Stormwater Management Plan

Lexington Apartments
St. Paul, MN

Prepared by Loucks
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Loucks Project No. 19114.0A

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St. Paul, Minnesota

Stormwater Management Plan

Introduction

This stormwater management plan was created for the Lexington Mixed-Use project located 411 & 417 Lexington Parkway North in St. Paul, Minnesota. The total project area encompasses 2.2 +/- acres.

The project generally consists of constructing an apartment building, with retail on the first floor, below ground parking and stormwater management systems.

Included in this plan are calculations for the proposed discharges of stormwater from each property area. The stormwater for all of the project area ultimately discharges to storm sewer in Lexington Parkway. A larger drainage area is analyzed based on the existing overall stormwater system in the shared road.

Requirements and Methodology

City of St. Paul and Capitol Region Watershed District Requirements

1. Rate Control – Peak rates shall not exceed 1.64 cubic feet per second per acre.
   – Runoff rates for the proposed activity shall not exceed existing runoff rates for the 2, 10, and 100-year critical storm events.

2. Volume Control – Stormwater runoff volume retention shall be achieved onsite in the amount equivalent to the runoff generated from 1.1-inch rainfall over the impervious surfaces of the development. The required stormwater runoff volume reduction shall be calculated as follows:

   Required Volume (ft^3) = Impervious Surfaces (ft^2) * 1.1 (in) * 1/12 (ft/in)

Methodology

The stormwater calculations were made utilizing the stormwater-modeling program HydroCAD 10.00. Calculations were performed for the Type II 24-hour 100-year rainfall events of 5.90 inches to meet the city of St. Paul requirements and ATLAS 14 2-year, 10-year, and 100-year rainfall events of 2.81 inches, 4.19 inches, and 7.36 inches respectively to meet the watershed requirements.

Existing Conditions

The existing site is currently vacant with the shared private roads on the north and west side of the site. There are currently two vaults in the shared private roads that treat stormwater. Infiltration is was a part of design but not utilized since infiltration was not required at the time of original design. The original design was recreated using the previous hydrology report and

current storm events. The existing stormwater treatment system does account for the north half of the proposed lot being to the requirements at that time.
The As-built model was created based on the survey, noting that the survey says the weir wall was never installed on the ultimate outlet from the system.

Proposed Conditions

The proposed plan will have two main drainage areas and two runoff drainage areas. The two main areas are the proposed building roof that will drain to an underground 8-foot pipe system. The storm vault will provide infiltration of the storm water to assist in meeting the watershed requirement of 1.1 inches of rainfall over new impervious area, as well as rate control to the larger vault system. The remainder of the infiltration will come from adjusting outlets within the existing vault system to utilize infiltration. Outlying areas will drain off site to the streets or into drainage areas that are captured in the existing vault system. To accommodate our proposed building, we will need to make modifications to the existing storm vault in terms of outlet control structures only. We will be adjusting the outlet and overflow elevations of the two existing structures to meet infiltration and rate control needs. It is noted on the survey that the ultimate outlet control structure for the system was never constructed, just a manhole that allows it to free flow off site. This will be rectified with the replacement of the structure.
The site consists of 1.67 acres of disturbed impervious surface within the site including disturbed existing roadway. There is an additional 0.2 acres of replaced and disturbed impervious outside the site boundary.
Modeling was done with the as-built storm, as that is what is in place with great effort to meet original design rates and high water level elevations.

Rate Control
The rate control requirements are that peak rates shall not exceed existing rates for the 2, 10, and 100-year events or 1.64 cfs/acre for the St. Paul 100-year event, whichever is less. Rate control is not required for the central drainage area. City streets will only be held to water quality standards, not rate control.

City rate control for the current site is achieved but hard to quantify as the larger area goes to the same system. The building is less and can be quantified because it goes to its own treatment system. Direct off is offset by reducing the total offsite. There are three direct off areas with impervious that would affect the rate control. The south and east are their own areas and can be quantified, the north direct to street is quantified by the change in rate from the existing to proposed for the drainage area to determine how much is increases by the site improvements. The existing conditions took into account a possible future development on the north side of our site with runoff to the north with rate control, the proposed condition, reduces the runoff to the north, see table 1.1 below. Table 1.2 shows the reduction of the remainder of the site, through reduction of the overall from the existing system as the system is reduced by more than just from our site through additional infiltration and outlet alterations. The existing systems reduced rates, including almost half of the proposed site already, making the north half of the site doubly reduced.

Table 1.1 – City Rate Off Site North

Street Rates (not to meet City 5.9")	Existing Runoff CFS	Proposed Runoff CFS	Different from Proposed
SE.LEX	0.84	0.79	-0.05
SW.LEX	2.51	2.48	-0.03

Table 1.2 – City Rate Off Site Total Remainder

Site (to meet City 5.9")	Drainage Area	Proposed Runoff	Allowed Runoff
SE.LP	0.035	0.19	0.06
E.LP	0.051	0.4	0.1
PROP	1.377	2.27	2.24
Total Site	1.463	**2.86**	**2.4**
LEX. Existing		26.79	
LEX. Proposed		25.25	
Difference		6.79-5.25 = 1.54	
Total Runoff		**2.86-1.54 =1.32**	**2.4**

Tables 1.3-1.5 below compare the existing peak runoff rate, and proposed peak runoff rates.

Table 1.3 – Peak Runoff Rates, Existing Design

	Area	2-Yr Storm Event		10-Yr Storm Event		5.9" Storm Event		100-Yr Storm Event	
Drainage Area	(Ac.)	Rate (cfs)	Volume (ac.ft.)	Rate (cfs)	Volume (ac.ft.)	Rate (cfs)	Volume (ac.ft.)	Rate (cfs)	Volume (ac.ft.)
E.HOU	0.01	0.01	0	**0.02**	0.001	0.05	0.002	**0.07**	0.003
EXSO	0.89	0.42	0.043	1.16	0.105	2.26	0.197	3.29	0.284
108"	1.05	0.68	0.134	0.93	0.23	1.41	0.36	7.22	0.475
SYS	7.46	6.33	1.157	8.46	1.926	30.29	2.917	48.33	3.782
TOTAL TO LEXINGTON	**8.36**	**6.75**	**1.201**	**9.6**	**2.032**	**32.08**	**3.116**	**50.14**	**4.069**

Table 1.4 – Peak Runoff Rates, Existing As-Built

Drainage Area	Area (Ac.)	2-Yr Storm Event Rate (cfs)	2-Yr Storm Event Volume (ac.ft.)	10-Yr Storm Event Rate (cfs)	10-Yr Storm Event Volume (ac.ft.)	5.9" Storm Event Rate (cfs)	5.9" Storm Event Volume (ac.ft.)	100-Yr Storm Event Rate (cfs)	100-Yr Storm Event Volume (ac.ft.)
E.HOU	0.01	0.01	0	**0.02**	0.001	0.05	0.002	**0.07**	0.003
EXSO	0.89	0.42	0.043	1.16	0.105	2.26	0.197	3.29	0.284
108"	1.05	0.68	0.125	0.94	0.221	2.1	0.35	6.9	0.466
SYS	7.46	6.08	1.179	7.83	1.948	24.67	2.938	40.2	3.803
TOTAL TO LEXINGTON	**8.36**	**6.5**	**1.223**	**8.96**	**2.054**	**26.79**	**3.138**	**40.22**	**4.09**

Table 1.5 – Peak Runoff Rates, Proposed As-Built

Drainage Area	Area (Ac.)	2-Yr Storm Event Rate (cfs)	2-Yr Storm Event Volume (ac.ft.)	10-Yr Storm Event Rate (cfs)	10-Yr Storm Event Volume (ac.ft.)	5.9" Storm Event Rate (cfs)	5.9" Storm Event Volume (ac.ft.)	100-Yr Storm Event Rate (cfs)	100-Yr Storm Event Volume (ac.ft.)
E.LP	0.051	0.15	0.007	0.26	0.012	0.4	0.019	0.52	0.024
SE.LP	0.035	0.04	0.002	0.1	0.004	0.19	0.008	0.27	0.012
PROP	1.377	1.02	0.142	1.6	0.29	2.27	0.48	8.48	0.645
108"	2.427	2.07	0.257	3.15	0.501	4.29	0.82	11.82	1.084
SYS	8.261	6.44	1.113	8.22	1.961	25.1	3.058	39.44	4
TOTAL TO LEXINGTON	**8.35**	**6.47**	**1.122**	**8.26**	**1.978**	**25.23**	**3.085**	**39.64**	**4.036**

Water Quality

To provide additional water quality, infiltration will be provided.

Based on the soil boring logs an infiltration type design is proposed to treat the stormwater runoff. The boring within the new proposed pipe system area shows SP type soils at the bottom of the system. The previous model used 0.25 in/hr for the larger existing system and none for the 108-inch pipe system, with the outlets at the bottom. As-built survey shows outlet elevations higher for the 108-inch system and no outlet control for the larger system. We are proposing raising the outlet and continuing to use the 0.25 in/hr for all existing even though borings show that at least 0.45 in/hr is practical for this area.

The proposed underground stormwater tank system is designed to meet the Capitol Region Watershed districts requirement of retaining 1.1 inch of rainfall over the impervious surfaces of the development with a maximum drawdown time of 48 hours. The calculations for the required volumes are shown below:

Required Volume (ft^3) = Impervious Surfaces (ft^2) * 1.1 (in) * 1/12 (ft/in)
= 1.87 x 1.1 x 1/12 = 0.1714 AC-FT or 7,467 CF

Volume below outlets:
SYS (881.35): 0.082 AC-FT
108" (881.5): 0.017 AC-FT
PROP (883.5): 0.091 AC-FT

The proposed volume under the outlets is = 0.190 AC-FT or 8,276 CF which is greater than required volume.

Best Management Practices

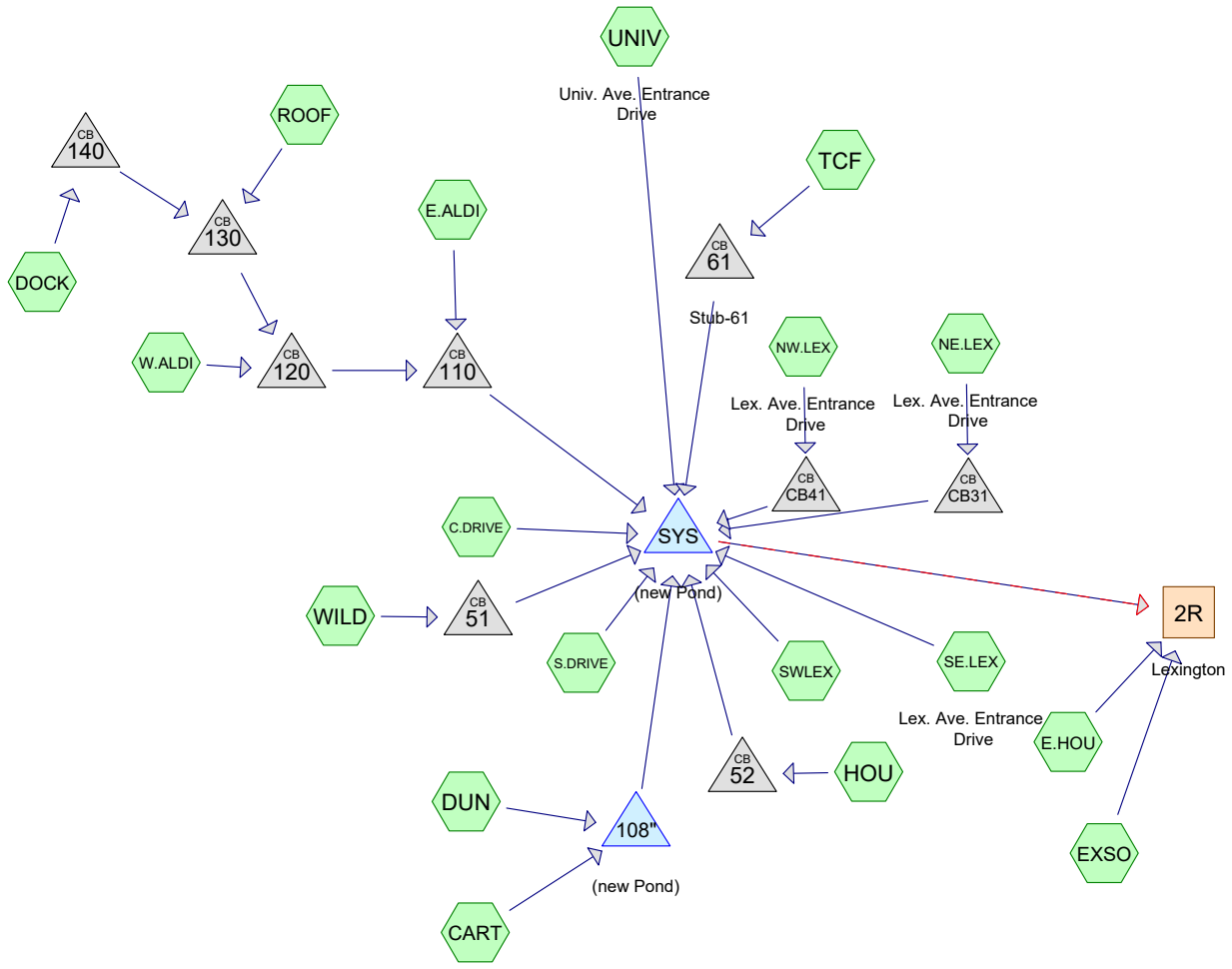
Best management practices (BMP's) will be implemented during construction per the project's stormwater pollution prevention plan. During construction, erosion control measures will include dust control, silt fencing, and a temporary rock construction entrance. Permanent BMP's will include stormwater management systems, surface pavements, and turf establishment (vegetation) of disturbed areas.

Conclusion

The proposed Stormwater Management Plan for the Lexington Apartment project provides an improved solution for the conveyance of stormwater on this site. The infiltration system will capture runoff and provide additional rate control and water quality on the site.

Appendix A

HydroCAD Report, Existing



Subcat Reach Pond Link

Routing Diagram for 19114-overall ex

Prepared by {enter your company name here}, Printed 12/9/2020

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.316	98	(C.DRIVE, CART, DOCK, DUN, E.ALDI, EXSO, HOU, NE.LEX, S.DRIVE, SWLEX, W.ALDI, WILD)
2.414	69	(C.DRIVE, CART, DOCK, DUN, E.ALDI, E.HOU, EXSO, HOU, S.DRIVE, SWLEX, W.ALDI, WILD)
0.110	85	(WILD)
0.190	69	50-75% Grass cover, Fair, HSG B (NE.LEX, NW.LEX, SE.LEX, TCF, UNIV)
0.110	98	Paved parking, HSG B (NW.LEX)
0.540	98	Paved parking, HSG C (TCF)
0.250	96	ROADWAY (UNIV)
0.350	98	ROOF (ROOF)
0.080	98	Water Surface, HSG B (SE.LEX)

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	CART	0.00	0.00	172.0	0.0100	0.013	0.0	12.0	0.0
2	DUN	0.00	0.00	166.0	0.0200	0.013	0.0	12.0	0.0
3	WILD	0.00	0.00	159.0	0.0100	0.013	0.0	12.0	0.0
4	WILD	0.00	0.00	126.0	0.0100	0.013	0.0	15.0	0.0
5	WILD	0.00	0.00	54.0	0.0055	0.013	0.0	18.0	0.0
6	51	884.05	884.00	10.0	0.0050	0.013	0.0	18.0	0.0
7	52	884.05	884.00	10.0	0.0050	0.013	0.0	15.0	0.0
8	61	884.11	884.00	22.0	0.0050	0.013	0.0	12.0	0.0
9	108"	881.00	881.00	11.0	0.0000	0.013	0.0	24.0	0.0
10	110	885.11	884.00	86.0	0.0129	0.013	0.0	15.0	0.0
11	120	885.90	885.11	132.0	0.0060	0.013	0.0	15.0	0.0
12	130	886.78	886.10	68.0	0.0100	0.013	0.0	12.0	0.0
13	140	887.11	886.78	108.0	0.0031	0.013	0.0	12.0	0.0
14	CB31	884.23	884.00	23.0	0.0100	0.013	0.0	12.0	0.0
15	CB41	884.19	884.00	19.0	0.0100	0.013	0.0	12.0	0.0
16	SYS	879.31	878.81	50.0	0.0100	0.013	0.0	24.0	0.0

Summary for Subcatchment C.DRIVE:

Runoff = 0.51 cfs @ 12.10 hrs, Volume= 0.025 af, Depth= 2.15"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.110	98	
*	0.030	69	
	0.140	92	Weighted Average
	0.030	69	21.43% Pervious Area
	0.110	98	78.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	13	0.0200	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.1	5	0.0200	0.71		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	34	0.0170	0.97		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.2	36	0.0195	2.83		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.9	88	Total			

Summary for Subcatchment CART:

Runoff = 1.27 cfs @ 12.23 hrs, Volume= 0.093 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.340	98	
*	0.420	69	
	0.760	82	Weighted Average
	0.420	69	55.26% Pervious Area
	0.340	98	44.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	156	0.0615	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.3	93	0.1150	5.09		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.6	172	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.8	421	Total			

Summary for Subcatchment DOCK:

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 0.013 af, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.060	98	
*	0.010	69	
	0.070	94	Weighted Average
	0.010	69	14.29% Pervious Area
	0.060	98	85.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	85	0.0400	1.65		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.0	98	Total			

Summary for Subcatchment DUN:

Runoff = 0.64 cfs @ 12.22 hrs, Volume= 0.046 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.190	98	
*	0.100	69	
	0.290	88	Weighted Average
	0.100	69	34.48% Pervious Area
	0.190	98	65.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	150	0.0700	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	137	0.0310	2.64		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	166	0.0200	6.42	5.04	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.1	453	Total			

Summary for Subcatchment E.ALDI:

Runoff = 1.32 cfs @ 12.23 hrs, Volume= 0.097 af, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.420	98	
*	0.150	69	
	0.570	90	Weighted Average
	0.150	69	26.32% Pervious Area
	0.420	98	73.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	115	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	100	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
15.2	215	Total			

Summary for Subcatchment E.HOU:

Runoff = 0.01 cfs @ 12.16 hrs, Volume= 0.000 af, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.000	98	
*	0.010	69	
	0.010	69	Weighted Average
	0.010	69	100.00% Pervious Area

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

Summary for Subcatchment EXSO:

Runoff = 0.42 cfs @ 12.43 hrs, Volume= 0.043 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.006	98	
*	0.884	69	
	0.890	69	Weighted Average
	0.884	69	99.33% Pervious Area
	0.006	98	0.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.1	240	0.0300	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"

Summary for Subcatchment HOU:

Runoff = 2.60 cfs @ 12.14 hrs, Volume= 0.144 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.650	98	
*	0.080	69	
	0.730	95	Weighted Average
	0.080	69	10.96% Pervious Area
	0.650	98	89.04% Impervious Area

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

Summary for Subcatchment NE.LEX: Lex. Ave. Entrance Drive

Runoff = 0.26 cfs @ 12.07 hrs, Volume= 0.012 af, Depth= 1.83"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.050	98	
	0.030	69	50-75% Grass cover, Fair, HSG B
	0.080	87	Weighted Average
	0.030	69	37.50% Pervious Area
	0.050	98	62.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	12	0.2500	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.5	36	0.0240	1.13		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.5	48	Total			

Summary for Subcatchment NW.LEX: Lex. Ave. Entrance Drive

Runoff = 0.52 cfs @ 12.06 hrs, Volume= 0.024 af, Depth= 2.41"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

Area (ac)	CN	Description
0.010	69	50-75% Grass cover, Fair, HSG B
0.110	98	Paved parking, HSG B
0.120	96	Weighted Average
0.010	69	8.33% Pervious Area
0.110	98	91.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	33	0.0215	1.06		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	27	0.0108	0.78		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.1	60	Total			

Summary for Subcatchment ROOF:

Runoff = 1.62 cfs @ 12.06 hrs, Volume= 0.075 af, Depth= 2.58"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.350	98	ROOF
	0.350	98	100.00% Impervious Area

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

Summary for Subcatchment S.DRIVE:

Runoff = 0.65 cfs @ 12.10 hrs, Volume= 0.031 af, Depth= 1.88"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

Area (ac)	CN	Description
* 0.130	98	
* 0.070	69	
0.200	88	Weighted Average
0.070	69	35.00% Pervious Area
0.130	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	19	0.0520	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.2	7	0.0200	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	28	0.0370	1.28		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.1	18	0.0295	3.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.5	72	Total			

Summary for Subcatchment SE.LEX: Lex. Ave. Entrance Drive

Runoff = 0.34 cfs @ 12.14 hrs, Volume= 0.019 af, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

Area (ac)	CN	Description
0.040	69	50-75% Grass cover, Fair, HSG B
0.080	98	Water Surface, HSG B
0.120	88	Weighted Average
0.040	69	33.33% Pervious Area
0.080	98	66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	43	0.0280	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.4	33	0.0333	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
7.2	76	Total			

Summary for Subcatchment SWLEX:

Runoff = 0.98 cfs @ 12.10 hrs, Volume= 0.047 af, Depth= 1.73"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.190	98	
*	0.140	69	
	0.330	86	Weighted Average
	0.140	69	42.42% Pervious Area
	0.190	98	57.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	11	0.0150	0.06		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	48	0.0225	1.17		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.6	59	Total			

Summary for Subcatchment TCF:

Runoff = 2.14 cfs @ 12.14 hrs, Volume= 0.118 af, Depth= 2.44"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

Area (ac)	CN	Description
0.540	98	Paved parking, HSG C
0.040	69	50-75% Grass cover, Fair, HSG B
0.580	96	Weighted Average
0.040	69	6.90% Pervious Area
0.540	98	93.10% Impervious Area

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

Summary for Subcatchment UNIV: Univ. Ave. Entrance Drive

Runoff = 1.10 cfs @ 12.10 hrs, Volume= 0.048 af, Depth= 1.81"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.250	96	ROADWAY
	0.070	69	50-75% Grass cover, Fair, HSG B
	0.320	90	Weighted Average
	0.320	90	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	15	0.0500	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.3	130	0.0307	1.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	50	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.0	195	Total			

Summary for Subcatchment W.ALDI:

Runoff = 1.91 cfs @ 12.09 hrs, Volume= 0.093 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.420	98	
*	0.050	69	
	0.470	95	Weighted Average
	0.050	69	10.64% Pervious Area
	0.420	98	89.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.4	105	0.0187	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.5	118	Total			

Summary for Subcatchment WILD:

Runoff = 5.78 cfs @ 12.22 hrs, Volume= 0.410 af, Depth= 2.11"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	1.750	98	
*	0.470	69	
*	0.110	85	
	2.330	92	Weighted Average
	0.580	72	24.89% Pervious Area
	1.750	98	75.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	58	0.0100	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.6	159	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.4	126	0.0100	5.26	6.46	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.2	54	0.0055	4.41	7.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
14.2	397	Total			

Summary for Reach 2R: Lexington

Inflow Area = 8.360 ac, 64.55% Impervious, Inflow Depth = 1.72" for 2-Year event
Inflow = 6.75 cfs @ 12.43 hrs, Volume= 1.201 af
Outflow = 6.75 cfs @ 12.43 hrs, Volume= 1.201 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Pond 51:

Inflow Area = 2.330 ac, 75.11% Impervious, Inflow Depth = 2.11" for 2-Year event
Inflow = 5.78 cfs @ 12.22 hrs, Volume= 0.410 af
Outflow = 5.78 cfs @ 12.22 hrs, Volume= 0.410 af, Atten= 0%, Lag= 0.0 min
Primary = 5.78 cfs @ 12.22 hrs, Volume= 0.410 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 885.55' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**18.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=5.67 cfs @ 12.22 hrs HW=885.53' (Free Discharge)
1=Culvert (Barrel Controls 5.67 cfs @ 4.05 fps)

Summary for Pond 52:

Inflow Area = 0.730 ac, 89.04% Impervious, Inflow Depth = 2.36" for 2-Year event
Inflow = 2.60 cfs @ 12.14 hrs, Volume= 0.144 af
Outflow = 2.60 cfs @ 12.14 hrs, Volume= 0.144 af, Atten= 0%, Lag= 0.0 min
Primary = 2.60 cfs @ 12.14 hrs, Volume= 0.144 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 885.05' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**15.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=2.52 cfs @ 12.14 hrs HW=885.03' (Free Discharge)
1=Culvert (Barrel Controls 2.52 cfs @ 3.34 fps)

Summary for Pond 61: Stub-61

Inflow Area = 0.580 ac, 93.10% Impervious, Inflow Depth = 2.44" for 2-Year event
Inflow = 2.14 cfs @ 12.14 hrs, Volume= 0.118 af
Outflow = 2.14 cfs @ 12.14 hrs, Volume= 0.118 af, Atten= 0%, Lag= 0.0 min
Primary = 2.14 cfs @ 12.14 hrs, Volume= 0.118 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 885.18' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.11'	**12.0" Round Culvert** L= 22.0' Ke= 0.900 Inlet / Outlet Invert= 884.11' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=2.07 cfs @ 12.14 hrs HW=885.16' (Free Discharge)
1=Culvert (Barrel Controls 2.07 cfs @ 3.14 fps)

Summary for Pond 108": (new Pond)

Inflow Area = 1.050 ac, 50.48% Impervious, Inflow Depth = 1.58" for 2-Year event
Inflow = 1.90 cfs @ 12.23 hrs, Volume= 0.139 af
Outflow = 0.68 cfs @ 12.52 hrs, Volume= 0.134 af, Atten= 64%, Lag= 17.7 min
Primary = 0.68 cfs @ 12.52 hrs, Volume= 0.134 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 883.76' @ 12.52 hrs Surf.Area= 0.023 ac Storage= 0.043 af

Plug-Flow detention time= 60.0 min calculated for 0.134 af (97% of inflow)
Center-of-Mass det. time= 41.6 min (820.7 - 779.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	880.50'	0.056 af	**15.00'W x 66.00'L x 10.00'H Field A** 0.227 af Overall - 0.088 af Embedded = 0.140 af x 40.0% Voids
#2A	881.00'	0.088 af	**CMP Round 108** x 3 Inside #1 Effective Size= 108.0"W x 108.0"H => 63.62 sf x 20.00'L = 1,272.3 cf Overall Size= 108.0"W x 108.0"H x 20.00'L
		0.143 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	881.00'	**24.0" Round Culvert** L= 11.0' Ke= 0.500 Inlet / Outlet Invert= 881.00' / 881.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	881.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	889.50'	**0.5' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.68 cfs @ 12.52 hrs HW=883.76' (Free Discharge)
└**1=Culvert** (Passes 0.68 cfs of 17.14 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.68 cfs @ 7.75 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 110:

Inflow Area = 1.460 ac, 85.62% Impervious, Inflow Depth = 2.29" for 2-Year event
Inflow = 4.43 cfs @ 12.09 hrs, Volume= 0.279 af
Outflow = 4.43 cfs @ 12.09 hrs, Volume= 0.279 af, Atten= 0%, Lag= 0.0 min
Primary = 4.43 cfs @ 12.09 hrs, Volume= 0.279 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 886.28' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.11'	**15.0" Round Culvert** L= 86.0' Ke= 0.500 Inlet / Outlet Invert= 885.11' / 884.00' S= 0.0129 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=4.27 cfs @ 12.09 hrs HW=886.25' (Free Discharge)
└**1=Culvert** (Inlet Controls 4.27 cfs @ 3.64 fps)

Summary for Pond 120:

Inflow Area = 0.890 ac, 93.26% Impervious, Inflow Depth = 2.44" for 2-Year event
Inflow = 3.69 cfs @ 12.08 hrs, Volume= 0.181 af
Outflow = 3.69 cfs @ 12.08 hrs, Volume= 0.181 af, Atten= 0%, Lag= 0.0 min
Primary = 3.69 cfs @ 12.08 hrs, Volume= 0.181 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 887.03' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.90'	**15.0" Round Culvert** L= 132.0' Ke= 0.500 Inlet / Outlet Invert= 885.90' / 885.11' S= 0.0060 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=3.48 cfs @ 12.08 hrs HW=886.99' (Free Discharge)
1=Culvert (Barrel Controls 3.48 cfs @ 4.11 fps)

Summary for Pond 130:

Inflow Area = 0.420 ac, 97.62% Impervious, Inflow Depth = 2.53" for 2-Year event
Inflow = 1.86 cfs @ 12.06 hrs, Volume= 0.089 af
Outflow = 1.86 cfs @ 12.06 hrs, Volume= 0.089 af, Atten= 0%, Lag= 0.0 min
Primary = 1.86 cfs @ 12.06 hrs, Volume= 0.089 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 887.54' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	886.78'	**12.0" Round Culvert** L= 68.0' Ke= 0.500 Inlet / Outlet Invert= 886.78' / 886.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.78 cfs @ 12.06 hrs HW=887.52' (Free Discharge)
1=Culvert (Barrel Controls 1.78 cfs @ 4.00 fps)

Summary for Pond 140:

Inflow Area = 0.070 ac, 85.71% Impervious, Inflow Depth = 2.29" for 2-Year event
Inflow = 0.28 cfs @ 12.09 hrs, Volume= 0.013 af
Outflow = 0.28 cfs @ 12.09 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.0 min
Primary = 0.28 cfs @ 12.09 hrs, Volume= 0.013 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 887.45' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	887.11'	**12.0" Round Culvert** L= 108.0' Ke= 0.500 Inlet / Outlet Invert= 887.11' / 886.78' S= 0.0031 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.27 cfs @ 12.09 hrs HW=887.44' (Free Discharge)
1=Culvert (Barrel Controls 0.27 cfs @ 1.77 fps)

Summary for Pond CB31:

Inflow Area = 0.080 ac, 62.50% Impervious, Inflow Depth = 1.83" for 2-Year event
Inflow = 0.26 cfs @ 12.07 hrs, Volume= 0.012 af
Outflow = 0.26 cfs @ 12.07 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min
Primary = 0.26 cfs @ 12.07 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 884.50' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.23'	**12.0" Round Culvert** L= 23.0' Ke= 0.500 Inlet / Outlet Invert= 884.23' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.25 cfs @ 12.07 hrs HW=884.49' (Free Discharge)
1=Culvert (Barrel Controls 0.25 cfs @ 2.33 fps)

Summary for Pond CB41:

Inflow Area = 0.120 ac, 91.67% Impervious, Inflow Depth = 2.41" for 2-Year event
Inflow = 0.52 cfs @ 12.06 hrs, Volume= 0.024 af
Outflow = 0.52 cfs @ 12.06 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min
Primary = 0.52 cfs @ 12.06 hrs, Volume= 0.024 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 884.58' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.19'	**12.0" Round Culvert** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 884.19' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.49 cfs @ 12.06 hrs HW=884.57' (Free Discharge)
1=Culvert (Barrel Controls 0.49 cfs @ 2.68 fps)

Summary for Pond SYS: (new Pond)

Inflow Area = 7.460 ac, 72.25% Impervious, Inflow Depth = 2.08" for 2-Year event
Inflow = 17.06 cfs @ 12.12 hrs, Volume= 1.292 af
Outflow = 6.39 cfs @ 12.42 hrs, Volume= 1.292 af, Atten= 63%, Lag= 18.5 min
Discarded = 0.05 cfs @ 6.25 hrs, Volume= 0.134 af
Primary = 6.33 cfs @ 12.42 hrs, Volume= 1.157 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 883.48' @ 12.42 hrs Surf.Area= 9,472 sf Storage= 17,198 cf

Plug-Flow detention time= 77.1 min calculated for 1.292 af (100% of inflow)
Center-of-Mass det. time= 76.7 min (846.0 - 769.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	880.50'	9,122 cf	**18.50'W x 316.00'L x 6.00'H Field A** 35,076 cf Overall - 12,272 cf Embedded = 22,804 cf x 40.0% Voids
#2A	881.00'	12,272 cf	**CMP Round 60** x 30 Inside #1 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L 30 Chambers in 2 Rows 12.50' Header x 19.63 sf x 2 = 490.9 cf Inside
#3B	880.50'	5,620 cf	**18.50'W x 196.00'L x 6.00'H Field B** 21,756 cf Overall - 7,707 cf Embedded = 14,049 cf x 40.0% Voids
#4B	881.00'	7,707 cf	**CMP Round 60** x 18 Inside #3 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L Row Length Adjustment= +10.00' x 19.63 sf x 2 rows 12.50' Header x 19.63 sf x 1 = 245.4 cf Inside
#5	886.00'	25 cf	**4.00'D x 2.00'H CBMH-30**
#6	886.00'	29 cf	**4.00'D x 2.29'H CBMH-31**
#7	886.00'	35 cf	**4.00'D x 2.82'H CBMH-40**
#8	886.00'	40 cf	**4.00'D x 3.18'H CBMH-41**
#9	886.00'	57 cf	**4.00'D x 4.50'H CBMH-50**
#10	886.00'	59 cf	**4.00'D x 4.70'H CBMH-51**
#11	886.00'	60 cf	**4.00'D x 4.80'H CBMH-52**
#12	886.00'	62 cf	**4.00'D x 4.95'H CBMH-60**
#13	886.00'	60 cf	**4.00'D x 4.75'H CBMH-70**
#14	886.00'	66 cf	**4.00'D x 5.26'H CBMH-80**
#15	886.00'	59 cf	**4.00'D x 4.70'H CBMH-90**
#16	886.00'	62 cf	**4.00'D x 4.92'H CBMH-100**
#17	888.33'	8,117 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		43,451 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
888.33	15	0	0
888.50	345	31	31
889.00	3,000	836	867
889.50	7,000	2,500	3,367
890.00	12,000	4,750	8,117

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.50'	**0.250 in/hr Exfiltration over Surface area**
#2	Primary	879.31'	**24.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 879.31' / 878.81' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Device 2	881.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	881.00'	**8.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#5	Device 2	885.80'	**7.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00

Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

#6 Secondary 888.40' **5.0' long x 5.0' breadth Broad-Crested Rectangular Weir**
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.05 cfs @ 6.25 hrs HW=880.61' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=6.33 cfs @ 12.42 hrs HW=883.47' (Free Discharge)
└**2=Culvert** (Passes 6.33 cfs of 26.90 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 1.41 cfs @ 7.18 fps)
  ├**4=Orifice/Grate** (Orifice Controls 4.92 cfs @ 7.04 fps)
  └**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=880.50' (Free Discharge)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment C.DRIVE:

Runoff = 0.80 cfs @ 12.10 hrs, Volume= 0.040 af, Depth= 3.41"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.110	98	
*	0.030	69	
	0.140	92	Weighted Average
	0.030	69	21.43% Pervious Area
	0.110	98	78.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	13	0.0200	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.1	5	0.0200	0.71		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	34	0.0170	0.97		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.2	36	0.0195	2.83		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.9	88	Total			

Summary for Subcatchment CART:

Runoff = 2.25 cfs @ 12.23 hrs, Volume= 0.161 af, Depth= 2.54"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.340	98	
*	0.420	69	
	0.760	82	Weighted Average
	0.420	69	55.26% Pervious Area
	0.340	98	44.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	156	0.0615	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.3	93	0.1150	5.09		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.6	172	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.8	421	Total			

Summary for Subcatchment DOCK:

Runoff = 0.44 cfs @ 12.09 hrs, Volume= 0.021 af, Depth= 3.59"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.060	98	
*	0.010	69	
	0.070	94	Weighted Average
	0.010	69	14.29% Pervious Area
	0.060	98	85.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	85	0.0400	1.65		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.0	98	Total			

Summary for Subcatchment DUN:

Runoff = 1.05 cfs @ 12.22 hrs, Volume= 0.074 af, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.190	98	
*	0.100	69	
	0.290	88	Weighted Average
	0.100	69	34.48% Pervious Area
	0.190	98	65.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	150	0.0700	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	137	0.0310	2.64		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	166	0.0200	6.42	5.04	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.1	453	Total			

Summary for Subcatchment E.ALDI:

Runoff = 2.11 cfs @ 12.23 hrs, Volume= 0.156 af, Depth= 3.28"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.420	98	
*	0.150	69	
	0.570	90	Weighted Average
	0.150	69	26.32% Pervious Area
	0.420	98	73.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	115	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	100	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
15.2	215	Total			

Summary for Subcatchment E.HOU:

Runoff = 0.02 cfs @ 12.15 hrs, Volume= 0.001 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.000	98	
*	0.010	69	
	0.010	69	Weighted Average
	0.010	69	100.00% Pervious Area

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

Summary for Subcatchment EXSO:

Runoff = 1.16 cfs @ 12.40 hrs, Volume= 0.105 af, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.006	98	
*	0.884	69	
	0.890	69	Weighted Average
	0.884	69	99.33% Pervious Area
	0.006	98	0.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.1	240	0.0300	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"

Summary for Subcatchment HOU:

Runoff = 4.00 cfs @ 12.14 hrs, Volume= 0.223 af, Depth= 3.67"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.650	98	
*	0.080	69	
	0.730	95	Weighted Average
	0.080	69	10.96% Pervious Area
	0.650	98	89.04% Impervious Area

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

Summary for Subcatchment NE.LEX: Lex. Ave. Entrance Drive

Runoff = 0.43 cfs @ 12.07 hrs, Volume= 0.020 af, Depth= 2.99"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.050	98	
	0.030	69	50-75% Grass cover, Fair, HSG B
	0.080	87	Weighted Average
	0.030	69	37.50% Pervious Area
	0.050	98	62.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	12	0.2500	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.5	36	0.0240	1.13		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.5	48	Total			

Summary for Subcatchment NW.LEX: Lex. Ave. Entrance Drive

Runoff = 0.79 cfs @ 12.06 hrs, Volume= 0.037 af, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

Area (ac)	CN	Description
0.010	69	50-75% Grass cover, Fair, HSG B
0.110	98	Paved parking, HSG B
0.120	96	Weighted Average
0.010	69	8.33% Pervious Area
0.110	98	91.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	33	0.0215	1.06		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	27	0.0108	0.78		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.1	60	Total			

Summary for Subcatchment ROOF:

Runoff = 2.43 cfs @ 12.06 hrs, Volume= 0.115 af, Depth= 3.95"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.350	98	ROOF
	0.350	98	100.00% Impervious Area

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

Summary for Subcatchment S.DRIVE:

Runoff = 1.06 cfs @ 12.10 hrs, Volume= 0.051 af, Depth= 3.06"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

Area (ac)	CN	Description
* 0.130	98	
* 0.070	69	
0.200	88	Weighted Average
0.070	69	35.00% Pervious Area
0.130	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	19	0.0520	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.2	7	0.0200	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	28	0.0370	1.28		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.1	18	0.0295	3.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.5	72	Total			

Summary for Subcatchment SE.LEX: Lex. Ave. Entrance Drive

Runoff = 0.56 cfs @ 12.14 hrs, Volume= 0.031 af, Depth= 3.10"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

Area (ac)	CN	Description
0.040	69	50-75% Grass cover, Fair, HSG B
0.080	98	Water Surface, HSG B
0.120	88	Weighted Average
0.040	69	33.33% Pervious Area
0.080	98	66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	43	0.0280	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.4	33	0.0333	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
7.2	76	Total			

Summary for Subcatchment SWLEX:

Runoff = 1.64 cfs @ 12.10 hrs, Volume= 0.079 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.190	98	
*	0.140	69	
	0.330	86	Weighted Average
	0.140	69	42.42% Pervious Area
	0.190	98	57.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	11	0.0150	0.06		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	48	0.0225	1.17		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.6	59	Total			

Summary for Subcatchment TCF:

Runoff = 3.26 cfs @ 12.14 hrs, Volume= 0.183 af, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

Area (ac)	CN	Description
0.540	98	Paved parking, HSG C
0.040	69	50-75% Grass cover, Fair, HSG B
0.580	96	Weighted Average
0.040	69	6.90% Pervious Area
0.540	98	93.10% Impervious Area

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

Summary for Subcatchment UNIV: Univ. Ave. Entrance Drive

Runoff = 1.83 cfs @ 12.10 hrs, Volume= 0.083 af, Depth= 3.10"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.250	96	ROADWAY
	0.070	69	50-75% Grass cover, Fair, HSG B
	0.320	90	Weighted Average
	0.320	90	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	15	0.0500	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.3	130	0.0307	1.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	50	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.0	195	Total			

Summary for Subcatchment W.ALDI:

Runoff = 2.93 cfs @ 12.09 hrs, Volume= 0.144 af, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.420	98	
*	0.050	69	
	0.470	95	Weighted Average
	0.050	69	10.64% Pervious Area
	0.420	98	89.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.4	105	0.0187	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.5	118	Total			

Summary for Subcatchment WILD:

Runoff = 9.18 cfs @ 12.22 hrs, Volume= 0.654 af, Depth= 3.37"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	1.750	98	
*	0.470	69	
*	0.110	85	
	2.330	92	Weighted Average
	0.580	72	24.89% Pervious Area
	1.750	98	75.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	58	0.0100	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.6	159	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.4	126	0.0100	5.26	6.46	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.2	54	0.0055	4.41	7.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
14.2	397	Total			

Summary for Reach 2R: Lexington

Inflow Area = 8.360 ac, 64.55% Impervious, Inflow Depth = 2.92" for 10-Year event
Inflow = 9.60 cfs @ 12.43 hrs, Volume= 2.032 af
Outflow = 9.60 cfs @ 12.43 hrs, Volume= 2.032 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Pond 51:

Inflow Area = 2.330 ac, 75.11% Impervious, Inflow Depth = 3.37" for 10-Year event
Inflow = 9.18 cfs @ 12.22 hrs, Volume= 0.654 af
Outflow = 9.18 cfs @ 12.22 hrs, Volume= 0.654 af, Atten= 0%, Lag= 0.0 min
Primary = 9.18 cfs @ 12.22 hrs, Volume= 0.654 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 886.21' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**18.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=9.01 cfs @ 12.22 hrs HW=886.18' (Free Discharge)
1=Culvert (Barrel Controls 9.01 cfs @ 5.10 fps)

Summary for Pond 52:

Inflow Area = 0.730 ac, 89.04% Impervious, Inflow Depth = 3.67" for 10-Year event
Inflow = 4.00 cfs @ 12.14 hrs, Volume= 0.223 af
Outflow = 4.00 cfs @ 12.14 hrs, Volume= 0.223 af, Atten= 0%, Lag= 0.0 min
Primary = 4.00 cfs @ 12.14 hrs, Volume= 0.223 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 885.37' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**15.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=3.87 cfs @ 12.14 hrs HW=885.34' (Free Discharge)
1=Culvert (Barrel Controls 3.87 cfs @ 3.78 fps)

Summary for Pond 61: Stub-61

Inflow Area = 0.580 ac, 93.10% Impervious, Inflow Depth = 3.78" for 10-Year event
Inflow = 3.26 cfs @ 12.14 hrs, Volume= 0.183 af
Outflow = 3.26 cfs @ 12.14 hrs, Volume= 0.183 af, Atten= 0%, Lag= 0.0 min
Primary = 3.26 cfs @ 12.14 hrs, Volume= 0.183 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 885.79' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.11'	**12.0" Round Culvert** L= 22.0' Ke= 0.900 Inlet / Outlet Invert= 884.11' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=3.16 cfs @ 12.14 hrs HW=885.73' (Free Discharge)
1=Culvert (Inlet Controls 3.16 cfs @ 4.02 fps)

Summary for Pond 108": (new Pond)

Inflow Area = 1.050 ac, 50.48% Impervious, Inflow Depth = 2.69" for 10-Year event
Inflow = 3.29 cfs @ 12.23 hrs, Volume= 0.235 af
Outflow = 0.93 cfs @ 12.59 hrs, Volume= 0.230 af, Atten= 72%, Lag= 21.5 min
Primary = 0.93 cfs @ 12.59 hrs, Volume= 0.230 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 886.08' @ 12.59 hrs Surf.Area= 0.023 ac Storage= 0.081 af

Plug-Flow detention time= 58.0 min calculated for 0.230 af (98% of inflow)
Center-of-Mass det. time= 46.4 min (822.4 - 776.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	880.50'	0.056 af	**15.00'W x 66.00'L x 10.00'H Field A** 0.227 af Overall - 0.088 af Embedded = 0.140 af x 40.0% Voids
#2A	881.00'	0.088 af	**CMP Round 108** x 3 Inside #1 Effective Size= 108.0"W x 108.0"H => 63.62 sf x 20.00'L = 1,272.3 cf Overall Size= 108.0"W x 108.0"H x 20.00'L
		0.143 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	881.00'	**24.0" Round Culvert** L= 11.0' Ke= 0.500 Inlet / Outlet Invert= 881.00' / 881.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	881.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	889.50'	**0.5' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.93 cfs @ 12.59 hrs HW=886.08' (Free Discharge)
└**1=Culvert** (Passes 0.93 cfs of 30.55 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.93 cfs @ 10.67 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 110:

Inflow Area = 1.460 ac, 85.62% Impervious, Inflow Depth = 3.59" for 10-Year event
Inflow = 6.81 cfs @ 12.09 hrs, Volume= 0.436 af
Outflow = 6.81 cfs @ 12.09 hrs, Volume= 0.436 af, Atten= 0%, Lag= 0.0 min
Primary = 6.81 cfs @ 12.09 hrs, Volume= 0.436 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 887.05' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.11'	**15.0" Round Culvert** L= 86.0' Ke= 0.500 Inlet / Outlet Invert= 885.11' / 884.00' S= 0.0129 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=6.56 cfs @ 12.09 hrs HW=886.97' (Free Discharge)
└**1=Culvert** (Inlet Controls 6.56 cfs @ 5.35 fps)

Summary for Pond 120:

Inflow Area = 0.890 ac, 93.26% Impervious, Inflow Depth = 3.78" for 10-Year event
Inflow = 5.62 cfs @ 12.08 hrs, Volume= 0.280 af
Outflow = 5.62 cfs @ 12.08 hrs, Volume= 0.280 af, Atten= 0%, Lag= 0.0 min
Primary = 5.62 cfs @ 12.08 hrs, Volume= 0.280 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 887.78' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.90'	**15.0" Round Culvert** L= 132.0' Ke= 0.500 Inlet / Outlet Invert= 885.90' / 885.11' S= 0.0060 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=5.16 cfs @ 12.08 hrs HW=887.62' (Free Discharge)
1=Culvert (Barrel Controls 5.16 cfs @ 4.21 fps)

Summary for Pond 130:

Inflow Area = 0.420 ac, 97.62% Impervious, Inflow Depth = 3.89" for 10-Year event
Inflow = 2.81 cfs @ 12.06 hrs, Volume= 0.136 af
Outflow = 2.81 cfs @ 12.06 hrs, Volume= 0.136 af, Atten= 0%, Lag= 0.0 min
Primary = 2.81 cfs @ 12.06 hrs, Volume= 0.136 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 887.82' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	886.78'	**12.0" Round Culvert** L= 68.0' Ke= 0.500 Inlet / Outlet Invert= 886.78' / 886.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=2.68 cfs @ 12.06 hrs HW=887.78' (Free Discharge)
1=Culvert (Inlet Controls 2.68 cfs @ 3.42 fps)

Summary for Pond 140:

Inflow Area = 0.070 ac, 85.71% Impervious, Inflow Depth = 3.59" for 10-Year event
Inflow = 0.44 cfs @ 12.09 hrs, Volume= 0.021 af
Outflow = 0.44 cfs @ 12.09 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min
Primary = 0.44 cfs @ 12.09 hrs, Volume= 0.021 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 887.53' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	887.11'	**12.0" Round Culvert** L= 108.0' Ke= 0.500 Inlet / Outlet Invert= 887.11' / 886.78' S= 0.0031 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.42 cfs @ 12.09 hrs HW=887.52' (Free Discharge)
1=Culvert (Barrel Controls 0.42 cfs @ 2.01 fps)

Summary for Pond CB31:

Inflow Area = 0.080 ac, 62.50% Impervious, Inflow Depth = 2.99" for 10-Year event
Inflow = 0.43 cfs @ 12.07 hrs, Volume= 0.020 af
Outflow = 0.43 cfs @ 12.07 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min
Primary = 0.43 cfs @ 12.07 hrs, Volume= 0.020 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 884.58' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.23'	**12.0" Round Culvert** L= 23.0' Ke= 0.500 Inlet / Outlet Invert= 884.23' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.41 cfs @ 12.07 hrs HW=884.57' (Free Discharge)
1=Culvert (Barrel Controls 0.41 cfs @ 2.62 fps)

Summary for Pond CB41:

Inflow Area = 0.120 ac, 91.67% Impervious, Inflow Depth = 3.74" for 10-Year event
Inflow = 0.79 cfs @ 12.06 hrs, Volume= 0.037 af
Outflow = 0.79 cfs @ 12.06 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min
Primary = 0.79 cfs @ 12.06 hrs, Volume= 0.037 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 884.69' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.19'	**12.0" Round Culvert** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 884.19' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.76 cfs @ 12.06 hrs HW=884.67' (Free Discharge)
1=Culvert (Barrel Controls 0.76 cfs @ 2.94 fps)

Summary for Pond SYS: (new Pond)

Inflow Area = 7.460 ac, 72.25% Impervious, Inflow Depth = 3.33" for 10-Year event
Inflow = 26.78 cfs @ 12.11 hrs, Volume= 2.067 af
Outflow = 8.52 cfs @ 12.47 hrs, Volume= 2.067 af, Atten= 68%, Lag= 21.2 min
Discarded = 0.05 cfs @ 4.85 hrs, Volume= 0.141 af
Primary = 8.46 cfs @ 12.47 hrs, Volume= 1.926 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 885.17' @ 12.47 hrs Surf.Area= 9,472 sf Storage= 28,404 cf

Plug-Flow detention time= 67.8 min calculated for 2.067 af (100% of inflow)
Center-of-Mass det. time= 67.4 min (832.8 - 765.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	880.50'	9,122 cf	**18.50'W x 316.00'L x 6.00'H Field A** 35,076 cf Overall - 12,272 cf Embedded = 22,804 cf x 40.0% Voids
#2A	881.00'	12,272 cf	**CMP Round 60** x 30 Inside #1 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L 30 Chambers in 2 Rows 12.50' Header x 19.63 sf x 2 = 490.9 cf Inside
#3B	880.50'	5,620 cf	**18.50'W x 196.00'L x 6.00'H Field B** 21,756 cf Overall - 7,707 cf Embedded = 14,049 cf x 40.0% Voids
#4B	881.00'	7,707 cf	**CMP Round 60** x 18 Inside #3 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L Row Length Adjustment= +10.00' x 19.63 sf x 2 rows 12.50' Header x 19.63 sf x 1 = 245.4 cf Inside
#5	886.00'	25 cf	**4.00'D x 2.00'H CBMH-30**
#6	886.00'	29 cf	**4.00'D x 2.29'H CBMH-31**
#7	886.00'	35 cf	**4.00'D x 2.82'H CBMH-40**
#8	886.00'	40 cf	**4.00'D x 3.18'H CBMH-41**
#9	886.00'	57 cf	**4.00'D x 4.50'H CBMH-50**
#10	886.00'	59 cf	**4.00'D x 4.70'H CBMH-51**
#11	886.00'	60 cf	**4.00'D x 4.80'H CBMH-52**
#12	886.00'	62 cf	**4.00'D x 4.95'H CBMH-60**
#13	886.00'	60 cf	**4.00'D x 4.75'H CBMH-70**
#14	886.00'	66 cf	**4.00'D x 5.26'H CBMH-80**
#15	886.00'	59 cf	**4.00'D x 4.70'H CBMH-90**
#16	886.00'	62 cf	**4.00'D x 4.92'H CBMH-100**
#17	888.33'	8,117 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		43,451 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
888.33	15	0	0
888.50	345	31	31
889.00	3,000	836	867
889.50	7,000	2,500	3,367
890.00	12,000	4,750	8,117

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.50'	**0.250 in/hr Exfiltration over Surface area**
#2	Primary	879.31'	**24.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 879.31' / 878.81' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Device 2	881.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	881.00'	**8.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#5	Device 2	885.80'	**7.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00

Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

#6 Secondary 888.40' **5.0' long x 5.0' breadth Broad-Crested Rectangular Weir**
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.05 cfs @ 4.85 hrs HW=880.61' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=8.46 cfs @ 12.47 hrs HW=885.17' (Free Discharge)
└**2=Culvert** (Passes 8.46 cfs of 33.35 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 1.87 cfs @ 9.53 fps)
  ├**4=Orifice/Grate** (Orifice Controls 6.58 cfs @ 9.43 fps)
  └**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=880.50' (Free Discharge)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment C.DRIVE:

Runoff = 1.49 cfs @ 12.10 hrs, Volume= 0.075 af, Depth= 6.41"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.110	98	
*	0.030	69	
	0.140	92	Weighted Average
	0.030	69	21.43% Pervious Area
	0.110	98	78.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	13	0.0200	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.1	5	0.0200	0.71		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	34	0.0170	0.97		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.2	36	0.0195	2.83		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.9	88	Total			

Summary for Subcatchment CART:

Runoff = 4.76 cfs @ 12.23 hrs, Volume= 0.335 af, Depth= 5.29"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.340	98	
*	0.420	69	
	0.760	82	Weighted Average
	0.420	69	55.26% Pervious Area
	0.340	98	44.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	156	0.0615	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.3	93	0.1150	5.09		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.6	172	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.8	421	Total			

Summary for Subcatchment DOCK:

Runoff = 0.80 cfs @ 12.09 hrs, Volume= 0.039 af, Depth= 6.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.060	98	
*	0.010	69	
	0.070	94	Weighted Average
	0.010	69	14.29% Pervious Area
	0.060	98	85.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	85	0.0400	1.65		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.0	98	Total			

Summary for Subcatchment DUN:

Runoff = 2.05 cfs @ 12.22 hrs, Volume= 0.145 af, Depth= 5.98"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.190	98	
*	0.100	69	
	0.290	88	Weighted Average
	0.100	69	34.48% Pervious Area
	0.190	98	65.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	150	0.0700	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	137	0.0310	2.64		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	166	0.0200	6.42	5.04	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.1	453	Total			

Summary for Subcatchment E.ALDI:

Runoff = 4.01 cfs @ 12.23 hrs, Volume= 0.297 af, Depth= 6.25"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.420	98	
*	0.150	69	
	0.570	90	Weighted Average
	0.150	69	26.32% Pervious Area
	0.420	98	73.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	115	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	100	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
15.2	215	Total			

Summary for Subcatchment E.HOU:

Runoff = 0.07 cfs @ 12.14 hrs, Volume= 0.003 af, Depth= 3.81"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.000	98	
*	0.010	69	
	0.010	69	Weighted Average
	0.010	69	100.00% Pervious Area

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

Summary for Subcatchment EXSO:

Runoff = 3.29 cfs @ 12.38 hrs, Volume= 0.284 af, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.006	98	
*	0.884	69	
	0.890	69	Weighted Average
	0.884	69	99.33% Pervious Area
	0.006	98	0.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.1	240	0.0300	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"

Summary for Subcatchment HOU:

Runoff = 7.25 cfs @ 12.14 hrs, Volume= 0.411 af, Depth= 6.76"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.650	98	
*	0.080	69	
	0.730	95	Weighted Average
	0.080	69	10.96% Pervious Area
	0.650	98	89.04% Impervious Area

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

Summary for Subcatchment NE.LEX: Lex. Ave. Entrance Drive

Runoff = 0.85 cfs @ 12.07 hrs, Volume= 0.039 af, Depth= 5.88"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.050	98	
	0.030	69	50-75% Grass cover, Fair, HSG B
	0.080	87	Weighted Average
	0.030	69	37.50% Pervious Area
	0.050	98	62.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	12	0.2500	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.5	36	0.0240	1.13		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.5	48	Total			

Summary for Subcatchment NW.LEX: Lex. Ave. Entrance Drive

Runoff = 1.43 cfs @ 12.06 hrs, Volume= 0.068 af, Depth= 6.84"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

Area (ac)	CN	Description
0.010	69	50-75% Grass cover, Fair, HSG B
0.110	98	Paved parking, HSG B
0.120	96	Weighted Average
0.010	69	8.33% Pervious Area
0.110	98	91.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	33	0.0215	1.06		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	27	0.0108	0.78		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.1	60	Total			

Summary for Subcatchment ROOF:

Runoff = 4.29 cfs @ 12.06 hrs, Volume= 0.208 af, Depth= 7.12"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.350	98	ROOF
	0.350	98	100.00% Impervious Area

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

Summary for Subcatchment S.DRIVE:

Runoff = 2.06 cfs @ 12.10 hrs, Volume= 0.099 af, Depth= 5.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.130	98	
*	0.070	69	
	0.200	88	Weighted Average
	0.070	69	35.00% Pervious Area
	0.130	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	19	0.0520	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.2	7	0.0200	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	28	0.0370	1.28		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.1	18	0.0295	3.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.5	72	Total			

Summary for Subcatchment SE.LEX: Lex. Ave. Entrance Drive

Runoff = 1.08 cfs @ 12.14 hrs, Volume= 0.060 af, Depth= 6.02"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

Area (ac)	CN	Description
0.040	69	50-75% Grass cover, Fair, HSG B
0.080	98	Water Surface, HSG B
0.120	88	Weighted Average
0.040	69	33.33% Pervious Area
0.080	98	66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	43	0.0280	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.4	33	0.0333	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
7.2	76	Total			

Summary for Subcatchment SWLEX:

Runoff = 3.28 cfs @ 12.10 hrs, Volume= 0.157 af, Depth= 5.72"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.190	98	
*	0.140	69	
	0.330	86	Weighted Average
	0.140	69	42.42% Pervious Area
	0.190	98	57.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	11	0.0150	0.06		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	48	0.0225	1.17		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.6	59	Total			

Summary for Subcatchment TCF:

Runoff = 5.85 cfs @ 12.14 hrs, Volume= 0.333 af, Depth= 6.89"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

Area (ac)	CN	Description
0.540	98	Paved parking, HSG C
0.040	69	50-75% Grass cover, Fair, HSG B
0.580	96	Weighted Average
0.040	69	6.90% Pervious Area
0.540	98	93.10% Impervious Area

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

Summary for Subcatchment UNIV: Univ. Ave. Entrance Drive

Runoff = 3.49 cfs @ 12.10 hrs, Volume= 0.165 af, Depth= 6.18"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.250	96	ROADWAY
	0.070	69	50-75% Grass cover, Fair, HSG B
	0.320	90	Weighted Average
	0.320	90	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	15	0.0500	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.3	130	0.0307	1.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	50	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.0	195	Total			

Summary for Subcatchment W.ALDI:

Runoff = 5.31 cfs @ 12.09 hrs, Volume= 0.265 af, Depth= 6.77"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.420	98	
*	0.050	69	
	0.470	95	Weighted Average
	0.050	69	10.64% Pervious Area
	0.420	98	89.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.4	105	0.0187	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.5	118	Total			

Summary for Subcatchment WILD:

Runoff = 17.27 cfs @ 12.22 hrs, Volume= 1.238 af, Depth= 6.38"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	1.750	98	
*	0.470	69	
*	0.110	85	
	2.330	92	Weighted Average
	0.580	72	24.89% Pervious Area
	1.750	98	75.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	58	0.0100	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.6	159	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.4	126	0.0100	5.26	6.46	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.2	54	0.0055	4.41	7.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
14.2	397	Total			

Summary for Reach 2R: Lexington

Inflow Area = 8.360 ac, 64.55% Impervious, Inflow Depth = 5.84" for 100-Year event
Inflow = 50.14 cfs @ 12.17 hrs, Volume= 4.069 af
Outflow = 50.14 cfs @ 12.17 hrs, Volume= 4.069 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Pond 51:

Inflow Area = 2.330 ac, 75.11% Impervious, Inflow Depth = 6.38" for 100-Year event
Inflow = 17.27 cfs @ 12.22 hrs, Volume= 1.238 af
Outflow = 17.27 cfs @ 12.22 hrs, Volume= 1.238 af, Atten= 0%, Lag= 0.0 min
Primary = 17.27 cfs @ 12.22 hrs, Volume= 1.238 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 888.91' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**18.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=16.95 cfs @ 12.22 hrs HW=888.77' (Free Discharge)
1=Culvert (Inlet Controls 16.95 cfs @ 9.59 fps)

Summary for Pond 52:

Inflow Area = 0.730 ac, 89.04% Impervious, Inflow Depth = 6.76" for 100-Year event
Inflow = 7.25 cfs @ 12.14 hrs, Volume= 0.411 af
Outflow = 7.25 cfs @ 12.14 hrs, Volume= 0.411 af, Atten= 0%, Lag= 0.0 min
Primary = 7.25 cfs @ 12.14 hrs, Volume= 0.411 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 886.18' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**15.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=7.02 cfs @ 12.14 hrs HW=886.13' (Free Discharge)
1=Culvert (Barrel Controls 7.02 cfs @ 5.72 fps)

Summary for Pond 61: Stub-61

Inflow Area = 0.580 ac, 93.10% Impervious, Inflow Depth = 6.89" for 100-Year event
Inflow = 5.85 cfs @ 12.14 hrs, Volume= 0.333 af
Outflow = 5.85 cfs @ 12.14 hrs, Volume= 0.333 af, Atten= 0%, Lag= 0.0 min
Primary = 5.85 cfs @ 12.14 hrs, Volume= 0.333 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 888.43' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.11'	**12.0" Round Culvert** L= 22.0' Ke= 0.900 Inlet / Outlet Invert= 884.11' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=5.66 cfs @ 12.14 hrs HW=888.21' (Free Discharge)
1=Culvert (Inlet Controls 5.66 cfs @ 7.21 fps)

Summary for Pond 108": (new Pond)

Inflow Area = 1.050 ac, 50.48% Impervious, Inflow Depth = 5.48" for 100-Year event
Inflow = 6.79 cfs @ 12.23 hrs, Volume= 0.480 af
Outflow = 7.22 cfs @ 12.35 hrs, Volume= 0.475 af, Atten= 0%, Lag= 7.5 min
Primary = 7.22 cfs @ 12.35 hrs, Volume= 0.475 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 892.18' @ 12.35 hrs Surf.Area= 0.023 ac Storage= 0.143 af

Plug-Flow detention time= 53.3 min calculated for 0.475 af (99% of inflow)
Center-of-Mass det. time= 47.5 min (818.5 - 770.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	880.50'	0.056 af	**15.00'W x 66.00'L x 10.00'H Field A** 0.227 af Overall - 0.088 af Embedded = 0.140 af x 40.0% Voids
#2A	881.00'	0.088 af	**CMP Round 108** x 3 Inside #1 Effective Size= 108.0"W x 108.0"H => 63.62 sf x 20.00'L = 1,272.3 cf Overall Size= 108.0"W x 108.0"H x 20.00'L
		0.143 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	881.00'	**24.0" Round Culvert** L= 11.0' Ke= 0.500 Inlet / Outlet Invert= 881.00' / 881.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	881.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	889.50'	**0.5' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=7.21 cfs @ 12.35 hrs HW=892.17' (Free Discharge)
└**1=Culvert** (Passes 7.21 cfs of 48.25 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.39 cfs @ 15.97 fps)
  └**3=Broad-Crested Rectangular Weir** (Weir Controls 5.81 cfs @ 4.35 fps)

Summary for Pond 110:

Inflow Area = 1.460 ac, 85.62% Impervious, Inflow Depth = 6.64" for 100-Year event
Inflow = 12.36 cfs @ 12.09 hrs, Volume= 0.808 af
Outflow = 12.36 cfs @ 12.09 hrs, Volume= 0.808 af, Atten= 0%, Lag= 0.0 min
Primary = 12.36 cfs @ 12.09 hrs, Volume= 0.808 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 890.74' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.11'	**15.0" Round Culvert** L= 86.0' Ke= 0.500 Inlet / Outlet Invert= 885.11' / 884.00' S= 0.0129 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=11.93 cfs @ 12.09 hrs HW=890.40' (Free Discharge)
└**1=Culvert** (Barrel Controls 11.93 cfs @ 9.72 fps)

Summary for Pond 120:

Inflow Area = 0.890 ac, 93.26% Impervious, Inflow Depth = 6.90" for 100-Year event
Inflow = 10.09 cfs @ 12.08 hrs, Volume= 0.512 af
Outflow = 10.09 cfs @ 12.08 hrs, Volume= 0.512 af, Atten= 0%, Lag= 0.0 min
Primary = 10.09 cfs @ 12.08 hrs, Volume= 0.512 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 891.06' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.90'	**15.0" Round Culvert** L= 132.0' Ke= 0.500 Inlet / Outlet Invert= 885.90' / 885.11' S= 0.0060 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=9.51 cfs @ 12.08 hrs HW=890.63' (Free Discharge)
1=Culvert (Barrel Controls 9.51 cfs @ 7.75 fps)

Summary for Pond 130:

Inflow Area = 0.420 ac, 97.62% Impervious, Inflow Depth = 7.04" for 100-Year event
Inflow = 4.99 cfs @ 12.06 hrs, Volume= 0.246 af
Outflow = 4.99 cfs @ 12.06 hrs, Volume= 0.246 af, Atten= 0%, Lag= 0.0 min
Primary = 4.99 cfs @ 12.06 hrs, Volume= 0.246 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 889.36' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	886.78'	**12.0" Round Culvert** L= 68.0' Ke= 0.500 Inlet / Outlet Invert= 886.78' / 886.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=4.77 cfs @ 12.06 hrs HW=889.18' (Free Discharge)
1=Culvert (Barrel Controls 4.77 cfs @ 6.07 fps)

Summary for Pond 140:

Inflow Area = 0.070 ac, 85.71% Impervious, Inflow Depth = 6.65" for 100-Year event
Inflow = 0.80 cfs @ 12.09 hrs, Volume= 0.039 af
Outflow = 0.80 cfs @ 12.09 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min
Primary = 0.80 cfs @ 12.09 hrs, Volume= 0.039 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 887.70' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	887.11'	**12.0" Round Culvert** L= 108.0' Ke= 0.500 Inlet / Outlet Invert= 887.11' / 886.78' S= 0.0031 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.76 cfs @ 12.09 hrs HW=887.68' (Free Discharge)
1=Culvert (Barrel Controls 0.76 cfs @ 2.37 fps)

Summary for Pond CB31:

Inflow Area = 0.080 ac, 62.50% Impervious, Inflow Depth = 5.88" for 100-Year event
Inflow = 0.85 cfs @ 12.07 hrs, Volume= 0.039 af
Outflow = 0.85 cfs @ 12.07 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min
Primary = 0.85 cfs @ 12.07 hrs, Volume= 0.039 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 884.74' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.23'	**12.0" Round Culvert** L= 23.0' Ke= 0.500 Inlet / Outlet Invert= 884.23' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.80 cfs @ 12.07 hrs HW=884.72' (Free Discharge)
1=Culvert (Barrel Controls 0.80 cfs @ 3.04 fps)

Summary for Pond CB41:

Inflow Area = 0.120 ac, 91.67% Impervious, Inflow Depth = 6.84" for 100-Year event
Inflow = 1.43 cfs @ 12.06 hrs, Volume= 0.068 af
Outflow = 1.43 cfs @ 12.06 hrs, Volume= 0.068 af, Atten= 0%, Lag= 0.0 min
Primary = 1.43 cfs @ 12.06 hrs, Volume= 0.068 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 884.90' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.19'	**12.0" Round Culvert** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 884.19' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.36 cfs @ 12.06 hrs HW=884.88' (Free Discharge)
1=Culvert (Barrel Controls 1.36 cfs @ 3.34 fps)

Summary for Pond SYS: (new Pond)

Inflow Area = 7.460 ac, 72.25% Impervious, Inflow Depth = 6.32" for 100-Year event
Inflow = 49.68 cfs @ 12.11 hrs, Volume= 3.930 af
Outflow = 48.39 cfs @ 12.17 hrs, Volume= 3.930 af, Atten= 3%, Lag= 3.5 min
Discarded = 0.06 cfs @ 12.16 hrs, Volume= 0.148 af
Primary = 47.65 cfs @ 12.17 hrs, Volume= 3.778 af
Secondary = 0.84 cfs @ 12.15 hrs, Volume= 0.004 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 888.88' @ 12.17 hrs Surf.Area= 12,000 sf Storage= 35,687 cf

Plug-Flow detention time= 49.6 min calculated for 3.930 af (100% of inflow)
Center-of-Mass det. time= 49.2 min (809.2 - 760.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	880.50'	9,122 cf	**18.50'W x 316.00'L x 6.00'H Field A** 35,076 cf Overall - 12,272 cf Embedded = 22,804 cf x 40.0% Voids
#2A	881.00'	12,272 cf	**CMP Round 60** x 30 Inside #1 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L 30 Chambers in 2 Rows 12.50' Header x 19.63 sf x 2 = 490.9 cf Inside
#3B	880.50'	5,620 cf	**18.50'W x 196.00'L x 6.00'H Field B** 21,756 cf Overall - 7,707 cf Embedded = 14,049 cf x 40.0% Voids
#4B	881.00'	7,707 cf	**CMP Round 60** x 18 Inside #3 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L Row Length Adjustment= +10.00' x 19.63 sf x 2 rows 12.50' Header x 19.63 sf x 1 = 245.4 cf Inside
#5	886.00'	25 cf	**4.00'D x 2.00'H CBMH-30**
#6	886.00'	29 cf	**4.00'D x 2.29'H CBMH-31**
#7	886.00'	35 cf	**4.00'D x 2.82'H CBMH-40**
#8	886.00'	40 cf	**4.00'D x 3.18'H CBMH-41**
#9	886.00'	57 cf	**4.00'D x 4.50'H CBMH-50**
#10	886.00'	59 cf	**4.00'D x 4.70'H CBMH-51**
#11	886.00'	60 cf	**4.00'D x 4.80'H CBMH-52**
#12	886.00'	62 cf	**4.00'D x 4.95'H CBMH-60**
#13	886.00'	60 cf	**4.00'D x 4.75'H CBMH-70**
#14	886.00'	66 cf	**4.00'D x 5.26'H CBMH-80**
#15	886.00'	59 cf	**4.00'D x 4.70'H CBMH-90**
#16	886.00'	62 cf	**4.00'D x 4.92'H CBMH-100**
#17	888.33'	8,117 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		43,451 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
888.33	15	0	0
888.50	345	31	31
889.00	3,000	836	867
889.50	7,000	2,500	3,367
890.00	12,000	4,750	8,117

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.50'	**0.250 in/hr Exfiltration over Surface area**
#2	Primary	879.31'	**24.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 879.31' / 878.81' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Device 2	881.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	881.00'	**8.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#5	Device 2	885.80'	**7.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00

Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

#6 Secondary 888.40' **5.0' long x 5.0' breadth Broad-Crested Rectangular Weir**
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.06 cfs @ 12.16 hrs HW=888.55' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=43.30 cfs @ 12.17 hrs HW=888.50' (Free Discharge)
└**2=Culvert** (Inlet Controls 43.30 cfs @ 13.78 fps)
├**3=Orifice/Grate** (Passes < 2.55 cfs potential flow)
├**4=Orifice/Grate** (Passes < 9.00 cfs potential flow)
└**5=Broad-Crested Rectangular Weir** (Passes < 103.14 cfs potential flow)

Secondary OutFlow Max=0.81 cfs @ 12.15 hrs HW=888.57' (Free Discharge)
└**6=Broad-Crested Rectangular Weir** (Weir Controls 0.81 cfs @ 0.96 fps)

Summary for Subcatchment C.DRIVE:

Runoff = 1.17 cfs @ 12.10 hrs, Volume= 0.058 af, Depth= 5.01"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.110	98	
*	0.030	69	
	0.140	92	Weighted Average
	0.030	69	21.43% Pervious Area
	0.110	98	78.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	13	0.0200	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.1	5	0.0200	0.71		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	34	0.0170	0.97		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.2	36	0.0195	2.83		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.9	88	Total			

Summary for Subcatchment CART:

Runoff = 3.58 cfs @ 12.23 hrs, Volume= 0.253 af, Depth= 3.99"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.340	98	
*	0.420	69	
	0.760	82	Weighted Average
	0.420	69	55.26% Pervious Area
	0.340	98	44.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	156	0.0615	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.3	93	0.1150	5.09		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.6	172	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.8	421	Total			

Summary for Subcatchment DOCK:

Runoff = 0.63 cfs @ 12.09 hrs, Volume= 0.031 af, Depth= 5.23"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.060	98	
*	0.010	69	
	0.070	94	Weighted Average
	0.010	69	14.29% Pervious Area
	0.060	98	85.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	85	0.0400	1.65		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.0	98	Total			

Summary for Subcatchment DUN:

Runoff = 1.58 cfs @ 12.22 hrs, Volume= 0.112 af, Depth= 4.62"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.190	98	
*	0.100	69	
	0.290	88	Weighted Average
	0.100	69	34.48% Pervious Area
	0.190	98	65.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	150	0.0700	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	137	0.0310	2.64		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	166	0.0200	6.42	5.04	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.1	453	Total			

Summary for Subcatchment E.ALDI:

Runoff = 3.13 cfs @ 12.23 hrs, Volume= 0.231 af, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.420	98	
*	0.150	69	
	0.570	90	Weighted Average
	0.150	69	26.32% Pervious Area
	0.420	98	73.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	115	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	100	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
15.2	215	Total			

Summary for Subcatchment E.HOU:

Runoff = 0.05 cfs @ 12.15 hrs, Volume= 0.002 af, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.000	98	
*	0.010	69	
	0.010	69	Weighted Average
	0.010	69	100.00% Pervious Area

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

Summary for Subcatchment EXSO:

Runoff = 2.26 cfs @ 12.39 hrs, Volume= 0.197 af, Depth= 2.66"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.006	98	
*	0.884	69	
	0.890	69	Weighted Average
	0.884	69	99.33% Pervious Area
	0.006	98	0.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.1	240	0.0300	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"

Summary for Subcatchment HOU:

Runoff = 5.75 cfs @ 12.14 hrs, Volume= 0.324 af, Depth= 5.33"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.650	98	
*	0.080	69	
	0.730	95	Weighted Average
	0.080	69	10.96% Pervious Area
	0.650	98	89.04% Impervious Area

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

Summary for Subcatchment NE.LEX: Lex. Ave. Entrance Drive

Runoff = 0.65 cfs @ 12.07 hrs, Volume= 0.030 af, Depth= 4.53"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.050	98	
	0.030	69	50-75% Grass cover, Fair, HSG B
	0.080	87	Weighted Average
	0.030	69	37.50% Pervious Area
	0.050	98	62.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	12	0.2500	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.5	36	0.0240	1.13		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.5	48	Total			

Summary for Subcatchment NW.LEX: Lex. Ave. Entrance Drive

Runoff = 1.13 cfs @ 12.06 hrs, Volume= 0.054 af, Depth= 5.41"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

Area (ac)	CN	Description
0.010	69	50-75% Grass cover, Fair, HSG B
0.110	98	Paved parking, HSG B
0.120	96	Weighted Average
0.010	69	8.33% Pervious Area
0.110	98	91.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	33	0.0215	1.06		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	27	0.0108	0.78		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.1	60	Total			

Summary for Subcatchment ROOF:

Runoff = 3.44 cfs @ 12.06 hrs, Volume= 0.165 af, Depth= 5.66"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.350	98	ROOF
	0.350	98	100.00% Impervious Area

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

Summary for Subcatchment S.DRIVE:

Runoff = 1.59 cfs @ 12.10 hrs, Volume= 0.077 af, Depth= 4.60"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.130	98	
*	0.070	69	
	0.200	88	Weighted Average
	0.070	69	35.00% Pervious Area
	0.130	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	19	0.0520	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.2	7	0.0200	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	28	0.0370	1.28		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.1	18	0.0295	3.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.5	72	Total			

Summary for Subcatchment SE.LEX: Lex. Ave. Entrance Drive

Runoff = 0.84 cfs @ 12.14 hrs, Volume= 0.047 af, Depth= 4.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

Area (ac)	CN	Description
0.040	69	50-75% Grass cover, Fair, HSG B
0.080	98	Water Surface, HSG B
0.120	88	Weighted Average
0.040	69	33.33% Pervious Area
0.080	98	66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	43	0.0280	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.4	33	0.0333	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
7.2	76	Total			

Summary for Subcatchment SWLEX:

Runoff = 2.51 cfs @ 12.10 hrs, Volume= 0.120 af, Depth= 4.38"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.190	98	
*	0.140	69	
	0.330	86	Weighted Average
	0.140	69	42.42% Pervious Area
	0.190	98	57.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	11	0.0150	0.06		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	48	0.0225	1.17		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.6	59	Total			

Summary for Subcatchment TCF:

Runoff = 4.65 cfs @ 12.14 hrs, Volume= 0.264 af, Depth= 5.45"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

Area (ac)	CN	Description
0.540	98	Paved parking, HSG C
0.040	69	50-75% Grass cover, Fair, HSG B
0.580	96	Weighted Average
0.040	69	6.90% Pervious Area
0.540	98	93.10% Impervious Area

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

Summary for Subcatchment UNIV: Univ. Ave. Entrance Drive

Runoff = 2.73 cfs @ 12.10 hrs, Volume= 0.127 af, Depth= 4.75"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.250	96	ROADWAY
	0.070	69	50-75% Grass cover, Fair, HSG B
	0.320	90	Weighted Average
	0.320	90	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	15	0.0500	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.3	130	0.0307	1.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	50	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.0	195	Total			

Summary for Subcatchment W.ALDI:

Runoff = 4.21 cfs @ 12.09 hrs, Volume= 0.209 af, Depth= 5.34"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.420	98	
*	0.050	69	
	0.470	95	Weighted Average
	0.050	69	10.64% Pervious Area
	0.420	98	89.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.4	105	0.0187	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.5	118	Total			

Summary for Subcatchment WILD:

Runoff = 13.52 cfs @ 12.22 hrs, Volume= 0.966 af, Depth= 4.98"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	1.750	98	
*	0.470	69	
*	0.110	85	
	2.330	92	Weighted Average
	0.580	72	24.89% Pervious Area
	1.750	98	75.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	58	0.0100	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.6	159	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.4	126	0.0100	5.26	6.46	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.2	54	0.0055	4.41	7.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
14.2	397	Total			

Summary for Reach 2R: Lexington

Inflow Area = 8.360 ac, 64.55% Impervious, Inflow Depth = 4.47" for 100-Year St. Paul event
Inflow = 32.08 cfs @ 12.26 hrs, Volume= 3.116 af
Outflow = 32.08 cfs @ 12.26 hrs, Volume= 3.116 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Pond 51:

Inflow Area = 2.330 ac, 75.11% Impervious, Inflow Depth = 4.98" for 100-Year St. Paul event
Inflow = 13.52 cfs @ 12.22 hrs, Volume= 0.966 af
Outflow = 13.52 cfs @ 12.22 hrs, Volume= 0.966 af, Atten= 0%, Lag= 0.0 min
Primary = 13.52 cfs @ 12.22 hrs, Volume= 0.966 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 887.32' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**18.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=13.26 cfs @ 12.22 hrs HW=887.23' (Free Discharge)
1=Culvert (Inlet Controls 13.26 cfs @ 7.51 fps)

Summary for Pond 52:

Inflow Area = 0.730 ac, 89.04% Impervious, Inflow Depth = 5.33" for 100-Year St. Paul event
Inflow = 5.75 cfs @ 12.14 hrs, Volume= 0.324 af
Outflow = 5.75 cfs @ 12.14 hrs, Volume= 0.324 af, Atten= 0%, Lag= 0.0 min
Primary = 5.75 cfs @ 12.14 hrs, Volume= 0.324 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 885.85' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**15.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=5.56 cfs @ 12.14 hrs HW=885.80' (Free Discharge)
1=Culvert (Barrel Controls 5.56 cfs @ 4.53 fps)

Summary for Pond 61: Stub-61

Inflow Area = 0.580 ac, 93.10% Impervious, Inflow Depth = 5.45" for 100-Year St. Paul event
Inflow = 4.65 cfs @ 12.14 hrs, Volume= 0.264 af
Outflow = 4.65 cfs @ 12.14 hrs, Volume= 0.264 af, Atten= 0%, Lag= 0.0 min
Primary = 4.65 cfs @ 12.14 hrs, Volume= 0.264 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 887.03' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.11'	**12.0" Round Culvert** L= 22.0' Ke= 0.900 Inlet / Outlet Invert= 884.11' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=4.51 cfs @ 12.14 hrs HW=886.89' (Free Discharge)
1=Culvert (Inlet Controls 4.51 cfs @ 5.74 fps)

Summary for Pond 108": (new Pond)

Inflow Area = 1.050 ac, 50.48% Impervious, Inflow Depth = 4.16" for 100-Year St. Paul event
Inflow = 5.15 cfs @ 12.23 hrs, Volume= 0.364 af
Outflow = 1.41 cfs @ 12.60 hrs, Volume= 0.360 af, Atten= 73%, Lag= 22.2 min
Primary = 1.41 cfs @ 12.60 hrs, Volume= 0.360 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 889.77' @ 12.60 hrs Surf.Area= 0.023 ac Storage= 0.137 af

Plug-Flow detention time= 61.9 min calculated for 0.360 af (99% of inflow)
Center-of-Mass det. time= 53.9 min (827.0 - 773.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	880.50'	0.056 af	**15.00'W x 66.00'L x 10.00'H Field A** 0.227 af Overall - 0.088 af Embedded = 0.140 af x 40.0% Voids
#2A	881.00'	0.088 af	**CMP Round 108** x 3 Inside #1 Effective Size= 108.0"W x 108.0"H => 63.62 sf x 20.00'L = 1,272.3 cf Overall Size= 108.0"W x 108.0"H x 20.00'L
		0.143 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	881.00'	**24.0" Round Culvert** L= 11.0' Ke= 0.500 Inlet / Outlet Invert= 881.00' / 881.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	881.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	889.50'	**0.5' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=1.40 cfs @ 12.60 hrs HW=889.77' (Free Discharge)
└**1=Culvert** (Passes 1.40 cfs of 42.16 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.23 cfs @ 14.12 fps)
  └**3=Broad-Crested Rectangular Weir** (Weir Controls 0.17 cfs @ 1.25 fps)

Summary for Pond 110:

Inflow Area = 1.460 ac, 85.62% Impervious, Inflow Depth = 5.23" for 100-Year St. Paul event
Inflow = 9.79 cfs @ 12.09 hrs, Volume= 0.636 af
Outflow = 9.79 cfs @ 12.09 hrs, Volume= 0.636 af, Atten= 0%, Lag= 0.0 min
Primary = 9.79 cfs @ 12.09 hrs, Volume= 0.636 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 888.68' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.11'	**15.0" Round Culvert** L= 86.0' Ke= 0.500 Inlet / Outlet Invert= 885.11' / 884.00' S= 0.0129 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=9.45 cfs @ 12.09 hrs HW=888.48' (Free Discharge)
└**1=Culvert** (Barrel Controls 9.45 cfs @ 7.70 fps)

Summary for Pond 120:

Inflow Area = 0.890 ac, 93.26% Impervious, Inflow Depth = 5.46" for 100-Year St. Paul event
Inflow = 8.03 cfs @ 12.08 hrs, Volume= 0.405 af
Outflow = 8.03 cfs @ 12.08 hrs, Volume= 0.405 af, Atten= 0%, Lag= 0.0 min
Primary = 8.03 cfs @ 12.08 hrs, Volume= 0.405 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 889.34' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.90'	**15.0" Round Culvert** L= 132.0' Ke= 0.500 Inlet / Outlet Invert= 885.90' / 885.11' S= 0.0060 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=7.56 cfs @ 12.08 hrs HW=889.06' (Free Discharge)
1=Culvert (Barrel Controls 7.56 cfs @ 6.16 fps)

Summary for Pond 130:

Inflow Area = 0.420 ac, 97.62% Impervious, Inflow Depth = 5.59" for 100-Year St. Paul event
Inflow = 3.99 cfs @ 12.06 hrs, Volume= 0.196 af
Outflow = 3.99 cfs @ 12.06 hrs, Volume= 0.196 af, Atten= 0%, Lag= 0.0 min
Primary = 3.99 cfs @ 12.06 hrs, Volume= 0.196 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 888.54' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	886.78'	**12.0" Round Culvert** L= 68.0' Ke= 0.500 Inlet / Outlet Invert= 886.78' / 886.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=3.81 cfs @ 12.06 hrs HW=888.43' (Free Discharge)
1=Culvert (Barrel Controls 3.81 cfs @ 4.85 fps)

Summary for Pond 140:

Inflow Area = 0.070 ac, 85.71% Impervious, Inflow Depth = 5.23" for 100-Year St. Paul event
Inflow = 0.63 cfs @ 12.09 hrs, Volume= 0.031 af
Outflow = 0.63 cfs @ 12.09 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min
Primary = 0.63 cfs @ 12.09 hrs, Volume= 0.031 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 887.63' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	887.11'	**12.0" Round Culvert** L= 108.0' Ke= 0.500 Inlet / Outlet Invert= 887.11' / 886.78' S= 0.0031 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.60 cfs @ 12.09 hrs HW=887.61' (Free Discharge)
1=Culvert (Barrel Controls 0.60 cfs @ 2.22 fps)

Summary for Pond CB31:

Inflow Area = 0.080 ac, 62.50% Impervious, Inflow Depth = 4.53" for 100-Year St. Paul event
Inflow = 0.65 cfs @ 12.07 hrs, Volume= 0.030 af
Outflow = 0.65 cfs @ 12.07 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min
Primary = 0.65 cfs @ 12.07 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 884.67' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.23'	**12.0" Round Culvert** L= 23.0' Ke= 0.500 Inlet / Outlet Invert= 884.23' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.62 cfs @ 12.07 hrs HW=884.66' (Free Discharge)
1=Culvert (Barrel Controls 0.62 cfs @ 2.87 fps)

Summary for Pond CB41:

Inflow Area = 0.120 ac, 91.67% Impervious, Inflow Depth = 5.41" for 100-Year St. Paul event
Inflow = 1.13 cfs @ 12.06 hrs, Volume= 0.054 af
Outflow = 1.13 cfs @ 12.06 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min
Primary = 1.13 cfs @ 12.06 hrs, Volume= 0.054 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 884.80' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.19'	**12.0" Round Culvert** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 884.19' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.08 cfs @ 12.06 hrs HW=884.79' (Free Discharge)
1=Culvert (Barrel Controls 1.08 cfs @ 3.18 fps)

Summary for Pond SYS: (new Pond)

Inflow Area = 7.460 ac, 72.25% Impervious, Inflow Depth = 4.93" for 100-Year St. Paul event
Inflow = 39.07 cfs @ 12.11 hrs, Volume= 3.063 af
Outflow = 30.34 cfs @ 12.26 hrs, Volume= 3.063 af, Atten= 22%, Lag= 8.5 min
Discarded = 0.06 cfs @ 12.20 hrs, Volume= 0.146 af
Primary = 30.29 cfs @ 12.26 hrs, Volume= 2.917 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 886.79' @ 12.26 hrs Surf.Area= 9,623 sf Storage= 34,839 cf

Plug-Flow detention time= 57.4 min calculated for 3.063 af (100% of inflow)
Center-of-Mass det. time= 57.0 min (819.9 - 762.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	880.50'	9,122 cf	**18.50'W x 316.00'L x 6.00'H Field A** 35,076 cf Overall - 12,272 cf Embedded = 22,804 cf x 40.0% Voids
#2A	881.00'	12,272 cf	**CMP Round 60** x 30 Inside #1 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L 30 Chambers in 2 Rows 12.50' Header x 19.63 sf x 2 = 490.9 cf Inside
#3B	880.50'	5,620 cf	**18.50'W x 196.00'L x 6.00'H Field B** 21,756 cf Overall - 7,707 cf Embedded = 14,049 cf x 40.0% Voids
#4B	881.00'	7,707 cf	**CMP Round 60** x 18 Inside #3 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L Row Length Adjustment= +10.00' x 19.63 sf x 2 rows 12.50' Header x 19.63 sf x 1 = 245.4 cf Inside
#5	886.00'	25 cf	**4.00'D x 2.00'H CBMH-30**
#6	886.00'	29 cf	**4.00'D x 2.29'H CBMH-31**
#7	886.00'	35 cf	**4.00'D x 2.82'H CBMH-40**
#8	886.00'	40 cf	**4.00'D x 3.18'H CBMH-41**
#9	886.00'	57 cf	**4.00'D x 4.50'H CBMH-50**
#10	886.00'	59 cf	**4.00'D x 4.70'H CBMH-51**
#11	886.00'	60 cf	**4.00'D x 4.80'H CBMH-52**
#12	886.00'	62 cf	**4.00'D x 4.95'H CBMH-60**
#13	886.00'	60 cf	**4.00'D x 4.75'H CBMH-70**
#14	886.00'	66 cf	**4.00'D x 5.26'H CBMH-80**
#15	886.00'	59 cf	**4.00'D x 4.70'H CBMH-90**
#16	886.00'	62 cf	**4.00'D x 4.92'H CBMH-100**
#17	888.33'	8,117 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		43,451 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
888.33	15	0	0
888.50	345	31	31
889.00	3,000	836	867
889.50	7,000	2,500	3,367
890.00	12,000	4,750	8,117

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.50'	**0.250 in/hr Exfiltration over Surface area**
#2	Primary	879.31'	**24.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 879.31' / 878.81' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Device 2	881.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	881.00'	**8.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#5	Device 2	885.80'	**7.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00

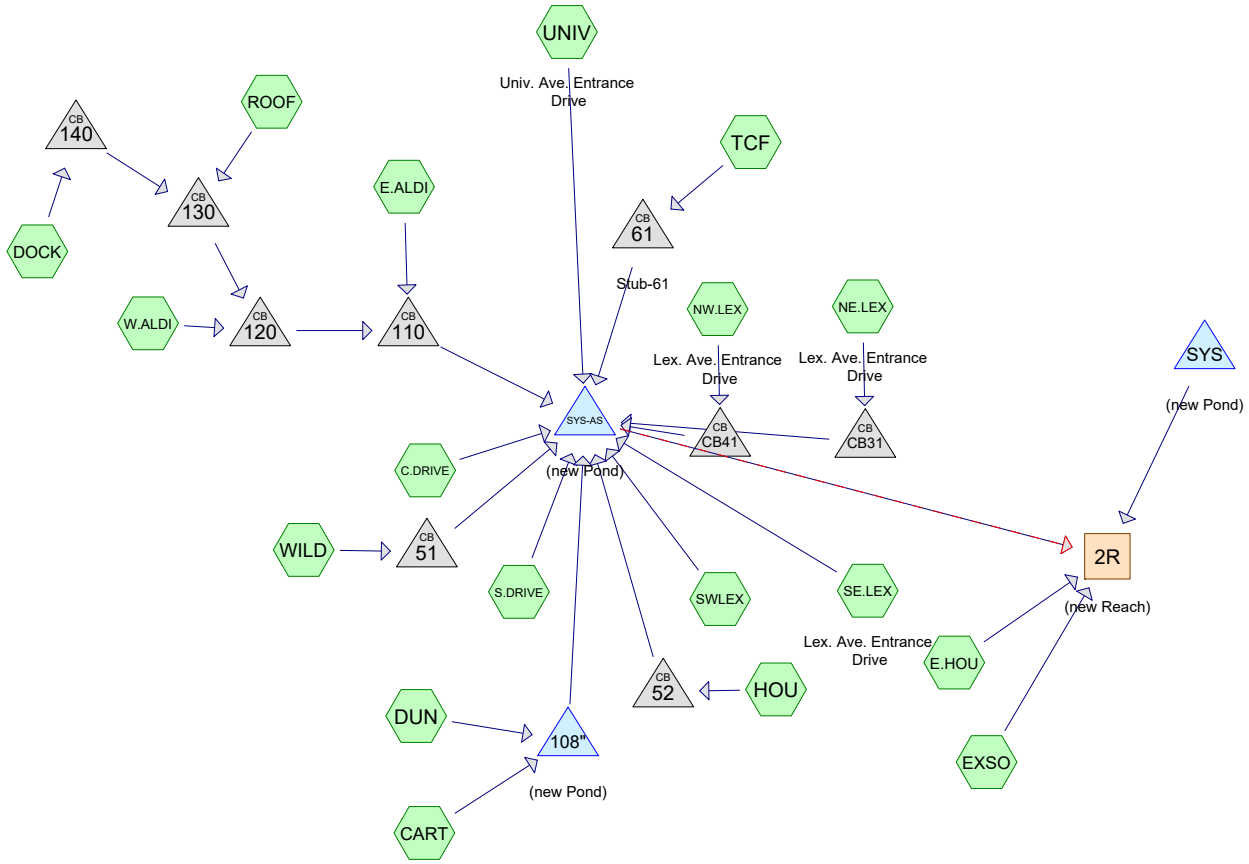
Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

#6 Secondary 888.40' **5.0' long x 5.0' breadth Broad-Crested Rectangular Weir**
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.06 cfs @ 12.20 hrs HW=886.17' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=28.58 cfs @ 12.26 hrs HW=886.73' (Free Discharge)
└─**2=Culvert** (Passes 28.58 cfs of 38.34 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 2.21 cfs @ 11.28 fps)
  ├─**4=Orifice/Grate** (Orifice Controls 7.81 cfs @ 11.19 fps)
  └─**5=Broad-Crested Rectangular Weir** (Weir Controls 18.55 cfs @ 2.84 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=880.50' (Free Discharge)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)



Subcat Reach Pond Link

Routing Diagram for 19114-overall ex asbuilt cr

Prepared by {enter your company name here}, Printed 12/9/2020

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.316	98	(C.DRIVE, CART, DOCK, DUN, E.ALDI, EXSO, HOU, NE.LEX, S.DRIVE, SWLEX, W.ALDI, WILD)
2.414	69	(C.DRIVE, CART, DOCK, DUN, E.ALDI, E.HOU, EXSO, HOU, S.DRIVE, SWLEX, W.ALDI, WILD)
0.110	85	(WILD)
0.190	69	50-75% Grass cover, Fair, HSG B (NE.LEX, NW.LEX, SE.LEX, TCF, UNIV)
0.110	98	Paved parking, HSG B (NW.LEX)
0.540	98	Paved parking, HSG C (TCF)
0.250	96	ROADWAY (UNIV)
0.350	98	ROOF (ROOF)
0.080	98	Water Surface, HSG B (SE.LEX)

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	CART	0.00	0.00	172.0	0.0100	0.013	0.0	12.0	0.0
2	DUN	0.00	0.00	166.0	0.0200	0.013	0.0	12.0	0.0
3	WILD	0.00	0.00	159.0	0.0100	0.013	0.0	12.0	0.0
4	WILD	0.00	0.00	126.0	0.0100	0.013	0.0	15.0	0.0
5	WILD	0.00	0.00	54.0	0.0055	0.013	0.0	18.0	0.0
6	51	884.05	884.00	10.0	0.0050	0.013	0.0	18.0	0.0
7	52	884.05	884.00	10.0	0.0050	0.013	0.0	15.0	0.0
8	61	884.11	884.00	22.0	0.0050	0.013	0.0	12.0	0.0
9	108"	882.45	882.15	20.0	0.0150	0.013	0.0	24.0	0.0
10	110	885.11	884.00	86.0	0.0129	0.013	0.0	15.0	0.0
11	120	885.90	885.11	132.0	0.0060	0.013	0.0	15.0	0.0
12	130	886.78	886.10	68.0	0.0100	0.013	0.0	12.0	0.0
13	140	887.11	886.78	108.0	0.0031	0.013	0.0	12.0	0.0
14	CB31	884.23	884.00	23.0	0.0100	0.013	0.0	12.0	0.0
15	CB41	884.19	884.00	19.0	0.0100	0.013	0.0	12.0	0.0
16	SYS	880.39	879.47	50.0	0.0184	0.013	0.0	24.0	0.0
17	SYS-AS	880.39	879.47	50.0	0.0184	0.013	0.0	12.0	0.0

Summary for Subcatchment C.DRIVE:

Runoff = 0.51 cfs @ 12.10 hrs, Volume= 0.025 af, Depth= 2.15"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.110	98	
*	0.030	69	
	0.140	92	Weighted Average
	0.030	69	21.43% Pervious Area
	0.110	98	78.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	13	0.0200	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.1	5	0.0200	0.71		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	34	0.0170	0.97		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.2	36	0.0195	2.83		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.9	88	Total			

Summary for Subcatchment CART:

Runoff = 1.27 cfs @ 12.23 hrs, Volume= 0.093 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.340	98	
*	0.420	69	
	0.760	82	Weighted Average
	0.420	69	55.26% Pervious Area
	0.340	98	44.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	156	0.0615	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.3	93	0.1150	5.09		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.6	172	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.8	421	Total			

Summary for Subcatchment DOCK:

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 0.013 af, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.060	98	
*	0.010	69	
	0.070	94	Weighted Average
	0.010	69	14.29% Pervious Area
	0.060	98	85.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	85	0.0400	1.65		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.0	98	Total			

Summary for Subcatchment DUN:

Runoff = 0.64 cfs @ 12.22 hrs, Volume= 0.046 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.190	98	
*	0.100	69	
	0.290	88	Weighted Average
	0.100	69	34.48% Pervious Area
	0.190	98	65.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	150	0.0700	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	137	0.0310	2.64		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	166	0.0200	6.42	5.04	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.1	453	Total			

Summary for Subcatchment E.ALDI:

Runoff = 1.32 cfs @ 12.23 hrs, Volume= 0.097 af, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.420	98	
*	0.150	69	
	0.570	90	Weighted Average
	0.150	69	26.32% Pervious Area
	0.420	98	73.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	115	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	100	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
15.2	215	Total			

Summary for Subcatchment E.HOU:

Runoff = 0.01 cfs @ 12.16 hrs, Volume= 0.000 af, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.000	98	
*	0.010	69	
	0.010	69	Weighted Average
	0.010	69	100.00% Pervious Area

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

Summary for Subcatchment EXSO:

Runoff = 0.42 cfs @ 12.43 hrs, Volume= 0.043 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.006	98	
*	0.884	69	
	0.890	69	Weighted Average
	0.884	69	99.33% Pervious Area
	0.006	98	0.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.1	240	0.0300	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"

Summary for Subcatchment HOU:

Runoff = 2.60 cfs @ 12.14 hrs, Volume= 0.144 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.650	98	
*	0.080	69	
	0.730	95	Weighted Average
	0.080	69	10.96% Pervious Area
	0.650	98	89.04% Impervious Area

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

Summary for Subcatchment NE.LEX: Lex. Ave. Entrance Drive

Runoff = 0.26 cfs @ 12.07 hrs, Volume= 0.012 af, Depth= 1.83"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.050	98	
	0.030	69	50-75% Grass cover, Fair, HSG B
	0.080	87	Weighted Average
	0.030	69	37.50% Pervious Area
	0.050	98	62.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	12	0.2500	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.5	36	0.0240	1.13		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.5	48	Total			

Summary for Subcatchment NW.LEX: Lex. Ave. Entrance Drive

Runoff = 0.52 cfs @ 12.06 hrs, Volume= 0.024 af, Depth= 2.41"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

Area (ac)	CN	Description
0.010	69	50-75% Grass cover, Fair, HSG B
0.110	98	Paved parking, HSG B
0.120	96	Weighted Average
0.010	69	8.33% Pervious Area
0.110	98	91.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	33	0.0215	1.06		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	27	0.0108	0.78		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.1	60	Total			

Summary for Subcatchment ROOF:

Runoff = 1.62 cfs @ 12.06 hrs, Volume= 0.075 af, Depth= 2.58"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.350	98	ROOF
	0.350	98	100.00% Impervious Area

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

Summary for Subcatchment S.DRIVE:

Runoff = 0.65 cfs @ 12.10 hrs, Volume= 0.031 af, Depth= 1.88"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

Area (ac)	CN	Description
* 0.130	98	
* 0.070	69	
0.200	88	Weighted Average
0.070	69	35.00% Pervious Area
0.130	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	19	0.0520	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.2	7	0.0200	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	28	0.0370	1.28		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.1	18	0.0295	3.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.5	72	Total			

Summary for Subcatchment SE.LEX: Lex. Ave. Entrance Drive

Runoff = 0.34 cfs @ 12.14 hrs, Volume= 0.019 af, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

Area (ac)	CN	Description
0.040	69	50-75% Grass cover, Fair, HSG B
0.080	98	Water Surface, HSG B
0.120	88	Weighted Average
0.040	69	33.33% Pervious Area
0.080	98	66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	43	0.0280	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.4	33	0.0333	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
7.2	76	Total			

Summary for Subcatchment SWLEX:

Runoff = 0.98 cfs @ 12.10 hrs, Volume= 0.047 af, Depth= 1.73"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.190	98	
*	0.140	69	
	0.330	86	Weighted Average
	0.140	69	42.42% Pervious Area
	0.190	98	57.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	11	0.0150	0.06		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	48	0.0225	1.17		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.6	59	Total			

Summary for Subcatchment TCF:

Runoff = 2.14 cfs @ 12.14 hrs, Volume= 0.118 af, Depth= 2.44"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

Area (ac)	CN	Description
0.540	98	Paved parking, HSG C
0.040	69	50-75% Grass cover, Fair, HSG B
0.580	96	Weighted Average
0.040	69	6.90% Pervious Area
0.540	98	93.10% Impervious Area

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

Summary for Subcatchment UNIV: Univ. Ave. Entrance Drive

Runoff = 1.10 cfs @ 12.10 hrs, Volume= 0.048 af, Depth= 1.81"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.250	96	ROADWAY
	0.070	69	50-75% Grass cover, Fair, HSG B
	0.320	90	Weighted Average
	0.320	90	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	15	0.0500	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.3	130	0.0307	1.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	50	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.0	195	Total			

Summary for Subcatchment W.ALDI:

Runoff = 1.91 cfs @ 12.09 hrs, Volume= 0.093 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	0.420	98	
*	0.050	69	
	0.470	95	Weighted Average
	0.050	69	10.64% Pervious Area
	0.420	98	89.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.4	105	0.0187	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.5	118	Total			

Summary for Subcatchment WILD:

Runoff = 5.78 cfs @ 12.22 hrs, Volume= 0.410 af, Depth= 2.11"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.81"

	Area (ac)	CN	Description
*	1.750	98	
*	0.470	69	
*	0.110	85	
	2.330	92	Weighted Average
	0.580	72	24.89% Pervious Area
	1.750	98	75.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	58	0.0100	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.6	159	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.4	126	0.0100	5.26	6.46	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.2	54	0.0055	4.41	7.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
14.2	397	Total			

Summary for Reach 2R: (new Reach)

Inflow Area = 8.360 ac, 64.55% Impervious, Inflow Depth = 1.76" for 2-Year event
Inflow = 6.50 cfs @ 12.44 hrs, Volume= 1.223 af
Outflow = 6.50 cfs @ 12.44 hrs, Volume= 1.223 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Pond 51:

Inflow Area = 2.330 ac, 75.11% Impervious, Inflow Depth = 2.11" for 2-Year event
Inflow = 5.78 cfs @ 12.22 hrs, Volume= 0.410 af
Outflow = 5.78 cfs @ 12.22 hrs, Volume= 0.410 af, Atten= 0%, Lag= 0.0 min
Primary = 5.78 cfs @ 12.22 hrs, Volume= 0.410 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 885.55' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**18.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=5.67 cfs @ 12.22 hrs HW=885.53' (Free Discharge)
1=Culvert (Barrel Controls 5.67 cfs @ 4.05 fps)

Summary for Pond 52:

Inflow Area = 0.730 ac, 89.04% Impervious, Inflow Depth = 2.36" for 2-Year event
Inflow = 2.60 cfs @ 12.14 hrs, Volume= 0.144 af
Outflow = 2.60 cfs @ 12.14 hrs, Volume= 0.144 af, Atten= 0%, Lag= 0.0 min
Primary = 2.60 cfs @ 12.14 hrs, Volume= 0.144 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 885.05' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**15.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=2.52 cfs @ 12.14 hrs HW=885.03' (Free Discharge)
1=Culvert (Barrel Controls 2.52 cfs @ 3.34 fps)

Summary for Pond 61: Stub-61

Inflow Area = 0.580 ac, 93.10% Impervious, Inflow Depth = 2.44" for 2-Year event
Inflow = 2.14 cfs @ 12.14 hrs, Volume= 0.118 af
Outflow = 2.14 cfs @ 12.14 hrs, Volume= 0.118 af, Atten= 0%, Lag= 0.0 min
Primary = 2.14 cfs @ 12.14 hrs, Volume= 0.118 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 885.18' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.11'	**12.0" Round Culvert** L= 22.0' Ke= 0.900 Inlet / Outlet Invert= 884.11' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=2.07 cfs @ 12.14 hrs HW=885.16' (Free Discharge)
1=Culvert (Barrel Controls 2.07 cfs @ 3.14 fps)

Summary for Pond 108": (new Pond)

Inflow Area = 1.050 ac, 50.48% Impervious, Inflow Depth = 1.58" for 2-Year event
Inflow = 1.90 cfs @ 12.23 hrs, Volume= 0.139 af
Outflow = 0.68 cfs @ 12.52 hrs, Volume= 0.125 af, Atten= 64%, Lag= 17.7 min
Primary = 0.68 cfs @ 12.52 hrs, Volume= 0.125 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 885.07' @ 12.52 hrs Surf.Area= 0.021 ac Storage= 0.052 af

Plug-Flow detention time= 96.4 min calculated for 0.125 af (90% of inflow)
Center-of-Mass det. time= 52.5 min (831.6 - 779.1)

Volume	Invert	Avail.Storage	Storage Description
#1	881.45'	0.088 af	**108.0" Round Pipe Storage** Inside #2 L= 60.0' S= 0.0123 '/'
#2	881.00'	0.052 af	**14.00'W x 66.00'L x 10.25'H Prismatoid** 0.217 af Overall - 0.088 af Embedded = 0.130 af x 40.0% Voids
		0.140 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	882.45'	**24.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 882.45' / 882.15' S= 0.0150 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	882.30'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	890.79'	**0.5' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.68 cfs @ 12.52 hrs HW=885.06' (Free Discharge)
└**1=Culvert** (Passes 0.68 cfs of 18.67 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.68 cfs @ 7.76 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 110:

Inflow Area = 1.460 ac, 85.62% Impervious, Inflow Depth = 2.29" for 2-Year event
Inflow = 4.43 cfs @ 12.09 hrs, Volume= 0.279 af
Outflow = 4.43 cfs @ 12.09 hrs, Volume= 0.279 af, Atten= 0%, Lag= 0.0 min
Primary = 4.43 cfs @ 12.09 hrs, Volume= 0.279 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 886.28' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.11'	**15.0" Round Culvert** L= 86.0' Ke= 0.500 Inlet / Outlet Invert= 885.11' / 884.00' S= 0.0129 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=4.27 cfs @ 12.09 hrs HW=886.25' (Free Discharge)
└**1=Culvert** (Inlet Controls 4.27 cfs @ 3.64 fps)

Summary for Pond 120:

Inflow Area = 0.890 ac, 93.26% Impervious, Inflow Depth = 2.44" for 2-Year event
Inflow = 3.69 cfs @ 12.08 hrs, Volume= 0.181 af
Outflow = 3.69 cfs @ 12.08 hrs, Volume= 0.181 af, Atten= 0%, Lag= 0.0 min
Primary = 3.69 cfs @ 12.08 hrs, Volume= 0.181 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Peak Elev= 887.03' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.90'	**15.0" Round Culvert** L= 132.0' Ke= 0.500 Inlet / Outlet Invert= 885.90' / 885.11' S= 0.0060 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=3.48 cfs @ 12.08 hrs HW=886.99' (Free Discharge)
└**1=Culvert** (Barrel Controls 3.48 cfs @ 4.11 fps)

Summary for Pond 130:

Inflow Area = 0.420 ac, 97.62% Impervious, Inflow Depth = 2.53" for 2-Year event
Inflow = 1.86 cfs @ 12.06 hrs, Volume= 0.089 af
Outflow = 1.86 cfs @ 12.06 hrs, Volume= 0.089 af, Atten= 0%, Lag= 0.0 min
Primary = 1.86 cfs @ 12.06 hrs, Volume= 0.089 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 887.54' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	886.78'	**12.0" Round Culvert** L= 68.0' Ke= 0.500 Inlet / Outlet Invert= 886.78' / 886.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.78 cfs @ 12.06 hrs HW=887.52' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.78 cfs @ 4.00 fps)

Summary for Pond 140:

Inflow Area = 0.070 ac, 85.71% Impervious, Inflow Depth = 2.29" for 2-Year event
Inflow = 0.28 cfs @ 12.09 hrs, Volume= 0.013 af
Outflow = 0.28 cfs @ 12.09 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.0 min
Primary = 0.28 cfs @ 12.09 hrs, Volume= 0.013 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 887.45' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	887.11'	**12.0" Round Culvert** L= 108.0' Ke= 0.500 Inlet / Outlet Invert= 887.11' / 886.78' S= 0.0031 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.27 cfs @ 12.09 hrs HW=887.44' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.27 cfs @ 1.77 fps)

Summary for Pond CB31:

Inflow Area = 0.080 ac, 62.50% Impervious, Inflow Depth = 1.83" for 2-Year event
Inflow = 0.26 cfs @ 12.07 hrs, Volume= 0.012 af
Outflow = 0.26 cfs @ 12.07 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min
Primary = 0.26 cfs @ 12.07 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 884.50' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.23'	**12.0" Round Culvert** L= 23.0' Ke= 0.500 Inlet / Outlet Invert= 884.23' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.25 cfs @ 12.07 hrs HW=884.49' (Free Discharge)
1=Culvert (Barrel Controls 0.25 cfs @ 2.33 fps)

Summary for Pond CB41:

Inflow Area = 0.120 ac, 91.67% Impervious, Inflow Depth = 2.41" for 2-Year event
Inflow = 0.52 cfs @ 12.06 hrs, Volume= 0.024 af
Outflow = 0.52 cfs @ 12.06 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min
Primary = 0.52 cfs @ 12.06 hrs, Volume= 0.024 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 884.58' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.19'	**12.0" Round Culvert** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 884.19' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.49 cfs @ 12.06 hrs HW=884.57' (Free Discharge)
1=Culvert (Barrel Controls 0.49 cfs @ 2.68 fps)

Summary for Pond SYS: (new Pond)

Volume	Invert	Avail.Storage	Storage Description
#1A	880.75'	0.209 af	**18.50'W x 316.00'L x 6.00'H Field A** 0.805 af Overall - 0.282 af Embedded = 0.524 af x 40.0% Voids
#2A	881.25'	0.282 af	**CMP Round 60** x 30 Inside #1 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L 30 Chambers in 2 Rows 12.50' Header x 19.63 sf x 2 = 490.9 cf Inside
#3B	880.75'	0.129 af	**18.50'W x 196.00'L x 6.00'H Field B** 0.499 af Overall - 0.177 af Embedded = 0.323 af x 40.0% Voids
#4B	881.25'	0.177 af	**CMP Round 60** x 18 Inside #3 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L Row Length Adjustment= +10.00' x 19.63 sf x 2 rows 12.50' Header x 19.63 sf x 1 = 245.4 cf Inside
#5	886.25'	0.001 af	**4.00'D x 2.00'H CBMH-30**
#6	886.25'	0.001 af	**4.00'D x 2.29'H CBMH-31**
#7	886.25'	0.001 af	**4.00'D x 2.82'H CBMH-40**
#8	886.25'	0.001 af	**4.00'D x 3.18'H CBMH-41**
#9	886.25'	0.001 af	**4.00'D x 4.50'H CBMH-50**
#10	886.25'	0.001 af	**4.00'D x 4.70'H CBMH-51**
#11	886.25'	0.001 af	**4.00'D x 4.80'H CBMH-52**
#12	886.25'	0.001 af	**4.00'D x 4.95'H CBMH-60**
#13	886.25'	0.001 af	**4.00'D x 4.75'H CBMH-70**
#14	886.25'	0.002 af	**4.00'D x 5.26'H CBMH-80**
#15	886.25'	0.001 af	**4.00'D x 4.70'H CBMH-90**
#16	886.25'	0.001 af	**4.00'D x 4.92'H CBMH-100**
		0.811 af	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.75'	**0.250 in/hr Exfiltration over Surface area**
#2	Primary	880.39'	**24.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 880.39' / 879.47' S= 0.0184 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Device 2	881.25'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	881.25'	**8.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#5	Device 2	886.05'	**7.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
└**1=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  ├**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond SYS-AS: (new Pond)

Inflow Area = 7.460 ac, 72.25% Impervious, Inflow Depth = 2.06" for 2-Year event
Inflow = 17.06 cfs @ 12.12 hrs, Volume= 1.282 af
Outflow = 6.13 cfs @ 12.44 hrs, Volume= 1.282 af, Atten= 64%, Lag= 19.2 min
Discarded = 0.05 cfs @ 6.25 hrs, Volume= 0.103 af
Primary = 6.08 cfs @ 12.44 hrs, Volume= 1.179 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 883.47' @ 12.44 hrs Surf.Area= 9,472 sf Storage= 15,463 cf

Plug-Flow detention time= 43.5 min calculated for 1.281 af (100% of inflow)
Center-of-Mass det. time= 43.8 min (813.9 - 770.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	880.75'	9,122 cf	**18.50'W x 316.00'L x 6.00'H Field A** 35,076 cf Overall - 12,272 cf Embedded = 22,804 cf x 40.0% Voids
#2A	881.25'	12,272 cf	**CMP Round 60** x 30 Inside #1 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L 30 Chambers in 2 Rows 12.50' Header x 19.63 sf x 2 = 490.9 cf Inside
#3B	880.75'	5,620 cf	**18.50'W x 196.00'L x 6.00'H Field B** 21,756 cf Overall - 7,707 cf Embedded = 14,049 cf x 40.0% Voids
#4B	881.25'	7,707 cf	**CMP Round 60** x 18 Inside #3 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L Row Length Adjustment= +10.00' x 19.63 sf x 2 rows 12.50' Header x 19.63 sf x 1 = 245.4 cf Inside
#5	886.25'	25 cf	**4.00'D x 2.00'H CBMH-30**
#6	886.25'	29 cf	**4.00'D x 2.29'H CBMH-31**
#7	886.25'	35 cf	**4.00'D x 2.82'H CBMH-40**
#8	886.25'	40 cf	**4.00'D x 3.18'H CBMH-41**
#9	886.25'	57 cf	**4.00'D x 4.50'H CBMH-50**
#10	886.25'	59 cf	**4.00'D x 4.70'H CBMH-51**
#11	886.25'	60 cf	**4.00'D x 4.80'H CBMH-52**
#12	886.25'	62 cf	**4.00'D x 4.95'H CBMH-60**
#13	886.25'	60 cf	**4.00'D x 4.75'H CBMH-70**
#14	886.25'	66 cf	**4.00'D x 5.26'H CBMH-80**
#15	886.25'	59 cf	**4.00'D x 4.70'H CBMH-90**
#16	886.25'	62 cf	**4.00'D x 4.92'H CBMH-100**
#17	888.33'	8,117 cf	**Low Road cb (Prismatic)**Listed below (Recalc)
		43,451 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
888.33	15	0	0
888.50	345	31	31
889.00	3,000	836	867
889.50	7,000	2,500	3,367
890.00	12,000	4,750	8,117

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.75'	**0.250 in/hr Exfiltration over Surface area**
#2	Primary	880.39'	**12.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 880.39' / 879.47' S= 0.0184 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	880.89'	**24.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	888.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.05 cfs @ 6.25 hrs HW=880.86' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=6.07 cfs @ 12.44 hrs HW=883.47' (Free Discharge)
↑**2=Culvert** (Inlet Controls 6.07 cfs @ 7.73 fps)
↑**3=Orifice/Grate** (Passes 6.07 cfs of 19.01 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=880.75' (Free Discharge)
↑**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment C.DRIVE:

Runoff = 0.80 cfs @ 12.10 hrs, Volume= 0.040 af, Depth= 3.41"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.110	98	
*	0.030	69	
	0.140	92	Weighted Average
	0.030	69	21.43% Pervious Area
	0.110	98	78.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	13	0.0200	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.1	5	0.0200	0.71		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	34	0.0170	0.97		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.2	36	0.0195	2.83		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.9	88	Total			

Summary for Subcatchment CART:

Runoff = 2.25 cfs @ 12.23 hrs, Volume= 0.161 af, Depth= 2.54"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.340	98	
*	0.420	69	
	0.760	82	Weighted Average
	0.420	69	55.26% Pervious Area
	0.340	98	44.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	156	0.0615	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.3	93	0.1150	5.09		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.6	172	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.8	421	Total			

Summary for Subcatchment DOCK:

Runoff = 0.44 cfs @ 12.09 hrs, Volume= 0.021 af, Depth= 3.59"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.060	98	
*	0.010	69	
	0.070	94	Weighted Average
	0.010	69	14.29% Pervious Area
	0.060	98	85.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	85	0.0400	1.65		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.0	98	Total			

Summary for Subcatchment DUN:

Runoff = 1.05 cfs @ 12.22 hrs, Volume= 0.074 af, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.190	98	
*	0.100	69	
	0.290	88	Weighted Average
	0.100	69	34.48% Pervious Area
	0.190	98	65.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	150	0.0700	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	137	0.0310	2.64		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	166	0.0200	6.42	5.04	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.1	453	Total			

Summary for Subcatchment E.ALDI:

Runoff = 2.11 cfs @ 12.23 hrs, Volume= 0.156 af, Depth= 3.28"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.420	98	
*	0.150	69	
	0.570	90	Weighted Average
	0.150	69	26.32% Pervious Area
	0.420	98	73.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	115	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	100	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
15.2	215	Total			

Summary for Subcatchment E.HOU:

Runoff = 0.02 cfs @ 12.15 hrs, Volume= 0.001 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.000	98	
*	0.010	69	
	0.010	69	Weighted Average
	0.010	69	100.00% Pervious Area

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

Summary for Subcatchment EXSO:

Runoff = 1.16 cfs @ 12.40 hrs, Volume= 0.105 af, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.006	98	
*	0.884	69	
	0.890	69	Weighted Average
	0.884	69	99.33% Pervious Area
	0.006	98	0.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.1	240	0.0300	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"

Summary for Subcatchment HOU:

Runoff = 4.00 cfs @ 12.14 hrs, Volume= 0.223 af, Depth= 3.67"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.650	98	
*	0.080	69	
	0.730	95	Weighted Average
	0.080	69	10.96% Pervious Area
	0.650	98	89.04% Impervious Area

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

Summary for Subcatchment NE.LEX: Lex. Ave. Entrance Drive

Runoff = 0.43 cfs @ 12.07 hrs, Volume= 0.020 af, Depth= 2.99"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.050	98	
	0.030	69	50-75% Grass cover, Fair, HSG B
	0.080	87	Weighted Average
	0.030	69	37.50% Pervious Area
	0.050	98	62.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	12	0.2500	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.5	36	0.0240	1.13		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.5	48	Total			

Summary for Subcatchment NW.LEX: Lex. Ave. Entrance Drive

Runoff = 0.79 cfs @ 12.06 hrs, Volume= 0.037 af, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

Area (ac)	CN	Description
0.010	69	50-75% Grass cover, Fair, HSG B
0.110	98	Paved parking, HSG B
0.120	96	Weighted Average
0.010	69	8.33% Pervious Area
0.110	98	91.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	33	0.0215	1.06		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	27	0.0108	0.78		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.1	60	Total			

Summary for Subcatchment ROOF:

Runoff = 2.43 cfs @ 12.06 hrs, Volume= 0.115 af, Depth= 3.95"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.350	98	ROOF
	0.350	98	100.00% Impervious Area

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

Summary for Subcatchment S.DRIVE:

Runoff = 1.06 cfs @ 12.10 hrs, Volume= 0.051 af, Depth= 3.06"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

Area (ac)	CN	Description
* 0.130	98	
* 0.070	69	
0.200	88	Weighted Average
0.070	69	35.00% Pervious Area
0.130	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	19	0.0520	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.2	7	0.0200	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	28	0.0370	1.28		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.1	18	0.0295	3.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.5	72	Total			

Summary for Subcatchment SE.LEX: Lex. Ave. Entrance Drive

Runoff = 0.56 cfs @ 12.14 hrs, Volume= 0.031 af, Depth= 3.10"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

Area (ac)	CN	Description
0.040	69	50-75% Grass cover, Fair, HSG B
0.080	98	Water Surface, HSG B
0.120	88	Weighted Average
0.040	69	33.33% Pervious Area
0.080	98	66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	43	0.0280	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.4	33	0.0333	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
7.2	76	Total			

Summary for Subcatchment SWLEX:

Runoff = 1.64 cfs @ 12.10 hrs, Volume= 0.079 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.190	98	
*	0.140	69	
	0.330	86	Weighted Average
	0.140	69	42.42% Pervious Area
	0.190	98	57.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	11	0.0150	0.06		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	48	0.0225	1.17		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.6	59	Total			

Summary for Subcatchment TCF:

Runoff = 3.26 cfs @ 12.14 hrs, Volume= 0.183 af, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

Area (ac)	CN	Description
0.540	98	Paved parking, HSG C
0.040	69	50-75% Grass cover, Fair, HSG B
0.580	96	Weighted Average
0.040	69	6.90% Pervious Area
0.540	98	93.10% Impervious Area

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

Summary for Subcatchment UNIV: Univ. Ave. Entrance Drive

Runoff = 1.83 cfs @ 12.10 hrs, Volume= 0.083 af, Depth= 3.10"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.250	96	ROADWAY
	0.070	69	50-75% Grass cover, Fair, HSG B
	0.320	90	Weighted Average
	0.320	90	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	15	0.0500	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.3	130	0.0307	1.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	50	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.0	195	Total			

Summary for Subcatchment W.ALDI:

Runoff = 2.93 cfs @ 12.09 hrs, Volume= 0.144 af, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.420	98	
*	0.050	69	
	0.470	95	Weighted Average
	0.050	69	10.64% Pervious Area
	0.420	98	89.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.4	105	0.0187	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.5	118	Total			

Summary for Subcatchment WILD:

Runoff = 9.18 cfs @ 12.22 hrs, Volume= 0.654 af, Depth= 3.37"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	1.750	98	
*	0.470	69	
*	0.110	85	
	2.330	92	Weighted Average
	0.580	72	24.89% Pervious Area
	1.750	98	75.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	58	0.0100	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.6	159	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.4	126	0.0100	5.26	6.46	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.2	54	0.0055	4.41	7.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
14.2	397	Total			

Summary for Reach 2R: (new Reach)

Inflow Area = 8.360 ac, 64.55% Impervious, Inflow Depth = 2.95" for 10-Year event
Inflow = 8.96 cfs @ 12.43 hrs, Volume= 2.054 af
Outflow = 8.96 cfs @ 12.43 hrs, Volume= 2.054 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Pond 51:

Inflow Area = 2.330 ac, 75.11% Impervious, Inflow Depth = 3.37" for 10-Year event
Inflow = 9.18 cfs @ 12.22 hrs, Volume= 0.654 af
Outflow = 9.18 cfs @ 12.22 hrs, Volume= 0.654 af, Atten= 0%, Lag= 0.0 min
Primary = 9.18 cfs @ 12.22 hrs, Volume= 0.654 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 886.21' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**18.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=9.01 cfs @ 12.22 hrs HW=886.18' (Free Discharge)
1=Culvert (Barrel Controls 9.01 cfs @ 5.10 fps)

Summary for Pond 52:

Inflow Area = 0.730 ac, 89.04% Impervious, Inflow Depth = 3.67" for 10-Year event
Inflow = 4.00 cfs @ 12.14 hrs, Volume= 0.223 af
Outflow = 4.00 cfs @ 12.14 hrs, Volume= 0.223 af, Atten= 0%, Lag= 0.0 min
Primary = 4.00 cfs @ 12.14 hrs, Volume= 0.223 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 885.37' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**15.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=3.87 cfs @ 12.14 hrs HW=885.34' (Free Discharge)
1=Culvert (Barrel Controls 3.87 cfs @ 3.78 fps)

Summary for Pond 61: Stub-61

Inflow Area = 0.580 ac, 93.10% Impervious, Inflow Depth = 3.78" for 10-Year event
Inflow = 3.26 cfs @ 12.14 hrs, Volume= 0.183 af
Outflow = 3.26 cfs @ 12.14 hrs, Volume= 0.183 af, Atten= 0%, Lag= 0.0 min
Primary = 3.26 cfs @ 12.14 hrs, Volume= 0.183 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 885.79' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.11'	**12.0" Round Culvert** L= 22.0' Ke= 0.900 Inlet / Outlet Invert= 884.11' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=3.16 cfs @ 12.14 hrs HW=885.73' (Free Discharge)
1=Culvert (Inlet Controls 3.16 cfs @ 4.02 fps)

Summary for Pond 108": (new Pond)

Inflow Area = 1.050 ac, 50.48% Impervious, Inflow Depth = 2.69" for 10-Year event
Inflow = 3.29 cfs @ 12.23 hrs, Volume= 0.235 af
Outflow = 0.94 cfs @ 12.58 hrs, Volume= 0.221 af, Atten= 71%, Lag= 21.3 min
Primary = 0.94 cfs @ 12.58 hrs, Volume= 0.221 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 887.46' @ 12.58 hrs Surf.Area= 0.021 ac Storage= 0.089 af

Plug-Flow detention time= 85.5 min calculated for 0.221 af (94% of inflow)
Center-of-Mass det. time= 55.8 min (831.8 - 776.0)

Volume	Invert	Avail.Storage	Storage Description
#1	881.45'	0.088 af	**108.0" Round Pipe Storage** Inside #2 L= 60.0' S= 0.0123 '/'
#2	881.00'	0.052 af	**14.00'W x 66.00'L x 10.25'H Prismatoid** 0.217 af Overall - 0.088 af Embedded = 0.130 af x 40.0% Voids
		0.140 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	882.45'	**24.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 882.45' / 882.15' S= 0.0150 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	882.30'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	890.79'	**0.5' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.94 cfs @ 12.58 hrs HW=887.45' (Free Discharge)
└**1=Culvert** (Passes 0.94 cfs of 30.26 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.94 cfs @ 10.75 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 110:

Inflow Area = 1.460 ac, 85.62% Impervious, Inflow Depth = 3.59" for 10-Year event
Inflow = 6.81 cfs @ 12.09 hrs, Volume= 0.436 af
Outflow = 6.81 cfs @ 12.09 hrs, Volume= 0.436 af, Atten= 0%, Lag= 0.0 min
Primary = 6.81 cfs @ 12.09 hrs, Volume= 0.436 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 887.05' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.11'	**15.0" Round Culvert** L= 86.0' Ke= 0.500 Inlet / Outlet Invert= 885.11' / 884.00' S= 0.0129 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=6.56 cfs @ 12.09 hrs HW=886.97' (Free Discharge)
└**1=Culvert** (Inlet Controls 6.56 cfs @ 5.35 fps)

Summary for Pond 120:

Inflow Area = 0.890 ac, 93.26% Impervious, Inflow Depth = 3.78" for 10-Year event
Inflow = 5.62 cfs @ 12.08 hrs, Volume= 0.280 af
Outflow = 5.62 cfs @ 12.08 hrs, Volume= 0.280 af, Atten= 0%, Lag= 0.0 min
Primary = 5.62 cfs @ 12.08 hrs, Volume= 0.280 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Peak Elev= 887.78' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.90'	**15.0" Round Culvert** L= 132.0' Ke= 0.500 Inlet / Outlet Invert= 885.90' / 885.11' S= 0.0060 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=5.16 cfs @ 12.08 hrs HW=887.62' (Free Discharge)
1=Culvert (Barrel Controls 5.16 cfs @ 4.21 fps)

Summary for Pond 130:

Inflow Area = 0.420 ac, 97.62% Impervious, Inflow Depth = 3.89" for 10-Year event
Inflow = 2.81 cfs @ 12.06 hrs, Volume= 0.136 af
Outflow = 2.81 cfs @ 12.06 hrs, Volume= 0.136 af, Atten= 0%, Lag= 0.0 min
Primary = 2.81 cfs @ 12.06 hrs, Volume= 0.136 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 887.82' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	886.78'	**12.0" Round Culvert** L= 68.0' Ke= 0.500 Inlet / Outlet Invert= 886.78' / 886.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=2.68 cfs @ 12.06 hrs HW=887.78' (Free Discharge)
1=Culvert (Inlet Controls 2.68 cfs @ 3.42 fps)

Summary for Pond 140:

Inflow Area = 0.070 ac, 85.71% Impervious, Inflow Depth = 3.59" for 10-Year event
Inflow = 0.44 cfs @ 12.09 hrs, Volume= 0.021 af
Outflow = 0.44 cfs @ 12.09 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min
Primary = 0.44 cfs @ 12.09 hrs, Volume= 0.021 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 887.53' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	887.11'	**12.0" Round Culvert** L= 108.0' Ke= 0.500 Inlet / Outlet Invert= 887.11' / 886.78' S= 0.0031 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.42 cfs @ 12.09 hrs HW=887.52' (Free Discharge)
1=Culvert (Barrel Controls 0.42 cfs @ 2.01 fps)

Summary for Pond CB31:

Inflow Area = 0.080 ac, 62.50% Impervious, Inflow Depth = 2.99" for 10-Year event
Inflow = 0.43 cfs @ 12.07 hrs, Volume= 0.020 af
Outflow = 0.43 cfs @ 12.07 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min
Primary = 0.43 cfs @ 12.07 hrs, Volume= 0.020 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 884.58' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.23'	**12.0" Round Culvert** L= 23.0' Ke= 0.500 Inlet / Outlet Invert= 884.23' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.41 cfs @ 12.07 hrs HW=884.57' (Free Discharge)
1=Culvert (Barrel Controls 0.41 cfs @ 2.62 fps)

Summary for Pond CB41:

Inflow Area = 0.120 ac, 91.67% Impervious, Inflow Depth = 3.74" for 10-Year event
Inflow = 0.79 cfs @ 12.06 hrs, Volume= 0.037 af
Outflow = 0.79 cfs @ 12.06 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min
Primary = 0.79 cfs @ 12.06 hrs, Volume= 0.037 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 884.69' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.19'	**12.0" Round Culvert** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 884.19' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.76 cfs @ 12.06 hrs HW=884.67' (Free Discharge)
1=Culvert (Barrel Controls 0.76 cfs @ 2.94 fps)

Summary for Pond SYS: (new Pond)

Volume	Invert	Avail.Storage	Storage Description
#1A	880.75'	0.209 af	**18.50'W x 316.00'L x 6.00'H Field A** 0.805 af Overall - 0.282 af Embedded = 0.524 af x 40.0% Voids
#2A	881.25'	0.282 af	**CMP Round 60** x 30 Inside #1 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L 30 Chambers in 2 Rows 12.50' Header x 19.63 sf x 2 = 490.9 cf Inside
#3B	880.75'	0.129 af	**18.50'W x 196.00'L x 6.00'H Field B** 0.499 af Overall - 0.177 af Embedded = 0.323 af x 40.0% Voids
#4B	881.25'	0.177 af	**CMP Round 60** x 18 Inside #3 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L Row Length Adjustment= +10.00' x 19.63 sf x 2 rows 12.50' Header x 19.63 sf x 1 = 245.4 cf Inside
#5	886.25'	0.001 af	**4.00'D x 2.00'H CBMH-30**
#6	886.25'	0.001 af	**4.00'D x 2.29'H CBMH-31**
#7	886.25'	0.001 af	**4.00'D x 2.82'H CBMH-40**
#8	886.25'	0.001 af	**4.00'D x 3.18'H CBMH-41**
#9	886.25'	0.001 af	**4.00'D x 4.50'H CBMH-50**
#10	886.25'	0.001 af	**4.00'D x 4.70'H CBMH-51**
#11	886.25'	0.001 af	**4.00'D x 4.80'H CBMH-52**
#12	886.25'	0.001 af	**4.00'D x 4.95'H CBMH-60**
#13	886.25'	0.001 af	**4.00'D x 4.75'H CBMH-70**
#14	886.25'	0.002 af	**4.00'D x 5.26'H CBMH-80**
#15	886.25'	0.001 af	**4.00'D x 4.70'H CBMH-90**
#16	886.25'	0.001 af	**4.00'D x 4.92'H CBMH-100**
		0.811 af	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.75'	**0.250 in/hr Exfiltration over Surface area**
#2	Primary	880.39'	**24.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 880.39' / 879.47' S= 0.0184 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Device 2	881.25'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	881.25'	**8.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#5	Device 2	886.05'	**7.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
└**1=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond SYS-AS: (new Pond)

Inflow Area = 7.460 ac, 72.25% Impervious, Inflow Depth = 3.31" for 10-Year event
Inflow = 26.77 cfs @ 12.11 hrs, Volume= 2.058 af
Outflow = 7.89 cfs @ 12.49 hrs, Volume= 2.058 af, Atten= 71%, Lag= 22.7 min
Discarded = 0.05 cfs @ 4.85 hrs, Volume= 0.110 af
Primary = 7.83 cfs @ 12.49 hrs, Volume= 1.948 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 885.21' @ 12.49 hrs Surf.Area= 9,472 sf Storage= 27,094 cf

Plug-Flow detention time= 46.5 min calculated for 2.058 af (100% of inflow)
Center-of-Mass det. time= 45.8 min (812.0 - 766.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	880.75'	9,122 cf	**18.50'W x 316.00'L x 6.00'H Field A** 35,076 cf Overall - 12,272 cf Embedded = 22,804 cf x 40.0% Voids
#2A	881.25'	12,272 cf	**CMP Round 60** x 30 Inside #1 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L 30 Chambers in 2 Rows 12.50' Header x 19.63 sf x 2 = 490.9 cf Inside
#3B	880.75'	5,620 cf	**18.50'W x 196.00'L x 6.00'H Field B** 21,756 cf Overall - 7,707 cf Embedded = 14,049 cf x 40.0% Voids
#4B	881.25'	7,707 cf	**CMP Round 60** x 18 Inside #3 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L Row Length Adjustment= +10.00' x 19.63 sf x 2 rows 12.50' Header x 19.63 sf x 1 = 245.4 cf Inside
#5	886.25'	25 cf	**4.00'D x 2.00'H CBMH-30**
#6	886.25'	29 cf	**4.00'D x 2.29'H CBMH-31**
#7	886.25'	35 cf	**4.00'D x 2.82'H CBMH-40**
#8	886.25'	40 cf	**4.00'D x 3.18'H CBMH-41**
#9	886.25'	57 cf	**4.00'D x 4.50'H CBMH-50**
#10	886.25'	59 cf	**4.00'D x 4.70'H CBMH-51**
#11	886.25'	60 cf	**4.00'D x 4.80'H CBMH-52**
#12	886.25'	62 cf	**4.00'D x 4.95'H CBMH-60**
#13	886.25'	60 cf	**4.00'D x 4.75'H CBMH-70**
#14	886.25'	66 cf	**4.00'D x 5.26'H CBMH-80**
#15	886.25'	59 cf	**4.00'D x 4.70'H CBMH-90**
#16	886.25'	62 cf	**4.00'D x 4.92'H CBMH-100**
#17	888.33'	8,117 cf	**Low Road cb (Prismatic)**Listed below (Recalc)
		43,451 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
888.33	15	0	0
888.50	345	31	31
889.00	3,000	836	867
889.50	7,000	2,500	3,367
890.00	12,000	4,750	8,117

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.75'	**0.250 in/hr Exfiltration over Surface area**
#2	Primary	880.39'	**12.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 880.39' / 879.47' S= 0.0184 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	880.89'	**24.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	888.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.05 cfs @ 4.85 hrs HW=880.86' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=7.83 cfs @ 12.49 hrs HW=885.21' (Free Discharge)
└**2=Culvert** (Barrel Controls 7.83 cfs @ 9.97 fps)
└**3=Orifice/Grate** (Passes 7.83 cfs of 27.56 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=880.75' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment C.DRIVE:

Runoff = 1.49 cfs @ 12.10 hrs, Volume= 0.075 af, Depth= 6.41"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.110	98	
*	0.030	69	
	0.140	92	Weighted Average
	0.030	69	21.43% Pervious Area
	0.110	98	78.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	13	0.0200	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.1	5	0.0200	0.71		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	34	0.0170	0.97		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.2	36	0.0195	2.83		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.9	88	Total			

Summary for Subcatchment CART:

Runoff = 4.76 cfs @ 12.23 hrs, Volume= 0.335 af, Depth= 5.29"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.340	98	
*	0.420	69	
	0.760	82	Weighted Average
	0.420	69	55.26% Pervious Area
	0.340	98	44.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	156	0.0615	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.3	93	0.1150	5.09		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.6	172	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.8	421	Total			

Summary for Subcatchment DOCK:

Runoff = 0.80 cfs @ 12.09 hrs, Volume= 0.039 af, Depth= 6.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.060	98	
*	0.010	69	
	0.070	94	Weighted Average
	0.010	69	14.29% Pervious Area
	0.060	98	85.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	85	0.0400	1.65		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.0	98	Total			

Summary for Subcatchment DUN:

Runoff = 2.05 cfs @ 12.22 hrs, Volume= 0.145 af, Depth= 5.98"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.190	98	
*	0.100	69	
	0.290	88	Weighted Average
	0.100	69	34.48% Pervious Area
	0.190	98	65.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	150	0.0700	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	137	0.0310	2.64		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	166	0.0200	6.42	5.04	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.1	453	Total			

Summary for Subcatchment E.ALDI:

Runoff = 4.01 cfs @ 12.23 hrs, Volume= 0.297 af, Depth= 6.25"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.420	98	
*	0.150	69	
	0.570	90	Weighted Average
	0.150	69	26.32% Pervious Area
	0.420	98	73.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	115	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	100	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
15.2	215	Total			

Summary for Subcatchment E.HOU:

Runoff = 0.07 cfs @ 12.14 hrs, Volume= 0.003 af, Depth= 3.81"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.000	98	
*	0.010	69	
	0.010	69	Weighted Average
	0.010	69	100.00% Pervious Area

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

Summary for Subcatchment EXSO:

Runoff = 3.29 cfs @ 12.38 hrs, Volume= 0.284 af, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.006	98	
*	0.884	69	
	0.890	69	Weighted Average
	0.884	69	99.33% Pervious Area
	0.006	98	0.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.1	240	0.0300	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"

Summary for Subcatchment HOU:

Runoff = 7.25 cfs @ 12.14 hrs, Volume= 0.411 af, Depth= 6.76"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.650	98	
*	0.080	69	
	0.730	95	Weighted Average
	0.080	69	10.96% Pervious Area
	0.650	98	89.04% Impervious Area

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

Summary for Subcatchment NE.LEX: Lex. Ave. Entrance Drive

Runoff = 0.85 cfs @ 12.07 hrs, Volume= 0.039 af, Depth= 5.88"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.050	98	
	0.030	69	50-75% Grass cover, Fair, HSG B
	0.080	87	Weighted Average
	0.030	69	37.50% Pervious Area
	0.050	98	62.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	12	0.2500	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.5	36	0.0240	1.13		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.5	48	Total			

Summary for Subcatchment NW.LEX: Lex. Ave. Entrance Drive

Runoff = 1.43 cfs @ 12.06 hrs, Volume= 0.068 af, Depth= 6.84"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

Area (ac)	CN	Description
0.010	69	50-75% Grass cover, Fair, HSG B
0.110	98	Paved parking, HSG B
0.120	96	Weighted Average
0.010	69	8.33% Pervious Area
0.110	98	91.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	33	0.0215	1.06		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	27	0.0108	0.78		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.1	60	Total			

Summary for Subcatchment ROOF:

Runoff = 4.29 cfs @ 12.06 hrs, Volume= 0.208 af, Depth= 7.12"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.350	98	ROOF
	0.350	98	100.00% Impervious Area

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

Summary for Subcatchment S.DRIVE:

Runoff = 2.06 cfs @ 12.10 hrs, Volume= 0.099 af, Depth= 5.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

Area (ac)	CN	Description
* 0.130	98	
* 0.070	69	
0.200	88	Weighted Average
0.070	69	35.00% Pervious Area
0.130	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	19	0.0520	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.2	7	0.0200	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	28	0.0370	1.28		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.1	18	0.0295	3.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.5	72	Total			

Summary for Subcatchment SE.LEX: Lex. Ave. Entrance Drive

Runoff = 1.08 cfs @ 12.14 hrs, Volume= 0.060 af, Depth= 6.02"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

Area (ac)	CN	Description
0.040	69	50-75% Grass cover, Fair, HSG B
0.080	98	Water Surface, HSG B
0.120	88	Weighted Average
0.040	69	33.33% Pervious Area
0.080	98	66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	43	0.0280	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.4	33	0.0333	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
7.2	76	Total			

Summary for Subcatchment SWLEX:

Runoff = 3.28 cfs @ 12.10 hrs, Volume= 0.157 af, Depth= 5.72"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.190	98	
*	0.140	69	
	0.330	86	Weighted Average
	0.140	69	42.42% Pervious Area
	0.190	98	57.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	11	0.0150	0.06		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	48	0.0225	1.17		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.6	59	Total			

Summary for Subcatchment TCF:

Runoff = 5.85 cfs @ 12.14 hrs, Volume= 0.333 af, Depth= 6.89"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

Area (ac)	CN	Description
0.540	98	Paved parking, HSG C
0.040	69	50-75% Grass cover, Fair, HSG B
0.580	96	Weighted Average
0.040	69	6.90% Pervious Area
0.540	98	93.10% Impervious Area

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

Summary for Subcatchment UNIV: Univ. Ave. Entrance Drive

Runoff = 3.49 cfs @ 12.10 hrs, Volume= 0.165 af, Depth= 6.18"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.250	96	ROADWAY
	0.070	69	50-75% Grass cover, Fair, HSG B
	0.320	90	Weighted Average
	0.320	90	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	15	0.0500	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.3	130	0.0307	1.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	50	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.0	195	Total			

Summary for Subcatchment W.ALDI:

Runoff = 5.31 cfs @ 12.09 hrs, Volume= 0.265 af, Depth= 6.77"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.420	98	
*	0.050	69	
	0.470	95	Weighted Average
	0.050	69	10.64% Pervious Area
	0.420	98	89.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.4	105	0.0187	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.5	118	Total			

Summary for Subcatchment WILD:

Runoff = 17.27 cfs @ 12.22 hrs, Volume= 1.238 af, Depth= 6.38"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	1.750	98	
*	0.470	69	
*	0.110	85	
	2.330	92	Weighted Average
	0.580	72	24.89% Pervious Area
	1.750	98	75.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	58	0.0100	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.6	159	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.4	126	0.0100	5.26	6.46	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.2	54	0.0055	4.41	7.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
14.2	397	Total			

Summary for Reach 2R: (new Reach)

Inflow Area = 8.360 ac, 64.55% Impervious, Inflow Depth = 5.87" for 100-Year event
Inflow = 40.22 cfs @ 12.23 hrs, Volume= 4.090 af
Outflow = 40.22 cfs @ 12.23 hrs, Volume= 4.090 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Pond 51:

Inflow Area = 2.330 ac, 75.11% Impervious, Inflow Depth = 6.38" for 100-Year event
Inflow = 17.27 cfs @ 12.22 hrs, Volume= 1.238 af
Outflow = 17.27 cfs @ 12.22 hrs, Volume= 1.238 af, Atten= 0%, Lag= 0.0 min
Primary = 17.27 cfs @ 12.22 hrs, Volume= 1.238 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 888.91' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**18.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=16.95 cfs @ 12.22 hrs HW=888.77' (Free Discharge)
1=Culvert (Inlet Controls 16.95 cfs @ 9.59 fps)

Summary for Pond 52:

Inflow Area = 0.730 ac, 89.04% Impervious, Inflow Depth = 6.76" for 100-Year event
Inflow = 7.25 cfs @ 12.14 hrs, Volume= 0.411 af
Outflow = 7.25 cfs @ 12.14 hrs, Volume= 0.411 af, Atten= 0%, Lag= 0.0 min
Primary = 7.25 cfs @ 12.14 hrs, Volume= 0.411 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 886.18' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**15.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=7.02 cfs @ 12.14 hrs HW=886.13' (Free Discharge)
1=Culvert (Barrel Controls 7.02 cfs @ 5.72 fps)

Summary for Pond 61: Stub-61

Inflow Area = 0.580 ac, 93.10% Impervious, Inflow Depth = 6.89" for 100-Year event
Inflow = 5.85 cfs @ 12.14 hrs, Volume= 0.333 af
Outflow = 5.85 cfs @ 12.14 hrs, Volume= 0.333 af, Atten= 0%, Lag= 0.0 min
Primary = 5.85 cfs @ 12.14 hrs, Volume= 0.333 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 888.43' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.11'	**12.0" Round Culvert** L= 22.0' Ke= 0.900 Inlet / Outlet Invert= 884.11' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=5.66 cfs @ 12.14 hrs HW=888.21' (Free Discharge)
1=Culvert (Inlet Controls 5.66 cfs @ 7.21 fps)

Summary for Pond 108": (new Pond)

Inflow Area = 1.050 ac, 50.48% Impervious, Inflow Depth = 5.48" for 100-Year event
Inflow = 6.79 cfs @ 12.23 hrs, Volume= 0.480 af
Outflow = 6.90 cfs @ 12.31 hrs, Volume= 0.466 af, Atten= 0%, Lag= 4.9 min
Primary = 6.90 cfs @ 12.31 hrs, Volume= 0.466 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 893.46' @ 12.31 hrs Surf.Area= 0.021 ac Storage= 0.140 af

Plug-Flow detention time= 67.9 min calculated for 0.465 af (97% of inflow)
Center-of-Mass det. time= 51.7 min (822.7 - 770.9)

Volume	Invert	Avail.Storage	Storage Description
#1	881.45'	0.088 af	**108.0" Round Pipe Storage** Inside #2 L= 60.0' S= 0.0123 '/'
#2	881.00'	0.052 af	**14.00'W x 66.00'L x 10.25'H Prismatoid** 0.217 af Overall - 0.088 af Embedded = 0.130 af x 40.0% Voids
		0.140 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	882.45'	**24.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 882.45' / 882.15' S= 0.0150 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	882.30'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	890.79'	**0.5' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=6.31 cfs @ 12.31 hrs HW=893.19' (Free Discharge)
└**1=Culvert** (Passes 6.31 cfs of 47.21 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.38 cfs @ 15.77 fps)
  └**3=Broad-Crested Rectangular Weir** (Weir Controls 4.94 cfs @ 4.12 fps)

Summary for Pond 110:

Inflow Area = 1.460 ac, 85.62% Impervious, Inflow Depth = 6.64" for 100-Year event
Inflow = 12.36 cfs @ 12.09 hrs, Volume= 0.808 af
Outflow = 12.36 cfs @ 12.09 hrs, Volume= 0.808 af, Atten= 0%, Lag= 0.0 min
Primary = 12.36 cfs @ 12.09 hrs, Volume= 0.808 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 890.74' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.11'	**15.0" Round Culvert** L= 86.0' Ke= 0.500 Inlet / Outlet Invert= 885.11' / 884.00' S= 0.0129 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=11.93 cfs @ 12.09 hrs HW=890.40' (Free Discharge)
└**1=Culvert** (Barrel Controls 11.93 cfs @ 9.72 fps)

Summary for Pond 120:

Inflow Area = 0.890 ac, 93.26% Impervious, Inflow Depth = 6.90" for 100-Year event
Inflow = 10.09 cfs @ 12.08 hrs, Volume= 0.512 af
Outflow = 10.09 cfs @ 12.08 hrs, Volume= 0.512 af, Atten= 0%, Lag= 0.0 min
Primary = 10.09 cfs @ 12.08 hrs, Volume= 0.512 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Peak Elev= 891.06' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.90'	**15.0" Round Culvert** L= 132.0' Ke= 0.500 Inlet / Outlet Invert= 885.90' / 885.11' S= 0.0060 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=9.51 cfs @ 12.08 hrs HW=890.63' (Free Discharge)
└**1=Culvert** (Barrel Controls 9.51 cfs @ 7.75 fps)

Summary for Pond 130:

Inflow Area = 0.420 ac, 97.62% Impervious, Inflow Depth = 7.04" for 100-Year event
Inflow = 4.99 cfs @ 12.06 hrs, Volume= 0.246 af
Outflow = 4.99 cfs @ 12.06 hrs, Volume= 0.246 af, Atten= 0%, Lag= 0.0 min
Primary = 4.99 cfs @ 12.06 hrs, Volume= 0.246 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 889.36' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	886.78'	**12.0" Round Culvert** L= 68.0' Ke= 0.500 Inlet / Outlet Invert= 886.78' / 886.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=4.77 cfs @ 12.06 hrs HW=889.18' (Free Discharge)
└**1=Culvert** (Barrel Controls 4.77 cfs @ 6.07 fps)

Summary for Pond 140:

Inflow Area = 0.070 ac, 85.71% Impervious, Inflow Depth = 6.65" for 100-Year event
Inflow = 0.80 cfs @ 12.09 hrs, Volume= 0.039 af
Outflow = 0.80 cfs @ 12.09 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min
Primary = 0.80 cfs @ 12.09 hrs, Volume= 0.039 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 887.70' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	887.11'	**12.0" Round Culvert** L= 108.0' Ke= 0.500 Inlet / Outlet Invert= 887.11' / 886.78' S= 0.0031 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.76 cfs @ 12.09 hrs HW=887.68' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.76 cfs @ 2.37 fps)

Summary for Pond CB31:

Inflow Area = 0.080 ac, 62.50% Impervious, Inflow Depth = 5.88" for 100-Year event
Inflow = 0.85 cfs @ 12.07 hrs, Volume= 0.039 af
Outflow = 0.85 cfs @ 12.07 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min
Primary = 0.85 cfs @ 12.07 hrs, Volume= 0.039 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 884.74' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.23'	**12.0" Round Culvert** L= 23.0' Ke= 0.500 Inlet / Outlet Invert= 884.23' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.80 cfs @ 12.07 hrs HW=884.72' (Free Discharge)
1=Culvert (Barrel Controls 0.80 cfs @ 3.04 fps)

Summary for Pond CB41:

Inflow Area = 0.120 ac, 91.67% Impervious, Inflow Depth = 6.84" for 100-Year event
Inflow = 1.43 cfs @ 12.06 hrs, Volume= 0.068 af
Outflow = 1.43 cfs @ 12.06 hrs, Volume= 0.068 af, Atten= 0%, Lag= 0.0 min
Primary = 1.43 cfs @ 12.06 hrs, Volume= 0.068 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 884.90' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.19'	**12.0" Round Culvert** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 884.19' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.36 cfs @ 12.06 hrs HW=884.88' (Free Discharge)
1=Culvert (Barrel Controls 1.36 cfs @ 3.34 fps)

Summary for Pond SYS: (new Pond)

Volume	Invert	Avail.Storage	Storage Description
#1A	880.75'	0.209 af	**18.50'W x 316.00'L x 6.00'H Field A** 0.805 af Overall - 0.282 af Embedded = 0.524 af x 40.0% Voids
#2A	881.25'	0.282 af	**CMP Round 60** x 30 Inside #1 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L 30 Chambers in 2 Rows 12.50' Header x 19.63 sf x 2 = 490.9 cf Inside
#3B	880.75'	0.129 af	**18.50'W x 196.00'L x 6.00'H Field B** 0.499 af Overall - 0.177 af Embedded = 0.323 af x 40.0% Voids
#4B	881.25'	0.177 af	**CMP Round 60** x 18 Inside #3 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L Row Length Adjustment= +10.00' x 19.63 sf x 2 rows 12.50' Header x 19.63 sf x 1 = 245.4 cf Inside
#5	886.25'	0.001 af	**4.00'D x 2.00'H CBMH-30**
#6	886.25'	0.001 af	**4.00'D x 2.29'H CBMH-31**
#7	886.25'	0.001 af	**4.00'D x 2.82'H CBMH-40**
#8	886.25'	0.001 af	**4.00'D x 3.18'H CBMH-41**
#9	886.25'	0.001 af	**4.00'D x 4.50'H CBMH-50**
#10	886.25'	0.001 af	**4.00'D x 4.70'H CBMH-51**
#11	886.25'	0.001 af	**4.00'D x 4.80'H CBMH-52**
#12	886.25'	0.001 af	**4.00'D x 4.95'H CBMH-60**
#13	886.25'	0.001 af	**4.00'D x 4.75'H CBMH-70**
#14	886.25'	0.002 af	**4.00'D x 5.26'H CBMH-80**
#15	886.25'	0.001 af	**4.00'D x 4.70'H CBMH-90**
#16	886.25'	0.001 af	**4.00'D x 4.92'H CBMH-100**
		0.811 af	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.75'	**0.250 in/hr Exfiltration over Surface area**
#2	Primary	880.39'	**24.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 880.39' / 879.47' S= 0.0184 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Device 2	881.25'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	881.25'	**8.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#5	Device 2	886.05'	**7.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
└**1=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond SYS-AS: (new Pond)

Inflow Area = 7.460 ac, 72.25% Impervious, Inflow Depth = 6.31" for 100-Year event
Inflow = 49.69 cfs @ 12.11 hrs, Volume= 3.921 af
Outflow = 40.35 cfs @ 12.22 hrs, Volume= 3.921 af, Atten= 19%, Lag= 6.6 min
Discarded = 0.10 cfs @ 12.22 hrs, Volume= 0.118 af
Primary = 10.81 cfs @ 12.20 hrs, Volume= 3.215 af
Secondary = 29.39 cfs @ 12.22 hrs, Volume= 0.588 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 889.50' @ 12.20 hrs Surf.Area= 16,669 sf Storage= 38,576 cf

Plug-Flow detention time= 40.0 min calculated for 3.921 af (100% of inflow)
Center-of-Mass det. time= 39.3 min (799.7 - 760.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	880.75'	9,122 cf	**18.50'W x 316.00'L x 6.00'H Field A** 35,076 cf Overall - 12,272 cf Embedded = 22,804 cf x 40.0% Voids
#2A	881.25'	12,272 cf	**CMP Round 60** x 30 Inside #1 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L 30 Chambers in 2 Rows 12.50' Header x 19.63 sf x 2 = 490.9 cf Inside
#3B	880.75'	5,620 cf	**18.50'W x 196.00'L x 6.00'H Field B** 21,756 cf Overall - 7,707 cf Embedded = 14,049 cf x 40.0% Voids
#4B	881.25'	7,707 cf	**CMP Round 60** x 18 Inside #3 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L Row Length Adjustment= +10.00' x 19.63 sf x 2 rows 12.50' Header x 19.63 sf x 1 = 245.4 cf Inside
#5	886.25'	25 cf	**4.00'D x 2.00'H CBMH-30**
#6	886.25'	29 cf	**4.00'D x 2.29'H CBMH-31**
#7	886.25'	35 cf	**4.00'D x 2.82'H CBMH-40**
#8	886.25'	40 cf	**4.00'D x 3.18'H CBMH-41**
#9	886.25'	57 cf	**4.00'D x 4.50'H CBMH-50**
#10	886.25'	59 cf	**4.00'D x 4.70'H CBMH-51**
#11	886.25'	60 cf	**4.00'D x 4.80'H CBMH-52**
#12	886.25'	62 cf	**4.00'D x 4.95'H CBMH-60**
#13	886.25'	60 cf	**4.00'D x 4.75'H CBMH-70**
#14	886.25'	66 cf	**4.00'D x 5.26'H CBMH-80**
#15	886.25'	59 cf	**4.00'D x 4.70'H CBMH-90**
#16	886.25'	62 cf	**4.00'D x 4.92'H CBMH-100**
#17	888.33'	8,117 cf	**Low Road cb (Prismatic)**Listed below (Recalc)
		43,451 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
888.33	15	0	0
888.50	345	31	31
889.00	3,000	836	867
889.50	7,000	2,500	3,367
890.00	12,000	4,750	8,117

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.75'	**0.250 in/hr Exfiltration over Surface area**
#2	Primary	880.39'	**12.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 880.39' / 879.47' S= 0.0184 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	880.89'	**24.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	888.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.10 cfs @ 12.22 hrs HW=889.50' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=10.81 cfs @ 12.20 hrs HW=889.50' (Free Discharge)
└**2=Culvert** (Barrel Controls 10.81 cfs @ 13.77 fps)
└**3=Orifice/Grate** (Passes 10.81 cfs of 41.74 cfs potential flow)

Secondary OutFlow Max=26.83 cfs @ 12.22 hrs HW=889.50' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 26.83 cfs @ 2.68 fps)

Summary for Subcatchment C.DRIVE:

Runoff = 1.17 cfs @ 12.10 hrs, Volume= 0.058 af, Depth= 5.01"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.110	98	
*	0.030	69	
	0.140	92	Weighted Average
	0.030	69	21.43% Pervious Area
	0.110	98	78.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	13	0.0200	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.1	5	0.0200	0.71		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	34	0.0170	0.97		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.2	36	0.0195	2.83		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.9	88	Total			

Summary for Subcatchment CART:

Runoff = 3.58 cfs @ 12.23 hrs, Volume= 0.253 af, Depth= 3.99"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.340	98	
*	0.420	69	
	0.760	82	Weighted Average
	0.420	69	55.26% Pervious Area
	0.340	98	44.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	156	0.0615	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.3	93	0.1150	5.09		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.6	172	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.8	421	Total			

Summary for Subcatchment DOCK:

Runoff = 0.63 cfs @ 12.09 hrs, Volume= 0.031 af, Depth= 5.23"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.060	98	
*	0.010	69	
	0.070	94	Weighted Average
	0.010	69	14.29% Pervious Area
	0.060	98	85.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	85	0.0400	1.65		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.0	98	Total			

Summary for Subcatchment DUN:

Runoff = 1.58 cfs @ 12.22 hrs, Volume= 0.112 af, Depth= 4.62"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.190	98	
*	0.100	69	
	0.290	88	Weighted Average
	0.100	69	34.48% Pervious Area
	0.190	98	65.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	150	0.0700	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	137	0.0310	2.64		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	166	0.0200	6.42	5.04	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.1	453	Total			

Summary for Subcatchment E.ALDI:

Runoff = 3.13 cfs @ 12.23 hrs, Volume= 0.231 af, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.420	98	
*	0.150	69	
	0.570	90	Weighted Average
	0.150	69	26.32% Pervious Area
	0.420	98	73.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	115	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	100	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
15.2	215	Total			

Summary for Subcatchment E.HOU:

Runoff = 0.05 cfs @ 12.15 hrs, Volume= 0.002 af, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.000	98	
*	0.010	69	
	0.010	69	Weighted Average
	0.010	69	100.00% Pervious Area

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

Summary for Subcatchment EXSO:

Runoff = 2.26 cfs @ 12.39 hrs, Volume= 0.197 af, Depth= 2.66"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.006	98	
*	0.884	69	
	0.890	69	Weighted Average
	0.884	69	99.33% Pervious Area
	0.006	98	0.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.1	240	0.0300	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"

Summary for Subcatchment HOU:

Runoff = 5.75 cfs @ 12.14 hrs, Volume= 0.324 af, Depth= 5.33"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.650	98	
*	0.080	69	
	0.730	95	Weighted Average
	0.080	69	10.96% Pervious Area
	0.650	98	89.04% Impervious Area

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

Summary for Subcatchment NE.LEX: Lex. Ave. Entrance Drive

Runoff = 0.65 cfs @ 12.07 hrs, Volume= 0.030 af, Depth= 4.53"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.050	98	
	0.030	69	50-75% Grass cover, Fair, HSG B
	0.080	87	Weighted Average
	0.030	69	37.50% Pervious Area
	0.050	98	62.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	12	0.2500	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.5	36	0.0240	1.13		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.5	48	Total			

Summary for Subcatchment NW.LEX: Lex. Ave. Entrance Drive

Runoff = 1.13 cfs @ 12.06 hrs, Volume= 0.054 af, Depth= 5.41"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

Area (ac)	CN	Description
0.010	69	50-75% Grass cover, Fair, HSG B
0.110	98	Paved parking, HSG B
0.120	96	Weighted Average
0.010	69	8.33% Pervious Area
0.110	98	91.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	33	0.0215	1.06		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	27	0.0108	0.78		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.1	60	Total			

Summary for Subcatchment ROOF:

Runoff = 3.44 cfs @ 12.06 hrs, Volume= 0.165 af, Depth= 5.66"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.350	98	ROOF
	0.350	98	100.00% Impervious Area

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

Summary for Subcatchment S.DRIVE:

Runoff = 1.59 cfs @ 12.10 hrs, Volume= 0.077 af, Depth= 4.60"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.130	98	
*	0.070	69	
	0.200	88	Weighted Average
	0.070	69	35.00% Pervious Area
	0.130	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	19	0.0520	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.2	7	0.0200	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	28	0.0370	1.28		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.1	18	0.0295	3.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.5	72	Total			

Summary for Subcatchment SE.LEX: Lex. Ave. Entrance Drive

Runoff = 0.84 cfs @ 12.14 hrs, Volume= 0.047 af, Depth= 4.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

Area (ac)	CN	Description
0.040	69	50-75% Grass cover, Fair, HSG B
0.080	98	Water Surface, HSG B
0.120	88	Weighted Average
0.040	69	33.33% Pervious Area
0.080	98	66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	43	0.0280	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.4	33	0.0333	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
7.2	76	Total			

Summary for Subcatchment SWLEX:

Runoff = 2.51 cfs @ 12.10 hrs, Volume= 0.120 af, Depth= 4.38"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.190	98	
*	0.140	69	
	0.330	86	Weighted Average
	0.140	69	42.42% Pervious Area
	0.190	98	57.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	11	0.0150	0.06		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	48	0.0225	1.17		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.6	59	Total			

Summary for Subcatchment TCF:

Runoff = 4.65 cfs @ 12.14 hrs, Volume= 0.264 af, Depth= 5.45"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

Area (ac)	CN	Description
0.540	98	Paved parking, HSG C
0.040	69	50-75% Grass cover, Fair, HSG B
0.580	96	Weighted Average
0.040	69	6.90% Pervious Area
0.540	98	93.10% Impervious Area

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

Summary for Subcatchment UNIV: Univ. Ave. Entrance Drive

Runoff = 2.73 cfs @ 12.10 hrs, Volume= 0.127 af, Depth= 4.75"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.250	96	ROADWAY
	0.070	69	50-75% Grass cover, Fair, HSG B
	0.320	90	Weighted Average
	0.320	90	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	15	0.0500	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.3	130	0.0307	1.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	50	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.0	195	Total			

Summary for Subcatchment W.ALDI:

Runoff = 4.21 cfs @ 12.09 hrs, Volume= 0.209 af, Depth= 5.34"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.420	98	
*	0.050	69	
	0.470	95	Weighted Average
	0.050	69	10.64% Pervious Area
	0.420	98	89.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.4	105	0.0187	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.5	118	Total			

Summary for Subcatchment WILD:

Runoff = 13.52 cfs @ 12.22 hrs, Volume= 0.966 af, Depth= 4.98"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	1.750	98	
*	0.470	69	
*	0.110	85	
	2.330	92	Weighted Average
	0.580	72	24.89% Pervious Area
	1.750	98	75.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	58	0.0100	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.6	159	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.4	126	0.0100	5.26	6.46	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.2	54	0.0055	4.41	7.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
14.2	397	Total			

Summary for Reach 2R: (new Reach)

Inflow Area = 8.360 ac, 64.55% Impervious, Inflow Depth = 4.50" for 100-Year St. Paul event
Inflow = 26.79 cfs @ 12.31 hrs, Volume= 3.138 af
Outflow = 26.79 cfs @ 12.31 hrs, Volume= 3.138 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Pond 51:

Inflow Area = 2.330 ac, 75.11% Impervious, Inflow Depth = 4.98" for 100-Year St. Paul event
Inflow = 13.52 cfs @ 12.22 hrs, Volume= 0.966 af
Outflow = 13.52 cfs @ 12.22 hrs, Volume= 0.966 af, Atten= 0%, Lag= 0.0 min
Primary = 13.52 cfs @ 12.22 hrs, Volume= 0.966 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 887.32' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**18.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=13.26 cfs @ 12.22 hrs HW=887.23' (Free Discharge)
1=Culvert (Inlet Controls 13.26 cfs @ 7.51 fps)

Summary for Pond 52:

Inflow Area = 0.730 ac, 89.04% Impervious, Inflow Depth = 5.33" for 100-Year St. Paul event
Inflow = 5.75 cfs @ 12.14 hrs, Volume= 0.324 af
Outflow = 5.75 cfs @ 12.14 hrs, Volume= 0.324 af, Atten= 0%, Lag= 0.0 min
Primary = 5.75 cfs @ 12.14 hrs, Volume= 0.324 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 885.85' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**15.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=5.56 cfs @ 12.14 hrs HW=885.80' (Free Discharge)
1=Culvert (Barrel Controls 5.56 cfs @ 4.53 fps)

Summary for Pond 61: Stub-61

Inflow Area = 0.580 ac, 93.10% Impervious, Inflow Depth = 5.45" for 100-Year St. Paul event
Inflow = 4.65 cfs @ 12.14 hrs, Volume= 0.264 af
Outflow = 4.65 cfs @ 12.14 hrs, Volume= 0.264 af, Atten= 0%, Lag= 0.0 min
Primary = 4.65 cfs @ 12.14 hrs, Volume= 0.264 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 887.03' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.11'	**12.0" Round Culvert** L= 22.0' Ke= 0.900 Inlet / Outlet Invert= 884.11' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=4.51 cfs @ 12.14 hrs HW=886.89' (Free Discharge)
1=Culvert (Inlet Controls 4.51 cfs @ 5.74 fps)

Summary for Pond 108": (new Pond)

Inflow Area = 1.050 ac, 50.48% Impervious, Inflow Depth = 4.16" for 100-Year St. Paul event
Inflow = 5.15 cfs @ 12.23 hrs, Volume= 0.364 af
Outflow = 2.10 cfs @ 12.50 hrs, Volume= 0.350 af, Atten= 59%, Lag= 16.7 min
Primary = 2.10 cfs @ 12.50 hrs, Volume= 0.350 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 891.52' @ 12.50 hrs Surf.Area= 0.021 ac Storage= 0.140 af

Plug-Flow detention time= 80.2 min calculated for 0.350 af (96% of inflow)
Center-of-Mass det. time= 59.7 min (832.8 - 773.1)

Volume	Invert	Avail.Storage	Storage Description
#1	881.45'	0.088 af	**108.0" Round Pipe Storage** Inside #2 L= 60.0' S= 0.0123 '/'
#2	881.00'	0.052 af	**14.00'W x 66.00'L x 10.25'H Prismatoid** 0.217 af Overall - 0.088 af Embedded = 0.130 af x 40.0% Voids
		0.140 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	882.45'	**24.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 882.45' / 882.15' S= 0.0150 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	882.30'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	890.79'	**0.5' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=2.06 cfs @ 12.50 hrs HW=891.49' (Free Discharge)
└**1=Culvert** (Passes 2.06 cfs of 42.90 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.26 cfs @ 14.47 fps)
  └**3=Broad-Crested Rectangular Weir** (Weir Controls 0.79 cfs @ 2.26 fps)

Summary for Pond 110:

Inflow Area = 1.460 ac, 85.62% Impervious, Inflow Depth = 5.23" for 100-Year St. Paul event
Inflow = 9.79 cfs @ 12.09 hrs, Volume= 0.636 af
Outflow = 9.79 cfs @ 12.09 hrs, Volume= 0.636 af, Atten= 0%, Lag= 0.0 min
Primary = 9.79 cfs @ 12.09 hrs, Volume= 0.636 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 888.68' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.11'	**15.0" Round Culvert** L= 86.0' Ke= 0.500 Inlet / Outlet Invert= 885.11' / 884.00' S= 0.0129 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=9.45 cfs @ 12.09 hrs HW=888.48' (Free Discharge)
└**1=Culvert** (Barrel Controls 9.45 cfs @ 7.70 fps)

Summary for Pond 120:

Inflow Area = 0.890 ac, 93.26% Impervious, Inflow Depth = 5.46" for 100-Year St. Paul event
Inflow = 8.03 cfs @ 12.08 hrs, Volume= 0.405 af
Outflow = 8.03 cfs @ 12.08 hrs, Volume= 0.405 af, Atten= 0%, Lag= 0.0 min
Primary = 8.03 cfs @ 12.08 hrs, Volume= 0.405 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Peak Elev= 889.34' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.90'	**15.0" Round Culvert** L= 132.0' Ke= 0.500 Inlet / Outlet Invert= 885.90' / 885.11' S= 0.0060 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=7.56 cfs @ 12.08 hrs HW=889.06' (Free Discharge)
↑**1=Culvert** (Barrel Controls 7.56 cfs @ 6.16 fps)

Summary for Pond 130:

Inflow Area = 0.420 ac, 97.62% Impervious, Inflow Depth = 5.59" for 100-Year St. Paul event
Inflow = 3.99 cfs @ 12.06 hrs, Volume= 0.196 af
Outflow = 3.99 cfs @ 12.06 hrs, Volume= 0.196 af, Atten= 0%, Lag= 0.0 min
Primary = 3.99 cfs @ 12.06 hrs, Volume= 0.196 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 888.54' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	886.78'	**12.0" Round Culvert** L= 68.0' Ke= 0.500 Inlet / Outlet Invert= 886.78' / 886.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=3.81 cfs @ 12.06 hrs HW=888.43' (Free Discharge)
↑**1=Culvert** (Barrel Controls 3.81 cfs @ 4.85 fps)

Summary for Pond 140:

Inflow Area = 0.070 ac, 85.71% Impervious, Inflow Depth = 5.23" for 100-Year St. Paul event
Inflow = 0.63 cfs @ 12.09 hrs, Volume= 0.031 af
Outflow = 0.63 cfs @ 12.09 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min
Primary = 0.63 cfs @ 12.09 hrs, Volume= 0.031 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 887.63' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	887.11'	**12.0" Round Culvert** L= 108.0' Ke= 0.500 Inlet / Outlet Invert= 887.11' / 886.78' S= 0.0031 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.60 cfs @ 12.09 hrs HW=887.61' (Free Discharge)
↑**1=Culvert** (Barrel Controls 0.60 cfs @ 2.22 fps)

Summary for Pond CB31:

Inflow Area = 0.080 ac, 62.50% Impervious, Inflow Depth = 4.53" for 100-Year St. Paul event
Inflow = 0.65 cfs @ 12.07 hrs, Volume= 0.030 af
Outflow = 0.65 cfs @ 12.07 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min
Primary = 0.65 cfs @ 12.07 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 884.67' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.23'	**12.0" Round Culvert** L= 23.0' Ke= 0.500 Inlet / Outlet Invert= 884.23' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.62 cfs @ 12.07 hrs HW=884.66' (Free Discharge)
1=Culvert (Barrel Controls 0.62 cfs @ 2.87 fps)

Summary for Pond CB41:

Inflow Area = 0.120 ac, 91.67% Impervious, Inflow Depth = 5.41" for 100-Year St. Paul event
Inflow = 1.13 cfs @ 12.06 hrs, Volume= 0.054 af
Outflow = 1.13 cfs @ 12.06 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min
Primary = 1.13 cfs @ 12.06 hrs, Volume= 0.054 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 884.80' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.19'	**12.0" Round Culvert** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 884.19' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.08 cfs @ 12.06 hrs HW=884.79' (Free Discharge)
1=Culvert (Barrel Controls 1.08 cfs @ 3.18 fps)

Summary for Pond SYS: (new Pond)

Volume	Invert	Avail.Storage	Storage Description
#1A	880.75'	0.209 af	**18.50'W x 316.00'L x 6.00'H Field A** 0.805 af Overall - 0.282 af Embedded = 0.524 af x 40.0% Voids
#2A	881.25'	0.282 af	**CMP Round 60** x 30 Inside #1 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L 30 Chambers in 2 Rows 12.50' Header x 19.63 sf x 2 = 490.9 cf Inside
#3B	880.75'	0.129 af	**18.50'W x 196.00'L x 6.00'H Field B** 0.499 af Overall - 0.177 af Embedded = 0.323 af x 40.0% Voids
#4B	881.25'	0.177 af	**CMP Round 60** x 18 Inside #3 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L Row Length Adjustment= +10.00' x 19.63 sf x 2 rows 12.50' Header x 19.63 sf x 1 = 245.4 cf Inside
#5	886.25'	0.001 af	**4.00'D x 2.00'H CBMH-30**
#6	886.25'	0.001 af	**4.00'D x 2.29'H CBMH-31**
#7	886.25'	0.001 af	**4.00'D x 2.82'H CBMH-40**
#8	886.25'	0.001 af	**4.00'D x 3.18'H CBMH-41**
#9	886.25'	0.001 af	**4.00'D x 4.50'H CBMH-50**
#10	886.25'	0.001 af	**4.00'D x 4.70'H CBMH-51**
#11	886.25'	0.001 af	**4.00'D x 4.80'H CBMH-52**
#12	886.25'	0.001 af	**4.00'D x 4.95'H CBMH-60**
#13	886.25'	0.001 af	**4.00'D x 4.75'H CBMH-70**
#14	886.25'	0.002 af	**4.00'D x 5.26'H CBMH-80**
#15	886.25'	0.001 af	**4.00'D x 4.70'H CBMH-90**
#16	886.25'	0.001 af	**4.00'D x 4.92'H CBMH-100**
		0.811 af	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.75'	**0.250 in/hr Exfiltration over Surface area**
#2	Primary	880.39'	**24.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 880.39' / 879.47' S= 0.0184 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Device 2	881.25'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	881.25'	**8.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#5	Device 2	886.05'	**7.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
└**1=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond SYS-AS: (new Pond)

Inflow Area = 7.460 ac, 72.25% Impervious, Inflow Depth = 4.91" for 100-Year St. Paul event
Inflow = 39.07 cfs @ 12.11 hrs, Volume= 3.053 af
Outflow = 24.75 cfs @ 12.31 hrs, Volume= 3.053 af, Atten= 37%, Lag= 11.9 min
Discarded = 0.08 cfs @ 12.31 hrs, Volume= 0.115 af
Primary = 10.60 cfs @ 12.32 hrs, Volume= 2.771 af
Secondary = 14.07 cfs @ 12.31 hrs, Volume= 0.167 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 889.15' @ 12.32 hrs Surf.Area= 13,859 sf Storage= 36,564 cf

Plug-Flow detention time= 45.2 min calculated for 3.053 af (100% of inflow)
Center-of-Mass det. time= 44.5 min (807.8 - 763.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	880.75'	9,122 cf	**18.50'W x 316.00'L x 6.00'H Field A** 35,076 cf Overall - 12,272 cf Embedded = 22,804 cf x 40.0% Voids
#2A	881.25'	12,272 cf	**CMP Round 60** x 30 Inside #1 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L 30 Chambers in 2 Rows 12.50' Header x 19.63 sf x 2 = 490.9 cf Inside
#3B	880.75'	5,620 cf	**18.50'W x 196.00'L x 6.00'H Field B** 21,756 cf Overall - 7,707 cf Embedded = 14,049 cf x 40.0% Voids
#4B	881.25'	7,707 cf	**CMP Round 60** x 18 Inside #3 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L Row Length Adjustment= +10.00' x 19.63 sf x 2 rows 12.50' Header x 19.63 sf x 1 = 245.4 cf Inside
#5	886.25'	25 cf	**4.00'D x 2.00'H CBMH-30**
#6	886.25'	29 cf	**4.00'D x 2.29'H CBMH-31**
#7	886.25'	35 cf	**4.00'D x 2.82'H CBMH-40**
#8	886.25'	40 cf	**4.00'D x 3.18'H CBMH-41**
#9	886.25'	57 cf	**4.00'D x 4.50'H CBMH-50**
#10	886.25'	59 cf	**4.00'D x 4.70'H CBMH-51**
#11	886.25'	60 cf	**4.00'D x 4.80'H CBMH-52**
#12	886.25'	62 cf	**4.00'D x 4.95'H CBMH-60**
#13	886.25'	60 cf	**4.00'D x 4.75'H CBMH-70**
#14	886.25'	66 cf	**4.00'D x 5.26'H CBMH-80**
#15	886.25'	59 cf	**4.00'D x 4.70'H CBMH-90**
#16	886.25'	62 cf	**4.00'D x 4.92'H CBMH-100**
#17	888.33'	8,117 cf	**Low Road cb (Prismatic)**Listed below (Recalc)
		43,451 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
888.33	15	0	0
888.50	345	31	31
889.00	3,000	836	867
889.50	7,000	2,500	3,367
890.00	12,000	4,750	8,117

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.75'	**0.250 in/hr Exfiltration over Surface area**
#2	Primary	880.39'	**12.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 880.39' / 879.47' S= 0.0184 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	880.89'	**24.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	888.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

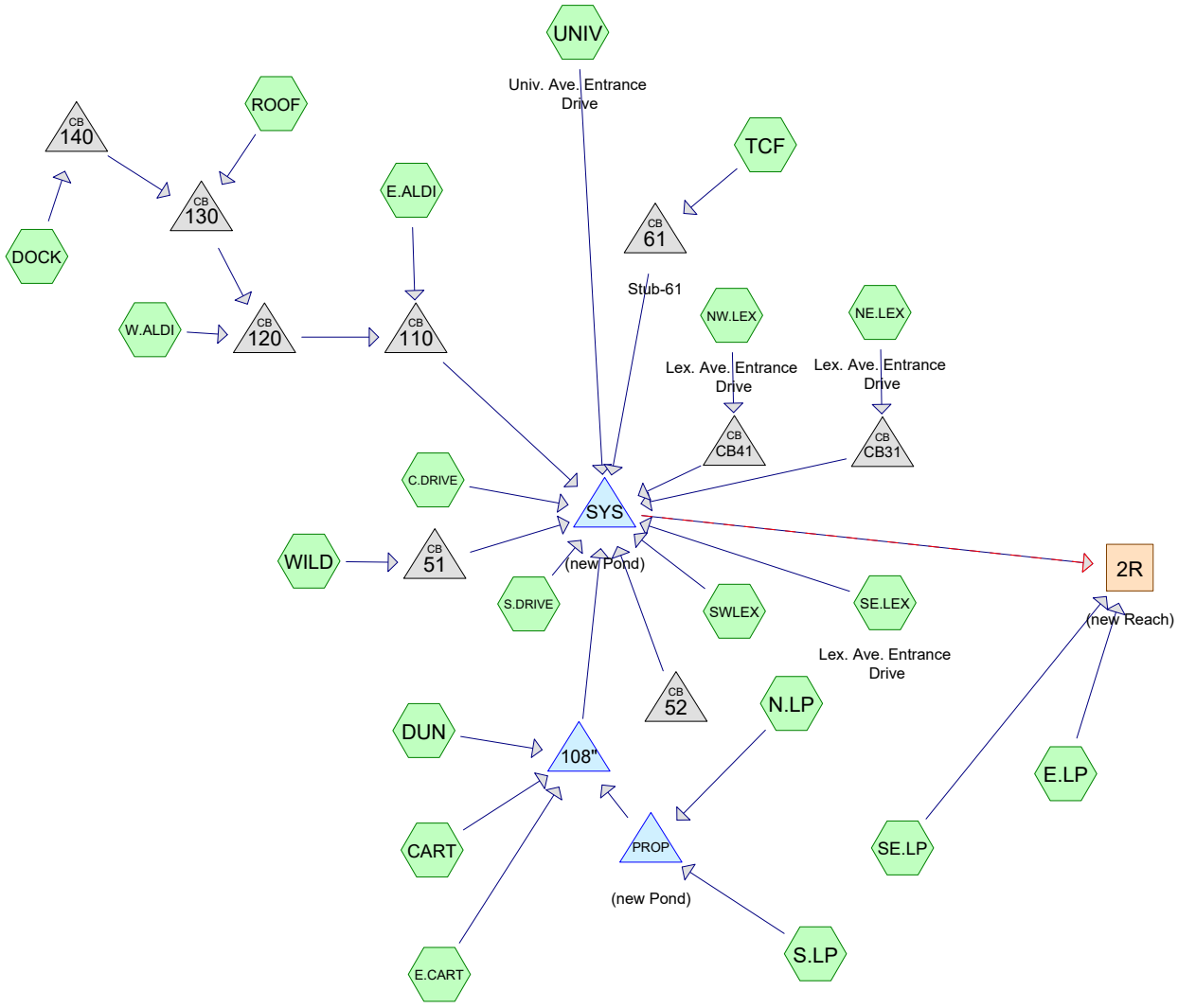
Discarded OutFlow Max=0.08 cfs @ 12.31 hrs HW=889.11' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=10.57 cfs @ 12.32 hrs HW=889.10' (Free Discharge)
└**2=Culvert** (Barrel Controls 10.57 cfs @ 13.46 fps)
└**3=Orifice/Grate** (Passes 10.57 cfs of 40.63 cfs potential flow)

Secondary OutFlow Max=12.76 cfs @ 12.31 hrs HW=889.11' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 12.76 cfs @ 2.10 fps)

Appendix B

HydroCAD Report, Proposed



Subcat Reach Pond Link

Routing Diagram for 19114-overall PROP as built cr

Prepared by {enter your company name here}, Printed 12/9/2020

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.108	98	(C.DRIVE, CART, DOCK, DUN, E.ALDI, E.CART, E.LP, N.LP, NE.LEX, S.DRIVE, S.LP, SE.LP, SWLEX, W.ALDI, WILD)
1.622	69	(C.DRIVE, CART, DOCK, DUN, E.ALDI, E.CART, E.LP, S.DRIVE, SE.LP, SWLEX, W.ALDI, WILD)
0.110	85	(WILD)
0.174	69	50-75% Grass cover, Fair, HSG B (NE.LEX, NW.LEX, SE.LEX, TCF, UNIV)
0.110	98	Paved parking, HSG B (NW.LEX)
0.540	98	Paved parking, HSG C (TCF)
0.250	96	ROADWAY (UNIV)
0.350	98	ROOF (ROOF)
0.083	98	Water Surface, HSG B (SE.LEX)

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	CART	0.00	0.00	85.0	0.0100	0.013	0.0	12.0	0.0
2	CART	0.00	0.00	255.0	0.0100	0.013	0.0	15.0	0.0
3	DUN	0.00	0.00	166.0	0.0200	0.013	0.0	12.0	0.0
4	E.CART	0.00	0.00	75.0	0.0100	0.013	0.0	12.0	0.0
5	WILD	0.00	0.00	159.0	0.0100	0.013	0.0	12.0	0.0
6	WILD	0.00	0.00	126.0	0.0100	0.013	0.0	15.0	0.0
7	WILD	0.00	0.00	54.0	0.0055	0.013	0.0	18.0	0.0
8	51	884.05	884.00	10.0	0.0050	0.013	0.0	18.0	0.0
9	52	884.05	884.00	10.0	0.0050	0.013	0.0	15.0	0.0
10	61	884.11	884.00	22.0	0.0050	0.013	0.0	12.0	0.0
11	108"	882.45	882.15	20.0	0.0150	0.013	0.0	24.0	0.0
12	110	885.11	884.00	86.0	0.0129	0.013	0.0	15.0	0.0
13	120	885.90	885.11	132.0	0.0060	0.013	0.0	15.0	0.0
14	130	886.78	886.10	68.0	0.0100	0.013	0.0	12.0	0.0
15	140	887.11	886.78	108.0	0.0031	0.013	0.0	12.0	0.0
16	CB31	884.23	884.00	23.0	0.0100	0.013	0.0	12.0	0.0
17	CB41	884.19	884.00	19.0	0.0100	0.013	0.0	12.0	0.0
18	PROP	889.00	887.00	50.0	0.0400	0.013	0.0	12.0	0.0
19	SYS	880.39	879.17	55.0	0.0222	0.013	0.0	12.0	0.0

Summary for Subcatchment C.DRIVE:

Runoff = 0.43 cfs @ 12.10 hrs, Volume= 0.021 af, Depth= 1.83"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.45"

	Area (ac)	CN	Description
*	0.110	98	
*	0.030	69	
	0.140	92	Weighted Average
	0.030	69	21.43% Pervious Area
	0.110	98	78.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	13	0.0200	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.1	5	0.0200	0.71		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	34	0.0170	0.97		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.2	36	0.0195	2.83		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.9	88	Total			

Summary for Subcatchment CART:

Runoff = 0.59 cfs @ 12.23 hrs, Volume= 0.043 af, Depth= 1.56"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.45"

	Area (ac)	CN	Description
*	0.210	98	
*	0.120	69	
	0.330	87	Weighted Average
	0.120	69	36.36% Pervious Area
	0.210	98	63.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	62	0.0100	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.3	85	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.8	255	0.0100	5.26	6.46	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
14.8	402	Total			

Summary for Subcatchment DOCK:

Runoff = 0.24 cfs @ 12.09 hrs, Volume= 0.011 af, Depth= 1.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.45"

	Area (ac)	CN	Description
*	0.060	98	
*	0.010	69	
	0.070	94	Weighted Average
	0.010	69	14.29% Pervious Area
	0.060	98	85.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	85	0.0400	1.65		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.0	98	Total			

Summary for Subcatchment DUN:

Runoff = 0.54 cfs @ 12.22 hrs, Volume= 0.038 af, Depth= 1.59"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.45"

	Area (ac)	CN	Description
*	0.190	98	
*	0.100	69	
	0.290	88	Weighted Average
	0.100	69	34.48% Pervious Area
	0.190	98	65.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	150	0.0700	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	137	0.0310	2.64		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	166	0.0200	6.42	5.04	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.1	453	Total			

Summary for Subcatchment E.ALDI:

Runoff = 1.13 cfs @ 12.23 hrs, Volume= 0.083 af, Depth= 1.74"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.45"

	Area (ac)	CN	Description
*	0.420	98	
*	0.150	69	
	0.570	90	Weighted Average
	0.150	69	26.32% Pervious Area
	0.420	98	73.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	115	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	100	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
15.2	215	Total			

Summary for Subcatchment E.CART:

Runoff = 0.45 cfs @ 12.24 hrs, Volume= 0.034 af, Depth= 0.95"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.45"

	Area (ac)	CN	Description
*	0.130	98	
*	0.300	69	
	0.430	78	Weighted Average
	0.300	69	69.77% Pervious Area
	0.130	98	30.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	156	0.0600	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.4	70	0.0400	3.00		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.3	75	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.7	301	Total			

Summary for Subcatchment E.LP:

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.006 af, Depth= 1.43"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.45"

	Area (ac)	CN	Description
*	0.029	98	
*	0.022	69	
	0.051	85	Weighted Average
	0.022	69	43.14% Pervious Area
	0.029	98	56.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	16	0.0300	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"

Summary for Subcatchment N.LP:

Runoff = 2.05 cfs @ 12.14 hrs, Volume= 0.112 af, Depth= 2.22"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.45"

	Area (ac)	CN	Description
*	0.607	98	
*	0.000	69	
	0.607	98	Weighted Average
	0.607	98	100.00% Impervious Area

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

Summary for Subcatchment NE.LEX: Lex. Ave. Entrance Drive

Runoff = 0.22 cfs @ 12.07 hrs, Volume= 0.010 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.45"

	Area (ac)	CN	Description
*	0.050	98	
	0.030	69	50-75% Grass cover, Fair, HSG B
	0.080	87	Weighted Average
	0.030	69	37.50% Pervious Area
	0.050	98	62.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	12	0.2500	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.5	36	0.0240	1.13		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.5	48	Total			

Summary for Subcatchment NW.LEX: Lex. Ave. Entrance Drive

Runoff = 0.45 cfs @ 12.06 hrs, Volume= 0.021 af, Depth= 2.07"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.45"

Area (ac)	CN	Description
0.010	69	50-75% Grass cover, Fair, HSG B
0.110	98	Paved parking, HSG B
0.120	96	Weighted Average
0.010	69	8.33% Pervious Area
0.110	98	91.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	33	0.0215	1.06		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	27	0.0108	0.78		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.1	60	Total			

Summary for Subcatchment ROOF:

Runoff = 1.40 cfs @ 12.06 hrs, Volume= 0.065 af, Depth= 2.22"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.45"

	Area (ac)	CN	Description
*	0.350	98	ROOF
	0.350	98	100.00% Impervious Area

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

Summary for Subcatchment S.DRIVE:

Runoff = 0.70 cfs @ 12.13 hrs, Volume= 0.038 af, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.45"

	Area (ac)	CN	Description
*	0.168	98	
*	0.206	69	
	0.374	82	Weighted Average
	0.206	69	55.08% Pervious Area
	0.168	98	44.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	35	0.0400	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.2	7	0.0200	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	28	0.0370	1.28		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.1	18	0.0295	3.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.7	88	Total			

Summary for Subcatchment S.LP:

Runoff = 2.60 cfs @ 12.14 hrs, Volume= 0.143 af, Depth= 2.22"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.45"

	Area (ac)	CN	Description
*	0.770	98	
*	0.000	69	
	0.770	98	Weighted Average
	0.770	98	100.00% Impervious Area

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

Summary for Subcatchment SE.LEX: Lex. Ave. Entrance Drive

Runoff = 0.29 cfs @ 12.14 hrs, Volume= 0.016 af, Depth= 1.81"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.45"

Area (ac)	CN	Description
0.024	69	50-75% Grass cover, Fair, HSG B
0.083	98	Water Surface, HSG B
0.107	91	Weighted Average
0.024	69	22.43% Pervious Area
0.083	98	77.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	43	0.0280	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.4	33	0.0333	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
7.2	76	Total			

Summary for Subcatchment SE.LP:

Runoff = 0.03 cfs @ 12.12 hrs, Volume= 0.001 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.45"

	Area (ac)	CN	Description
*	0.002	98	
*	0.033	69	
	0.035	71	Weighted Average
	0.033	69	94.29% Pervious Area
	0.002	98	5.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	22	0.0300	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"

Summary for Subcatchment SWLEX:

Runoff = 0.82 cfs @ 12.10 hrs, Volume= 0.040 af, Depth= 1.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.45"

	Area (ac)	CN	Description
*	0.192	98	
*	0.131	69	
	0.323	86	Weighted Average
	0.131	69	40.56% Pervious Area
	0.192	98	59.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	11	0.0150	0.06		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	48	0.0225	1.17		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.6	59	Total			

Summary for Subcatchment TCF:

Runoff = 1.85 cfs @ 12.14 hrs, Volume= 0.101 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.45"

Area (ac)	CN	Description
0.540	98	Paved parking, HSG C
0.040	69	50-75% Grass cover, Fair, HSG B
0.580	96	Weighted Average
0.040	69	6.90% Pervious Area
0.540	98	93.10% Impervious Area

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

Summary for Subcatchment UNIV: Univ. Ave. Entrance Drive

Runoff = 0.91 cfs @ 12.10 hrs, Volume= 0.040 af, Depth= 1.49"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.45"

Area (ac)	CN	Description
* 0.250	96	ROADWAY
0.070	69	50-75% Grass cover, Fair, HSG B
0.320	90	Weighted Average
0.320	90	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	15	0.0500	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.3	130	0.0307	1.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	50	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.0	195	Total			

Summary for Subcatchment W.ALDI:

Runoff = 1.65 cfs @ 12.10 hrs, Volume= 0.079 af, Depth= 2.03"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.45"

	Area (ac)	CN	Description
*	0.420	98	
*	0.050	69	
	0.470	95	Weighted Average
	0.050	69	10.64% Pervious Area
	0.420	98	89.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.4	105	0.0187	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.5	118	Total			

Summary for Subcatchment WILD:

Runoff = 4.92 cfs @ 12.22 hrs, Volume= 0.348 af, Depth= 1.79"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.45"

	Area (ac)	CN	Description
*	1.750	98	
*	0.470	69	
*	0.110	85	
	2.330	92	Weighted Average
	0.580	72	24.89% Pervious Area
	1.750	98	75.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	58	0.0100	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.6	159	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.4	126	0.0100	5.26	6.46	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.2	54	0.0055	4.41	7.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
14.2	397	Total			

Summary for Reach 2R: (new Reach)

Inflow Area = 8.347 ac, 74.17% Impervious, Inflow Depth = 1.31" for 1-Year event
Inflow = 5.78 cfs @ 12.44 hrs, Volume= 0.908 af
Outflow = 5.78 cfs @ 12.44 hrs, Volume= 0.908 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs

Summary for Pond 51:

Inflow Area = 2.330 ac, 75.11% Impervious, Inflow Depth = 1.79" for 1-Year event
Inflow = 4.92 cfs @ 12.22 hrs, Volume= 0.348 af
Outflow = 4.92 cfs @ 12.22 hrs, Volume= 0.348 af, Atten= 0%, Lag= 0.0 min
Primary = 4.92 cfs @ 12.22 hrs, Volume= 0.348 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 885.40' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**18.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=4.83 cfs @ 12.22 hrs HW=885.38' (Free Discharge)
1=Culvert (Barrel Controls 4.83 cfs @ 3.87 fps)

Summary for Pond 52:

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**15.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
1=Culvert (Controls 0.00 cfs)

Summary for Pond 61: Stub-61

Inflow Area = 0.580 ac, 93.10% Impervious, Inflow Depth = 2.10" for 1-Year event
Inflow = 1.85 cfs @ 12.14 hrs, Volume= 0.101 af
Outflow = 1.85 cfs @ 12.14 hrs, Volume= 0.101 af, Atten= 0%, Lag= 0.0 min
Primary = 1.85 cfs @ 12.14 hrs, Volume= 0.101 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 885.07' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.11'	**12.0" Round Culvert** L= 22.0' Ke= 0.900 Inlet / Outlet Invert= 884.11' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=1.79 cfs @ 12.14 hrs HW=885.05' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.79 cfs @ 3.01 fps)

Summary for Pond 108":

Inflow Area = 2.427 ac, 78.57% Impervious, Inflow Depth = 1.09" for 1-Year event
Inflow = 2.26 cfs @ 12.25 hrs, Volume= 0.220 af
Outflow = 1.73 cfs @ 12.40 hrs, Volume= 0.220 af, Atten= 23%, Lag= 8.8 min
Discarded = 0.01 cfs @ 7.00 hrs, Volume= 0.023 af
Primary = 1.72 cfs @ 12.40 hrs, Volume= 0.197 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 883.89' @ 12.40 hrs Surf.Area= 0.021 ac Storage= 0.034 af

Plug-Flow detention time= 131.6 min calculated for 0.220 af (100% of inflow)
Center-of-Mass det. time= 132.9 min (923.8 - 790.9)

Volume	Invert	Avail.Storage	Storage Description
#1	890.50'	0.003 af	**4.00'D x 4.50'H Vertical Cone/Cylinder** x 2
#2	881.00'	0.052 af	**14.00'W x 66.00'L x 10.25'H Prismatoid** 0.217 af Overall - 0.088 af Embedded = 0.130 af x 40.0% Voids
#3	881.45'	0.088 af	**108.0" Round Pipe Storage** Inside #2 L= 60.0' S= 0.0123 '/'
		0.142 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	882.45'	**24.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 882.45' / 882.15' S= 0.0150 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	882.50'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	889.50'	**0.5' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#4	Discarded	881.00'	**0.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 7.00 hrs HW=881.14' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.72 cfs @ 12.40 hrs HW=883.89' (Free Discharge)
└**1=Culvert** (Passes 1.72 cfs of 8.53 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.72 cfs @ 4.94 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 110:

Inflow Area = 1.460 ac, 85.62% Impervious, Inflow Depth = 1.96" for 1-Year event
Inflow = 3.82 cfs @ 12.09 hrs, Volume= 0.238 af
Outflow = 3.82 cfs @ 12.09 hrs, Volume= 0.238 af, Atten= 0%, Lag= 0.0 min
Primary = 3.82 cfs @ 12.09 hrs, Volume= 0.238 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 886.16' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.11'	**15.0" Round Culvert** L= 86.0' Ke= 0.500 Inlet / Outlet Invert= 885.11' / 884.00' S= 0.0129 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=3.67 cfs @ 12.09 hrs HW=886.13' (Free Discharge)
1=Culvert (Inlet Controls 3.67 cfs @ 3.43 fps)

Summary for Pond 120:

Inflow Area = 0.890 ac, 93.26% Impervious, Inflow Depth = 2.10" for 1-Year event
Inflow = 3.19 cfs @ 12.08 hrs, Volume= 0.156 af
Outflow = 3.19 cfs @ 12.08 hrs, Volume= 0.156 af, Atten= 0%, Lag= 0.0 min
Primary = 3.19 cfs @ 12.08 hrs, Volume= 0.156 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 886.93' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.90'	**15.0" Round Culvert** L= 132.0' Ke= 0.500 Inlet / Outlet Invert= 885.90' / 885.11' S= 0.0060 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=3.01 cfs @ 12.08 hrs HW=886.88' (Free Discharge)
1=Culvert (Barrel Controls 3.01 cfs @ 3.98 fps)

Summary for Pond 130:

Inflow Area = 0.420 ac, 97.62% Impervious, Inflow Depth = 2.18" for 1-Year event
Inflow = 1.62 cfs @ 12.06 hrs, Volume= 0.076 af
Outflow = 1.62 cfs @ 12.06 hrs, Volume= 0.076 af, Atten= 0%, Lag= 0.0 min
Primary = 1.62 cfs @ 12.06 hrs, Volume= 0.076 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 887.47' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	886.78'	**12.0" Round Culvert** L= 68.0' Ke= 0.500 Inlet / Outlet Invert= 886.78' / 886.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.54 cfs @ 12.06 hrs HW=887.45' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.54 cfs @ 3.88 fps)

Summary for Pond 140:

Inflow Area = 0.070 ac, 85.71% Impervious, Inflow Depth = 1.96" for 1-Year event
Inflow = 0.24 cfs @ 12.09 hrs, Volume= 0.011 af
Outflow = 0.24 cfs @ 12.09 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min
Primary = 0.24 cfs @ 12.09 hrs, Volume= 0.011 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 887.42' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	887.11'	**12.0" Round Culvert** L= 108.0' Ke= 0.500 Inlet / Outlet Invert= 887.11' / 886.78' S= 0.0031 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.23 cfs @ 12.09 hrs HW=887.42' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.23 cfs @ 1.70 fps)

Summary for Pond CB31:

Inflow Area = 0.080 ac, 62.50% Impervious, Inflow Depth = 1.54" for 1-Year event
Inflow = 0.22 cfs @ 12.07 hrs, Volume= 0.010 af
Outflow = 0.22 cfs @ 12.07 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min
Primary = 0.22 cfs @ 12.07 hrs, Volume= 0.010 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 884.47' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.23'	**12.0" Round Culvert** L= 23.0' Ke= 0.500 Inlet / Outlet Invert= 884.23' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.21 cfs @ 12.07 hrs HW=884.46' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.21 cfs @ 2.24 fps)

Summary for Pond CB41:

Inflow Area = 0.120 ac, 91.67% Impervious, Inflow Depth = 2.07" for 1-Year event
Inflow = 0.45 cfs @ 12.06 hrs, Volume= 0.021 af
Outflow = 0.45 cfs @ 12.06 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min
Primary = 0.45 cfs @ 12.06 hrs, Volume= 0.021 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 884.55' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.19'	**12.0" Round Culvert** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 884.19' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.43 cfs @ 12.06 hrs HW=884.54' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 0.43 cfs @ 2.60 fps)

Summary for Pond PROP: (new Pond)

Inflow Area = 1.377 ac,100.00% Impervious, Inflow Depth = 2.22" for 1-Year event
Inflow = 4.66 cfs @ 12.14 hrs, Volume= 0.255 af
Outflow = 0.86 cfs @ 12.46 hrs, Volume= 0.255 af, Atten= 81%, Lag= 19.0 min
Discarded = 0.05 cfs @ 9.15 hrs, Volume= 0.150 af
Primary = 0.82 cfs @ 12.46 hrs, Volume= 0.105 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 890.10' @ 12.46 hrs Surf.Area= 0.057 ac Storage= 0.137 af

Plug-Flow detention time= 508.6 min calculated for 0.255 af (100% of inflow)
Center-of-Mass det. time= 509.2 min (1,266.6 - 757.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	886.50'	0.102 af	**45.00'W x 55.00'L x 9.00'H Field A** 0.511 af Overall - 0.256 af Embedded = 0.255 af x 40.0% Voids
#2A	887.00'	0.256 af	**CMP Round 96** x 8 Inside #1 Effective Size= 96.0"W x 96.0"H => 50.27 sf x 20.00'L = 1,005.3 cf Overall Size= 96.0"W x 96.0"H x 20.00'L Row Length Adjustment= -5.00' x 50.27 sf x 4 rows 41.00' Header x 50.27 sf x 2 = 4,121.8 cf Inside
#3	896.00'	0.003 af	**4.00'D x 5.00'H Vertical Cone/Cylinder** x 2
		0.361 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	889.00'	**12.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 889.00' / 887.00' S= 0.0400 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	889.10'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	886.50'	**0.800 in/hr Exfiltration over Surface area**
#4	Device 1	894.40'	**4.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.05 cfs @ 9.15 hrs HW=886.65' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.82 cfs @ 12.46 hrs HW=890.10' (Free Discharge)
└**1=Culvert** (Passes 0.82 cfs of 2.92 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.82 cfs @ 4.16 fps)
  └**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond SYS: (new Pond)

Inflow Area =	8.261 ac,	74.57% Impervious,	Inflow Depth =	1.56" for 1-Year event
Inflow =	13.01 cfs @	12.12 hrs,	Volume=	1.071 af
Outflow =	5.81 cfs @	12.45 hrs,	Volume=	1.071 af, Atten= 55%, Lag= 19.9 min
Discarded =	0.05 cfs @	7.15 hrs,	Volume=	0.170 af
Primary =	5.75 cfs @	12.45 hrs,	Volume=	0.901 af
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 883.45' @ 12.45 hrs Surf.Area= 9,472 sf Storage= 15,329 cf

Plug-Flow detention time= 144.1 min calculated for 1.071 af (100% of inflow)
Center-of-Mass det. time= 143.5 min (917.9 - 774.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	880.75'	9,122 cf	**18.50'W x 316.00'L x 6.00'H Field A** 35,076 cf Overall - 12,272 cf Embedded = 22,804 cf x 40.0% Voids
#2A	881.25'	12,272 cf	**CMP Round 60** x 30 Inside #1 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L 30 Chambers in 2 Rows 12.50' Header x 19.63 sf x 2 = 490.9 cf Inside
#3B	880.75'	5,620 cf	**18.50'W x 196.00'L x 6.00'H Field B** 21,756 cf Overall - 7,707 cf Embedded = 14,049 cf x 40.0% Voids
#4B	881.25'	7,707 cf	**CMP Round 60** x 18 Inside #3 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L Row Length Adjustment= +10.00' x 19.63 sf x 2 rows 12.50' Header x 19.63 sf x 1 = 245.4 cf Inside
#5	886.25'	25 cf	**4.00'D x 2.00'H CBMH-30**
#6	886.25'	29 cf	**4.00'D x 2.29'H CBMH-31**
#7	886.25'	35 cf	**4.00'D x 2.82'H CBMH-40**
#8	886.25'	40 cf	**4.00'D x 3.18'H CBMH-41**
#9	886.25'	57 cf	**4.00'D x 4.50'H CBMH-50**
#10	886.25'	59 cf	**4.00'D x 4.70'H CBMH-51**
#11	886.25'	60 cf	**4.00'D x 4.80'H CBMH-52**
#12	886.25'	62 cf	**4.00'D x 4.95'H CBMH-60**
#13	886.25'	60 cf	**4.00'D x 4.75'H CBMH-70**
#14	886.25'	66 cf	**4.00'D x 5.26'H CBMH-80**
#15	886.25'	59 cf	**4.00'D x 4.70'H CBMH-90**
#16	886.25'	62 cf	**4.00'D x 4.92'H CBMH-100**
#17	888.33'	8,117 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		43,451 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
888.33	15	0	0
888.50	345	31	31
889.00	3,000	836	867
889.50	7,000	2,500	3,367
890.00	12,000	4,750	8,117

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.75'	**0.250 in/hr Exfiltration over Surface area**
#2	Primary	880.39'	**12.0" Round Culvert** L= 55.0' Ke= 0.500 Inlet / Outlet Invert= 880.39' / 879.17' S= 0.0222 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	881.60'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	881.60'	**8.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#5	Device 2	885.60'	**7.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00

Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

#6 Secondary 888.50' **10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.05 cfs @ 7.15 hrs HW=880.86' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=5.75 cfs @ 12.45 hrs HW=883.45' (Free Discharge)
└**2=Culvert** (Passes 5.75 cfs of 6.05 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 1.61 cfs @ 6.02 fps)
  ├**4=Orifice/Grate** (Orifice Controls 4.14 cfs @ 5.93 fps)
  └**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=880.75' (Free Discharge)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment C.DRIVE:

Runoff = 0.80 cfs @ 12.10 hrs, Volume= 0.040 af, Depth= 3.41"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.110	98	
*	0.030	69	
	0.140	92	Weighted Average
	0.030	69	21.43% Pervious Area
	0.110	98	78.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	13	0.0200	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.1	5	0.0200	0.71		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	34	0.0170	0.97		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.2	36	0.0195	2.83		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.9	88	Total			

Summary for Subcatchment CART:

Runoff = 1.15 cfs @ 12.23 hrs, Volume= 0.083 af, Depth= 3.02"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.210	98	
*	0.120	69	
	0.330	87	Weighted Average
	0.120	69	36.36% Pervious Area
	0.210	98	63.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	62	0.0100	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.3	85	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.8	255	0.0100	5.26	6.46	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
14.8	402	Total			

Summary for Subcatchment DOCK:

Runoff = 0.44 cfs @ 12.09 hrs, Volume= 0.021 af, Depth= 3.59"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.060	98	
*	0.010	69	
	0.070	94	Weighted Average
	0.010	69	14.29% Pervious Area
	0.060	98	85.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	85	0.0400	1.65		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.0	98	Total			

Summary for Subcatchment DUN:

Runoff = 1.05 cfs @ 12.22 hrs, Volume= 0.074 af, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.190	98	
*	0.100	69	
	0.290	88	Weighted Average
	0.100	69	34.48% Pervious Area
	0.190	98	65.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	150	0.0700	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	137	0.0310	2.64		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	166	0.0200	6.42	5.04	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.1	453	Total			

Summary for Subcatchment E.ALDI:

Runoff = 2.11 cfs @ 12.23 hrs, Volume= 0.156 af, Depth= 3.28"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.420	98	
*	0.150	69	
	0.570	90	Weighted Average
	0.150	69	26.32% Pervious Area
	0.420	98	73.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	115	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	100	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
15.2	215	Total			

Summary for Subcatchment E.CART:

Runoff = 1.10 cfs @ 12.24 hrs, Volume= 0.078 af, Depth= 2.17"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.130	98	
*	0.300	69	
	0.430	78	Weighted Average
	0.300	69	69.77% Pervious Area
	0.130	98	30.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	156	0.0600	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.4	70	0.0400	3.00		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.3	75	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.7	301	Total			

Summary for Subcatchment E.LP:

Runoff = 0.26 cfs @ 12.09 hrs, Volume= 0.012 af, Depth= 2.85"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.029	98	
*	0.022	69	
	0.051	85	Weighted Average
	0.022	69	43.14% Pervious Area
	0.029	98	56.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	16	0.0300	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"

Summary for Subcatchment N.LP:

Runoff = 3.56 cfs @ 12.14 hrs, Volume= 0.200 af, Depth= 3.95"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.607	98	
*	0.000	69	
	0.607	98	Weighted Average
	0.607	98	100.00% Impervious Area

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

Summary for Subcatchment NE.LEX: Lex. Ave. Entrance Drive

Runoff = 0.43 cfs @ 12.07 hrs, Volume= 0.020 af, Depth= 2.99"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.050	98	
	0.030	69	50-75% Grass cover, Fair, HSG B
	0.080	87	Weighted Average
	0.030	69	37.50% Pervious Area
	0.050	98	62.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	12	0.2500	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.5	36	0.0240	1.13		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.5	48	Total			

Summary for Subcatchment NW.LEX: Lex. Ave. Entrance Drive

Runoff = 0.79 cfs @ 12.06 hrs, Volume= 0.037 af, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

Area (ac)	CN	Description
0.010	69	50-75% Grass cover, Fair, HSG B
0.110	98	Paved parking, HSG B
0.120	96	Weighted Average
0.010	69	8.33% Pervious Area
0.110	98	91.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	33	0.0215	1.06		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	27	0.0108	0.78		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.1	60	Total			

Summary for Subcatchment ROOF:

Runoff = 2.43 cfs @ 12.06 hrs, Volume= 0.115 af, Depth= 3.95"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.350	98	ROOF
	0.350	98	100.00% Impervious Area

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

Summary for Subcatchment S.DRIVE:

Runoff = 1.52 cfs @ 12.13 hrs, Volume= 0.079 af, Depth= 2.54"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.168	98	
*	0.206	69	
	0.374	82	Weighted Average
	0.206	69	55.08% Pervious Area
	0.168	98	44.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	35	0.0400	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.2	7	0.0200	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	28	0.0370	1.28		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.1	18	0.0295	3.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.7	88	Total			

Summary for Subcatchment S.LP:

Runoff = 4.51 cfs @ 12.14 hrs, Volume= 0.254 af, Depth= 3.95"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.770	98	
*	0.000	69	
	0.770	98	Weighted Average
	0.770	98	100.00% Impervious Area

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

Summary for Subcatchment SE.LEX: Lex. Ave. Entrance Drive

Runoff = 0.54 cfs @ 12.14 hrs, Volume= 0.030 af, Depth= 3.38"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

Area (ac)	CN	Description
0.024	69	50-75% Grass cover, Fair, HSG B
0.083	98	Water Surface, HSG B
0.107	91	Weighted Average
0.024	69	22.43% Pervious Area
0.083	98	77.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	43	0.0280	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.4	33	0.0333	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
7.2	76	Total			

Summary for Subcatchment SE.LP:

Runoff = 0.10 cfs @ 12.11 hrs, Volume= 0.004 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.002	98	
*	0.033	69	
	0.035	71	Weighted Average
	0.033	69	94.29% Pervious Area
	0.002	98	5.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	22	0.0300	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"

Summary for Subcatchment SWLEX:

Runoff = 1.63 cfs @ 12.10 hrs, Volume= 0.078 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.192	98	
*	0.131	69	
	0.323	86	Weighted Average
	0.131	69	40.56% Pervious Area
	0.192	98	59.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	11	0.0150	0.06		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	48	0.0225	1.17		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.6	59	Total			

Summary for Subcatchment TCF:

Runoff = 3.26 cfs @ 12.14 hrs, Volume= 0.183 af, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

Area (ac)	CN	Description
0.540	98	Paved parking, HSG C
0.040	69	50-75% Grass cover, Fair, HSG B
0.580	96	Weighted Average
0.040	69	6.90% Pervious Area
0.540	98	93.10% Impervious Area

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

Summary for Subcatchment UNIV: Univ. Ave. Entrance Drive

Runoff = 1.83 cfs @ 12.10 hrs, Volume= 0.083 af, Depth= 3.10"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

Area (ac)	CN	Description
* 0.250	96	ROADWAY
0.070	69	50-75% Grass cover, Fair, HSG B
0.320	90	Weighted Average
0.320	90	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	15	0.0500	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.3	130	0.0307	1.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	50	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.0	195	Total			

Summary for Subcatchment W.ALDI:

Runoff = 2.93 cfs @ 12.09 hrs, Volume= 0.144 af, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	0.420	98	
*	0.050	69	
	0.470	95	Weighted Average
	0.050	69	10.64% Pervious Area
	0.420	98	89.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.4	105	0.0187	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.5	118	Total			

Summary for Subcatchment WILD:

Runoff = 9.18 cfs @ 12.22 hrs, Volume= 0.654 af, Depth= 3.37"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.19"

	Area (ac)	CN	Description
*	1.750	98	
*	0.470	69	
*	0.110	85	
	2.330	92	Weighted Average
	0.580	72	24.89% Pervious Area
	1.750	98	75.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	58	0.0100	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.6	159	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.4	126	0.0100	5.26	6.46	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.2	54	0.0055	4.41	7.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
14.2	397	Total			

Summary for Reach 2R: (new Reach)

Inflow Area = 8.347 ac, 74.17% Impervious, Inflow Depth = 2.84" for 10-Year event
Inflow = 8.26 cfs @ 12.53 hrs, Volume= 1.978 af
Outflow = 8.26 cfs @ 12.53 hrs, Volume= 1.978 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs

Summary for Pond 51:

Inflow Area = 2.330 ac, 75.11% Impervious, Inflow Depth = 3.37" for 10-Year event
Inflow = 9.18 cfs @ 12.22 hrs, Volume= 0.654 af
Outflow = 9.18 cfs @ 12.22 hrs, Volume= 0.654 af, Atten= 0%, Lag= 0.0 min
Primary = 9.18 cfs @ 12.22 hrs, Volume= 0.654 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 886.21' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**18.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=9.01 cfs @ 12.22 hrs HW=886.18' (Free Discharge)
↑**1=Culvert** (Barrel Controls 9.01 cfs @ 5.10 fps)

Summary for Pond 52:

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**15.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
↑**1=Culvert** (Controls 0.00 cfs)

Summary for Pond 61: Stub-61

Inflow Area = 0.580 ac, 93.10% Impervious, Inflow Depth = 3.78" for 10-Year event
Inflow = 3.26 cfs @ 12.14 hrs, Volume= 0.183 af
Outflow = 3.26 cfs @ 12.14 hrs, Volume= 0.183 af, Atten= 0%, Lag= 0.0 min
Primary = 3.26 cfs @ 12.14 hrs, Volume= 0.183 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 885.79' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.11'	**12.0" Round Culvert** L= 22.0' Ke= 0.900 Inlet / Outlet Invert= 884.11' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=3.16 cfs @ 12.14 hrs HW=885.73' (Free Discharge)
└**1=Culvert** (Inlet Controls 3.16 cfs @ 4.02 fps)

Summary for Pond 108":

Inflow Area = 2.427 ac, 78.57% Impervious, Inflow Depth = 2.60" for 10-Year event
Inflow = 4.78 cfs @ 12.24 hrs, Volume= 0.525 af
Outflow = 3.15 cfs @ 12.45 hrs, Volume= 0.525 af, Atten= 34%, Lag= 12.6 min
Discarded = 0.01 cfs @ 5.05 hrs, Volume= 0.024 af
Primary = 3.15 cfs @ 12.45 hrs, Volume= 0.501 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 886.34' @ 12.45 hrs Surf.Area= 0.021 ac Storage= 0.072 af

Plug-Flow detention time= 64.6 min calculated for 0.525 af (100% of inflow)
Center-of-Mass det. time= 65.9 min (864.3 - 798.4)

Volume	Invert	Avail.Storage	Storage Description
#1	890.50'	0.003 af	**4.00'D x 4.50'H Vertical Cone/Cylinder** x 2
#2	881.00'	0.052 af	**14.00'W x 66.00'L x 10.25'H Prismatoid** 0.217 af Overall - 0.088 af Embedded = 0.130 af x 40.0% Voids
#3	881.45'	0.088 af	**108.0" Round Pipe Storage** Inside #2 L= 60.0' S= 0.0123 '/'
		0.142 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	882.45'	**24.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 882.45' / 882.15' S= 0.0150 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	882.50'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	889.50'	**0.5' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#4	Discarded	881.00'	**0.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 5.05 hrs HW=881.14' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=3.14 cfs @ 12.45 hrs HW=886.33' (Free Discharge)
└**1=Culvert** (Passes 3.14 cfs of 25.69 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 3.14 cfs @ 9.01 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 110:

Inflow Area = 1.460 ac, 85.62% Impervious, Inflow Depth = 3.59" for 10-Year event
Inflow = 6.81 cfs @ 12.09 hrs, Volume= 0.436 af
Outflow = 6.81 cfs @ 12.09 hrs, Volume= 0.436 af, Atten= 0%, Lag= 0.0 min
Primary = 6.81 cfs @ 12.09 hrs, Volume= 0.436 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 887.05' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.11'	**15.0" Round Culvert** L= 86.0' Ke= 0.500 Inlet / Outlet Invert= 885.11' / 884.00' S= 0.0129 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=6.56 cfs @ 12.09 hrs HW=886.97' (Free Discharge)
1=Culvert (Inlet Controls 6.56 cfs @ 5.35 fps)

Summary for Pond 120:

Inflow Area = 0.890 ac, 93.26% Impervious, Inflow Depth = 3.78" for 10-Year event
Inflow = 5.62 cfs @ 12.08 hrs, Volume= 0.280 af
Outflow = 5.62 cfs @ 12.08 hrs, Volume= 0.280 af, Atten= 0%, Lag= 0.0 min
Primary = 5.62 cfs @ 12.08 hrs, Volume= 0.280 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 887.78' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.90'	**15.0" Round Culvert** L= 132.0' Ke= 0.500 Inlet / Outlet Invert= 885.90' / 885.11' S= 0.0060 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=5.16 cfs @ 12.08 hrs HW=887.62' (Free Discharge)
1=Culvert (Barrel Controls 5.16 cfs @ 4.21 fps)

Summary for Pond 130:

Inflow Area = 0.420 ac, 97.62% Impervious, Inflow Depth = 3.89" for 10-Year event
Inflow = 2.81 cfs @ 12.06 hrs, Volume= 0.136 af
Outflow = 2.81 cfs @ 12.06 hrs, Volume= 0.136 af, Atten= 0%, Lag= 0.0 min
Primary = 2.81 cfs @ 12.06 hrs, Volume= 0.136 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 887.82' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	886.78'	**12.0" Round Culvert** L= 68.0' Ke= 0.500 Inlet / Outlet Invert= 886.78' / 886.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=2.68 cfs @ 12.06 hrs HW=887.78' (Free Discharge)
└**1=Culvert** (Inlet Controls 2.68 cfs @ 3.42 fps)

Summary for Pond 140:

Inflow Area = 0.070 ac, 85.71% Impervious, Inflow Depth = 3.59" for 10-Year event
Inflow = 0.44 cfs @ 12.09 hrs, Volume= 0.021 af
Outflow = 0.44 cfs @ 12.09 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min
Primary = 0.44 cfs @ 12.09 hrs, Volume= 0.021 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 887.53' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	887.11'	**12.0" Round Culvert** L= 108.0' Ke= 0.500 Inlet / Outlet Invert= 887.11' / 886.78' S= 0.0031 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.42 cfs @ 12.09 hrs HW=887.52' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.42 cfs @ 2.01 fps)

Summary for Pond CB31:

Inflow Area = 0.080 ac, 62.50% Impervious, Inflow Depth = 2.99" for 10-Year event
Inflow = 0.43 cfs @ 12.07 hrs, Volume= 0.020 af
Outflow = 0.43 cfs @ 12.07 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min
Primary = 0.43 cfs @ 12.07 hrs, Volume= 0.020 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 884.58' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.23'	**12.0" Round Culvert** L= 23.0' Ke= 0.500 Inlet / Outlet Invert= 884.23' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.41 cfs @ 12.07 hrs HW=884.57' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.41 cfs @ 2.62 fps)

Summary for Pond CB41:

Inflow Area = 0.120 ac, 91.67% Impervious, Inflow Depth = 3.74" for 10-Year event
Inflow = 0.79 cfs @ 12.06 hrs, Volume= 0.037 af
Outflow = 0.79 cfs @ 12.06 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min
Primary = 0.79 cfs @ 12.06 hrs, Volume= 0.037 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 884.69' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.19'	**12.0" Round Culvert** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 884.19' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.76 cfs @ 12.06 hrs HW=884.67' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 0.76 cfs @ 2.94 fps)

Summary for Pond PROP: (new Pond)

Inflow Area = 1.377 ac,100.00% Impervious, Inflow Depth = 3.95" for 10-Year event
Inflow = 8.06 cfs @ 12.14 hrs, Volume= 0.454 af
Outflow = 1.64 cfs @ 12.42 hrs, Volume= 0.454 af, Atten= 80%, Lag= 17.2 min
Discarded = 0.05 cfs @ 6.15 hrs, Volume= 0.164 af
Primary = 1.60 cfs @ 12.42 hrs, Volume= 0.290 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 892.21' @ 12.42 hrs Surf.Area= 0.057 ac Storage= 0.236 af

Plug-Flow detention time= 339.0 min calculated for 0.454 af (100% of inflow)
Center-of-Mass det. time= 339.6 min (1,088.2 - 748.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	886.50'	0.102 af	**45.00'W x 55.00'L x 9.00'H Field A** 0.511 af Overall - 0.256 af Embedded = 0.255 af x 40.0% Voids
#2A	887.00'	0.256 af	**CMP Round 96** x 8 Inside #1 Effective Size= 96.0"W x 96.0"H => 50.27 sf x 20.00'L = 1,005.3 cf Overall Size= 96.0"W x 96.0"H x 20.00'L Row Length Adjustment= -5.00' x 50.27 sf x 4 rows 41.00' Header x 50.27 sf x 2 = 4,121.8 cf Inside
#3	896.00'	0.003 af	**4.00'D x 5.00'H Vertical Cone/Cylinder** x 2
		0.361 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	889.00'	**12.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 889.00' / 887.00' S= 0.0400 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	889.10'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	886.50'	**0.800 in/hr Exfiltration over Surface area**
#4	Device 1	894.40'	**4.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.05 cfs @ 6.15 hrs HW=886.65' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=1.60 cfs @ 12.42 hrs HW=892.20' (Free Discharge)
└**1=Culvert** (Passes 1.60 cfs of 6.22 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 1.60 cfs @ 8.13 fps)
  └**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond SYS: (new Pond)

Inflow Area = 8.261 ac, 74.57% Impervious, Inflow Depth = 3.11" for 10-Year event
Inflow = 24.71 cfs @ 12.12 hrs, Volume= 2.142 af
Outflow = 8.27 cfs @ 12.55 hrs, Volume= 2.142 af, Atten= 67%, Lag= 26.2 min
Discarded = 0.05 cfs @ 5.05 hrs, Volume= 0.180 af
Primary = 8.22 cfs @ 12.55 hrs, Volume= 1.961 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 885.66' @ 12.55 hrs Surf.Area= 9,472 sf Storage= 29,768 cf

Plug-Flow detention time= 101.4 min calculated for 2.142 af (100% of inflow)
Center-of-Mass det. time= 100.8 min (873.8 - 773.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	880.75'	9,122 cf	**18.50'W x 316.00'L x 6.00'H Field A** 35,076 cf Overall - 12,272 cf Embedded = 22,804 cf x 40.0% Voids
#2A	881.25'	12,272 cf	**CMP Round 60** x 30 Inside #1 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L 30 Chambers in 2 Rows 12.50' Header x 19.63 sf x 2 = 490.9 cf Inside
#3B	880.75'	5,620 cf	**18.50'W x 196.00'L x 6.00'H Field B** 21,756 cf Overall - 7,707 cf Embedded = 14,049 cf x 40.0% Voids
#4B	881.25'	7,707 cf	**CMP Round 60** x 18 Inside #3 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L Row Length Adjustment= +10.00' x 19.63 sf x 2 rows 12.50' Header x 19.63 sf x 1 = 245.4 cf Inside
#5	886.25'	25 cf	**4.00'D x 2.00'H CBMH-30**
#6	886.25'	29 cf	**4.00'D x 2.29'H CBMH-31**
#7	886.25'	35 cf	**4.00'D x 2.82'H CBMH-40**
#8	886.25'	40 cf	**4.00'D x 3.18'H CBMH-41**
#9	886.25'	57 cf	**4.00'D x 4.50'H CBMH-50**
#10	886.25'	59 cf	**4.00'D x 4.70'H CBMH-51**
#11	886.25'	60 cf	**4.00'D x 4.80'H CBMH-52**
#12	886.25'	62 cf	**4.00'D x 4.95'H CBMH-60**
#13	886.25'	60 cf	**4.00'D x 4.75'H CBMH-70**
#14	886.25'	66 cf	**4.00'D x 5.26'H CBMH-80**
#15	886.25'	59 cf	**4.00'D x 4.70'H CBMH-90**
#16	886.25'	62 cf	**4.00'D x 4.92'H CBMH-100**
#17	888.33'	8,117 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		43,451 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
888.33	15	0	0
888.50	345	31	31
889.00	3,000	836	867
889.50	7,000	2,500	3,367
890.00	12,000	4,750	8,117

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.75'	**0.250 in/hr Exfiltration over Surface area**
#2	Primary	880.39'	**12.0" Round Culvert** L= 55.0' Ke= 0.500 Inlet / Outlet Invert= 880.39' / 879.17' S= 0.0222 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	881.60'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	881.60'	**8.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#5	Device 2	885.60'	**7.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00

Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

#6 Secondary 888.50' **10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.05 cfs @ 5.05 hrs HW=880.86' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=8.22 cfs @ 12.55 hrs HW=885.65' (Free Discharge)
└**2=Culvert** (Barrel Controls 8.22 cfs @ 10.46 fps)
  ├**3=Orifice/Grate** (Passes < 2.50 cfs potential flow)
  ├**4=Orifice/Grate** (Passes < 6.48 cfs potential flow)
  └**5=Broad-Crested Rectangular Weir** (Passes < 0.24 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=880.75' (Free Discharge)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment C.DRIVE:

Runoff = 1.49 cfs @ 12.10 hrs, Volume= 0.075 af, Depth= 6.41"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

Area (ac)	CN	Description
* 0.110	98	
* 0.030	69	
0.140	92	Weighted Average
0.030	69	21.43% Pervious Area
0.110	98	78.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	13	0.0200	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.1	5	0.0200	0.71		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	34	0.0170	0.97		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.2	36	0.0195	2.83		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.9	88	Total			

Summary for Subcatchment CART:

Runoff = 2.26 cfs @ 12.23 hrs, Volume= 0.163 af, Depth= 5.92"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

Area (ac)	CN	Description
* 0.210	98	
* 0.120	69	
0.330	87	Weighted Average
0.120	69	36.36% Pervious Area
0.210	98	63.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	62	0.0100	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.3	85	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.8	255	0.0100	5.26	6.46	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
14.8	402	Total			

Summary for Subcatchment DOCK:

Runoff = 0.80 cfs @ 12.09 hrs, Volume= 0.039 af, Depth= 6.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.060	98	
*	0.010	69	
	0.070	94	Weighted Average
	0.010	69	14.29% Pervious Area
	0.060	98	85.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	85	0.0400	1.65		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.0	98	Total			

Summary for Subcatchment DUN:

Runoff = 2.05 cfs @ 12.22 hrs, Volume= 0.145 af, Depth= 5.98"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.190	98	
*	0.100	69	
	0.290	88	Weighted Average
	0.100	69	34.48% Pervious Area
	0.190	98	65.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	150	0.0700	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	137	0.0310	2.64		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	166	0.0200	6.42	5.04	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.1	453	Total			

Summary for Subcatchment E.ALDI:

Runoff = 4.01 cfs @ 12.23 hrs, Volume= 0.297 af, Depth= 6.25"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.420	98	
*	0.150	69	
	0.570	90	Weighted Average
	0.150	69	26.32% Pervious Area
	0.420	98	73.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	115	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	100	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
15.2	215	Total			

Summary for Subcatchment E.CART:

Runoff = 2.50 cfs @ 12.23 hrs, Volume= 0.172 af, Depth= 4.81"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.130	98	
*	0.300	69	
	0.430	78	Weighted Average
	0.300	69	69.77% Pervious Area
	0.130	98	30.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	156	0.0600	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.4	70	0.0400	3.00		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.3	75	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.7	301	Total			

Summary for Subcatchment E.LP:

Runoff = 0.52 cfs @ 12.09 hrs, Volume= 0.024 af, Depth= 5.69"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.029	98	
*	0.022	69	
	0.051	85	Weighted Average
	0.022	69	43.14% Pervious Area
	0.029	98	56.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	16	0.0300	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"

Summary for Subcatchment N.LP:

Runoff = 6.28 cfs @ 12.14 hrs, Volume= 0.360 af, Depth= 7.12"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.607	98	
*	0.000	69	
	0.607	98	Weighted Average
	0.607	98	100.00% Impervious Area

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

Summary for Subcatchment NE.LEX: Lex. Ave. Entrance Drive

Runoff = 0.85 cfs @ 12.07 hrs, Volume= 0.039 af, Depth= 5.88"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.050	98	
	0.030	69	50-75% Grass cover, Fair, HSG B
	0.080	87	Weighted Average
	0.030	69	37.50% Pervious Area
	0.050	98	62.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	12	0.2500	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.5	36	0.0240	1.13		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.5	48	Total			

Summary for Subcatchment NW.LEX: Lex. Ave. Entrance Drive

Runoff = 1.43 cfs @ 12.06 hrs, Volume= 0.068 af, Depth= 6.84"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

Area (ac)	CN	Description
0.010	69	50-75% Grass cover, Fair, HSG B
0.110	98	Paved parking, HSG B
0.120	96	Weighted Average
0.010	69	8.33% Pervious Area
0.110	98	91.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	33	0.0215	1.06		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	27	0.0108	0.78		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.1	60	Total			

Summary for Subcatchment ROOF:

Runoff = 4.29 cfs @ 12.06 hrs, Volume= 0.208 af, Depth= 7.12"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.350	98	ROOF
	0.350	98	100.00% Impervious Area

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

Summary for Subcatchment S.DRIVE:

Runoff = 3.20 cfs @ 12.13 hrs, Volume= 0.165 af, Depth= 5.30"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.168	98	
*	0.206	69	
	0.374	82	Weighted Average
	0.206	69	55.08% Pervious Area
	0.168	98	44.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	35	0.0400	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.2	7	0.0200	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	28	0.0370	1.28		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.1	18	0.0295	3.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.7	88	Total			

Summary for Subcatchment S.LP:

Runoff = 7.96 cfs @ 12.14 hrs, Volume= 0.457 af, Depth= 7.12"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.770	98	
*	0.000	69	
	0.770	98	Weighted Average
	0.770	98	100.00% Impervious Area

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

Summary for Subcatchment SE.LEX: Lex. Ave. Entrance Drive

Runoff = 1.01 cfs @ 12.14 hrs, Volume= 0.057 af, Depth= 6.38"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

Area (ac)	CN	Description
0.024	69	50-75% Grass cover, Fair, HSG B
0.083	98	Water Surface, HSG B
0.107	91	Weighted Average
0.024	69	22.43% Pervious Area
0.083	98	77.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	43	0.0280	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.4	33	0.0333	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
7.2	76	Total			

Summary for Subcatchment SE.LP:

Runoff = 0.27 cfs @ 12.10 hrs, Volume= 0.012 af, Depth= 4.00"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.002	98	
*	0.033	69	
	0.035	71	Weighted Average
	0.033	69	94.29% Pervious Area
	0.002	98	5.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	22	0.0300	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"

Summary for Subcatchment SWLEX:

Runoff = 3.23 cfs @ 12.10 hrs, Volume= 0.156 af, Depth= 5.78"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.192	98	
*	0.131	69	
	0.323	86	Weighted Average
	0.131	69	40.56% Pervious Area
	0.192	98	59.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	11	0.0150	0.06		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	48	0.0225	1.17		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.6	59	Total			

Summary for Subcatchment TCF:

Runoff = 5.85 cfs @ 12.14 hrs, Volume= 0.333 af, Depth= 6.89"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

Area (ac)	CN	Description
0.540	98	Paved parking, HSG C
0.040	69	50-75% Grass cover, Fair, HSG B
0.580	96	Weighted Average
0.040	69	6.90% Pervious Area
0.540	98	93.10% Impervious Area

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

Summary for Subcatchment UNIV: Univ. Ave. Entrance Drive

Runoff = 3.49 cfs @ 12.10 hrs, Volume= 0.165 af, Depth= 6.18"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

Area (ac)	CN	Description
* 0.250	96	ROADWAY
0.070	69	50-75% Grass cover, Fair, HSG B
0.320	90	Weighted Average
0.320	90	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	15	0.0500	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.3	130	0.0307	1.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	50	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.0	195	Total			

Summary for Subcatchment W.ALDI:

Runoff = 5.31 cfs @ 12.09 hrs, Volume= 0.265 af, Depth= 6.77"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	0.420	98	
*	0.050	69	
	0.470	95	Weighted Average
	0.050	69	10.64% Pervious Area
	0.420	98	89.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.4	105	0.0187	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.5	118	Total			

Summary for Subcatchment WILD:

Runoff = 17.27 cfs @ 12.22 hrs, Volume= 1.238 af, Depth= 6.38"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.36"

	Area (ac)	CN	Description
*	1.750	98	
*	0.470	69	
*	0.110	85	
	2.330	92	Weighted Average
	0.580	72	24.89% Pervious Area
	1.750	98	75.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	58	0.0100	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.6	159	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.4	126	0.0100	5.26	6.46	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.2	54	0.0055	4.41	7.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
14.2	397	Total			

Summary for Reach 2R: (new Reach)

Inflow Area = 8.347 ac, 74.17% Impervious, Inflow Depth = 5.80" for 100-Year event
Inflow = 39.64 cfs @ 12.27 hrs, Volume= 4.036 af
Outflow = 39.64 cfs @ 12.27 hrs, Volume= 4.036 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs

Summary for Pond 51:

Inflow Area = 2.330 ac, 75.11% Impervious, Inflow Depth = 6.38" for 100-Year event
Inflow = 17.27 cfs @ 12.22 hrs, Volume= 1.238 af
Outflow = 17.27 cfs @ 12.22 hrs, Volume= 1.238 af, Atten= 0%, Lag= 0.0 min
Primary = 17.27 cfs @ 12.22 hrs, Volume= 1.238 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 888.91' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**18.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=16.95 cfs @ 12.22 hrs HW=888.77' (Free Discharge)
1=Culvert (Inlet Controls 16.95 cfs @ 9.59 fps)

Summary for Pond 52:

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**15.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
1=Culvert (Controls 0.00 cfs)

Summary for Pond 61: Stub-61

Inflow Area = 0.580 ac, 93.10% Impervious, Inflow Depth = 6.89" for 100-Year event
Inflow = 5.85 cfs @ 12.14 hrs, Volume= 0.333 af
Outflow = 5.85 cfs @ 12.14 hrs, Volume= 0.333 af, Atten= 0%, Lag= 0.0 min
Primary = 5.85 cfs @ 12.14 hrs, Volume= 0.333 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 888.43' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.11'	**12.0" Round Culvert** L= 22.0' Ke= 0.900 Inlet / Outlet Invert= 884.11' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=5.66 cfs @ 12.14 hrs HW=888.21' (Free Discharge)
└**1=Culvert** (Inlet Controls 5.66 cfs @ 7.21 fps)

Summary for Pond 108":

Inflow Area = 2.427 ac, 78.57% Impervious, Inflow Depth = 5.56" for 100-Year event
Inflow = 15.23 cfs @ 12.24 hrs, Volume= 1.124 af
Outflow = 11.83 cfs @ 12.26 hrs, Volume= 1.109 af, Atten= 22%, Lag= 1.5 min
Discarded = 0.01 cfs @ 12.25 hrs, Volume= 0.024 af
Primary = 11.82 cfs @ 12.26 hrs, Volume= 1.084 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 892.59' @ 12.27 hrs Surf.Area= 0.022 ac Storage= 0.141 af

Plug-Flow detention time= 48.5 min calculated for 1.109 af (99% of inflow)
Center-of-Mass det. time= 40.4 min (838.0 - 797.6)

Volume	Invert	Avail.Storage	Storage Description
#1	890.50'	0.003 af	**4.00'D x 4.50'H Vertical Cone/Cylinder** x 2
#2	881.00'	0.052 af	**14.00'W x 66.00'L x 10.25'H Prismatoid** 0.217 af Overall - 0.088 af Embedded = 0.130 af x 40.0% Voids
#3	881.45'	0.088 af	**108.0" Round Pipe Storage** Inside #2 L= 60.0' S= 0.0123 '/'
		0.142 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	882.45'	**24.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 882.45' / 882.15' S= 0.0150 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	882.50'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	889.50'	**0.5' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#4	Discarded	881.00'	**0.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 12.25 hrs HW=892.30' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=10.84 cfs @ 12.26 hrs HW=892.14' (Free Discharge)
└**1=Culvert** (Passes 10.84 cfs of 44.60 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 5.13 cfs @ 14.69 fps)
  └**3=Broad-Crested Rectangular Weir** (Weir Controls 5.71 cfs @ 4.32 fps)

Summary for Pond 110:

Inflow Area = 1.460 ac, 85.62% Impervious, Inflow Depth = 6.64" for 100-Year event
Inflow = 12.36 cfs @ 12.09 hrs, Volume= 0.808 af
Outflow = 12.36 cfs @ 12.09 hrs, Volume= 0.808 af, Atten= 0%, Lag= 0.0 min
Primary = 12.36 cfs @ 12.09 hrs, Volume= 0.808 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 890.74' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.11'	**15.0" Round Culvert** L= 86.0' Ke= 0.500 Inlet / Outlet Invert= 885.11' / 884.00' S= 0.0129 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=11.93 cfs @ 12.09 hrs HW=890.40' (Free Discharge)
1=Culvert (Barrel Controls 11.93 cfs @ 9.72 fps)

Summary for Pond 120:

Inflow Area = 0.890 ac, 93.26% Impervious, Inflow Depth = 6.90" for 100-Year event
Inflow = 10.09 cfs @ 12.08 hrs, Volume= 0.512 af
Outflow = 10.09 cfs @ 12.08 hrs, Volume= 0.512 af, Atten= 0%, Lag= 0.0 min
Primary = 10.09 cfs @ 12.08 hrs, Volume= 0.512 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 891.06' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.90'	**15.0" Round Culvert** L= 132.0' Ke= 0.500 Inlet / Outlet Invert= 885.90' / 885.11' S= 0.0060 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=9.51 cfs @ 12.08 hrs HW=890.63' (Free Discharge)
1=Culvert (Barrel Controls 9.51 cfs @ 7.75 fps)

Summary for Pond 130:

Inflow Area = 0.420 ac, 97.62% Impervious, Inflow Depth = 7.04" for 100-Year event
Inflow = 4.99 cfs @ 12.06 hrs, Volume= 0.246 af
Outflow = 4.99 cfs @ 12.06 hrs, Volume= 0.246 af, Atten= 0%, Lag= 0.0 min
Primary = 4.99 cfs @ 12.06 hrs, Volume= 0.246 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 889.36' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	886.78'	**12.0" Round Culvert** L= 68.0' Ke= 0.500 Inlet / Outlet Invert= 886.78' / 886.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=4.77 cfs @ 12.06 hrs HW=889.18' (Free Discharge)
└**1=Culvert** (Barrel Controls 4.77 cfs @ 6.07 fps)

Summary for Pond 140:

Inflow Area = 0.070 ac, 85.71% Impervious, Inflow Depth = 6.65" for 100-Year event
Inflow = 0.80 cfs @ 12.09 hrs, Volume= 0.039 af
Outflow = 0.80 cfs @ 12.09 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min
Primary = 0.80 cfs @ 12.09 hrs, Volume= 0.039 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 887.70' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	887.11'	**12.0" Round Culvert** L= 108.0' Ke= 0.500 Inlet / Outlet Invert= 887.11' / 886.78' S= 0.0031 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.76 cfs @ 12.09 hrs HW=887.68' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.76 cfs @ 2.37 fps)

Summary for Pond CB31:

Inflow Area = 0.080 ac, 62.50% Impervious, Inflow Depth = 5.88" for 100-Year event
Inflow = 0.85 cfs @ 12.07 hrs, Volume= 0.039 af
Outflow = 0.85 cfs @ 12.07 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min
Primary = 0.85 cfs @ 12.07 hrs, Volume= 0.039 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 884.74' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.23'	**12.0" Round Culvert** L= 23.0' Ke= 0.500 Inlet / Outlet Invert= 884.23' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.80 cfs @ 12.07 hrs HW=884.72' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.80 cfs @ 3.04 fps)

Summary for Pond CB41:

Inflow Area = 0.120 ac, 91.67% Impervious, Inflow Depth = 6.84" for 100-Year event
Inflow = 1.43 cfs @ 12.06 hrs, Volume= 0.068 af
Outflow = 1.43 cfs @ 12.06 hrs, Volume= 0.068 af, Atten= 0%, Lag= 0.0 min
Primary = 1.43 cfs @ 12.06 hrs, Volume= 0.068 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 884.90' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.19'	**12.0" Round Culvert** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 884.19' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.36 cfs @ 12.06 hrs HW=884.88' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 1.36 cfs @ 3.34 fps)

Summary for Pond PROP: (new Pond)

Inflow Area = 1.377 ac,100.00% Impervious, Inflow Depth = 7.12" for 100-Year event
Inflow = 14.24 cfs @ 12.14 hrs, Volume= 0.817 af
Outflow = 8.53 cfs @ 12.24 hrs, Volume= 0.817 af, Atten= 40%, Lag= 6.2 min
Discarded = 0.05 cfs @ 4.05 hrs, Volume= 0.172 af
Primary = 8.48 cfs @ 12.24 hrs, Volume= 0.645 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 895.11' @ 12.24 hrs Surf.Area= 0.057 ac Storage= 0.349 af

Plug-Flow detention time= 229.9 min calculated for 0.817 af (100% of inflow)
Center-of-Mass det. time= 230.7 min (972.1 - 741.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	886.50'	0.102 af	**45.00'W x 55.00'L x 9.00'H Field A** 0.511 af Overall - 0.256 af Embedded = 0.255 af x 40.0% Voids
#2A	887.00'	0.256 af	**CMP Round 96** x 8 Inside #1 Effective Size= 96.0"W x 96.0"H => 50.27 sf x 20.00'L = 1,005.3 cf Overall Size= 96.0"W x 96.0"H x 20.00'L Row Length Adjustment= -5.00' x 50.27 sf x 4 rows 41.00' Header x 50.27 sf x 2 = 4,121.8 cf Inside
#3	896.00'	0.003 af	**4.00'D x 5.00'H Vertical Cone/Cylinder** x 2
		0.361 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	889.00'	**12.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 889.00' / 887.00' S= 0.0400 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	889.10'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	886.50'	**0.800 in/hr Exfiltration over Surface area**
#4	Device 1	894.40'	**4.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.05 cfs @ 4.05 hrs HW=886.65' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=8.57 cfs @ 12.24 hrs HW=895.08' (Free Discharge)
└**1=Culvert** (Passes 8.57 cfs of 8.94 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 2.26 cfs @ 11.53 fps)
  └**4=Broad-Crested Rectangular Weir** (Weir Controls 6.30 cfs @ 2.31 fps)

Summary for Pond SYS: (new Pond)

Inflow Area = 8.261 ac, 74.57% Impervious, Inflow Depth = 6.09" for 100-Year event
Inflow = 46.14 cfs @ 12.11 hrs, Volume= 4.189 af
Outflow = 39.54 cfs @ 12.27 hrs, Volume= 4.189 af, Atten= 14%, Lag= 9.1 min
Discarded = 0.10 cfs @ 12.27 hrs, Volume= 0.189 af
Primary = 10.74 cfs @ 12.27 hrs, Volume= 3.284 af
Secondary = 28.70 cfs @ 12.27 hrs, Volume= 0.716 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 889.55' @ 12.27 hrs Surf.Area= 17,081 sf Storage= 38,879 cf

Plug-Flow detention time= 68.4 min calculated for 4.187 af (100% of inflow)
Center-of-Mass det. time= 69.2 min (838.7 - 769.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	880.75'	9,122 cf	**18.50'W x 316.00'L x 6.00'H Field A** 35,076 cf Overall - 12,272 cf Embedded = 22,804 cf x 40.0% Voids
#2A	881.25'	12,272 cf	**CMP Round 60** x 30 Inside #1 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L 30 Chambers in 2 Rows 12.50' Header x 19.63 sf x 2 = 490.9 cf Inside
#3B	880.75'	5,620 cf	**18.50'W x 196.00'L x 6.00'H Field B** 21,756 cf Overall - 7,707 cf Embedded = 14,049 cf x 40.0% Voids
#4B	881.25'	7,707 cf	**CMP Round 60** x 18 Inside #3 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L Row Length Adjustment= +10.00' x 19.63 sf x 2 rows 12.50' Header x 19.63 sf x 1 = 245.4 cf Inside
#5	886.25'	25 cf	**4.00'D x 2.00'H CBMH-30**
#6	886.25'	29 cf	**4.00'D x 2.29'H CBMH-31**
#7	886.25'	35 cf	**4.00'D x 2.82'H CBMH-40**
#8	886.25'	40 cf	**4.00'D x 3.18'H CBMH-41**
#9	886.25'	57 cf	**4.00'D x 4.50'H CBMH-50**
#10	886.25'	59 cf	**4.00'D x 4.70'H CBMH-51**
#11	886.25'	60 cf	**4.00'D x 4.80'H CBMH-52**
#12	886.25'	62 cf	**4.00'D x 4.95'H CBMH-60**
#13	886.25'	60 cf	**4.00'D x 4.75'H CBMH-70**
#14	886.25'	66 cf	**4.00'D x 5.26'H CBMH-80**
#15	886.25'	59 cf	**4.00'D x 4.70'H CBMH-90**
#16	886.25'	62 cf	**4.00'D x 4.92'H CBMH-100**
#17	888.33'	8,117 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		43,451 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
888.33	15	0	0
888.50	345	31	31
889.00	3,000	836	867
889.50	7,000	2,500	3,367
890.00	12,000	4,750	8,117

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.75'	**0.250 in/hr Exfiltration over Surface area**
#2	Primary	880.39'	**12.0" Round Culvert** L= 55.0' Ke= 0.500 Inlet / Outlet Invert= 880.39' / 879.17' S= 0.0222 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	881.60'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	881.60'	**8.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#5	Device 2	885.60'	**7.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00

Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

#6 Secondary 888.50' **10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.10 cfs @ 12.27 hrs HW=889.54' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=10.74 cfs @ 12.27 hrs HW=889.54' (Free Discharge)
└**2=Culvert** (Barrel Controls 10.74 cfs @ 13.67 fps)
  ├**3=Orifice/Grate** (Passes < 3.56 cfs potential flow)
  ├**4=Orifice/Grate** (Passes < 9.27 cfs potential flow)
  └**5=Broad-Crested Rectangular Weir** (Passes < 181.62 cfs potential flow)

Secondary OutFlow Max=28.37 cfs @ 12.27 hrs HW=889.54' (Free Discharge)
└**6=Broad-Crested Rectangular Weir** (Weir Controls 28.37 cfs @ 2.73 fps)

Summary for Subcatchment C.DRIVE:

Runoff = 1.17 cfs @ 12.10 hrs, Volume= 0.058 af, Depth= 5.01"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.110	98	
*	0.030	69	
	0.140	92	Weighted Average
	0.030	69	21.43% Pervious Area
	0.110	98	78.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	13	0.0200	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.1	5	0.0200	0.71		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	34	0.0170	0.97		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.2	36	0.0195	2.83		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.9	88	Total			

Summary for Subcatchment CART:

Runoff = 1.74 cfs @ 12.23 hrs, Volume= 0.125 af, Depth= 4.56"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.210	98	
*	0.120	69	
	0.330	87	Weighted Average
	0.120	69	36.36% Pervious Area
	0.210	98	63.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	62	0.0100	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.3	85	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.8	255	0.0100	5.26	6.46	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
14.8	402	Total			

Summary for Subcatchment DOCK:

Runoff = 0.63 cfs @ 12.09 hrs, Volume= 0.031 af, Depth= 5.23"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.060	98	
*	0.010	69	
	0.070	94	Weighted Average
	0.010	69	14.29% Pervious Area
	0.060	98	85.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	85	0.0400	1.65		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.0	98	Total			

Summary for Subcatchment DUN:

Runoff = 1.58 cfs @ 12.22 hrs, Volume= 0.112 af, Depth= 4.62"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.190	98	
*	0.100	69	
	0.290	88	Weighted Average
	0.100	69	34.48% Pervious Area
	0.190	98	65.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	150	0.0700	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.9	137	0.0310	2.64		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	166	0.0200	6.42	5.04	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.1	453	Total			

Summary for Subcatchment E.ALDI:

Runoff = 3.13 cfs @ 12.23 hrs, Volume= 0.231 af, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.420	98	
*	0.150	69	
	0.570	90	Weighted Average
	0.150	69	26.32% Pervious Area
	0.420	98	73.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	115	0.0300	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	100	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
15.2	215	Total			

Summary for Subcatchment E.CART:

Runoff = 1.84 cfs @ 12.23 hrs, Volume= 0.127 af, Depth= 3.55"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.130	98	
*	0.300	69	
	0.430	78	Weighted Average
	0.300	69	69.77% Pervious Area
	0.130	98	30.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	156	0.0600	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.4	70	0.0400	3.00		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.3	75	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
14.7	301	Total			

Summary for Subcatchment E.LP:

Runoff = 0.40 cfs @ 12.09 hrs, Volume= 0.019 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.029	98	
*	0.022	69	
	0.051	85	Weighted Average
	0.022	69	43.14% Pervious Area
	0.029	98	56.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	16	0.0300	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"

Summary for Subcatchment N.LP:

Runoff = 5.02 cfs @ 12.14 hrs, Volume= 0.286 af, Depth= 5.66"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.607	98	
*	0.000	69	
	0.607	98	Weighted Average
	0.607	98	100.00% Impervious Area

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

Summary for Subcatchment NE.LEX: Lex. Ave. Entrance Drive

Runoff = 0.65 cfs @ 12.07 hrs, Volume= 0.030 af, Depth= 4.53"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.050	98	
	0.030	69	50-75% Grass cover, Fair, HSG B
	0.080	87	Weighted Average
	0.030	69	37.50% Pervious Area
	0.050	98	62.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	12	0.2500	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.5	36	0.0240	1.13		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.5	48	Total			

Summary for Subcatchment NW.LEX: Lex. Ave. Entrance Drive

Runoff = 1.13 cfs @ 12.06 hrs, Volume= 0.054 af, Depth= 5.41"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

Area (ac)	CN	Description
0.010	69	50-75% Grass cover, Fair, HSG B
0.110	98	Paved parking, HSG B
0.120	96	Weighted Average
0.010	69	8.33% Pervious Area
0.110	98	91.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	33	0.0215	1.06		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.6	27	0.0108	0.78		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
1.1	60	Total			

Summary for Subcatchment ROOF:

Runoff = 3.44 cfs @ 12.06 hrs, Volume= 0.165 af, Depth= 5.66"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.350	98	ROOF
	0.350	98	100.00% Impervious Area

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

Summary for Subcatchment S.DRIVE:

Runoff = 2.41 cfs @ 12.13 hrs, Volume= 0.124 af, Depth= 3.99"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.168	98	
*	0.206	69	
	0.374	82	Weighted Average
	0.206	69	55.08% Pervious Area
	0.168	98	44.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	35	0.0400	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.2	7	0.0200	0.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	28	0.0370	1.28		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.1	18	0.0295	3.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.7	88	Total			

Summary for Subcatchment S.LP:

Runoff = 6.37 cfs @ 12.14 hrs, Volume= 0.363 af, Depth= 5.66"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.770	98	
*	0.000	69	
	0.770	98	Weighted Average
	0.770	98	100.00% Impervious Area

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

Summary for Subcatchment SE.LEX: Lex. Ave. Entrance Drive

Runoff = 0.79 cfs @ 12.14 hrs, Volume= 0.044 af, Depth= 4.98"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

Area (ac)	CN	Description
0.024	69	50-75% Grass cover, Fair, HSG B
0.083	98	Water Surface, HSG B
0.107	91	Weighted Average
0.024	69	22.43% Pervious Area
0.083	98	77.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	43	0.0280	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.4	33	0.0333	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
7.2	76	Total			

Summary for Subcatchment SE.LP:

Runoff = 0.19 cfs @ 12.10 hrs, Volume= 0.008 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.002	98	
*	0.033	69	
	0.035	71	Weighted Average
	0.033	69	94.29% Pervious Area
	0.002	98	5.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	22	0.0300	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"

Summary for Subcatchment SWLEX:

Runoff = 2.48 cfs @ 12.10 hrs, Volume= 0.119 af, Depth= 4.43"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.192	98	
*	0.131	69	
	0.323	86	Weighted Average
	0.131	69	40.56% Pervious Area
	0.192	98	59.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	11	0.0150	0.06		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.7	48	0.0225	1.17		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.6	59	Total			

Summary for Subcatchment TCF:

Runoff = 4.65 cfs @ 12.14 hrs, Volume= 0.264 af, Depth= 5.45"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

Area (ac)	CN	Description
0.540	98	Paved parking, HSG C
0.040	69	50-75% Grass cover, Fair, HSG B
0.580	96	Weighted Average
0.040	69	6.90% Pervious Area
0.540	98	93.10% Impervious Area

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

Summary for Subcatchment UNIV: Univ. Ave. Entrance Drive

Runoff = 2.73 cfs @ 12.10 hrs, Volume= 0.127 af, Depth= 4.75"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

Area (ac)	CN	Description
* 0.250	96	ROADWAY
0.070	69	50-75% Grass cover, Fair, HSG B
0.320	90	Weighted Average
0.320	90	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	15	0.0500	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.3	130	0.0307	1.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
0.4	50	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.0	195	Total			

Summary for Subcatchment W.ALDI:

Runoff = 4.21 cfs @ 12.09 hrs, Volume= 0.209 af, Depth= 5.34"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	0.420	98	
*	0.050	69	
	0.470	95	Weighted Average
	0.050	69	10.64% Pervious Area
	0.420	98	89.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	13	0.0500	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
1.4	105	0.0187	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.81"
3.5	118	Total			

Summary for Subcatchment WILD:

Runoff = 13.52 cfs @ 12.22 hrs, Volume= 0.966 af, Depth= 4.98"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year St. Paul Rainfall=5.90"

	Area (ac)	CN	Description
*	1.750	98	
*	0.470	69	
*	0.110	85	
	2.330	92	Weighted Average
	0.580	72	24.89% Pervious Area
	1.750	98	75.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	58	0.0100	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
0.6	159	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.4	126	0.0100	5.26	6.46	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.2	54	0.0055	4.41	7.79	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
14.2	397	Total			

Summary for Reach 2R: (new Reach)

Inflow Area = 8.347 ac, 74.17% Impervious, Inflow Depth = 4.43" for 100-Year St. Paul event
Inflow = 25.23 cfs @ 12.31 hrs, Volume= 3.085 af
Outflow = 25.23 cfs @ 12.31 hrs, Volume= 3.085 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs

Summary for Pond 51:

Inflow Area = 2.330 ac, 75.11% Impervious, Inflow Depth = 4.98" for 100-Year St. Paul event
Inflow = 13.52 cfs @ 12.22 hrs, Volume= 0.966 af
Outflow = 13.52 cfs @ 12.22 hrs, Volume= 0.966 af, Atten= 0%, Lag= 0.0 min
Primary = 13.52 cfs @ 12.22 hrs, Volume= 0.966 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 887.32' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**18.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=13.26 cfs @ 12.22 hrs HW=887.23' (Free Discharge)
↑**1=Culvert** (Inlet Controls 13.26 cfs @ 7.51 fps)

Summary for Pond 52:

Device	Routing	Invert	Outlet Devices
#1	Primary	884.05'	**15.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 884.05' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
↑**1=Culvert** (Controls 0.00 cfs)

Summary for Pond 61: Stub-61

Inflow Area = 0.580 ac, 93.10% Impervious, Inflow Depth = 5.45" for 100-Year St. Paul event
Inflow = 4.65 cfs @ 12.14 hrs, Volume= 0.264 af
Outflow = 4.65 cfs @ 12.14 hrs, Volume= 0.264 af, Atten= 0%, Lag= 0.0 min
Primary = 4.65 cfs @ 12.14 hrs, Volume= 0.264 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 887.03' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.11'	**12.0" Round Culvert** L= 22.0' Ke= 0.900 Inlet / Outlet Invert= 884.11' / 884.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=4.51 cfs @ 12.14 hrs HW=886.89' (Free Discharge)
└**1=Culvert** (Inlet Controls 4.51 cfs @ 5.74 fps)

Summary for Pond 108":

Inflow Area = 2.427 ac, 78.57% Impervious, Inflow Depth = 4.18" for 100-Year St. Paul event
Inflow = 7.13 cfs @ 12.23 hrs, Volume= 0.844 af
Outflow = 4.30 cfs @ 12.48 hrs, Volume= 0.844 af, Atten= 40%, Lag= 14.8 min
Discarded = 0.01 cfs @ 4.05 hrs, Volume= 0.024 af
Primary = 4.29 cfs @ 12.48 hrs, Volume= 0.820 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 889.36' @ 12.48 hrs Surf.Area= 0.021 ac Storage= 0.118 af

Plug-Flow detention time= 46.9 min calculated for 0.844 af (100% of inflow)
Center-of-Mass det. time= 48.1 min (851.3 - 803.2)

Volume	Invert	Avail.Storage	Storage Description
#1	890.50'	0.003 af	**4.00'D x 4.50'H Vertical Cone/Cylinder** x 2
#2	881.00'	0.052 af	**14.00'W x 66.00'L x 10.25'H Prismatoid** 0.217 af Overall - 0.088 af Embedded = 0.130 af x 40.0% Voids
#3	881.45'	0.088 af	**108.0" Round Pipe Storage** Inside #2 L= 60.0' S= 0.0123 '/'
		0.142 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	882.45'	**24.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 882.45' / 882.15' S= 0.0150 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	882.50'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	889.50'	**0.5' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#4	Discarded	881.00'	**0.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 4.05 hrs HW=881.14' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=4.29 cfs @ 12.48 hrs HW=889.34' (Free Discharge)
└**1=Culvert** (Passes 4.29 cfs of 36.71 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 4.29 cfs @ 12.28 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 110:

Inflow Area = 1.460 ac, 85.62% Impervious, Inflow Depth = 5.23" for 100-Year St. Paul event
Inflow = 9.79 cfs @ 12.09 hrs, Volume= 0.636 af
Outflow = 9.79 cfs @ 12.09 hrs, Volume= 0.636 af, Atten= 0%, Lag= 0.0 min
Primary = 9.79 cfs @ 12.09 hrs, Volume= 0.636 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 888.68' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.11'	**15.0" Round Culvert** L= 86.0' Ke= 0.500 Inlet / Outlet Invert= 885.11' / 884.00' S= 0.0129 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=9.45 cfs @ 12.09 hrs HW=888.48' (Free Discharge)
1=Culvert (Barrel Controls 9.45 cfs @ 7.70 fps)

Summary for Pond 120:

Inflow Area = 0.890 ac, 93.26% Impervious, Inflow Depth = 5.46" for 100-Year St. Paul event
Inflow = 8.03 cfs @ 12.08 hrs, Volume= 0.405 af
Outflow = 8.03 cfs @ 12.08 hrs, Volume= 0.405 af, Atten= 0%, Lag= 0.0 min
Primary = 8.03 cfs @ 12.08 hrs, Volume= 0.405 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 889.34' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	885.90'	**15.0" Round Culvert** L= 132.0' Ke= 0.500 Inlet / Outlet Invert= 885.90' / 885.11' S= 0.0060 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=7.56 cfs @ 12.08 hrs HW=889.06' (Free Discharge)
1=Culvert (Barrel Controls 7.56 cfs @ 6.16 fps)

Summary for Pond 130:

Inflow Area = 0.420 ac, 97.62% Impervious, Inflow Depth = 5.59" for 100-Year St. Paul event
Inflow = 3.99 cfs @ 12.06 hrs, Volume= 0.196 af
Outflow = 3.99 cfs @ 12.06 hrs, Volume= 0.196 af, Atten= 0%, Lag= 0.0 min
Primary = 3.99 cfs @ 12.06 hrs, Volume= 0.196 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 888.54' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	886.78'	**12.0" Round Culvert** L= 68.0' Ke= 0.500 Inlet / Outlet Invert= 886.78' / 886.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=3.81 cfs @ 12.06 hrs HW=888.43' (Free Discharge)
└**1=Culvert** (Barrel Controls 3.81 cfs @ 4.85 fps)

Summary for Pond 140:

Inflow Area = 0.070 ac, 85.71% Impervious, Inflow Depth = 5.23" for 100-Year St. Paul event
Inflow = 0.63 cfs @ 12.09 hrs, Volume= 0.031 af
Outflow = 0.63 cfs @ 12.09 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min
Primary = 0.63 cfs @ 12.09 hrs, Volume= 0.031 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 887.63' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	887.11'	**12.0" Round Culvert** L= 108.0' Ke= 0.500 Inlet / Outlet Invert= 887.11' / 886.78' S= 0.0031 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.60 cfs @ 12.09 hrs HW=887.61' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.60 cfs @ 2.22 fps)

Summary for Pond CB31:

Inflow Area = 0.080 ac, 62.50% Impervious, Inflow Depth = 4.53" for 100-Year St. Paul event
Inflow = 0.65 cfs @ 12.07 hrs, Volume= 0.030 af
Outflow = 0.65 cfs @ 12.07 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min
Primary = 0.65 cfs @ 12.07 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 884.67' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.23'	**12.0" Round Culvert** L= 23.0' Ke= 0.500 Inlet / Outlet Invert= 884.23' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.62 cfs @ 12.07 hrs HW=884.66' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.62 cfs @ 2.87 fps)

Summary for Pond CB41:

Inflow Area = 0.120 ac, 91.67% Impervious, Inflow Depth = 5.41" for 100-Year St. Paul event
Inflow = 1.13 cfs @ 12.06 hrs, Volume= 0.054 af
Outflow = 1.13 cfs @ 12.06 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min
Primary = 1.13 cfs @ 12.06 hrs, Volume= 0.054 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 884.80' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	884.19'	**12.0" Round Culvert** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 884.19' / 884.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.08 cfs @ 12.06 hrs HW=884.79' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 1.08 cfs @ 3.18 fps)

Summary for Pond PROP: (new Pond)

Inflow Area = 1.377 ac,100.00% Impervious, Inflow Depth = 5.66" for 100-Year St. Paul event
Inflow = 11.40 cfs @ 12.14 hrs, Volume= 0.650 af
Outflow = 2.32 cfs @ 12.43 hrs, Volume= 0.650 af, Atten= 80%, Lag= 17.3 min
Discarded = 0.05 cfs @ 4.80 hrs, Volume= 0.169 af
Primary = 2.27 cfs @ 12.43 hrs, Volume= 0.480 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 894.45' @ 12.43 hrs Surf.Area= 0.057 ac Storage= 0.330 af

Plug-Flow detention time= 273.2 min calculated for 0.650 af (100% of inflow)
Center-of-Mass det. time= 272.9 min (1,016.9 - 744.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	886.50'	0.102 af	**45.00'W x 55.00'L x 9.00'H Field A** 0.511 af Overall - 0.256 af Embedded = 0.255 af x 40.0% Voids
#2A	887.00'	0.256 af	**CMP Round 96** x 8 Inside #1 Effective Size= 96.0"W x 96.0"H => 50.27 sf x 20.00'L = 1,005.3 cf Overall Size= 96.0"W x 96.0"H x 20.00'L Row Length Adjustment= -5.00' x 50.27 sf x 4 rows 41.00' Header x 50.27 sf x 2 = 4,121.8 cf Inside
#3	896.00'	0.003 af	**4.00'D x 5.00'H Vertical Cone/Cylinder** x 2
		0.361 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	889.00'	**12.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 889.00' / 887.00' S= 0.0400 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	889.10'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	886.50'	**0.800 in/hr Exfiltration over Surface area**
#4	Device 1	894.40'	**4.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.05 cfs @ 4.80 hrs HW=886.65' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=2.26 cfs @ 12.43 hrs HW=894.45' (Free Discharge)
└**1=Culvert** (Passes 2.26 cfs of 8.41 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 2.14 cfs @ 10.87 fps)
  └**4=Broad-Crested Rectangular Weir** (Weir Controls 0.12 cfs @ 0.60 fps)

Summary for Pond SYS: (new Pond)

Inflow Area = 8.261 ac, 74.57% Impervious, Inflow Depth = 4.71" for 100-Year St. Paul event
Inflow = 36.27 cfs @ 12.11 hrs, Volume= 3.244 af
Outflow = 25.18 cfs @ 12.31 hrs, Volume= 3.244 af, Atten= 31%, Lag= 11.5 min
Discarded = 0.08 cfs @ 12.31 hrs, Volume= 0.186 af
Primary = 10.52 cfs @ 12.31 hrs, Volume= 2.816 af
Secondary = 14.58 cfs @ 12.31 hrs, Volume= 0.242 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.05 hrs
Peak Elev= 889.16' @ 12.31 hrs Surf.Area= 13,927 sf Storage= 36,601 cf

Plug-Flow detention time= 82.5 min calculated for 3.244 af (100% of inflow)
Center-of-Mass det. time= 81.8 min (854.3 - 772.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	880.75'	9,122 cf	**18.50'W x 316.00'L x 6.00'H Field A** 35,076 cf Overall - 12,272 cf Embedded = 22,804 cf x 40.0% Voids
#2A	881.25'	12,272 cf	**CMP Round 60** x 30 Inside #1 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L 30 Chambers in 2 Rows 12.50' Header x 19.63 sf x 2 = 490.9 cf Inside
#3B	880.75'	5,620 cf	**18.50'W x 196.00'L x 6.00'H Field B** 21,756 cf Overall - 7,707 cf Embedded = 14,049 cf x 40.0% Voids
#4B	881.25'	7,707 cf	**CMP Round 60** x 18 Inside #3 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L Row Length Adjustment= +10.00' x 19.63 sf x 2 rows 12.50' Header x 19.63 sf x 1 = 245.4 cf Inside
#5	886.25'	25 cf	**4.00'D x 2.00'H CBMH-30**
#6	886.25'	29 cf	**4.00'D x 2.29'H CBMH-31**
#7	886.25'	35 cf	**4.00'D x 2.82'H CBMH-40**
#8	886.25'	40 cf	**4.00'D x 3.18'H CBMH-41**
#9	886.25'	57 cf	**4.00'D x 4.50'H CBMH-50**
#10	886.25'	59 cf	**4.00'D x 4.70'H CBMH-51**
#11	886.25'	60 cf	**4.00'D x 4.80'H CBMH-52**
#12	886.25'	62 cf	**4.00'D x 4.95'H CBMH-60**
#13	886.25'	60 cf	**4.00'D x 4.75'H CBMH-70**
#14	886.25'	66 cf	**4.00'D x 5.26'H CBMH-80**
#15	886.25'	59 cf	**4.00'D x 4.70'H CBMH-90**
#16	886.25'	62 cf	**4.00'D x 4.92'H CBMH-100**
#17	888.33'	8,117 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		43,451 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
888.33	15	0	0
888.50	345	31	31
889.00	3,000	836	867
889.50	7,000	2,500	3,367
890.00	12,000	4,750	8,117

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.75'	**0.250 in/hr Exfiltration over Surface area**
#2	Primary	880.39'	**12.0" Round Culvert** L= 55.0' Ke= 0.500 Inlet / Outlet Invert= 880.39' / 879.17' S= 0.0222 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	881.60'	**7.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	881.60'	**8.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#5	Device 2	885.60'	**7.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00

Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

#6 Secondary 888.50' **10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.08 cfs @ 12.31 hrs HW=889.15' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=10.52 cfs @ 12.31 hrs HW=889.15' (Free Discharge)
└**2=Culvert** (Barrel Controls 10.52 cfs @ 13.39 fps)
  ├**3=Orifice/Grate** (Passes < 3.47 cfs potential flow)
  ├**4=Orifice/Grate** (Passes < 9.03 cfs potential flow)
  └**5=Broad-Crested Rectangular Weir** (Passes < 155.53 cfs potential flow)

Secondary OutFlow Max=14.18 cfs @ 12.31 hrs HW=889.15' (Free Discharge)
└**6=Broad-Crested Rectangular Weir** (Weir Controls 14.18 cfs @ 2.18 fps)

Figures A

Existing Drainage Map
Proposed Drainage Map

LEXINGTON APARTMENTS
St. Paul, MN

OWNER NAME
OWNER ADDRESS

LOUCKS
PLANNING
CIVIL ENGINEERING
LAND SURVEYING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL SERVICES
7200 Hemlock Lane, Suite 300
Maple Grove, MN 55369
763.424.5505
www.loucks.com

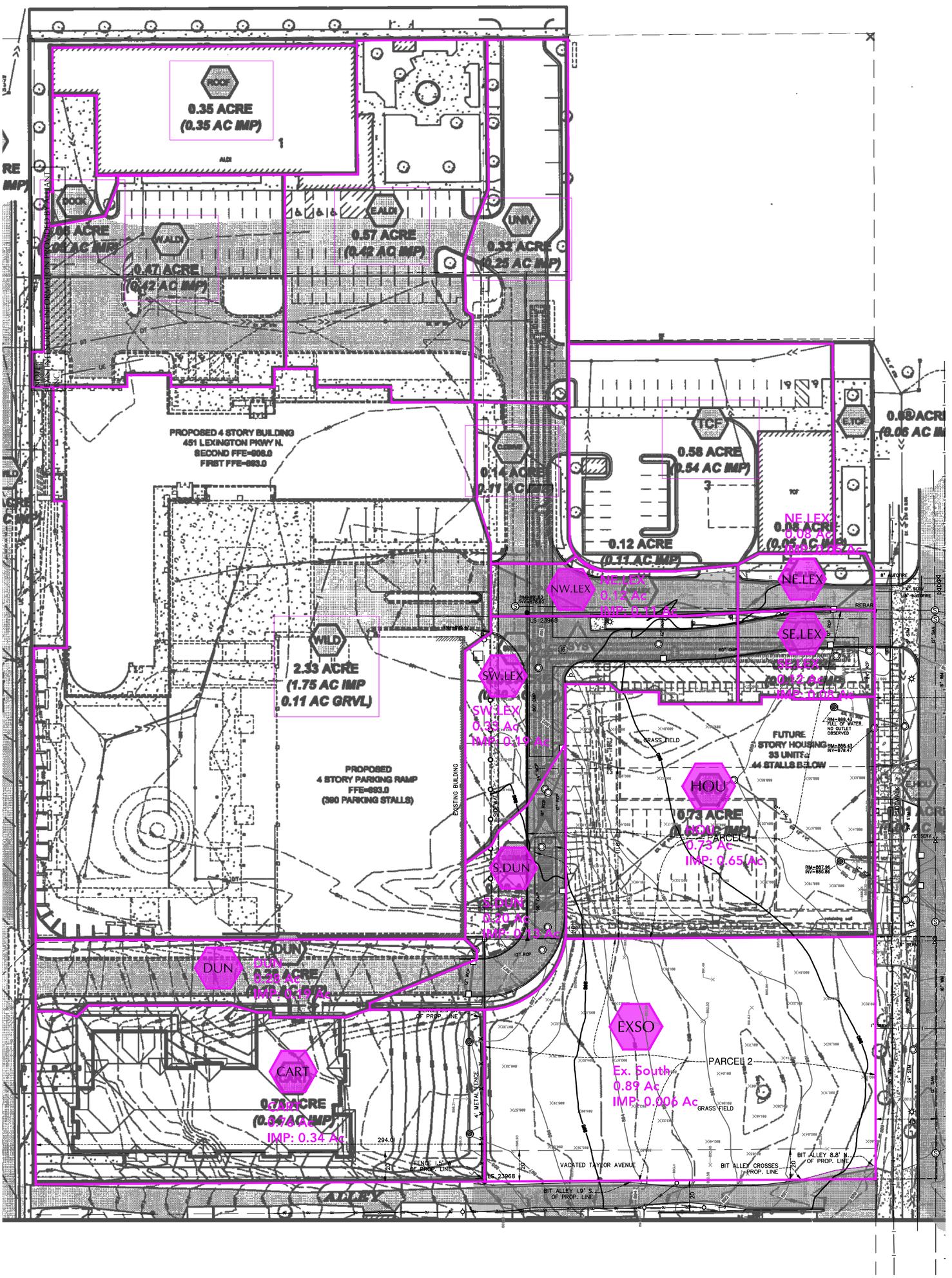
CADD QUALIFICATION

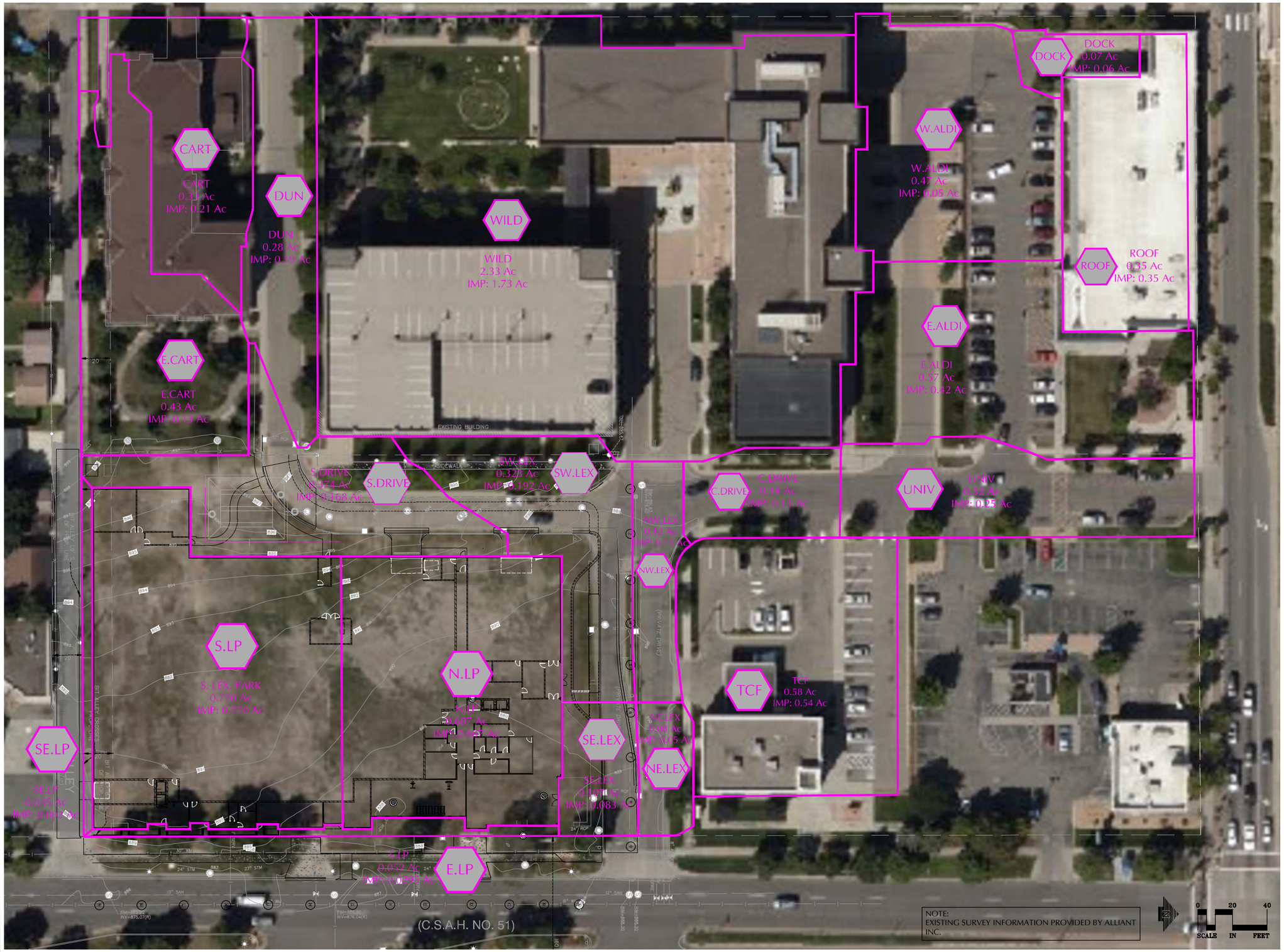
SUBMITTAL/REVISIONS

PROFESSIONAL SIGNATURE

QUALITY CONTROL

EXISTING DRAINAGE AREAS
H1-1





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CADD QUALIFICATION

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PROFESSIONAL SIGNATURE

QUALITY CONTROL

PROPOSED HYDROLOGY AREAS

H2-1

Plotted: 11/12/2020 12:7 PM W:\2019\1911AA\HYDROLOGY\CAD\H2-1 PROPOSED Drainage

Figure B

Geotechnical Report

Geotechnical Evaluation Report

Proposed Mixed-Use Building
Southwest of North Lexington Parkway and University Avenue West
St. Paul, Minnesota

Prepared for

Alatus, LLC

Professional Certification:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Minnesota.

Mark L. Jenkins, PE
Senior Engineer
License Number: 41770
October 1, 2019

BRAUN INTERTEC
The Science You Build On.

Project B1907294

Braun Intertec Corporation

BRAUN INTERTEC
The Science You Build On.

Braun Intertec Corporation
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Minneapolis, MN 55438

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Web: braunintertec.com

October 1, 2019 Project B1907294

Ms. Carla Dunham
Alatus, LLC
800 Nicollet Mall, Suite 2850
Minneapolis, MN 55402

Re: Geotechnical Evaluation
Proposed Mixed-Use Building
Southwest of North Lexington Parkway and University Avenue West
St. Paul, Minnesota

Dear Ms. Dunham:

We are pleased to present this Geotechnical Evaluation Report for the proposed Mixed-Used Building to be located southwest of North Lexington parkway and University Avenue West in St. Paul, Minnesota.

Thank you for making Braun Intertec your geotechnical consultant for this project. If you have questions about this report, or if there are other services that we can provide in support of our work to date, please contact Dan Martin at 952.995.2227 (dmartin@braunintertec.com), Mark Jenkins at 651.487.7010 (mjenkins@braunintertec.com), or Ray Huber (rhuber@braunintertec.com).

Sincerely,

BRAUN INTERTEC CORPORATION

Mark L. Jenkins, PE
Senior Engineer

Daniel E. Martin
Principal – Senior Project Manager

Ray A. Huber, PE
Vice President – Principal Engineer

Table of Contents

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Description **Page**

Appendix

A. Introduction

A.1. Project Description

This Geotechnical Evaluation Report addresses the proposed design and construction of the Mixed-Use Building, located southwest of University Avenue and Lexington Parkway in St. Paul, Minnesota. The project will include the construction of a building with below-grade parking, one level of commercial use and five levels of residential use. Tables 1 and 2 provide project details.

Table 1. Building Description

Aspect	Description
Below-grade levels	One (Provided)
Above-grade levels	Six (Provided)
Lowest level floor elevation	881.5 (Provided)
Grade level floor elevation	890 (Provided)
Column loads (kips)	650 (Assumed)
Wall loads (kips/foot)	15 (Assumed)
Cuts or fills for buildings	Cuts of 9 1/2 to 14 1/2 feet to establish basement subgrade elevation; mostly 9 1/2 to 11 feet (Provided)
Tolerable building settlement	1 inch (Assumed)
Comments	Below-grade parking below building, with commercial space on first level (pre-cast concrete walls and precast plank flooring likely) and residential space to be wood-framed

Table 2. Site Aspects and Grading Description

Aspect	Description
Pavement type(s)	Concrete (below grade) and bituminous (exterior)
Assumed pavement loads	Medium-duty: 150,000 ESALs*
Grade changes	Exterior cuts and fills of less than 5 feet

*Equivalent 18,000-lb single axle loads based on 20-year design.

The figure below shows an illustration of the proposed site layout.

Figure 1. Site Layout

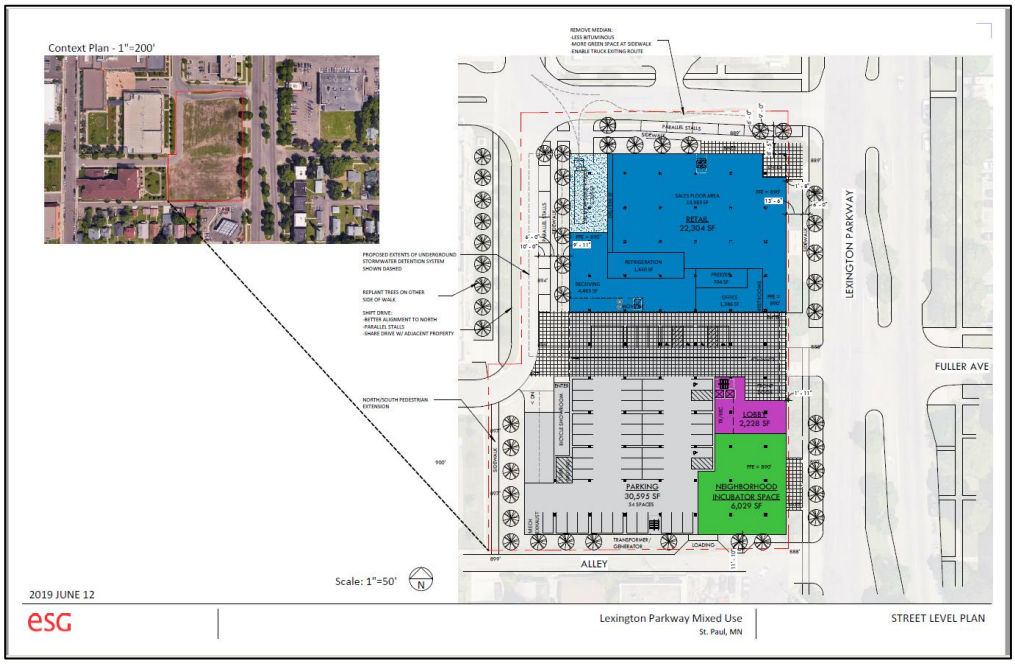


Figure provided by ESG dated June 12, 2019.

A.2. Site Conditions and History

Currently, the site exists as an open parcel with sparse grass.

Current grades range from 889 to 895 1/2 at the boring locations (mostly 889 to 892 1/2). Generally, the site is relatively level, sloping from the northeast to the southwest.

Historically, the site has been impacted by previous development. Previous buildings that were constructed on this site have been demolished and the site is currently graded relatively level.

Photograph 1. Aerial Photograph of the Site in 2018

Photograph provided by Google Earth™.

A.3. Purpose

The purpose of our geotechnical evaluation was to characterize the subsurface geologic conditions at the selected exploration locations and evaluate their impact on the design and construction of building foundations, grade-bearing slabs, below-grade walls, pavements and utilities. Estimated infiltration rates are provided per Minnesota Stormwater Manual guidelines.

A.4. Background Information and Reference Documents

We reviewed the following information:

- Lower and upper level plans prepared by ESG dated June 20, 2019.
- Site survey and topographic plan prepared by Alliant Engineering dated February 26, 2019.
- Previous geotechnical report for this site prepared by Braun Intertec dated April 27, 2001.

In addition to the provided sources, we have used several publicly available sources of information.

We have described our understanding of the proposed construction and site to the extent others reported it to us. Depending on the extent of available information, we may have made assumptions based on our experience with similar projects. If we have not correctly recorded or interpreted the project details, the project team should notify us. New or changed information could require additional evaluation, analyses and/or recommendations.

A.5. Scope of Services

We performed our scope of services for the project in accordance with our Proposal QTB102873 to Ms. Carla Dunham, dated June 27, 2019, and authorized shortly thereafter. The following list describes the geotechnical tasks completed in accordance with our authorized scope of services.

- Reviewing the background information and reference documents previously cited.

- Staking and clearing the exploration location of underground utilities. We selected and staked the new exploration locations in locations that supplement existing boring data. We acquired the surface elevations and locations with GPS technology using the State of Minnesota's permanent GPS base station network. The Soil Boring Location Sketch included in the Appendix shows the approximate locations of the borings.

- Performing 6 standard penetration test (SPT) borings, denoted as ST-1 to ST-6, to nominal depths of 31 feet below grade across the site.

- Performing laboratory testing on select samples to aid in soil classification and engineering analysis.

- Perform engineering analysis including bearing capacity, settlement and pavement design.

- Preparing this report containing a boring location sketch, logs of soil borings, a summary of the soils encountered, results of laboratory tests, and recommendations for structure and pavement subgrade preparation and the design of foundations, floor slabs, exterior slabs, utilities, stormwater improvements and pavements.

Our authorized scope of services for the project also included a Phase II Environmental Site Assessment, which will be submitted separately.

B. Results

B.1. Geologic Overview

The native soils on this site consist of glacial outwash sands (poorly graded sand and poorly graded sand with silt). Existing fill associated with previous developments covers the site in variable thicknesses.

We based the geologic origins used in this report on the soil types, in-situ and laboratory testing, and available common knowledge of the geological history of the site. Because of the complex depositional history, geologic origins can be difficult to ascertain. We did not perform a detailed investigation of the geologic history for the site.

B.2. Previous Geotechnical Information

We performed 23 borings within, or in close proximity to, this site in 2001. Those historic borings were performed at the locations shown on our Boring Location Sketch in the Appendix.

We could not obtain permission to include those historic boring logs with this report. The data obtained from those historic borings are summarized below in Table 4.

The previous borings were very similar to our current borings, but did encounter isolated layers of lean clay and a few encountered buried topsoil beneath the fill. We accounted for the removal of those materials in Table 4.

B.3. Boring Results

Table 3 provides a summary of the soil boring results, in the general order we encountered the strata. Please refer to the Log of Boring sheets in the Appendix for additional details. The Descriptive Terminology sheet in the Appendix includes definitions of abbreviations used in Table 3.

Table 3. Subsurface Profile Summary*

Strata	Soil Type - ASTM Classification	Range of Penetration Resistances	Commentary and Details
Topsoil fill	SM	NA	▪ Typically fine-grained ▪ Dark brown to black ▪ Trace roots ▪ Thicknesses at boring locations varied from 4 to 8 inches (mostly 4 inches) ▪ Moisture condition generally moist
Fill	SM, SC, SP-SM and CL layers in historic borings	3 to 22 BPF	▪ Penetration resistance of 3 to 16 BPF ▪ Moisture condition generally moist ▪ Thicknesses at boring locations varied from 4 to 18 feet (mostly 10 to 11 1/2 feet) ▪ Portions with concrete fragments ▪ Buried topsoil below fill in a few historic borings (accounted for in Table 4)
Glacial Outwash	SP, SP-SM	4 to 22 BPF	▪ General penetration resistances of 6 to 11 BPF ▪ Moisture condition generally moist ▪ May contain cobbles and boulders

*Abbreviations defined in the attached Descriptive Terminology sheet.
BPF = blows-per-foot

For simplicity in this report, we define existing fill to mean existing, uncontrolled or undocumented fill.

B.4. Groundwater

We did not observe groundwater while advancing our borings. Based on the historical borings that extended to depths of up to 50 feet, groundwater appeared to be down 45 feet at the time of that exploration. Due to the layered nature of the existing fill, perched groundwater may exist within granular layers of the fill seasonally and periodically. Project planning should anticipate seasonal and annual fluctuations of groundwater.

B.5. Laboratory Test Results

The boring logs show the results of laboratory testing we performed, next to the tested sample depth. A summary table of laboratory test results is included in the Appendix.

The moisture content of the fill was approximately 13 percent, indicating that the materials were likely near their probable optimum moisture contents. The moisture content of the glacial outwash sands ranged from approximately 4 to 6 percent, indicating they were dry of their optimal moisture content.

Our mechanical analyses indicated that the fill contained 32 percent silt and clay by weight (visually ranging from about 15 to 35 percent, with isolated layers of cleaner sand and sandy lean clay based on the historical borings).

C. Recommendations

C.1. Site Grading and Subgrade Preparation

C.1.a. Building Subgrade Excavations

We recommend removing topsoil fill and existing fill from below building slabs, foundations and their oversize areas. Excavations to establish basement subgrade elevation (assumed to be at about elevation 880.5) will sometimes penetrate the existing fill. Table 4 shows the anticipated excavation depths and bottom elevations for each of the recent and historic borings, and the anticipated depth below basement slab subgrade elevation. We also recommend having a geotechnical engineer, or an engineering technician working under the direction of a geotechnical engineer (geotechnical representative), evaluate the suitability of exposed subgrade soils to support the proposed structure. Note that surface grades at the historic borings that were drilling in 2001 may have changed.

Table 4. Building Excavation Depths

Location	Approximate Surface Elevation (feet)	Anticipated Excavation Depth (feet)	Anticipated Bottom Elevation (feet)	Anticipated Depth Below Floor Subgrade (880.5) (feet)
ST-1	889.9	11 1/2	878 1/2	2
ST-2	889.0	10	879	1 1/2
ST-3	889.0	11 1/2	877 1/2	3
ST-4	890.4	18	872 1/2	8
ST-5	895.4	4	891	---
ST-6	892.6	10	882 1/2	---
HB-1	891.0	14	877	3 1/2
HB-2	890.0	9	881	---
HB-3	890.0	6	884	---
HB-4	889.0	6	883	---
HB-5	891.0	6	885	---
HB-6	890.0	9	881	---
HB-7	889.0	8	881	---
HB-8	889.0	11	878	2 1/2
HB-9	897.0	4	893	---
HB-10	896.0	5	891	---
HB-11	897.0	3	894	---
HB-12	894.0	6	888	---
HB-13	893.0	8	885	---
HB-14	891.0	7	884	---
HB-15	897.0	4	893	---

Location	Approximate Surface Elevation (feet)	Anticipated Excavation Depth (feet)	Anticipated Bottom Elevation (feet)	Anticipated Depth Below Floor Subgrade (880.5) (feet)
HB-16	897.0	2	895	---
HB-17	897.0	3	894	---
HB-18	900.0	2	898	---
HB-19	894.7	4	890 1/2	---
HB-20	890.0	11	879	1 1/2
HB-21	889.0	1	888	---
HB-22	898.0	1	897	---
HB-23	892.0	4	888	---

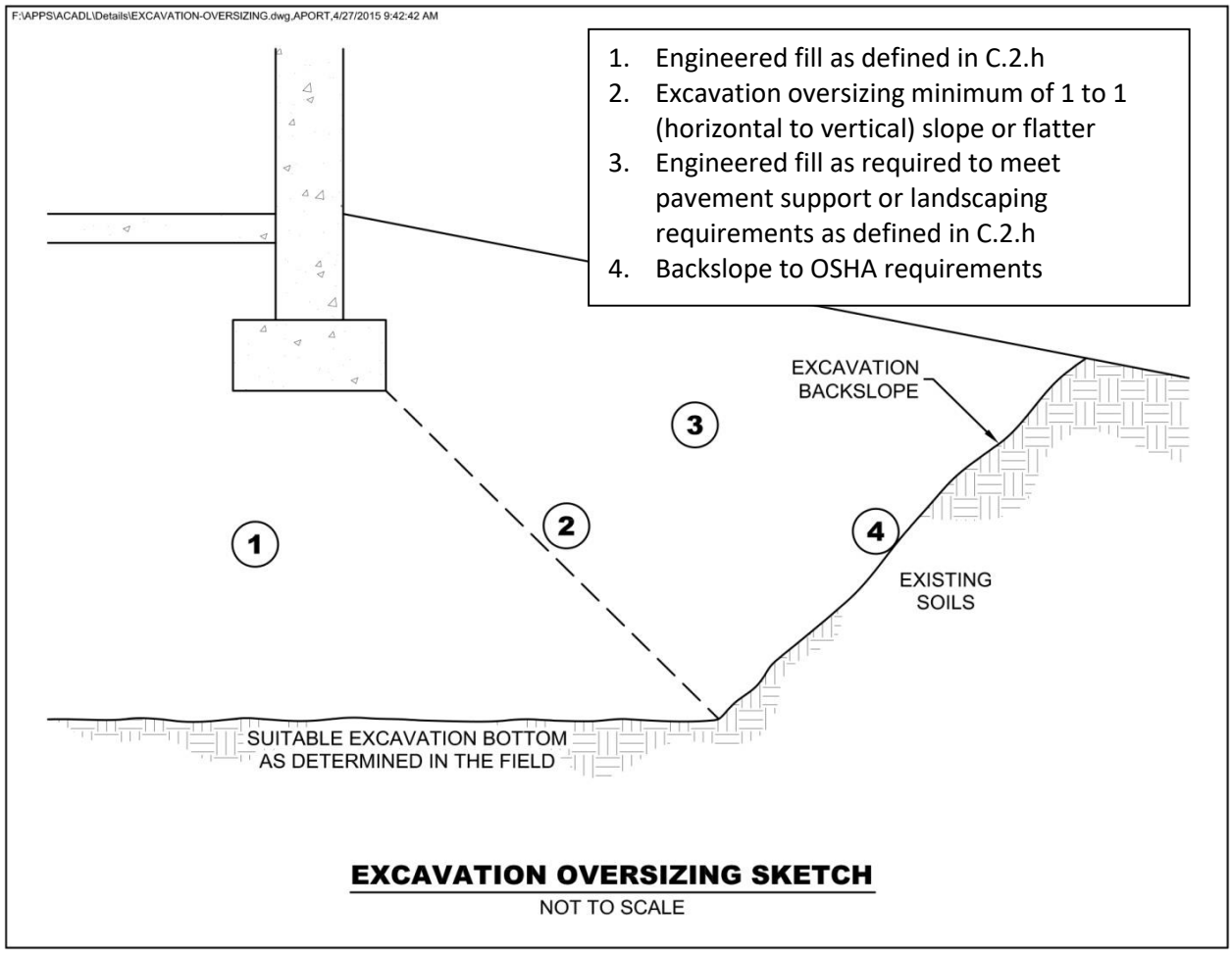
Excavation depths will vary between the borings. Portions of the excavations may also extend deeper than indicated by the borings. A geotechnical representative should observe the excavations to make the necessary field judgments regarding the suitability of the exposed soils.

Prior to the placement of engineered fill or footings, we recommend surface compacting the exposed soils in the bottoms of the excavations with a minimum of 4 passes by a large (minimum diameter of 3 1/2 feet), vibratory smooth-drum compactor, to a minimum of 100 percent of the standard Proctor. The final pass is recommended to be performed in the static mode.

C.1.b. Excavation Oversizing

When removing unsuitable materials below structures or pavements, we recommend the excavation extend outward and downward at a slope of 1H:1V (horizontal:vertical) or lower gradient. See Figure 2 for an illustration of excavation oversizing.

Figure 2. Generalized Illustration of Oversizing



C.1.c. Excavated Slopes

Based on the borings, we anticipate on-site soils in excavations will consist primarily of existing fill (mostly silty sand and clayey sand). These soils are typically considered Type C Soil under OSHA (Occupational Safety and Health Administration) guidelines. OSHA guidelines indicate unsupported excavations in Type C soils should have a gradient no steeper than 1 1/2H:1V. Slopes constructed in this manner may still exhibit surface sloughing. OSHA requires an engineer to evaluate slopes or excavations over 20 feet in depth.

An OSHA-approved qualified person should review the soil classification in the field. Excavations must comply with the requirements of OSHA 29 CFR, Part 1926, Subpart P, “Excavations and Trenches.” This document states excavation safety is the responsibility of the contractor. The project specifications should reference these OSHA requirements.

C.1.d. Excavation Support

In the event there is insufficient room to slope excavations, or if the excavations are exposed to surcharges and need to be shored, we recommend designing the shoring based on the parameters presented below in Table 5. The parameters shown have not been reduced by safety factors.

Saturated unit weights are recommended to account for the potential buildup of hydrostatic pressure behind undrained support structures within the low permeability fill.

Table 5. Parameters for Shoring Design

Geologic Material	Wet Unit Weight (γ, pcf)	Friction Angle (Ø, deg)	Cohesion (C, psf)	K_A	K_O	K_P
Existing fill upper 2 to 18 feet (mostly 6 to 11 feet)	125	30	0	0.33	0.50	3.0
Outwash SP and SP-SM	120	34	0	0.28	0.44	3.5

C.1.e. Excavation Dewatering

We recommend removing perched groundwater from the excavations. Project planning should include temporary sumps and pumps for excavations in low-permeability soils, such as the existing fill. Based on groundwater levels observed in 2001 (at a depth of about 45 feet), we do not expect hydrostatic groundwater will be encountered by the excavations that are anticipated for this project.

C.1.f. Exterior Pavement and Slab Subgrade Preparation

We recommend the following steps for exterior pavement and exterior slab subgrade preparation, understanding the site will have exterior grade changes of 5 feet or less. Note that project planning may need to require additional subcuts to limit frost heave.

1. Strip unsuitable soils consisting of topsoil, organic soils, vegetation, existing structures and pavements from the area, within 3 feet of the surface of the proposed pavement grade.

2. Have a geotechnical representative observe the excavated subgrade to evaluate if additional subgrade improvements are necessary.

3. Slope subgrade soils to areas of sand or drain tile to allow the removal of accumulating water.

4. Scarify, moisture condition and surface compact the subgrade with at least 4 passes of a large vibratory roller with a minimum drum diameter of 3 1/2 feet. Surface compact to at least 100 percent of standard Proctor density.

5. Place pavement engineered fill to grade and compact in accordance with Section C.1.h to bottom of pavement and exterior slab section. See Section C.5 for additional considerations related to frost heave.

6. Proofroll the pavement or exterior slab subgrade as described in Section C.1.g.

To improve long-term pavement performance, we recommend incorporating 18 inches of engineered fill (sand with less than 12 percent by weight passing the #200 sieve) in paved areas, in addition to the recommendations above, as a sand subbase. Section C.7 provides recommended pavement design sections with and without the sand subbase. Note, we recommend sloping subgrade soils to promote drainage and removal of accumulated water.

C.1.g. Exterior Pavement Subgrade Proofroll

After preparing the subgrade as described above and prior to the placement of the aggregate base, we recommend proofrolling the exterior subgrade soils with a fully loaded tandem-axle truck. We also recommend having a geotechnical representative observe the proofroll. Areas that fail the proofroll likely indicate soft or weak areas that will require additional soil correction work to support pavements.

The contractor should correct areas that display excessive yielding or rutting during the proofroll, as determined by the geotechnical representative. Possible options for subgrade correction include moisture conditioning and recompaction, subcutting and replacement with soil or crushed aggregate, and/or geotextiles. We recommend performing a second proofroll after the aggregate base material is in place, and prior to placing bituminous or concrete pavement.

C.1.h. Engineered Fill Materials and Compaction

Table 6 below contains our recommendations for engineered fill materials.

Table 6. Engineered Fill Materials*

Locations To Be Used	Engineered Fill Classification	Possible Soil Type Descriptions	Gradation	Additional Requirements
▪ Below foundations ▪ Below interior slabs	Structural fill	SP, SP-SM	100% passing 2-inch sieve < 12% passing #200 sieve	< 2% Organic Content (OC)
▪ Drainage layer ▪ Non-frost-susceptible	▪ Free-draining ▪ Non-frost-susceptible fill	GP, GW, SP, SW	100% passing 1-inch sieve < 50% passing #40 sieve < 5% passing #200 sieve	< 2% OC
Behind below-grade walls, beyond drainage layer	Retained fill	SP, SW, SP-SM, SW-SM, SM	100% passing 3-inch sieve < 20% passing #200 sieve	< 2% OC Plasticity Index (PI) < 4%
Pavements	Pavement fill	SP, SP-SM, SM, SC	100% passing 3-inch sieve	< 2% OC PI < 15%
Below landscaped surfaces, where subsidence is not a concern	Non-structural fill	---	100% passing 6-inch sieve	< 10% OC

* Engineered fill materials should satisfy the approved Response Action Plan (RAP), or applicable environmental requirements.

* More select soils comprised of coarse sands with < 5% passing #200 sieve may be needed to accommodate work occurring in periods of wet or freezing weather.

We recommend spreading engineered fill in loose lifts of approximately 10 inches thick (for silty and clayey sands a maximum thickness of 8 inches is recommended). We recommend compacting engineered fill in accordance with the criteria presented below in Table 7. The project documents should specify relative compaction of engineered fill, based on the structure located above the engineered fill, and vertical proximity to that structure.

Table 7. Compaction Recommendations Summary

Reference	Relative Compaction, percent (ASTM D698 – Standard Proctor)	Moisture Content Variance from Optimum, percentage points	
		< 12% Passing #200 Sieve (typically SP, SP-SM)	> 12% Passing #200 Sieve (typically CL, SC, ML, SM)
Below foundations and oversizing zones	100	±3	-1 to +3
Below interior slabs	100	±3	-1 to +3
Within 3 feet of pavement subgrade	100	±3	-2 to +1
More than 3 feet below pavement subgrade	95	±3	±3
Below landscaped surfaces	90	±5	±5
Adjacent to below-grade wall	95*	±3	-1 to +3

*Increase compaction requirement to meet compaction required for structure supported by this engineered fill.

The project documents should not allow the contractor to use frozen material as engineered fill or to place engineered fill on frozen material. Frost should not penetrate under foundations during construction.

We recommend performing density tests in engineered fill to evaluate if the contractors are effectively compacting the soil and meeting project requirements.

C.1.i. Special Inspections of Soils

We recommend including the site grading and placement of engineered fill within the building pad under the requirements of Special Inspections, as provided in Chapter 17 of the International Building Code, which is part of the Minnesota State Building Code. Special Inspection requires observation of soil conditions below engineered fill or footings, evaluations to determine if excavations extend to the anticipated soils, and if engineered fill materials meet requirements for type of engineered fill and compaction condition of engineered fill. A licensed geotechnical engineer should direct the Special Inspections of site grading and engineered fill placement. The purpose of these Special Inspections is to evaluate whether the work is in accordance with the approved Geotechnical Report for the project. Special Inspections should include evaluation of the subgrade, observing preparation of the subgrade (surface compaction or dewatering, excavation oversizing, placement procedures and materials used for engineered fill, etc.) and compaction testing of the engineered fill.

C.2. Spread Footings

Table 8 below contains our recommended parameters for foundation design.

Table 8. Recommended Spread Footing Design Parameters

Item	Description
Maximum net allowable bearing pressure (psf)	6,000
Minimum factor of safety for bearing capacity failure	3.0
Minimum width (inches)	24 (wall) 48 (column)
Minimum embedment below final exterior grade for heated structures (inches)	42
Minimum embedment below final exterior grade for unheated structures or for footings not protected from freezing temperatures during construction (inches)	60
Total estimated settlement (inches)	1
Differential settlement	Typically about 1/2 of total settlement*

* Actual differential settlement amounts will depend on final loads and foundation layout. We can evaluate differential settlement based on final foundation plans and loadings.

C.3. Below-Grade Walls

We recommend designing the walls based on silty sand backfill having an equivalent fluid pressure of 62 pounds per cubic foot (pcf) for at-rest earth pressure. Designs should also consider the slope of any fill and dead or live loads, including equipment and materials, placed within a horizontal distance behind the walls that is equal to the height of the walls. Our recommended values also assume the wall design provides drainage to prevent water from accumulating behind the walls. The construction documents should clearly identify the material properties of the soil the contractor should use for wall fill.

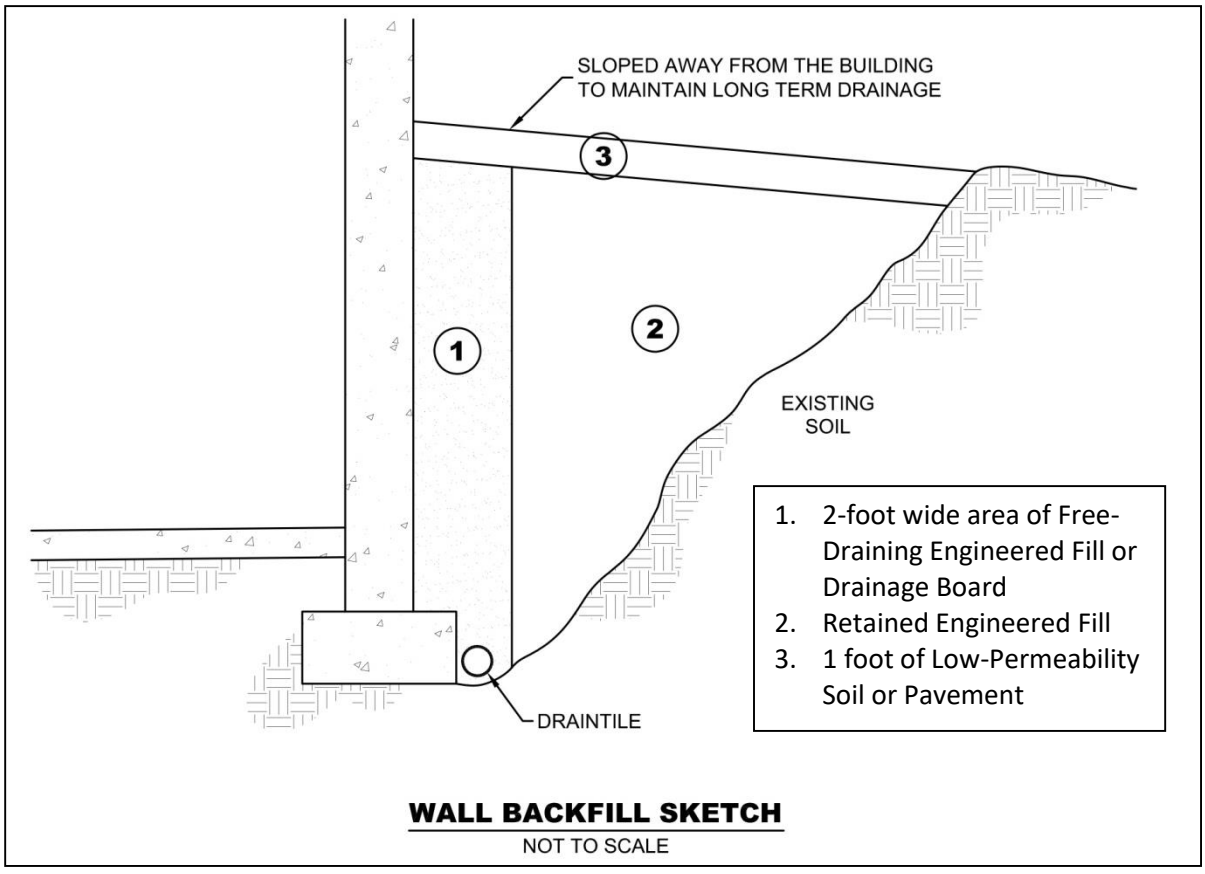
The project documents should indicate if walls need bracing prior to filling and allowable unbalanced fill heights.

C.3.a. Drainage Control

We recommend installing drain tile to remove water behind the below-grade walls, at the location shown in Figure 3. The below-grade wall drainage system should also incorporate free-draining, engineered fill or a drainage board placed against the wall and connected to the drain tile.

Even with the use of free-draining, engineered fill, we recommend general waterproofing of below-grade walls that surround occupied or potentially occupied areas because of the potential cost impacts related to seepage after construction is complete.

Figure 3. Generalized Illustration of Wall Engineered Fill



The materials listed in the sketch should meet the definitions in Section C.1.h. Low-permeability material is capable of directing water away from the wall, like clay, topsoil or pavement. The project documents should indicate if the contractor should brace the walls prior to filling and allowable unbalanced fill heights.

As shown in Figure 3, we recommend Zone 2 consist of retained, engineered fill, and this material will control lateral pressures on the wall. However, we are also providing design parameters for using other engineered fill material. If final design uses non-sand material for engineered fill, project planning should account for the following items:

- Other engineered fill material may result in higher lateral pressure on the wall.
- Other engineered fill material may be more difficult to compact.
- Post-construction consolidation of other engineered fill material may result in settlement-related damage to the structures or slabs supported on the engineered fill. Post-construction settlement of other engineered fill material may also cause drainage towards the structure. The magnitude of consolidation could be up to about 3 percent of the wall fill thickness.

C.3.b. Configuring and Resisting Lateral Loads

Below-grade wall design can use active earth pressure conditions, if the walls can rotate slightly. If the wall design cannot tolerate rotation, then design should use at-rest earth pressure conditions. Rotation up to 0.002 times the wall height is generally required for walls supporting sand. Rotation up to 0.02 times the wall height is required when wall supports clay.

Table 9 presents our recommended lateral coefficients and equivalent fluid pressures for wall design of active, at-rest and passive earth pressure conditions. The table also provides recommended wet unit weights and internal friction angles. Designs should also consider the slope of any engineered fill and dead or live loads placed behind the walls within a horizontal distance that is equal to the height of the walls. Our recommended values assume the wall design provides drainage so water cannot accumulate behind the walls. The construction documents should clearly identify what soils the contractor should use for engineered fill of walls. For areas that will support settlement-sensitive structures, we recommend the wall backfill consist of sand with less than 12 percent by weight particles passing the #200 sieve.

Table 9. Recommended Below-Grade Wall Design Parameters – Drained Conditions

Retained Soil	Wet Unit Weight, (pcf)	Friction Angle, degrees	Active Lateral Coefficient/ Equivalent Fluid Pressure* (pcf)	At-Rest Lateral Coefficient/ Equivalent Fluid Pressure* (pcf)	Passive Lateral Coefficient/ Equivalent Fluid Pressure* (pcf)
On-Site SM Fill	125	30	42	62	375
SP and SP-SM	120	34	34	53	424

* Based on Rankine model for soils in a region behind the wall extending at least 2 horizontal feet beyond the bottom outer edges of the wall footings and then rising up and away from the wall at an angle no steeper than 60 degrees from horizontal.

Sliding resistance between the bottom of the footing and the soil can also resist lateral pressures. We recommend assuming a sliding coefficient equal to 0.4 between the concrete and soil.

The values presented in this section are un-factored.

C.4. Interior Slabs/Pavements

C.4.a. Subgrade Modulus

The anticipated floor subgrade is poorly graded sand and poorly graded sand with silt. We recommend using a modulus of subgrade reaction, k, of 200 pounds per square inch per inch of deflection (pci) to design the slabs. If the slab design requires placing 6 inches of compacted crushed aggregate base immediately below the slab, the slab design may increase the k-value by 50 pci. We recommend that the aggregate base materials be free of bituminous. In addition to improving the modulus of subgrade reaction, an aggregate base facilitates construction activities and is less weather sensitive.

C.4.b. Moisture Vapor Protection

Excess transmission of water vapor could cause floor dampness, certain types of floor bonding agents to separate, or mold to form under floor coverings. If project planning includes using floor coverings or coatings, we recommend placing a vapor retarder or vapor barrier immediately beneath the slab. We also recommend consulting with floor covering manufacturers regarding the appropriate type, use and installation of the vapor retarder or barrier to preserve warranty assurances.

C.5. Frost Protection

C.5.a. General

The on-site silty soil fill will underlie all or some of the exterior slabs and pavements. We consider those materials to be moderately to highly frost susceptible. Soils of this type can retain moisture and heave upon freezing. In general, this characteristic is not an issue unless these soils become saturated, due to surface runoff or infiltration, or are excessively wet in situ. Once frozen, unfavorable amounts of general and isolated heaving of the soils and the surface structures supported on them could develop. This type of heaving could affect design drainage patterns and the performance of exterior slabs and pavements, as well as any isolated exterior footings and piers.

Note that general runoff and infiltration from precipitation are not the only sources of water that can saturate subgrade soils and contribute to frost heave. Roof drainage and irrigation of landscaped areas in close proximity to exterior slabs, pavements, and isolated footings and piers, contribute as well.

C.5.b. Frost Heave Mitigation

To address most of the heave related issues, we recommend setting general site grades and grades for exterior surface features to direct surface drainage away from buildings, across large paved areas and away from walkways. Such grading will limit the potential for saturation of the subgrade and subsequent heaving. General grades should also have enough “slope” to tolerate potential larger areas of heave, which may not fully settle after thawing.

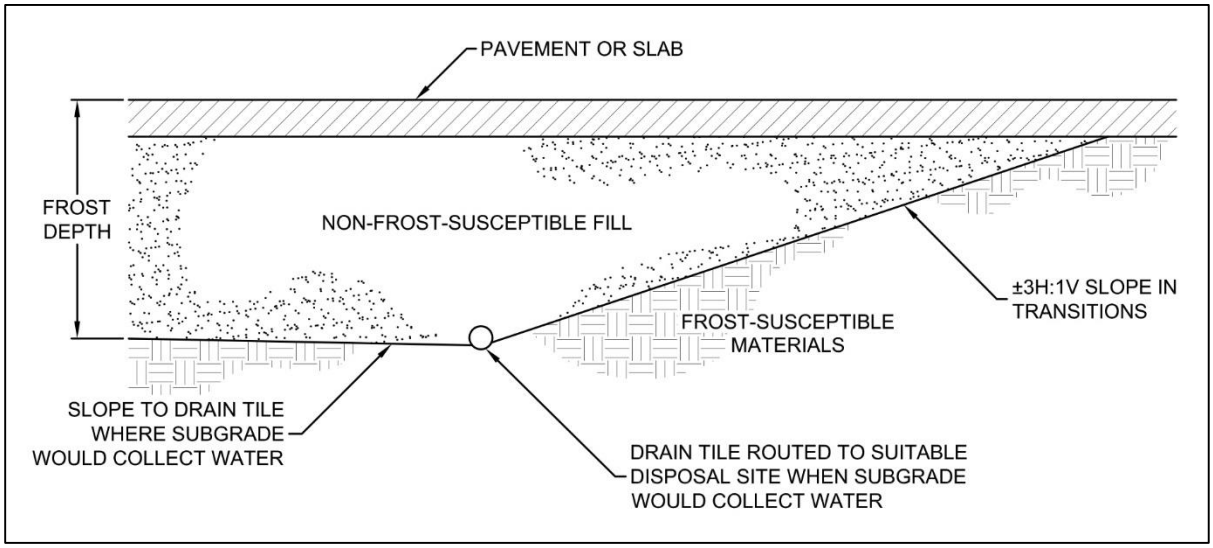
Even small amounts of frost-related differential movement at walkway joints or cracks can create tripping hazards. Project planning can explore several subgrade improvement options to address this condition.

One of the more conservative subgrade improvement options to mitigate potential heave is removing any frost-susceptible soils present below the exterior slab areas down to a minimum depth of 4 feet below subgrade elevations. We recommend filling the resulting excavation with non-frost-susceptible fill. We also recommend sloping the bottom of the excavation toward one or more collection points to remove any water entering the engineered fill. This approach will not be effective in controlling frost heave without removing the water.

An important geometric aspect of the excavation and replacement approach described above is sloping the banks of the excavations to create a more gradual transition between the unexcavated soils considered frost susceptible and the engineered fill in the excavated area, which is not frost susceptible. The slope allows attenuation of differential movement that may occur along the excavation boundary. We recommend slopes that are 3H:1V, or flatter, along transitions between frost-susceptible and non-frost-susceptible soils.

Figure 4 shows an illustration summarizing some of the recommendations.

Figure 4. Frost Protection Geometry Illustration



Another option is to limit frost heave in critical areas, such as doorways and entrances, via frost-depth footings or localized excavations with sloped transitions between frost-susceptible and non-frost-susceptible soils, as described above.

Over the life of slabs and pavements, cracks will develop and joints will open up, which will expose the subgrade and allow water to enter from the surface and either saturate or perch atop the subgrade soils. This water intrusion increases the potential for frost heave or moisture-related distress near the crack or joint. Therefore, we recommend implementing a detailed maintenance program to seal and/or fill any cracks and joints. The maintenance program should give special attention to areas where dissimilar materials abut one another, where construction joints occur and where shrinkage cracks develop.

C.6. Pavements and Exterior Slabs

C.6.a. Design Sections

Our scope of services for this project did not include laboratory tests on subgrade soils to determine an R-value for pavement design. Based on our experience with similar silty and clayey sand soils anticipated at the pavement subgrade elevation, we recommend pavement design assume an R-value of 25. Note the contractor may need to perform limited removal of unsuitable or less suitable soils to achieve this value. Table 10 provides recommended pavement sections, based on the soils support and traffic loads.

We based the concrete pavement designs on a modulus of subgrade reaction (k) of 125 pci (exterior).

Table 10. Recommended Bituminous Pavement Sections

Use	Medium Duty – No Sand Subbase	Medium Duty – With Sand Subbase	Light Duty Walkways	Medium Duty
Minimum asphalt thickness (inches)	4	4	---	---
Minimum concrete thickness (inches)	---	---	4	6
Minimum aggregate base thickness (inches)	12	8	6	6
Minimum granular subbase	NA	18	NA	NA

C.6.b. Concrete Pavements

We assumed the concrete pavement section in Table 10 will have edge support. We recommend placing an aggregate base below the pavement to provide a suitable subgrade for concrete placement, reduce faulting and help dissipate loads. Appropriate mix designs, panel sizing, jointing, doweling and edge reinforcement are critical to performance of rigid pavements. We recommend you contact your civil engineer to determine the final design or consult with us for guidance on these items.

C.6.c. Bituminous Pavement Materials

Appropriate mix designs are critical to the performance of flexible pavements. We can provide recommendations for pavement material selection during final pavement design.

C.6.d. Subgrade Drainage

We recommend installing perforated drainpipes throughout pavement areas at low points, around catch basins, and behind curb in landscaped areas. We also recommend installing drainpipes along pavement and exterior slab edges where exterior grades promote drainage toward those edge areas. The contractor should place drainpipes in small trenches, extended at least 8 inches below the granular subbase layer, or below the aggregate base material where no subbase is present.

C.6.e. Performance and Maintenance

We based the above pavement designs on a 20-year performance life for bituminous and a 35-year life for concrete. This is the amount of time before we anticipate the pavement will require reconstruction. This performance life assumes routine maintenance, such as seal coating and crack sealing. The actual pavement life will vary depending on variations in weather, traffic conditions and maintenance.

It is common to place the non-wear course of bituminous and then delay placement of wear course. For this situation, we recommend evaluating if the reduced pavement section will have sufficient structure to support construction traffic.

Many conditions affect the overall performance of the exterior slabs and pavements. Some of these conditions include the environment, loading conditions and the level of ongoing maintenance. With regard to bituminous pavements in particular, it is common to have thermal cracking develop within the first few years of placement, and continue throughout the life of the pavement. We recommend developing a regular maintenance plan for filling cracks in exterior slabs and pavements to lessen the potential impacts for cold weather distress due to frost heave or warm weather distress due to wetting and softening of the subgrade.

C.7. Utilities

C.7.a. Subgrade Stabilization

Earthwork activities associated with utility installations located inside the building area should adhere to the recommendations in Section C.1.

For exterior utilities, we anticipate the soils at typical invert elevations will generally be suitable for utility support. However, if construction encounters unfavorable conditions such as soft fill, soft clay, organic soils or perched water at invert grades, the unsuitable soils may require some additional subcutting and replacement with sand or crushed rock to prepare a proper subgrade for pipe support. Project design and construction should not place utilities within the 1H:1V oversizing of foundations.

C.7.b. Corrosion Potential

Based on our experience, the fill soils encountered by the borings are moderately corrosive to metallic conduits, but only marginally corrosive to concrete. We recommend specifying non-corrosive materials or providing corrosion protection, unless project planning chooses to perform additional tests to demonstrate the soils are not corrosive.

For interior utilities that will be installed within sandy soils, we consider those soils non- to slightly corrosive to metallic conduits. If utilities extend through exterior fill soils, we recommend bedding the utilities in sandy soil free of any clay lumps or constructing the utilities with non-corrosive materials.

C.8. Stormwater

We estimated infiltration rates for some of the soils we encountered in our soil borings, as listed in Table 11. These infiltration rates represent the long-term infiltration capacity of a practice and not the capacity of the soils in their natural state. Field testing, such as with a double-ring infiltrometer (ASTM D3385), may justify the use of higher infiltration rates. However, we recommend adjusting field test rates by the appropriate correction factor, as provided for in the Minnesota Stormwater Manual or as allowed by the local watershed. We recommend consulting the Minnesota Stormwater Manual for stormwater design.

Table 11. Estimated Design Infiltration Rates Based on Soil Classification

Soil Type	Infiltration Rate * (inches/hour)
Sands with less than 12% fines, poorly graded or well graded sands	0.8
On-site fill with silty and clayey sand layers	0.06

* From Minnesota Stormwater Manual. Rates may differ at individual sites.

Fine-grained soils (silts and clays), topsoil or organic matter that mixes into or washes onto the soil will lower the permeability. The contractor should maintain and protect infiltration areas during construction. Furthermore, organic matter and silt washed into the system after construction can fill the soil pores and reduce permeability over time. Proper maintenance is important for long-term performance of infiltration systems.

This geotechnical evaluation does not constitute a review of site suitability for stormwater infiltration or evaluate the potential impacts, if any, from infiltration of large amounts of stormwater.

C.9. Equipment Support

The recommendations included in the report may not be applicable to equipment used for the construction and maintenance of this project. We recommend evaluating subgrade conditions in areas of shoring, scaffolding, cranes, pumps, lifts and other construction equipment prior to mobilization to determine if the exposed materials are suitable for equipment support, or require some form of subgrade improvement. We also recommend project planning consider the effect that loads applied by such equipment may have on structures they bear on or surcharge – including pavements, buried utilities, below-grade walls, etc. We can assist you in this evaluation.

D. Procedures

D.1. Penetration Test Borings

We drilled the penetration test borings with an all-terrain mounted core and auger drill equipped with hollow-stem auger. We performed the borings in general accordance with ASTM D6151 taking penetration test samples at 2 1/2- or 5-foot intervals in general accordance to ASTM D1586. The boring logs show the actual sample intervals and corresponding depths.

We sealed penetration test boreholes meeting the Minnesota Department of Health (MDH) Environmental Borehole criteria with an MDH-approved grout. We will forward sealing records for those boreholes to the Minnesota Department of Health Well Management Section.

D.2. Exploration Logs

D.2.a. Log of Boring Sheets

The Appendix includes Log of Boring sheets for our penetration test borings. The logs identify and describe the penetrated geologic materials, and present the results of penetration resistance tests performed. The logs also present the results of laboratory tests performed on penetration test samples, and groundwater measurements.

We inferred strata boundaries from changes in the penetration test samples and the auger cuttings. Because we did not perform continuous sampling, the strata boundary depths are only approximate. The boundary depths likely vary away from the boring locations, and the boundaries themselves may occur as gradual rather than abrupt transitions.

D.2.b. Geologic Origins

We assigned geologic origins to the materials shown on the logs and referenced within this report, based on: (1) a review of the background information and reference documents cited above, (2) visual classification of the various geologic material samples retrieved during the course of our subsurface exploration, (3) penetration resistance testing performed for the project, (4) laboratory test results, and (5) available common knowledge of the geologic processes and environments that have impacted the site and surrounding area in the past.

D.3. Material Classification and Testing

D.3.a. Visual and Manual Classification

We visually and manually classified the geologic materials encountered based on ASTM D2488. When we performed laboratory classification tests, we used the results to classify the geologic materials in accordance with ASTM D2487. The Appendix includes a chart explaining the classification system we used.

D.3.b. Laboratory Testing

The exploration logs in the Appendix note most of the results of the laboratory tests performed on geologic material samples. The remaining laboratory test results follow the exploration logs. We performed the tests in general accordance with ASTM procedures.

D.4. Groundwater Measurements

The drillers checked for groundwater while advancing the penetration test borings, and again after auger withdrawal. We then sealed the boreholes, as noted on the boring logs, preventing further groundwater level observations.

E. Qualifications

E.1. Variations in Subsurface Conditions

E.1.a. Material Strata

We developed our evaluation, analyses and recommendations from a limited amount of site and subsurface information. It is not standard engineering practice to retrieve material samples from exploration locations continuously with depth. Therefore, we must infer strata boundaries and thicknesses to some extent. Strata boundaries may also be gradual transitions, and project planning should expect the strata to vary in depth, elevation and thickness, away from the exploration locations.

Variations in subsurface conditions present between exploration locations may not be revealed until performing additional exploration work, or starting construction. If future activity for this project reveals any such variations, you should notify us so that we may reevaluate our recommendations. Such variations could increase construction costs, and we recommend including a contingency to accommodate them.

E.1.b. Groundwater Levels

We made groundwater measurements under the conditions reported herein and shown on the exploration logs, and interpreted in the text of this report. Note that the observation periods were relatively short, and project planning can expect groundwater levels to fluctuate in response to rainfall, flooding, irrigation, seasonal freezing and thawing, surface drainage modifications and other seasonal and annual factors.

E.2. Continuity of Professional Responsibility

E.2.a. Plan Review

We based this report on a limited amount of information, and we made a number of assumptions to help us develop our recommendations. We should be retained to review the geotechnical aspects of the designs and specifications. This review will allow us to evaluate whether we anticipated the design correctly, if any design changes affect the validity of our recommendations, and if the design and specifications correctly interpret and implement our recommendations.

E.2.b. Construction Observations and Testing

We recommend retaining us to perform the required observations and testing during construction as part of the ongoing geotechnical evaluation. This will allow us to correlate the subsurface conditions exposed during construction with those encountered by the borings and provide professional continuity from the design phase to the construction phase. If we do not perform observations and testing during construction, it becomes the responsibility of others to validate the assumption made during the preparation of this report and to accept the construction-related geotechnical engineer-of-record responsibilities.

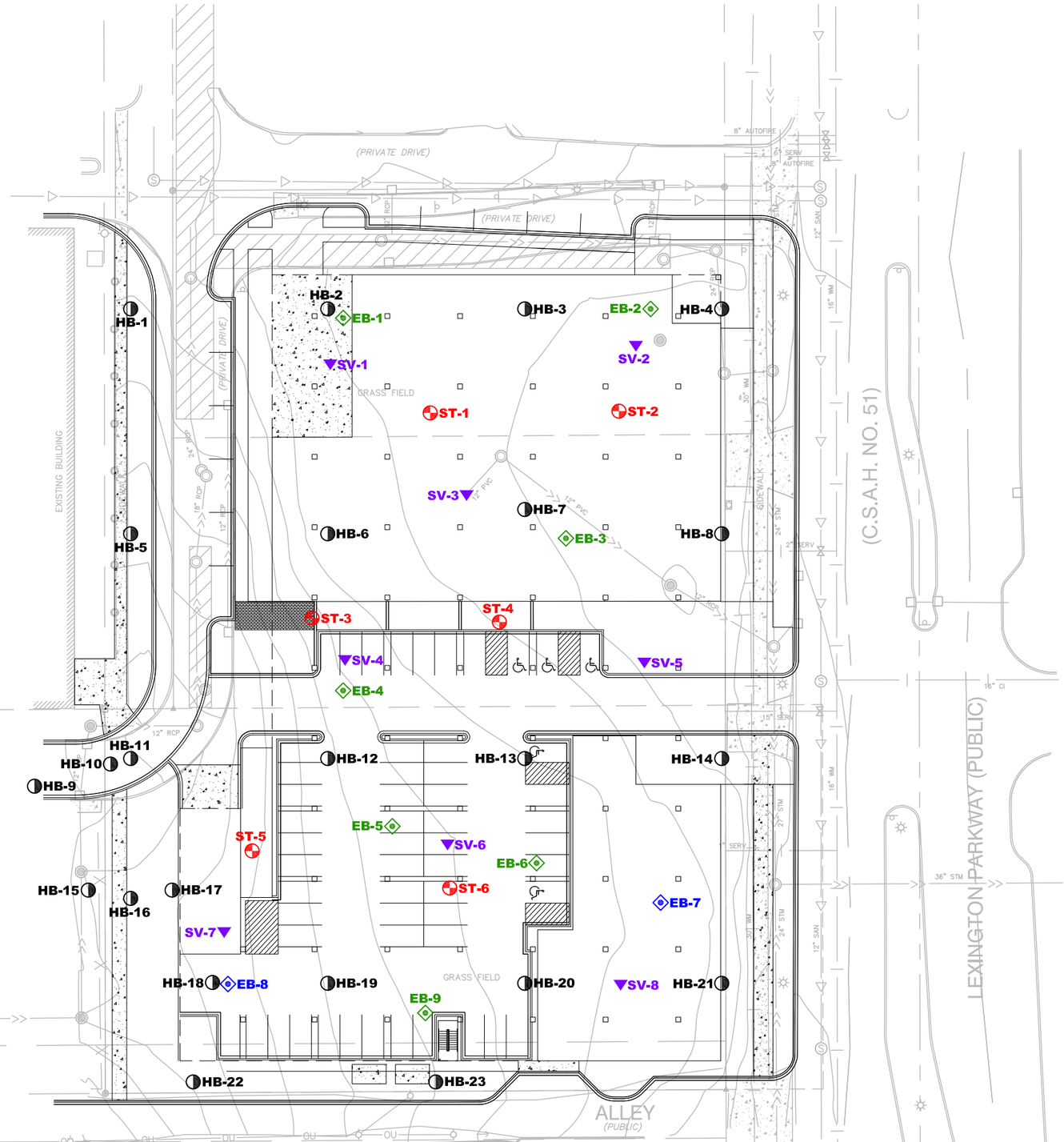
E.3. Use of Report

This report is for the exclusive use of the addressed parties. Without written approval, we assume no responsibility to other parties regarding this report. Our evaluation, analyses and recommendations may not be appropriate for other parties or projects.

E.4. Standard of Care

In performing its services, Braun Intertec used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession currently practicing in the same locality. No warranty, express or implied, is made.

Appendix



STANDARD PENETRATION TEST BORING

ENVIRONMENTAL SOIL BORING

ENVIRONMENTAL SOIL BORING WITH GROUNDWATER SAMPLE

SOIL VAPOR PROBE

PREVIOUSLY COMPLETED GEOTECHNICAL SOIL BORING

25' 0 50'

SCALE: 1" = 50'

BRAUN INTERTEC
The Science You Build On.

11001 Hampshire Avenue S
Minneapolis, MN 55438
952.995.2000
braunintertec.com

Drawing Information

Project No:	B1907294
Drawing No:	B1907294
Drawn By:	BJB
Date Drawn:	7/15/19
Checked By:	MJ
Last Modified:	9/17/19

Project Information

Proposed Lexington Mixed Use Building

SW of North Lexington Parkway and University Avenue

Saint Paul, Minnesota

Investigation Locations

Figure 2

F:\2019\B1907294.dwg,Geo,9/17/2019 11:28:46 AM

BRAUN INTERTEC
The Science You Build On.

LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1907294
Geotechnical Evaluation
Proposed Lexington Mixed Use Building
411-417 Lexington Parkway North
St. Paul, Minnesota

BORING: **ST-1**
LOCATION: See attached sketch
NORTHING: EASTING:
DRILLER: M. Takada | LOGGED BY: M. Jenkins | START DATE: 09/11/19 | END DATE: 09/11/19
SURFACE ELEVATION: 889.9 ft | RIG: 7507 | METHOD: 3 1/4" HSA | SURFACING: | WEATHER: Rain

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
~~889.6~~ 0.3		SILTY SAND (SM), fine-grained Sand, trace roots, black, moist (TOPSOIL FILL)				13	OC=3.0%
		FILL: SILTY SAND (SM), fine to medium-grained Gravel, trace Gravel, contains layers of Clayey Sand, trace glass, dark brown, moist		10-8-7 (15) 4"			
			5	5-3-3 (6) 5"			
				3-1-3 (4) 7"			
			10	5-5-5 (10) 8"			
878.4							
11.5		POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained Sand, trace Gravel, brown, moist, loose (GLACIAL OUTWASH)		3-3-5 (8) 4"		6	P200=7%
			15	3-3-3 (6) 5"			
871.9							
18.0		POORLY GRADED SAND (SP), fine to medium-grained Sand, trace Gravel, brown, moist, very loose to medium dense (GLACIAL OUTWASH)	20	2-2-2 (4) 4"			
			25	4-3-3 (6) 6"			
			30	8-6-5 (11) 3"			
858.9							
31.0		END OF BORING					Water not observed while drilling.

Boring immediately grouted.

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1907294
Geotechnical Evaluation
Proposed Lexington Mixed Use Building
411-417 Lexington Parkway North
St. Paul, Minnesota

BORING: **ST-2**
LOCATION: See attached sketch
NORTHING: EASTING:
DRILLER: M. Takada | LOGGED BY: M. Jenkins | START DATE: 09/11/19 | END DATE: 09/11/19
SURFACE ELEVATION: 889.0 ft | RIG: 7507 | METHOD: 3 1/4" HSA | SURFACING: | WEATHER: Rain

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
~~888.7~~ 0.3		SILTY SAND (SM), fine-grained Sand, trace roots, black, moist (TOPSOIL FILL)					
		FILL: SILTY SAND (SM), fine to medium-grained Sand, trace Gravel, dark brown, moist		9-7-5 (12) 2"			
5				4-3-2 (5) 4"			
				5-4-3 (7) 5"			
879.0 10.0		POORLY GRADED SAND (SP), fine to medium-grained Sand, trace Gravel, brown, moist, very loose to medium dense (GLACIAL OUTWASH)		9-7-4 (11) 4"			
10				2-1-3 (4) 4"			
15				2-3-3 (6) 6"			
20				2-3-6 (9) 9"			
25				5-4-6 (10) 3"			
30				5-7-4 (11) 3"			
858.0 31.0		END OF BORING					Water not observed while drilling.

Boring immediately grouted.

BRAUN INTERTEC
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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1907294
Geotechnical Evaluation
Proposed Lexington Mixed Use Building
411-417 Lexington Parkway North
St. Paul, Minnesota

BORING: **ST-3**
LOCATION: See attached sketch
NORTHING: EASTING:
DRILLER: M. Takada | LOGGED BY: M. Jenkins | START DATE: 09/11/19 | END DATE: 09/11/19
SURFACE ELEVATION: 889.0 ft | RIG: 7507 | METHOD: 3 1/4" HSA | SURFACING: | WEATHER: Rain

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
~~888.7~~ 0.3		SILTY SAND (SM), fine-grained Sand, trace roots, black, moist (TOPSOIL FILL)					
		FILL: SILTY SAND (SM), fine to medium-grained Sand, trace Gravel, contains layers of Clayey Sand, dark brown, moist *Clayey layers from 1 to 5 feet*		8-7-8 (15) 6"			
			5	8-6-6 (12) 8"			
				7-5-3 (8) 7"			
			10	5-20-2 (22) 2"			
877.5 11.5		POORLY GRADED SAND (SP), fine to medium-grained Sand, trace Gravel, brown, moist, loose to medium dense (GLACIAL OUTWASH)		3-2-4 (6) 3"		4	P200=4%
			15	6-6-5 (11) 2"			
			20	2-3-2 (5) 4"			
			25	4-3-5 (8) 4"			
			30	4-5-7 (12) 5"			
858.0 31.0		END OF BORING Boring immediately grouted					Water not observed while drilling.

BRAUN INTERTEC
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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1907294
Geotechnical Evaluation
Proposed Lexington Mixed Use Building
411-417 Lexington Parkway North
St. Paul, Minnesota

BORING: **ST-4**
LOCATION: See attached sketch
NORTHING: EASTING:
DRILLER: M. Takada | LOGGED BY: M. Jenkins | START DATE: 09/11/19 | END DATE: 09/11/19
SURFACE ELEVATION: 890.4 ft | RIG: 7507 | METHOD: 3 1/4" HSA | SURFACING: | WEATHER: Rain

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
889.7		SILTY SAND (SM), fine-grained Sand, black, moist (TOPSOIL FILL)					
0.7		FILL: SILTY SAND (SM), fine to medium-grained Sand, trace Gravel, and concrete fragments, with Clayey Sand, dark brown, moist		6-7-9 (16) 6"			
			5	5-4-5 (9) 8"			
				18-7-4 (11) 3"			
			10	3-2-2 (4) 10"		13	P200=32%
				6-5-5 (10) 6"			
			15	5-5-3 (8) 1"			
872.4							
18.0		POORLY GRADED SAND (SP), fine to medium-grained Sand, trace Gravel, brown, moist, very loose to loose (GLACIAL OUTWASH)	20	3-2-3 (5) 4"			
			25	3-2-2 (4) 5"			
			30	4-4-4 (8) 25"			
859.4							
31.0		END OF BORING					Water not observed while drilling.

Boring immediately grouted.

BRAUN INTERTEC
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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1907294
Geotechnical Evaluation
Proposed Lexington Mixed Use Building
411-417 Lexington Parkway North
St. Paul, Minnesota

BORING: **ST-5**
LOCATION: See attached sketch
NORTHING: EASTING:
DRILLER: M. Takada | LOGGED BY: M. Jenkins | START DATE: 09/11/19 | END DATE: 09/11/19
SURFACE ELEVATION: 895.4 ft | RIG: 7507 | METHOD: 3 1/4" HSA | SURFACING: | WEATHER: Rain

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
~~895.1~~ 0.3		SILTY SAND (SM), fine-grained Sand, trace roots, black, moist (TOPSOIL FILL)					
		FILL: SILTY SAND (SM), fine to medium-grained Sand, trace Gravel, dark brown, moist		1-3-2 (5) 4"			
891.4 4.0		POORLY GRADED SAND (SP), fine to medium-grained Sand, trace Gravel, brown, moist, loose to medium dense (GLACIAL OUTWASH)	5	4-3-3 (6) 4"		4	P200=2%
				4-3-2 (5) 3"			
			10	4-4-5 (9) 4"			
				4-5-5 (10) 0"			
			15	5-3-4 (7) 5"			
			20	4-6-5 (11) 4"			
			25	7-6-6 (12) 4"			
			30	12-7-11 (18) 3"			
864.4 31.0		END OF BORING					Water not observed while drilling.

Boring immediately grouted.

BRAUN INTERTEC
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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1907294
Geotechnical Evaluation
Proposed Lexington Mixed Use Building
411-417 Lexington Parkway North
St. Paul, Minnesota

BORING: **ST-6**
LOCATION: See attached sketch
NORTHING: EASTING:
DRILLER: M. Takada | LOGGED BY: M. Jenkins | START DATE: 09/11/19 | END DATE: 09/11/19
SURFACE ELEVATION: 892.6 ft | RIG: 7507 | METHOD: 3 1/4" HSA | SURFACING: | WEATHER: Rain

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
~~892.3~~ 0.3		SILTY SAND (SM), fine-grained Sand, black, moist (TOPSOIL FILL)					
		FILL: SILTY SAND (SM), fine to medium-grained Sand, trace Gravel, dark brown, moist		6-5-4 (9) 3"			
5				2-2-6 (8) 4"			
				2-2-1 (3) 7"			
882.6 10.0			10	4-3-4 (7) 5"			
		POORLY GRADED SAND (SP), fine to medium-grained Sand, trace Gravel, brown, moist, loose to medium dense (GLACIAL OUTWASH)		6-4-4 (8) 4"			
15				5-7-6 (13) 3"			
20				6-7-7 (14) 4"			
25				7-11-11 (22) 4"			
30				6-6-11 (17) 3"			
861.6 31.0		END OF BORING					Water not observed while drilling.

Boring immediately grouted.

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Geotechnical Testing

Various ASTM

9/21/2019

11001 Hampshire Avenue S
Minneapolis, MN 55438
Phone: 952-995-2000

Client:

Alatus, LLC
800 Nicollet Mall, Suite 2850
Minneapolis, MN 55402

Project:

B1907294
Proposed Lexington Mixed Use Building
411-417 Lexington Parkway North
St. Paul, MN

Sample Information

Metafield ID: 270856

Completed Date: 09/21/2019 **Prepared By:** Streier, Jim

Laboratory Results Summary

Boring	Sample	Depth (ft)	MC (%)	Wash Loss (%)	LL	PL	PI	Organic Content %	Dry Density (pcf)	Resistivity (ohm-cm)	Q_u (tsf)	Specific Gravity
ST-1	41	1.0	12.8					3				
ST-1	46	12.5	5.6	7								
ST-3	36	12.5	3.9	3.7								
ST-4	25	10.0	13.2	32								
ST-5	3	5.0	3.9	2.4								

General

BRAUN INTERTEC
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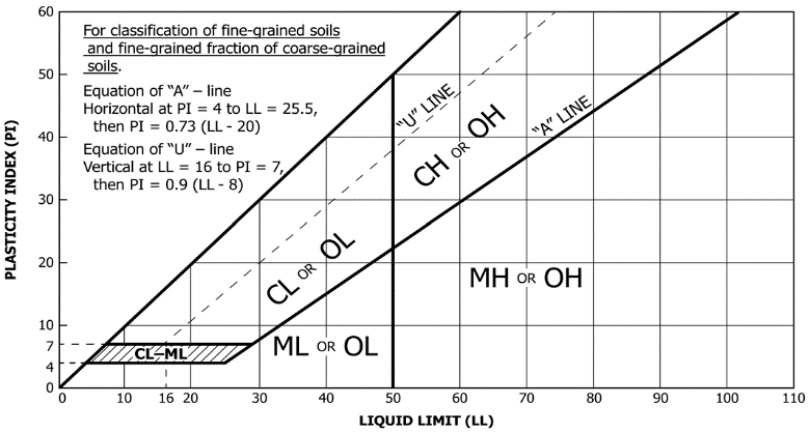
Descriptive Terminology of Soil

Based on Standards ASTM D2487/2488
(Unified Soil Classification System)

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]				Soil Classification	
				Group Symbol	Group Name[B]
Coarse-grained Soils (more than 50% retained on No. 200 sieve)	Gravels (More than 50% of coarse fraction retained on No. 4 sieve)	Clean Gravels (Less than 5% fines[C])	$C_u \geq 4$ and $1 \leq C_c \leq 3$[D]	GW	Well-graded gravel[E]
			$C_u < 4$ and/or ($C_c < 1$ or $C_c > 3$)[D]	GP	Poorly graded gravel[E]
		Gravels with Fines (More than 12% fines[C])	Fines classify as ML or MH	GM	Silty gravel[E F G]
			Fines Classify as CL or CH	GC	Clayey gravel[E F G]
	Sands (50% or more coarse fraction passes No. 4 sieve)	Clean Sands (Less than 5% fines[H])	$C_u \geq 6$ and $1 \leq C_c \leq 3$[D]	SW	Well-graded sand[I]
			$C_u < 6$ and/or ($C_c < 1$ or $C_c > 3$)[D]	SP	Poorly graded sand[J]
		Sands with Fines (More than 12% fines[H])	Fines classify as ML or MH	SM	Silty sand[F G I]
			Fines classify as CL or CH	SC	Clayey sand[F G I]
Fine-grained Soils (50% or more passes the No. 200 sieve)	Silts and Clays (Liquid limit less than 50)	Inorganic	PI > 7 and plots on or above "A" line[J]	CL	Lean clay[K L M]
			PI < 4 or plots below "A" line[J]	ML	Silt[K L M]
		Organic	Liquid Limit – oven dried / Liquid Limit – not dried <0.75	OL	Organic clay[K L M N] / Organic silt[K L M O]
	Silts and Clays (Liquid limit 50 or more)	Inorganic	PI plots on or above "A" line	CH	Fat clay[K L M]
			PI plots below "A" line	MH	Elastic silt[K L M]
		Organic	Liquid Limit – oven dried / Liquid Limit – not dried <0.75	OH	Organic clay[K L M P] / Organic silt[K L M Q]
Highly Organic Soils		Primarily organic matter, dark in color, and organic odor		PT	Peat

A. Based on the material passing the 3-inch (75-mm) sieve.
B. If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
C. Gravels with 5 to 12% fines require dual symbols:
   GW-GM well-graded gravel with silt
   GW-GC well-graded gravel with clay
   GP-GM poorly graded gravel with silt
   GP-GC poorly graded gravel with clay
D. $C_u = D_{60} / D_{10}$ $C_c = (D_{30})^2 / (D_{10} \times D_{60})$
E. If soil contains ≥ 15% sand, add "with sand" to group name.
F. If fines classify as CL-ML, use dual symbol GC-GM or SC-SM.
G. If fines are organic, add "with organic fines" to group name.
H. Sands with 5 to 12% fines require dual symbols:
   SW-SM well-graded sand with silt
   SW-SC well-graded sand with clay
   SP-SM poorly graded sand with silt
   SP-SC poorly graded sand with clay
I. If soil contains ≥ 15% gravel, add "with gravel" to group name.
J. If Atterberg limits plot in hatched area, soil is CL-ML, silty clay.
K. If soil contains 15 to < 30% plus No. 200, add "with sand" or "with gravel", whichever is predominant.
L. If soil contains ≥ 30% plus No. 200, predominantly sand, add "sandy" to group name.
M. If soil contains ≥ 30% plus No. 200 predominantly gravel, add "gravelly" to group name.
N. PI ≥ 4 and plots on or above "A" line.
O. PI < 4 or plots below "A" line.
P. PI plots on or above "A" line.
Q. PI plots below "A" line.



Particle Size Identification

Boulders..... over 12"
Cobbles..... 3" to 12"
Gravel
  Coarse..... 3/4" to 3" (19.00 mm to 75.00 mm)
  Fine..... No. 4 to 3/4" (4.75 mm to 19.00 mm)
Sand
  Coarse..... No. 10 to No. 4 (2.00 mm to 4.75 mm)
  Medium..... No. 40 to No. 10 (0.425 mm to 2.00 mm)
  Fine..... No. 200 to No. 40 (0.075 mm to 0.425 mm)
Silt..... No. 200 (0.075 mm) to .005 mm
Clay..... < .005 mm

Relative Proportions[L, M]

trace..... 0 to 5%
little..... 6 to 14%
with..... ≥ 15%

Inclusion Thicknesses

lens..... 0 to 1/8"
seam..... 1/8" to 1"
layer..... over 1"

Apparent Relative Density of Cohesionless Soils

Very loose ..... 0 to 4 BPF
Loose ..... 5 to 10 BPF
Medium dense..... 11 to 30 BPF
Dense..... 31 to 50 BPF
Very dense..... over 50 BPF

Consistency of Cohesive Soils	Blows Per Foot	Approximate Unconfined Compressive Strength
Very soft	0 to 1 BPF	< 0.25 tsf
Soft	2 to 4 BPF	0.25 to 0.5 tsf
Medium	5 to 8 BPF	0.5 to 1 tsf
Stiff	9 to 15 BPF	1 to 2 tsf
Very Stiff	16 to 30 BPF	2 to 4 tsf
Hard	over 30 BPF	> 4 tsf

Moisture Content:

Dry: Absence of moisture, dusty, dry to the touch.
Moist: Damp but no visible water.
Wet: Visible free water, usually soil is below water table.

Drilling Notes:

Blows/N-value: Blows indicate the driving resistance recorded for each 6-inch interval. The reported N-value is the blows per foot recorded by summing the second and third interval in accordance with the Standard Penetration Test, ASTM D1586.

Partial Penetration: If the sampler could not be driven through a full 6-inch interval, the number of blows for that partial penetration is shown as #/x" (i.e. 50/2"). The N-value is reported as "REF" indicating refusal.

Recovery: Indicates the inches of sample recovered from the sampled interval. For a standard penetration test, full recovery is 18", and is 24" for a thinwall/shelby tube sample.

WOH: Indicates the sampler penetrated soil under weight of hammer and rods alone; driving not required.

WOR: Indicates the sampler penetrated soil under weight of rods alone; hammer weight and driving not required.

Water Level: Indicates the water level measured by the drillers either while drilling (▽), at the end of drilling (▼), or at some time after drilling (▼).

Laboratory Tests

DD	Dry density, pcf	**OC**	Organic content, %	**LL**	Liquid limit
WD	Wet density, pcf	**q_p**	Pocket penetrometer strength, tsf	**PL**	Plastic limit
P200	% Passing #200 sieve	**MC**	Moisture content, %	**PI**	Plasticity index
		q_U	Unconfined compression test, tsf		

3/2019