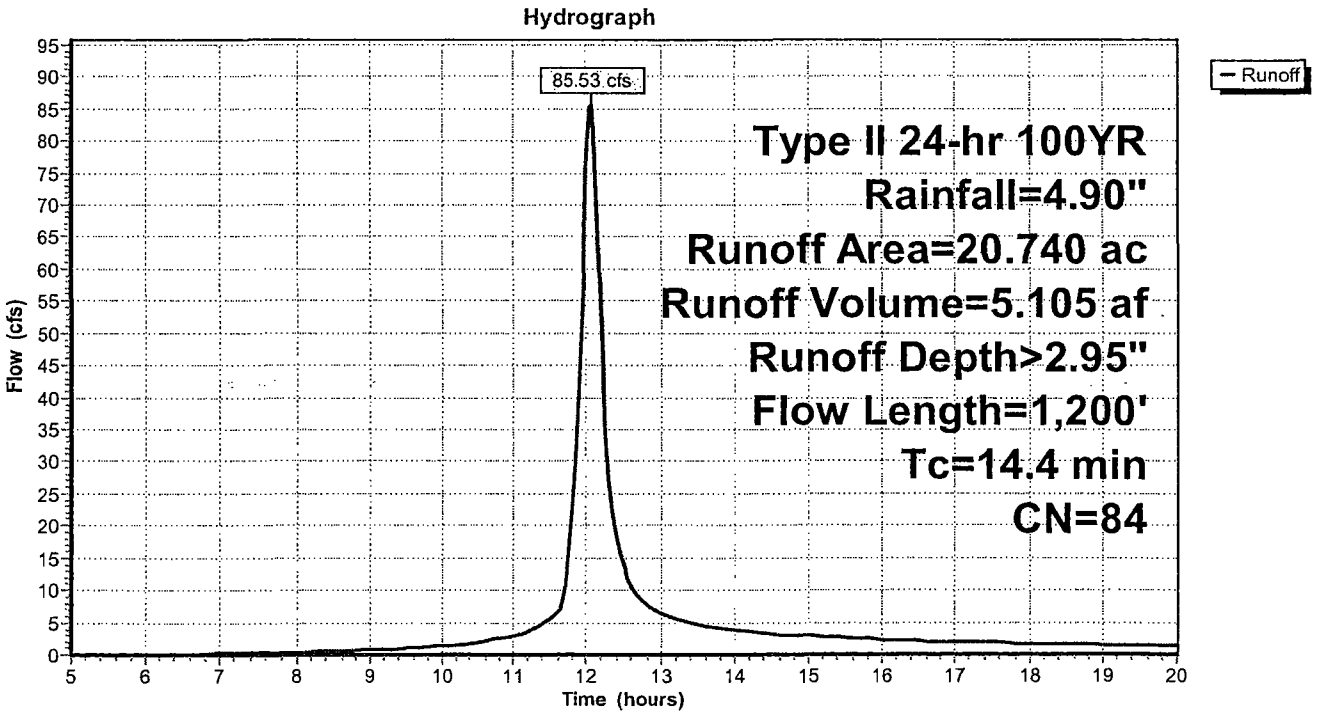
Runoff = 85.53 cfs @ 12.06 hrs, Volume= 5.105 af, Depth> 2.95"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR Rainfall=4.90"

Area (ac)	CN	Description
5.380	98	Paved parking & roofs
15.360	79	50-75% Grass cover, Fair, HSG C
20.740	84	Weighted Average
15.360		Pervious Area
5.380		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0700	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
7.7	1,100	0.0217	2.37		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.4	1,200	Total			

Subcatchment DA-2: TO NORTH EAST PROPERTY LINE



Hydrograph for Subcatchment DA-2: TO NORTH EAST PROPERTY LINE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.31	0.00	0.00
5.25	0.33	0.00	0.00
5.50	0.35	0.00	0.00
5.75	0.37	0.00	0.00
6.00	0.39	0.00	0.00
6.25	0.41	0.00	0.03
6.50	0.44	0.00	0.07
6.75	0.46	0.00	0.12
7.00	0.49	0.01	0.16
7.25	0.51	0.01	0.21
7.50	0.54	0.01	0.26
7.75	0.56	0.02	0.32
8.00	0.59	0.02	0.37
8.25	0.62	0.03	0.44
8.50	0.65	0.03	0.54
8.75	0.68	0.04	0.65
9.00	0.72	0.05	0.79
9.25	0.76	0.06	0.92
9.50	0.80	0.08	1.00
9.75	0.84	0.09	1.11
10.00	0.89	0.11	1.32
10.25	0.94	0.13	1.59
10.50	1.00	0.15	1.94
10.75	1.07	0.18	2.39
11.00	1.15	0.22	3.01
11.25	1.25	0.27	3.90
11.50	1.39	0.35	5.43
11.75	1.90	0.67	15.68
12.00	3.25	1.72	**74.70**
12.25	3.46	1.90	**35.21**
12.50	3.60	2.02	13.49
12.75	3.70	2.11	8.05
13.00	3.78	2.18	6.48
13.25	3.85	2.24	5.44
13.50	3.92	2.30	4.78
13.75	3.97	2.34	4.20
14.00	4.02	2.39	3.74
14.25	4.06	2.43	3.36
14.50	4.10	2.46	3.18
14.75	4.14	2.50	3.02
15.00	4.18	2.53	2.87
15.25	4.22	2.56	2.71
15.50	4.25	2.59	2.56
15.75	4.28	2.62	2.40
16.00	4.31	2.65	2.25
16.25	4.34	2.67	2.11
16.50	4.37	2.70	2.05
16.75	4.39	2.72	1.99
17.00	4.42	2.74	1.93
17.25	4.44	2.77	1.88
17.50	4.47	2.79	1.82
17.75	4.49	2.81	1.77
18.00	4.51	2.83	1.71
18.25	4.53	2.85	1.65
18.50	4.56	2.87	1.60
18.75	4.58	2.88	1.54
19.00	4.59	2.90	1.48
19.25	4.61	2.92	1.43
19.50	4.63	2.94	1.37
19.75	4.65	2.95	1.31
20.00	**4.66**	**2.97**	1.26

Summary for Subcatchment DA-3: TO EAST PROPERTY LINE

[49] Hint: Tc<2dt may require smaller dt

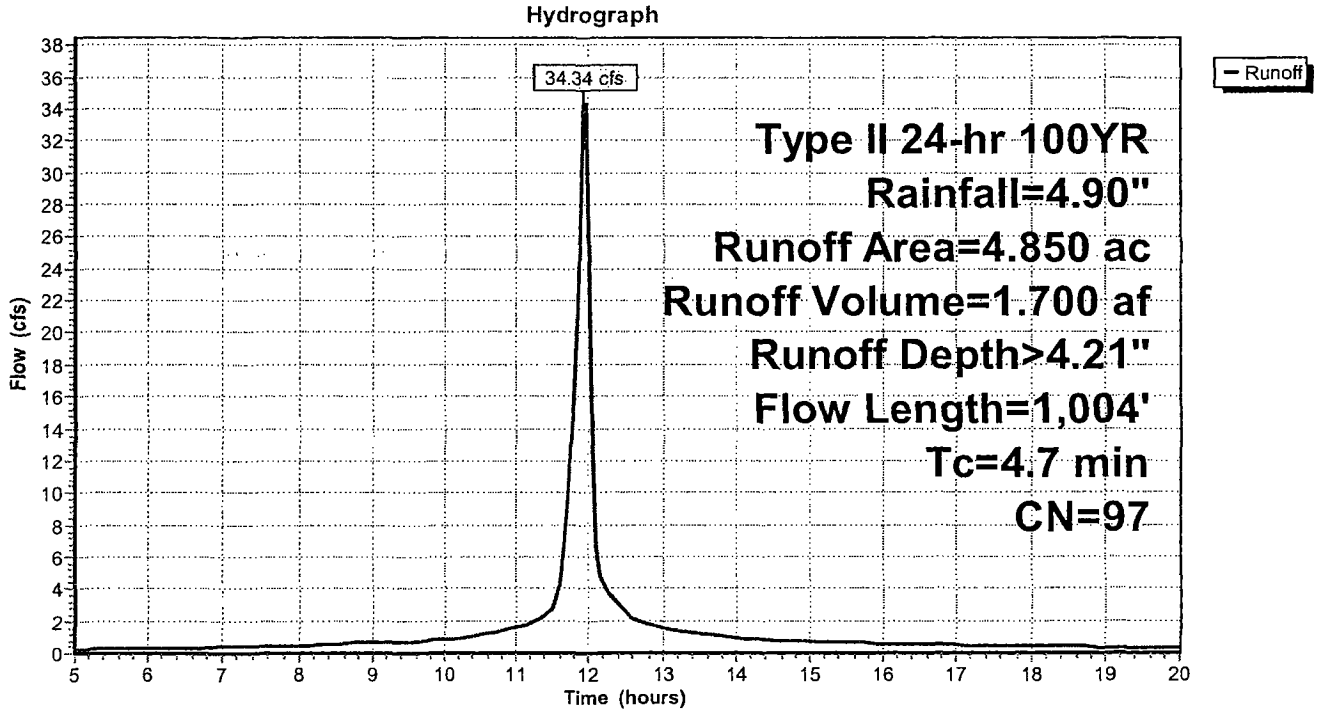
Runoff = 34.34 cfs @ 11.95 hrs, Volume= 1.700 af, Depth> 4.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR Rainfall=4.90"

Area (ac)	CN	Description
4.640	98	Paved roads w/curbs & sewers
0.210	79	50-75% Grass cover, Fair, HSG C
4.850	97	Weighted Average
0.210		Pervious Area
4.640		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	76	0.0158	1.05		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
1.5	648	0.0138	6.98	12.34	**Circular Channel (pipe),** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
2.0	280	0.0214	2.36		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.7	1,004	Total			

Subcatchment DA-3: TO EAST PROPERTY LINE



Hydrograph for Subcatchment DA-3: TO EAST PROPERTY LINE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.31	0.11	0.26
5.25	0.33	0.12	0.28
5.50	0.35	0.14	0.29
5.75	0.37	0.15	0.31
6.00	0.39	0.17	0.33
6.25	0.41	0.19	0.34
6.50	0.44	0.21	0.36
6.75	0.46	0.22	0.37
7.00	0.49	0.24	0.39
7.25	0.51	0.27	0.40
7.50	0.54	0.29	0.42
7.75	0.56	0.31	0.44
8.00	0.59	0.33	0.45
8.25	0.62	0.36	0.50
8.50	0.65	0.38	0.55
8.75	0.68	0.41	0.61
9.00	0.72	0.45	0.67
9.25	0.76	0.48	0.69
9.50	0.80	0.52	0.70
9.75	0.84	0.56	0.77
10.00	0.89	0.60	0.86
10.25	0.94	0.65	0.99
10.50	1.00	0.71	1.13
10.75	1.07	0.77	1.34
11.00	1.15	0.85	1.57
11.25	1.25	0.95	2.04
11.50	1.39	1.07	2.61
11.75	1.90	1.57	**12.61**
12.00	3.25	2.90	**27.53**
12.25	3.46	3.11	3.82
12.50	3.60	3.26	2.47
12.75	3.70	3.35	1.85
13.00	3.78	3.44	1.54
13.25	3.85	3.51	1.34
13.50	3.92	3.57	1.17
13.75	3.97	3.62	1.04
14.00	4.02	3.67	0.92
14.25	4.06	3.71	0.85
14.50	4.10	3.76	0.81
14.75	4.14	3.79	0.77
15.00	4.18	3.83	0.73
15.25	4.22	3.87	0.69
15.50	4.25	3.90	0.64
15.75	4.28	3.93	0.60
16.00	4.31	3.96	0.56
16.25	4.34	3.99	0.54
16.50	4.37	4.02	0.52
16.75	4.39	4.04	0.51
17.00	4.42	4.07	0.49
17.25	4.44	4.09	0.48
17.50	4.47	4.12	0.46
17.75	4.49	4.14	0.45
18.00	4.51	4.16	0.43
18.25	4.53	4.18	0.42
18.50	4.56	4.20	0.40
18.75	4.58	4.22	0.39
19.00	4.59	4.24	0.37
19.25	4.61	4.26	0.36
19.50	4.63	4.28	0.34
19.75	4.65	4.30	0.33
20.00	**4.66**	**4.31**	0.31

Summary for Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE

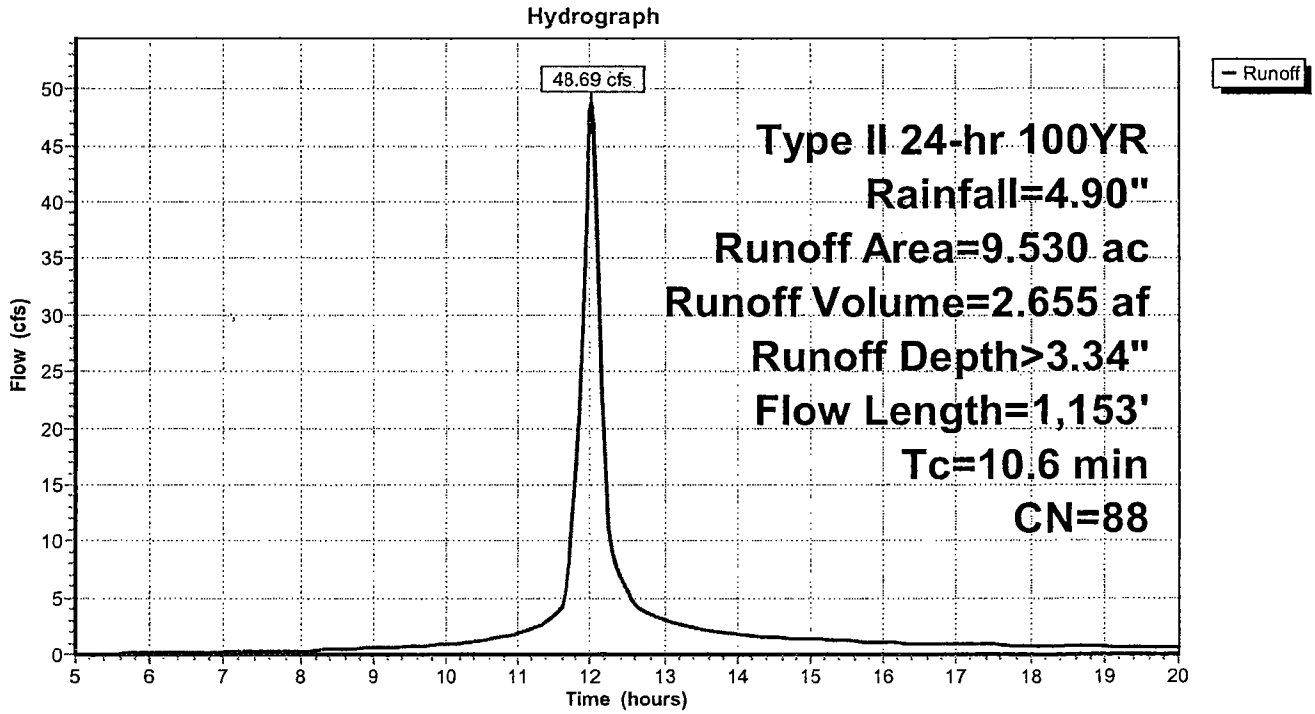
Runoff = 48.69 cfs @ 12.02 hrs, Volume= 2.655 af, Depth> 3.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR Rainfall=4.90"

Area (ac)	CN	Description
4.760	98	Paved parking & roofs
4.770	79	50-75% Grass cover, Fair, HSG C
9.530	88	Weighted Average
4.770		Pervious Area
4.760		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0200	1.22		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
3.6	471	0.0114	2.17		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.6	582	0.0114	1.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.6	1,153	Total			

Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE



Hydrograph for Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE

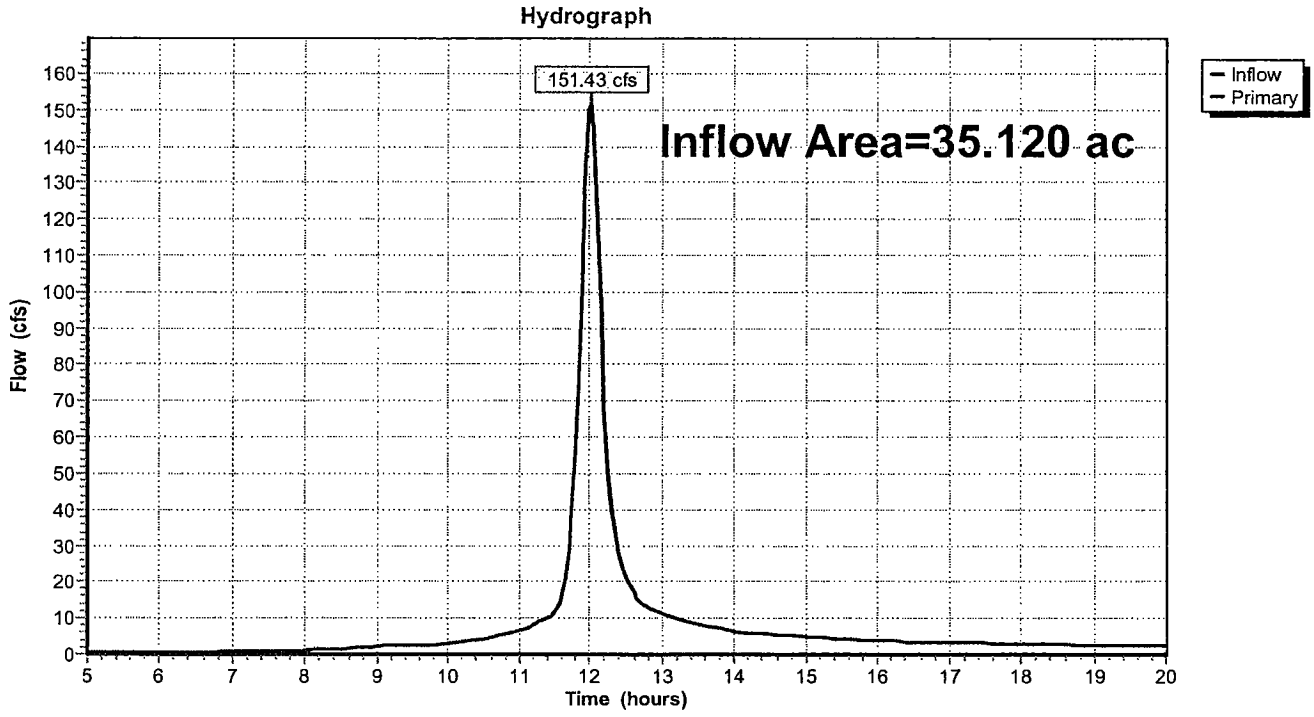
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.31	0.00	0.02
5.25	0.33	0.00	0.05
5.50	0.35	0.00	0.07
5.75	0.37	0.01	0.09
6.00	0.39	0.01	0.11
6.25	0.41	0.01	0.14
6.50	0.44	0.02	0.17
6.75	0.46	0.02	0.19
7.00	0.49	0.03	0.22
7.25	0.51	0.04	0.25
7.50	0.54	0.04	0.27
7.75	0.56	0.05	0.30
8.00	0.59	0.06	0.33
8.25	0.62	0.07	0.38
8.50	0.65	0.08	0.44
8.75	0.68	0.09	0.52
9.00	0.72	0.11	0.60
9.25	0.76	0.13	0.66
9.50	0.80	0.15	0.70
9.75	0.84	0.17	0.77
10.00	0.89	0.19	0.90
10.25	0.94	0.22	1.06
10.50	1.00	0.25	1.26
10.75	1.07	0.29	1.53
11.00	1.15	0.34	1.89
11.25	1.25	0.41	2.44
11.50	1.39	0.50	3.31
11.75	1.90	0.88	11.88
12.00	3.25	2.04	**48.09**
12.25	3.46	2.23	11.35
12.50	3.60	2.36	5.40
12.75	3.70	2.45	3.63
13.00	3.78	2.53	3.01
13.25	3.85	2.59	2.55
13.50	3.92	2.65	2.25
13.75	3.97	2.70	1.98
14.00	4.02	2.75	1.76
14.25	4.06	2.79	1.60
14.50	4.10	2.83	1.52
14.75	4.14	2.86	1.44
15.00	4.18	2.90	1.37
15.25	4.22	2.93	1.29
15.50	4.25	2.96	1.22
15.75	4.28	2.99	1.14
16.00	4.31	3.02	1.06
16.25	4.34	3.05	1.01
16.50	4.37	3.07	0.98
16.75	4.39	3.10	0.95
17.00	4.42	3.12	0.92
17.25	4.44	3.14	0.90
17.50	4.47	3.17	0.87
17.75	4.49	3.19	0.84
18.00	4.51	3.21	0.82
18.25	4.53	3.23	0.79
18.50	4.56	3.25	0.76
18.75	4.58	3.27	0.73
19.00	4.59	3.29	0.71
19.25	4.61	3.30	0.68
19.50	4.63	3.32	0.65
19.75	4.65	3.34	0.62
20.00	**4.66**	**3.35**	0.60

Summary for Link 1L: EAST PROPERTY LINE

Inflow Area = 35.120 ac, 42.08% Impervious, Inflow Depth > 3.23" for 100YR event
Inflow = 151.43 cfs @ 12.02 hrs, Volume= 9.459 af
Primary = 151.43 cfs @ 12.02 hrs, Volume= 9.459 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 1L: EAST PROPERTY LINE

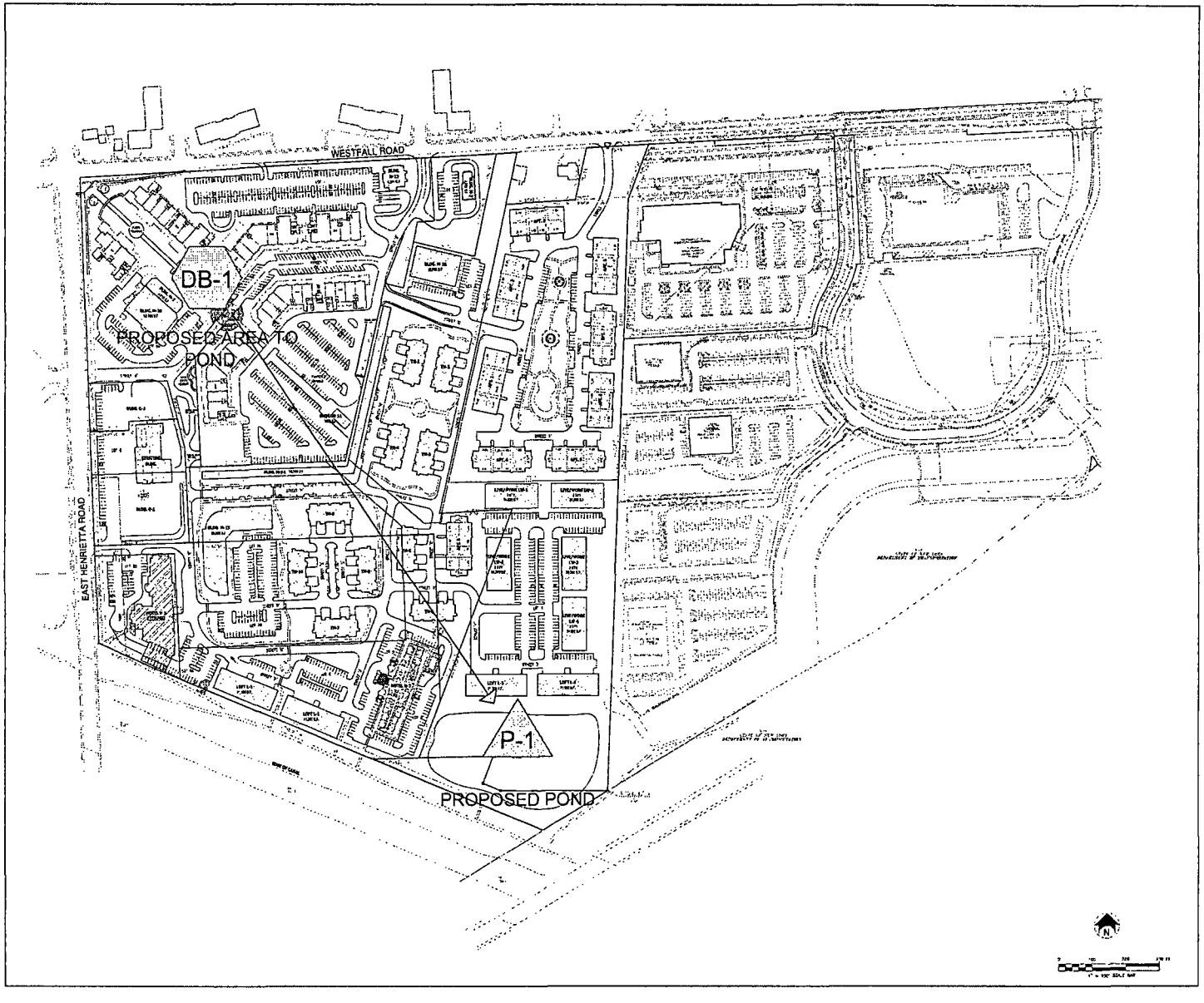


Hydrograph for Link 1L: EAST PROPERTY LINE

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.28	**0.00**	0.28
5.25	0.32	0.00	0.32
5.50	0.36	0.00	0.36
5.75	0.40	0.00	0.40
6.00	0.44	0.00	0.44
6.25	0.51	0.00	0.51
6.50	0.59	0.00	0.59
6.75	0.68	0.00	0.68
7.00	0.77	0.00	0.77
7.25	0.86	0.00	0.86
7.50	0.96	0.00	0.96
7.75	1.06	0.00	1.06
8.00	1.15	0.00	1.15
8.25	1.31	0.00	1.31
8.50	1.53	0.00	1.53
8.75	1.78	0.00	1.78
9.00	2.05	0.00	2.05
9.25	2.27	0.00	2.27
9.50	2.40	0.00	2.40
9.75	2.65	0.00	2.65
10.00	3.08	0.00	3.08
10.25	3.63	0.00	3.63
10.50	4.33	0.00	4.33
10.75	5.25	0.00	5.25
11.00	6.47	0.00	6.47
11.25	8.38	0.00	8.38
11.50	11.35	0.00	11.35
11.75	40.17	0.00	40.17
12.00	**150.32**	0.00	**150.32**
12.25	50.38	0.00	50.38
12.50	21.36	0.00	21.36
12.75	13.53	0.00	13.53
13.00	11.04	0.00	11.04
13.25	9.33	0.00	9.33
13.50	8.19	0.00	8.19
13.75	7.21	0.00	7.21
14.00	6.41	0.00	6.41
14.25	5.81	0.00	5.81
14.50	5.51	0.00	5.51
14.75	5.24	0.00	5.24
15.00	4.96	0.00	4.96
15.25	4.69	0.00	4.69
15.50	4.42	0.00	4.42
15.75	4.15	0.00	4.15
16.00	3.87	0.00	3.87
16.25	3.66	0.00	3.66
16.50	3.55	0.00	3.55
16.75	3.45	0.00	3.45
17.00	3.35	0.00	3.35
17.25	3.25	0.00	3.25
17.50	3.16	0.00	3.16
17.75	3.06	0.00	3.06
18.00	2.96	0.00	2.96
18.25	2.86	0.00	2.86
18.50	2.76	0.00	2.76
18.75	2.66	0.00	2.66
19.00	2.57	0.00	2.57
19.25	2.47	0.00	2.47
19.50	2.37	0.00	2.37
19.75	2.27	0.00	2.27
20.00	2.17	0.00	2.17

Appendix B

Proposed Drainage Conditions Map And Hydrograph Reports



CITYGATE

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County of Monroe
State of New York

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Engineers / Architects / Planners / Surveyors

REVISIONS

NO.	DATE	DESCRIPTION	SEE	DWG

CONCEPTUAL SITE PLAN

CP-27

Subcat Reach Pond Link

Drainage Diagram for PROPOSEDCP27

Prepared by Bergmann Associates, Printed 7/28/2008

Summary for Subcatchment DB-1: PROPOSED AREA TO POND

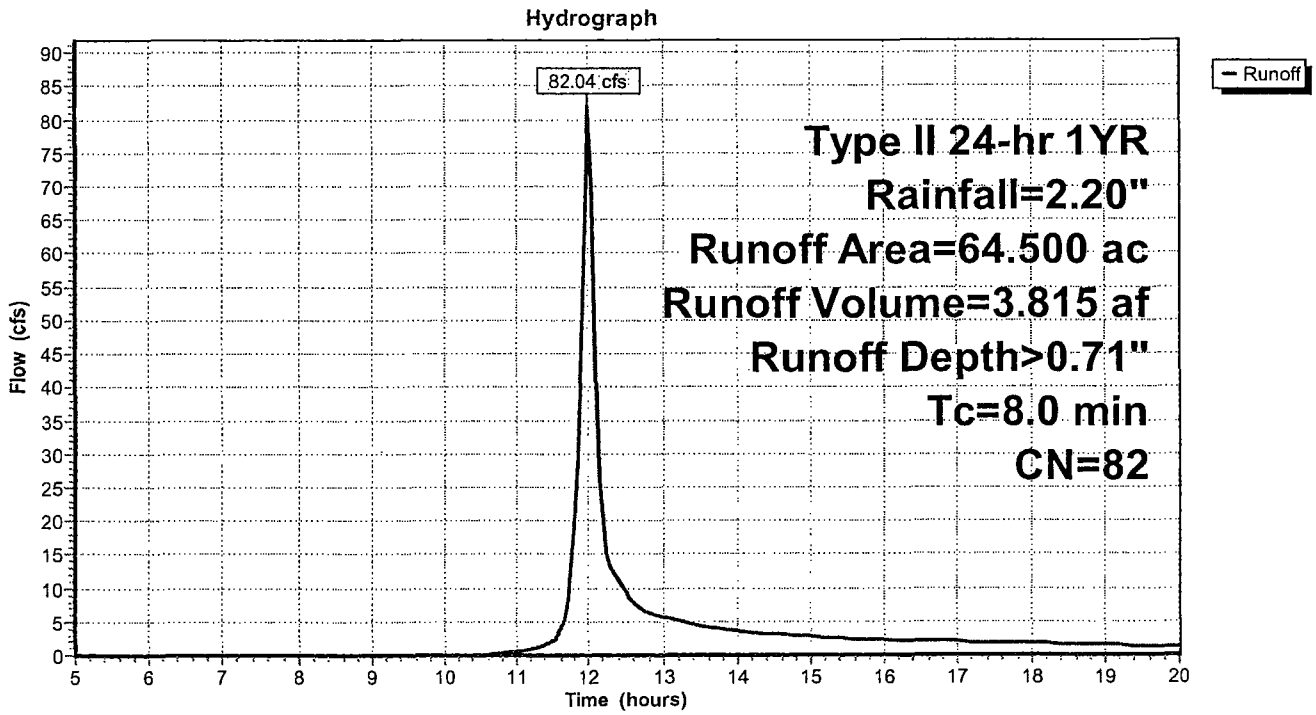
Runoff = 82.04 cfs @ 12.00 hrs, Volume= 3.815 af, Depth> 0.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1YR Rainfall=2.20"

	Area (ac)	CN	Description
	13.774	98	Paved parking & roofs
	21.521	98	Paved parking & roofs
	27.717	61	>75% Grass cover, Good, HSG B
*	1.488	98	
	64.500	82	Weighted Average
	27.717		Pervious Area
	36.783		Impervious Area

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

Subcatchment DB-1: PROPOSED AREA TO POND



Hydrograph for Subcatchment DB-1: PROPOSED AREA TO POND

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.14	0.00	0.00
5.25	0.15	0.00	0.00
5.50	0.16	0.00	0.00
5.75	0.17	0.00	0.00
6.00	0.18	0.00	0.00
6.25	0.19	0.00	0.00
6.50	0.20	0.00	0.00
6.75	0.21	0.00	0.00
7.00	0.22	0.00	0.00
7.25	0.23	0.00	0.00
7.50	0.24	0.00	0.00
7.75	0.25	0.00	0.00
8.00	0.26	0.00	0.00
8.25	0.28	0.00	0.00
8.50	0.29	0.00	0.00
8.75	0.31	0.00	0.00
9.00	0.32	0.00	0.00
9.25	0.34	0.00	0.00
9.50	0.36	0.00	0.00
9.75	0.38	0.00	0.00
10.00	0.40	0.00	0.00
10.25	0.42	0.00	0.00
10.50	0.45	0.00	0.01
10.75	0.48	0.00	0.19
11.00	0.52	0.00	0.50
11.25	0.56	0.01	1.03
11.50	0.62	0.01	1.96
11.75	0.85	0.07	12.99
12.00	1.46	0.32	**82.04**
12.25	1.55	0.38	15.25
12.50	1.62	0.41	9.37
12.75	1.66	0.44	6.73
13.00	1.70	0.46	5.71
13.25	1.73	0.48	4.94
13.50	1.76	0.49	4.38
13.75	1.78	0.51	3.90
14.00	1.80	0.52	3.49
14.25	1.82	0.54	3.22
14.50	1.84	0.55	3.08
14.75	1.86	0.56	2.94
15.00	1.88	0.57	2.80
15.25	1.89	0.58	2.65
15.50	1.91	0.59	2.51
15.75	1.92	0.60	2.36
16.00	1.94	0.61	2.20
16.25	1.95	0.62	2.10
16.50	1.96	0.62	2.05
16.75	1.97	0.63	2.00
17.00	1.98	0.64	1.95
17.25	1.99	0.65	1.90
17.50	2.01	0.65	1.84
17.75	2.02	0.66	1.79
18.00	2.03	0.67	1.74
18.25	2.04	0.67	1.68
18.50	2.05	0.68	1.63
18.75	2.05	0.68	1.57
19.00	2.06	0.69	1.51
19.25	2.07	0.70	1.46
19.50	2.08	0.70	1.40
19.75	2.09	0.71	1.34
20.00	**2.09**	**0.71**	1.28

Summary for Pond P-1: PROPOSED POND

4.05 ACRE-FT REQUIRED AT 110 CFS DISCHARGE

Inflow Area =	64.500 ac, 57.03% Impervious, Inflow Depth >	0.71"	for 1YR event	
Inflow =	82.04 cfs @	12.00 hrs, Volume=	3.815 af	
Outflow =	1.19 cfs @	20.00 hrs, Volume=	0.754 af, Atten= 99%, Lag= 480.0 min	
Primary =	0.60 cfs @	20.00 hrs, Volume=	0.377 af	
Secondary =	0.60 cfs @	20.00 hrs, Volume=	0.377 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 515.00' Surf.Area= 56,413 sf Storage= 240,139 cf
Peak Elev= 517.18' @ 20.00 hrs Surf.Area= 65,961 sf Storage= 373,469 cf (133,331 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 160.6 min (966.6 - 806.0)

Volume	Invert	Avail.Storage	Storage Description
#1	508.50'	576,976 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

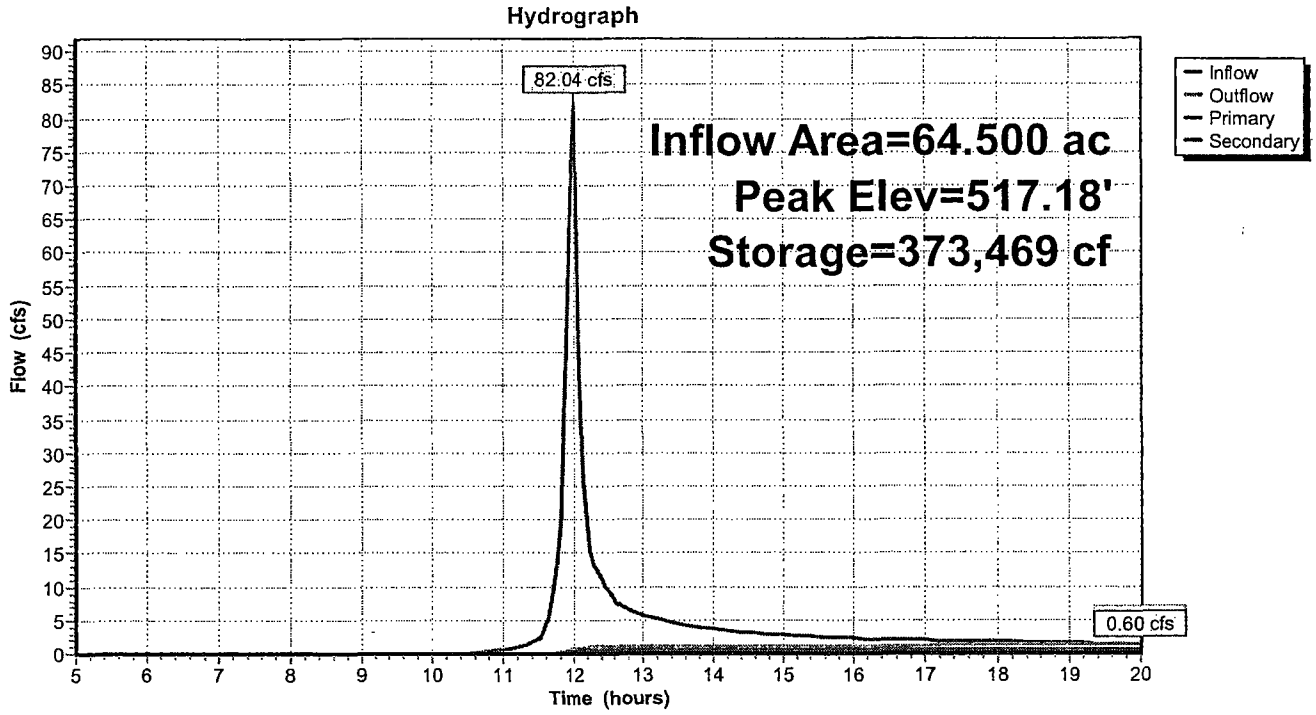
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
508.50	24,824	0	0
513.50	41,775	166,498	166,498
515.00	56,413	73,641	240,139
520.00	78,322	336,838	576,976

Device	Routing	Invert	Outlet Devices
#1	Primary	515.00'	**36.0" x 100.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 514.00' S= 0.0100 '/' Cc= 0.900 n= 0.013
#2	Secondary	515.00'	**36.0" x 100.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 514.00' S= 0.0100 '/' Cc= 0.900 n= 0.013
#3	Device 1	515.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	515.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#6	Device 2	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#7	Device 1	517.25'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 2.50 Width (feet) 3.00 3.00
#8	Device 2	517.25'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 2.50 Width (feet) 3.00 3.00

Primary OutFlow Max=0.60 cfs @ 20.00 hrs HW=517.18' (Free Discharge)
↑—**1=Culvert** (Passes 0.60 cfs of 26.61 cfs potential flow)
↑—**3=Orifice/Grate** (Orifice Controls 0.60 cfs @ 6.83 fps)
—**5=Orifice/Grate** (Controls 0.00 cfs)
—**7=Custom Weir/Orifice** (Controls 0.00 cfs)

Secondary OutFlow Max=0.60 cfs @ 20.00 hrs HW=517.18' (Free Discharge)
↑—**2=Culvert** (Passes 0.60 cfs of 26.61 cfs potential flow)
↑—**4=Orifice/Grate** (Orifice Controls 0.60 cfs @ 6.83 fps)
—**6=Orifice/Grate** (Controls 0.00 cfs)
—**8=Custom Weir/Orifice** (Controls 0.00 cfs)

Pond P-1: PROPOSED POND



Hydrograph for Pond P-1: PROPOSED POND

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	240,139	515.00	0.00	0.00	0.00
5.50	0.00	240,139	515.00	0.00	0.00	0.00
6.00	0.00	240,139	515.00	0.00	0.00	0.00
6.50	0.00	240,139	515.00	0.00	0.00	0.00
7.00	0.00	240,139	515.00	0.00	0.00	0.00
7.50	0.00	240,139	515.00	0.00	0.00	0.00
8.00	0.00	240,139	515.00	0.00	0.00	0.00
8.50	0.00	240,139	515.00	0.00	0.00	0.00
9.00	0.00	240,139	515.00	0.00	0.00	0.00
9.50	0.00	240,139	515.00	0.00	0.00	0.00
10.00	0.00	240,139	515.00	0.00	0.00	0.00
10.50	0.01	240,139	515.00	0.00	0.00	0.00
11.00	0.50	240,511	515.01	0.00	0.00	0.00
11.50	1.96	242,481	515.04	0.01	0.01	0.01
12.00	**82.04**	284,759	515.77	0.65	0.33	0.33
12.50	9.37	330,705	516.52	0.98	0.49	0.49
13.00	5.71	341,425	516.69	1.04	0.52	0.52
13.50	4.38	348,469	516.80	1.07	0.54	0.54
14.00	3.49	353,550	516.87	1.10	0.55	0.55
14.50	3.08	357,380	516.93	1.12	0.56	0.56
15.00	2.80	360,645	516.98	1.13	0.57	0.57
15.50	2.51	363,368	517.03	1.15	0.57	0.57
16.00	2.20	365,536	517.06	1.16	0.58	0.58
16.50	2.05	367,247	517.08	1.16	0.58	0.58
17.00	1.95	368,746	517.11	1.17	0.59	0.59
17.50	1.84	370,046	517.13	1.18	0.59	0.59
18.00	1.74	371,144	517.14	1.18	0.59	0.59
18.50	1.63	372,038	517.16	1.19	0.59	0.59
19.00	1.51	372,726	517.17	1.19	0.59	0.59
19.50	1.40	373,205	517.17	1.19	0.60	0.60
20.00	1.28	**373,476**	**517.18**	**1.19**	**0.60**	**0.60**

Summary for Subcatchment DB-1: PROPOSED AREA TO POND

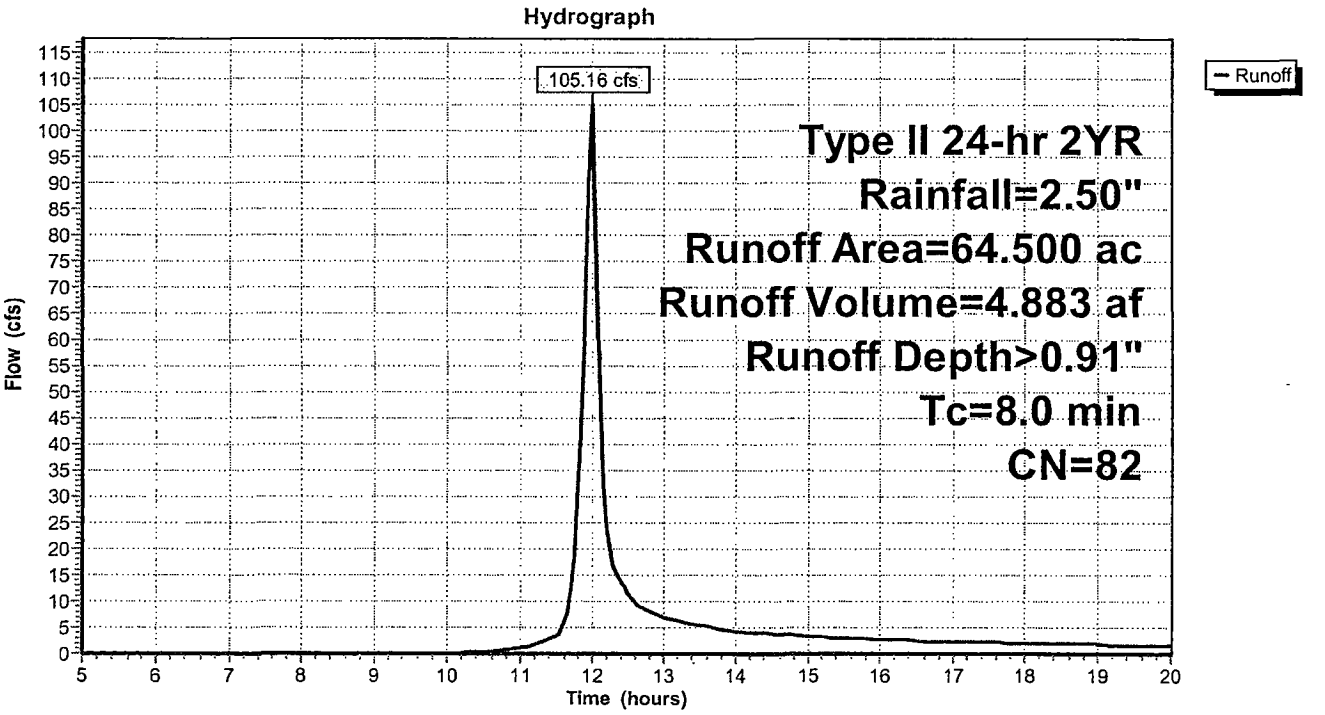
Runoff = 105.16 cfs @ 12.00 hrs, Volume= 4.883 af, Depth> 0.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2YR Rainfall=2.50"

	Area (ac)	CN	Description
	13.774	98	Paved parking & roofs
	21.521	98	Paved parking & roofs
	27.717	61	>75% Grass cover, Good, HSG B
*	1.488	98	
	64.500	82	Weighted Average
	27.717		Pervious Area
	36.783		Impervious Area

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

Subcatchment DB-1: PROPOSED AREA TO POND



Hydrograph for Subcatchment DB-1: PROPOSED AREA TO POND

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.16	0.00	0.00
5.25	0.17	0.00	0.00
5.50	0.18	0.00	0.00
5.75	0.19	0.00	0.00
6.00	0.20	0.00	0.00
6.25	0.21	0.00	0.00
6.50	0.22	0.00	0.00
6.75	0.24	0.00	0.00
7.00	0.25	0.00	0.00
7.25	0.26	0.00	0.00
7.50	0.27	0.00	0.00
7.75	0.29	0.00	0.00
8.00	0.30	0.00	0.00
8.25	0.31	0.00	0.00
8.50	0.33	0.00	0.00
8.75	0.35	0.00	0.00
9.00	0.37	0.00	0.00
9.25	0.39	0.00	0.00
9.50	0.41	0.00	0.00
9.75	0.43	0.00	0.00
10.00	0.45	0.00	0.02
10.25	0.48	0.00	0.17
10.50	0.51	0.00	0.39
10.75	0.55	0.00	0.71
11.00	0.59	0.01	1.16
11.25	0.64	0.02	1.94
11.50	0.71	0.03	3.23
11.75	0.97	0.10	18.81
12.00	1.66	0.43	**105.14**
12.25	1.77	0.50	19.01
12.50	1.84	0.54	11.60
12.75	1.89	0.58	8.30
13.00	1.93	0.60	7.03
13.25	1.97	0.63	6.07
13.50	2.00	0.65	5.38
13.75	2.03	0.67	4.78
14.00	2.05	0.68	4.27
14.25	2.07	0.70	3.93
14.50	2.09	0.71	3.76
14.75	2.11	0.73	3.59
15.00	2.13	0.74	3.41
15.25	2.15	0.75	3.23
15.50	2.17	0.76	3.05
15.75	2.19	0.77	2.87
16.00	2.20	0.78	2.68
16.25	2.21	0.79	2.56
16.50	2.23	0.80	2.49
16.75	2.24	0.81	2.43
17.00	2.25	0.82	2.37
17.25	2.27	0.83	2.30
17.50	2.28	0.84	2.24
17.75	2.29	0.85	2.17
18.00	2.30	0.86	2.10
18.25	2.31	0.86	2.04
18.50	2.32	0.87	1.97
18.75	2.33	0.88	1.90
19.00	2.34	0.89	1.83
19.25	2.35	0.89	1.76
19.50	2.36	0.90	1.69
19.75	2.37	0.90	1.62
20.00	**2.38**	**0.91**	1.55

Summary for Pond P-1: PROPOSED POND

4.05 ACRE-FT REQUIRED AT 110 CFS DISCHARGE

Inflow Area = 64.500 ac, 57.03% Impervious, Inflow Depth > 0.91" for 2YR event
Inflow = 105.16 cfs @ 12.00 hrs, Volume= 4.883 af
Outflow = 3.06 cfs @ 15.49 hrs, Volume= 1.548 af, Atten= 97%, Lag= 209.2 min
Primary = 1.53 cfs @ 15.49 hrs, Volume= 0.774 af
Secondary = 1.53 cfs @ 15.49 hrs, Volume= 0.774 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 515.00' Surf.Area= 56,413 sf Storage= 240,139 cf
Peak Elev= 517.45' @ 15.49 hrs Surf.Area= 67,149 sf Storage= 391,510 cf (151,371 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 174.3 min (975.1 - 800.8)

Volume	Invert	Avail.Storage	Storage Description
#1	508.50'	576,976 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

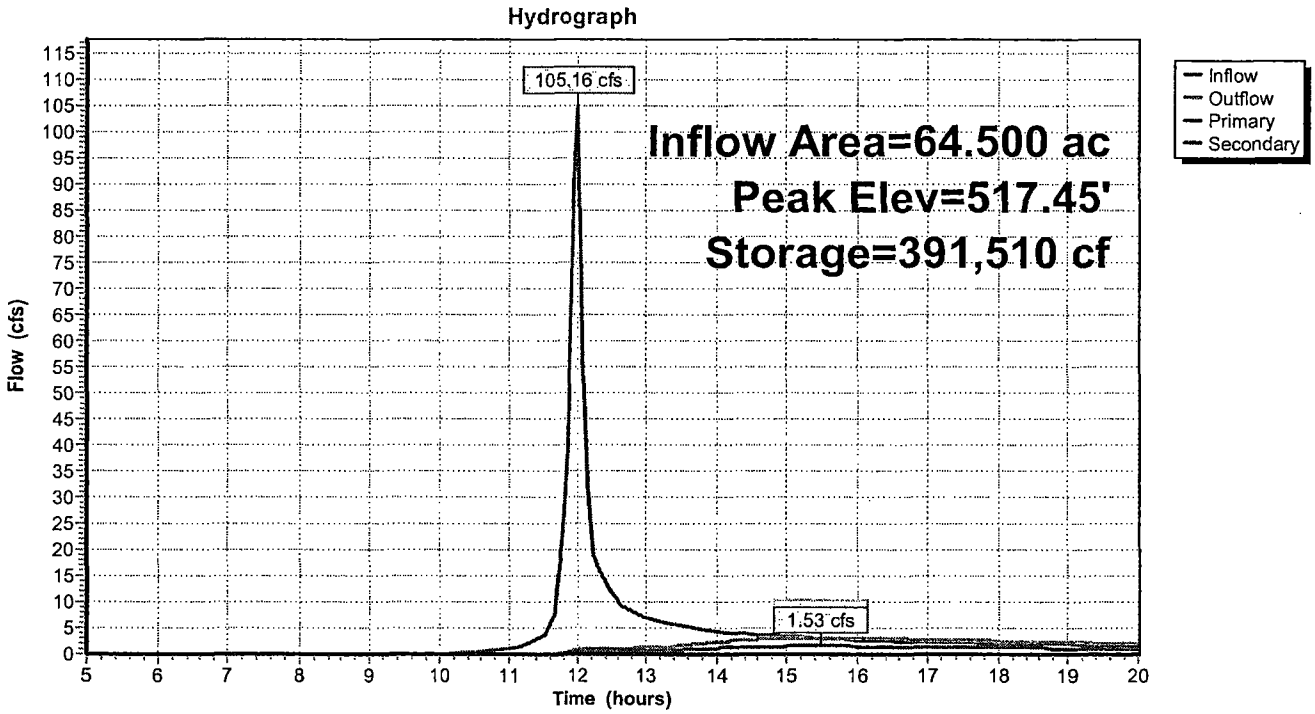
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
508.50	24,824	0	0
513.50	41,775	166,498	166,498
515.00	56,413	73,641	240,139
520.00	78,322	336,838	576,976

Device	Routing	Invert	Outlet Devices
#1	Primary	515.00'	**36.0" x 100.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 514.00' S= 0.0100 '/' Cc= 0.900 n= 0.013
#2	Secondary	515.00'	**36.0" x 100.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 514.00' S= 0.0100 '/' Cc= 0.900 n= 0.013
#3	Device 1	515.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	515.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#6	Device 2	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#7	Device 1	517.25'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 2.50 Width (feet) 3.00 3.00
#8	Device 2	517.25'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 2.50 Width (feet) 3.00 3.00

Primary OutFlow Max=1.51 cfs @ 15.49 hrs HW=517.45' (Free Discharge)
└─**1=Culvert** (Passes 1.51 cfs of 31.74 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.63 cfs @ 7.28 fps)
  ├─**5=Orifice/Grate** (Controls 0.00 cfs)
  └─**7=Custom Weir/Orifice** (Weir Controls 0.88 cfs @ 1.47 fps)

Secondary OutFlow Max=1.51 cfs @ 15.49 hrs HW=517.45' (Free Discharge)
└─**2=Culvert** (Passes 1.51 cfs of 31.74 cfs potential flow)
  ├─**4=Orifice/Grate** (Orifice Controls 0.63 cfs @ 7.28 fps)
  ├─**6=Orifice/Grate** (Controls 0.00 cfs)
  └─**8=Custom Weir/Orifice** (Weir Controls 0.88 cfs @ 1.47 fps)

Pond P-1: PROPOSED POND



Hydrograph for Pond P-1: PROPOSED POND

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	240,139	515.00	0.00	0.00	0.00
5.50	0.00	240,139	515.00	0.00	0.00	0.00
6.00	0.00	240,139	515.00	0.00	0.00	0.00
6.50	0.00	240,139	515.00	0.00	0.00	0.00
7.00	0.00	240,139	515.00	0.00	0.00	0.00
7.50	0.00	240,139	515.00	0.00	0.00	0.00
8.00	0.00	240,139	515.00	0.00	0.00	0.00
8.50	0.00	240,139	515.00	0.00	0.00	0.00
9.00	0.00	240,139	515.00	0.00	0.00	0.00
9.50	0.00	240,139	515.00	0.00	0.00	0.00
10.00	0.02	240,141	515.00	0.00	0.00	0.00
10.50	0.39	240,464	515.01	0.00	0.00	0.00
11.00	1.16	241,771	515.03	0.01	0.00	0.00
11.50	3.23	245,381	515.09	0.05	0.03	0.03
12.00	**105.14**	302,329	516.06	0.79	0.40	0.40
12.50	11.60	360,407	516.98	1.13	0.57	0.57
13.00	7.03	373,785	517.18	1.19	0.60	0.60
13.50	5.38	382,383	517.31	1.64	0.82	0.82
14.00	4.27	387,461	517.39	2.33	1.17	1.17
14.50	3.76	389,942	517.43	2.78	1.39	1.39
15.00	3.41	391,171	517.45	3.00	1.50	1.50
15.50	3.05	**391,513**	**517.45**	**3.06**	**1.53**	**1.53**
16.00	2.68	391,198	517.45	3.01	1.50	1.50
16.50	2.49	390,516	517.44	2.88	1.44	1.44
17.00	2.37	389,817	517.42	2.76	1.38	1.38
17.50	2.24	389,113	517.41	2.63	1.31	1.31
18.00	2.10	388,402	517.40	2.50	1.25	1.25
18.50	1.97	387,683	517.39	2.37	1.19	1.19
19.00	1.83	386,955	517.38	2.24	1.12	1.12
19.50	1.69	386,217	517.37	2.11	1.05	1.05
20.00	1.55	385,470	517.36	1.97	0.99	0.99

Summary for Subcatchment DB-1: PROPOSED AREA TO POND

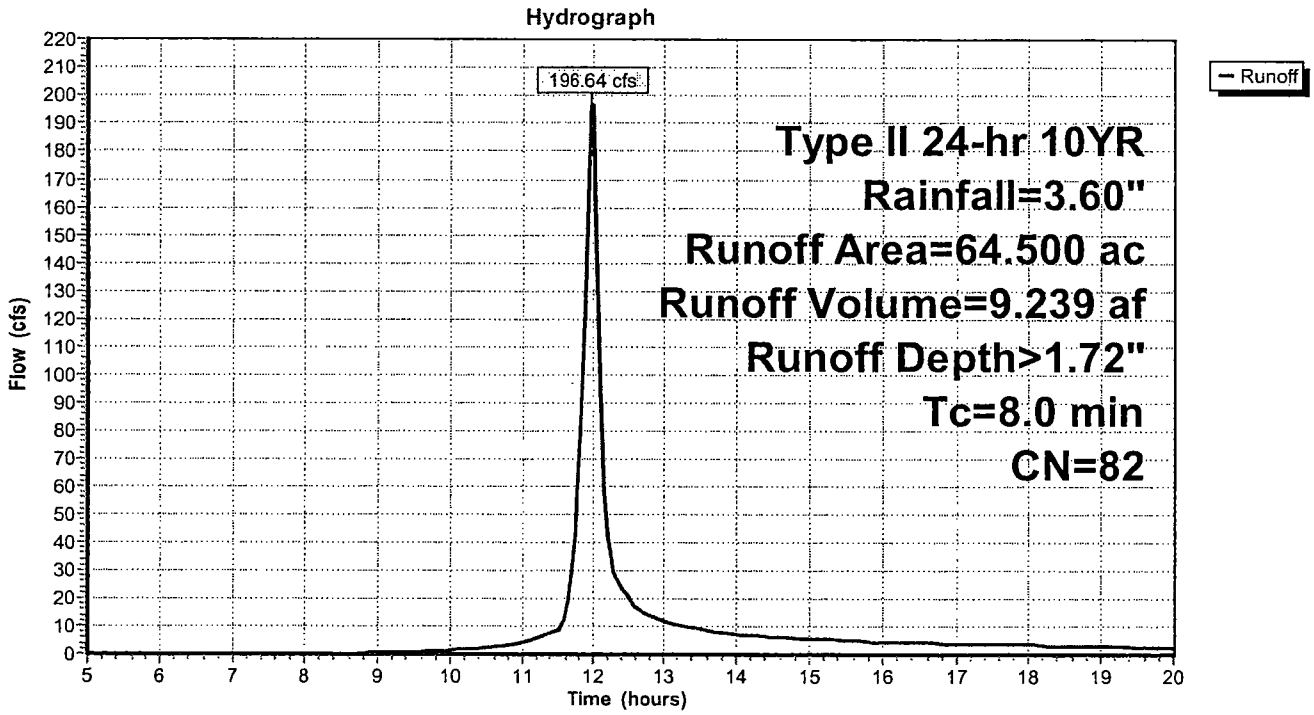
Runoff = 196.64 cfs @ 11.99 hrs, Volume= 9.239 af, Depth> 1.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10YR Rainfall=3.60"

	Area (ac)	CN	Description
	13.774	98	Paved parking & roofs
	21.521	98	Paved parking & roofs
	27.717	61	>75% Grass cover, Good, HSG B
*	1.488	98	
	64.500	82	Weighted Average
	27.717		Pervious Area
	36.783		Impervious Area

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

Subcatchment DB-1: PROPOSED AREA TO POND



Hydrograph for Subcatchment DB-1: PROPOSED AREA TO POND

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.23	0.00	0.00
5.25	0.24	0.00	0.00
5.50	0.26	0.00	0.00
5.75	0.27	0.00	0.00
6.00	0.29	0.00	0.00
6.25	0.30	0.00	0.00
6.50	0.32	0.00	0.00
6.75	0.34	0.00	0.00
7.00	0.36	0.00	0.00
7.25	0.37	0.00	0.00
7.50	0.39	0.00	0.00
7.75	0.41	0.00	0.00
8.00	0.43	0.00	0.00
8.25	0.45	0.00	0.02
8.50	0.48	0.00	0.14
8.75	0.50	0.00	0.29
9.00	0.53	0.00	0.48
9.25	0.56	0.01	0.67
9.50	0.59	0.01	0.83
9.75	0.62	0.01	1.06
10.00	0.65	0.02	1.40
10.25	0.69	0.03	1.83
10.50	0.73	0.04	2.40
10.75	0.79	0.05	3.19
11.00	0.85	0.06	4.26
11.25	0.92	0.09	6.08
11.50	1.02	0.12	8.90
11.75	1.39	0.29	43.69
12.00	2.39	0.92	**196.32**
12.25	2.54	1.03	33.48
12.50	2.65	1.11	20.11
12.75	2.72	1.16	14.29
13.00	2.78	1.21	12.04
13.25	2.83	1.25	10.35
13.50	2.88	1.28	9.14
13.75	2.92	1.31	8.10
14.00	2.95	1.34	7.22
14.25	2.98	1.37	6.64
14.50	3.02	1.39	6.33
14.75	3.04	1.41	6.03
15.00	3.07	1.44	5.72
15.25	3.10	1.46	5.42
15.50	3.12	1.48	5.10
15.75	3.15	1.50	4.79
16.00	3.17	1.51	4.47
16.25	3.19	1.53	4.26
16.50	3.21	1.54	4.15
16.75	3.23	1.56	4.04
17.00	3.25	1.58	3.93
17.25	3.26	1.59	3.82
17.50	3.28	1.60	3.71
17.75	3.30	1.62	3.59
18.00	3.32	1.63	3.48
18.25	3.33	1.64	3.37
18.50	3.35	1.66	3.25
18.75	3.36	1.67	3.14
19.00	3.38	1.68	3.02
19.25	3.39	1.69	2.91
19.50	3.40	1.70	2.79
19.75	3.42	1.71	2.67
20.00	**3.43**	**1.72**	2.56

Summary for Pond P-1: PROPOSED POND

4.05 ACRE-FT REQUIRED AT 110 CFS DISCHARGE

Inflow Area = 64.500 ac, 57.03% Impervious, Inflow Depth > 1.72" for 10YR event
Inflow = 196.64 cfs @ 11.99 hrs, Volume= 9.239 af
Outflow = 24.26 cfs @ 12.40 hrs, Volume= 5.751 af, Atten= 88%, Lag= 24.1 min
Primary = 12.13 cfs @ 12.40 hrs, Volume= 2.876 af
Secondary = 12.13 cfs @ 12.40 hrs, Volume= 2.876 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 515.00' Surf.Area= 56,413 sf Storage= 240,139 cf
Peak Elev= 518.35' @ 12.40 hrs Surf.Area= 71,102 sf Storage= 453,875 cf (213,737 cf above start)

Plug-Flow detention time= 569.4 min calculated for 0.238 af (3% of inflow)
Center-of-Mass det. time= 87.4 min (874.7 - 787.4)

Volume	Invert	Avail.Storage	Storage Description
#1	508.50'	576,976 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

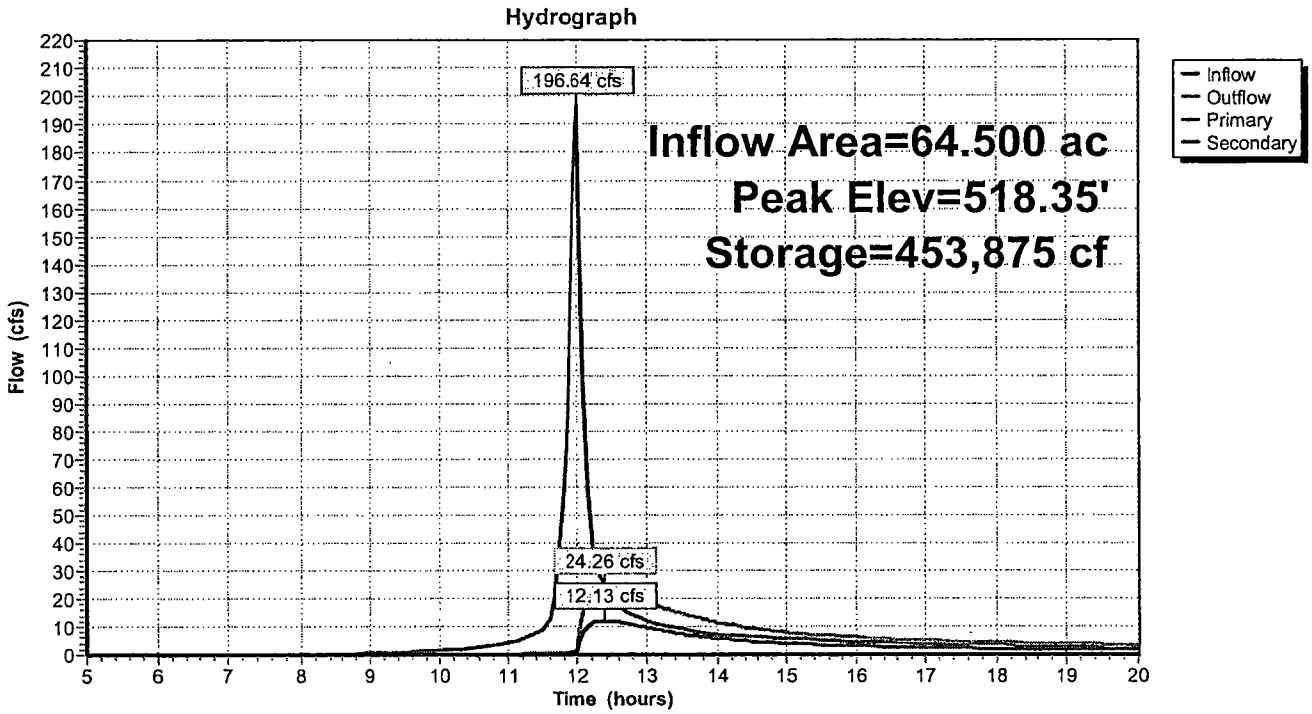
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
508.50	24,824	0	0
513.50	41,775	166,498	166,498
515.00	56,413	73,641	240,139
520.00	78,322	336,838	576,976

Device	Routing	Invert	Outlet Devices
#1	Primary	515.00'	**36.0" x 100.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 514.00' S= 0.0100 '/' Cc= 0.900 n= 0.013
#2	Secondary	515.00'	**36.0" x 100.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 514.00' S= 0.0100 '/' Cc= 0.900 n= 0.013
#3	Device 1	515.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	515.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#6	Device 2	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#7	Device 1	517.25'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 2.50 Width (feet) 3.00 3.00
#8	Device 2	517.25'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 2.50 Width (feet) 3.00 3.00

Primary OutFlow Max=12.12 cfs @ 12.40 hrs HW=518.35' (Free Discharge)
└─**1=Culvert** (Passes 12.12 cfs of 46.32 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.75 cfs @ 8.59 fps)
  ├─**5=Orifice/Grate** (Controls 0.00 cfs)
  └─**7=Custom Weir/Orifice** (Weir Controls 11.37 cfs @ 3.44 fps)

Secondary OutFlow Max=12.12 cfs @ 12.40 hrs HW=518.35' (Free Discharge)
└─**2=Culvert** (Passes 12.12 cfs of 46.32 cfs potential flow)
  ├─**4=Orifice/Grate** (Orifice Controls 0.75 cfs @ 8.59 fps)
  ├─**6=Orifice/Grate** (Controls 0.00 cfs)
  └─**8=Custom Weir/Orifice** (Weir Controls 11.37 cfs @ 3.44 fps)

Pond P-1: PROPOSED POND



Hydrograph for Pond P-1: PROPOSED POND

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	240,139	515.00	0.00	0.00	0.00
5.50	0.00	240,139	515.00	0.00	0.00	0.00
6.00	0.00	240,139	515.00	0.00	0.00	0.00
6.50	0.00	240,139	515.00	0.00	0.00	0.00
7.00	0.00	240,139	515.00	0.00	0.00	0.00
7.50	0.00	240,139	515.00	0.00	0.00	0.00
8.00	0.00	240,139	515.00	0.00	0.00	0.00
8.50	0.14	240,210	515.00	0.00	0.00	0.00
9.00	0.48	240,740	515.01	0.00	0.00	0.00
9.50	0.83	241,924	515.03	0.01	0.00	0.00
10.00	1.40	243,844	515.07	0.03	0.01	0.01
10.50	2.40	247,094	515.12	0.08	0.04	0.04
11.00	4.26	252,691	515.22	0.20	0.10	0.10
11.50	8.90	263,386	515.41	0.41	0.21	0.21
12.00	**196.32**	**380,704**	**517.29**	**1.47**	**0.73**	**0.73**
12.50	20.11	**453,126**	**518.34**	**23.93**	**11.97**	**11.97**
13.00	12.04	441,123	518.17	18.86	9.43	9.43
13.50	9.14	430,027	518.01	14.54	7.27	7.27
14.00	7.22	421,411	517.89	11.45	5.73	5.73
14.50	6.33	414,919	517.79	9.28	4.64	4.64
15.00	5.72	410,392	517.73	7.88	3.94	3.94
15.50	5.10	406,933	517.68	6.86	3.43	3.43
16.00	4.47	403,959	517.63	6.04	3.02	3.02
16.50	4.15	401,439	517.60	5.35	2.67	2.67
17.00	3.93	399,552	517.57	4.87	2.44	2.44
17.50	3.71	397,995	517.55	4.51	2.25	2.25
18.00	3.48	396,643	517.53	4.19	2.10	2.10
18.50	3.25	395,421	517.51	3.91	1.95	1.95
19.00	3.02	394,282	517.49	3.64	1.82	1.82
19.50	2.79	393,194	517.48	3.38	1.69	1.69
20.00	2.56	392,115	517.46	3.17	1.59	1.59

Summary for Subcatchment DB-1: PROPOSED AREA TO POND

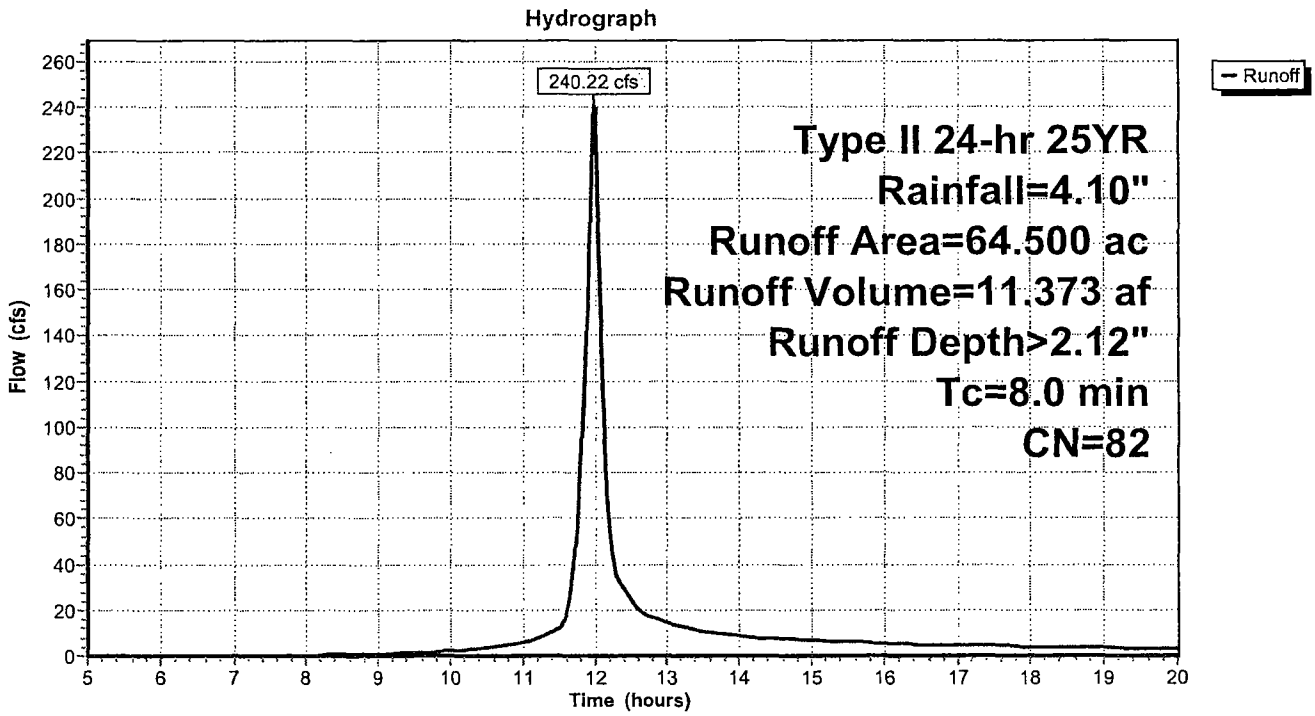
Runoff = 240.22 cfs @ 11.99 hrs, Volume= 11.373 af, Depth> 2.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25YR Rainfall=4.10"

	Area (ac)	CN	Description
	13.774	98	Paved parking & roofs
	21.521	98	Paved parking & roofs
	27.717	61	>75% Grass cover, Good, HSG B
*	1.488	98	
	64.500	82	Weighted Average
	27.717		Pervious Area
	36.783		Impervious Area

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

Subcatchment DB-1: PROPOSED AREA TO POND



Hydrograph for Subcatchment DB-1: PROPOSED AREA TO POND

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.26	0.00	0.00
5.25	0.27	0.00	0.00
5.50	0.29	0.00	0.00
5.75	0.31	0.00	0.00
6.00	0.33	0.00	0.00
6.25	0.35	0.00	0.00
6.50	0.37	0.00	0.00
6.75	0.39	0.00	0.00
7.00	0.41	0.00	0.00
7.25	0.43	0.00	0.00
7.50	0.45	0.00	0.01
7.75	0.47	0.00	0.10
8.00	0.49	0.00	0.22
8.25	0.52	0.00	0.35
8.50	0.54	0.00	0.53
8.75	0.57	0.01	0.75
9.00	0.60	0.01	1.00
9.25	0.64	0.02	1.25
9.50	0.67	0.02	1.44
9.75	0.70	0.03	1.74
10.00	0.74	0.04	2.19
10.25	0.79	0.05	2.77
10.50	0.84	0.06	3.52
10.75	0.89	0.08	4.55
11.00	0.96	0.10	5.93
11.25	1.05	0.13	8.27
11.50	1.16	0.18	11.85
11.75	1.59	0.39	56.25
12.00	2.72	1.16	**239.67**
12.25	2.90	1.30	40.23
12.50	3.01	1.39	24.05
12.75	3.10	1.45	17.06
13.00	3.17	1.51	14.35
13.25	3.22	1.56	12.32
13.50	3.28	1.60	10.87
13.75	3.32	1.64	9.63
14.00	3.36	1.67	8.57
14.25	3.40	1.70	7.88
14.50	3.43	1.73	7.51
14.75	3.47	1.76	7.15
15.00	3.50	1.78	6.79
15.25	3.53	1.81	6.42
15.50	3.56	1.83	6.04
15.75	3.58	1.85	5.67
16.00	3.61	1.87	5.29
16.25	3.63	1.89	5.04
16.50	3.65	1.91	4.91
16.75	3.68	1.93	4.78
17.00	3.70	1.95	4.65
17.25	3.72	1.96	4.51
17.50	3.74	1.98	4.38
17.75	3.76	2.00	4.25
18.00	3.78	2.01	4.11
18.25	3.79	2.03	3.98
18.50	3.81	2.04	3.84
18.75	3.83	2.06	3.70
19.00	3.84	2.07	3.57
19.25	3.86	2.08	3.43
19.50	3.88	2.10	3.29
19.75	3.89	2.11	3.15
20.00	**3.90**	**2.12**	3.01

Summary for Pond P-1: PROPOSED POND

4.05 ACRE-FT REQUIRED AT 110 CFS DISCHARGE

Inflow Area = 64.500 ac, 57.03% Impervious, Inflow Depth > 2.12" for 25YR event
Inflow = 240.22 cfs @ 11.99 hrs, Volume= 11.373 af
Outflow = 57.89 cfs @ 12.19 hrs, Volume= 7.831 af, Atten= 76%, Lag= 11.5 min
Primary = 28.94 cfs @ 12.19 hrs, Volume= 3.916 af
Secondary = 28.94 cfs @ 12.19 hrs, Volume= 3.916 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 515.00' Surf.Area= 56,413 sf Storage= 240,139 cf
Peak Elev= 518.81' @ 12.19 hrs Surf.Area= 73,109 sf Storage= 486,898 cf (246,760 cf above start)

Plug-Flow detention time= 348.0 min calculated for 2.311 af (20% of inflow)
Center-of-Mass det. time= 72.6 min (855.5 - 782.9)

Volume	Invert	Avail.Storage	Storage Description
#1	508.50'	576,976 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

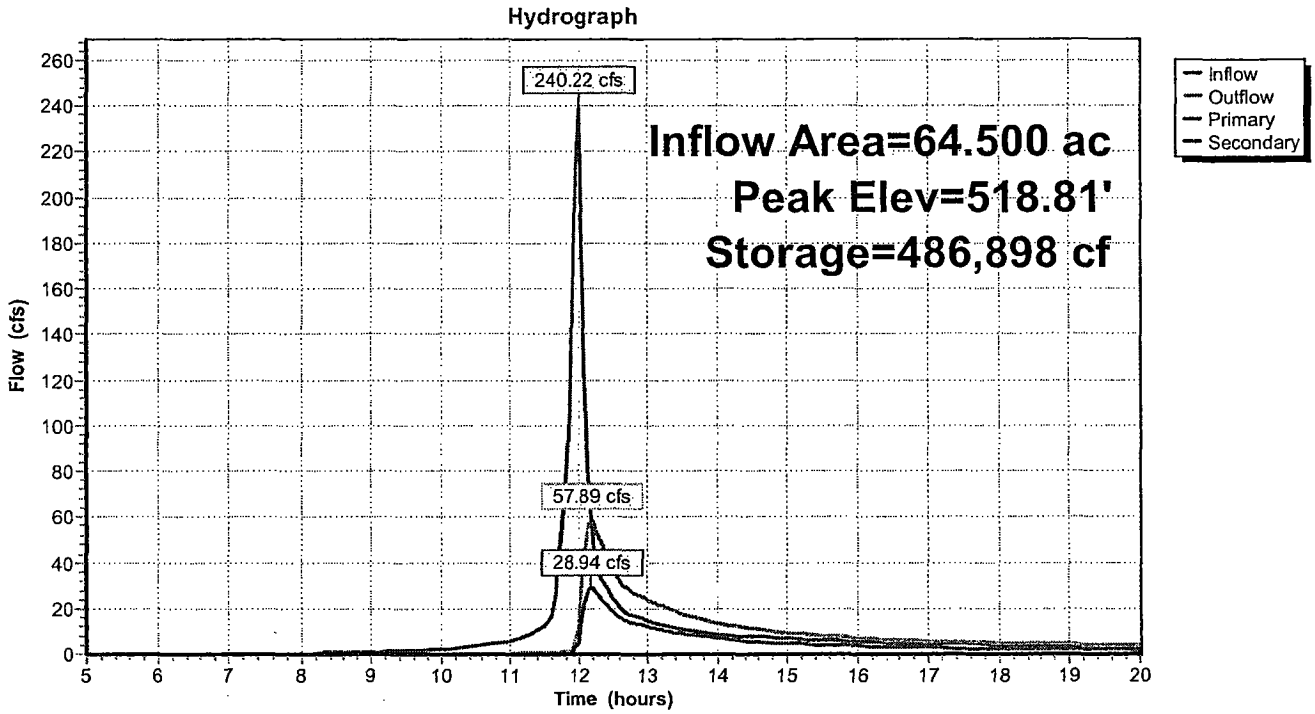
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
508.50	24,824	0	0
513.50	41,775	166,498	166,498
515.00	56,413	73,641	240,139
520.00	78,322	336,838	576,976

Device	Routing	Invert	Outlet Devices
#1	Primary	515.00'	**36.0" x 100.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 514.00' S= 0.0100 '/' Cc= 0.900 n= 0.013
#2	Secondary	515.00'	**36.0" x 100.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 514.00' S= 0.0100 '/' Cc= 0.900 n= 0.013
#3	Device 1	515.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	515.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#6	Device 2	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#7	Device 1	517.25'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 2.50 Width (feet) 3.00 3.00
#8	Device 2	517.25'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 2.50 Width (feet) 3.00 3.00

Primary OutFlow Max=28.62 cfs @ 12.19 hrs HW=518.81' (Free Discharge)
└─**1=Culvert** (Passes 28.62 cfs of 51.69 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.80 cfs @ 9.19 fps)
  ├─**5=Orifice/Grate** (Weir Controls 8.73 cfs @ 1.81 fps)
  └─**7=Custom Weir/Orifice** (Weir Controls 19.09 cfs @ 4.09 fps)

Secondary OutFlow Max=28.62 cfs @ 12.19 hrs HW=518.81' (Free Discharge)
└─**2=Culvert** (Passes 28.62 cfs of 51.69 cfs potential flow)
  ├─**4=Orifice/Grate** (Orifice Controls 0.80 cfs @ 9.19 fps)
  ├─**6=Orifice/Grate** (Weir Controls 8.73 cfs @ 1.81 fps)
  └─**8=Custom Weir/Orifice** (Weir Controls 19.09 cfs @ 4.09 fps)

Pond P-1: PROPOSED POND



Hydrograph for Pond P-1: PROPOSED POND

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	240,139	515.00	0.00	0.00	0.00
5.50	0.00	240,139	515.00	0.00	0.00	0.00
6.00	0.00	240,139	515.00	0.00	0.00	0.00
6.50	0.00	240,139	515.00	0.00	0.00	0.00
7.00	0.00	240,139	515.00	0.00	0.00	0.00
7.50	0.01	240,139	515.00	0.00	0.00	0.00
8.00	0.22	240,325	515.00	0.00	0.00	0.00
8.50	0.53	240,967	515.01	0.00	0.00	0.00
9.00	1.00	242,312	515.04	0.01	0.01	0.01
9.50	1.44	244,505	515.08	0.04	0.02	0.02
10.00	2.19	247,574	515.13	0.09	0.04	0.04
10.50	3.52	252,373	515.21	0.19	0.09	0.09
11.00	5.93	260,174	515.35	0.36	0.18	0.18
11.50	11.85	274,613	515.60	0.55	0.28	0.28
12.00	**239.67**	**420,758**	**517.88**	**11.23**	**5.62**	**5.62**
12.50	24.05	**472,201**	**518.61**	**36.49**	**18.25**	**18.25**
13.00	14.35	452,651	518.34	23.73	11.86	11.86
13.50	10.87	438,125	518.13	17.67	8.83	8.83
14.00	8.57	427,565	517.98	13.64	6.82	6.82
14.50	7.51	419,915	517.87	10.94	5.47	5.47
15.00	6.79	414,748	517.79	9.23	4.62	4.62
15.50	6.04	410,819	517.73	8.01	4.01	4.01
16.00	5.29	407,533	517.69	7.02	3.51	3.51
16.50	4.91	404,725	517.65	6.25	3.13	3.13
17.00	4.65	402,619	517.61	5.67	2.84	2.84
17.50	4.38	400,960	517.59	5.21	2.61	2.61
18.00	4.11	399,542	517.57	4.87	2.43	2.43
18.50	3.84	398,217	517.55	4.56	2.28	2.28
19.00	3.57	396,946	517.53	4.26	2.13	2.13
19.50	3.29	395,708	517.51	3.97	1.99	1.99
20.00	3.01	394,489	517.49	3.69	1.84	1.84

Summary for Subcatchment DB-1: PROPOSED AREA TO POND

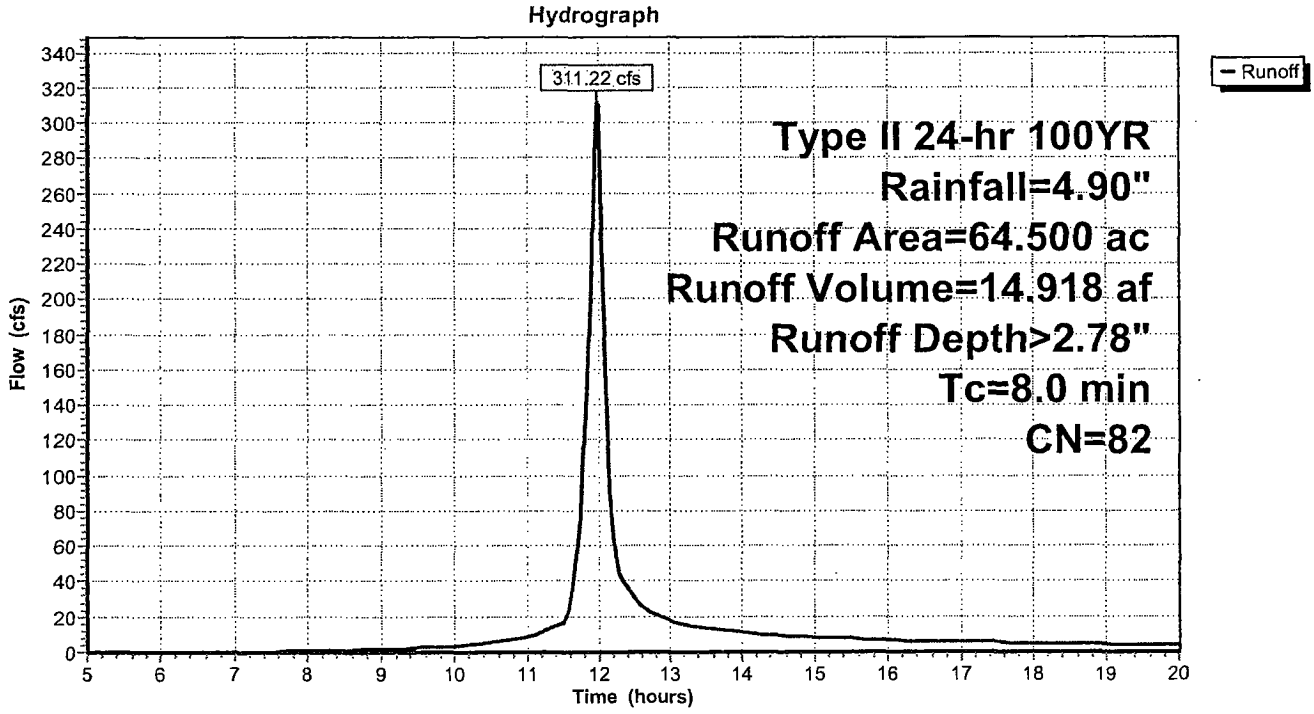
Runoff = 311.22 cfs @ 11.99 hrs, Volume= 14.918 af, Depth> 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR Rainfall=4.90"

	Area (ac)	CN	Description
	13.774	98	Paved parking & roofs
	21.521	98	Paved parking & roofs
	27.717	61	>75% Grass cover, Good, HSG B
*	1.488	98	
	64.500	82	Weighted Average
	27.717		Pervious Area
	36.783		Impervious Area

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

Subcatchment DB-1: PROPOSED AREA TO POND



Hydrograph for Subcatchment DB-1: PROPOSED AREA TO POND

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.31	0.00	0.00
5.25	0.33	0.00	0.00
5.50	0.35	0.00	0.00
5.75	0.37	0.00	0.00
6.00	0.39	0.00	0.00
6.25	0.41	0.00	0.00
6.50	0.44	0.00	0.00
6.75	0.46	0.00	0.06
7.00	0.49	0.00	0.19
7.25	0.51	0.00	0.33
7.50	0.54	0.00	0.48
7.75	0.56	0.01	0.63
8.00	0.59	0.01	0.78
8.25	0.62	0.01	0.99
8.50	0.65	0.02	1.27
8.75	0.68	0.02	1.61
9.00	0.72	0.03	1.98
9.25	0.76	0.04	2.31
9.50	0.80	0.05	2.55
9.75	0.84	0.06	2.97
10.00	0.89	0.08	3.61
10.25	0.94	0.09	4.44
10.50	1.00	0.11	5.49
10.75	1.07	0.14	6.93
11.00	1.15	0.17	8.84
11.25	1.25	0.22	12.06
11.50	1.39	0.29	16.91
11.75	1.90	0.58	77.37
12.00	3.25	1.58	**310.20**
12.25	3.46	1.75	51.09
12.50	3.60	1.87	30.39
12.75	3.70	1.95	21.50
13.00	3.78	2.02	18.06
13.25	3.85	2.08	15.49
13.50	3.92	2.13	13.65
13.75	3.97	2.18	12.07
14.00	4.02	2.22	10.75
14.25	4.06	2.26	9.87
14.50	4.10	2.29	9.40
14.75	4.14	2.33	8.95
15.00	4.18	2.36	8.48
15.25	4.22	2.39	8.02
15.50	4.25	2.42	7.55
15.75	4.28	2.45	7.08
16.00	4.31	2.47	6.61
16.25	4.34	2.50	6.29
16.50	4.37	2.52	6.12
16.75	4.39	2.54	5.96
17.00	4.42	2.56	5.79
17.25	4.44	2.59	5.62
17.50	4.47	2.61	5.45
17.75	4.49	2.63	5.29
18.00	4.51	2.65	5.12
18.25	4.53	2.67	4.95
18.50	4.56	2.68	4.78
18.75	4.58	2.70	4.61
19.00	4.59	2.72	4.43
19.25	4.61	2.74	4.26
19.50	4.63	2.75	4.09
19.75	4.65	2.77	3.92
20.00	**4.66**	**2.78**	3.74

Summary for Pond P-1: PROPOSED POND

4.05 ACRE-FT REQUIRED AT 110 CFS DISCHARGE

Inflow Area = 64.500 ac, 57.03% Impervious, Inflow Depth > 2.78" for 100YR event
Inflow = 311.22 cfs @ 11.99 hrs, Volume= 14.918 af
Outflow = 117.37 cfs @ 12.13 hrs, Volume= 11.294 af, Atten= 62%, Lag= 8.2 min
Primary = 58.69 cfs @ 12.13 hrs, Volume= 5.647 af
Secondary = 58.69 cfs @ 12.13 hrs, Volume= 5.647 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 515.00' Surf.Area= 56,413 sf Storage= 240,139 cf
Peak Elev= 519.47' @ 12.13 hrs Surf.Area= 76,015 sf Storage= 536,341 cf (296,203 cf above start)

Plug-Flow detention time= 235.1 min calculated for 5.762 af (39% of inflow)
Center-of-Mass det. time= 58.1 min (835.0 - 776.9)

Volume	Invert	Avail.Storage	Storage Description
#1	508.50'	576,976 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

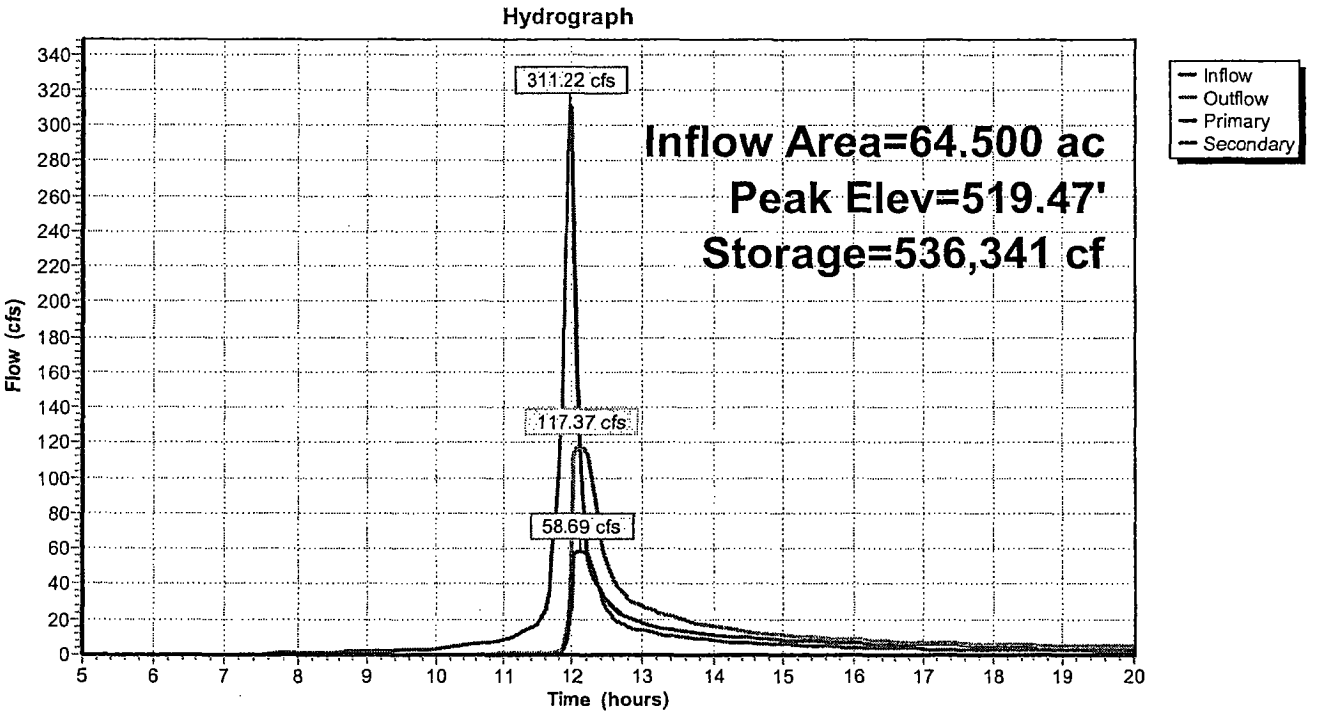
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
508.50	24,824	0	0
513.50	41,775	166,498	166,498
515.00	56,413	73,641	240,139
520.00	78,322	336,838	576,976

Device	Routing	Invert	Outlet Devices
#1	Primary	515.00'	**36.0" x 100.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 514.00' S= 0.0100 '/' Cc= 0.900 n= 0.013
#2	Secondary	515.00'	**36.0" x 100.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 514.00' S= 0.0100 '/' Cc= 0.900 n= 0.013
#3	Device 1	515.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	515.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#6	Device 2	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#7	Device 1	517.25'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 2.50 Width (feet) 3.00 3.00
#8	Device 2	517.25'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 2.50 Width (feet) 3.00 3.00

Primary OutFlow Max=58.57 cfs @ 12.13 hrs HW=519.46' (Free Discharge)
└─**1=Culvert** (Inlet Controls 58.57 cfs @ 8.29 fps)
  ├─**3=Orifice/Grate** (Passes < 0.87 cfs potential flow)
  ├─**5=Orifice/Grate** (Passes < 48.39 cfs potential flow)
  └─**7=Custom Weir/Orifice** (Passes < 32.30 cfs potential flow)

Secondary OutFlow Max=58.57 cfs @ 12.13 hrs HW=519.46' (Free Discharge)
└─**2=Culvert** (Inlet Controls 58.57 cfs @ 8.29 fps)
  ├─**4=Orifice/Grate** (Passes < 0.87 cfs potential flow)
  ├─**6=Orifice/Grate** (Passes < 48.39 cfs potential flow)
  └─**8=Custom Weir/Orifice** (Passes < 32.30 cfs potential flow)

Pond P-1: PROPOSED POND



Hydrograph for Pond P-1: PROPOSED POND

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	240,139	515.00	0.00	0.00	0.00
5.50	0.00	240,139	515.00	0.00	0.00	0.00
6.00	0.00	240,139	515.00	0.00	0.00	0.00
6.50	0.00	240,139	515.00	0.00	0.00	0.00
7.00	0.19	240,264	515.00	0.00	0.00	0.00
7.50	0.48	240,858	515.01	0.00	0.00	0.00
8.00	0.78	241,979	515.03	0.01	0.00	0.00
8.50	1.27	243,761	515.06	0.02	0.01	0.01
9.00	1.98	246,582	515.11	0.07	0.04	0.04
9.50	2.55	250,530	515.18	0.14	0.07	0.07
10.00	3.61	255,573	515.27	0.27	0.13	0.13
10.50	5.49	263,027	515.40	0.41	0.20	0.20
11.00	8.84	274,783	515.60	0.55	0.28	0.28
11.50	16.91	295,801	515.95	0.74	0.37	0.37
12.00	**310.20**	**484,147**	**518.77**	**53.36**	**26.68**	**26.68**
12.50	30.39	**483,426**	**518.76**	**52.17**	**26.09**	**26.09**
13.00	18.06	460,163	518.44	27.06	13.53	13.53
13.50	13.65	445,577	518.24	20.71	10.35	10.35
14.00	10.75	434,391	518.08	16.20	8.10	8.10
14.50	9.40	426,105	517.96	13.10	6.55	6.55
15.00	8.48	420,508	517.88	11.15	5.57	5.57
15.50	7.55	416,235	517.81	9.69	4.85	4.85
16.00	6.61	412,570	517.76	8.56	4.28	4.28
16.50	6.12	409,448	517.71	7.59	3.79	3.79
17.00	5.79	407,157	517.68	6.92	3.46	3.46
17.50	5.45	405,295	517.65	6.41	3.20	3.20
18.00	5.12	403,683	517.63	5.96	2.98	2.98
18.50	4.78	402,220	517.61	5.56	2.78	2.78
19.00	4.43	400,844	517.59	5.18	2.59	2.59
19.50	4.09	399,488	517.57	4.86	2.43	2.43
20.00	3.74	398,092	517.55	4.53	2.26	2.26

Appendix C

Water Quality Volume/Channel Protection Volume

Summary for Pond 1P: PROPOSED POND

4.05 ACRE-FT REQUIRED AT 110 CFS DISCHARGE

Inflow Area = 64.500 ac, 57.03% Impervious, Inflow Depth = 0.78" for 1YR event
Inflow = 82.04 cfs @ 12.00 hrs, Volume= 4.213 af
Outflow = 1.19 cfs @ 21.68 hrs, Volume= 4.182 af, Atten= 99%, Lag= 580.7 min
Primary = 0.60 cfs @ 21.68 hrs, Volume= 2.091 af
Secondary = 0.60 cfs @ 21.68 hrs, Volume= 2.091 af

Routing by Stor-Ind method, Time Span= 5.00-160.00 hrs, dt= 0.05 hrs
Starting Elev= 515.00' Surf.Area= 56,413 sf Storage= 240,139 cf
Peak Elev= 517.18' @ 21.68 hrs Surf.Area= 65,975 sf Storage= 373,683 cf (133,545 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 1,464.7 min (2,319.4 - 854.7)

Volume	Invert	Avail.Storage	Storage Description
#1	508.50'	576,976 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

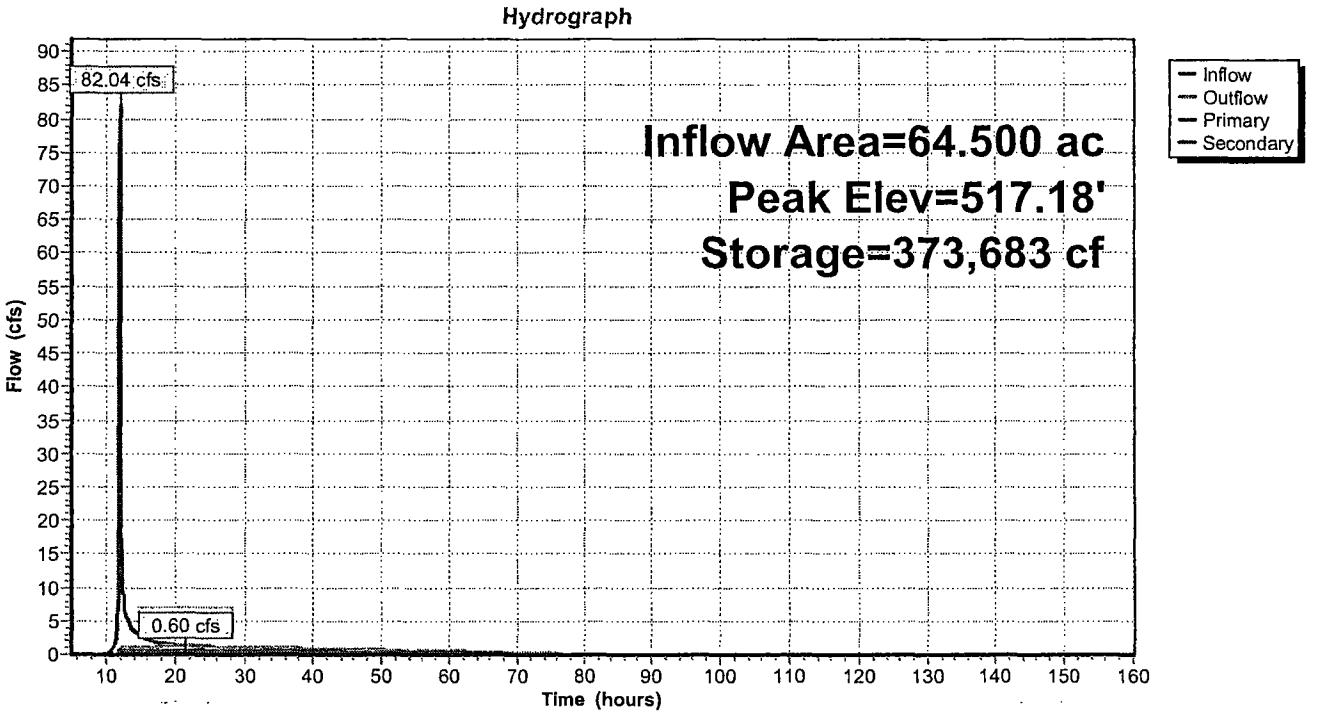
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
508.50	24,824	0	0
513.50	41,775	166,498	166,498
515.00	56,413	73,641	240,139
520.00	78,322	336,838	576,976

Device	Routing	Invert	Outlet Devices
#1	Primary	515.00'	**36.0" x 100.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 514.00' S= 0.0100 '/' Cc= 0.900 n= 0.013
#2	Secondary	515.00'	**36.0" x 100.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 514.00' S= 0.0100 '/' Cc= 0.900 n= 0.013
#3	Device 1	515.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	515.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#6	Device 2	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#7	Device 1	517.25'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 2.50 Width (feet) 3.00 3.00
#8	Device 2	517.25'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 2.50 Width (feet) 3.00 3.00

Primary OutFlow Max=0.60 cfs @ 21.68 hrs HW=517.18' (Free Discharge)
└─**1=Culvert** (Passes 0.60 cfs of 26.67 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.60 cfs @ 6.84 fps)
  ├─**5=Orifice/Grate** (Controls 0.00 cfs)
  └─**7=Custom Weir/Orifice** (Controls 0.00 cfs)

Secondary OutFlow Max=0.60 cfs @ 21.68 hrs HW=517.18' (Free Discharge)
└─**2=Culvert** (Passes 0.60 cfs of 26.67 cfs potential flow)
  ├─**4=Orifice/Grate** (Orifice Controls 0.60 cfs @ 6.84 fps)
  ├─**6=Orifice/Grate** (Controls 0.00 cfs)
  └─**8=Custom Weir/Orifice** (Controls 0.00 cfs)

Pond 1P: PROPOSED POND



Hydrograph for Pond 1P: PROPOSED POND

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	240,139	515.00	0.00	0.00	0.00
10.00	**0.00**	240,139	515.00	0.00	0.00	0.00
15.00	**2.80**	360,645	516.98	1.13	0.57	0.57
20.00	1.28	**373,476**	**517.18**	**1.19**	**0.60**	**0.60**
25.00	0.00	**369,514**	**517.12**	**1.17**	**0.59**	**0.59**
30.00	0.00	349,257	516.81	1.08	0.54	0.54
35.00	0.00	330,779	516.52	0.98	0.49	0.49
40.00	0.00	314,116	516.25	0.87	0.44	0.44
45.00	0.00	299,301	516.01	0.77	0.39	0.39
50.00	0.00	286,369	515.79	0.67	0.33	0.33
55.00	0.00	275,348	515.61	0.56	0.28	0.28
60.00	0.00	266,273	515.46	0.45	0.22	0.22
65.00	0.00	259,174	515.33	0.34	0.17	0.17
70.00	0.00	254,038	515.24	0.23	0.12	0.12
75.00	0.00	250,688	515.19	0.15	0.07	0.07
80.00	0.00	248,486	515.15	0.10	0.05	0.05
85.00	0.00	246,879	515.12	0.08	0.04	0.04
90.00	0.00	245,693	515.10	0.06	0.03	0.03
95.00	0.00	244,818	515.08	0.04	0.02	0.02
100.00	0.00	244,173	515.07	0.03	0.02	0.02
105.00	0.00	243,697	515.06	0.02	0.01	0.01
110.00	0.00	243,346	515.06	0.02	0.01	0.01
115.00	0.00	243,075	515.05	0.01	0.01	0.01
120.00	0.00	242,830	515.05	0.01	0.01	0.01
125.00	0.00	242,605	515.04	0.01	0.01	0.01
130.00	0.00	242,399	515.04	0.01	0.01	0.01
135.00	0.00	242,211	515.04	0.01	0.01	0.01
140.00	0.00	242,038	515.03	0.01	0.00	0.00
145.00	0.00	241,880	515.03	0.01	0.00	0.00
150.00	0.00	241,734	515.03	0.01	0.00	0.00
155.00	0.00	241,601	515.03	0.01	0.00	0.00
160.00	0.00	241,479	515.02	0.01	0.00	0.00

BERGMANN associates

Project:

Project No. 7594
Date: 6/26/2008
By: JWL
Checked:
Sheet: 1 of 1

TITLE: **WATER QUALITY STORAGE VOLUME**

Water Quality Volume

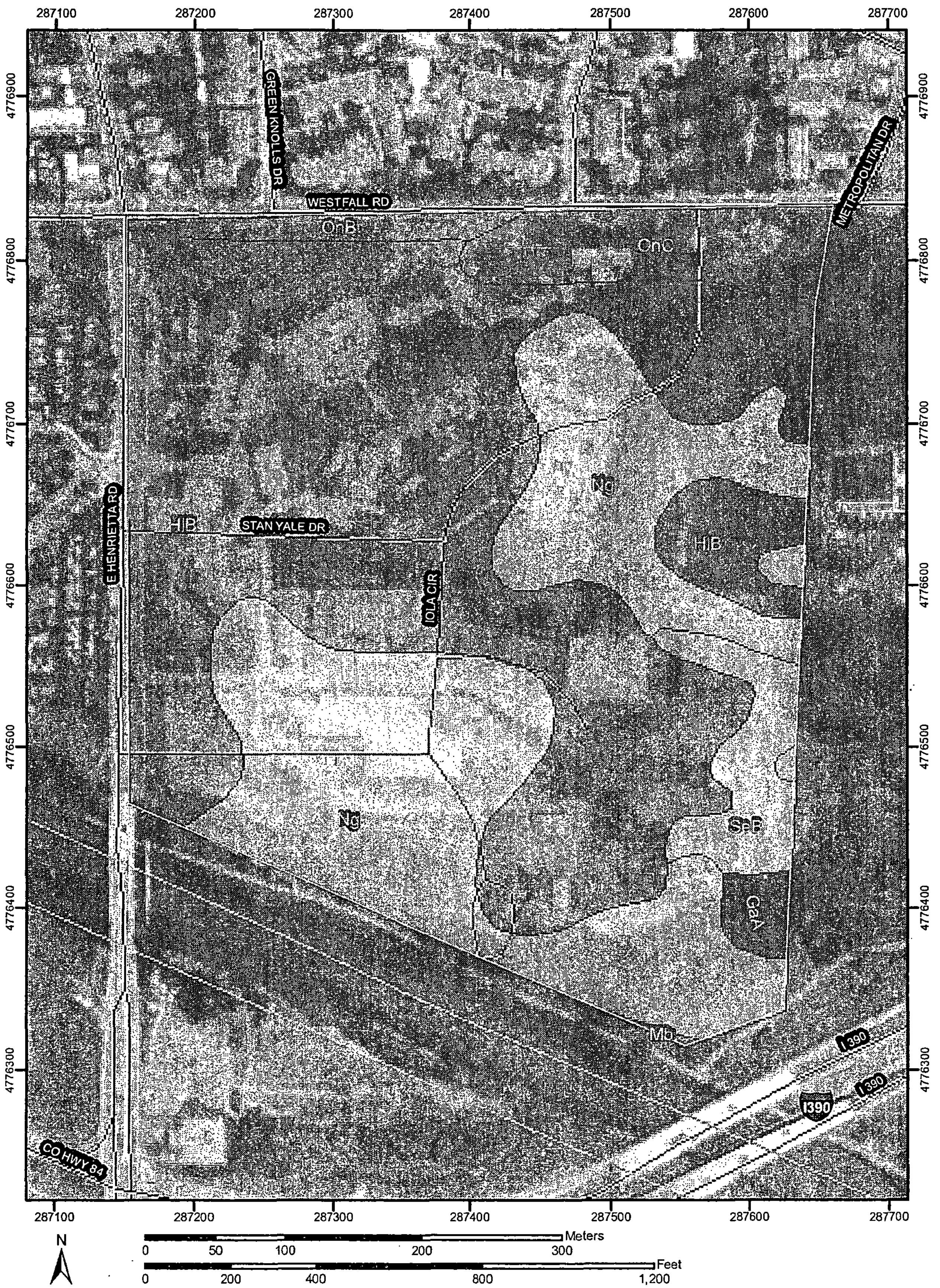
DESCRIPTION:
Total Water Quality Volume Required

Formula for calculating the Water Quality storage volume (WQv) = $\frac{(P)\,(Rv)\,(A)}{12}$

P = 90% Rainfall Event =	1.00
I = percent Impervious Cover =	57
Rv = 0.05 + 0.009(I) =	0.56
A = Acres =	64.51
Water Quality Storage Volume (acre-feet) =	3.03
	131,838 Cubic-Feet

Appendix D

Soils Map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WESTFALL RD
METROPOLITAN DR
OnB
CnC
Ng
HlB
STAN YALE DR
E HENRIETTA RD
IOLA CIR
HlB
Ng
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CaA
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I390
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N
Meters
0
50
100
200
300
Feet
0
200
400
800
1,200

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Soil Ratings
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Political Features

Municipalities
- Cities
- Urban Areas

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails

Roads
- Interstate Highways
- US Routes
- State Highways
- Local Roads
- Other Roads

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Monroe County, New York
Survey Area Data: Version 7, Aug 24, 2007

Date(s) aerial images were photographed: 4/22/1994

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Monroe County, New York				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
GaA	Galen very fine sandy loam, 0 to 2 percent slopes	B	0.7	1.1%
HlB	Hilton loam, 3 to 8 percent slopes	B	35.1	54.8%
Mb	Made land	D	0.1	0.1%
Ng	Niagara silt loam	C	21.2	33.1%
OnB	Ontario loam, 3 to 8 percent slopes	B	1.1	1.8%
OnC	Ontario loam, 8 to 15 percent slopes	B	3.4	5.3%
SeB	Schoharie silt loam, 2 to 6 percent slopes	C	2.4	3.8%
Totals for Area of Interest (AOI)			64.0	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

STORMWATER MANAGEMENT REPORT FOR ALTERNATE

For

Citygate

Westfall Road
City of Rochester, Monroe County, NY

July 28th, 2008

Prepared For

ANTHONY J. COSTELLO & SON DEVELOPMENT

Prepared by:

Bergmann associates
585.232.5135 fax: 585.232.4652

Table of Contents

Section I General Information

A. PROJECT DESCRIPTION

This Stormwater Management Report is for the proposed Citygate development. The project site is located at the southeast corner of East Henrietta and Westfall Road, in the City of Rochester, and the Town of Brighton, NY.

This proposed design will mitigate the increase in peak flow created by the proposed development. This is done by reducing the undetained drainage area and through peak flow attenuation. This approach will alleviate impacts to existing downstream structures and properties from the proposed site improvements. The proposed stormwater management facility meets the SPDES Phase II requirements.

B. SOIL CLASSIFICATION

According to the Monroe Soil Survey, Natural Resources Conservation Service website (NRCS), there are seven (7) mapped soil units identified on the project property (see Appendix D). Hilton loam is the dominant soil type and is located on approximately 35 percent of the project area. This soil type slopes at approximately 3 to 8 percent. These Soils have a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

The complete list of soils found on the project site is identified in the table below (see Appendix D for soils map).

Table I- Monroe County Soils Summary

Unit	Name	Hydrologic Group
GaA	Galen very fine sandy loam, 0 to 2 percent slopes	B
HIB	Hilton loam, 3 to 8 percent slopes	B
Mb	Made land	D
Ng	Niagara silt loam	C
OnB	Ontario loam, 3 to 8 percent slopes	B
OnC	Ontario loam, 8 to 15 percent slopes	B
SeB	Schoharie silt loam, 2 to 6 percent slopes	C

Section II Hydrology

A. METHODOLOGY

Stormwater runoff rates discharged from the site under the existing conditions provide the basis on which to compare the impacts of the proposed site improvements. Analysis points are established where runoff exits the site to provide a fixed location at which existing and proposed stormwater quantities can be compared. The areas draining to each analysis point are delineated using topographic survey maps, grading plans and utility plans. HydroCAD 8.0 by HydroCAD Software Solutions LLC was used to model the existing and proposed condition. This program simulates the USDA Soil Conservations Service's TR-20 hydrologic model to analyze discharges from drainage areas and retention basins.

The parameters required to calculate stormwater runoff are area, curve number, and time of concentration. Each drainage area is evaluated using the guidelines described in USDA Soil Conservation Service's TR-55 to determine the curve number and time of concentration.

The runoff curve number (CN) is based on a weighted average of ground cover and soil type. The underlying soil types are described in county soil maps. Site and grading plans and survey maps outline existing and proposed ground cover. CN values for specific locations are determined from the tables presented in TR-55.

Time of concentration (Tc) represents the amount of time it takes for runoff to travel from the hydraulically most distant point of the watershed to the point of analysis. Surface roughness, slope, channel shape and flow patterns are the factors that affect the time of concentration. Stormwater runoff flows through the drainage area as sheet flow, shallow concentrated flow, open channel flow, or concentrated flow (such as in storm sewers). For this report sheet flow will become shallow concentrated flow after a maximum of 150 feet for the existing condition and 100 feet for the proposed condition. The sum of the travel times over the various surfaces within the assumed flow path for a specific drainage area determines that area's time of concentration. The figures and formulas in TR-55 are employed to compute travel times for sheet flow and shallow concentrated flow. Manning's equation is used to determine flow velocities through pipes.

The stage-storage-discharge relationship for the proposed detention area is determined from topographical data and outlet structure characteristics. Discharge rates and storage volumes at various elevations (stage) are represented by this relationship. The pond storage capacity is calculated by determining the surface area at various elevations.

B. EXISTING CONDITIONS

The existing drainage area comprises a total of ±65 acres. This includes a small portion of off site drainage along the south property line of the canal bank. The parcel to be developed consists of woods, underbrush, grass areas and multiple vacant and occupied building and their associated parking and utilities.

As described in Table II and Appendix A. The site consists or 4 drainage areas which ultimately drain to two locations. The largest area is located on the west side of the site is assumed to drain into three storm sewer networks, which discharge to a swale located at the south west corner of the site. This swale is then piped under the Canal way Trail and into the canal. This area consists of mostly existing development made up of building, asphalt, gravel, and some grassed areas.

The remaining three drainage areas drain towards the east property line. All three areas ultimately drain to the NYDOT pond located at the 390 interchange. Area DA-2 drains through the storm system located on the offsite development east of the property, Area DA-3 via overland flow and a swale, and Area DA-4 drains via wetlands. Since these areas all have the same destination the discharges will be combined for

analysis purposes. These three areas consist of mostly grass and woodlands; as well as a large gravel/asphalt stockpile area and some existing building and parking lots.

Existing Drainage Area DA-1, consisting of 29.38 acres, includes the western portion of the property, consists of mostly existing development made up of building, asphalt, gravel, and some grassed areas. This area drains south to the canal

Existing Drainage Area DA-2, consisting of 20.74 acres, includes the north eastern corner of the site, this area consists of mainly woodlands and grass area with some building and pavement area. This area drains east to the east property line via overland flow and a small storm sewer system. Runoff ultimately drains to the NYSDOT pond.

Existing Drainage Area DA-3, consisting of 4.85 acres, includes the eastern center of the site; this area consists of mainly gravel/asphalt area with some grass area and some building and pavement area. This area drains east to the east property line via overland flow and a small storm sewer system. Runoff ultimately drains to the NYSDOT pond.

Existing Drainage Area DA-4, consisting of 9.53 acres, includes the south eastern corner of the site; this area consists of mainly gravel/asphalt area with some grass area. This area drains east to the east property line via overland flow. Runoff ultimately drains to the NYSDOT pond.

Table II summarizes the hydrologic characteristics of the drainage areas described above. See Appendix A for computations for the existing drainage conditions.

Table II
Existing Conditions Summary

Drainage Area	Description	Size (ac)	Composite Cn	Tc (min)
Area DA-1	The western portion of the property, consists of mostly existing development made up of building, asphalt, gravel, and some grassed areas.	29.38	89	20.6
Area DA-2	The north eastern corner of the site, this area consists of mainly woodlands and grass area with some building and pavement area.	20.74	84	14.4
Area DA-3	The eastern center of the site; this area consists of mainly gravel/asphalt area with some grass area and some building and pavement area.	4.85	97	4.7
Area DA-4	The south eastern corner of the site; this area consists of mainly gravel/asphalt area with some grass area.	9.53	88	10.6

C. PROPOSED CONDITIONS

The overall drainage area for the proposed condition consists of ±65 acres and drains to proposed pond P-1 located at the east side of the site, refer to Appendix B for the proposed conditions drainage map. Pond P-1 contains two outfall structures which divert the pond outfall to two separate water bodies. Half of the discharge is piped to the canal while the other half drains to the wetlands at the east of the site. This is done in order to maintain similar drainage patterns to the existing conditions.

Proposed Drainage Area DB-1, consisting of 64.5 acres, is comprised of the western half of the site. Buildings, parking lots, and some lawn area makes up this portion of the site. Stormwater from this area will drain via the closed storm sewer system to Detention Pond P-1 prior to being outlet to the canal and wetland. For analysis purposes, the primary discharge from this pond was compared to Existing Drainage Area DA-1 and the secondary discharge was compared to Existing Drainage Area DA-2, DA-3, and DA-4.

Table III Summarized the hydrologic characteristics of the drainage areas described above.

Table III
Proposed Conditions Summary

Drainage Area	Description	Size (ac)	Composite Cn	Tc (min)
Area DB-1	The whole site area. Buildings, parking lots, and some lawn area makes up this portion of the site.	64.5	84	8

Section III Stormwater Management & SPDES Phase II Requirements

The amount of stormwater runoff generated under proposed conditions is increased due to the newly added impervious surfaces. To manage the increased runoff, a detention/retention pond is proposed.

As required by the SPDES Phase II Requirements, and the NYS DEC, the on-site SMP (Stormwater Management Practice) must be designed to meet pollutant removal goals, reduce channel erosion, prevent overbank flooding, and help control extreme floods. To do this, the design will incorporate many of the pond features shown in the NYSDEC Stormwater Design Manual. This design incorporates the ability to keep the ponds aesthetically pleasing and functionally sound.

A. WATER QUALITY VOLUME

The Water Quality Volume requirement is designed to improve the quality of stormwater leaving the site. To meet the Water Quality volume, you must capture and treat 90% of the average annual stormwater runoff volume. The Water Quality Volume (WQv) portion of the design standards (see Appendix C) permit the Water Quality Volume to be provided by retention. For this reason a large Wet Pond has been designed to detain stormwater runoff. Pond P-1 at the east side of the site, provides 223,314 ft^3 where 129,731 ft^3 is required. This required volume uses a P value of 1.0 for the 90% rainfall event.

B. CHANNEL PROTECTION VOLUME

The Channel Protection Volume stated in the NYS Stormwater Design Manual is used to reduce flow out of a storage facility so as to protect the outlet channel or stream from erosion. The Channel Protection Volume is met by providing the 24 hour extended detention of the post developed 1 year, 24 hour storm event. As shown in Appendix C, for Pond P-1, a 4.00 inch orifice would be required to provide a detention time of 24 hrs. Therefore a 4 inch orifice is being used in pond P-1 to provide the required Channel Protection Volume.

C. OVERBANK FLOOD

Overbank Flood protection is provided by controlling the peak discharge from the 10-year storm to 10-year predevelopment rates. This requirement is being satisfied as the proposed development is reducing the peak discharge from the 10 yr storm below pre-development rates. Refer to Table IV for details.

D. EXTREME STORM

Extreme Storm protection is provided by controlling the peak discharge from the 100-year storm to 100-year predevelopment rates. This requirement is being satisfied as the proposed development is reducing the peak discharge from the 100 yr storm below pre-development rates. Refer to Table V for details

Section IV Summary of Findings

A. Summary of Results

Table IV and Table V depict the peak discharges from the 10 and 100 year design storms for the existing and proposed conditions. Refer to Appendix A and B for peak discharges for the 1, 2, and 25 year storms

Table IV-Existing and Proposed Peak Discharge for the 10-Year Storm (cfs)

Drainage Area	10 yr Design Storm Discharge	
	Existing	Proposed
Existing-Area DA-1 Proposed-Area DB-1 Primary	77.50	12.88
Existing-Area DA-2,DA-3,DA-4 Proposed-Area DB-1 Secondary	100.21	12.88

Table V-Existing and Proposed Peak Discharge for the 100-Year Storm (cfs)

Drainage Area	100 yr Design Storm Discharge	
	Existing	Proposed
Existing-Area DA-1 Proposed-Area DB-1 Primary	114.66	65.52
Existing-Area DA-2,DA-3,DA-4 Proposed-Area DB-1 Secondary	151.43	65.52

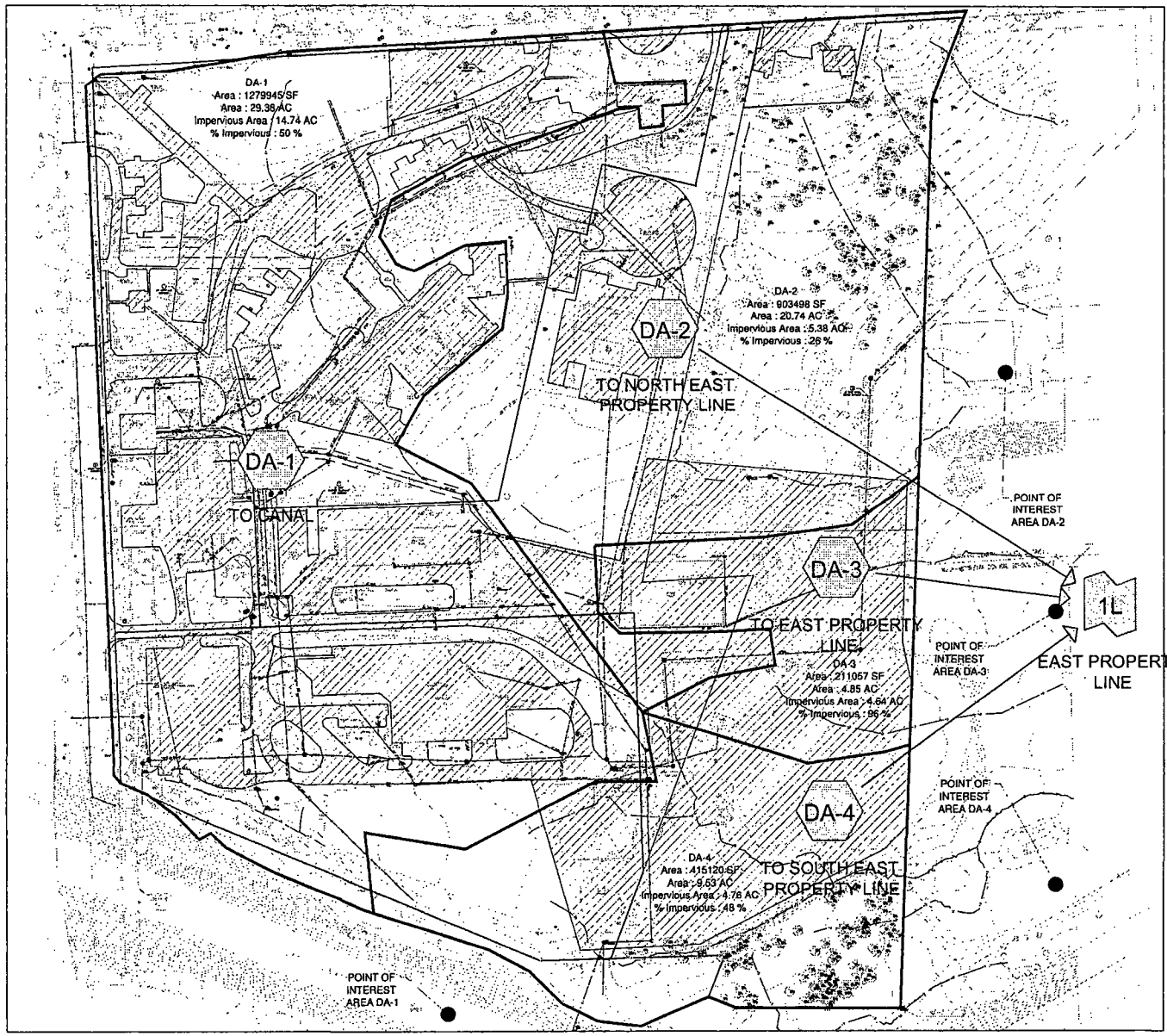
As depicted in the above tables, the peak discharge from the site for each of the design storms will be decreased after this project is constructed and the stormwater management plan is implemented.

B. Conclusion

Although existing conditions show multiple points of discharge along the east property line, all drainage collects and drains to the DOT pond near 390. Thus the three existing areas are compared to a portion of the one large post development area. Therefore, this project has provided sufficient mitigation to minimize any negative effect to downstream systems and properties.

Appendix A

Existing Drainage Conditions Map And Hydrograph Reports



E. Henrietta Road & Westfall Road
City of Rochester
County of Monroe
State of New York

Anthony J. Costello & Sons Development

Bergmann associates

EXISTING CONDITIONS DRAINAGE MAP

DR-EX

Subcat | Reach | Pond | Link

Drainage Diagram for EXISTING
Prepared by Bergmann Associates, Printed 7/1/2008
HydroCAD® 8.50 s/n 003498 © 2007 HydroCAD Software Solutions LLC

Summary for Subcatchment DA-1: TO CANAL

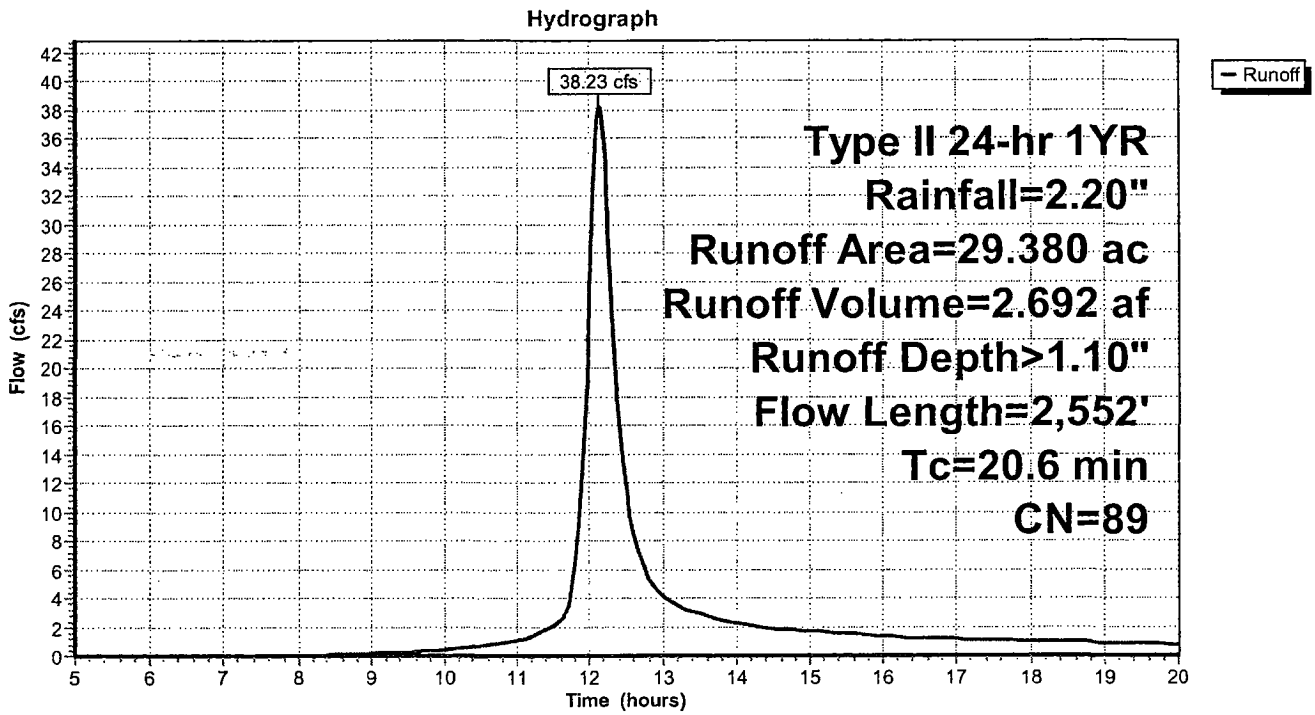
Runoff = 38.23 cfs @ 12.14 hrs, Volume= 2.692 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1YR Rainfall=2.20"

Area (ac)	CN	Description
14.640	79	50-75% Grass cover, Fair, HSG C
14.740	98	Water Surface, 0% imp
29.380	89	Weighted Average
29.380		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0110	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
2.7	567	0.0476	3.51		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.8	1,885	0.0196	8.32	14.71	**Circular Channel (pipe),** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
20.6	2,552	Total			

Subcatchment DA-1: TO CANAL



Hydrograph for Subcatchment DA-1: TO CANAL

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.14	0.00	0.00
5.25	0.15	0.00	0.00
5.50	0.16	0.00	0.00
5.75	0.17	0.00	0.00
6.00	0.18	0.00	0.00
6.25	0.19	0.00	0.00
6.50	0.20	0.00	0.00
6.75	0.21	0.00	0.00
7.00	0.22	0.00	0.00
7.25	0.23	0.00	0.00
7.50	0.24	0.00	0.00
7.75	0.25	0.00	0.00
8.00	0.26	0.00	0.01
8.25	0.28	0.00	0.03
8.50	0.29	0.00	0.06
8.75	0.31	0.00	0.11
9.00	0.32	0.00	0.16
9.25	0.34	0.01	0.22
9.50	0.36	0.01	0.27
9.75	0.38	0.01	0.32
10.00	0.40	0.02	0.40
10.25	0.42	0.02	0.51
10.50	0.45	0.03	0.66
10.75	0.48	0.04	0.84
11.00	0.52	0.05	1.11
11.25	0.56	0.06	1.47
11.50	0.62	0.09	2.11
11.75	0.85	0.20	4.71
12.00	1.46	0.60	**25.22**
12.25	1.55	0.67	**29.73**
12.50	1.62	0.72	11.26
12.75	1.66	0.75	5.95
13.00	1.70	0.78	4.14
13.25	1.73	0.81	3.36
13.50	1.76	0.83	2.90
13.75	1.78	0.85	2.55
14.00	1.80	0.87	2.27
14.25	1.82	0.88	2.03
14.50	1.84	0.90	1.89
14.75	1.86	0.91	1.79
15.00	1.88	0.93	1.70
15.25	1.89	0.94	1.62
15.50	1.91	0.95	1.53
15.75	1.92	0.96	1.44
16.00	1.94	0.98	1.35
16.25	1.95	0.99	1.26
16.50	1.96	1.00	1.21
16.75	1.97	1.01	1.18
17.00	1.98	1.01	1.15
17.25	1.99	1.02	1.11
17.50	2.01	1.03	1.08
17.75	2.02	1.04	1.05
18.00	2.03	1.05	1.02
18.25	2.04	1.06	0.98
18.50	2.05	1.07	0.95
18.75	2.05	1.07	0.92
19.00	2.06	1.08	0.89
19.25	2.07	1.09	0.85
19.50	2.08	1.09	0.82
19.75	2.09	1.10	0.79
20.00	**2.09**	**1.11**	0.75

Summary for Subcatchment DA-2: TO NORTH EAST PROPERTY LINE

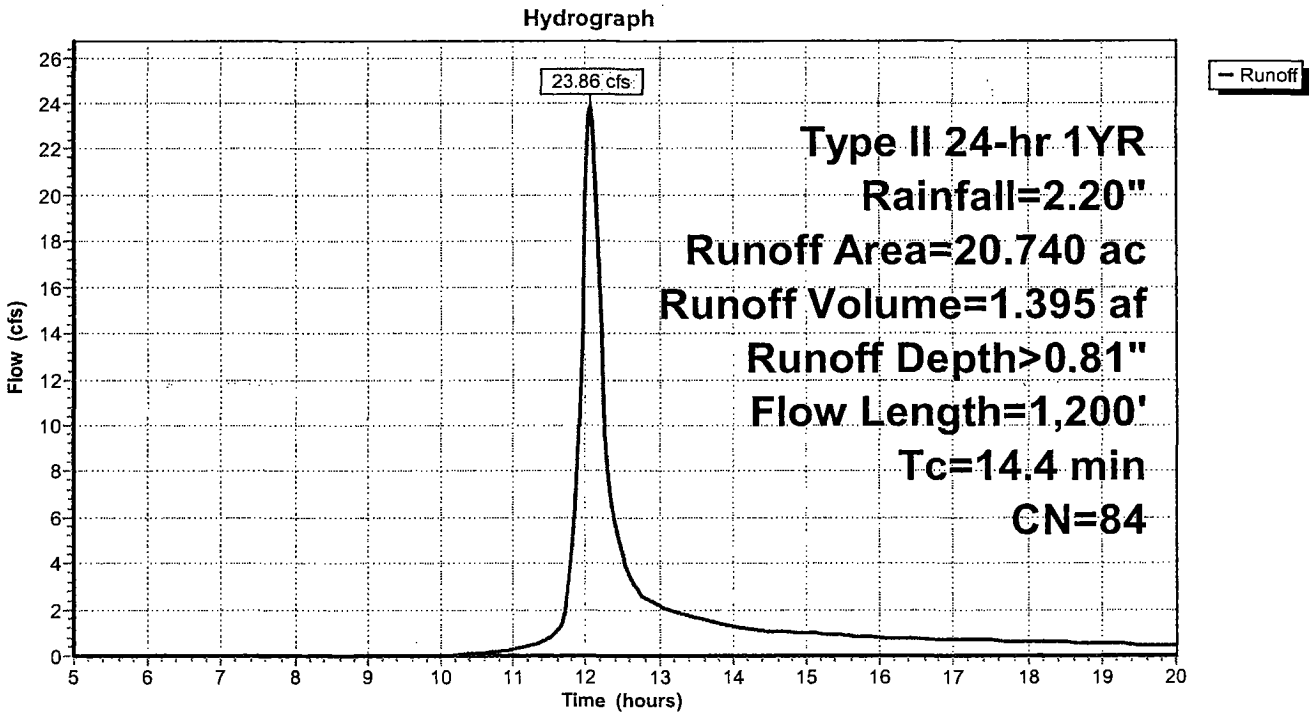
Runoff = 23.86 cfs @ 12.07 hrs, Volume= 1.395 af, Depth> 0.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1YR Rainfall=2.20"

Area (ac)	CN	Description
5.380	98	Paved parking & roofs
15.360	79	50-75% Grass cover, Fair, HSG C
20.740	84	Weighted Average
15.360		Pervious Area
5.380		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0700	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
7.7	1,100	0.0217	2.37		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.4	1,200	Total			

Subcatchment DA-2: TO NORTH EAST PROPERTY LINE



Hydrograph for Subcatchment DA-2: TO NORTH EAST PROPERTY LINE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.14	0.00	0.00
5.25	0.15	0.00	0.00
5.50	0.16	0.00	0.00
5.75	0.17	0.00	0.00
6.00	0.18	0.00	0.00
6.25	0.19	0.00	0.00
6.50	0.20	0.00	0.00
6.75	0.21	0.00	0.00
7.00	0.22	0.00	0.00
7.25	0.23	0.00	0.00
7.50	0.24	0.00	0.00
7.75	0.25	0.00	0.00
8.00	0.26	0.00	0.00
8.25	0.28	0.00	0.00
8.50	0.29	0.00	0.00
8.75	0.31	0.00	0.00
9.00	0.32	0.00	0.00
9.25	0.34	0.00	0.00
9.50	0.36	0.00	0.00
9.75	0.38	0.00	0.00
10.00	0.40	0.00	0.00
10.25	0.42	0.00	0.04
10.50	0.45	0.00	0.10
10.75	0.48	0.00	0.18
11.00	0.52	0.01	0.29
11.25	0.56	0.02	0.47
11.50	0.62	0.03	0.79
11.75	0.85	0.09	2.90
12.00	1.46	0.39	**19.64**
12.25	1.55	0.45	**10.57**
12.50	1.62	0.49	4.32
12.75	1.66	0.51	2.65
13.00	1.70	0.54	2.16
13.25	1.73	0.56	1.83
13.50	1.76	0.58	1.61
13.75	1.78	0.59	1.43
14.00	1.80	0.61	1.28
14.25	1.82	0.62	1.15
14.50	1.84	0.63	1.09
14.75	1.86	0.65	1.04
15.00	1.88	0.66	0.99
15.25	1.89	0.67	0.94
15.50	1.91	0.68	0.89
15.75	1.92	0.69	0.84
16.00	1.94	0.70	0.79
16.25	1.95	0.71	0.74
16.50	1.96	0.72	0.72
16.75	1.97	0.72	0.70
17.00	1.98	0.73	0.68
17.25	1.99	0.74	0.66
17.50	2.01	0.75	0.64
17.75	2.02	0.76	0.63
18.00	2.03	0.76	0.61
18.25	2.04	0.77	0.59
18.50	2.05	0.78	0.57
18.75	2.05	0.78	0.55
19.00	2.06	0.79	0.53
19.25	2.07	0.79	0.51
19.50	2.08	0.80	0.49
19.75	2.09	0.81	0.47
20.00	**2.09**	**0.81**	0.45

Summary for Subcatchment DA-3: TO EAST PROPERTY LINE

[49] Hint: Tc<2dt may require smaller dt

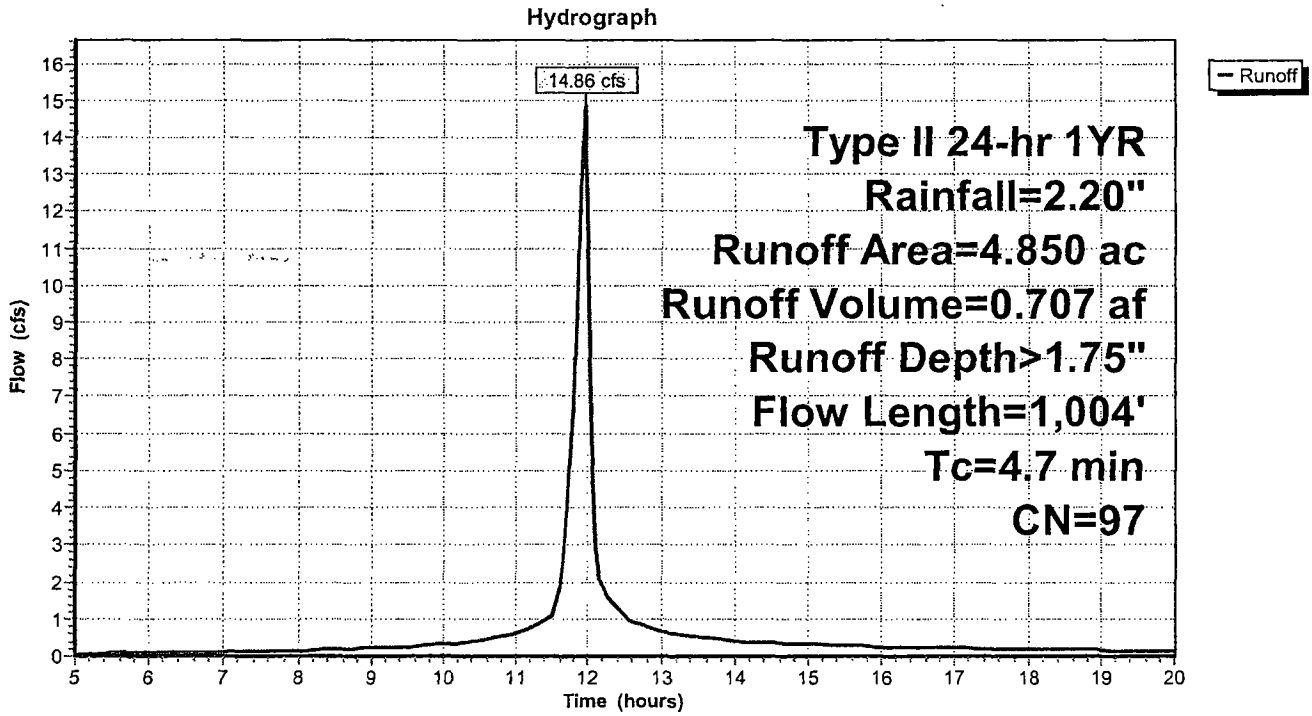
Runoff = 14.86 cfs @ 11.95 hrs, Volume= 0.707 af, Depth> 1.75"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1YR Rainfall=2.20"

Area (ac)	CN	Description
4.640	98	Paved roads w/curbs & sewers
0.210	79	50-75% Grass cover, Fair, HSG C
4.850	97	Weighted Average
0.210		Pervious Area
4.640		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	76	0.0158	1.05		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
1.5	648	0.0138	6.98	12.34	**Circular Channel (pipe),** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
2.0	280	0.0214	2.36		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.7	1,004	Total			

Subcatchment DA-3: TO EAST PROPERTY LINE



Hydrograph for Subcatchment DA-3: TO EAST PROPERTY LINE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.14	0.02	0.06
5.25	0.15	0.02	0.07
5.50	0.16	0.02	0.07
5.75	0.17	0.03	0.08
6.00	0.18	0.03	0.09
6.25	0.19	0.04	0.10
6.50	0.20	0.04	0.10
6.75	0.21	0.05	0.11
7.00	0.22	0.05	0.12
7.25	0.23	0.06	0.13
7.50	0.24	0.07	0.13
7.75	0.25	0.07	0.14
8.00	0.26	0.08	0.15
8.25	0.28	0.09	0.17
8.50	0.29	0.10	0.19
8.75	0.31	0.11	0.21
9.00	0.32	0.12	0.24
9.25	0.34	0.13	0.25
9.50	0.36	0.15	0.25
9.75	0.38	0.16	0.28
10.00	0.40	0.18	0.32
10.25	0.42	0.19	0.37
10.50	0.45	0.22	0.43
10.75	0.48	0.24	0.52
11.00	0.52	0.27	0.62
11.25	0.56	0.31	0.81
11.50	0.62	0.36	1.06
11.75	0.85	0.57	**5.26**
12.00	1.46	1.14	**11.98**
12.25	1.55	1.24	1.68
12.50	1.62	1.30	1.08
12.75	1.66	1.34	0.81
13.00	1.70	1.38	0.68
13.25	1.73	1.41	0.59
13.50	1.76	1.43	0.51
13.75	1.78	1.46	0.46
14.00	1.80	1.48	0.40
14.25	1.82	1.50	0.38
14.50	1.84	1.52	0.36
14.75	1.86	1.53	0.34
15.00	1.88	1.55	0.32
15.25	1.89	1.57	0.30
15.50	1.91	1.58	0.28
15.75	1.92	1.60	0.27
16.00	1.94	1.61	0.25
16.25	1.95	1.62	0.24
16.50	1.96	1.63	0.23
16.75	1.97	1.64	0.22
17.00	1.98	1.66	0.22
17.25	1.99	1.67	0.21
17.50	2.01	1.68	0.21
17.75	2.02	1.69	0.20
18.00	2.03	1.70	0.19
18.25	2.04	1.71	0.19
18.50	2.05	1.72	0.18
18.75	2.05	1.72	0.17
19.00	2.06	1.73	0.17
19.25	2.07	1.74	0.16
19.50	2.08	1.75	0.15
19.75	2.09	1.76	0.15
20.00	**2.09**	**1.76**	0.14

Summary for Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE

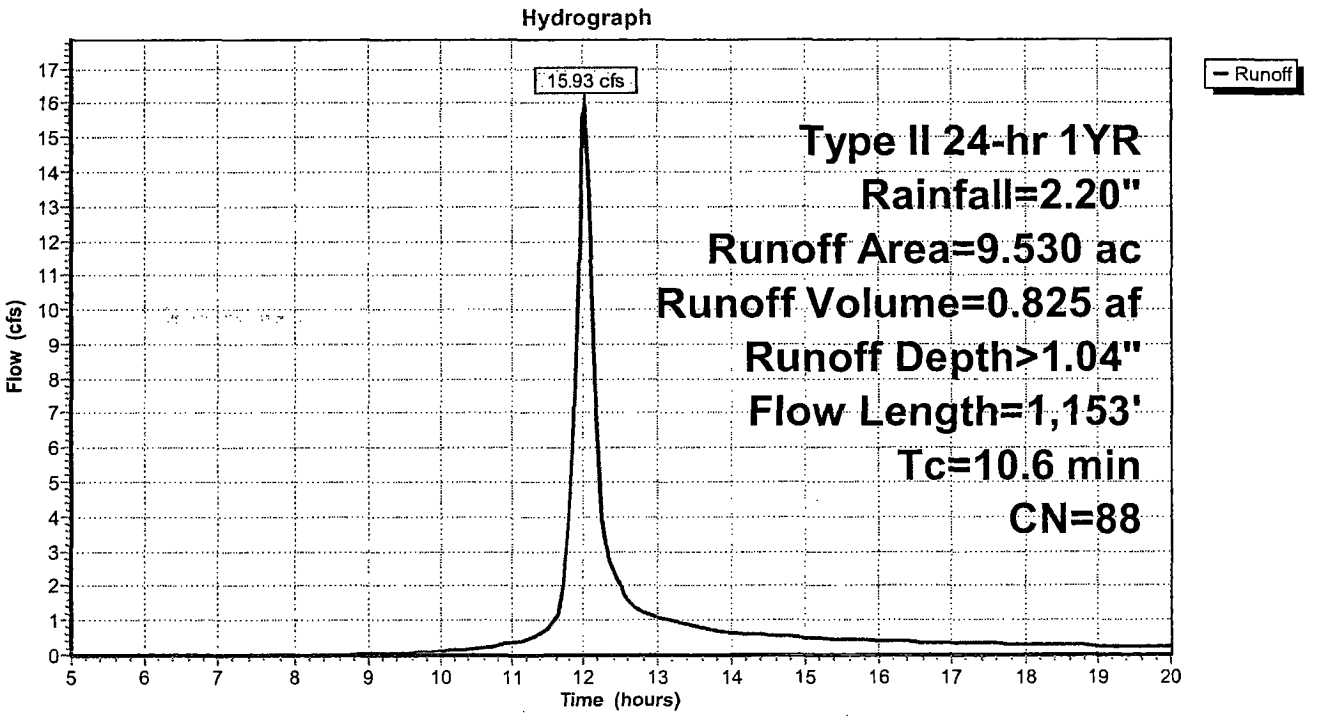
Runoff = 15.93 cfs @ 12.02 hrs, Volume= 0.825 af, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1YR Rainfall=2.20"

Area (ac)	CN	Description
4.760	98	Paved parking & roofs
4.770	79	50-75% Grass cover, Fair, HSG C
9.530	88	Weighted Average
4.770		Pervious Area
4.760		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0200	1.22		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
3.6	471	0.0114	2.17		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.6	582	0.0114	1.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.6	1,153	Total			

Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE



Hydrograph for Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE

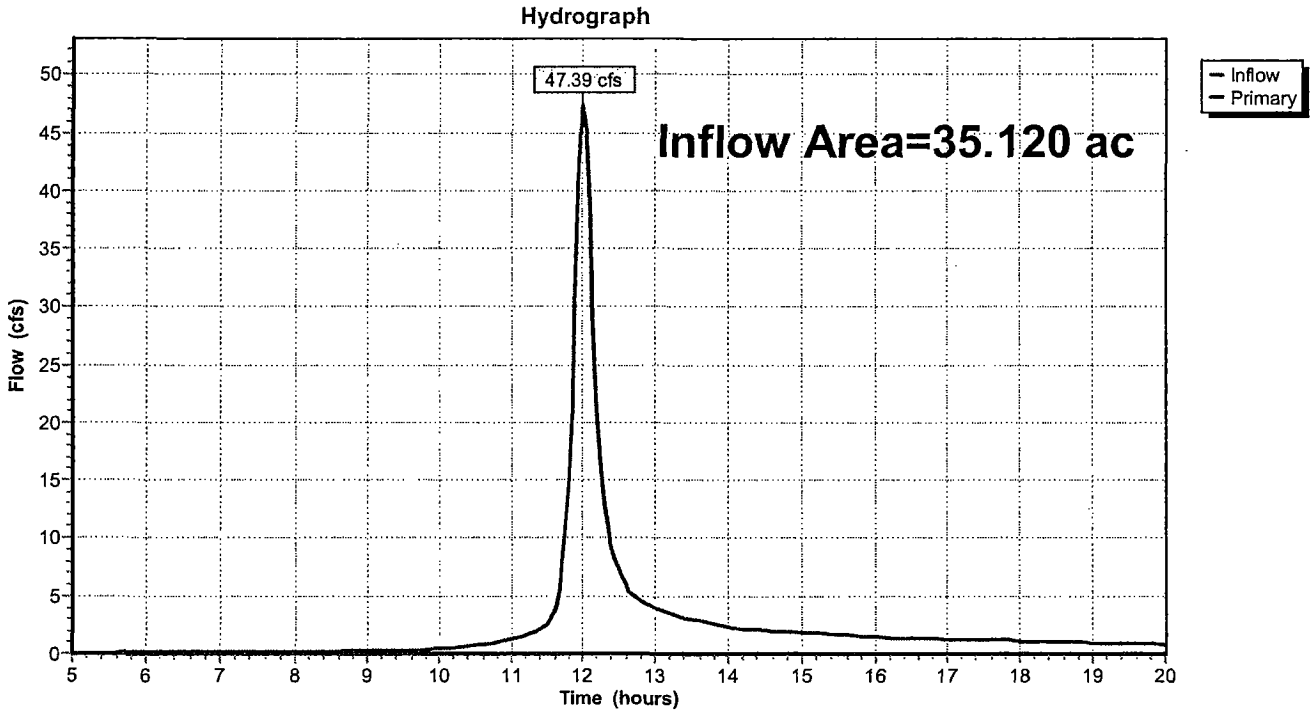
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.14	0.00	0.00
5.25	0.15	0.00	0.00
5.50	0.16	0.00	0.00
5.75	0.17	0.00	0.00
6.00	0.18	0.00	0.00
6.25	0.19	0.00	0.00
6.50	0.20	0.00	0.00
6.75	0.21	0.00	0.00
7.00	0.22	0.00	0.00
7.25	0.23	0.00	0.00
7.50	0.24	0.00	0.00
7.75	0.25	0.00	0.00
8.00	0.26	0.00	0.00
8.25	0.28	0.00	0.00
8.50	0.29	0.00	0.01
8.75	0.31	0.00	0.02
9.00	0.32	0.00	0.04
9.25	0.34	0.00	0.05
9.50	0.36	0.01	0.07
9.75	0.38	0.01	0.09
10.00	0.40	0.01	0.12
10.25	0.42	0.01	0.15
10.50	0.45	0.02	0.20
10.75	0.48	0.03	0.27
11.00	0.52	0.04	0.36
11.25	0.56	0.05	0.50
11.50	0.62	0.07	0.74
11.75	0.85	0.17	3.04
12.00	1.46	0.55	**15.54**
12.25	1.55	0.62	3.98
12.50	1.62	0.67	1.96
12.75	1.66	0.70	1.33
13.00	1.70	0.73	1.11
13.25	1.73	0.75	0.95
13.50	1.76	0.77	0.84
13.75	1.78	0.79	0.74
14.00	1.80	0.81	0.66
14.25	1.82	0.83	0.60
14.50	1.84	0.84	0.57
14.75	1.86	0.85	0.55
15.00	1.88	0.87	0.52
15.25	1.89	0.88	0.49
15.50	1.91	0.89	0.46
15.75	1.92	0.90	0.43
16.00	1.94	0.91	0.41
16.25	1.95	0.92	0.38
16.50	1.96	0.93	0.37
16.75	1.97	0.94	0.36
17.00	1.98	0.95	0.35
17.25	1.99	0.96	0.34
17.50	2.01	0.97	0.33
17.75	2.02	0.98	0.32
18.00	2.03	0.99	0.31
18.25	2.04	0.99	0.30
18.50	2.05	1.00	0.29
18.75	2.05	1.01	0.28
19.00	2.06	1.02	0.27
19.25	2.07	1.02	0.26
19.50	2.08	1.03	0.25
19.75	2.09	1.04	0.24
20.00	**2.09**	**1.04**	0.23

Summary for Link 1L: EAST PROPERTY LINE

Inflow Area = 35.120 ac, 42.08% Impervious, Inflow Depth > 1.00" for 1YR event
Inflow = 47.39 cfs @ 12.01 hrs, Volume= 2.927 af
Primary = 47.39 cfs @ 12.01 hrs, Volume= 2.927 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 1L: EAST PROPERTY LINE



Hydrograph for Link 1L: EAST PROPERTY LINE

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.06	**0.00**	0.06
5.25	0.07	0.00	0.07
5.50	0.07	0.00	0.07
5.75	0.08	0.00	0.08
6.00	0.09	0.00	0.09
6.25	0.10	0.00	0.10
6.50	0.10	0.00	0.10
6.75	0.11	0.00	0.11
7.00	0.12	0.00	0.12
7.25	0.13	0.00	0.13
7.50	0.13	0.00	0.13
7.75	0.14	0.00	0.14
8.00	0.15	0.00	0.15
8.25	0.17	0.00	0.17
8.50	0.19	0.00	0.19
8.75	0.23	0.00	0.23
9.00	0.27	0.00	0.27
9.25	0.30	0.00	0.30
9.50	0.32	0.00	0.32
9.75	0.37	0.00	0.37
10.00	0.44	0.00	0.44
10.25	0.56	0.00	0.56
10.50	0.73	0.00	0.73
10.75	0.96	0.00	0.96
11.00	1.27	0.00	1.27
11.25	1.79	0.00	1.79
11.50	2.59	0.00	2.59
11.75	11.20	0.00	11.20
12.00	**47.15**	0.00	**47.15**
12.25	16.22	0.00	16.22
12.50	7.37	0.00	7.37
12.75	4.80	0.00	4.80
13.00	3.95	0.00	3.95
13.25	3.36	0.00	3.36
13.50	2.96	0.00	2.96
13.75	2.62	0.00	2.62
14.00	2.34	0.00	2.34
14.25	2.13	0.00	2.13
14.50	2.02	0.00	2.02
14.75	1.93	0.00	1.93
15.00	1.83	0.00	1.83
15.25	1.74	0.00	1.74
15.50	1.64	0.00	1.64
15.75	1.54	0.00	1.54
16.00	1.44	0.00	1.44
16.25	1.36	0.00	1.36
16.50	1.32	0.00	1.32
16.75	1.29	0.00	1.29
17.00	1.25	0.00	1.25
17.25	1.22	0.00	1.22
17.50	1.18	0.00	1.18
17.75	1.15	0.00	1.15
18.00	1.11	0.00	1.11
18.25	1.08	0.00	1.08
18.50	1.04	0.00	1.04
18.75	1.00	0.00	1.00
19.00	0.97	0.00	0.97
19.25	0.93	0.00	0.93
19.50	0.89	0.00	0.89
19.75	0.86	0.00	0.86
20.00	0.82	0.00	0.82

Summary for Subcatchment DA-1: TO CANAL

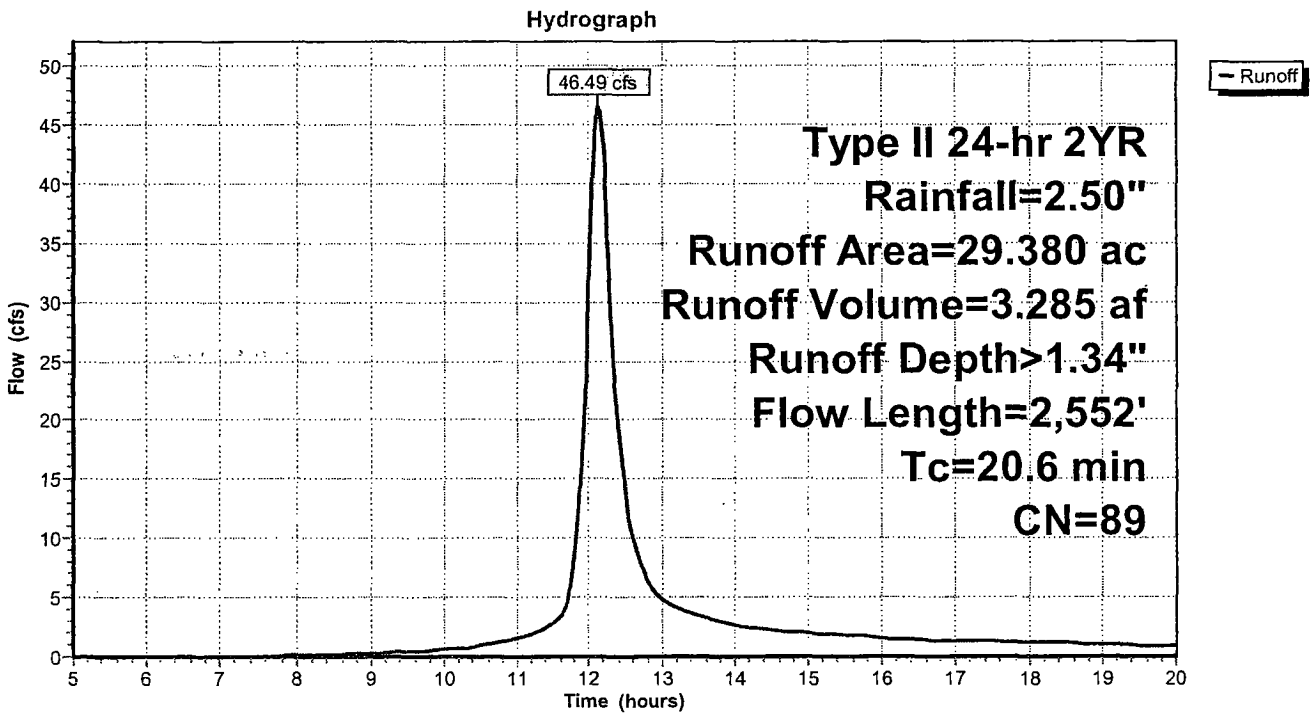
Runoff = 46.49 cfs @ 12.13 hrs, Volume= 3.285 af, Depth> 1.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2YR Rainfall=2.50"

Area (ac)	CN	Description
14.640	79	50-75% Grass cover, Fair, HSG C
14.740	98	Water Surface, 0% imp
29.380	89	Weighted Average
29.380		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0110	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
2.7	567	0.0476	3.51		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.8	1,885	0.0196	8.32	14.71	**Circular Channel (pipe),** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
20.6	2,552	Total			

Subcatchment DA-1: TO CANAL



Hydrograph for Subcatchment DA-1: TO CANAL

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.16	0.00	0.00
5.25	0.17	0.00	0.00
5.50	0.18	0.00	0.00
5.75	0.19	0.00	0.00
6.00	0.20	0.00	0.00
6.25	0.21	0.00	0.00
6.50	0.22	0.00	0.00
6.75	0.24	0.00	0.00
7.00	0.25	0.00	0.00
7.25	0.26	0.00	0.00
7.50	0.27	0.00	0.02
7.75	0.29	0.00	0.05
8.00	0.30	0.00	0.09
8.25	0.31	0.00	0.12
8.50	0.33	0.01	0.17
8.75	0.35	0.01	0.23
9.00	0.37	0.01	0.30
9.25	0.39	0.01	0.38
9.50	0.41	0.02	0.44
9.75	0.43	0.02	0.50
10.00	0.45	0.03	0.61
10.25	0.48	0.04	0.75
10.50	0.51	0.05	0.94
10.75	0.55	0.06	1.18
11.00	0.59	0.07	1.52
11.25	0.64	0.09	1.98
11.50	0.71	0.12	2.79
11.75	0.97	0.27	6.07
12.00	1.66	0.75	**31.17**
12.25	1.77	0.84	**35.93**
12.50	1.84	0.89	13.48
12.75	1.89	0.94	7.08
13.00	1.93	0.97	4.91
13.25	1.97	1.00	3.97
13.50	2.00	1.03	3.43
13.75	2.03	1.05	3.01
14.00	2.05	1.07	2.68
14.25	2.07	1.09	2.39
14.50	2.09	1.11	2.23
14.75	2.11	1.12	2.11
15.00	2.13	1.14	2.01
15.25	2.15	1.16	1.90
15.50	2.17	1.17	1.80
15.75	2.19	1.18	1.69
16.00	2.20	1.20	1.58
16.25	2.21	1.21	1.48
16.50	2.23	1.22	1.42
16.75	2.24	1.23	1.38
17.00	2.25	1.24	1.35
17.25	2.27	1.25	1.31
17.50	2.28	1.26	1.27
17.75	2.29	1.27	1.23
18.00	2.30	1.28	1.19
18.25	2.31	1.29	1.16
18.50	2.32	1.30	1.12
18.75	2.33	1.31	1.08
19.00	2.34	1.32	1.04
19.25	2.35	1.33	1.00
19.50	2.36	1.34	0.96
19.75	2.37	1.34	0.92
20.00	**2.38**	**1.35**	0.88

Summary for Subcatchment DA-2: TO NORTH EAST PROPERTY LINE

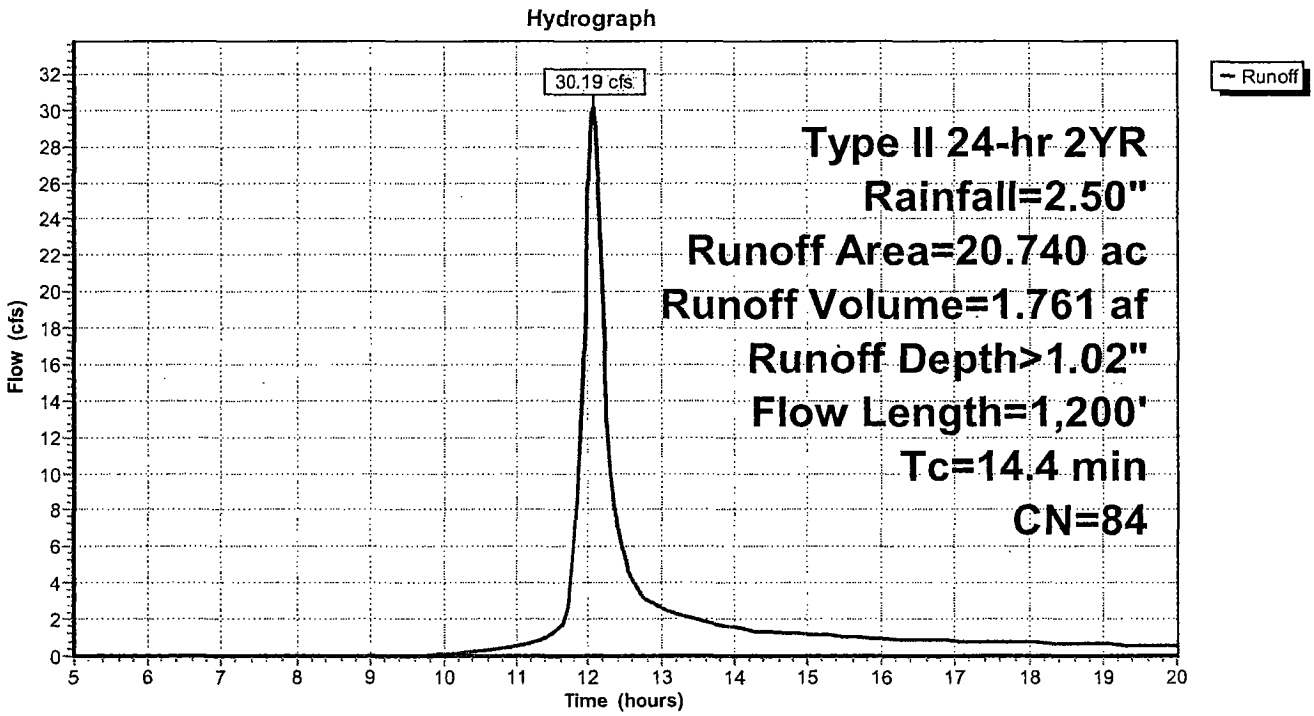
Runoff = 30.19 cfs @ 12.07 hrs, Volume= 1.761 af, Depth> 1.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2YR Rainfall=2.50"

Area (ac)	CN	Description
5.380	98	Paved parking & roofs
15.360	79	50-75% Grass cover, Fair, HSG C
20.740	84	Weighted Average
15.360		Pervious Area
5.380		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0700	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
7.7	1,100	0.0217	2.37		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.4	1,200	Total			

Subcatchment DA-2: TO NORTH EAST PROPERTY LINE



Hydrograph for Subcatchment DA-2: TO NORTH EAST PROPERTY LINE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.16	0.00	0.00
5.25	0.17	0.00	0.00
5.50	0.18	0.00	0.00
5.75	0.19	0.00	0.00
6.00	0.20	0.00	0.00
6.25	0.21	0.00	0.00
6.50	0.22	0.00	0.00
6.75	0.24	0.00	0.00
7.00	0.25	0.00	0.00
7.25	0.26	0.00	0.00
7.50	0.27	0.00	0.00
7.75	0.29	0.00	0.00
8.00	0.30	0.00	0.00
8.25	0.31	0.00	0.00
8.50	0.33	0.00	0.00
8.75	0.35	0.00	0.00
9.00	0.37	0.00	0.00
9.25	0.39	0.00	0.00
9.50	0.41	0.00	0.02
9.75	0.43	0.00	0.05
10.00	0.45	0.00	0.10
10.25	0.48	0.00	0.16
10.50	0.51	0.01	0.24
10.75	0.55	0.01	0.36
11.00	0.59	0.02	0.52
11.25	0.64	0.03	0.77
11.50	0.71	0.05	1.20
11.75	0.97	0.14	4.07
12.00	1.66	0.51	**25.20**
12.25	1.77	0.58	**13.16**
12.50	1.84	0.63	5.30
12.75	1.89	0.67	3.23
13.00	1.93	0.69	2.63
13.25	1.97	0.72	2.22
13.50	2.00	0.74	1.96
13.75	2.03	0.76	1.73
14.00	2.05	0.78	1.54
14.25	2.07	0.80	1.39
14.50	2.09	0.81	1.32
14.75	2.11	0.83	1.26
15.00	2.13	0.84	1.20
15.25	2.15	0.85	1.14
15.50	2.17	0.87	1.07
15.75	2.19	0.88	1.01
16.00	2.20	0.89	0.95
16.25	2.21	0.90	0.89
16.50	2.23	0.91	0.86
16.75	2.24	0.92	0.84
17.00	2.25	0.93	0.82
17.25	2.27	0.94	0.80
17.50	2.28	0.95	0.77
17.75	2.29	0.96	0.75
18.00	2.30	0.96	0.73
18.25	2.31	0.97	0.71
18.50	2.32	0.98	0.68
18.75	2.33	0.99	0.66
19.00	2.34	1.00	0.63
19.25	2.35	1.00	0.61
19.50	2.36	1.01	0.59
19.75	2.37	1.02	0.56
20.00	**2.38**	**1.02**	0.54

Summary for Subcatchment DA-3: TO EAST PROPERTY LINE

[49] Hint: Tc<2dt may require smaller dt

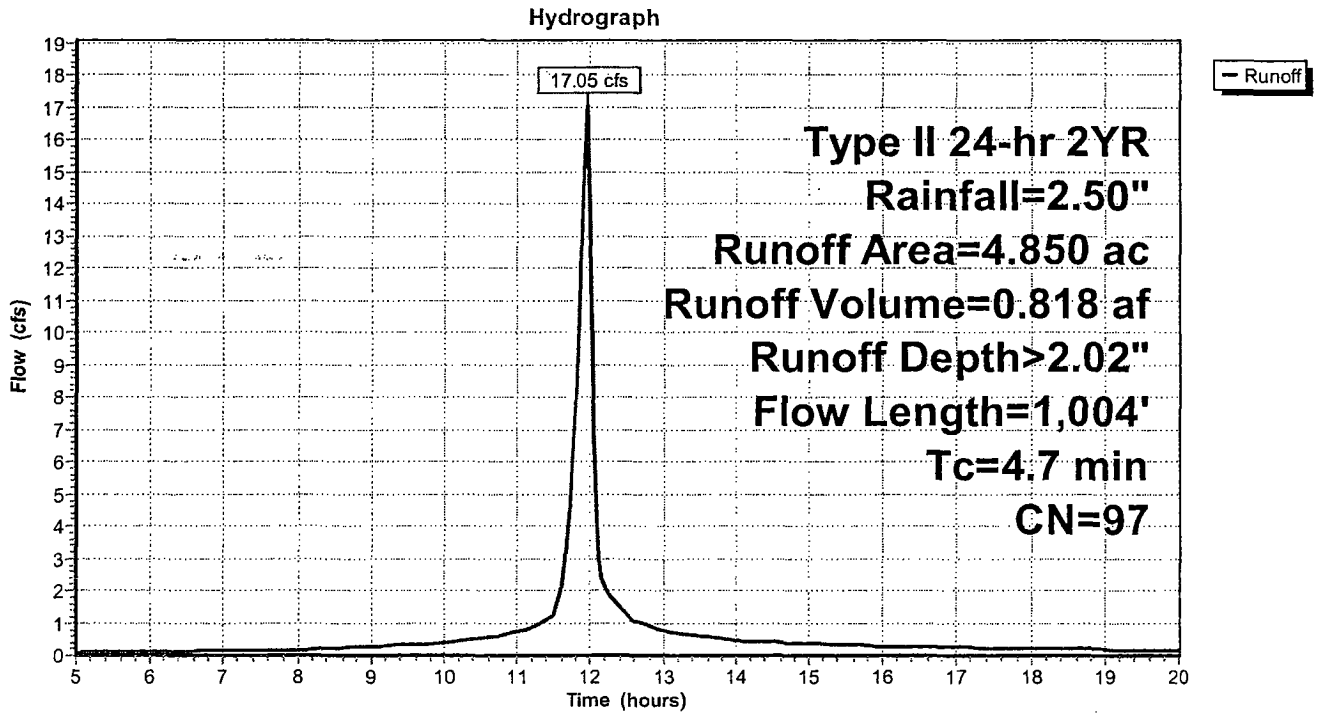
Runoff = 17.05 cfs @ 11.95 hrs, Volume= 0.818 af, Depth> 2.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2YR Rainfall=2.50"

Area (ac)	CN	Description
4.640	98	Paved roads w/curbs & sewers
0.210	79	50-75% Grass cover, Fair, HSG C
4.850	97	Weighted Average
0.210		Pervious Area
4.640		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	76	0.0158	1.05		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
1.5	648	0.0138	6.98	12.34	**Circular Channel (pipe),** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
2.0	280	0.0214	2.36		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.7	1,004	Total			

Subcatchment DA-3: TO EAST PROPERTY LINE



Hydrograph for Subcatchment DA-3: TO EAST PROPERTY LINE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.16	0.02	0.08
5.25	0.17	0.03	0.09
5.50	0.18	0.03	0.10
5.75	0.19	0.04	0.10
6.00	0.20	0.04	0.11
6.25	0.21	0.05	0.12
6.50	0.22	0.06	0.13
6.75	0.24	0.06	0.14
7.00	0.25	0.07	0.15
7.25	0.26	0.08	0.16
7.50	0.27	0.09	0.16
7.75	0.29	0.09	0.17
8.00	0.30	0.10	0.18
8.25	0.31	0.11	0.20
8.50	0.33	0.12	0.23
8.75	0.35	0.14	0.26
9.00	0.37	0.15	0.28
9.25	0.39	0.17	0.30
9.50	0.41	0.18	0.30
9.75	0.43	0.20	0.34
10.00	0.45	0.22	0.38
10.25	0.48	0.24	0.44
10.50	0.51	0.27	0.51
10.75	0.55	0.30	0.61
11.00	0.59	0.33	0.73
11.25	0.64	0.38	0.95
11.50	0.71	0.44	1.23
11.75	0.97	0.68	**6.09**
12.00	1.66	1.34	**13.72**
12.25	1.77	1.44	1.92
12.50	1.84	1.51	1.24
12.75	1.89	1.56	0.93
13.00	1.93	1.60	0.78
13.25	1.97	1.64	0.67
13.50	2.00	1.67	0.59
13.75	2.03	1.70	0.52
14.00	2.05	1.72	0.46
14.25	2.07	1.74	0.43
14.50	2.09	1.76	0.41
14.75	2.11	1.78	0.39
15.00	2.13	1.80	0.37
15.25	2.15	1.82	0.35
15.50	2.17	1.84	0.32
15.75	2.19	1.85	0.30
16.00	2.20	1.87	0.28
16.25	2.21	1.88	0.27
16.50	2.23	1.90	0.26
16.75	2.24	1.91	0.26
17.00	2.25	1.92	0.25
17.25	2.27	1.93	0.24
17.50	2.28	1.95	0.23
17.75	2.29	1.96	0.23
18.00	2.30	1.97	0.22
18.25	2.31	1.98	0.21
18.50	2.32	1.99	0.20
18.75	2.33	2.00	0.20
19.00	2.34	2.01	0.19
19.25	2.35	2.02	0.18
19.50	2.36	2.03	0.17
19.75	2.37	2.04	0.17
20.00	**2.38**	**2.05**	0.16

Summary for Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE

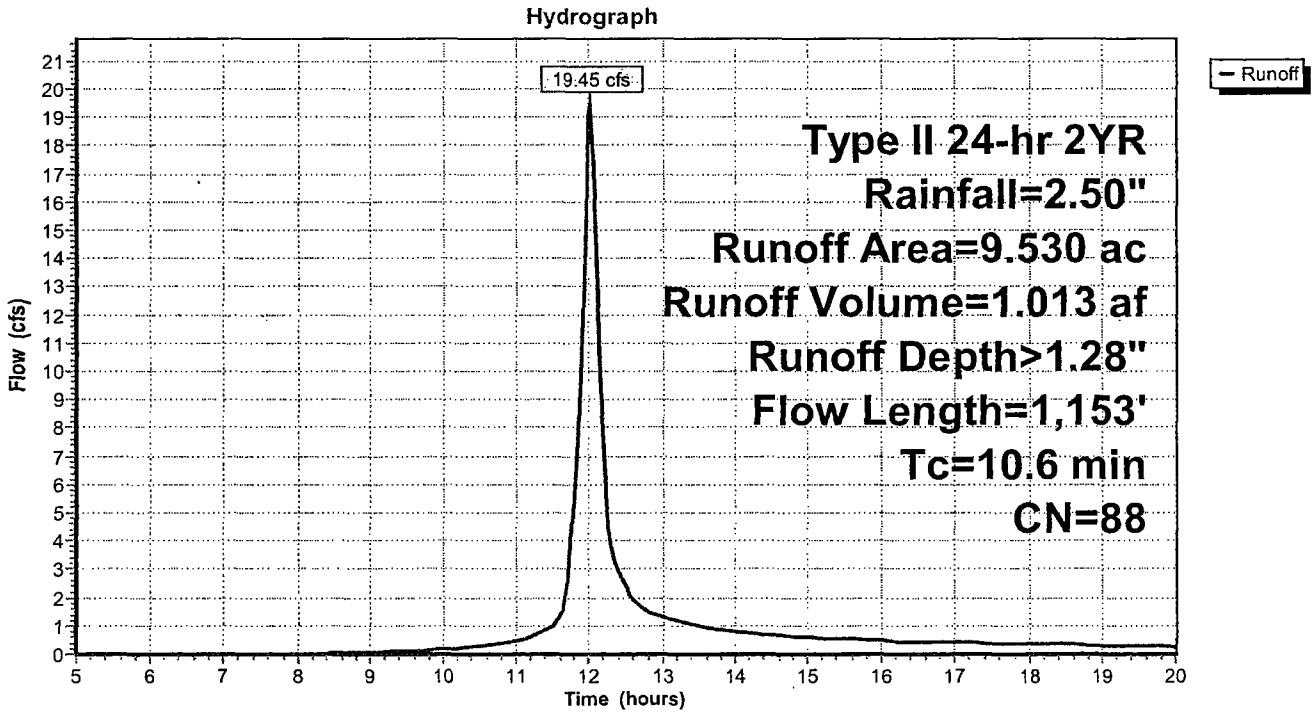
Runoff = 19.45 cfs @ 12.02 hrs, Volume= 1.013 af, Depth> 1.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2YR Rainfall=2.50"

Area (ac)	CN	Description
4.760	98	Paved parking & roofs
4.770	79	50-75% Grass cover, Fair, HSG C
9.530	88	Weighted Average
4.770		Pervious Area
4.760		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0200	1.22		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
3.6	471	0.0114	2.17		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.6	582	0.0114	1.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.6	1,153	Total			

Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE



Hydrograph for Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE

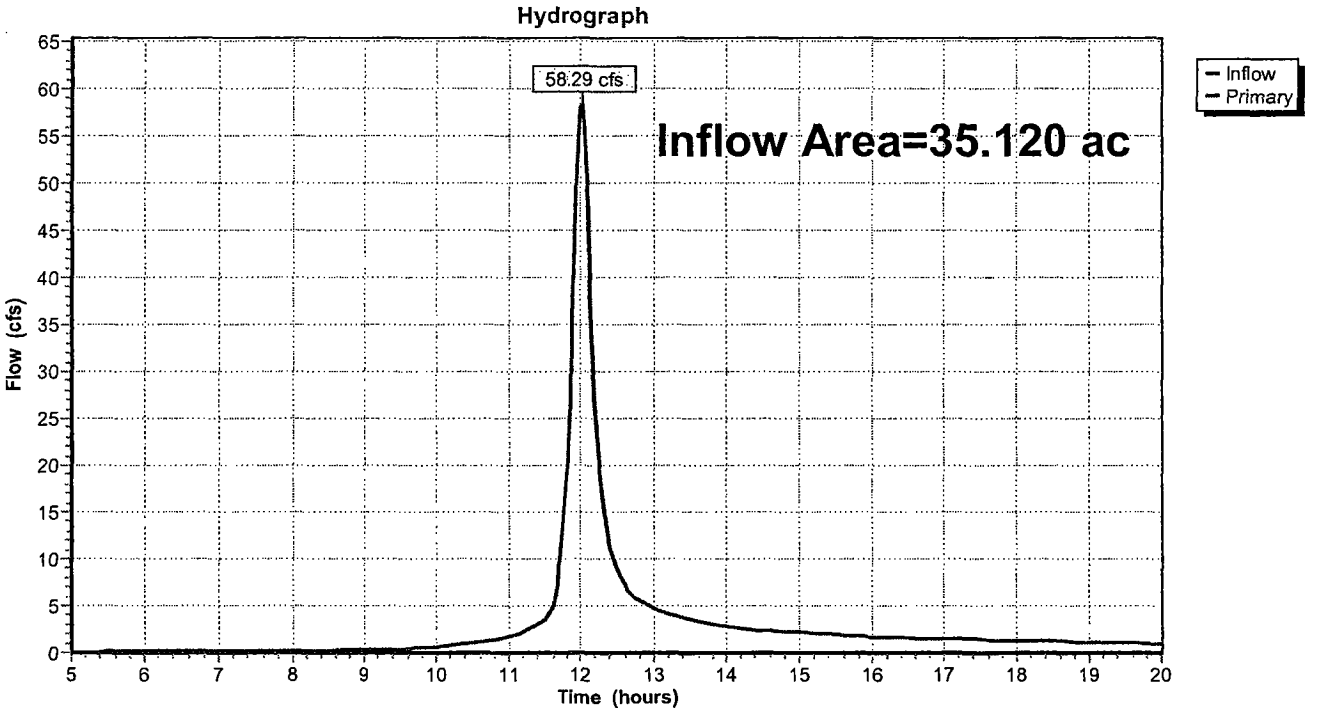
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.16	0.00	0.00
5.25	0.17	0.00	0.00
5.50	0.18	0.00	0.00
5.75	0.19	0.00	0.00
6.00	0.20	0.00	0.00
6.25	0.21	0.00	0.00
6.50	0.22	0.00	0.00
6.75	0.24	0.00	0.00
7.00	0.25	0.00	0.00
7.25	0.26	0.00	0.00
7.50	0.27	0.00	0.00
7.75	0.29	0.00	0.00
8.00	0.30	0.00	0.01
8.25	0.31	0.00	0.03
8.50	0.33	0.00	0.04
8.75	0.35	0.00	0.06
9.00	0.37	0.01	0.08
9.25	0.39	0.01	0.10
9.50	0.41	0.01	0.12
9.75	0.43	0.02	0.14
10.00	0.45	0.02	0.18
10.25	0.48	0.03	0.23
10.50	0.51	0.04	0.30
10.75	0.55	0.05	0.38
11.00	0.59	0.06	0.50
11.25	0.64	0.08	0.69
11.50	0.71	0.11	0.99
11.75	0.97	0.23	3.93
12.00	1.66	0.70	**19.03**
12.25	1.77	0.78	4.79
12.50	1.84	0.84	2.34
12.75	1.89	0.88	1.59
13.00	1.93	0.91	1.32
13.25	1.97	0.94	1.13
13.50	2.00	0.96	0.99
13.75	2.03	0.99	0.88
14.00	2.05	1.01	0.78
14.25	2.07	1.02	0.71
14.50	2.09	1.04	0.68
14.75	2.11	1.06	0.65
15.00	2.13	1.07	0.61
15.25	2.15	1.09	0.58
15.50	2.17	1.10	0.55
15.75	2.19	1.12	0.51
16.00	2.20	1.13	0.48
16.25	2.21	1.14	0.45
16.50	2.23	1.15	0.44
16.75	2.24	1.16	0.43
17.00	2.25	1.17	0.42
17.25	2.27	1.18	0.41
17.50	2.28	1.19	0.39
17.75	2.29	1.20	0.38
18.00	2.30	1.21	0.37
18.25	2.31	1.22	0.36
18.50	2.32	1.23	0.35
18.75	2.33	1.24	0.33
19.00	2.34	1.25	0.32
19.25	2.35	1.26	0.31
19.50	2.36	1.26	0.30
19.75	2.37	1.27	0.28
20.00	**2.38**	**1.28**	0.27

Summary for Link 1L: EAST PROPERTY LINE

Inflow Area = 35.120 ac, 42.08% Impervious, Inflow Depth > 1.23" for 2YR event
Inflow = 58.29 cfs @ 12.01 hrs, Volume= 3.591 af
Primary = 58.29 cfs @ 12.01 hrs, Volume= 3.591 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 1L: EAST PROPERTY LINE



Hydrograph for Link 1L: EAST PROPERTY LINE

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.08	**0.00**	0.08
5.25	0.09	0.00	0.09
5.50	0.10	0.00	0.10
5.75	0.10	0.00	0.10
6.00	0.11	0.00	0.11
6.25	0.12	0.00	0.12
6.50	0.13	0.00	0.13
6.75	0.14	0.00	0.14
7.00	0.15	0.00	0.15
7.25	0.16	0.00	0.16
7.50	0.16	0.00	0.16
7.75	0.18	0.00	0.18
8.00	0.19	0.00	0.19
8.25	0.23	0.00	0.23
8.50	0.27	0.00	0.27
8.75	0.31	0.00	0.31
9.00	0.36	0.00	0.36
9.25	0.40	0.00	0.40
9.50	0.44	0.00	0.44
9.75	0.53	0.00	0.53
10.00	0.66	0.00	0.66
10.25	0.83	0.00	0.83
10.50	1.05	0.00	1.05
10.75	1.35	0.00	1.35
11.00	1.74	0.00	1.74
11.25	2.40	0.00	2.40
11.50	3.42	0.00	3.42
11.75	14.09	0.00	14.09
12.00	**57.96**	0.00	**57.96**
12.25	19.87	0.00	19.87
12.50	8.88	0.00	8.88
12.75	5.75	0.00	5.75
13.00	4.72	0.00	4.72
13.25	4.02	0.00	4.02
13.50	3.54	0.00	3.54
13.75	3.13	0.00	3.13
14.00	2.79	0.00	2.79
14.25	2.54	0.00	2.54
14.50	2.41	0.00	2.41
14.75	2.29	0.00	2.29
15.00	2.18	0.00	2.18
15.25	2.06	0.00	2.06
15.50	1.95	0.00	1.95
15.75	1.83	0.00	1.83
16.00	1.71	0.00	1.71
16.25	1.62	0.00	1.62
16.50	1.57	0.00	1.57
16.75	1.53	0.00	1.53
17.00	1.49	0.00	1.49
17.25	1.45	0.00	1.45
17.50	1.40	0.00	1.40
17.75	1.36	0.00	1.36
18.00	1.32	0.00	1.32
18.25	1.28	0.00	1.28
18.50	1.23	0.00	1.23
18.75	1.19	0.00	1.19
19.00	1.15	0.00	1.15
19.25	1.10	0.00	1.10
19.50	1.06	0.00	1.06
19.75	1.01	0.00	1.01
20.00	0.97	0.00	0.97

Summary for Subcatchment DA-1: TO CANAL

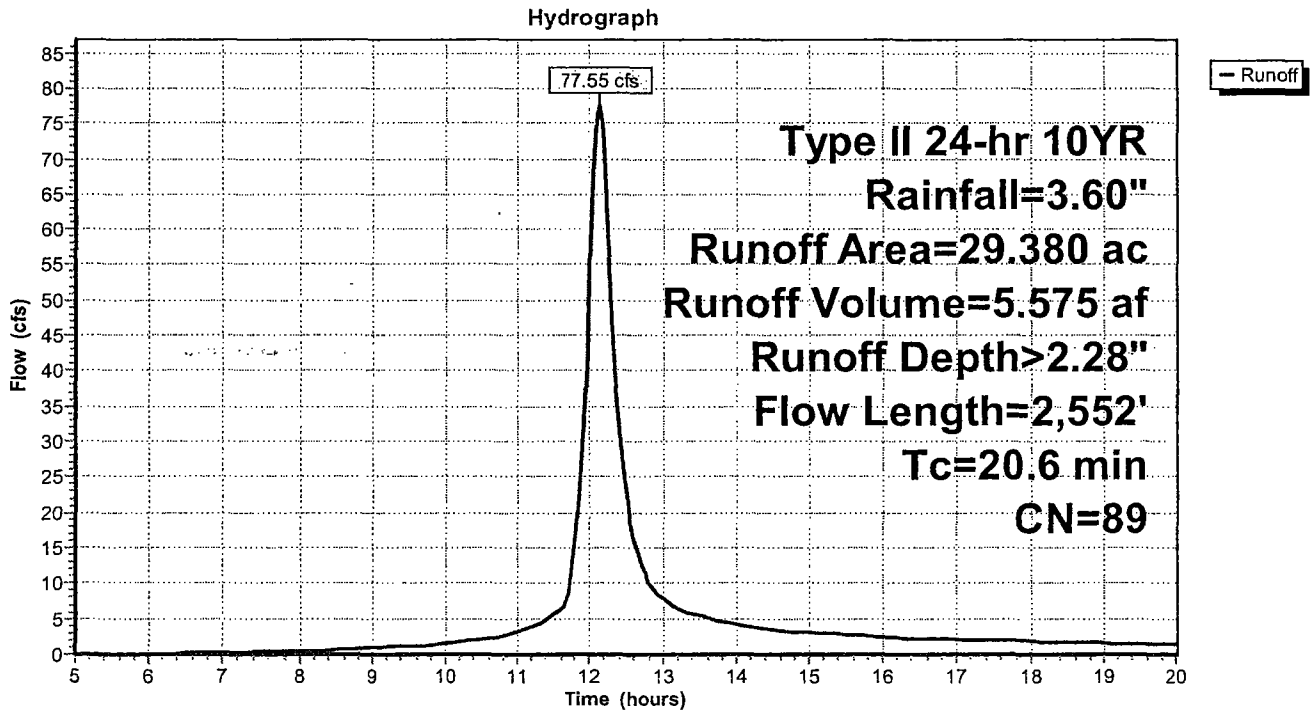
Runoff = 77.55 cfs @ 12.13 hrs, Volume= 5.575 af, Depth> 2.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10YR Rainfall=3.60"

Area (ac)	CN	Description
14.640	79	50-75% Grass cover, Fair, HSG C
14.740	98	Water Surface, 0% imp
29.380	89	Weighted Average
29.380		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0110	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
2.7	567	0.0476	3.51		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.8	1,885	0.0196	8.32	14.71	**Circular Channel (pipe),** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
20.6	2,552	Total			

Subcatchment DA-1: TO CANAL



Hydrograph for Subcatchment DA-1: TO CANAL

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.23	0.00	0.00
5.25	0.24	0.00	0.00
5.50	0.26	0.00	0.00
5.75	0.27	0.00	0.02
6.00	0.29	0.00	0.06
6.25	0.30	0.00	0.11
6.50	0.32	0.00	0.16
6.75	0.34	0.01	0.21
7.00	0.36	0.01	0.26
7.25	0.37	0.01	0.32
7.50	0.39	0.02	0.37
7.75	0.41	0.02	0.43
8.00	0.43	0.02	0.49
8.25	0.45	0.03	0.56
8.50	0.48	0.04	0.66
8.75	0.50	0.04	0.79
9.00	0.53	0.05	0.94
9.25	0.56	0.06	1.10
9.50	0.59	0.07	1.21
9.75	0.62	0.09	1.31
10.00	0.65	0.10	1.51
10.25	0.69	0.12	1.78
10.50	0.73	0.14	2.15
10.75	0.79	0.16	2.60
11.00	0.85	0.20	3.23
11.25	0.92	0.24	4.07
11.50	1.02	0.30	5.54
11.75	1.39	0.55	11.48
12.00	2.39	1.36	**53.85**
12.25	2.54	1.49	**59.06**
12.50	2.65	1.58	21.72
12.75	2.72	1.65	11.23
13.00	2.78	1.70	7.72
13.25	2.83	1.75	6.23
13.50	2.88	1.79	5.37
13.75	2.92	1.82	4.70
14.00	2.95	1.86	4.17
14.25	2.98	1.89	3.72
14.50	3.02	1.91	3.46
14.75	3.04	1.94	3.28
15.00	3.07	1.97	3.11
15.25	3.10	1.99	2.95
15.50	3.12	2.01	2.78
15.75	3.15	2.03	2.62
16.00	3.17	2.05	2.45
16.25	3.19	2.07	2.29
16.50	3.21	2.09	2.20
16.75	3.23	2.11	2.14
17.00	3.25	2.12	2.08
17.25	3.26	2.14	2.02
17.50	3.28	2.16	1.96
17.75	3.30	2.17	1.90
18.00	3.32	2.19	1.84
18.25	3.33	2.20	1.78
18.50	3.35	2.22	1.72
18.75	3.36	2.23	1.66
19.00	3.38	2.24	1.60
19.25	3.39	2.26	1.54
19.50	3.40	2.27	1.48
19.75	3.42	2.28	1.42
20.00	**3.43**	**2.29**	1.36

Summary for Subcatchment DA-2: TO NORTH EAST PROPERTY LINE

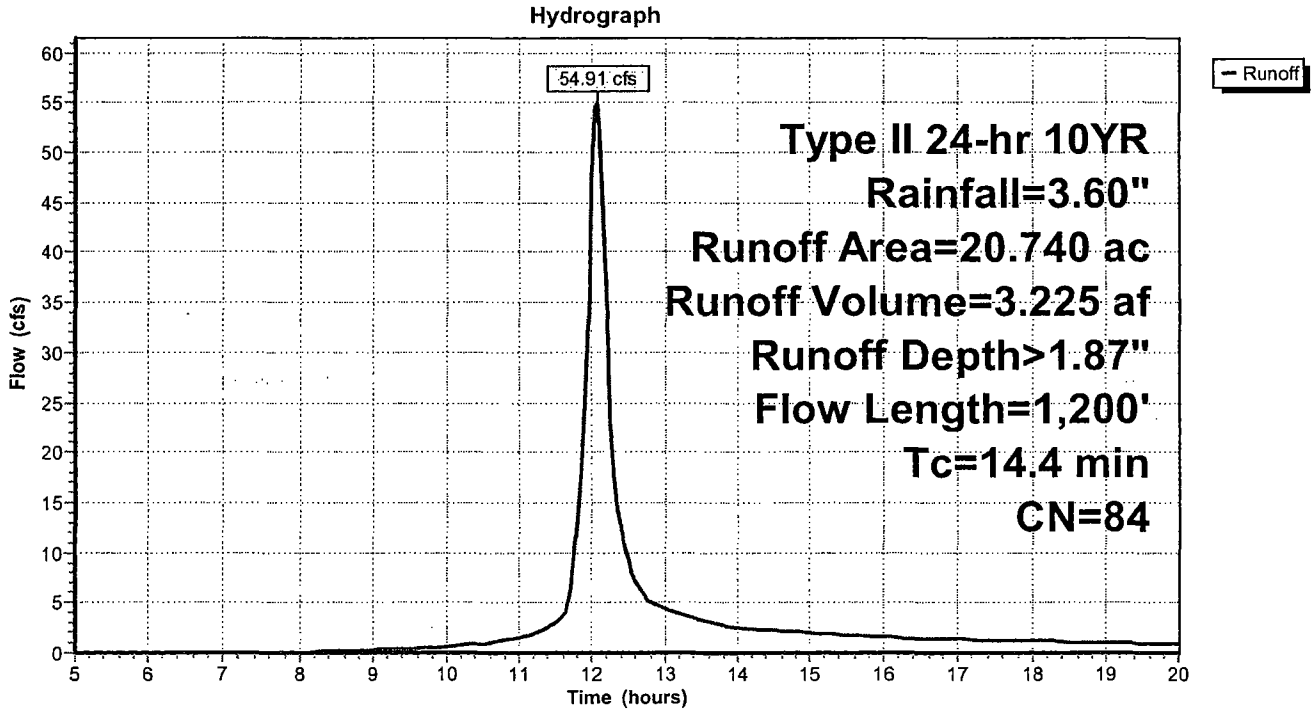
Runoff = 54.91 cfs @ 12.06 hrs, Volume= 3.225 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10YR Rainfall=3.60"

Area (ac)	CN	Description
5.380	98	Paved parking & roofs
15.360	79	50-75% Grass cover, Fair, HSG C
20.740	84	Weighted Average
15.360		Pervious Area
5.380		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0700	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
7.7	1,100	0.0217	2.37		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.4	1,200	Total			

Subcatchment DA-2: TO NORTH EAST PROPERTY LINE



Hydrograph for Subcatchment DA-2: TO NORTH EAST PROPERTY LINE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.23	0.00	0.00
5.25	0.24	0.00	0.00
5.50	0.26	0.00	0.00
5.75	0.27	0.00	0.00
6.00	0.29	0.00	0.00
6.25	0.30	0.00	0.00
6.50	0.32	0.00	0.00
6.75	0.34	0.00	0.00
7.00	0.36	0.00	0.00
7.25	0.37	0.00	0.00
7.50	0.39	0.00	0.00
7.75	0.41	0.00	0.02
8.00	0.43	0.00	0.06
8.25	0.45	0.00	0.09
8.50	0.48	0.00	0.14
8.75	0.50	0.01	0.20
9.00	0.53	0.01	0.27
9.25	0.56	0.02	0.34
9.50	0.59	0.02	0.40
9.75	0.62	0.03	0.47
10.00	0.65	0.03	0.58
10.25	0.69	0.04	0.73
10.50	0.73	0.06	0.93
10.75	0.79	0.07	1.18
11.00	0.85	0.09	1.54
11.25	0.92	0.12	2.07
11.50	1.02	0.16	2.98
11.75	1.39	0.35	9.04
12.00	2.39	1.03	**47.18**
12.25	2.54	1.15	**23.10**
12.50	2.65	1.23	9.02
12.75	2.72	1.29	5.43
13.00	2.78	1.34	4.38
13.25	2.83	1.38	3.69
13.50	2.88	1.42	3.25
13.75	2.92	1.45	2.86
14.00	2.95	1.48	2.55
14.25	2.98	1.50	2.29
14.50	3.02	1.53	2.17
14.75	3.04	1.55	2.07
15.00	3.07	1.58	1.96
15.25	3.10	1.60	1.86
15.50	3.12	1.62	1.75
15.75	3.15	1.64	1.65
16.00	3.17	1.66	1.54
16.25	3.19	1.67	1.45
16.50	3.21	1.69	1.41
16.75	3.23	1.71	1.37
17.00	3.25	1.72	1.33
17.25	3.26	1.74	1.29
17.50	3.28	1.75	1.26
17.75	3.30	1.77	1.22
18.00	3.32	1.78	1.18
18.25	3.33	1.79	1.14
18.50	3.35	1.81	1.10
18.75	3.36	1.82	1.06
19.00	3.38	1.83	1.03
19.25	3.39	1.84	0.99
19.50	3.40	1.85	0.95
19.75	3.42	1.86	0.91
20.00	**3.43**	**1.87**	0.87

Summary for Subcatchment DA-3: TO EAST PROPERTY LINE

[49] Hint: Tc<2dt may require smaller dt

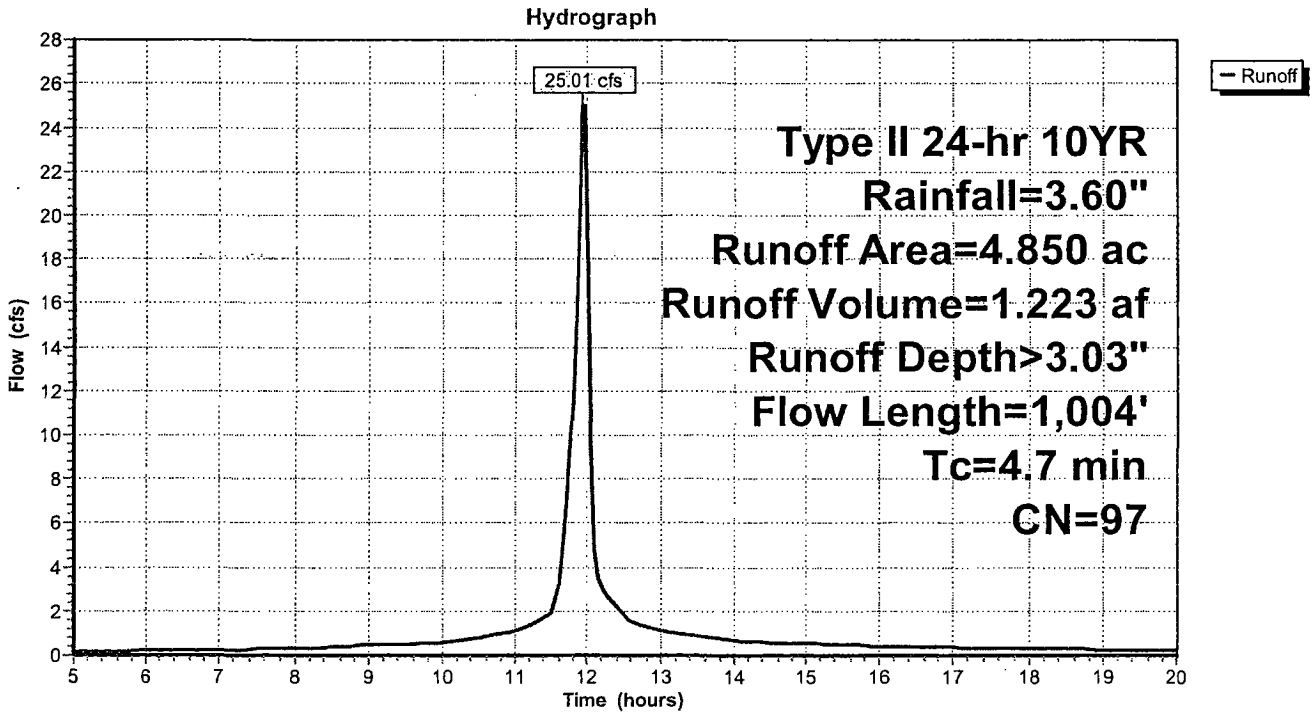
Runoff = 25.01 cfs @ 11.95 hrs, Volume= 1.223 af, Depth> 3.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10YR Rainfall=3.60"

Area (ac)	CN	Description
4.640	98	Paved roads w/curbs & sewers
0.210	79	50-75% Grass cover, Fair, HSG C
4.850	97	Weighted Average
0.210		Pervious Area
4.640		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	76	0.0158	1.05		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
1.5	648	0.0138	6.98	12.34	**Circular Channel (pipe),** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
2.0	280	0.0214	2.36		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.7	1,004	Total			

Subcatchment DA-3: TO EAST PROPERTY LINE



Hydrograph for Subcatchment DA-3: TO EAST PROPERTY LINE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.23	0.06	0.16
5.25	0.24	0.07	0.17
5.50	0.26	0.08	0.18
5.75	0.27	0.09	0.20
6.00	0.29	0.10	0.21
6.25	0.30	0.11	0.22
6.50	0.32	0.12	0.23
6.75	0.34	0.13	0.24
7.00	0.36	0.14	0.26
7.25	0.37	0.16	0.27
7.50	0.39	0.17	0.28
7.75	0.41	0.19	0.29
8.00	0.43	0.20	0.30
8.25	0.45	0.22	0.34
8.50	0.48	0.24	0.38
8.75	0.50	0.26	0.42
9.00	0.53	0.28	0.46
9.25	0.56	0.31	0.48
9.50	0.59	0.33	0.48
9.75	0.62	0.36	0.53
10.00	0.65	0.39	0.60
10.25	0.69	0.42	0.69
10.50	0.73	0.46	0.79
10.75	0.79	0.51	0.94
11.00	0.85	0.56	1.12
11.25	0.92	0.63	1.45
11.50	1.02	0.72	1.87
11.75	1.39	1.08	**9.10**
12.00	2.39	2.05	**20.07**
12.25	2.54	2.21	2.79
12.50	2.65	2.31	1.80
12.75	2.72	2.38	1.35
13.00	2.78	2.44	1.13
13.25	2.83	2.49	0.98
13.50	2.88	2.54	0.85
13.75	2.92	2.58	0.76
14.00	2.95	2.61	0.67
14.25	2.98	2.64	0.62
14.50	3.02	2.67	0.59
14.75	3.04	2.70	0.56
15.00	3.07	2.73	0.53
15.25	3.10	2.76	0.50
15.50	3.12	2.78	0.47
15.75	3.15	2.80	0.44
16.00	3.17	2.82	0.41
16.25	3.19	2.85	0.39
16.50	3.21	2.86	0.38
16.75	3.23	2.88	0.37
17.00	3.25	2.90	0.36
17.25	3.26	2.92	0.35
17.50	3.28	2.94	0.34
17.75	3.30	2.95	0.33
18.00	3.32	2.97	0.32
18.25	3.33	2.99	0.31
18.50	3.35	3.00	0.30
18.75	3.36	3.02	0.28
19.00	3.38	3.03	0.27
19.25	3.39	3.04	0.26
19.50	3.40	3.06	0.25
19.75	3.42	3.07	0.24
20.00	**3.43**	**3.08**	0.23

Summary for Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE

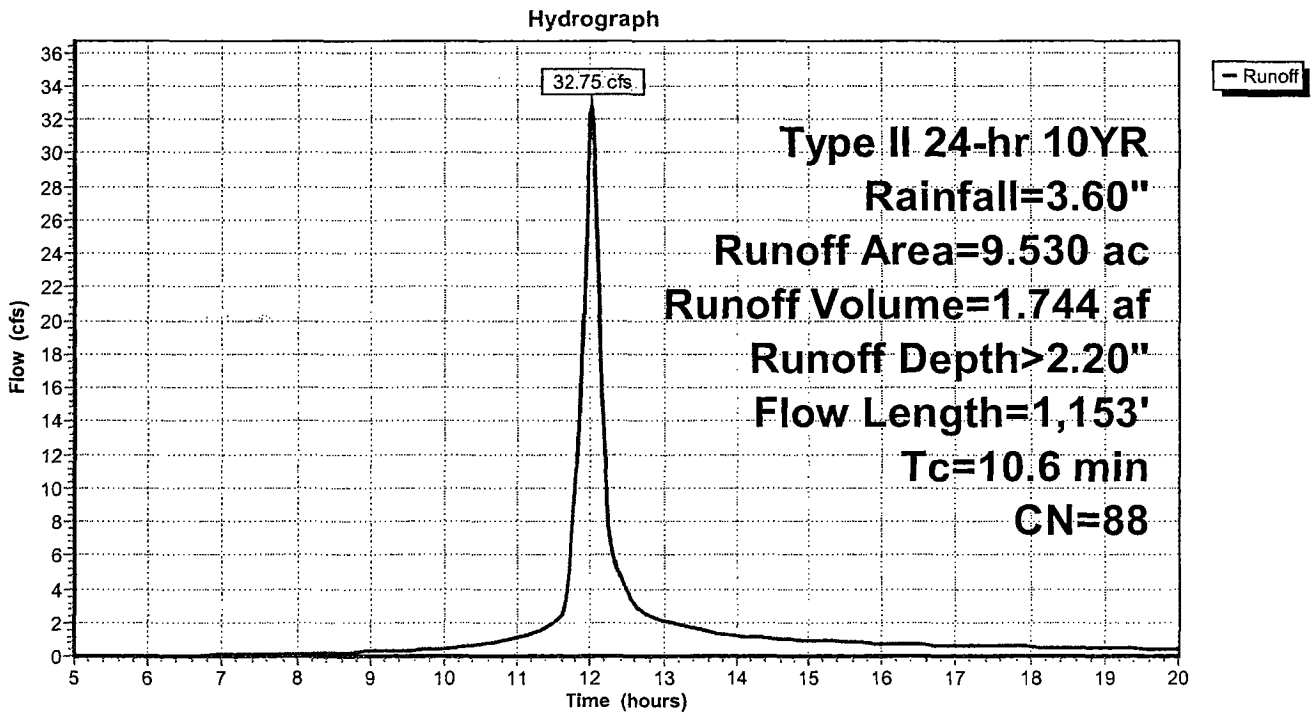
Runoff = 32.75 cfs @ 12.02 hrs, Volume= 1.744 af, Depth> 2.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10YR Rainfall=3.60"

Area (ac)	CN	Description
4.760	98	Paved parking & roofs
4.770	79	50-75% Grass cover, Fair, HSG C
9.530	88	Weighted Average
4.770		Pervious Area
4.760		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0200	1.22		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
3.6	471	0.0114	2.17		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.6	582	0.0114	1.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.6	1,153	Total			

Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE



Hydrograph for Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE

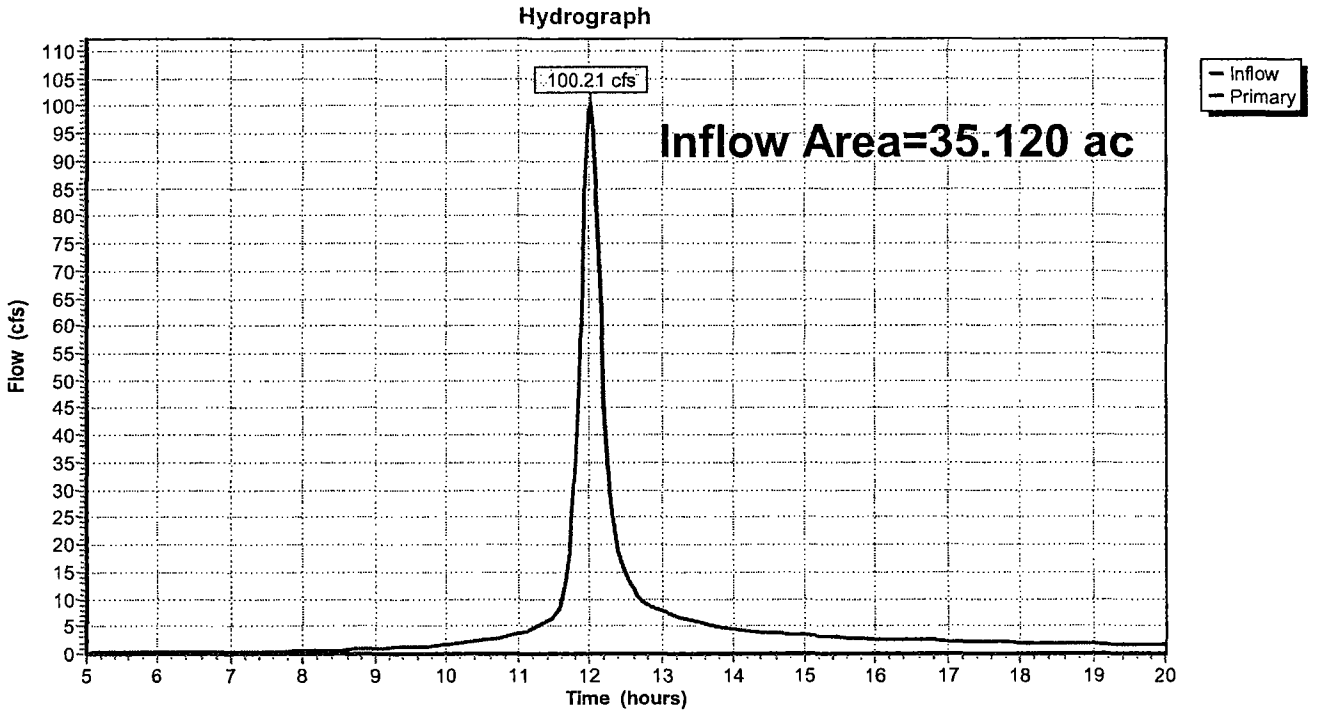
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.23	0.00	0.00
5.25	0.24	0.00	0.00
5.50	0.26	0.00	0.00
5.75	0.27	0.00	0.00
6.00	0.29	0.00	0.00
6.25	0.30	0.00	0.02
6.50	0.32	0.00	0.03
6.75	0.34	0.00	0.05
7.00	0.36	0.00	0.07
7.25	0.37	0.01	0.08
7.50	0.39	0.01	0.10
7.75	0.41	0.01	0.12
8.00	0.43	0.02	0.14
8.25	0.45	0.02	0.16
8.50	0.48	0.03	0.20
8.75	0.50	0.03	0.24
9.00	0.53	0.04	0.29
9.25	0.56	0.05	0.33
9.50	0.59	0.06	0.36
9.75	0.62	0.07	0.40
10.00	0.65	0.08	0.48
10.25	0.69	0.10	0.58
10.50	0.73	0.12	0.70
10.75	0.79	0.14	0.87
11.00	0.85	0.17	1.09
11.25	0.92	0.21	1.45
11.50	1.02	0.26	2.01
11.75	1.39	0.51	7.45
12.00	2.39	1.29	**32.25**
12.25	2.54	1.42	7.80
12.50	2.65	1.51	3.75
12.75	2.72	1.57	2.53
13.00	2.78	1.62	2.10
13.25	2.83	1.67	1.78
13.50	2.88	1.71	1.57
13.75	2.92	1.74	1.38
14.00	2.95	1.78	1.23
14.25	2.98	1.80	1.12
14.50	3.02	1.83	1.07
14.75	3.04	1.86	1.01
15.00	3.07	1.88	0.96
15.25	3.10	1.91	0.91
15.50	3.12	1.93	0.86
15.75	3.15	1.95	0.80
16.00	3.17	1.97	0.75
16.25	3.19	1.99	0.71
16.50	3.21	2.00	0.69
16.75	3.23	2.02	0.67
17.00	3.25	2.04	0.65
17.25	3.26	2.06	0.63
17.50	3.28	2.07	0.61
17.75	3.30	2.09	0.59
18.00	3.32	2.10	0.58
18.25	3.33	2.12	0.56
18.50	3.35	2.13	0.54
18.75	3.36	2.14	0.52
19.00	3.38	2.16	0.50
19.25	3.39	2.17	0.48
19.50	3.40	2.18	0.46
19.75	3.42	2.19	0.44
20.00	**3.43**	**2.20**	0.42

Summary for Link 1L: EAST PROPERTY LINE

Inflow Area = 35.120 ac, 42.08% Impervious, Inflow Depth > 2.12" for 10YR event
Inflow = 100.21 cfs @ 12.01 hrs, Volume= 6.193 af
Primary = 100.21 cfs @ 12.01 hrs, Volume= 6.193 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 1L: EAST PROPERTY LINE



Hydrograph for Link 1L: EAST PROPERTY LINE

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.16	**0.00**	0.16	18.50	1.94	0.00	1.94
5.25	0.17	0.00	0.17	18.75	1.87	0.00	1.87
5.50	0.18	0.00	0.18	19.00	1.80	0.00	1.80
5.75	0.20	0.00	0.20	19.25	1.73	0.00	1.73
6.00	0.21	0.00	0.21	19.50	1.66	0.00	1.66
6.25	0.24	0.00	0.24	19.75	1.59	0.00	1.59
6.50	0.27	0.00	0.27	20.00	1.52	0.00	1.52
6.75	0.29	0.00	0.29				
7.00	0.32	0.00	0.32				
7.25	0.35	0.00	0.35				
7.50	0.38	0.00	0.38				
7.75	0.44	0.00	0.44				
8.00	0.50	0.00	0.50				
8.25	0.59	0.00	0.59				
8.50	0.71	0.00	0.71				
8.75	0.86	0.00	0.86				
9.00	1.02	0.00	1.02				
9.25	1.15	0.00	1.15				
9.50	1.24	0.00	1.24				
9.75	1.40	0.00	1.40				
10.00	1.66	0.00	1.66				
10.25	2.00	0.00	2.00				
10.50	2.43	0.00	2.43				
10.75	3.00	0.00	3.00				
11.00	3.75	0.00	3.75				
11.25	4.97	0.00	4.97				
11.50	6.85	0.00	6.85				
11.75	25.60	0.00	25.60				
12.00	**99.51**	0.00	**99.51**				
12.25	33.69	0.00	33.69				
12.50	14.58	0.00	14.58				
12.75	9.31	0.00	9.31				
13.00	7.61	0.00	7.61				
13.25	6.45	0.00	6.45				
13.50	5.67	0.00	5.67				
13.75	5.00	0.00	5.00				
14.00	4.45	0.00	4.45				
14.25	4.04	0.00	4.04				
14.50	3.83	0.00	3.83				
14.75	3.64	0.00	3.64				
15.00	3.46	0.00	3.46				
15.25	3.27	0.00	3.27				
15.50	3.08	0.00	3.08				
15.75	2.89	0.00	2.89				
16.00	2.70	0.00	2.70				
16.25	2.55	0.00	2.55				
16.50	2.48	0.00	2.48				
16.75	2.41	0.00	2.41				
17.00	2.34	0.00	2.34				
17.25	2.28	0.00	2.28				
17.50	2.21	0.00	2.21				
17.75	2.14	0.00	2.14				
18.00	2.07	0.00	2.07				
18.25	2.00	0.00	2.00				

Summary for Subcatchment DA-1: TO CANAL

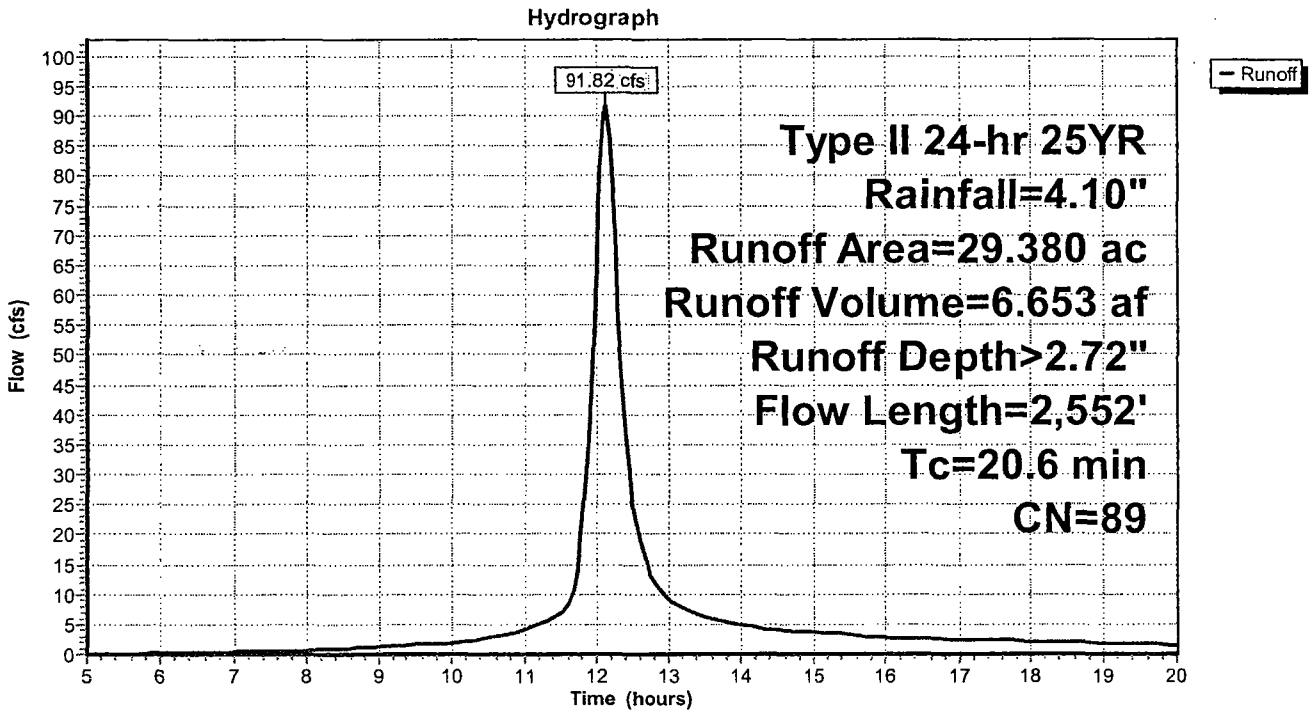
Runoff = 91.82 cfs @ 12.13 hrs, Volume= 6.653 af, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25YR Rainfall=4.10"

Area (ac)	CN	Description
14.640	79	50-75% Grass cover, Fair, HSG C
14.740	98	Water Surface, 0% imp
29.380	89	Weighted Average
29.380		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0110	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
2.7	567	0.0476	3.51		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.8	1,885	0.0196	8.32	14.71	**Circular Channel (pipe),** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
20.6	2,552	Total			

Subcatchment DA-1: TO CANAL



Hydrograph for Subcatchment DA-1: TO CANAL

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.26	0.00	0.00
5.25	0.27	0.00	0.03
5.50	0.29	0.00	0.07
5.75	0.31	0.00	0.13
6.00	0.33	0.00	0.18
6.25	0.35	0.01	0.24
6.50	0.37	0.01	0.31
6.75	0.39	0.01	0.37
7.00	0.41	0.02	0.44
7.25	0.43	0.02	0.50
7.50	0.45	0.03	0.57
7.75	0.47	0.03	0.64
8.00	0.49	0.04	0.72
8.25	0.52	0.05	0.80
8.50	0.54	0.06	0.93
8.75	0.57	0.07	1.10
9.00	0.60	0.08	1.28
9.25	0.64	0.09	1.47
9.50	0.67	0.11	1.60
9.75	0.70	0.12	1.72
10.00	0.74	0.14	1.97
10.25	0.79	0.16	2.30
10.50	0.84	0.19	2.75
10.75	0.89	0.22	3.30
11.00	0.96	0.26	4.07
11.25	1.05	0.32	5.10
11.50	1.16	0.39	6.87
11.75	1.59	0.70	14.06
12.00	2.72	1.65	**64.37**
12.25	2.90	1.81	**69.63**
12.50	3.01	1.91	25.46
12.75	3.10	1.99	13.11
13.00	3.17	2.05	9.00
13.25	3.22	2.10	7.24
13.50	3.28	2.15	6.24
13.75	3.32	2.19	5.47
14.00	3.36	2.23	4.85
14.25	3.40	2.26	4.32
14.50	3.43	2.30	4.02
14.75	3.47	2.33	3.81
15.00	3.50	2.36	3.61
15.25	3.53	2.38	3.42
15.50	3.56	2.41	3.23
15.75	3.58	2.43	3.03
16.00	3.61	2.46	2.84
16.25	3.63	2.48	2.66
16.50	3.65	2.50	2.55
16.75	3.68	2.52	2.47
17.00	3.70	2.54	2.40
17.25	3.72	2.56	2.34
17.50	3.74	2.58	2.27
17.75	3.76	2.60	2.20
18.00	3.78	2.61	2.13
18.25	3.79	2.63	2.06
18.50	3.81	2.65	1.99
18.75	3.83	2.66	1.92
19.00	3.84	2.68	1.85
19.25	3.86	2.69	1.78
19.50	3.88	2.71	1.71
19.75	3.89	2.72	1.64
20.00	**3.90**	**2.73**	1.57

Summary for Subcatchment DA-2: TO NORTH EAST PROPERTY LINE

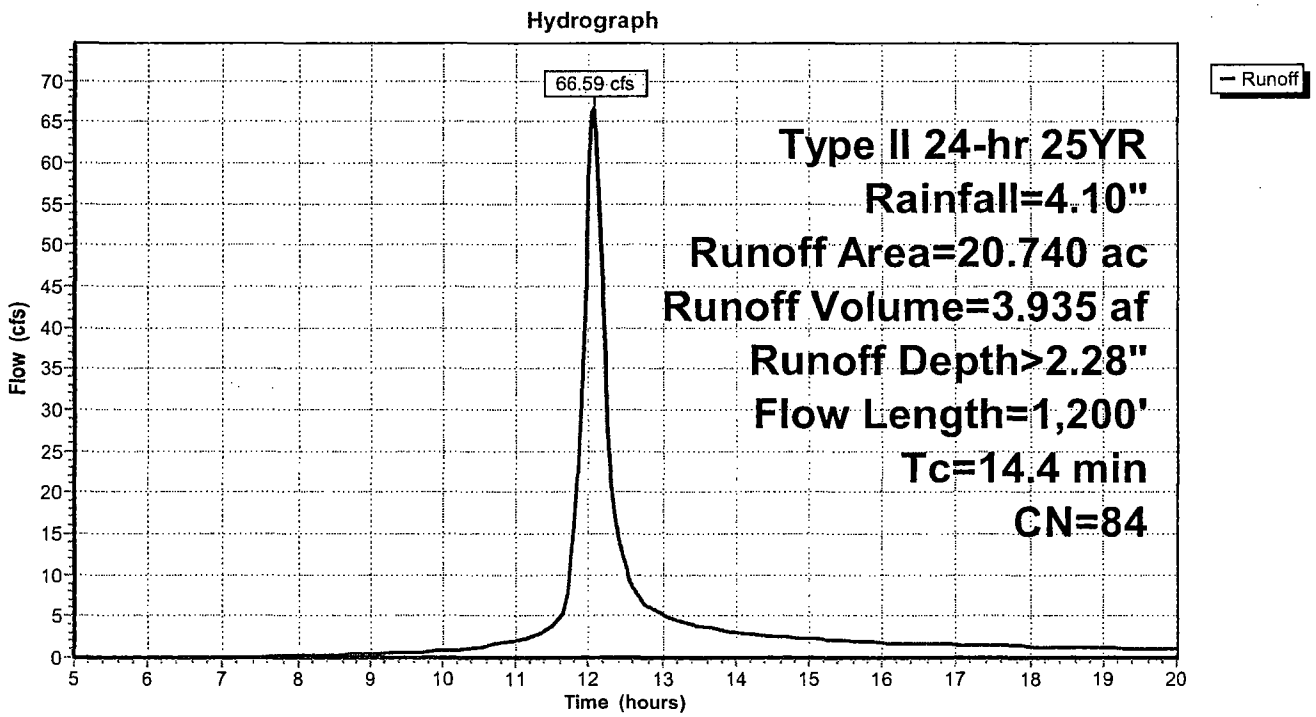
Runoff = 66.59 cfs @ 12.06 hrs, Volume= 3.935 af, Depth> 2.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25YR Rainfall=4.10"

Area (ac)	CN	Description
5.380	98	Paved parking & roofs
15.360	79	50-75% Grass cover, Fair, HSG C
20.740	84	Weighted Average
15.360		Pervious Area
5.380		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0700	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
7.7	1,100	0.0217	2.37		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.4	1,200	Total			

Subcatchment DA-2: TO NORTH EAST PROPERTY LINE



Hydrograph for Subcatchment DA-2: TO NORTH EAST PROPERTY LINE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.26	0.00	0.00
5.25	0.27	0.00	0.00
5.50	0.29	0.00	0.00
5.75	0.31	0.00	0.00
6.00	0.33	0.00	0.00
6.25	0.35	0.00	0.00
6.50	0.37	0.00	0.00
6.75	0.39	0.00	0.00
7.00	0.41	0.00	0.01
7.25	0.43	0.00	0.05
7.50	0.45	0.00	0.09
7.75	0.47	0.00	0.12
8.00	0.49	0.01	0.17
8.25	0.52	0.01	0.21
8.50	0.54	0.01	0.28
8.75	0.57	0.02	0.36
9.00	0.60	0.02	0.45
9.25	0.64	0.03	0.55
9.50	0.67	0.04	0.62
9.75	0.70	0.05	0.70
10.00	0.74	0.06	0.85
10.25	0.79	0.07	1.04
10.50	0.84	0.09	1.30
10.75	0.89	0.11	1.62
11.00	0.96	0.14	2.08
11.25	1.05	0.17	2.74
11.50	1.16	0.23	3.89
11.75	1.59	0.47	11.53
12.00	2.72	1.29	**57.65**
12.25	2.90	1.43	**27.74**
12.50	3.01	1.53	10.74
12.75	3.10	1.60	6.44
13.00	3.17	1.65	5.19
13.25	3.22	1.70	4.37
13.50	3.28	1.75	3.83
13.75	3.32	1.78	3.37
14.00	3.36	1.82	3.01
14.25	3.40	1.85	2.71
14.50	3.43	1.88	2.56
14.75	3.47	1.91	2.44
15.00	3.50	1.94	2.31
15.25	3.53	1.96	2.19
15.50	3.56	1.99	2.06
15.75	3.58	2.01	1.94
16.00	3.61	2.03	1.81
16.25	3.63	2.05	1.71
16.50	3.65	2.07	1.65
16.75	3.68	2.09	1.61
17.00	3.70	2.11	1.56
17.25	3.72	2.12	1.52
17.50	3.74	2.14	1.47
17.75	3.76	2.16	1.43
18.00	3.78	2.17	1.38
18.25	3.79	2.19	1.34
18.50	3.81	2.21	1.29
18.75	3.83	2.22	1.25
19.00	3.84	2.23	1.20
19.25	3.86	2.25	1.16
19.50	3.88	2.26	1.11
19.75	3.89	2.27	1.06
20.00	**3.90**	**2.29**	1.02

Summary for Subcatchment DA-3: TO EAST PROPERTY LINE

[49] Hint: Tc<2dt may require smaller dt

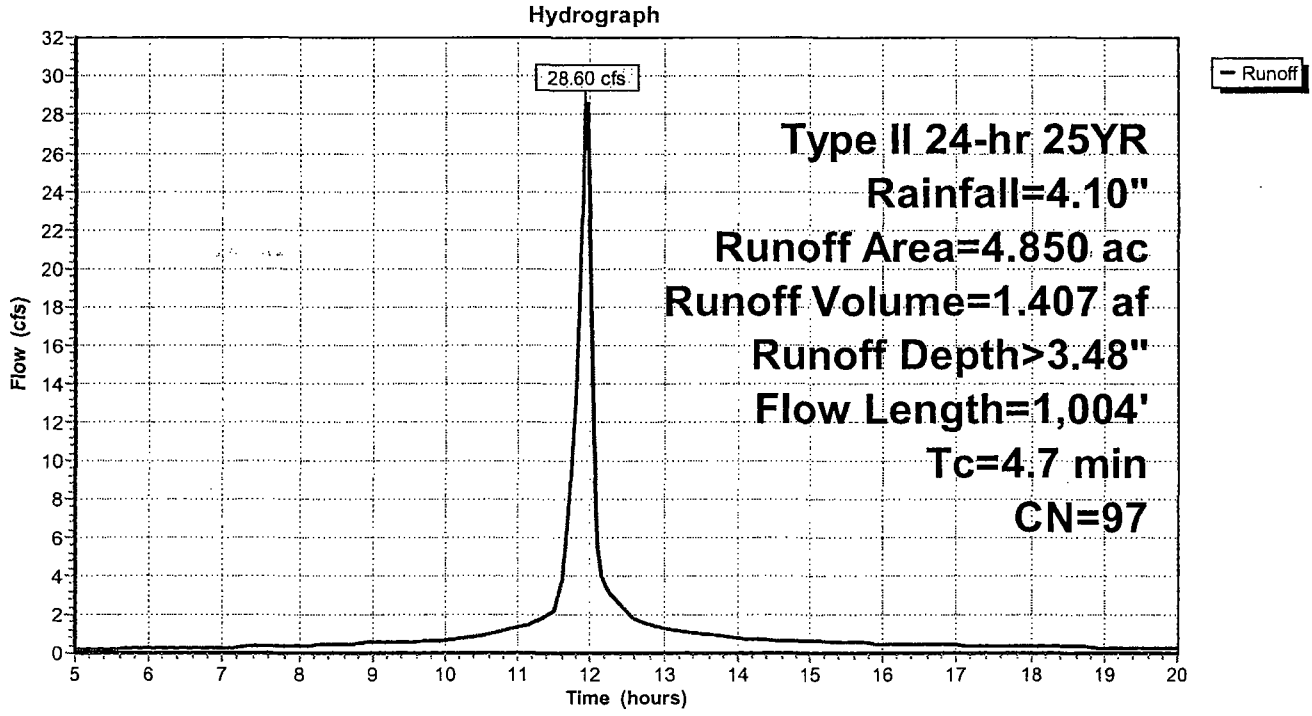
Runoff = 28.60 cfs @ 11.95 hrs, Volume= 1.407 af, Depth> 3.48"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25YR Rainfall=4.10"

Area (ac)	CN	Description
4.640	98	Paved roads w/curbs & sewers
0.210	79	50-75% Grass cover, Fair, HSG C
4.850	97	Weighted Average
0.210		Pervious Area
4.640		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	76	0.0158	1.05		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
1.5	648	0.0138	6.98	12.34	**Circular Channel (pipe),** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
2.0	280	0.0214	2.36		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.7	1,004	Total			

Subcatchment DA-3: TO EAST PROPERTY LINE



Hydrograph for Subcatchment DA-3: TO EAST PROPERTY LINE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.26	0.08	0.20
5.25	0.27	0.09	0.21
5.50	0.29	0.10	0.22
5.75	0.31	0.11	0.24
6.00	0.33	0.12	0.25
6.25	0.35	0.14	0.27
6.50	0.37	0.15	0.28
6.75	0.39	0.17	0.29
7.00	0.41	0.18	0.31
7.25	0.43	0.20	0.32
7.50	0.45	0.21	0.33
7.75	0.47	0.23	0.35
8.00	0.49	0.25	0.36
8.25	0.52	0.27	0.40
8.50	0.54	0.29	0.44
8.75	0.57	0.32	0.49
9.00	0.60	0.34	0.54
9.25	0.64	0.37	0.56
9.50	0.67	0.40	0.57
9.75	0.70	0.43	0.62
10.00	0.74	0.47	0.70
10.25	0.79	0.51	0.81
10.50	0.84	0.55	0.92
10.75	0.89	0.61	1.10
11.00	0.96	0.67	1.29
11.25	1.05	0.75	1.68
11.50	1.16	0.86	2.15
11.75	1.59	1.27	**10.45**
12.00	2.72	2.38	**22.95**
12.25	2.90	2.55	3.19
12.50	3.01	2.67	2.06
12.75	3.10	2.75	1.55
13.00	3.17	2.82	1.29
13.25	3.22	2.88	1.11
13.50	3.28	2.93	0.98
13.75	3.32	2.98	0.86
14.00	3.36	3.02	0.77
14.25	3.40	3.05	0.71
14.50	3.43	3.09	0.68
14.75	3.47	3.12	0.64
15.00	3.50	3.15	0.61
15.25	3.53	3.18	0.57
15.50	3.56	3.21	0.54
15.75	3.58	3.24	0.50
16.00	3.61	3.26	0.47
16.25	3.63	3.28	0.45
16.50	3.65	3.31	0.44
16.75	3.68	3.33	0.42
17.00	3.70	3.35	0.41
17.25	3.72	3.37	0.40
17.50	3.74	3.39	0.39
17.75	3.76	3.41	0.37
18.00	3.78	3.43	0.36
18.25	3.79	3.45	0.35
18.50	3.81	3.46	0.34
18.75	3.83	3.48	0.33
19.00	3.84	3.50	0.31
19.25	3.86	3.51	0.30
19.50	3.88	3.53	0.29
19.75	3.89	3.54	0.28
20.00	**3.90**	**3.56**	0.26

Summary for Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE

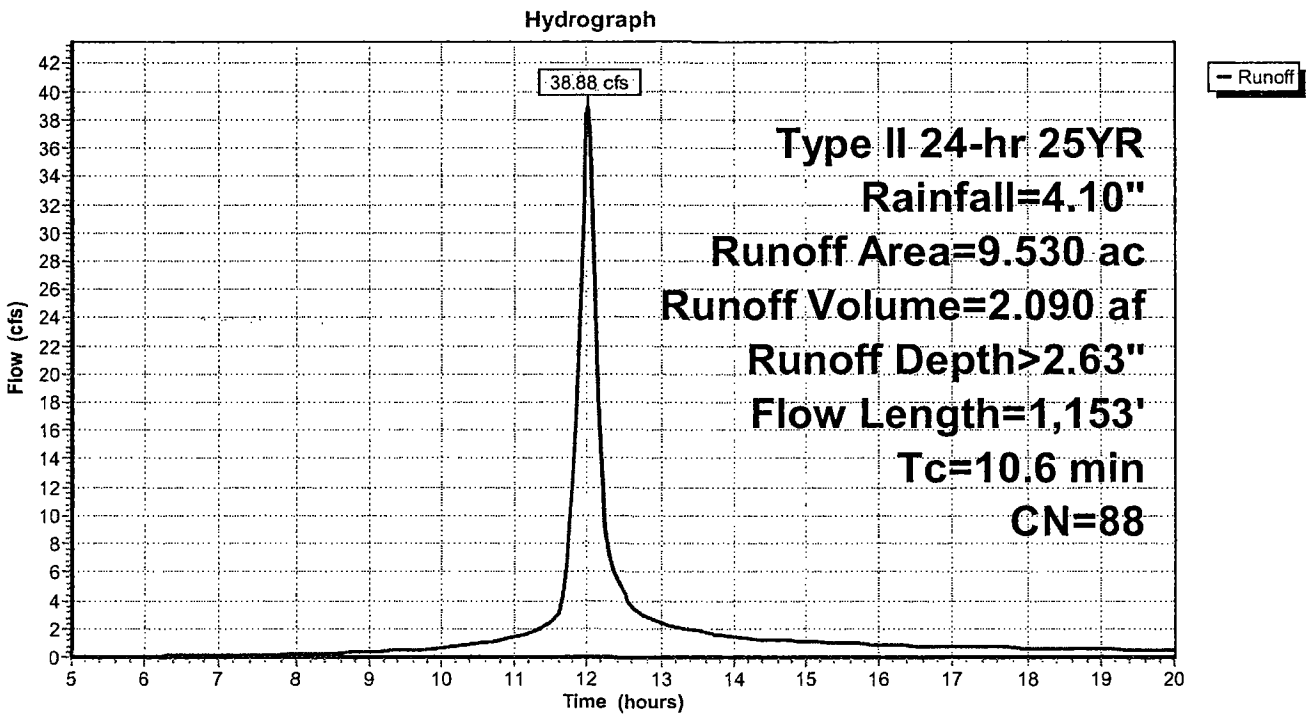
Runoff = 38.88 cfs @ 12.02 hrs, Volume= 2.090 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25YR Rainfall=4.10"

Area (ac)	CN	Description
4.760	98	Paved parking & roofs
4.770	79	50-75% Grass cover, Fair, HSG C
9.530	88	Weighted Average
4.770		Pervious Area
4.760		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0200	1.22		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
3.6	471	0.0114	2.17		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.6	582	0.0114	1.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.6	1,153	Total			

Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE



Hydrograph for Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE

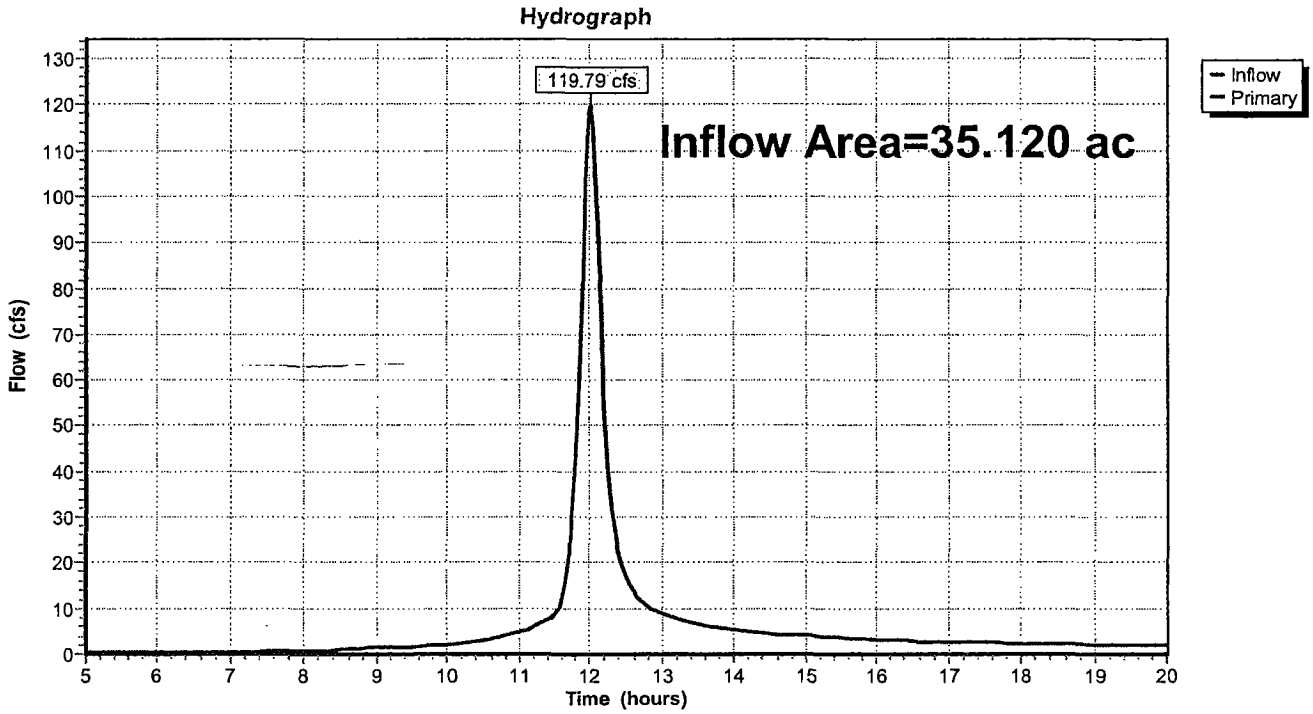
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.26	0.00	0.00
5.25	0.27	0.00	0.00
5.50	0.29	0.00	0.01
5.75	0.31	0.00	0.02
6.00	0.33	0.00	0.04
6.25	0.35	0.00	0.06
6.50	0.37	0.01	0.08
6.75	0.39	0.01	0.10
7.00	0.41	0.01	0.12
7.25	0.43	0.02	0.14
7.50	0.45	0.02	0.16
7.75	0.47	0.02	0.19
8.00	0.49	0.03	0.21
8.25	0.52	0.04	0.24
8.50	0.54	0.04	0.29
8.75	0.57	0.05	0.34
9.00	0.60	0.06	0.40
9.25	0.64	0.08	0.45
9.50	0.67	0.09	0.48
9.75	0.70	0.10	0.54
10.00	0.74	0.12	0.63
10.25	0.79	0.14	0.76
10.50	0.84	0.16	0.91
10.75	0.89	0.19	1.12
11.00	0.96	0.23	1.39
11.25	1.05	0.28	1.82
11.50	1.16	0.35	2.50
11.75	1.59	0.64	9.14
12.00	2.72	1.57	**38.33**
12.25	2.90	1.73	9.16
12.50	3.01	1.83	4.39
12.75	3.10	1.90	2.95
13.00	3.17	1.97	2.45
13.25	3.22	2.02	2.08
13.50	3.28	2.07	1.83
13.75	3.32	2.11	1.61
14.00	3.36	2.14	1.44
14.25	3.40	2.18	1.30
14.50	3.43	2.21	1.24
14.75	3.47	2.24	1.18
15.00	3.50	2.27	1.12
15.25	3.53	2.30	1.06
15.50	3.56	2.32	0.99
15.75	3.58	2.34	0.93
16.00	3.61	2.37	0.87
16.25	3.63	2.39	0.82
16.50	3.65	2.41	0.80
16.75	3.68	2.43	0.78
17.00	3.70	2.45	0.76
17.25	3.72	2.47	0.73
17.50	3.74	2.49	0.71
17.75	3.76	2.50	0.69
18.00	3.78	2.52	0.67
18.25	3.79	2.54	0.65
18.50	3.81	2.55	0.62
18.75	3.83	2.57	0.60
19.00	3.84	2.59	0.58
19.25	3.86	2.60	0.56
19.50	3.88	2.61	0.53
19.75	3.89	2.63	0.51
20.00	**3.90**	**2.64**	0.49

Summary for Link 1L: EAST PROPERTY LINE

Inflow Area = 35.120 ac, 42.08% Impervious, Inflow Depth > 2.54" for 25YR event
Inflow = 119.79 cfs @ 12.02 hrs, Volume= 7.432 af
Primary = 119.79 cfs @ 12.02 hrs, Volume= 7.432 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 1L: EAST PROPERTY LINE



Hydrograph for Link 1L: EAST PROPERTY LINE

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.20	**0.00**	0.20	18.50	2.25	0.00	2.25
5.25	0.21	0.00	0.21	18.75	2.17	0.00	2.17
5.50	0.23	0.00	0.23	19.00	2.09	0.00	2.09
5.75	0.26	0.00	0.26	19.25	2.01	0.00	2.01
6.00	0.29	0.00	0.29	19.50	1.93	0.00	1.93
6.25	0.33	0.00	0.33	19.75	1.85	0.00	1.85
6.50	0.36	0.00	0.36	20.00	1.77	0.00	1.77
6.75	0.39	0.00	0.39				
7.00	0.44	0.00	0.44				
7.25	0.51	0.00	0.51				
7.50	0.58	0.00	0.58				
7.75	0.66	0.00	0.66				
8.00	0.73	0.00	0.73				
8.25	0.85	0.00	0.85				
8.50	1.01	0.00	1.01				
8.75	1.19	0.00	1.19				
9.00	1.39	0.00	1.39				
9.25	1.56	0.00	1.56				
9.50	1.67	0.00	1.67				
9.75	1.86	0.00	1.86				
10.00	2.18	0.00	2.18				
10.25	2.60	0.00	2.60				
10.50	3.13	0.00	3.13				
10.75	3.83	0.00	3.83				
11.00	4.76	0.00	4.76				
11.25	6.24	0.00	6.24				
11.50	8.54	0.00	8.54				
11.75	31.12	0.00	31.12				
12.00	**118.93**	0.00	**118.93**				
12.25	40.09	0.00	40.09				
12.50	17.18	0.00	17.18				
12.75	10.94	0.00	10.94				
13.00	8.93	0.00	8.93				
13.25	7.56	0.00	7.56				
13.50	6.64	0.00	6.64				
13.75	5.85	0.00	5.85				
14.00	5.21	0.00	5.21				
14.25	4.72	0.00	4.72				
14.50	4.48	0.00	4.48				
14.75	4.26	0.00	4.26				
15.00	4.04	0.00	4.04				
15.25	3.82	0.00	3.82				
15.50	3.60	0.00	3.60				
15.75	3.38	0.00	3.38				
16.00	3.15	0.00	3.15				
16.25	2.98	0.00	2.98				
16.50	2.89	0.00	2.89				
16.75	2.81	0.00	2.81				
17.00	2.73	0.00	2.73				
17.25	2.65	0.00	2.65				
17.50	2.57	0.00	2.57				
17.75	2.49	0.00	2.49				
18.00	2.41	0.00	2.41				
18.25	2.33	0.00	2.33				

Summary for Subcatchment DA-1: TO CANAL

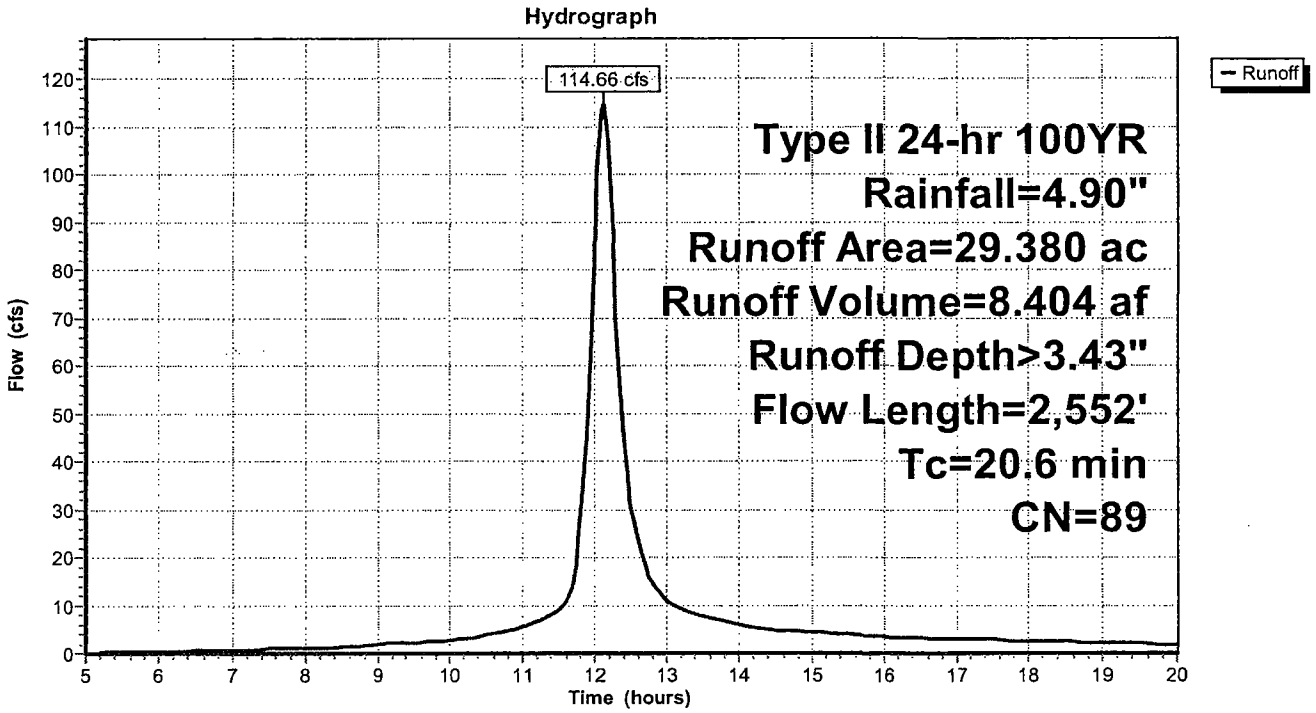
Runoff = 114.66 cfs @ 12.13 hrs, Volume= 8.404 af, Depth> 3.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR Rainfall=4.90"

Area (ac)	CN	Description
14.640	79	50-75% Grass cover, Fair, HSG C
14.740	98	Water Surface, 0% imp
29.380	89	Weighted Average
29.380		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0110	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
2.7	567	0.0476	3.51		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
3.8	1,885	0.0196	8.32	14.71	**Circular Channel (pipe),** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
20.6	2,552	Total			

Subcatchment DA-1: TO CANAL



Hydrograph for Subcatchment DA-1: TO CANAL

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.31	0.00	0.13
5.25	0.33	0.01	0.20
5.50	0.35	0.01	0.27
5.75	0.37	0.01	0.34
6.00	0.39	0.02	0.42
6.25	0.41	0.02	0.50
6.50	0.44	0.03	0.58
6.75	0.46	0.03	0.66
7.00	0.49	0.04	0.75
7.25	0.51	0.05	0.84
7.50	0.54	0.05	0.93
7.75	0.56	0.06	1.02
8.00	0.59	0.07	1.11
8.25	0.62	0.08	1.22
8.50	0.65	0.10	1.40
8.75	0.68	0.11	1.62
9.00	0.72	0.13	1.87
9.25	0.76	0.15	2.12
9.50	0.80	0.17	2.28
9.75	0.84	0.19	2.43
10.00	0.89	0.22	2.75
10.25	0.94	0.25	3.19
10.50	1.00	0.28	3.77
10.75	1.07	0.33	4.48
11.00	1.15	0.38	5.48
11.25	1.25	0.45	6.79
11.50	1.39	0.55	9.06
11.75	1.90	0.94	18.26
12.00	3.25	2.13	**81.29**
12.25	3.46	2.32	**86.52**
12.50	3.60	2.45	31.43
12.75	3.70	2.54	16.10
13.00	3.78	2.62	11.02
13.25	3.85	2.69	8.86
13.50	3.92	2.74	7.63
13.75	3.97	2.79	6.68
14.00	4.02	2.84	5.92
14.25	4.06	2.88	5.27
14.50	4.10	2.92	4.90
14.75	4.14	2.96	4.64
15.00	4.18	2.99	4.41
15.25	4.22	3.03	4.17
15.50	4.25	3.06	3.93
15.75	4.28	3.09	3.70
16.00	4.31	3.12	3.46
16.25	4.34	3.14	3.24
16.50	4.37	3.17	3.11
16.75	4.39	3.19	3.01
17.00	4.42	3.22	2.93
17.25	4.44	3.24	2.84
17.50	4.47	3.26	2.76
17.75	4.49	3.29	2.67
18.00	4.51	3.31	2.59
18.25	4.53	3.33	2.50
18.50	4.56	3.35	2.42
18.75	4.58	3.37	2.33
19.00	4.59	3.39	2.25
19.25	4.61	3.40	2.16
19.50	4.63	3.42	2.08
19.75	4.65	3.44	1.99
20.00	**4.66**	**3.45**	1.91

Summary for Subcatchment DA-2: TO NORTH EAST PROPERTY LINE

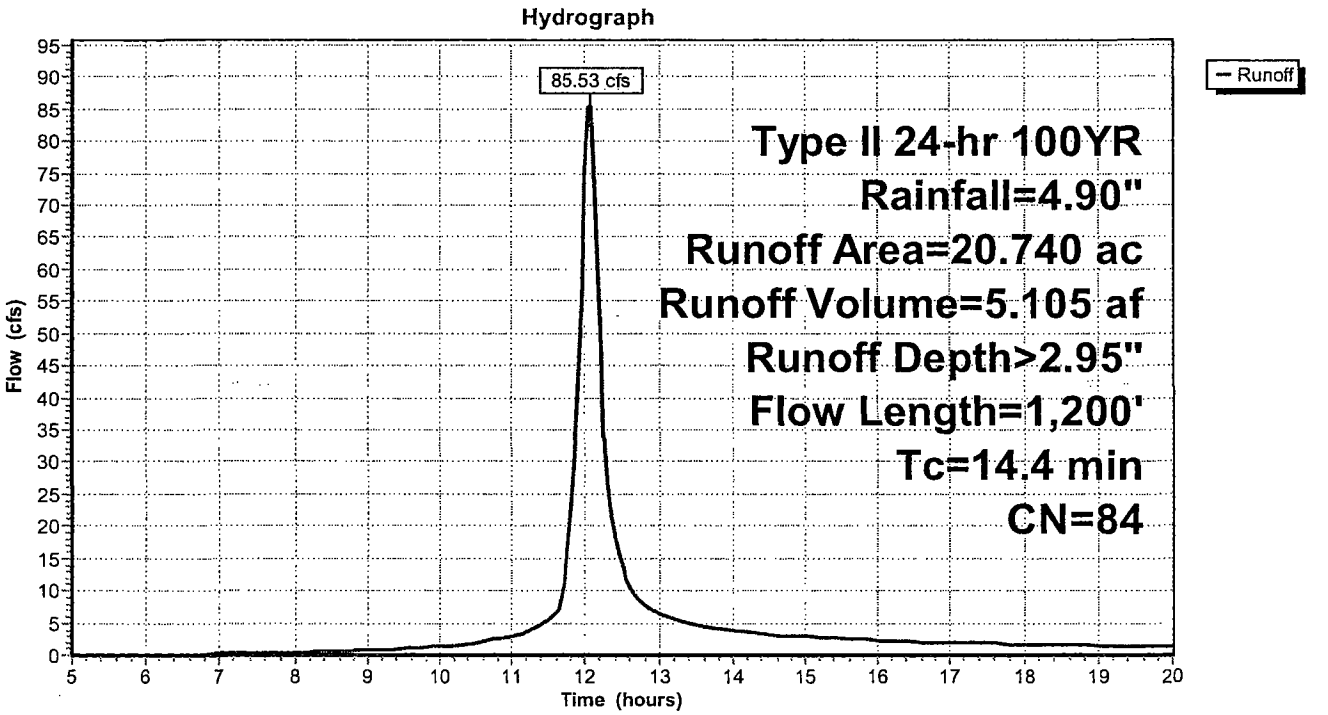
Runoff = 85.53 cfs @ 12.06 hrs, Volume= 5.105 af, Depth> 2.95"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR Rainfall=4.90"

Area (ac)	CN	Description
5.380	98	Paved parking & roofs
15.360	79	50-75% Grass cover, Fair, HSG C
20.740	84	Weighted Average
15.360		Pervious Area
5.380		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0700	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.50"
7.7	1,100	0.0217	2.37		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.4	1,200	Total			

Subcatchment DA-2: TO NORTH EAST PROPERTY LINE



Hydrograph for Subcatchment DA-2: TO NORTH EAST PROPERTY LINE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.31	0.00	0.00
5.25	0.33	0.00	0.00
5.50	0.35	0.00	0.00
5.75	0.37	0.00	0.00
6.00	0.39	0.00	0.00
6.25	0.41	0.00	0.03
6.50	0.44	0.00	0.07
6.75	0.46	0.00	0.12
7.00	0.49	0.01	0.16
7.25	0.51	0.01	0.21
7.50	0.54	0.01	0.26
7.75	0.56	0.02	0.32
8.00	0.59	0.02	0.37
8.25	0.62	0.03	0.44
8.50	0.65	0.03	0.54
8.75	0.68	0.04	0.65
9.00	0.72	0.05	0.79
9.25	0.76	0.06	0.92
9.50	0.80	0.08	1.00
9.75	0.84	0.09	1.11
10.00	0.89	0.11	1.32
10.25	0.94	0.13	1.59
10.50	1.00	0.15	1.94
10.75	1.07	0.18	2.39
11.00	1.15	0.22	3.01
11.25	1.25	0.27	3.90
11.50	1.39	0.35	5.43
11.75	1.90	0.67	15.68
12.00	3.25	1.72	**74.70**
12.25	3.46	1.90	**35.21**
12.50	3.60	2.02	13.49
12.75	3.70	2.11	8.05
13.00	3.78	2.18	6.48
13.25	3.85	2.24	5.44
13.50	3.92	2.30	4.78
13.75	3.97	2.34	4.20
14.00	4.02	2.39	3.74
14.25	4.06	2.43	3.36
14.50	4.10	2.46	3.18
14.75	4.14	2.50	3.02
15.00	4.18	2.53	2.87
15.25	4.22	2.56	2.71
15.50	4.25	2.59	2.56
15.75	4.28	2.62	2.40
16.00	4.31	2.65	2.25
16.25	4.34	2.67	2.11
16.50	4.37	2.70	2.05
16.75	4.39	2.72	1.99
17.00	4.42	2.74	1.93
17.25	4.44	2.77	1.88
17.50	4.47	2.79	1.82
17.75	4.49	2.81	1.77
18.00	4.51	2.83	1.71
18.25	4.53	2.85	1.65
18.50	4.56	2.87	1.60
18.75	4.58	2.88	1.54
19.00	4.59	2.90	1.48
19.25	4.61	2.92	1.43
19.50	4.63	2.94	1.37
19.75	4.65	2.95	1.31
20.00	**4.66**	**2.97**	1.26

Summary for Subcatchment DA-3: TO EAST PROPERTY LINE

[49] Hint: Tc<2dt may require smaller dt

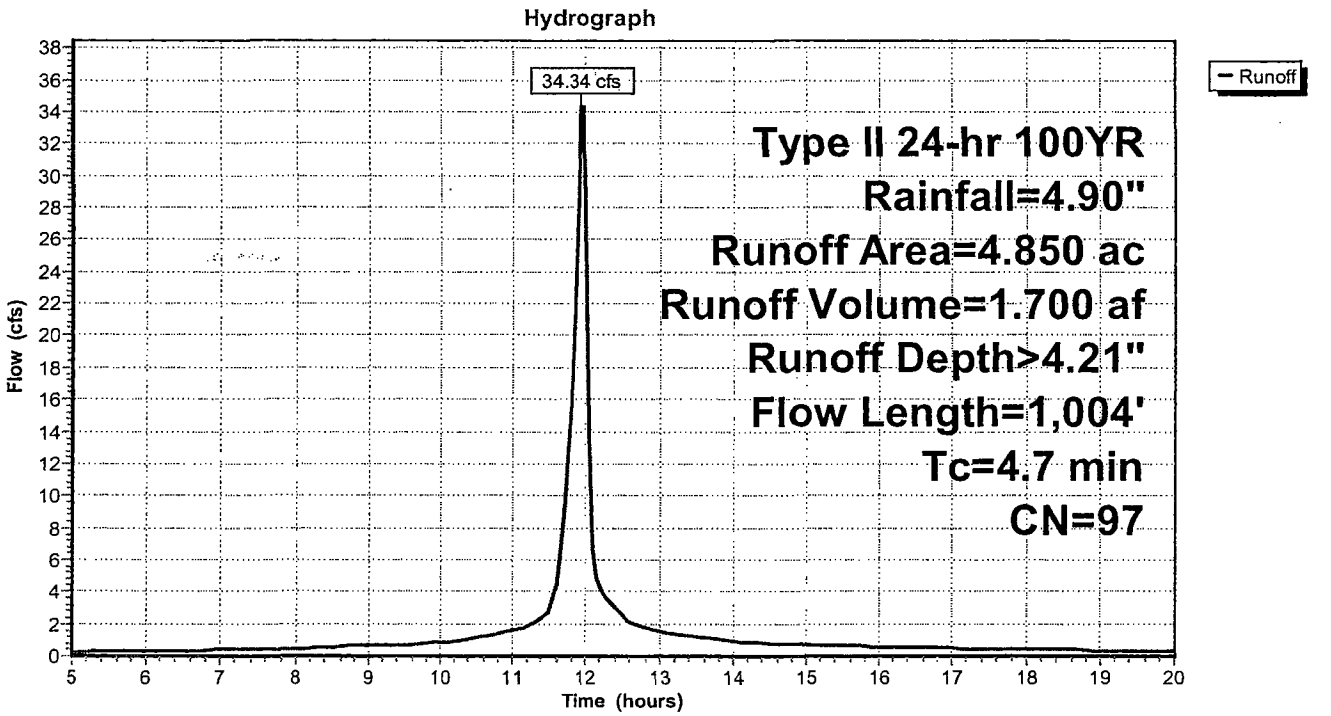
Runoff = 34.34 cfs @ 11.95 hrs, Volume= 1.700 af, Depth> 4.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR Rainfall=4.90"

Area (ac)	CN	Description
4.640	98	Paved roads w/curbs & sewers
0.210	79	50-75% Grass cover, Fair, HSG C
4.850	97	Weighted Average
0.210		Pervious Area
4.640		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	76	0.0158	1.05		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
1.5	648	0.0138	6.98	12.34	**Circular Channel (pipe),** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
2.0	280	0.0214	2.36		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.7	1,004	Total			

Subcatchment DA-3: TO EAST PROPERTY LINE



Hydrograph for Subcatchment DA-3: TO EAST PROPERTY LINE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.31	0.11	0.26
5.25	0.33	0.12	0.28
5.50	0.35	0.14	0.29
5.75	0.37	0.15	0.31
6.00	0.39	0.17	0.33
6.25	0.41	0.19	0.34
6.50	0.44	0.21	0.36
6.75	0.46	0.22	0.37
7.00	0.49	0.24	0.39
7.25	0.51	0.27	0.40
7.50	0.54	0.29	0.42
7.75	0.56	0.31	0.44
8.00	0.59	0.33	0.45
8.25	0.62	0.36	0.50
8.50	0.65	0.38	0.55
8.75	0.68	0.41	0.61
9.00	0.72	0.45	0.67
9.25	0.76	0.48	0.69
9.50	0.80	0.52	0.70
9.75	0.84	0.56	0.77
10.00	0.89	0.60	0.86
10.25	0.94	0.65	0.99
10.50	1.00	0.71	1.13
10.75	1.07	0.77	1.34
11.00	1.15	0.85	1.57
11.25	1.25	0.95	2.04
11.50	1.39	1.07	2.61
11.75	1.90	1.57	**12.61**
12.00	3.25	2.90	**27.53**
12.25	3.46	3.11	3.82
12.50	3.60	3.26	2.47
12.75	3.70	3.35	1.85
13.00	3.78	3.44	1.54
13.25	3.85	3.51	1.34
13.50	3.92	3.57	1.17
13.75	3.97	3.62	1.04
14.00	4.02	3.67	0.92
14.25	4.06	3.71	0.85
14.50	4.10	3.76	0.81
14.75	4.14	3.79	0.77
15.00	4.18	3.83	0.73
15.25	4.22	3.87	0.69
15.50	4.25	3.90	0.64
15.75	4.28	3.93	0.60
16.00	4.31	3.96	0.56
16.25	4.34	3.99	0.54
16.50	4.37	4.02	0.52
16.75	4.39	4.04	0.51
17.00	4.42	4.07	0.49
17.25	4.44	4.09	0.48
17.50	4.47	4.12	0.46
17.75	4.49	4.14	0.45
18.00	4.51	4.16	0.43
18.25	4.53	4.18	0.42
18.50	4.56	4.20	0.40
18.75	4.58	4.22	0.39
19.00	4.59	4.24	0.37
19.25	4.61	4.26	0.36
19.50	4.63	4.28	0.34
19.75	4.65	4.30	0.33
20.00	**4.66**	**4.31**	0.31

Summary for Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE

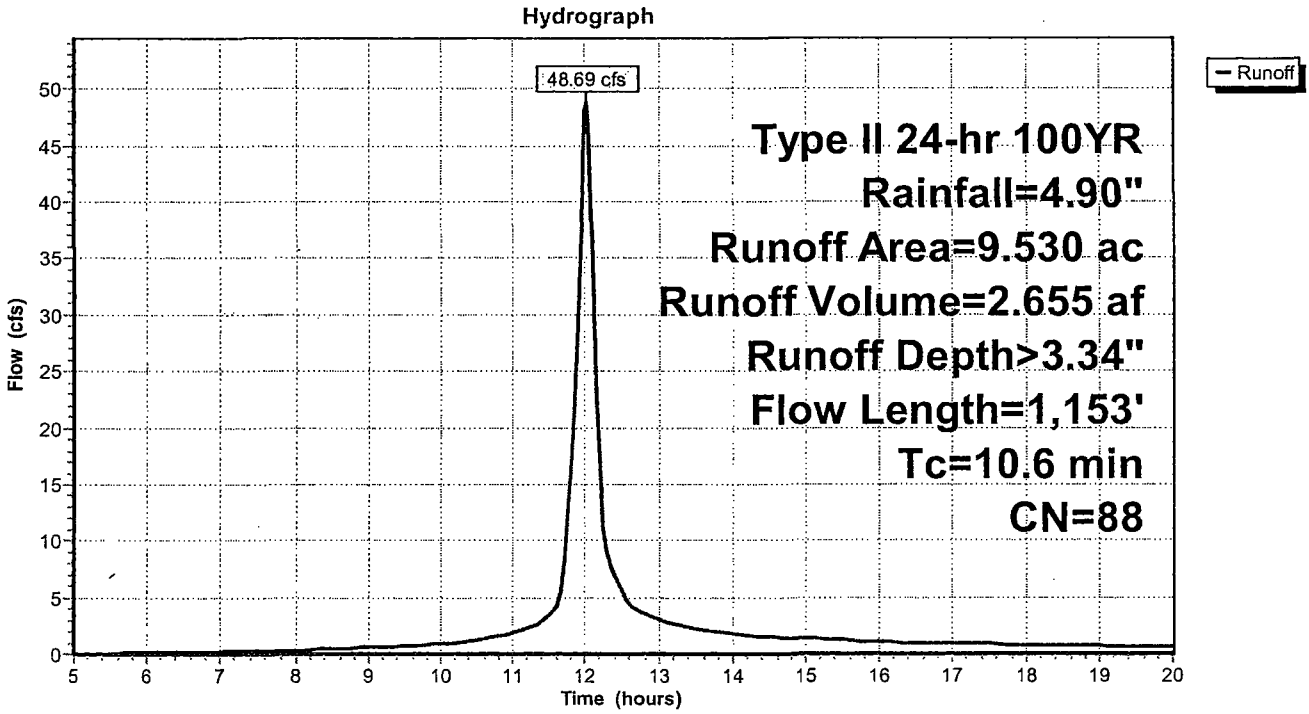
Runoff = 48.69 cfs @ 12.02 hrs, Volume= 2.655 af, Depth> 3.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR Rainfall=4.90"

Area (ac)	CN	Description
4.760	98	Paved parking & roofs
4.770	79	50-75% Grass cover, Fair, HSG C
9.530	88	Weighted Average
4.770		Pervious Area
4.760		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0200	1.22		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
3.6	471	0.0114	2.17		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.6	582	0.0114	1.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.6	1,153	Total			

Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE



Hydrograph for Subcatchment DA-4: TO SOUTH EAST PROPERTY LINE

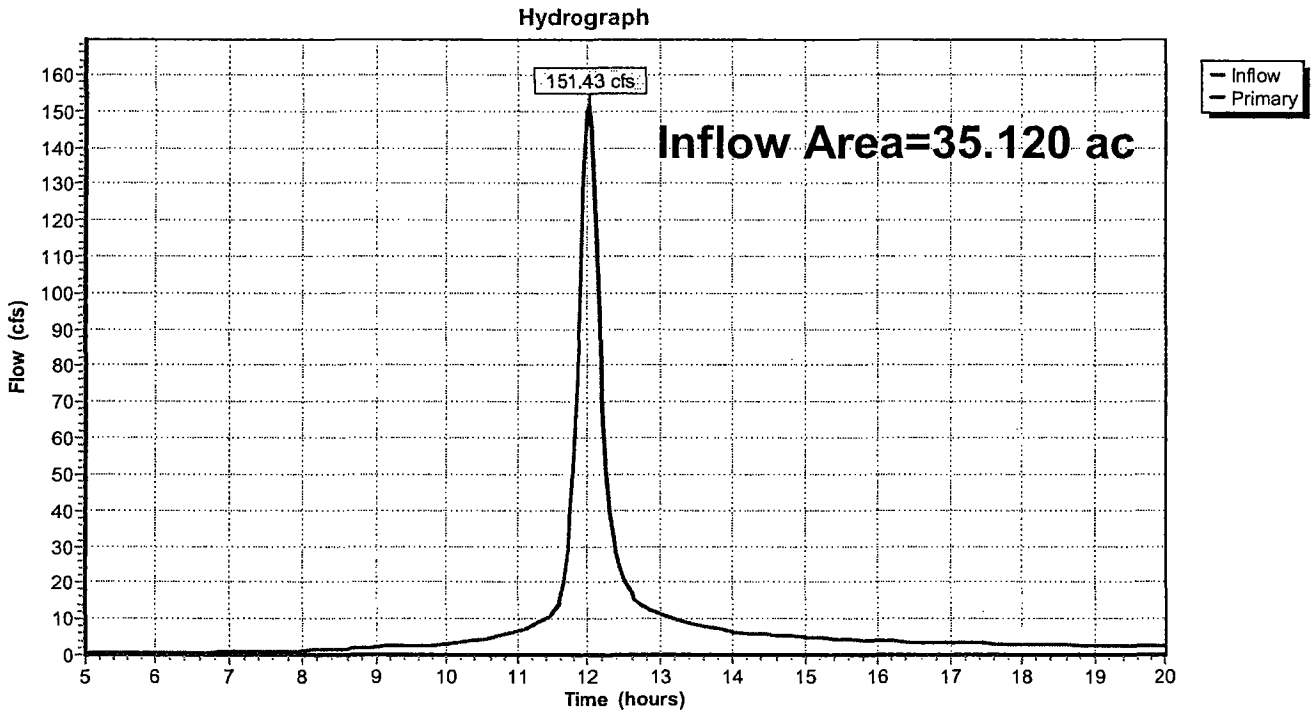
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.31	0.00	0.02
5.25	0.33	0.00	0.05
5.50	0.35	0.00	0.07
5.75	0.37	0.01	0.09
6.00	0.39	0.01	0.11
6.25	0.41	0.01	0.14
6.50	0.44	0.02	0.17
6.75	0.46	0.02	0.19
7.00	0.49	0.03	0.22
7.25	0.51	0.04	0.25
7.50	0.54	0.04	0.27
7.75	0.56	0.05	0.30
8.00	0.59	0.06	0.33
8.25	0.62	0.07	0.38
8.50	0.65	0.08	0.44
8.75	0.68	0.09	0.52
9.00	0.72	0.11	0.60
9.25	0.76	0.13	0.66
9.50	0.80	0.15	0.70
9.75	0.84	0.17	0.77
10.00	0.89	0.19	0.90
10.25	0.94	0.22	1.06
10.50	1.00	0.25	1.26
10.75	1.07	0.29	1.53
11.00	1.15	0.34	1.89
11.25	1.25	0.41	2.44
11.50	1.39	0.50	3.31
11.75	1.90	0.88	11.88
12.00	3.25	2.04	**48.09**
12.25	3.46	2.23	11.35
12.50	3.60	2.36	5.40
12.75	3.70	2.45	3.63
13.00	3.78	2.53	3.01
13.25	3.85	2.59	2.55
13.50	3.92	2.65	2.25
13.75	3.97	2.70	1.98
14.00	4.02	2.75	1.76
14.25	4.06	2.79	1.60
14.50	4.10	2.83	1.52
14.75	4.14	2.86	1.44
15.00	4.18	2.90	1.37
15.25	4.22	2.93	1.29
15.50	4.25	2.96	1.22
15.75	4.28	2.99	1.14
16.00	4.31	3.02	1.06
16.25	4.34	3.05	1.01
16.50	4.37	3.07	0.98
16.75	4.39	3.10	0.95
17.00	4.42	3.12	0.92
17.25	4.44	3.14	0.90
17.50	4.47	3.17	0.87
17.75	4.49	3.19	0.84
18.00	4.51	3.21	0.82
18.25	4.53	3.23	0.79
18.50	4.56	3.25	0.76
18.75	4.58	3.27	0.73
19.00	4.59	3.29	0.71
19.25	4.61	3.30	0.68
19.50	4.63	3.32	0.65
19.75	4.65	3.34	0.62
20.00	**4.66**	**3.35**	0.60

Summary for Link 1L: EAST PROPERTY LINE

Inflow Area = 35.120 ac, 42.08% Impervious, Inflow Depth > 3.23" for 100YR event
Inflow = 151.43 cfs @ 12.02 hrs, Volume= 9.459 af
Primary = 151.43 cfs @ 12.02 hrs, Volume= 9.459 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 1L: EAST PROPERTY LINE

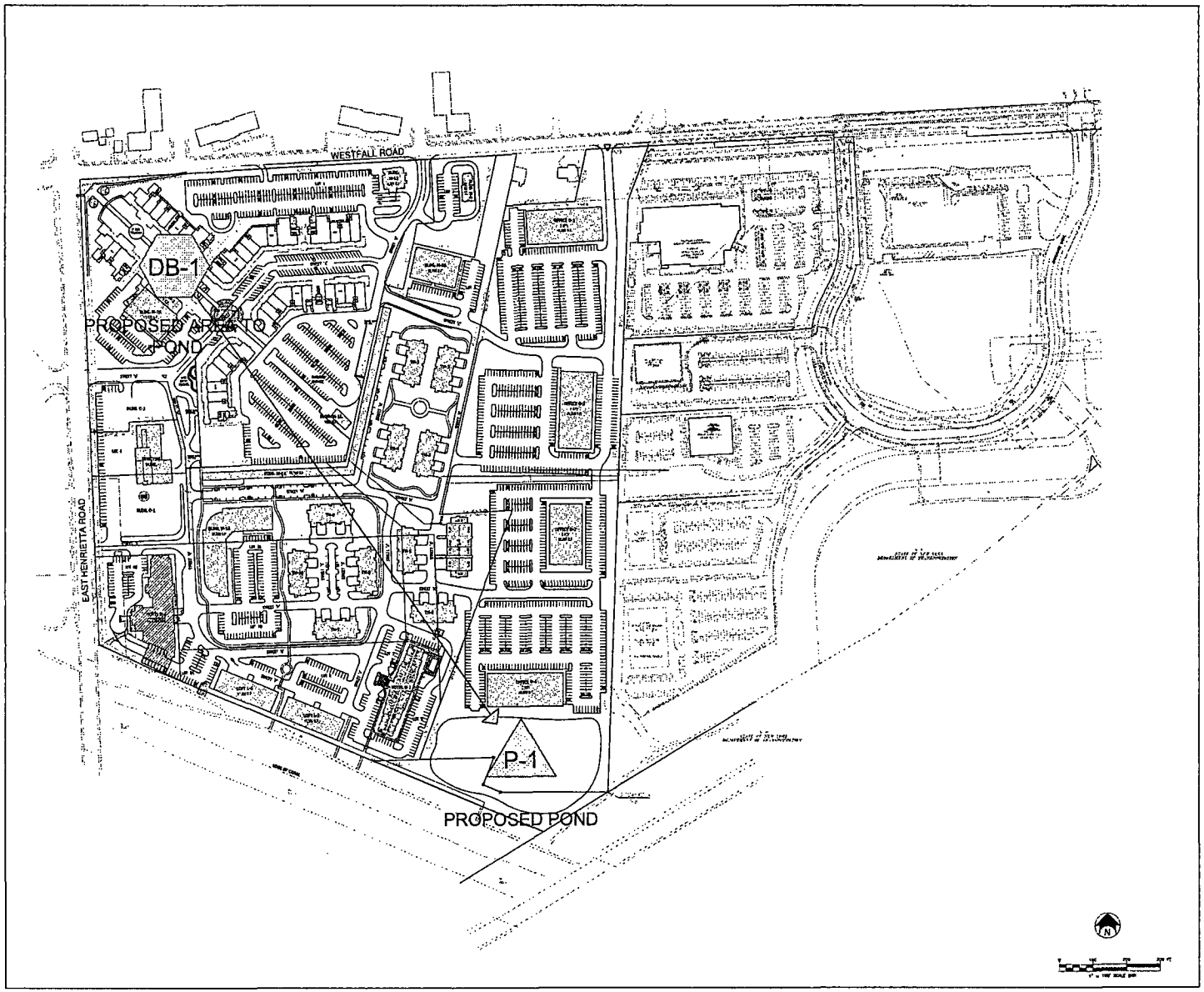


Hydrograph for Link 1L: EAST PROPERTY LINE

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.28	**0.00**	0.28
5.25	0.32	0.00	0.32
5.50	0.36	0.00	0.36
5.75	0.40	0.00	0.40
6.00	0.44	0.00	0.44
6.25	0.51	0.00	0.51
6.50	0.59	0.00	0.59
6.75	0.68	0.00	0.68
7.00	0.77	0.00	0.77
7.25	0.86	0.00	0.86
7.50	0.96	0.00	0.96
7.75	1.06	0.00	1.06
8.00	1.15	0.00	1.15
8.25	1.31	0.00	1.31
8.50	1.53	0.00	1.53
8.75	1.78	0.00	1.78
9.00	2.05	0.00	2.05
9.25	2.27	0.00	2.27
9.50	2.40	0.00	2.40
9.75	2.65	0.00	2.65
10.00	3.08	0.00	3.08
10.25	3.63	0.00	3.63
10.50	4.33	0.00	4.33
10.75	5.25	0.00	5.25
11.00	6.47	0.00	6.47
11.25	8.38	0.00	8.38
11.50	11.35	0.00	11.35
11.75	40.17	0.00	40.17
12.00	**150.32**	0.00	**150.32**
12.25	50.38	0.00	50.38
12.50	21.36	0.00	21.36
12.75	13.53	0.00	13.53
13.00	11.04	0.00	11.04
13.25	9.33	0.00	9.33
13.50	8.19	0.00	8.19
13.75	7.21	0.00	7.21
14.00	6.41	0.00	6.41
14.25	5.81	0.00	5.81
14.50	5.51	0.00	5.51
14.75	5.24	0.00	5.24
15.00	4.96	0.00	4.96
15.25	4.69	0.00	4.69
15.50	4.42	0.00	4.42
15.75	4.15	0.00	4.15
16.00	3.87	0.00	3.87
16.25	3.66	0.00	3.66
16.50	3.55	0.00	3.55
16.75	3.45	0.00	3.45
17.00	3.35	0.00	3.35
17.25	3.25	0.00	3.25
17.50	3.16	0.00	3.16
17.75	3.06	0.00	3.06
18.00	2.96	0.00	2.96
18.25	2.86	0.00	2.86
18.50	2.76	0.00	2.76
18.75	2.66	0.00	2.66
19.00	2.57	0.00	2.57
19.25	2.47	0.00	2.47
19.50	2.37	0.00	2.37
19.75	2.27	0.00	2.27
20.00	2.17	0.00	2.17

Appendix B

Proposed Drainage Conditions Map And Hydrograph Reports



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County of Monroe
State of New York

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Engineers / Architects /Planners/ Surveyors

NO.	DATE	REVISION	BY	APP'D

CONCEPTUAL SITE PLAN

CP-29

Subcat Reach Pond Link

Drainage Diagram for PROPOSEDCP29

Prepared by Bergmann Associates, Printed 7/28/2008

Summary for Subcatchment DB-1: PROPOSED AREA TO POND

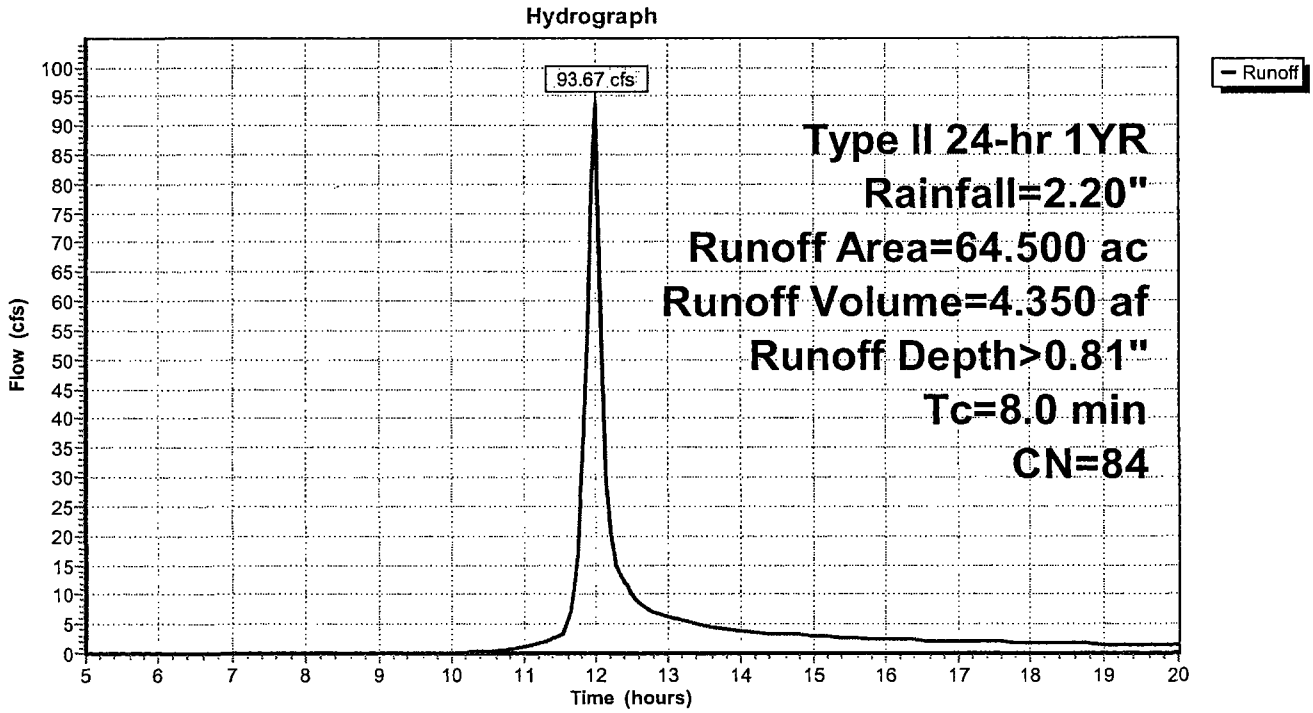
Runoff = 93.67 cfs @ 12.00 hrs, Volume= 4.350 af, Depth> 0.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1YR Rainfall=2.20"

	Area (ac)	CN	Description
	11.547	98	Paved parking & roofs
	26.984	98	Paved parking & roofs
	24.208	61	>75% Grass cover, Good, HSG B
*	1.761	98	
	64.500	84	Weighted Average
	24.208		Pervious Area
	40.292		Impervious Area

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

Subcatchment DB-1: PROPOSED AREA TO POND



Hydrograph for Subcatchment DB-1: PROPOSED AREA TO POND

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.14	0.00	0.00
5.25	0.15	0.00	0.00
5.50	0.16	0.00	0.00
5.75	0.17	0.00	0.00
6.00	0.18	0.00	0.00
6.25	0.19	0.00	0.00
6.50	0.20	0.00	0.00
6.75	0.21	0.00	0.00
7.00	0.22	0.00	0.00
7.25	0.23	0.00	0.00
7.50	0.24	0.00	0.00
7.75	0.25	0.00	0.00
8.00	0.26	0.00	0.00
8.25	0.28	0.00	0.00
8.50	0.29	0.00	0.00
8.75	0.31	0.00	0.00
9.00	0.32	0.00	0.00
9.25	0.34	0.00	0.00
9.50	0.36	0.00	0.00
9.75	0.38	0.00	0.00
10.00	0.40	0.00	0.04
10.25	0.42	0.00	0.18
10.50	0.45	0.00	0.38
10.75	0.48	0.00	0.67
11.00	0.52	0.01	1.08
11.25	0.56	0.02	1.78
11.50	0.62	0.03	2.94
11.75	0.85	0.09	16.95
12.00	1.46	0.39	**93.66**
12.25	1.55	0.45	16.89
12.50	1.62	0.49	10.30
12.75	1.66	0.51	7.37
13.00	1.70	0.54	6.24
13.25	1.73	0.56	5.38
13.50	1.76	0.58	4.77
13.75	1.78	0.59	4.24
14.00	1.80	0.61	3.79
14.25	1.82	0.62	3.49
14.50	1.84	0.63	3.33
14.75	1.86	0.65	3.18
15.00	1.88	0.66	3.02
15.25	1.89	0.67	2.87
15.50	1.91	0.68	2.70
15.75	1.92	0.69	2.54
16.00	1.94	0.70	2.38
16.25	1.95	0.71	2.27
16.50	1.96	0.72	2.21
16.75	1.97	0.72	2.15
17.00	1.98	0.73	2.10
17.25	1.99	0.74	2.04
17.50	2.01	0.75	1.98
17.75	2.02	0.76	1.92
18.00	2.03	0.76	1.86
18.25	2.04	0.77	1.80
18.50	2.05	0.78	1.74
18.75	2.05	0.78	1.68
19.00	2.06	0.79	1.62
19.25	2.07	0.79	1.56
19.50	2.08	0.80	1.50
19.75	2.09	0.81	1.44
20.00	**2.09**	**0.81**	1.38

Summary for Pond P-1: PROPOSED POND

4.05 ACRE-FT REQUIRED AT 110 CFS DISCHARGE

Inflow Area = 64.500 ac, 62.47% Impervious, Inflow Depth > 0.81" for 1YR event
Inflow = 93.67 cfs @ 12.00 hrs, Volume= 4.350 af
Outflow = 1.31 cfs @ 20.00 hrs, Volume= 0.839 af, Atten= 99%, Lag= 480.1 min
Primary = 0.66 cfs @ 20.00 hrs, Volume= 0.420 af
Secondary = 0.66 cfs @ 20.00 hrs, Volume= 0.420 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 514.00' Surf.Area= 53,357 sf Storage= 223,314 cf
Peak Elev= 516.60' @ 20.00 hrs Surf.Area= 64,184 sf Storage= 376,244 cf (152,930 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 164.0 min (964.2 - 800.3)

Volume	Invert	Avail.Storage	Storage Description
#1	507.50'	618,351 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

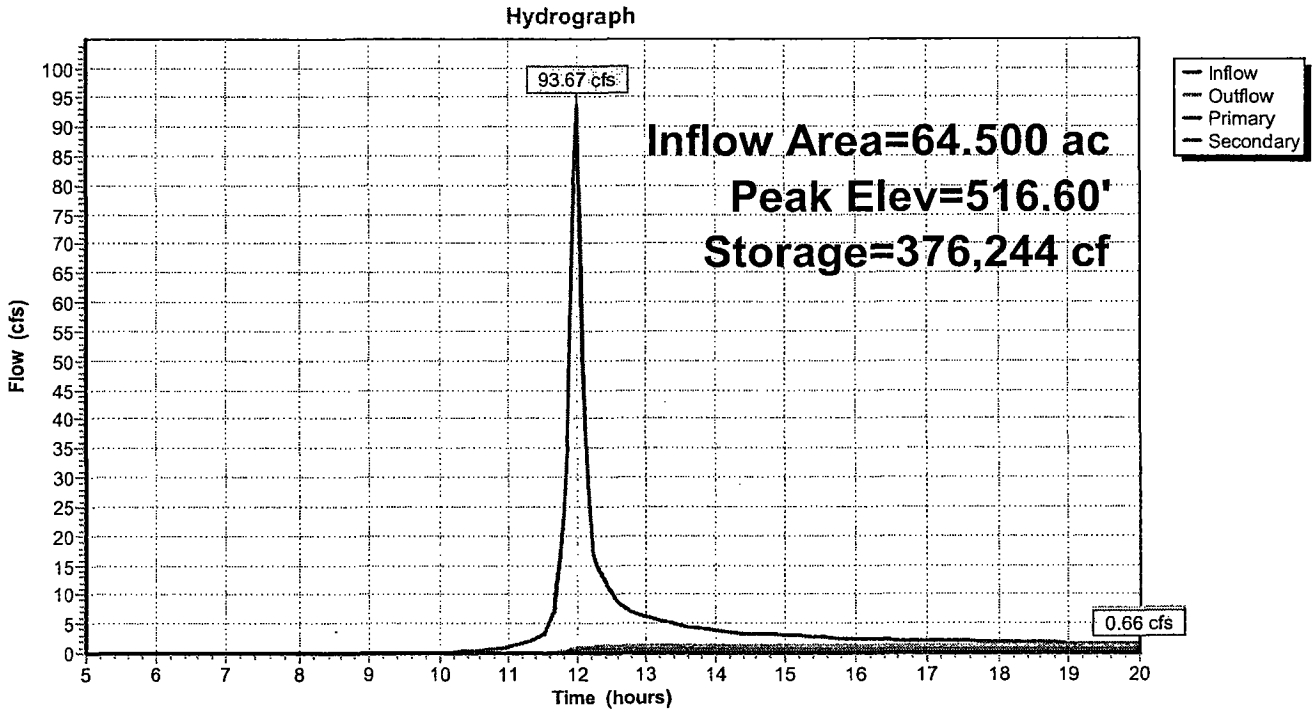
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
507.50	22,560	0	0
512.50	39,045	154,013	154,013
514.00	53,357	69,302	223,314
520.00	78,322	395,037	618,351

Device	Routing	Invert	Outlet Devices
#1	Primary	514.00'	**36.0" x 220.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 512.00' S= 0.0091 '/' Cc= 0.900 n= 0.013
#2	Secondary	514.00'	**36.0" x 100.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 513.00' S= 0.0100 '/' Cc= 0.900 n= 0.013
#3	Device 1	514.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	514.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#6	Device 2	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#7	Device 1	516.75'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 3.25 Width (feet) 3.00 3.00
#8	Device 2	516.75'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 3.25 Width (feet) 3.00 3.00

Primary OutFlow Max=0.66 cfs @ 20.00 hrs HW=516.60' (Free Discharge)
└─**1=Culvert** (Passes 0.66 cfs of 35.77 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.66 cfs @ 7.51 fps)
  ├─**5=Orifice/Grate** (Controls 0.00 cfs)
  └─**7=Custom Weir/Orifice** (Controls 0.00 cfs)

Secondary OutFlow Max=0.66 cfs @ 20.00 hrs HW=516.60' (Free Discharge)
└─**2=Culvert** (Passes 0.66 cfs of 34.63 cfs potential flow)
  ├─**4=Orifice/Grate** (Orifice Controls 0.66 cfs @ 7.51 fps)
  ├─**6=Orifice/Grate** (Controls 0.00 cfs)
  └─**8=Custom Weir/Orifice** (Controls 0.00 cfs)

Pond P-1: PROPOSED POND



Hydrograph for Pond P-1: PROPOSED POND

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	223,314	514.00	0.00	0.00	0.00
5.50	0.00	223,314	514.00	0.00	0.00	0.00
6.00	0.00	223,314	514.00	0.00	0.00	0.00
6.50	0.00	223,314	514.00	0.00	0.00	0.00
7.00	0.00	223,314	514.00	0.00	0.00	0.00
7.50	0.00	223,314	514.00	0.00	0.00	0.00
8.00	0.00	223,314	514.00	0.00	0.00	0.00
8.50	0.00	223,314	514.00	0.00	0.00	0.00
9.00	0.00	223,314	514.00	0.00	0.00	0.00
9.50	0.00	223,314	514.00	0.00	0.00	0.00
10.00	0.04	223,323	514.00	0.00	0.00	0.00
10.50	0.38	223,668	514.01	0.00	0.00	0.00
11.00	1.08	224,897	514.03	0.02	0.01	0.01
11.50	2.94	228,187	514.09	0.05	0.03	0.03
12.00	**93.66**	279,131	515.01	0.77	0.39	0.39
12.50	10.30	330,628	515.87	1.10	0.55	0.55
13.00	6.24	342,326	516.06	1.16	0.58	0.58
13.50	4.77	349,957	516.19	1.19	0.60	0.60
14.00	3.79	355,430	516.27	1.22	0.61	0.61
14.50	3.33	359,531	516.34	1.24	0.62	0.62
15.00	3.02	363,012	516.39	1.25	0.63	0.63
15.50	2.70	365,900	516.44	1.27	0.63	0.63
16.00	2.38	368,184	516.48	1.28	0.64	0.64
16.50	2.21	369,971	516.50	1.28	0.64	0.64
17.00	2.10	371,529	516.53	1.29	0.65	0.65
17.50	1.98	372,869	516.55	1.30	0.65	0.65
18.00	1.86	373,990	516.57	1.30	0.65	0.65
18.50	1.74	374,890	516.58	1.31	0.65	0.65
19.00	1.62	375,568	516.59	1.31	0.65	0.65
19.50	1.50	376,021	516.60	1.31	0.66	0.66
20.00	1.38	**376,249**	**516.60**	**1.31**	**0.66**	**0.66**

Summary for Subcatchment DB-1: PROPOSED AREA TO POND

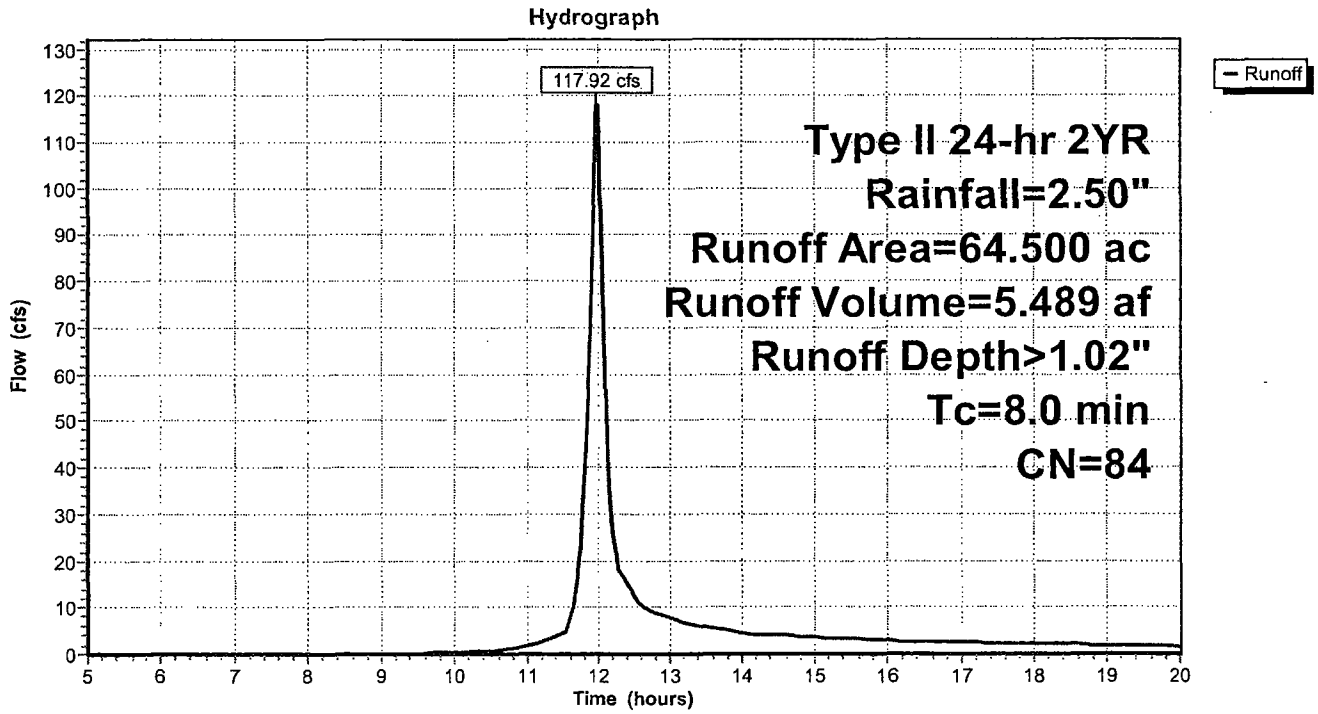
Runoff = 117.92 cfs @ 12.00 hrs, Volume= 5.489 af, Depth> 1.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2YR Rainfall=2.50"

	Area (ac)	CN	Description
	11.547	98	Paved parking & roofs
	26.984	98	Paved parking & roofs
	24.208	61	>75% Grass cover, Good, HSG B
*	1.761	98	
	64.500	84	Weighted Average
	24.208		Pervious Area
	40.292		Impervious Area

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

Subcatchment DB-1: PROPOSED AREA TO POND



Hydrograph for Subcatchment DB-1: PROPOSED AREA TO POND

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.16	0.00	0.00
5.25	0.17	0.00	0.00
5.50	0.18	0.00	0.00
5.75	0.19	0.00	0.00
6.00	0.20	0.00	0.00
6.25	0.21	0.00	0.00
6.50	0.22	0.00	0.00
6.75	0.24	0.00	0.00
7.00	0.25	0.00	0.00
7.25	0.26	0.00	0.00
7.50	0.27	0.00	0.00
7.75	0.29	0.00	0.00
8.00	0.30	0.00	0.00
8.25	0.31	0.00	0.00
8.50	0.33	0.00	0.00
8.75	0.35	0.00	0.00
9.00	0.37	0.00	0.00
9.25	0.39	0.00	0.00
9.50	0.41	0.00	0.09
9.75	0.43	0.00	0.21
10.00	0.45	0.00	0.37
10.25	0.48	0.00	0.58
10.50	0.51	0.01	0.87
10.75	0.55	0.01	1.28
11.00	0.59	0.02	1.85
11.25	0.64	0.03	2.82
11.50	0.71	0.05	4.37
11.75	0.97	0.14	23.33
12.00	1.66	0.51	**117.85**
12.25	1.77	0.58	20.77
12.50	1.84	0.63	12.59
12.75	1.89	0.67	8.98
13.00	1.93	0.69	7.59
13.25	1.97	0.72	6.54
13.50	2.00	0.74	5.78
13.75	2.03	0.76	5.13
14.00	2.05	0.78	4.58
14.25	2.07	0.80	4.22
14.50	2.09	0.81	4.03
14.75	2.11	0.83	3.84
15.00	2.13	0.84	3.65
15.25	2.15	0.85	3.46
15.50	2.17	0.87	3.26
15.75	2.19	0.88	3.06
16.00	2.20	0.89	2.86
16.25	2.21	0.90	2.73
16.50	2.23	0.91	2.66
16.75	2.24	0.92	2.59
17.00	2.25	0.93	2.52
17.25	2.27	0.94	2.45
17.50	2.28	0.95	2.38
17.75	2.29	0.96	2.31
18.00	2.30	0.96	2.24
18.25	2.31	0.97	2.16
18.50	2.32	0.98	2.09
18.75	2.33	0.99	2.02
19.00	2.34	1.00	1.95
19.25	2.35	1.00	1.87
19.50	2.36	1.01	1.80
19.75	2.37	1.02	1.72
20.00	**2.38**	**1.02**	1.65

Summary for Pond P-1: PROPOSED POND

4.05 ACRE-FT REQUIRED AT 110 CFS DISCHARGE

Inflow Area = 64.500 ac, 62.47% Impervious, Inflow Depth > 1.02" for 2YR event
Inflow = 117.92 cfs @ 12.00 hrs, Volume= 5.489 af
Outflow = 3.16 cfs @ 15.63 hrs, Volume= 1.599 af, Atten= 97%, Lag= 218.0 min
Primary = 1.58 cfs @ 15.63 hrs, Volume= 0.799 af
Secondary = 1.58 cfs @ 15.63 hrs, Volume= 0.799 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 514.00' Surf.Area= 53,357 sf Storage= 223,314 cf
Peak Elev= 516.94' @ 15.63 hrs Surf.Area= 65,610 sf Storage= 398,489 cf (175,175 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 180.3 min (975.7 - 795.4)

Volume	Invert	Avail.Storage	Storage Description
#1	507.50'	618,351 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

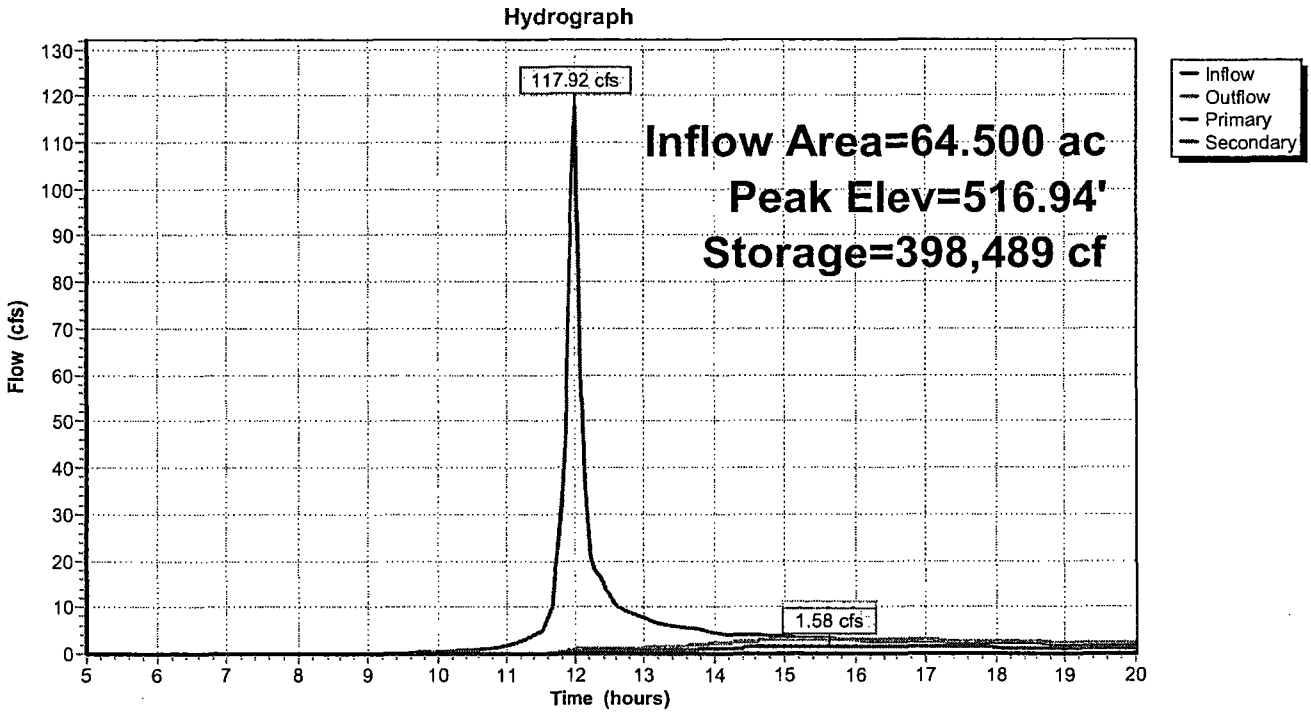
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
507.50	22,560	0	0
512.50	39,045	154,013	154,013
514.00	53,357	69,302	223,314
520.00	78,322	395,037	618,351

Device	Routing	Invert	Outlet Devices
#1	Primary	514.00'	**36.0" x 220.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 512.00' S= 0.0091 '/' Cc= 0.900 n= 0.013
#2	Secondary	514.00'	**36.0" x 100.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 513.00' S= 0.0100 '/' Cc= 0.900 n= 0.013
#3	Device 1	514.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	514.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#6	Device 2	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#7	Device 1	516.75'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 3.25 Width (feet) 3.00 3.00
#8	Device 2	516.75'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 3.25 Width (feet) 3.00 3.00

Primary OutFlow Max=1.55 cfs @ 15.63 hrs HW=516.94' (Free Discharge)
└─**1=Culvert** (Passes 1.55 cfs of 41.13 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.70 cfs @ 8.03 fps)
  ├─**5=Orifice/Grate** (Controls 0.00 cfs)
  └─**7=Custom Weir/Orifice** (Weir Controls 0.85 cfs @ 1.45 fps)

Secondary OutFlow Max=1.55 cfs @ 15.63 hrs HW=516.94' (Free Discharge)
└─**2=Culvert** (Passes 1.55 cfs of 41.02 cfs potential flow)
  ├─**4=Orifice/Grate** (Orifice Controls 0.70 cfs @ 8.03 fps)
  ├─**6=Orifice/Grate** (Controls 0.00 cfs)
  └─**8=Custom Weir/Orifice** (Weir Controls 0.85 cfs @ 1.45 fps)

Pond P-1: PROPOSED POND



Hydrograph for Pond P-1: PROPOSED POND

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	223,314	514.00	0.00	0.00	0.00
5.50	0.00	223,314	514.00	0.00	0.00	0.00
6.00	0.00	223,314	514.00	0.00	0.00	0.00
6.50	0.00	223,314	514.00	0.00	0.00	0.00
7.00	0.00	223,314	514.00	0.00	0.00	0.00
7.50	0.00	223,314	514.00	0.00	0.00	0.00
8.00	0.00	223,314	514.00	0.00	0.00	0.00
8.50	0.00	223,314	514.00	0.00	0.00	0.00
9.00	0.00	223,314	514.00	0.00	0.00	0.00
9.50	0.09	223,351	514.00	0.00	0.00	0.00
10.00	0.37	223,737	514.01	0.00	0.00	0.00
10.50	0.87	224,795	514.03	0.02	0.01	0.01
11.00	1.85	227,100	514.07	0.04	0.02	0.02
11.50	4.37	232,219	514.17	0.13	0.06	0.06
12.00	**117.85**	298,868	515.35	0.91	0.46	0.46
12.50	12.59	362,964	516.39	1.25	0.63	0.63
13.00	7.59	377,389	516.62	1.32	0.66	0.66
13.50	5.78	386,812	516.77	1.47	0.73	0.73
14.00	4.58	392,791	516.86	2.13	1.06	1.06
14.50	4.03	396,104	516.91	2.68	1.34	1.34
15.00	3.65	397,839	516.93	3.03	1.51	1.51
15.50	3.26	**398,472**	**516.94**	**3.15**	**1.58**	**1.58**
16.00	2.86	**398,316**	**516.94**	**3.12**	**1.56**	**1.56**
16.50	2.66	397,726	516.93	3.01	1.50	1.50
17.00	2.52	397,091	516.92	2.88	1.44	1.44
17.50	2.38	396,435	516.91	2.75	1.37	1.37
18.00	2.24	395,760	516.90	2.62	1.31	1.31
18.50	2.09	395,069	516.89	2.48	1.24	1.24
19.00	1.95	394,364	516.88	2.34	1.17	1.17
19.50	1.80	393,639	516.87	2.22	1.11	1.11
20.00	1.65	392,821	516.86	2.13	1.07	1.07

Summary for Subcatchment DB-1: PROPOSED AREA TO POND

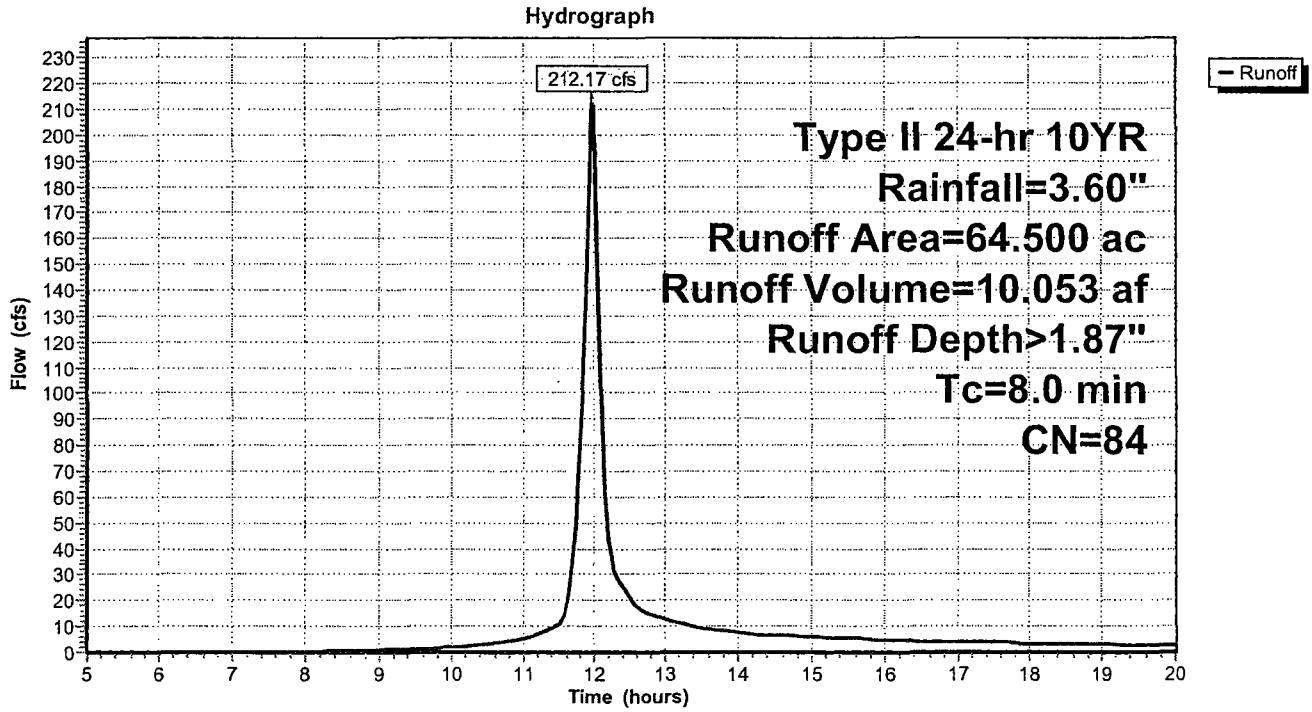
Runoff = 212.17 cfs @ 11.99 hrs, Volume= 10.053 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10YR Rainfall=3.60"

	Area (ac)	CN	Description
	11.547	98	Paved parking & roofs
	26.984	98	Paved parking & roofs
	24.208	61	>75% Grass cover, Good, HSG B
*	1.761	98	
	64.500	84	Weighted Average
	24.208		Pervious Area
	40.292		Impervious Area

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

Subcatchment DB-1: PROPOSED AREA TO POND



Hydrograph for Subcatchment DB-1: PROPOSED AREA TO POND

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.23	0.00	0.00
5.25	0.24	0.00	0.00
5.50	0.26	0.00	0.00
5.75	0.27	0.00	0.00
6.00	0.29	0.00	0.00
6.25	0.30	0.00	0.00
6.50	0.32	0.00	0.00
6.75	0.34	0.00	0.00
7.00	0.36	0.00	0.00
7.25	0.37	0.00	0.00
7.50	0.39	0.00	0.02
7.75	0.41	0.00	0.11
8.00	0.43	0.00	0.21
8.25	0.45	0.00	0.34
8.50	0.48	0.00	0.50
8.75	0.50	0.01	0.69
9.00	0.53	0.01	0.92
9.25	0.56	0.02	1.13
9.50	0.59	0.02	1.31
9.75	0.62	0.03	1.57
10.00	0.65	0.03	1.97
10.25	0.69	0.04	2.49
10.50	0.73	0.06	3.15
10.75	0.79	0.07	4.07
11.00	0.85	0.09	5.29
11.25	0.92	0.12	7.37
11.50	1.02	0.16	10.54
11.75	1.39	0.35	49.90
12.00	2.39	1.03	**211.67**
12.25	2.54	1.15	35.48
12.50	2.65	1.23	21.20
12.75	2.72	1.29	15.04
13.00	2.78	1.34	12.65
13.25	2.83	1.38	10.86
13.50	2.88	1.42	9.58
13.75	2.92	1.45	8.48
14.00	2.95	1.48	7.56
14.25	2.98	1.50	6.94
14.50	3.02	1.53	6.62
14.75	3.04	1.55	6.30
15.00	3.07	1.58	5.98
15.25	3.10	1.60	5.65
15.50	3.12	1.62	5.33
15.75	3.15	1.64	4.99
16.00	3.17	1.66	4.66
16.25	3.19	1.67	4.44
16.50	3.21	1.69	4.32
16.75	3.23	1.71	4.21
17.00	3.25	1.72	4.09
17.25	3.26	1.74	3.98
17.50	3.28	1.75	3.86
17.75	3.30	1.77	3.74
18.00	3.32	1.78	3.62
18.25	3.33	1.79	3.50
18.50	3.35	1.81	3.38
18.75	3.36	1.82	3.26
19.00	3.38	1.83	3.14
19.25	3.39	1.84	3.02
19.50	3.40	1.85	2.90
19.75	3.42	1.86	2.78
20.00	**3.43**	**1.87**	2.65

Summary for Pond P-1: PROPOSED POND

4.05 ACRE-FT REQUIRED AT 110 CFS DISCHARGE

Inflow Area = 64.500 ac, 62.47% Impervious, Inflow Depth > 1.87" for 10YR event
Inflow = 212.17 cfs @ 11.99 hrs, Volume= 10.053 af
Outflow = 25.77 cfs @ 12.39 hrs, Volume= 6.015 af, Atten= 88%, Lag= 23.9 min
Primary = 12.88 cfs @ 12.39 hrs, Volume= 3.008 af
Secondary = 12.88 cfs @ 12.39 hrs, Volume= 3.008 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 514.00' Surf.Area= 53,357 sf Storage= 223,314 cf
Peak Elev= 517.90' @ 12.39 hrs Surf.Area= 69,571 sf Storage= 462,821 cf (239,507 cf above start)

Plug-Flow detention time= 470.6 min calculated for 0.886 af (9% of inflow)
Center-of-Mass det. time= 90.7 min (873.2 - 782.5)

Volume	Invert	Avail.Storage	Storage Description
#1	507.50'	618,351 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

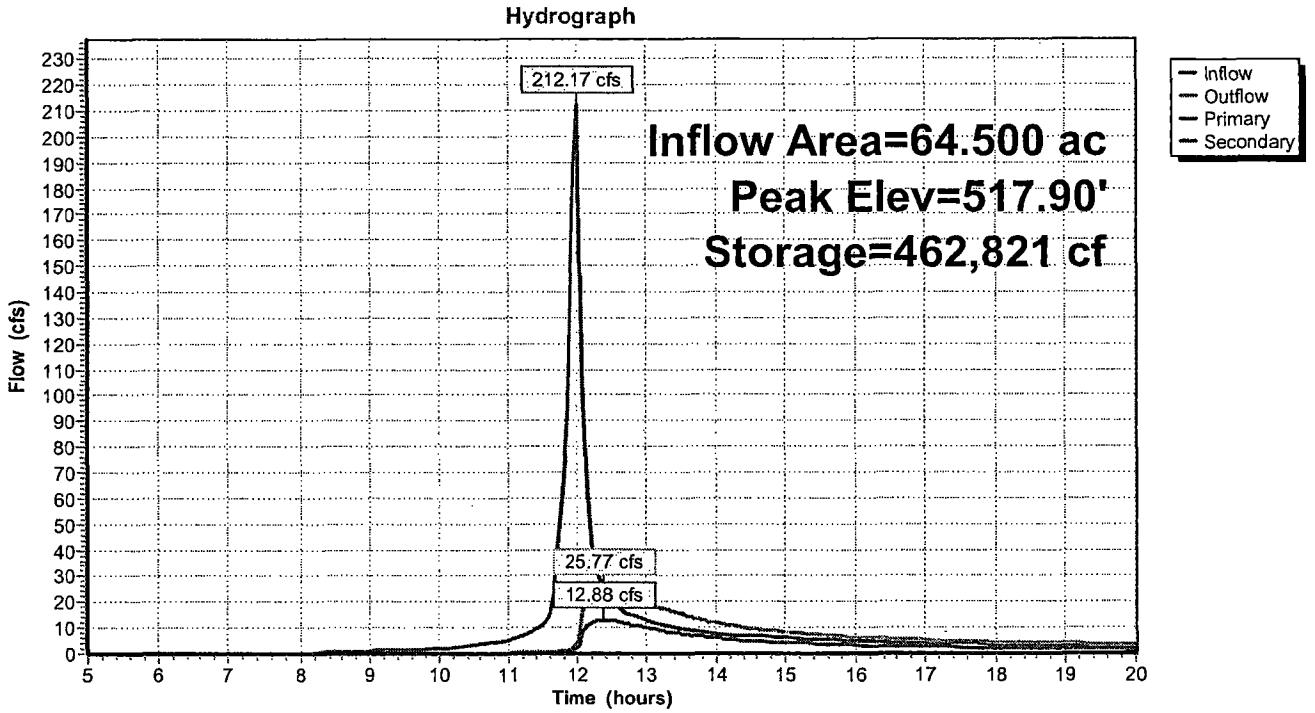
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
507.50	22,560	0	0
512.50	39,045	154,013	154,013
514.00	53,357	69,302	223,314
520.00	78,322	395,037	618,351

Device	Routing	Invert	Outlet Devices
#1	Primary	514.00'	**36.0" x 220.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 512.00' S= 0.0091 '/' Cc= 0.900 n= 0.013
#2	Secondary	514.00'	**36.0" x 100.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 513.00' S= 0.0100 '/' Cc= 0.900 n= 0.013
#3	Device 1	514.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	514.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#6	Device 2	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#7	Device 1	516.75'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 3.25 Width (feet) 3.00 3.00
#8	Device 2	516.75'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 3.25 Width (feet) 3.00 3.00

Primary OutFlow Max=12.87 cfs @ 12.39 hrs HW=517.90' (Free Discharge)
└─**1=Culvert** (Passes 12.87 cfs of 52.69 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.81 cfs @ 9.30 fps)
  ├─**5=Orifice/Grate** (Controls 0.00 cfs)
  └─**7=Custom Weir/Orifice** (Weir Controls 12.06 cfs @ 3.51 fps)

Secondary OutFlow Max=12.87 cfs @ 12.39 hrs HW=517.90' (Free Discharge)
└─**2=Culvert** (Passes 12.87 cfs of 52.69 cfs potential flow)
  ├─**4=Orifice/Grate** (Orifice Controls 0.81 cfs @ 9.30 fps)
  ├─**6=Orifice/Grate** (Controls 0.00 cfs)
  └─**8=Custom Weir/Orifice** (Weir Controls 12.06 cfs @ 3.51 fps)

Pond P-1: PROPOSED POND



Hydrograph for Pond P-1: PROPOSED POND

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	223,314	514.00	0.00	0.00	0.00
5.50	0.00	223,314	514.00	0.00	0.00	0.00
6.00	0.00	223,314	514.00	0.00	0.00	0.00
6.50	0.00	223,314	514.00	0.00	0.00	0.00
7.00	0.00	223,314	514.00	0.00	0.00	0.00
7.50	0.02	223,317	514.00	0.00	0.00	0.00
8.00	0.21	223,521	514.00	0.00	0.00	0.00
8.50	0.50	224,128	514.02	0.01	0.00	0.00
9.00	0.92	225,355	514.04	0.02	0.01	0.01
9.50	1.31	227,325	514.07	0.04	0.02	0.02
10.00	1.97	230,090	514.13	0.07	0.04	0.04
10.50	3.15	234,388	514.21	0.18	0.09	0.09
11.00	5.29	241,342	514.33	0.34	0.17	0.17
11.50	10.54	254,152	514.57	0.53	0.26	0.26
12.00	**211.67**	**384,217**	**516.73**	**1.34**	**0.67**	**0.67**
12.50	21.20	**461,973**	**517.88**	**25.37**	**12.69**	**12.69**
13.00	12.65	449,240	517.70	19.81	9.90	9.90
13.50	9.58	437,711	517.53	15.15	7.57	7.57
14.00	7.56	428,879	517.40	11.87	5.93	5.93
14.50	6.62	422,279	517.30	9.61	4.81	4.81
15.00	5.98	417,740	517.24	8.14	4.07	4.07
15.50	5.33	414,230	517.18	7.10	3.55	3.55
16.00	4.66	411,251	517.14	6.22	3.11	3.11
16.50	4.32	408,734	517.10	5.54	2.77	2.77
17.00	4.09	406,789	517.07	5.05	2.53	2.53
17.50	3.86	405,217	517.05	4.66	2.33	2.33
18.00	3.62	403,878	517.03	4.32	2.16	2.16
18.50	3.38	402,684	517.01	4.02	2.01	2.01
19.00	3.14	401,566	516.99	3.76	1.88	1.88
19.50	2.90	400,428	516.97	3.54	1.77	1.77
20.00	2.65	399,262	516.96	3.31	1.65	1.65

Summary for Subcatchment DB-1: PROPOSED AREA TO POND

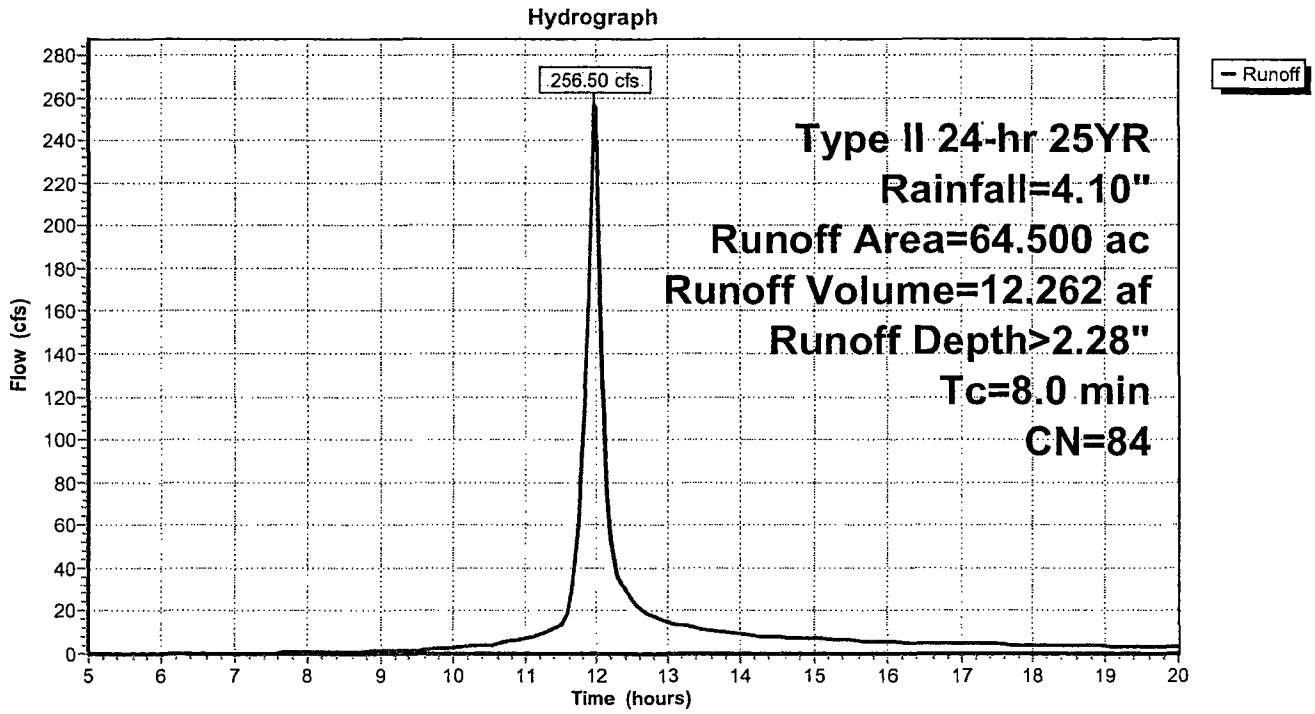
Runoff = 256.50 cfs @ 11.99 hrs, Volume= 12.262 af, Depth> 2.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25YR Rainfall=4.10"

	Area (ac)	CN	Description
	11.547	98	Paved parking & roofs
	26.984	98	Paved parking & roofs
	24.208	61	>75% Grass cover, Good, HSG B
*	1.761	98	
	64.500	84	Weighted Average
	24.208		Pervious Area
	40.292		Impervious Area

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

Subcatchment DB-1: PROPOSED AREA TO POND



Hydrograph for Subcatchment DB-1: PROPOSED AREA TO POND

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.26	0.00	0.00
5.25	0.27	0.00	0.00
5.50	0.29	0.00	0.00
5.75	0.31	0.00	0.00
6.00	0.33	0.00	0.00
6.25	0.35	0.00	0.00
6.50	0.37	0.00	0.00
6.75	0.39	0.00	0.00
7.00	0.41	0.00	0.08
7.25	0.43	0.00	0.20
7.50	0.45	0.00	0.31
7.75	0.47	0.00	0.44
8.00	0.49	0.01	0.56
8.25	0.52	0.01	0.73
8.50	0.54	0.01	0.96
8.75	0.57	0.02	1.22
9.00	0.60	0.02	1.52
9.25	0.64	0.03	1.79
9.50	0.67	0.04	1.99
9.75	0.70	0.05	2.33
10.00	0.74	0.06	2.85
10.25	0.79	0.07	3.52
10.50	0.84	0.09	4.37
10.75	0.89	0.11	5.55
11.00	0.96	0.14	7.10
11.25	1.05	0.17	9.73
11.50	1.16	0.23	13.69
11.75	1.59	0.47	63.05
12.00	2.72	1.29	**255.70**
12.25	2.90	1.43	42.27
12.50	3.01	1.53	25.16
12.75	3.10	1.60	17.81
13.00	3.17	1.65	14.97
13.25	3.22	1.70	12.84
13.50	3.28	1.75	11.31
13.75	3.32	1.78	10.01
14.00	3.36	1.82	8.91
14.25	3.40	1.85	8.18
14.50	3.43	1.88	7.80
14.75	3.47	1.91	7.42
15.00	3.50	1.94	7.04
15.25	3.53	1.96	6.65
15.50	3.56	1.99	6.27
15.75	3.58	2.01	5.88
16.00	3.61	2.03	5.48
16.25	3.63	2.05	5.22
16.50	3.65	2.07	5.08
16.75	3.68	2.09	4.95
17.00	3.70	2.11	4.81
17.25	3.72	2.12	4.67
17.50	3.74	2.14	4.53
17.75	3.76	2.16	4.39
18.00	3.78	2.17	4.25
18.25	3.79	2.19	4.11
18.50	3.81	2.21	3.97
18.75	3.83	2.22	3.83
19.00	3.84	2.23	3.68
19.25	3.86	2.25	3.54
19.50	3.88	2.26	3.40
19.75	3.89	2.27	3.25
20.00	**3.90**	**2.29**	3.11

Summary for Pond P-1: PROPOSED POND

4.05 ACRE-FT REQUIRED AT 110 CFS DISCHARGE

Inflow Area = 64.500 ac, 62.47% Impervious, Inflow Depth > 2.28" for 25YR event
Inflow = 256.50 cfs @ 11.99 hrs, Volume= 12.262 af
Outflow = 46.08 cfs @ 12.23 hrs, Volume= 8.169 af, Atten= 82%, Lag= 14.5 min
Primary = 23.04 cfs @ 12.23 hrs, Volume= 4.085 af
Secondary = 23.04 cfs @ 12.23 hrs, Volume= 4.085 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 514.00' Surf.Area= 53,357 sf Storage= 223,314 cf
Peak Elev= 518.47' @ 12.23 hrs Surf.Area= 71,956 sf Storage= 503,382 cf (280,068 cf above start)

Plug-Flow detention time= 317.6 min calculated for 3.042 af (25% of inflow)
Center-of-Mass det. time= 77.4 min (855.5 - 778.1)

Volume	Invert	Avail.Storage	Storage Description
#1	507.50'	618,351 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

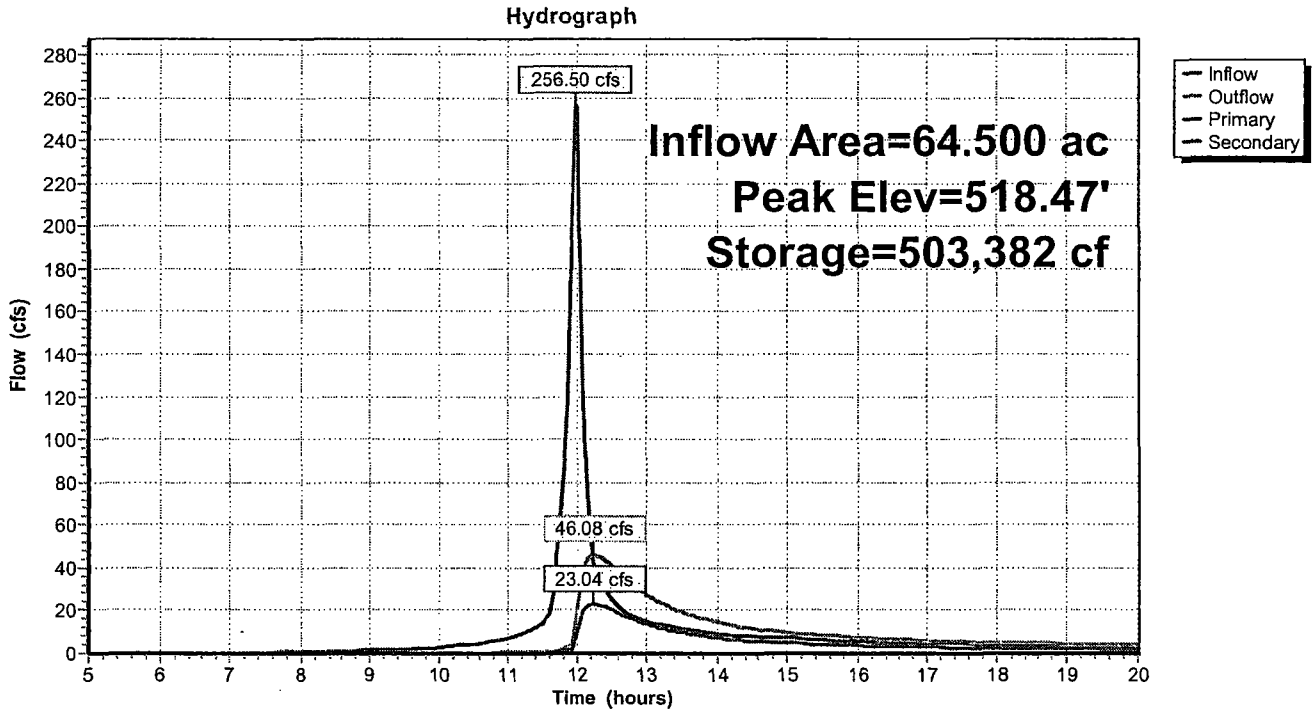
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
507.50	22,560	0	0
512.50	39,045	154,013	154,013
514.00	53,357	69,302	223,314
520.00	78,322	395,037	618,351

Device	Routing	Invert	Outlet Devices
#1	Primary	514.00'	**36.0" x 220.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 512.00' S= 0.0091 '/' Cc= 0.900 n= 0.013
#2	Secondary	514.00'	**36.0" x 100.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 513.00' S= 0.0100 '/' Cc= 0.900 n= 0.013
#3	Device 1	514.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	514.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#6	Device 2	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#7	Device 1	516.75'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 3.25 Width (feet) 3.00 3.00
#8	Device 2	516.75'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 3.25 Width (feet) 3.00 3.00

Primary OutFlow Max=22.99 cfs @ 12.23 hrs HW=518.47' (Free Discharge)
└─**1=Culvert** (Passes 22.99 cfs of 58.63 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.87 cfs @ 9.99 fps)
  ├─**5=Orifice/Grate** (Controls 0.00 cfs)
  └─**7=Custom Weir/Orifice** (Weir Controls 22.12 cfs @ 4.29 fps)

Secondary OutFlow Max=22.99 cfs @ 12.23 hrs HW=518.47' (Free Discharge)
└─**2=Culvert** (Passes 22.99 cfs of 58.63 cfs potential flow)
  ├─**4=Orifice/Grate** (Orifice Controls 0.87 cfs @ 9.99 fps)
  ├─**6=Orifice/Grate** (Controls 0.00 cfs)
  └─**8=Custom Weir/Orifice** (Weir Controls 22.12 cfs @ 4.29 fps)

Pond P-1: PROPOSED POND



Hydrograph for Pond P-1: PROPOSED POND

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	223,314	514.00	0.00	0.00	0.00
5.50	0.00	223,314	514.00	0.00	0.00	0.00
6.00	0.00	223,314	514.00	0.00	0.00	0.00
6.50	0.00	223,314	514.00	0.00	0.00	0.00
7.00	0.08	223,344	514.00	0.00	0.00	0.00
7.50	0.31	223,694	514.01	0.00	0.00	0.00
8.00	0.56	224,467	514.02	0.01	0.01	0.01
8.50	0.96	225,765	514.05	0.03	0.01	0.01
9.00	1.52	227,906	514.09	0.05	0.02	0.02
9.50	1.99	230,991	514.14	0.10	0.05	0.05
10.00	2.85	234,983	514.22	0.19	0.10	0.10
10.50	4.37	240,911	514.33	0.33	0.16	0.16
11.00	7.10	250,278	514.50	0.48	0.24	0.24
11.50	13.69	267,143	514.80	0.67	0.33	0.33
12.00	**255.70**	**427,054**	**517.37**	**11.20**	**5.60**	**5.60**
12.50	25.16	**492,983**	**518.32**	**40.56**	**20.28**	**20.28**
13.00	14.97	466,040	517.94	27.26	13.63	13.63
13.50	11.31	448,054	517.68	19.31	9.66	9.66
14.00	8.91	436,031	517.51	14.49	7.24	7.24
14.50	7.80	427,723	517.38	11.44	5.72	5.72
15.00	7.04	422,249	517.30	9.60	4.80	4.80
15.50	6.27	418,198	517.24	8.27	4.14	4.14
16.00	5.48	414,802	517.19	7.27	3.63	3.63
16.50	5.08	411,946	517.15	6.42	3.21	3.21
17.00	4.81	409,860	517.12	5.83	2.91	2.91
17.50	4.53	408,167	517.09	5.40	2.70	2.70
18.00	4.25	406,689	517.07	5.03	2.51	2.51
18.50	3.97	405,344	517.05	4.69	2.34	2.34
19.00	3.68	404,081	517.03	4.37	2.18	2.18
19.50	3.40	402,867	517.01	4.06	2.03	2.03
20.00	3.11	401,675	516.99	3.79	1.89	1.89

Summary for Subcatchment DB-1: PROPOSED AREA TO POND

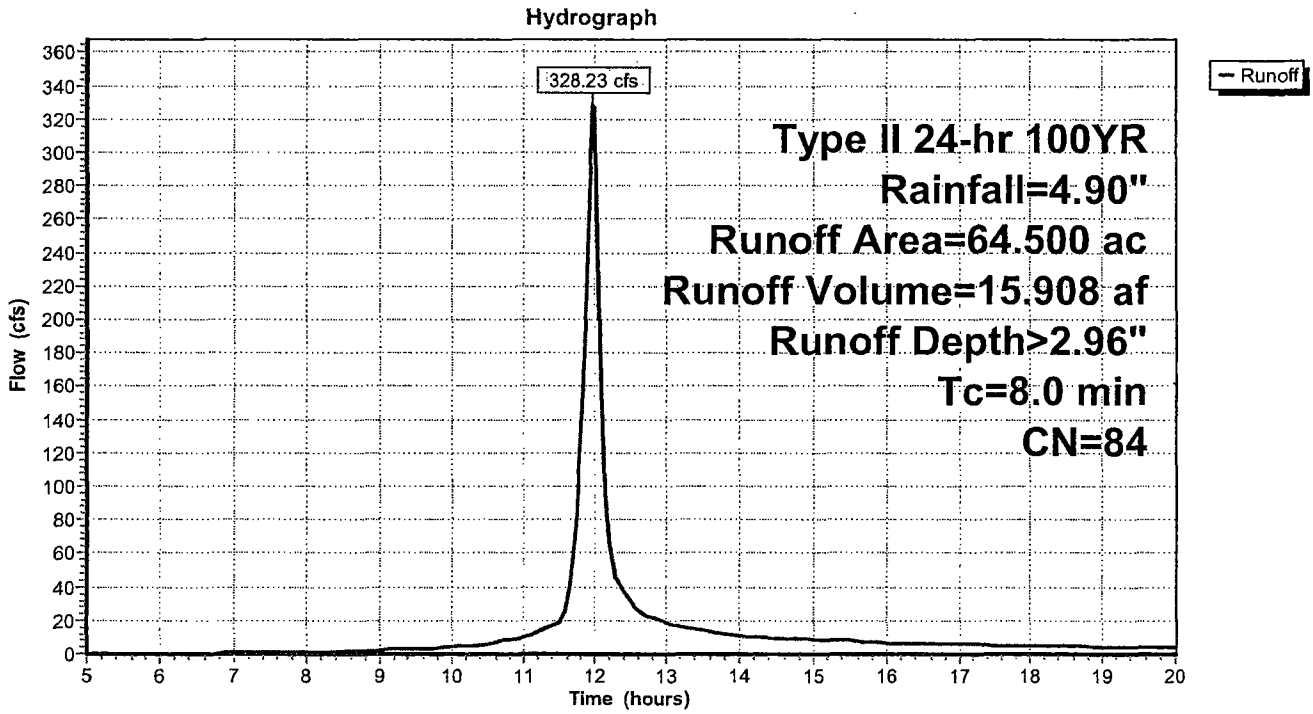
Runoff = 328.23 cfs @ 11.99 hrs, Volume= 15.908 af, Depth> 2.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR Rainfall=4.90"

	Area (ac)	CN	Description
	11.547	98	Paved parking & roofs
	26.984	98	Paved parking & roofs
	24.208	61	>75% Grass cover, Good, HSG B
*	1.761	98	
	64.500	84	Weighted Average
	24.208		Pervious Area
	40.292		Impervious Area

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

Subcatchment DB-1: PROPOSED AREA TO POND



Hydrograph for Subcatchment DB-1: PROPOSED AREA TO POND

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.31	0.00	0.00
5.25	0.33	0.00	0.00
5.50	0.35	0.00	0.00
5.75	0.37	0.00	0.00
6.00	0.39	0.00	0.01
6.25	0.41	0.00	0.13
6.50	0.44	0.00	0.27
6.75	0.46	0.00	0.42
7.00	0.49	0.01	0.57
7.25	0.51	0.01	0.72
7.50	0.54	0.01	0.88
7.75	0.56	0.02	1.05
8.00	0.59	0.02	1.22
8.25	0.62	0.03	1.46
8.50	0.65	0.03	1.80
8.75	0.68	0.04	2.19
9.00	0.72	0.05	2.62
9.25	0.76	0.06	2.98
9.50	0.80	0.08	3.22
9.75	0.84	0.09	3.68
10.00	0.89	0.11	4.40
10.25	0.94	0.13	5.34
10.50	1.00	0.15	6.51
10.75	1.07	0.18	8.11
11.00	1.15	0.22	10.19
11.25	1.25	0.27	13.74
11.50	1.39	0.35	19.00
11.75	1.90	0.67	84.91
12.00	3.25	1.72	**326.89**
12.25	3.46	1.90	53.15
12.50	3.60	2.02	31.50
12.75	3.70	2.11	22.26
13.00	3.78	2.18	18.68
13.25	3.85	2.24	16.00
13.50	3.92	2.30	14.09
13.75	3.97	2.34	12.46
14.00	4.02	2.39	11.08
14.25	4.06	2.43	10.17
14.50	4.10	2.46	9.69
14.75	4.14	2.50	9.21
15.00	4.18	2.53	8.73
15.25	4.22	2.56	8.25
15.50	4.25	2.59	7.77
15.75	4.28	2.62	7.28
16.00	4.31	2.65	6.79
16.25	4.34	2.67	6.46
16.50	4.37	2.70	6.29
16.75	4.39	2.72	6.12
17.00	4.42	2.74	5.95
17.25	4.44	2.77	5.77
17.50	4.47	2.79	5.60
17.75	4.49	2.81	5.43
18.00	4.51	2.83	5.25
18.25	4.53	2.85	5.08
18.50	4.56	2.87	4.90
18.75	4.58	2.88	4.72
19.00	4.59	2.90	4.55
19.25	4.61	2.92	4.37
19.50	4.63	2.94	4.19
19.75	4.65	2.95	4.02
20.00	**4.66**	**2.97**	3.84

Summary for Pond P-1: PROPOSED POND

4.05 ACRE-FT REQUIRED AT 110 CFS DISCHARGE

Inflow Area = 64.500 ac, 62.47% Impervious, Inflow Depth > 2.96" for 100YR event
Inflow = 328.23 cfs @ 11.99 hrs, Volume= 15.908 af
Outflow = 131.04 cfs @ 12.12 hrs, Volume= 11.737 af, Atten= 60%, Lag= 8.0 min
Primary = 65.52 cfs @ 12.12 hrs, Volume= 5.868 af
Secondary = 65.52 cfs @ 12.12 hrs, Volume= 5.868 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 514.00' Surf.Area= 53,357 sf Storage= 223,314 cf
Peak Elev= 519.19' @ 12.12 hrs Surf.Area= 74,969 sf Storage= 556,584 cf (333,270 cf above start)

Plug-Flow detention time= 224.8 min calculated for 6.610 af (42% of inflow)
Center-of-Mass det. time= 63.3 min (835.5 - 772.2)

Volume	Invert	Avail.Storage	Storage Description
#1	507.50'	618,351 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

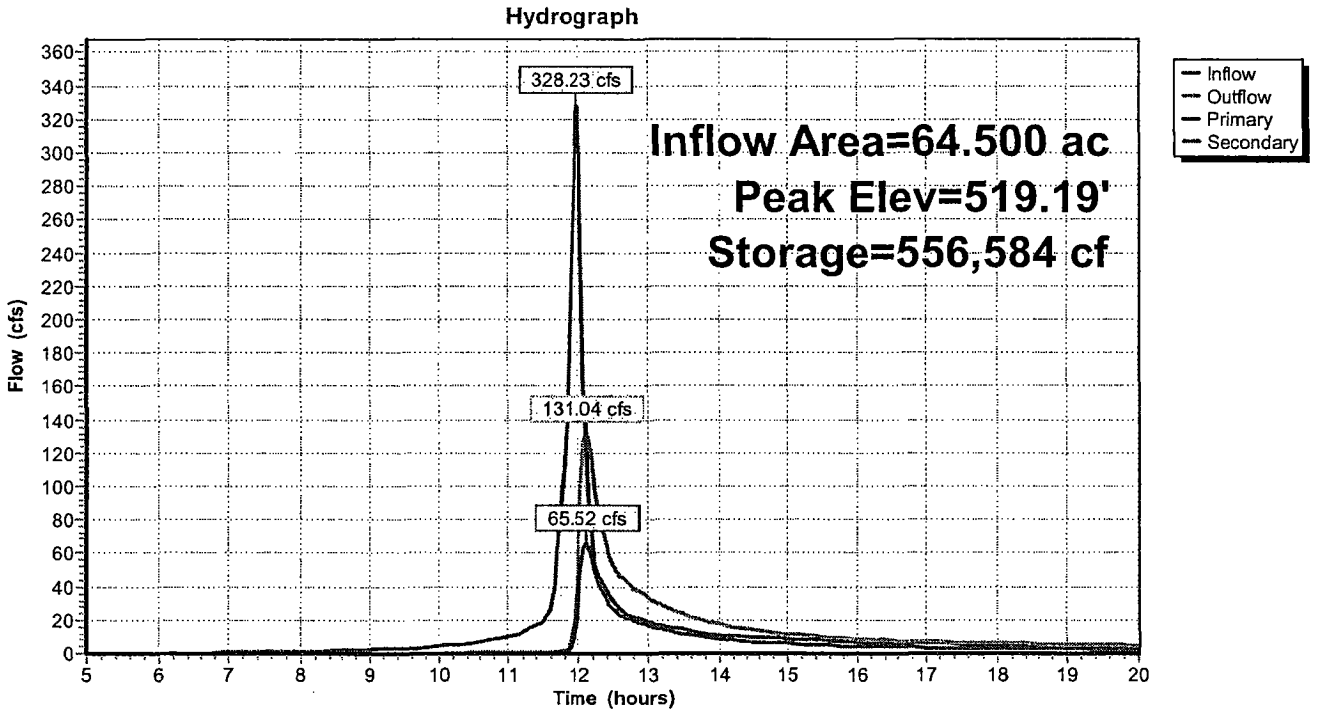
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
507.50	22,560	0	0
512.50	39,045	154,013	154,013
514.00	53,357	69,302	223,314
520.00	78,322	395,037	618,351

Device	Routing	Invert	Outlet Devices
#1	Primary	514.00'	**36.0" x 220.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 512.00' S= 0.0091 '/' Cc= 0.900 n= 0.013
#2	Secondary	514.00'	**36.0" x 100.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 513.00' S= 0.0100 '/' Cc= 0.900 n= 0.013
#3	Device 1	514.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	514.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#6	Device 2	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#7	Device 1	516.75'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 3.25 Width (feet) 3.00 3.00
#8	Device 2	516.75'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 3.25 Width (feet) 3.00 3.00

Primary OutFlow Max=65.15 cfs @ 12.12 hrs HW=519.16' (Free Discharge)
└─**1=Culvert** (Inlet Controls 65.15 cfs @ 9.22 fps)
  ├─**3=Orifice/Grate** (Passes < 0.94 cfs potential flow)
  ├─**5=Orifice/Grate** (Passes < 27.77 cfs potential flow)
  └─**7=Custom Weir/Orifice** (Passes < 36.84 cfs potential flow)

Secondary OutFlow Max=65.15 cfs @ 12.12 hrs HW=519.16' (Free Discharge)
└─**2=Culvert** (Inlet Controls 65.15 cfs @ 9.22 fps)
  ├─**4=Orifice/Grate** (Passes < 0.94 cfs potential flow)
  ├─**6=Orifice/Grate** (Passes < 27.77 cfs potential flow)
  └─**8=Custom Weir/Orifice** (Passes < 36.84 cfs potential flow)

Pond P-1: PROPOSED POND



Hydrograph for Pond P-1: PROPOSED POND

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	223,314	514.00	0.00	0.00	0.00
5.50	0.00	223,314	514.00	0.00	0.00	0.00
6.00	0.01	223,316	514.00	0.00	0.00	0.00
6.50	0.27	223,559	514.00	0.00	0.00	0.00
7.00	0.57	224,301	514.02	0.01	0.01	0.01
7.50	0.88	225,574	514.04	0.02	0.01	0.01
8.00	1.22	227,406	514.08	0.04	0.02	0.02
8.50	1.80	229,966	514.12	0.07	0.04	0.04
9.00	2.62	233,713	514.19	0.16	0.08	0.08
9.50	3.22	238,644	514.28	0.28	0.14	0.14
10.00	4.40	244,734	514.40	0.40	0.20	0.20
10.50	6.51	253,582	514.56	0.52	0.26	0.26
11.00	10.19	267,246	514.80	0.67	0.33	0.33
11.50	19.00	291,095	515.21	0.86	0.43	0.43
12.00	**326.89**	**495,389**	**518.36**	**41.81**	**20.91**	**20.91**
12.50	31.50	**511,276**	**518.58**	**53.27**	**26.64**	**26.64**
13.00	18.68	478,483	518.12	33.20	16.60	16.60
13.50	14.09	457,425	517.82	23.35	11.67	11.67
14.00	11.08	443,594	517.62	17.46	8.73	8.73
14.50	9.69	434,166	517.48	13.79	6.90	6.90
15.00	8.73	428,049	517.39	11.56	5.78	5.78
15.50	7.77	423,535	517.32	10.03	5.02	5.02
16.00	6.79	419,742	517.27	8.77	4.39	4.39
16.50	6.29	416,576	517.22	7.79	3.90	3.90
17.00	5.95	414,217	517.18	7.10	3.55	3.55
17.50	5.60	412,351	517.15	6.54	3.27	3.27
18.00	5.25	410,770	517.13	6.08	3.04	3.04
18.50	4.90	409,327	517.11	5.69	2.85	2.85
19.00	4.55	407,906	517.09	5.34	2.67	2.67
19.50	4.19	406,493	517.07	4.98	2.49	2.49
20.00	3.84	405,082	517.04	4.62	2.31	2.31

Appendix C

Water Quality Volume/Channel Protection Volume

Summary for Pond P-1: PROPOSED POND

4.05 ACRE-FT REQUIRED AT 110 CFS DISCHARGE

Inflow Area =	64.500 ac,	62.47% Impervious,	Inflow Depth =	0.89" for 1YR event
Inflow =	93.67 cfs @	12.00 hrs, Volume=	4.776 af	
Outflow =	1.31 cfs @	20.87 hrs, Volume=	4.767 af,	Atten= 99%, Lag= 532.4 min
Primary =	0.66 cfs @	20.87 hrs, Volume=	2.384 af	
Secondary =	0.66 cfs @	20.87 hrs, Volume=	2.384 af	

Routing by Stor-Ind method, Time Span= 5.00-160.00 hrs, dt= 0.05 hrs
Starting Elev= 514.00' Surf.Area= 53,357 sf Storage= 223,314 cf
Peak Elev= 516.60' @ 20.87 hrs Surf.Area= 64,189 sf Storage= 376,312 cf (152,998 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 1,520.2 min (2,366.9 - 846.7)

Volume	Invert	Avail.Storage	Storage Description
#1	507.50'	618,351 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

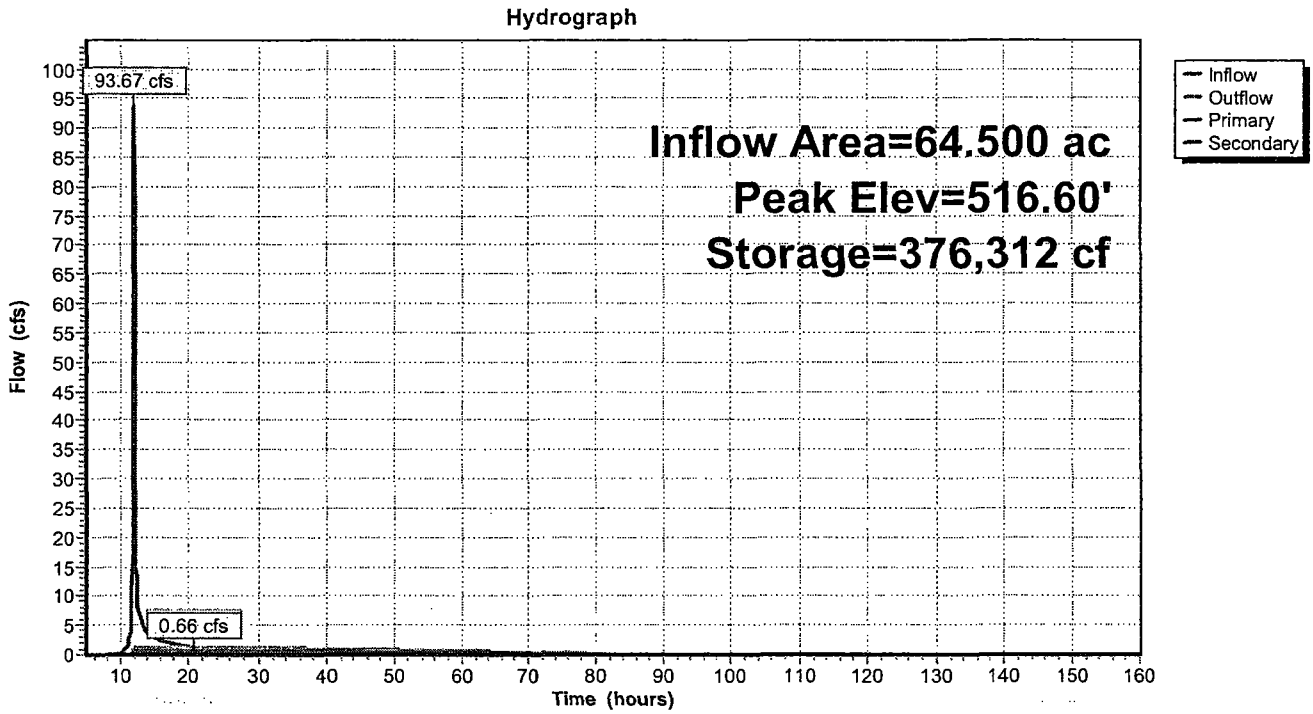
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
507.50	22,560	0	0
512.50	39,045	154,013	154,013
514.00	53,357	69,302	223,314
520.00	78,322	395,037	618,351

Device	Routing	Invert	Outlet Devices
#1	Primary	514.00'	**36.0" x 100.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 513.00' S= 0.0100 '/' Cc= 0.900 n= 0.013
#2	Secondary	514.00'	**36.0" x 100.0' long Culvert** CMP, end-section conforming to fill, Ke= 0.500 Outlet Invert= 513.00' S= 0.0100 '/' Cc= 0.900 n= 0.013
#3	Device 1	514.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	514.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#6	Device 2	518.50'	**60.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600
#7	Device 1	516.75'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 3.25 Width (feet) 3.00 3.00
#8	Device 2	516.75'	**Custom Weir/Orifice, C= 2.62** Head (feet) 0.00 3.25 Width (feet) 3.00 3.00

Primary OutFlow Max=0.66 cfs @ 20.87 hrs HW=516.60' (Free Discharge)
└─**1=Culvert** (Passes 0.66 cfs of 34.65 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.66 cfs @ 7.52 fps)
  ├─**5=Orifice/Grate** (Controls 0.00 cfs)
  └─**7=Custom Weir/Orifice** (Controls 0.00 cfs)

Secondary OutFlow Max=0.66 cfs @ 20.87 hrs HW=516.60' (Free Discharge)
└─**2=Culvert** (Passes 0.66 cfs of 34.65 cfs potential flow)
  ├─**4=Orifice/Grate** (Orifice Controls 0.66 cfs @ 7.52 fps)
  ├─**6=Orifice/Grate** (Controls 0.00 cfs)
  └─**8=Custom Weir/Orifice** (Controls 0.00 cfs)

Pond P-1: PROPOSED POND



Hydrograph for Pond P-1: PROPOSED POND

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	223,314	514.00	0.00	0.00	0.00
10.00	**0.04**	223,323	514.00	0.00	0.00	0.00
15.00	**3.02**	363,012	516.39	1.25	0.63	0.63
20.00	1.38	**376,249**	**516.60**	**1.31**	**0.66**	**0.66**
25.00	0.00	**371,365**	**516.53**	**1.29**	**0.65**	**0.65**
30.00	0.00	349,036	516.17	1.19	0.59	0.59
35.00	0.00	328,539	515.84	1.09	0.54	0.54
40.00	0.00	309,919	515.53	0.98	0.49	0.49
45.00	0.00	293,214	515.25	0.87	0.44	0.44
50.00	0.00	278,464	514.99	0.76	0.38	0.38
55.00	0.00	265,707	514.77	0.65	0.33	0.33
60.00	0.00	254,973	514.58	0.54	0.27	0.27
65.00	0.00	246,304	514.42	0.42	0.21	0.21
70.00	0.00	239,751	514.30	0.30	0.15	0.15
75.00	0.00	235,252	514.22	0.20	0.10	0.10
80.00	0.00	232,328	514.17	0.13	0.06	0.06
85.00	0.00	230,452	514.13	0.08	0.04	0.04
90.00	0.00	229,184	514.11	0.06	0.03	0.03
95.00	0.00	228,152	514.09	0.05	0.03	0.03
100.00	0.00	227,302	514.07	0.04	0.02	0.02
105.00	0.00	226,601	514.06	0.04	0.02	0.02
110.00	0.00	226,024	514.05	0.03	0.01	0.01
115.00	0.00	225,547	514.04	0.02	0.01	0.01
120.00	0.00	225,155	514.03	0.02	0.01	0.01
125.00	0.00	224,831	514.03	0.02	0.01	0.01
130.00	0.00	224,565	514.02	0.01	0.01	0.01
135.00	0.00	224,345	514.02	0.01	0.01	0.01
140.00	0.00	224,164	514.02	0.01	0.00	0.00
145.00	0.00	224,014	514.01	0.01	0.00	0.00
150.00	0.00	223,891	514.01	0.01	0.00	0.00
155.00	0.00	223,790	514.01	0.01	0.00	0.00
160.00	0.00	223,706	514.01	0.00	0.00	0.00

BERGMANN associates

Project:

Project No. 7594
Date: 6/26/2008
By: JWL
Checked:
Sheet: 1 of 1

TITLE: **WATER QUALITY STORAGE VOLUME**

Water Quality Volume

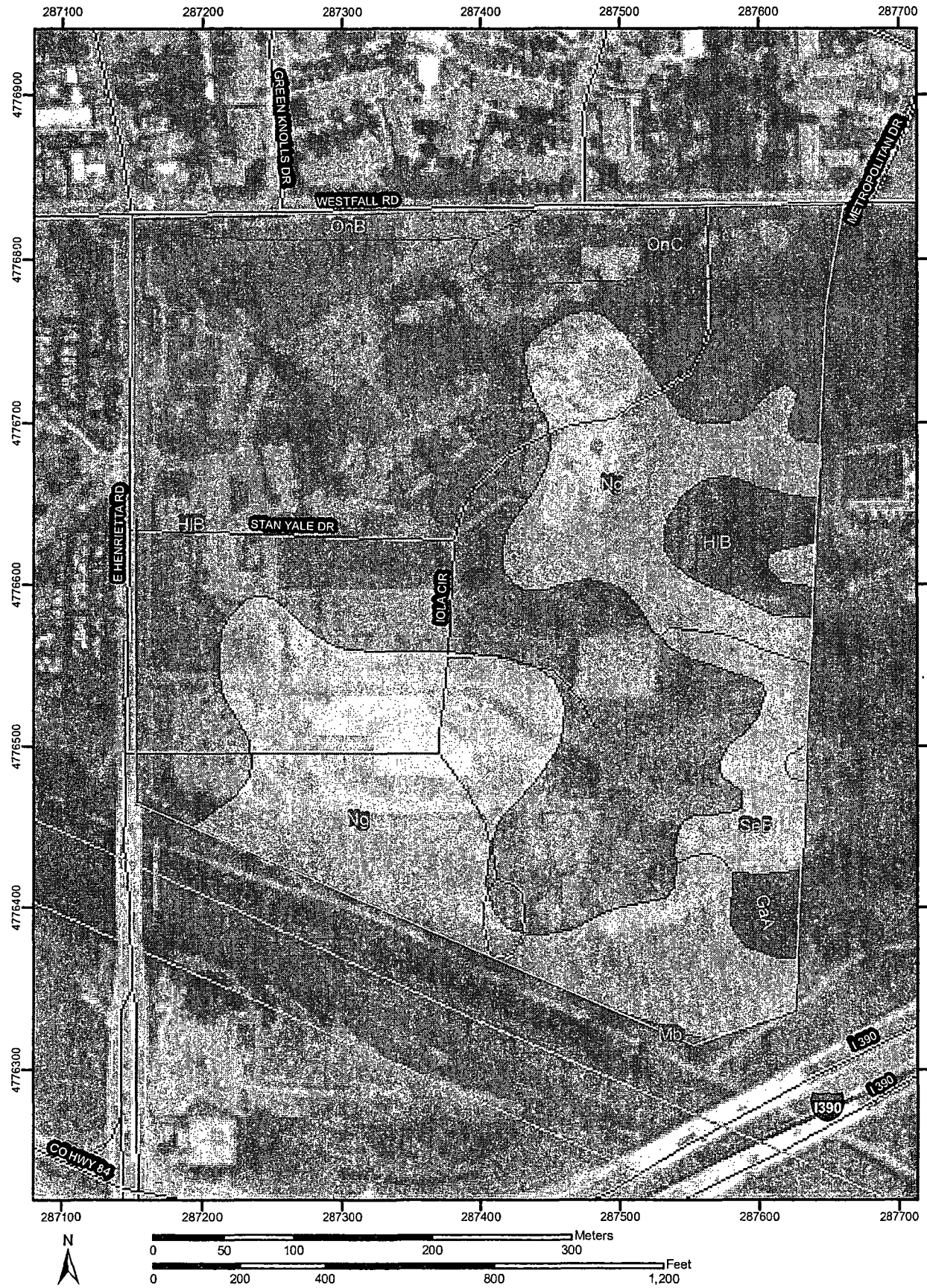
DESCRIPTION:
Total Water Quality Volume Required

Formula for calculating the Water Quality storage volume (WQv) = $\frac{(P)(Rv)(A)}{12}$

P = 90% Rainfall Event =	1.00
I = percent Impervious Cover =	62
Rv = 0.05 + 0.009(I) =	0.61
A = Acres =	64.51
Water Quality Storage Volume (acre-feet) =	3.27
	142,376 Cubic-Feet

Appendix D

Soils Map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4776300
GREEN KNOLLS DR
WESTFALL RD
METROPOLITAN DR
OnB
OnC
Ng
HIB
STAN YALE DR
E HENRIETTA RD
OTA CIR
SeF
CaA
Mb
I 390
CO HWY 64
N
Meters
0 50 100 200 300
Feet
0 200 400 800 1,200

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Soil Ratings
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Political Features

Municipalities
- Cities
- Urban Areas

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails

Roads
- Interstate Highways
- US Routes
- State Highways
- Local Roads
- Other Roads

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Monroe County, New York
Survey Area Data: Version 7, Aug 24, 2007

Date(s) aerial images were photographed: 4/22/1994

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Monroe County, New York				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
GaA	Galen very fine sandy loam, 0 to 2 percent slopes	B	0.7	1.1%
HlB	Hilton loam, 3 to 8 percent slopes	B	35.1	54.8%
Mb	Made land	D	0.1	0.1%
Ng	Niagara silt loam	C	21.2	33.1%
OnB	Ontario loam, 3 to 8 percent slopes	B	1.1	1.8%
OnC	Ontario loam, 8 to 15 percent slopes	B	3.4	5.3%
SeB	Schoharie silt loam, 2 to 6 percent slopes	C	2.4	3.8%
Totals for Area of Interest (AOI)			64.0	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower