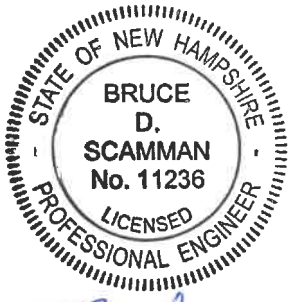
Drainage Report & Supporting Documents

TURBOCAM International
Route 9 / Redemption Road (Site)
Barrington, NH 03825

January 7, 2020

Prepared for:

TURBOCAM International
607 Calef Highway
Barrington, NH 03825



Prepared by:

Emanuel Engineering, Inc.
Bruce Scamman, PE
118 Portsmouth Avenue, Suite A202
Stratham, NH 03885
EEI Project # 19-020

Includes:

- Pre & Post-Development Area Summaries
- Pre & Post-Development Peak Flow & Volume Summaries
- Extreme Precipitation Tables
- Drainage Report
- Riprap Apron Calculations

STORMWATER ANALYSIS AREA WORKSHEET

EMANUEL ENGINEERING INC.

JOB: 19-020 CFA - TurboCAM
DATE: 1/7/2020
ENGINEER: MCV

PRE DEVELOPMENT DRAINAGE AREAS:

SOIL TYPE	*SOIL GROUP*	*CN#*	***SUBCAT ES1*** *Area (SF)*	***SUBCAT ES3*** *Area (SF)*	***SUBCAT ES4*** *Area (SF)*	***SUBCAT ES5*** *Area (SF)*	***SUBCAT ES6*** *Area (SF)*	***SUBCAT ES7*** *Area (SF)*	***SUBCAT ES9*** *Area (SF)*
Grass	A	39	0	0	0	0	0	0	9,841
	B	61	0	0	0	0	0	0	0
	C	74	0	0	0	0	0	0	0
Woods	A	30	56,403	12,689	9,025	13,071	26,865	0	2,369
	B	55	8,020	0	0	0	3,861	0	13,310
	C	70	36,985	3,241	0	0	26,009	84,458	24,652
Pavement	A	98	0	0	0	0	0	0	5,551
	B	98	0	0	0	0	0	0	0
Total Area (SF)			**101,408**	**15,930**	**9,025**	**13,071**	**56,735**	**84,458**	**55,723**
Total Area (Acres)			**2.33**	**0.37**	**0.21**	**0.30**	**1.30**	**1.94**	**1.28**

Total Impervious (SF)			**0**	**0**	**0**	**0**	**0**	**0**	**5,551**
Impervious (Acres)			**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.13**

SUBCAT ES10 *Area (SF)*	***SUBCAT ES11*** *Area (SF)*	***SUBCAT ES12*** *Area (SF)*	***SUBCAT ES13*** *Area (SF)*	***SUBCAT ES14*** *Area (SF)*	***SUBCAT ES15*** *Area (SF)*	***SUBCAT ES16*** *Area (SF)*	***TOTAL AREA*** *(SF)*
31,198	9,251	9,469	9,045	13,418	0	13,397	**95,619**
0	0	1,648	2,932	0	0	0	**4,580**
0	0	0	0	0	0	0	**0**
23,985	0	16,115	17,458	8,782	43,592	29,498	**259,852**
0	0	1,651	0	0	0	0	**26,842**
19,689	4,095	12,250	18,383	26,352	27,802	32,875	**316,792**
0	2,085	2,121	2,266	5,681	272	0	**17,975**
0	0	0	996	0	0	0	**996**
74,872	**15,431**	**43,254**	**51,080**	**54,233**	**71,666**	**75,770**	**722,655**
1.72	**0.35**	**0.99**	**1.17**	**1.25**	**1.65**	**1.74**	**16.59**

0	**2,085**	**2,121**	**3,262**	**5,681**	**272**	**0**	**18,971**
0.00	**0.05**	**0.05**	**0.07**	**0.13**	**0.01**	**0.00**	**0.44**

STORMWATER ANALYSIS AREA WORKSHEET

EMANUEL ENGINEERING INC.

JOB: 19-020 CFA - TurboCAM
DATE: 1/7/2020
ENGINEER: JJM

POST DEVELOPMENT DRAINAGE AREAS:

SOIL TYPE	*SOIL GROUP*	*CN#*	***SUBCAT PS1*** *Area (SF)*	***SUBCAT PS3*** *Area (SF)*	***SUBCAT PS4*** *Area (SF)*	***SUBCAT PS6*** *Area (SF)*	***SUBCAT PS7*** *Area (SF)*	***SUBCAT PS8*** *Area (SF)*	***SUBCAT PS9*** *Area (SF)*	***SUBCAT PS10*** *Area (SF)*
Grass	A	39	18,898	16,928	1,166	0	6,597	9,841	31,198	9,251
	B	61	3,788	0		0	0	0	0	0
	C	74	0	0	6,755	2,618	0	0	0	0
Woods	A	30	39,435	271		0	0	2,369	23,985	0
	B	55	3,580	0		0	0	13,310	0	0
	C	70	36,257	3,241	21,381	62,199	0	24,652	19,689	4,095
Gravel	A	96	0	0		0	0	0	0	0
	B	96	0	0		0	0	0	0	0
	C	96	0	0		0	0	0	0	0
Pavement	A	98	0	0	5,324	0	2,121	5,551	0	2,085
	B	98	0	0		0	0	0	0	0
	C	98	0	0	4,744	0	0	0	0	0
Buildings	A	98	0	0	1,200	0	0	0	0	0
	B	98	0	0		0	0	0	0	0
	C	98	0	0		0	0	0	0	0
Crushed Stone	A		0	0		0	0	0	0	0
	B		0	0		0	0	0	0	0
	C		0	0		0	0	0	0	0
Total Area (SF)			**101,958**	**20,440**	**40,570**	**64,817**	**8,718**	**55,723**	**74,872**	**15,431**
Area (Acres)			**2.34**	**0.47**	**0.93**	**1.49**	**0.20**	**1.28**	**1.72**	**0.35**

Total Impervious (SF)			**0**	**0**	**11,268**	**0**	**2,121**	**5,551**	**0**	**2,085**
Impervious (Acres)			**0.00**	**0.00**	**0.26**	**0.00**	**0.05**	**0.13**	**0.00**	**0.05**

A	58,333	17,199	7,690	0	8,718	17,761	55,183	11,336
B	7,368	0	0	0	0	13,310	0	0
C	36,257	3,241	32,880	64,817	0	24,652	19,689	4,095

SUBCAT PS11 *Area (SF)*	***SUBCAT PS12*** *Area (SF)*	***SUBCAT PS13*** *Area (SF)*	***SUBCAT PS14*** *Area (SF)*	***SUBCAT PS15*** *Area (SF)*	***SUBCAT PS16*** *Area (SF)*	***SUBCAT PS17*** *Area (SF)*	***SUBCAT PS19*** *Area (SF)*	***SUBCAT PS20*** *Area (SF)*
11,193	22,740	2,871	0	0	0	1,103		877
1,648	2,934	0	0	0	0	0	0	0
8,273	17,678	14,723	2,277	0	0	0	0	0
8,389	0	0	0	0	0	0	0	0
1,651	0	0	0	0	0	0	0	0
3,977	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	3,055	1,307	0	0	0	12,190	0	3,745
0	996	0	0	0	0	0	0	0
0	0	2,321	5,451	0	0	0	0	0
0	0	0	0	0	4,898	0	6,250	0
0	0	0	0	0	0	0	0	0
0	0	0	0	7,785	1,330	0	0	0
0	0	0	0	0	204	0	484	0
0	0	0	0	0	0	0	0	0
0	0	0	0	503	195	0	0	0
35,131	**47,403**	**21,222**	**7,728**	**8,288**	**6,627**	**13,293**	**6,734**	**4,622**
0.81	**1.09**	**0.49**	**0.18**	**0.19**	**0.15**	**0.31**	**0.15**	**0.11**

0	**4,051**	**3,628**	**5,451**	**7,785**	**6,228**	**12,190**	**6,250**	**3,745**
0.00	**0.09**	**0.08**	**0.13**	**0.18**	**0.14**	**0.28**	**0.14**	**0.09**

19,582	25,795	4,178	0	0	5,102	13,293	6,734	4,622
3,299	3,930	0	0	0	0	0	0	0
12,250	17,678	17,044	7,728	8,288	1,525	0	0	0

SUBCAT PS22 *Area (SF)*	***SUBCAT PS23*** *Area (SF)*	***SUBCAT PS24*** *Area (SF)*	***SUBCAT PS25*** *Area (SF)*	***SUBCAT PS26*** *Area (SF)*	***SUBCAT PS28*** *Area (SF)*	***SUBCAT PS29*** *Area (SF)*	***SUBCAT PS30*** *Area (SF)*	***TOTAL AREA*** *(SF)*
0	4,828	13,397	15,044	9,291	2,867	3,827	5,352	**187,269**
0	2,502	0	0	0	0	0		**10,872**
	0	0	0	179	1,387	0	4,610	**58,500**
0	603	29,498	8,960	701	0	2,526	0	**116,737**
0	2,009	0	0	0	0	0	0	**20,550**
0	3,393	32,875	4,533	2,046	0	1,627	0	**219,965**
0	0	0	1,441	0	0	0	0	**1,441**
0	0	0	0	0	0	0	0	**0**
0	0	0	0	0	0	0	0	**0**
0	0	0	302	4,077	1,756	2,293	11,054	**54,860**
0	0	0	0	0	0	0	0	**996**
0	0	0	0	0	3,689	0	5,681	**21,886**
103	0	0	0	0	0	0	0	**12,451**
0	0	0	0	0	0	0	0	**0**
6,147	0	0	0	0	0	0	0	**15,262**
0	0	0	0	0	0	0	0	**688**
0	0	0	0	0	0	0	0	**0**
480	0	0	0	0	0	0	0	**1,178**
6,730	**13,335**	**75,770**	**30,280**	**16,294**	**9,699**	**10,273**	**26,697**	**722,655**
0.15	**0.31**	**1.74**	**0.70**	**0.37**	**0.22**	**0.24**	**0.61**	**16.59**

6,250	**0**	**0**	**1,743**	**4,077**	**5,445**	**2,293**	**16,735**	**106,896**
0.14	**0.00**	**0.00**	**0.04**	**0.09**	**0.13**	**0.05**	**0.38**	**2.45**

								total
103	5,431	42,895	25,747	14,069	4,623	8,646	16,406	373,445
0	4,511	0	0	0	0	0	0	32,418
6,627	3,393	32,875	4,533	2,225	5,076	1,627	10,291	316,791

STORMWATER/DRAINAGE SUMMARY

EMANUEL ENGINEERING, INC.

JOB: 19-020 CFA - TurboCAM
DATE: 1/7/2020
ENGINEER: JJM

PEAK FLOWS FROM HYDROCAD

Subcatchment Area	Storm Quality 1"		2-Year Storm 3.07"		10-Year Storm 4.61"		25-Year Storm 5.83"		50-Year Storm 6.97"	
	Pre (CFS)	Post (CFS)	Pre (CFS)	Post (CFS)	Pre (CFS)	Post (CFS)	Pre (CFS)	Post (CFS)	Pre (CFS)	Post (CFS)
POINTS OF DISCHARGE										
LINK 200L	0.00	0.00	0.05	0.04	0.70	0.51	2.48	1.76	4.91	4.64
LINK 300L	0.00	0.00	0.01	0.01	0.08	0.08	0.41	0.41	1.07	1.07
LINK 400L	0.00	0.00	0.27	0.27	1.16	1.14	2.30	1.97	3.56	3.41
LINK 500L	0.00	0.00	0.14	0.04	0.78	0.30	1.43	0.65	2.05	1.89
FLOW TOTALS (CFS)	**0.00**	**0.00**	**0.47**	**0.36**	**2.72**	**2.03**	**6.62**	**4.79**	**11.59**	**11.01**
Net Increase/(Decrease) (CFS)		**0.00**		**(0.11)**		**(0.69)**		**(1.83)**		**(0.58)**

VOLUMES FROM HYDROCAD

Subcatchment Area	Storm Quality 1"		2-Year Storm 3.07"		10-Year Storm 4.61"		25-Year Storm 5.83"		50-Year Storm 6.97"	
	Pre (AF)	Post (AF)	Pre (AF)	Post (AF)	Pre (AF)	Post (AF)	Pre (AF)	Post (AF)	Pre (AF)	Post (AF)
POINTS OF DISCHARGE										
LINK 200L	0.000	0.000	0.040	0.032	0.262	0.205	0.548	0.494	0.884	0.869
LINK 300L	0.000	0.000	0.003	0.003	0.041	0.041	0.097	0.097	0.163	0.163
LINK 400L	0.000	0.000	0.101	0.052	0.444	0.305	0.790	0.655	1.153	1.024
LINK 500L	0.000	0.000	0.034	0.009	0.106	0.034	0.180	0.074	0.258	0.123
Voume TOTALS (AF)	**0.000**	**0.000**	**0.178**	**0.096**	**0.853**	**0.585**	**1.615**	**1.320**	**2.458**	**2.179**
Net Increase/(Decrease) (AF)		**0.000**		**(0.082)**		**(0.268)**		**(0.295)**		**(0.279)**

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	No
State	New Hampshire
Location	
Longitude	71.019 degrees West
Latitude	43.216 degrees North
Elevation	0 feet
Date/Time	Fri, 17 May 2019 15:13:11 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.49	0.66	0.81	1.00	**1yr**	0.70	0.98	1.13	1.57	1.99	2.55	2.80	**1yr**	2.26	2.69	3.11	3.83	4.40	**1yr**
2yr	0.32	0.49	0.60	0.82	1.01	1.19	**2yr**	0.87	1.16	1.38	1.85	2.39	3.07	3.41	**2yr**	2.71	3.28	3.78	4.51	5.13	**2yr**
5yr	0.37	0.57	0.70	0.96	1.23	1.47	**5yr**	1.06	1.44	1.71	2.29	2.93	3.87	4.36	**5yr**	3.42	4.19	4.81	5.68	6.42	**5yr**
10yr	0.41	0.64	0.79	1.10	1.42	1.72	**10yr**	1.23	1.69	2.01	2.69	3.42	4.61	5.25	**10yr**	4.08	5.05	5.78	6.76	7.61	**10yr**
25yr	0.49	0.74	0.92	1.31	1.73	2.13	**25yr**	1.49	2.09	2.49	3.33	4.21	5.83	6.72	**25yr**	5.16	6.47	7.37	8.53	9.53	**25yr**
50yr	0.55	0.84	1.04	1.50	2.01	2.51	**50yr**	1.74	2.45	2.92	3.92	4.92	6.97	8.11	**50yr**	6.17	7.80	8.86	10.17	11.31	**50yr**
100yr	0.63	0.94	1.18	1.71	2.34	2.95	**100yr**	2.02	2.89	3.44	4.62	5.76	8.32	9.78	**100yr**	7.37	9.41	10.65	12.14	13.42	**100yr**
200yr	0.71	1.07	1.35	1.96	2.73	3.48	**200yr**	2.36	3.40	4.05	5.44	6.74	9.95	11.80	**200yr**	8.80	11.35	12.80	14.49	15.93	**200yr**
500yr	0.85	1.26	1.62	2.35	3.35	4.32	**500yr**	2.89	4.22	5.03	6.76	8.30	12.60	15.14	**500yr**	11.15	14.56	16.35	18.33	20.01	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.60	0.73	0.90	**1yr**	0.63	0.88	0.92	1.25	1.52	1.95	2.48	**1yr**	1.73	2.38	2.90	3.29	3.91	**1yr**
2yr	0.31	0.48	0.59	0.81	0.99	1.18	**2yr**	0.86	1.15	1.35	1.81	2.33	2.97	3.31	**2yr**	2.63	3.18	3.66	4.39	5.01	**2yr**
5yr	0.35	0.54	0.67	0.92	1.16	1.40	**5yr**	1.01	1.37	1.61	2.13	2.76	3.57	4.00	**5yr**	3.16	3.84	4.45	5.32	5.97	**5yr**
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.56	1.81	2.42	3.11	4.07	4.61	**10yr**	3.60	4.43	5.14	6.15	6.80	**10yr**
25yr	0.44	0.67	0.83	1.19	1.57	1.91	**25yr**	1.35	1.87	2.12	2.83	3.62	4.83	5.54	**25yr**	4.28	5.33	6.24	7.46	8.22	**25yr**
50yr	0.49	0.74	0.92	1.33	1.79	2.19	**50yr**	1.54	2.14	2.38	3.19	4.06	5.49	6.36	**50yr**	4.86	6.12	7.22	8.62	9.50	**50yr**
100yr	0.55	0.83	1.03	1.49	2.05	2.51	**100yr**	1.77	2.46	2.67	3.59	4.53	6.23	7.29	**100yr**	5.52	7.01	8.36	9.95	10.85	**100yr**
200yr	0.61	0.92	1.16	1.68	2.35	2.88	**200yr**	2.03	2.82	3.00	4.03	5.06	7.06	8.78	**200yr**	6.25	8.44	9.70	11.50	12.43	**200yr**
500yr	0.72	1.06	1.37	1.99	2.83	3.48	**500yr**	2.44	3.41	3.52	4.71	5.88	8.29	10.64	**500yr**	7.33	10.23	11.81	13.93	14.80	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.43	0.53	0.71	0.87	1.07	**1yr**	0.75	1.05	1.23	1.72	2.17	2.76	3.04	**1yr**	2.44	2.92	3.36	4.12	4.75	**1yr**
2yr	0.33	0.50	0.62	0.84	1.03	1.24	**2yr**	0.89	1.21	1.46	1.93	2.49	3.19	3.54	**2yr**	2.82	3.40	3.92	4.64	5.28	**2yr**
5yr	0.39	0.60	0.75	1.02	1.30	1.57	**5yr**	1.13	1.53	1.83	2.46	3.15	4.18	4.72	**5yr**	3.70	4.54	5.19	6.03	6.85	**5yr**
10yr	0.46	0.70	0.87	1.21	1.57	1.90	**10yr**	1.35	1.86	2.21	2.99	3.79	5.17	5.89	**10yr**	4.58	5.66	6.44	7.36	8.35	**10yr**
25yr	0.56	0.84	1.05	1.50	1.97	2.44	**25yr**	1.70	2.39	2.84	3.88	4.85	6.86	7.89	**25yr**	6.07	7.59	8.56	9.68	10.69	**25yr**
50yr	0.64	0.98	1.22	1.75	2.36	2.94	**50yr**	2.03	2.87	3.44	4.72	5.87	8.51	9.88	**50yr**	7.53	9.50	10.63	11.87	13.05	**50yr**
100yr	0.75	1.13	1.42	2.05	2.81	3.54	**100yr**	2.43	3.46	4.16	5.75	7.12	10.55	12.37	**100yr**	9.34	11.89	13.18	14.58	15.91	**100yr**
200yr	0.87	1.31	1.66	2.41	3.36	4.28	**200yr**	2.90	4.19	5.05	7.02	8.62	13.13	14.97	**200yr**	11.62	14.39	16.36	17.88	19.44	**200yr**
500yr	1.07	1.59	2.04	2.97	4.22	5.48	**500yr**	3.64	5.36	6.51	9.14	11.12	17.58	20.04	**500yr**	15.56	19.27	21.76	23.47	25.36	**500yr**

Powered by ACIS Northeast Regional Climate Center

NOTES:

1. OWNER OF RECORD:
   TAX MAP 233 LOT 77 & TAX MAP 234 LOTS 1.2 & 1.4
   TOWN OF BARRINGTON
   P.O. BOX 660
   BARRINGTON, NH 03825
   SCRD BK4342 P60044 (MAP 233 LOT 77)
   SCRD BK2326 P60758 (MAP 234 LOT 1.2)

2. THE INTENT OF THIS PLAN IS TO CALCULATE PRE-DEVEOPLMENT SUBCATCHMENT AREAS AND FLOW PATHS FOR MODELING VARIOUS STORM EVENTS IN PREPARATION FOR SITE IMPROVEMENTS.

3. PRE-DEVELOPMENT DRAINAGE AREA CALCS:

   DRAINAGE ANALYSIS TOTAL AREA = 722,655 SF

   DRAINAGE ANALYSIS IMPERVIOUS = 18,971 SF
   DRAINAGE ANALYSIS % IMPERVIOUS = 2.63%

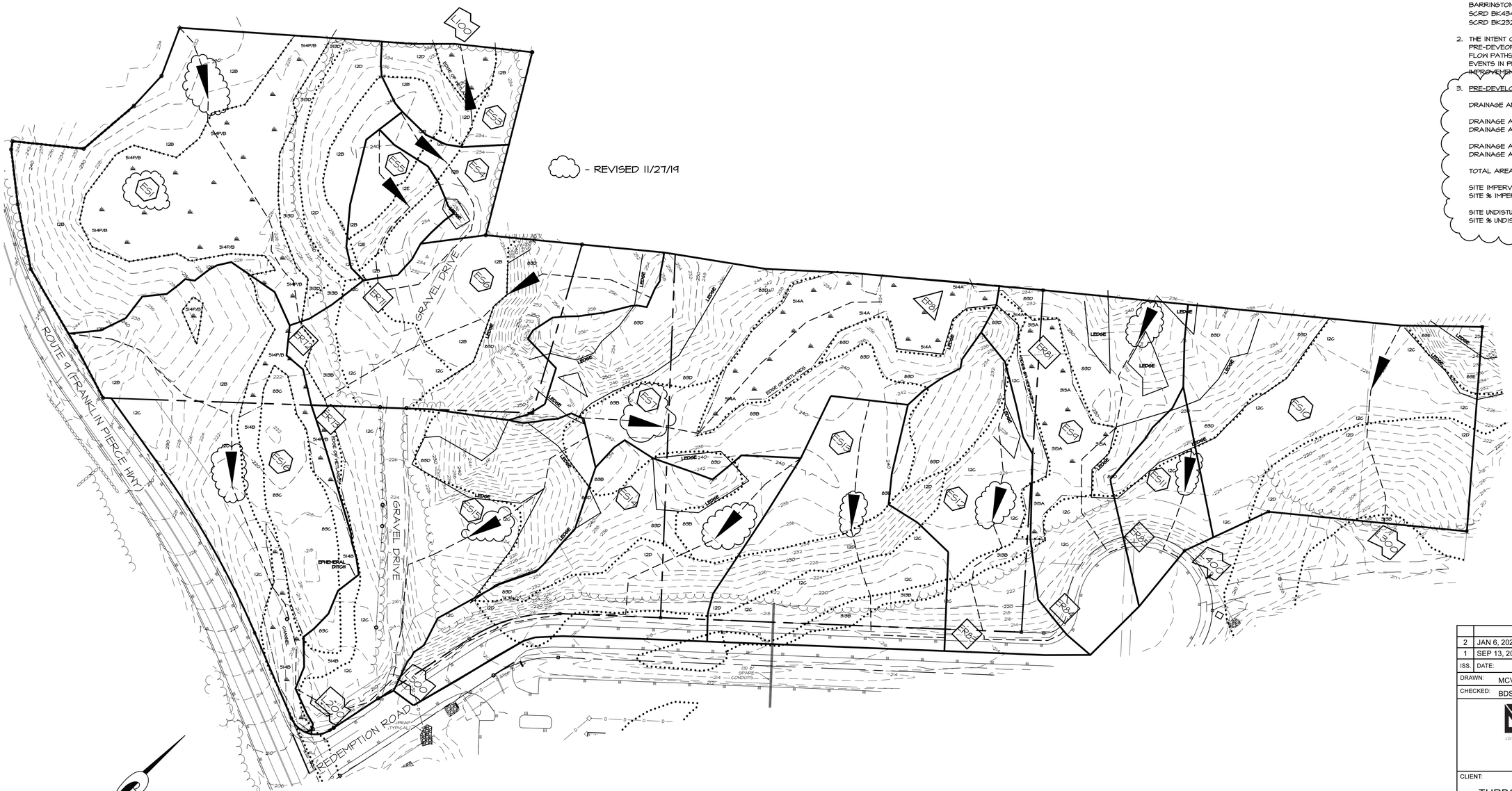
   DRAINAGE ANALYSIS UNDISTURBED = 722,655 SF
   DRAINAGE ANALYSIS % UNDISTURBED = 100%

   TOTAL AREA OF SITE = 554,574 SF

   SITE IMPERVIOUS AREA = 0 SF
   SITE % IMPERVIOUS = 0%

   SITE UNDISTURBED AREA = 554,574 SF
   SITE % UNDISTURBED = 100%

- REVISED 11/27/19



GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

ISS.	DATE:	DESCRIPTION OF ISSUE:	CHK.
2	JAN 6, 2020	FOR APPROVAL	
1	SEP 13, 2019	FOR APPROVAL	

DRAWN: MCV	DESIGN: MCV
CHECKED: BDS	CHECKED: BDS

EMANUEL ENGINEERING
civil & structural consultants, land planners
118 Portsmouth Avenue, A202
Stratham, NH 03885
P: 603-772-4400 F: 603-772-4487
www.emanuelengineering.com

CLIENT:

TURBOCAM INTERNATIONAL
607 CALEF HIGHWAY
BARRINGTON, NH 03825

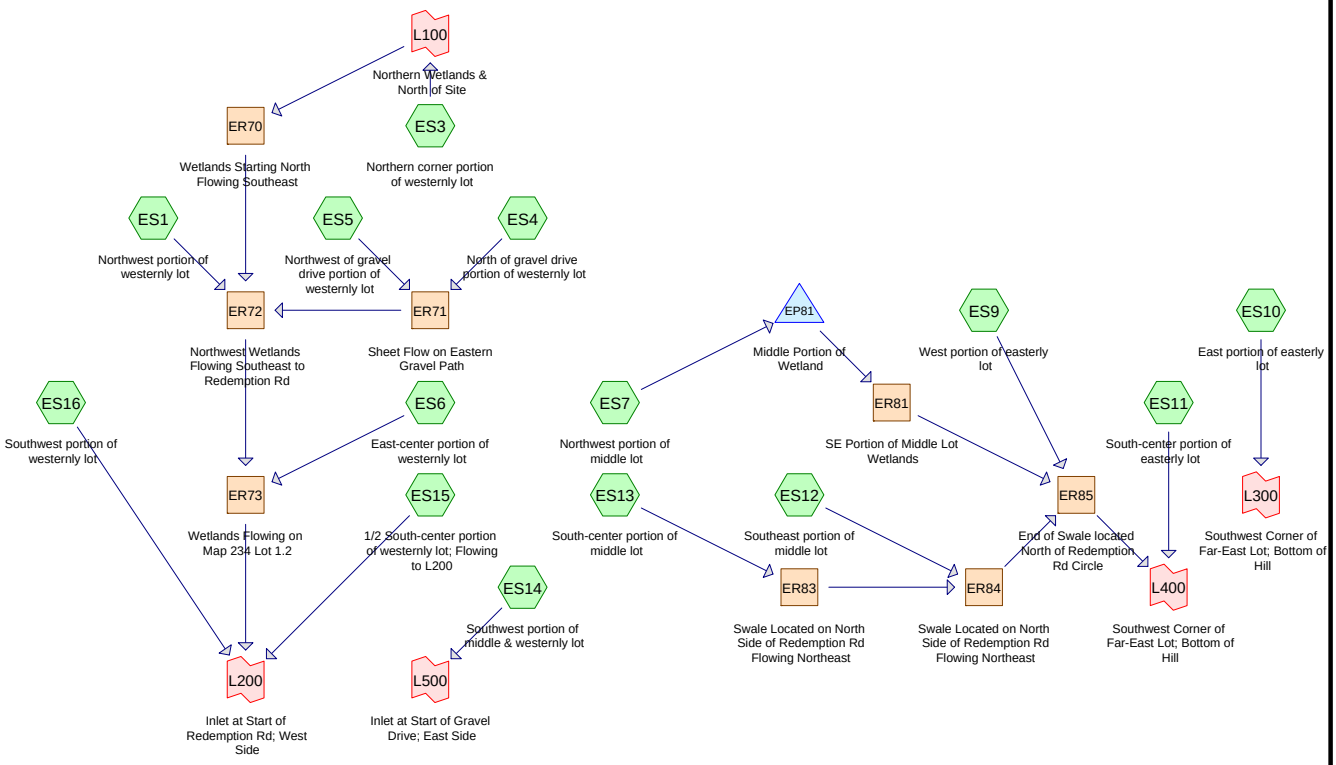
SEAL:

TITLE:

PRE-DEVELOPMENT DRAINAGE PLAN

FOR
TAX MAP 233 LOTS 1.2, 1.4, AND 77
TURBOCAM INTERNATIONAL
ROUTE 9 (SITE)
BARRINGTON, NH 03825
& TOWN OF BARRINGTON
PO BOX 660
BARRINGTON, NH 03825

PROJECT:	SCALE:	SHEET:
19-020	1"=60'	SW1



Subcat Reach Pond Link

Routing Diagram for Turbocam Predevelopment 11-26-19
Prepared by Microsoft, Printed 1/7/2020

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.965	30	Woods, Good, HSG A (ES1, ES10, ES12, ES13, ES14, ES15, ES16, ES3, ES4, ES5, ES6, ES9)
2.195	39	>75% Grass cover, Good, HSG A (ES10, ES11, ES12, ES13, ES14, ES16, ES9)
0.616	55	Woods, Good, HSG B (ES1, ES12, ES6, ES9)
0.105	61	>75% Grass cover, Good, HSG B (ES12, ES13)
7.273	70	Woods, Good, HSG C (ES1, ES10, ES11, ES12, ES13, ES14, ES15, ES16, ES3, ES6, ES7, ES9)
0.413	98	Paved parking, HSG A (ES11, ES12, ES13, ES14, ES15, ES9)
0.023	98	Paved parking, HSG B (ES13)
16.590	**52**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
8.573	HSG A	ES1, ES10, ES11, ES12, ES13, ES14, ES15, ES16, ES3, ES4, ES5, ES6, ES9
0.744	HSG B	ES1, ES12, ES13, ES6, ES9
7.273	HSG C	ES1, ES10, ES11, ES12, ES13, ES14, ES15, ES16, ES3, ES6, ES7, ES9
0.000	HSG D	
0.000	Other	
16.590		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
2.195	0.105	0.000	0.000	0.000	2.300	>75% Grass cover, Good	ES10, ES11, ES12, ES13, ES14, ES16, ES9
0.413	0.023	0.000	0.000	0.000	0.436	Paved parking	ES11, ES12, ES13, ES14, ES15, ES9
5.965	0.616	7.273	0.000	0.000	13.854	Woods, Good	ES1, ES10, ES11, ES12, ES13, ES14, ES15, ES16, ES3, ES4, ES5, ES6, ES7, ES9
8.573	**0.744**	**7.273**	**0.000**	**0.000**	**16.590**	**TOTAL AREA**	

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES1: Northwest portion of Runoff Area=101,408 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=373' Tc=15.4 min CN=47 Runoff=0.00 cfs 0.000 af

Subcatchment ES10: East portion of Runoff Area=74,872 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=235' Tc=7.5 min CN=44 Runoff=0.00 cfs 0.000 af

Subcatchment ES11: South-center portion Runoff Area=15,431 sf 13.51% Impervious Runoff Depth=0.00"
Flow Length=151' Tc=5.6 min CN=55 Runoff=0.00 cfs 0.000 af

Subcatchment ES12: Southeast portion of Runoff Area=43,254 sf 4.90% Impervious Runoff Depth=0.00"
Flow Length=427' Tc=21.9 min CN=49 Runoff=0.00 cfs 0.000 af

Subcatchment ES13: South-center portion Runoff Area=51,080 sf 6.39% Impervious Runoff Depth=0.00"
Flow Length=357' Tc=25.9 min CN=52 Runoff=0.00 cfs 0.000 af

Subcatchment ES14: Southwest portion of Runoff Area=54,233 sf 10.48% Impervious Runoff Depth=0.00"
Flow Length=531' Tc=12.3 min CN=59 Runoff=0.00 cfs 0.000 af

Subcatchment ES15: 1/2 South-center Runoff Area=71,666 sf 0.38% Impervious Runoff Depth=0.00"
Flow Length=457' Tc=11.5 min CN=46 Runoff=0.00 cfs 0.000 af

Subcatchment ES16: Southwest portion of Runoff Area=75,770 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=569' Tc=11.4 min CN=49 Runoff=0.00 cfs 0.000 af

Subcatchment ES3: Northern corner portion Runoff Area=15,930 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=130' Slope=0.0400 '/' Tc=7.3 min CN=38 Runoff=0.00 cfs 0.000 af

Subcatchment ES4: North of gravel drive Runoff Area=9,025 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=215' Tc=5.9 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment ES5: Northwest of gravel Runoff Area=13,071 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=100' Tc=5.2 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment ES6: East-center portion of Runoff Area=56,735 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=417' Tc=12.7 min CN=50 Runoff=0.00 cfs 0.000 af

Subcatchment ES7: Northwest portion of Runoff Area=84,458 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=398' Tc=23.9 min CN=70 Runoff=0.00 cfs 0.001 af

Subcatchment ES9: West portion of Runoff Area=55,723 sf 9.96% Impervious Runoff Depth=0.00"
Flow Length=344' Tc=12.7 min CN=62 Runoff=0.00 cfs 0.000 af

Reach ER70: Wetlands Starting North Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=350.0' S=0.0100 '/' Capacity=328.04 cfs Outflow=0.00 cfs 0.000 af

Reach ER71: Sheet Flow on Eastern Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.240 L=210.0' S=0.0548 '/' Capacity=50.29 cfs Outflow=0.00 cfs 0.000 af

Reach ER72: Northwest Wetlands Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=140.0' S=0.0250 '/' Capacity=699.46 cfs Outflow=0.00 cfs 0.000 af

Reach ER73: Wetlands Flowing on Map Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=340.0' S=0.0382 '/' Capacity=771.38 cfs Outflow=0.00 cfs 0.000 af

Reach ER81: SE Portion of Middle Lot Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.750 L=370.0' S=0.0554 '/' Capacity=13.04 cfs Outflow=0.00 cfs 0.000 af

Reach ER83: Swale Located on North Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=140.0' S=0.0071 '/' Capacity=123.09 cfs Outflow=0.00 cfs 0.000 af

Reach ER84: Swale Located on North Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=140.0' S=0.0071 '/' Capacity=239.10 cfs Outflow=0.00 cfs 0.000 af

Reach ER85: End of Swale located Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=75.0' S=0.0133 '/' Capacity=528.23 cfs Outflow=0.00 cfs 0.000 af

Pond EP81: Middle Portion of Wetland Peak Elev=232.06' Storage=32 cf Inflow=0.00 cfs 0.001 af
Outflow=0.00 cfs 0.000 af

Link L100: Northern Wetlands & North of Site Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link L200: Inlet at Start of Redemption Rd; West Side Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link L300: Southwest Corner of Far-East Lot; Bottom of Hill Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link L400: Southwest Corner of Far-East Lot; Bottom of Hill Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link L500: Inlet at Start of Gravel Drive; East Side Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 16.590 ac Runoff Volume = 0.001 af Average Runoff Depth = 0.00"
97.37% Pervious = 16.154 ac 2.63% Impervious = 0.436 ac

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES1: Northwest portion of Runoff Area=101,408 sf 0.00% Impervious Runoff Depth=0.05"
Flow Length=373' Tc=15.4 min CN=47 Runoff=0.01 cfs 0.011 af

Subcatchment ES10: East portion of Runoff Area=74,872 sf 0.00% Impervious Runoff Depth=0.02"
Flow Length=235' Tc=7.5 min CN=44 Runoff=0.01 cfs 0.003 af

Subcatchment ES11: South-center portion Runoff Area=15,431 sf 13.51% Impervious Runoff Depth=0.21"
Flow Length=151' Tc=5.6 min CN=55 Runoff=0.02 cfs 0.006 af

Subcatchment ES12: Southeast portion of Runoff Area=43,254 sf 4.90% Impervious Runoff Depth=0.09"
Flow Length=427' Tc=21.9 min CN=49 Runoff=0.01 cfs 0.007 af

Subcatchment ES13: South-center portion Runoff Area=51,080 sf 6.39% Impervious Runoff Depth=0.14"
Flow Length=357' Tc=25.9 min CN=52 Runoff=0.02 cfs 0.014 af

Subcatchment ES14: Southwest portion of Runoff Area=54,233 sf 10.48% Impervious Runoff Depth=0.33"
Flow Length=531' Tc=12.3 min CN=59 Runoff=0.14 cfs 0.034 af

Subcatchment ES15: 1/2 South-center Runoff Area=71,666 sf 0.38% Impervious Runoff Depth=0.04"
Flow Length=457' Tc=11.5 min CN=46 Runoff=0.01 cfs 0.006 af

Subcatchment ES16: Southwest portion of Runoff Area=75,770 sf 0.00% Impervious Runoff Depth=0.09"
Flow Length=569' Tc=11.4 min CN=49 Runoff=0.01 cfs 0.012 af

Subcatchment ES3: Northern corner portion Runoff Area=15,930 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=130' Slope=0.0400 '/' Tc=7.3 min CN=38 Runoff=0.00 cfs 0.000 af

Subcatchment ES4: North of gravel drive Runoff Area=9,025 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=215' Tc=5.9 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment ES5: Northwest of gravel Runoff Area=13,071 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=100' Tc=5.2 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment ES6: East-center portion of Runoff Area=56,735 sf 0.00% Impervious Runoff Depth=0.10"
Flow Length=417' Tc=12.7 min CN=50 Runoff=0.01 cfs 0.011 af

Subcatchment ES7: Northwest portion of Runoff Area=84,458 sf 0.00% Impervious Runoff Depth=0.75"
Flow Length=398' Tc=23.9 min CN=70 Runoff=0.78 cfs 0.122 af

Subcatchment ES9: West portion of Runoff Area=55,723 sf 9.96% Impervious Runoff Depth=0.43"
Flow Length=344' Tc=12.7 min CN=62 Runoff=0.26 cfs 0.045 af

Reach ER70: Wetlands Starting North Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=350.0' S=0.0100 '/' Capacity=328.04 cfs Outflow=0.00 cfs 0.000 af

Reach ER71: Sheet Flow on Eastern Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.240 L=210.0' S=0.0548 '/' Capacity=50.29 cfs Outflow=0.00 cfs 0.000 af

Reach ER72: Northwest Wetlands Avg. Flow Depth=0.00' Max Vel=0.49 fps Inflow=0.01 cfs 0.011 af
n=0.035 L=140.0' S=0.0250 '/' Capacity=699.46 cfs Outflow=0.01 cfs 0.011 af

Reach ER73: Wetlands Flowing on Map Avg. Flow Depth=0.00' Max Vel=0.61 fps Inflow=0.03 cfs 0.022 af
n=0.035 L=340.0' S=0.0382 '/' Capacity=771.38 cfs Outflow=0.03 cfs 0.022 af

Reach ER81: SE Portion of Middle Lot Avg. Flow Depth=0.08' Max Vel=0.07 fps Inflow=0.06 cfs 0.028 af
n=0.750 L=370.0' S=0.0554 '/' Capacity=13.04 cfs Outflow=0.05 cfs 0.028 af

Reach ER83: Swale Located on North Avg. Flow Depth=0.01' Max Vel=0.26 fps Inflow=0.02 cfs 0.014 af
n=0.035 L=140.0' S=0.0071 '/' Capacity=123.09 cfs Outflow=0.02 cfs 0.014 af

Reach ER84: Swale Located on North Avg. Flow Depth=0.01' Max Vel=0.34 fps Inflow=0.02 cfs 0.021 af
n=0.035 L=140.0' S=0.0071 '/' Capacity=239.10 cfs Outflow=0.02 cfs 0.021 af

Reach ER85: End of Swale located Avg. Flow Depth=0.07' Max Vel=0.84 fps Inflow=0.26 cfs 0.094 af
n=0.035 L=75.0' S=0.0133 '/' Capacity=528.23 cfs Outflow=0.26 cfs 0.094 af

Pond EP81: Middle Portion of Wetland Peak Elev=233.55' Storage=4,343 cf Inflow=0.78 cfs 0.122 af
Outflow=0.06 cfs 0.028 af

Link L100: Northern Wetlands & North of Site Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link L200: Inlet at Start of Redemption Rd; West Side Inflow=0.05 cfs 0.040 af
Primary=0.05 cfs 0.040 af

Link L300: Southwest Corner of Far-East Lot; Bottom of Hill Inflow=0.01 cfs 0.003 af
Primary=0.01 cfs 0.003 af

Link L400: Southwest Corner of Far-East Lot; Bottom of Hill Inflow=0.27 cfs 0.101 af
Primary=0.27 cfs 0.101 af

Link L500: Inlet at Start of Gravel Drive; East Side Inflow=0.14 cfs 0.034 af
Primary=0.14 cfs 0.034 af

Total Runoff Area = 16.590 ac Runoff Volume = 0.272 af Average Runoff Depth = 0.20"
97.37% Pervious = 16.154 ac 2.63% Impervious = 0.436 ac

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES1: Northwest portion of Runoff Area=101,408 sf 0.00% Impervious Runoff Depth=0.41"
Flow Length=373' Tc=15.4 min CN=47 Runoff=0.21 cfs 0.079 af

Subcatchment ES10: East portion of Runoff Area=74,872 sf 0.00% Impervious Runoff Depth=0.29"
Flow Length=235' Tc=7.5 min CN=44 Runoff=0.08 cfs 0.041 af

Subcatchment ES11: South-center portion Runoff Area=15,431 sf 13.51% Impervious Runoff Depth=0.79"
Flow Length=151' Tc=5.6 min CN=55 Runoff=0.20 cfs 0.023 af

Subcatchment ES12: Southeast portion of Runoff Area=43,254 sf 4.90% Impervious Runoff Depth=0.49"
Flow Length=427' Tc=21.9 min CN=49 Runoff=0.12 cfs 0.041 af

Subcatchment ES13: South-center portion Runoff Area=51,080 sf 6.39% Impervious Runoff Depth=0.64"
Flow Length=357' Tc=25.9 min CN=52 Runoff=0.24 cfs 0.062 af

Subcatchment ES14: Southwest portion of Runoff Area=54,233 sf 10.48% Impervious Runoff Depth=1.02"
Flow Length=531' Tc=12.3 min CN=59 Runoff=0.78 cfs 0.106 af

Subcatchment ES15: 1/2 South-center Runoff Area=71,666 sf 0.38% Impervious Runoff Depth=0.37"
Flow Length=457' Tc=11.5 min CN=46 Runoff=0.12 cfs 0.050 af

Subcatchment ES16: Southwest portion of Runoff Area=75,770 sf 0.00% Impervious Runoff Depth=0.49"
Flow Length=569' Tc=11.4 min CN=49 Runoff=0.26 cfs 0.072 af

Subcatchment ES3: Northern corner portion Runoff Area=15,930 sf 0.00% Impervious Runoff Depth=0.10"
Flow Length=130' Slope=0.0400 '/' Tc=7.3 min CN=38 Runoff=0.00 cfs 0.003 af

Subcatchment ES4: North of gravel drive Runoff Area=9,025 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=215' Tc=5.9 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment ES5: Northwest of gravel Runoff Area=13,071 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=100' Tc=5.2 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment ES6: East-center portion of Runoff Area=56,735 sf 0.00% Impervious Runoff Depth=0.54"
Flow Length=417' Tc=12.7 min CN=50 Runoff=0.23 cfs 0.059 af

Subcatchment ES7: Northwest portion of Runoff Area=84,458 sf 0.00% Impervious Runoff Depth=1.75"
Flow Length=398' Tc=23.9 min CN=70 Runoff=1.86 cfs 0.283 af

Subcatchment ES9: West portion of Runoff Area=55,723 sf 9.96% Impervious Runoff Depth=1.20"
Flow Length=344' Tc=12.7 min CN=62 Runoff=1.01 cfs 0.128 af

Reach ER70: Wetlands Starting North Avg. Flow Depth=0.00' Max Vel=0.31 fps Inflow=0.00 cfs 0.003 af
n=0.035 L=350.0' S=0.0100 '/' Capacity=328.04 cfs Outflow=0.00 cfs 0.003 af

Reach ER71: Sheet Flow on Eastern Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.240 L=210.0' S=0.0548 '/' Capacity=50.29 cfs Outflow=0.00 cfs 0.000 af

Reach ER72: Northwest Wetlands Avg. Flow Depth=0.02' Max Vel=0.49 fps Inflow=0.21 cfs 0.082 af
n=0.035 L=140.0' S=0.0250 '/' Capacity=699.46 cfs Outflow=0.20 cfs 0.082 af

Reach ER73: Wetlands Flowing on Map Avg. Flow Depth=0.02' Max Vel=0.75 fps Inflow=0.38 cfs 0.141 af
n=0.035 L=340.0' S=0.0382 '/' Capacity=771.38 cfs Outflow=0.38 cfs 0.141 af

Reach ER81: SE Portion of Middle Lot Avg. Flow Depth=0.18' Max Vel=0.11 fps Inflow=0.42 cfs 0.189 af
n=0.750 L=370.0' S=0.0554 '/' Capacity=13.04 cfs Outflow=0.31 cfs 0.189 af

Reach ER83: Swale Located on North Avg. Flow Depth=0.05' Max Vel=0.52 fps Inflow=0.24 cfs 0.062 af
n=0.035 L=140.0' S=0.0071 '/' Capacity=123.09 cfs Outflow=0.23 cfs 0.062 af

Reach ER84: Swale Located on North Avg. Flow Depth=0.08' Max Vel=0.68 fps Inflow=0.36 cfs 0.103 af
n=0.035 L=140.0' S=0.0071 '/' Capacity=239.10 cfs Outflow=0.35 cfs 0.103 af

Reach ER85: End of Swale located Avg. Flow Depth=0.17' Max Vel=1.38 fps Inflow=1.03 cfs 0.421 af
n=0.035 L=75.0' S=0.0133 '/' Capacity=528.23 cfs Outflow=1.03 cfs 0.421 af

Pond EP81: Middle Portion of Wetland Peak Elev=233.68' Storage=5,093 cf Inflow=1.86 cfs 0.283 af
Outflow=0.42 cfs 0.189 af

Link L100: Northern Wetlands & North of Site Inflow=0.00 cfs 0.003 af
Primary=0.00 cfs 0.003 af

Link L200: Inlet at Start of Redemption Rd; West Side Inflow=0.70 cfs 0.262 af
Primary=0.70 cfs 0.262 af

Link L300: Southwest Corner of Far-East Lot; Bottom of Hill Inflow=0.08 cfs 0.041 af
Primary=0.08 cfs 0.041 af

Link L400: Southwest Corner of Far-East Lot; Bottom of Hill Inflow=1.16 cfs 0.444 af
Primary=1.16 cfs 0.444 af

Link L500: Inlet at Start of Gravel Drive; East Side Inflow=0.78 cfs 0.106 af
Primary=0.78 cfs 0.106 af

Total Runoff Area = 16.590 ac Runoff Volume = 0.947 af Average Runoff Depth = 0.69"
97.37% Pervious = 16.154 ac 2.63% Impervious = 0.436 ac

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES1: Northwest portion of Runoff Area=101,408 sf 0.00% Impervious Runoff Depth=0.86"
Flow Length=373' Tc=15.4 min CN=47 Runoff=0.79 cfs 0.167 af

Subcatchment ES10: East portion of Runoff Area=74,872 sf 0.00% Impervious Runoff Depth=0.67"
Flow Length=235' Tc=7.5 min CN=44 Runoff=0.41 cfs 0.097 af

Subcatchment ES11: South-center portion Runoff Area=15,431 sf 13.51% Impervious Runoff Depth=1.42"
Flow Length=151' Tc=5.6 min CN=55 Runoff=0.42 cfs 0.042 af

Subcatchment ES12: Southeast portion of Runoff Area=43,254 sf 4.90% Impervious Runoff Depth=0.99"
Flow Length=427' Tc=21.9 min CN=49 Runoff=0.38 cfs 0.082 af

Subcatchment ES13: South-center portion Runoff Area=51,080 sf 6.39% Impervious Runoff Depth=1.20"
Flow Length=357' Tc=25.9 min CN=52 Runoff=0.58 cfs 0.117 af

Subcatchment ES14: Southwest portion of Runoff Area=54,233 sf 10.48% Impervious Runoff Depth=1.73"
Flow Length=531' Tc=12.3 min CN=59 Runoff=1.43 cfs 0.180 af

Subcatchment ES15: 1/2 South-center Runoff Area=71,666 sf 0.38% Impervious Runoff Depth=0.80"
Flow Length=457' Tc=11.5 min CN=46 Runoff=0.53 cfs 0.109 af

Subcatchment ES16: Southwest portion of Runoff Area=75,770 sf 0.00% Impervious Runoff Depth=0.99"
Flow Length=569' Tc=11.4 min CN=49 Runoff=0.88 cfs 0.144 af

Subcatchment ES3: Northern corner portion Runoff Area=15,930 sf 0.00% Impervious Runoff Depth=0.35"
Flow Length=130' Slope=0.0400 '/' Tc=7.3 min CN=38 Runoff=0.02 cfs 0.011 af

Subcatchment ES4: North of gravel drive Runoff Area=9,025 sf 0.00% Impervious Runoff Depth=0.06"
Flow Length=215' Tc=5.9 min CN=30 Runoff=0.00 cfs 0.001 af

Subcatchment ES5: Northwest of gravel Runoff Area=13,071 sf 0.00% Impervious Runoff Depth=0.06"
Flow Length=100' Tc=5.2 min CN=30 Runoff=0.00 cfs 0.001 af

Subcatchment ES6: East-center portion of Runoff Area=56,735 sf 0.00% Impervious Runoff Depth=1.06"
Flow Length=417' Tc=12.7 min CN=50 Runoff=0.71 cfs 0.115 af

Subcatchment ES7: Northwest portion of Runoff Area=84,458 sf 0.00% Impervious Runoff Depth=2.67"
Flow Length=398' Tc=23.9 min CN=70 Runoff=2.79 cfs 0.432 af

Subcatchment ES9: West portion of Runoff Area=55,723 sf 9.96% Impervious Runoff Depth=1.98"
Flow Length=344' Tc=12.7 min CN=62 Runoff=1.71 cfs 0.211 af

Reach ER70: Wetlands Starting North Avg. Flow Depth=0.00' Max Vel=0.31 fps Inflow=0.02 cfs 0.011 af
n=0.035 L=350.0' S=0.0100 '/' Capacity=328.04 cfs Outflow=0.01 cfs 0.011 af

Reach ER71: Sheet Flow on Eastern Avg. Flow Depth=0.01' Max Vel=0.10 fps Inflow=0.00 cfs 0.002 af
n=0.240 L=210.0' S=0.0548 '/' Capacity=50.29 cfs Outflow=0.00 cfs 0.002 af

Reach ER72: Northwest Wetlands Avg. Flow Depth=0.04' Max Vel=0.77 fps Inflow=0.80 cfs 0.180 af
n=0.035 L=140.0' S=0.0250 '/' Capacity=699.46 cfs Outflow=0.77 cfs 0.180 af

Reach ER73: Wetlands Flowing on Map Avg. Flow Depth=0.05' Max Vel=1.19 fps Inflow=1.40 cfs 0.295 af
n=0.035 L=340.0' S=0.0382 '/' Capacity=771.38 cfs Outflow=1.32 cfs 0.295 af

Reach ER81: SE Portion of Middle Lot Avg. Flow Depth=0.28' Max Vel=0.15 fps Inflow=1.25 cfs 0.338 af
n=0.750 L=370.0' S=0.0554 '/' Capacity=13.04 cfs Outflow=0.84 cfs 0.338 af

Reach ER83: Swale Located on North Avg. Flow Depth=0.09' Max Vel=0.73 fps Inflow=0.58 cfs 0.117 af
n=0.035 L=140.0' S=0.0071 '/' Capacity=123.09 cfs Outflow=0.57 cfs 0.117 af

Reach ER84: Swale Located on North Avg. Flow Depth=0.15' Max Vel=0.97 fps Inflow=0.94 cfs 0.199 af
n=0.035 L=140.0' S=0.0071 '/' Capacity=239.10 cfs Outflow=0.94 cfs 0.199 af

Reach ER85: End of Swale located Avg. Flow Depth=0.25' Max Vel=1.75 fps Inflow=2.08 cfs 0.748 af
n=0.035 L=75.0' S=0.0133 '/' Capacity=528.23 cfs Outflow=2.08 cfs 0.748 af

Pond EP81: Middle Portion of Wetland Peak Elev=233.88' Storage=6,305 cf Inflow=2.79 cfs 0.432 af
Outflow=1.25 cfs 0.338 af

Link L100: Northern Wetlands & North of Site Inflow=0.02 cfs 0.011 af
Primary=0.02 cfs 0.011 af

Link L200: Inlet at Start of Redemption Rd; West Side Inflow=2.48 cfs 0.548 af
Primary=2.48 cfs 0.548 af

Link L300: Southwest Corner of Far-East Lot; Bottom of Hill Inflow=0.41 cfs 0.097 af
Primary=0.41 cfs 0.097 af

Link L400: Southwest Corner of Far-East Lot; Bottom of Hill Inflow=2.30 cfs 0.790 af
Primary=2.30 cfs 0.790 af

Link L500: Inlet at Start of Gravel Drive; East Side Inflow=1.43 cfs 0.180 af
Primary=1.43 cfs 0.180 af

Total Runoff Area = 16.590 ac Runoff Volume = 1.708 af Average Runoff Depth = 1.24"
97.37% Pervious = 16.154 ac 2.63% Impervious = 0.436 ac

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES1: Northwest portion of Runoff Area=101,408 sf 0.00% Impervious Runoff Depth=1.39"
Flow Length=373' Tc=15.4 min CN=47 Runoff=1.57 cfs 0.270 af

Subcatchment ES10: East portion of Runoff Area=74,872 sf 0.00% Impervious Runoff Depth=1.14"
Flow Length=235' Tc=7.5 min CN=44 Runoff=1.07 cfs 0.163 af

Subcatchment ES11: South-center portion Runoff Area=15,431 sf 13.51% Impervious Runoff Depth=2.10"
Flow Length=151' Tc=5.6 min CN=55 Runoff=0.63 cfs 0.062 af

Subcatchment ES12: Southeast portion of Runoff Area=43,254 sf 4.90% Impervious Runoff Depth=1.56"
Flow Length=427' Tc=21.9 min CN=49 Runoff=0.69 cfs 0.129 af

Subcatchment ES13: South-center portion Runoff Area=51,080 sf 6.39% Impervious Runoff Depth=1.83"
Flow Length=357' Tc=25.9 min CN=52 Runoff=0.94 cfs 0.179 af

Subcatchment ES14: Southwest portion of Runoff Area=54,233 sf 10.48% Impervious Runoff Depth=2.49"
Flow Length=531' Tc=12.3 min CN=59 Runoff=2.05 cfs 0.258 af

Subcatchment ES15: 1/2 South-center Runoff Area=71,666 sf 0.38% Impervious Runoff Depth=1.31"
Flow Length=457' Tc=11.5 min CN=46 Runoff=1.12 cfs 0.179 af

Subcatchment ES16: Southwest portion of Runoff Area=75,770 sf 0.00% Impervious Runoff Depth=1.56"
Flow Length=569' Tc=11.4 min CN=49 Runoff=1.58 cfs 0.226 af

Subcatchment ES3: Northern corner portion Runoff Area=15,930 sf 0.00% Impervious Runoff Depth=0.69"
Flow Length=130' Slope=0.0400 '/' Tc=7.3 min CN=38 Runoff=0.06 cfs 0.021 af

Subcatchment ES4: North of gravel drive Runoff Area=9,025 sf 0.00% Impervious Runoff Depth=0.21"
Flow Length=215' Tc=5.9 min CN=30 Runoff=0.00 cfs 0.004 af

Subcatchment ES5: Northwest of gravel Runoff Area=13,071 sf 0.00% Impervious Runoff Depth=0.21"
Flow Length=100' Tc=5.2 min CN=30 Runoff=0.01 cfs 0.005 af

Subcatchment ES6: East-center portion of Runoff Area=56,735 sf 0.00% Impervious Runoff Depth=1.65"
Flow Length=417' Tc=12.7 min CN=50 Runoff=1.23 cfs 0.179 af

Subcatchment ES7: Northwest portion of Runoff Area=84,458 sf 0.00% Impervious Runoff Depth=3.59"
Flow Length=398' Tc=23.9 min CN=70 Runoff=3.63 cfs 0.581 af

Subcatchment ES9: West portion of Runoff Area=55,723 sf 9.96% Impervious Runoff Depth=2.78"
Flow Length=344' Tc=12.7 min CN=62 Runoff=2.36 cfs 0.296 af

Reach ER70: Wetlands Starting North Avg. Flow Depth=0.01' Max Vel=0.31 fps Inflow=0.06 cfs 0.021 af
n=0.035 L=350.0' S=0.0100 '/' Capacity=328.04 cfs Outflow=0.05 cfs 0.021 af

Reach ER71: Sheet Flow on Eastern Avg. Flow Depth=0.02' Max Vel=0.11 fps Inflow=0.01 cfs 0.009 af
n=0.240 L=210.0' S=0.0548 '/' Capacity=50.29 cfs Outflow=0.01 cfs 0.009 af

Reach ER72: Northwest Wetlands Avg. Flow Depth=0.06' Max Vel=1.02 fps Inflow=1.59 cfs 0.299 af
n=0.035 L=140.0' S=0.0250 '/' Capacity=699.46 cfs Outflow=1.57 cfs 0.299 af

Reach ER73: Wetlands Flowing on Map Avg. Flow Depth=0.08' Max Vel=1.53 fps Inflow=2.68 cfs 0.478 af
n=0.035 L=340.0' S=0.0382 '/' Capacity=771.38 cfs Outflow=2.59 cfs 0.478 af

Reach ER81: SE Portion of Middle Lot Avg. Flow Depth=0.37' Max Vel=0.18 fps Inflow=3.45 cfs 0.487 af
n=0.750 L=370.0' S=0.0554 '/' Capacity=13.04 cfs Outflow=1.49 cfs 0.487 af

Reach ER83: Swale Located on North Avg. Flow Depth=0.13' Max Vel=0.88 fps Inflow=0.94 cfs 0.179 af
n=0.035 L=140.0' S=0.0071 '/' Capacity=123.09 cfs Outflow=0.94 cfs 0.179 af

Reach ER84: Swale Located on North Avg. Flow Depth=0.21' Max Vel=1.17 fps Inflow=1.60 cfs 0.308 af
n=0.035 L=140.0' S=0.0071 '/' Capacity=239.10 cfs Outflow=1.59 cfs 0.308 af

Reach ER85: End of Swale located Avg. Flow Depth=0.32' Max Vel=2.03 fps Inflow=3.25 cfs 1.091 af
n=0.035 L=75.0' S=0.0133 '/' Capacity=528.23 cfs Outflow=3.25 cfs 1.091 af

Pond EP81: Middle Portion of Wetland Peak Elev=234.25' Storage=7,132 cf Inflow=3.63 cfs 0.581 af
Outflow=3.45 cfs 0.487 af

Link L100: Northern Wetlands & North of Site Inflow=0.06 cfs 0.021 af
Primary=0.06 cfs 0.021 af

Link L200: Inlet at Start of Redemption Rd; West Side Inflow=4.91 cfs 0.884 af
Primary=4.91 cfs 0.884 af

Link L300: Southwest Corner of Far-East Lot; Bottom of Hill Inflow=1.07 cfs 0.163 af
Primary=1.07 cfs 0.163 af

Link L400: Southwest Corner of Far-East Lot; Bottom of Hill Inflow=3.56 cfs 1.153 af
Primary=3.56 cfs 1.153 af

Link L500: Inlet at Start of Gravel Drive; East Side Inflow=2.05 cfs 0.258 af
Primary=2.05 cfs 0.258 af

Total Runoff Area = 16.590 ac Runoff Volume = 2.552 af Average Runoff Depth = 1.85"
97.37% Pervious = 16.154 ac 2.63% Impervious = 0.436 ac

Summary for Subcatchment ES1: Northwest portion of westerly lot

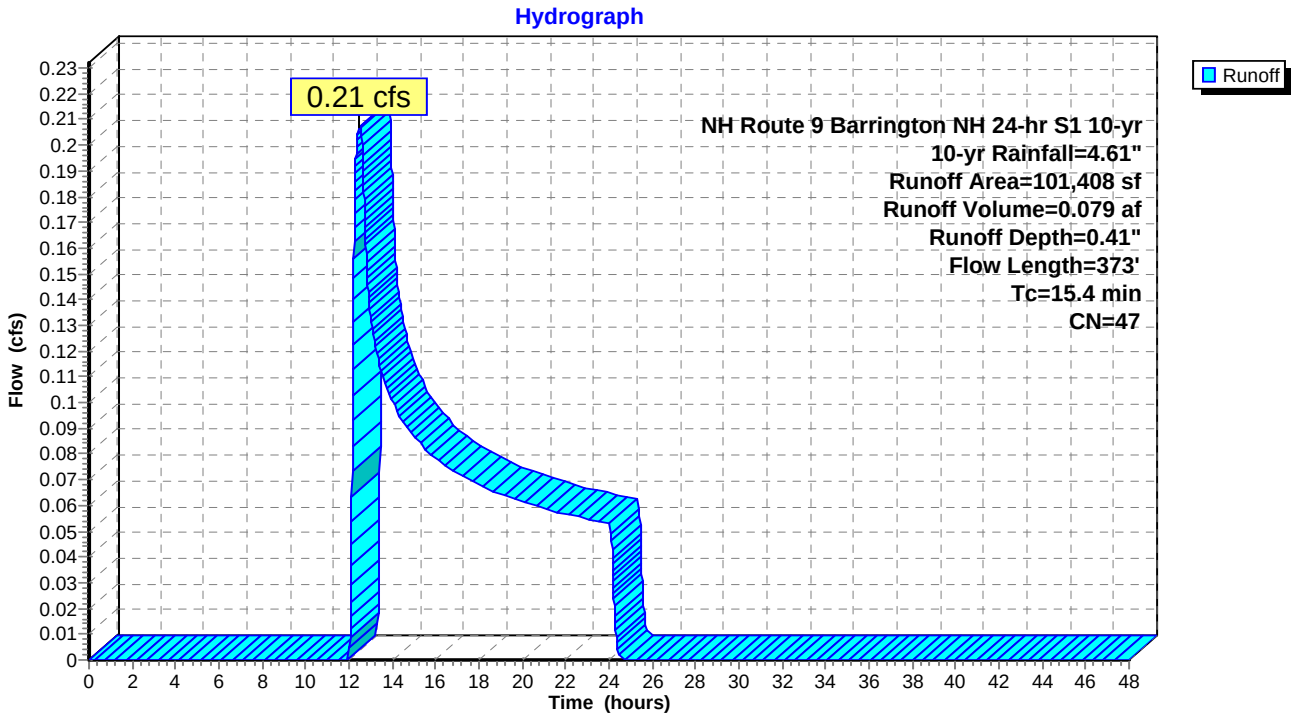
Runoff = 0.21 cfs @ 12.48 hrs, Volume= 0.079 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
56,403	30	Woods, Good, HSG A
8,020	55	Woods, Good, HSG B
36,985	70	Woods, Good, HSG C
101,408	47	Weighted Average
101,408		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	50	0.0700	0.11		**Sheet Flow, Woodland Flow** Woods: Light underbrush n= 0.400 P2= 3.07"
0.9	65	0.0600	1.22		**Shallow Concentrated Flow, Woodland Flow** Woodland Kv= 5.0 fps
6.9	258	0.0155	0.62		**Shallow Concentrated Flow, Wetland flow** Woodland Kv= 5.0 fps
15.4	373	Total			

Subcatchment ES1: Northwest portion of westerly lot



Summary for Subcatchment ES10: East portion of easterly lot

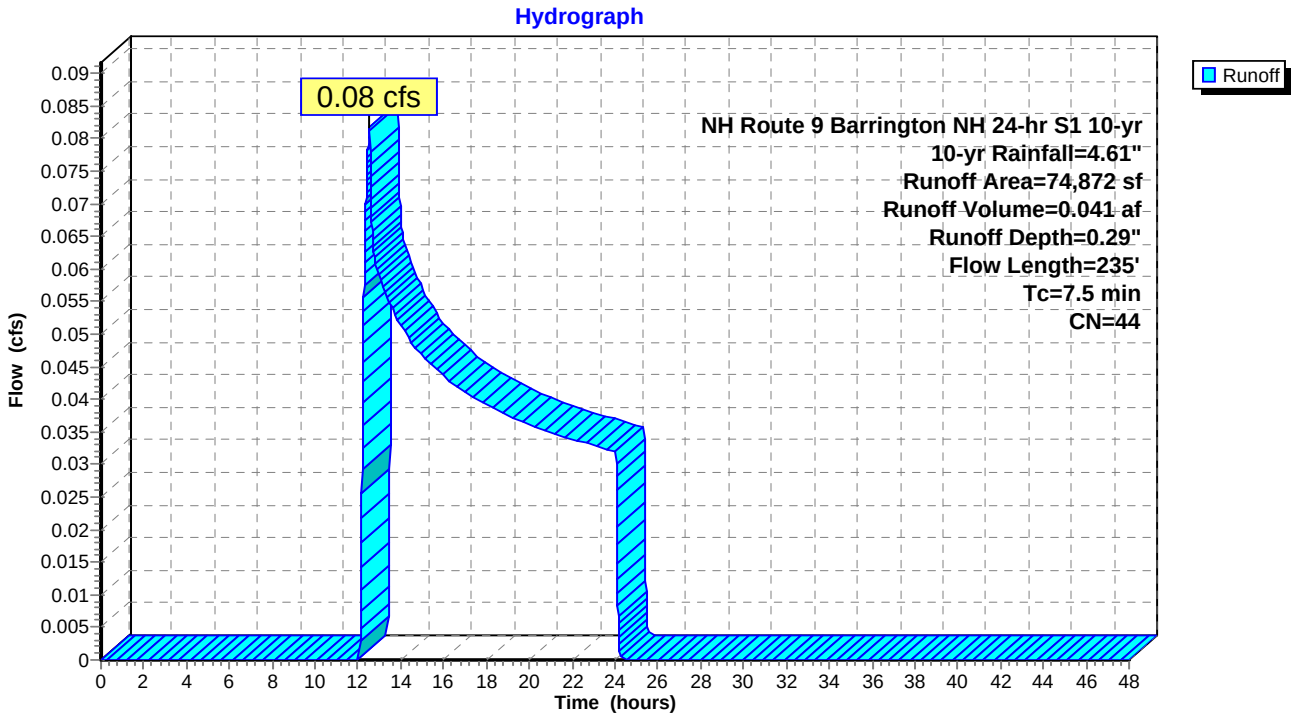
Runoff = 0.08 cfs @ 12.54 hrs, Volume= 0.041 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
31,198	39	>75% Grass cover, Good, HSG A
23,985	30	Woods, Good, HSG A
19,689	70	Woods, Good, HSG C
74,872	44	Weighted Average
74,872		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 3.07"
0.8	50	0.0200	0.99		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.0	135	0.1850	2.15		**Shallow Concentrated Flow, steep woods** Woodland Kv= 5.0 fps
7.5	235	Total			

Subcatchment ES10: East portion of easterly lot



Summary for Subcatchment ES11: South-center portion of easterly lot

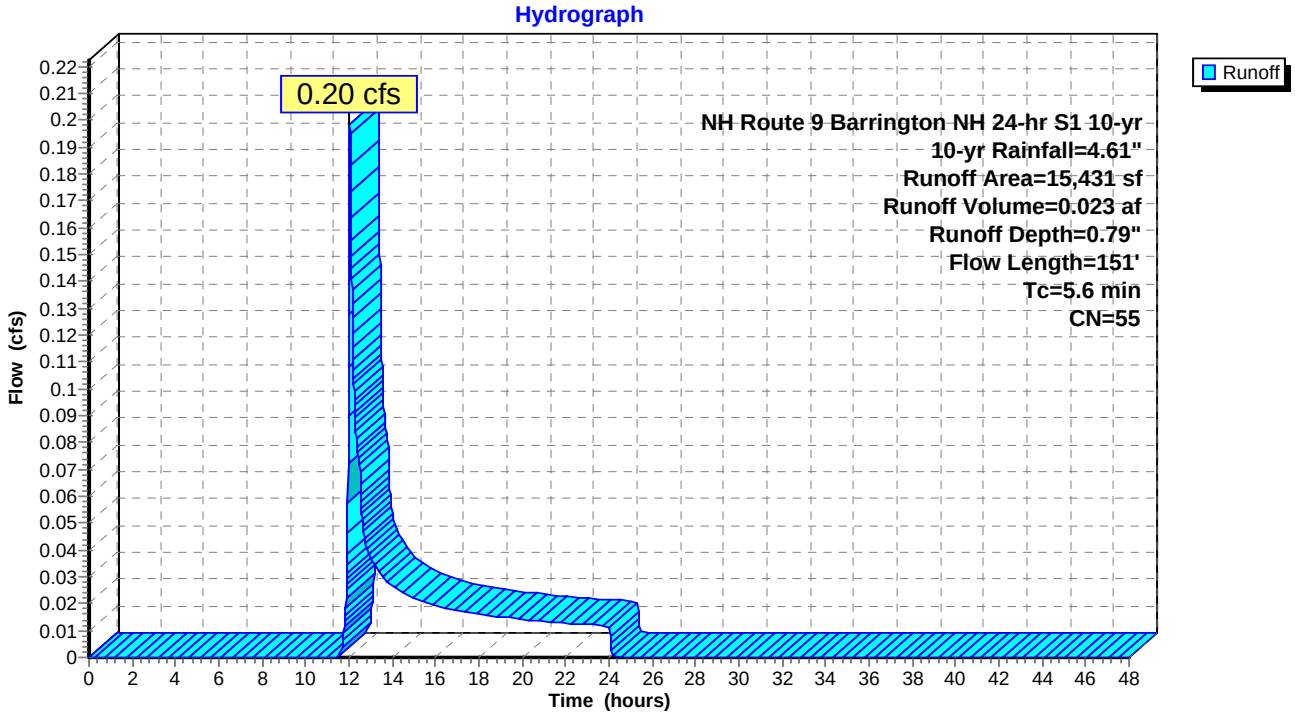
Runoff = 0.20 cfs @ 12.05 hrs, Volume= 0.023 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
9,251	39	>75% Grass cover, Good, HSG A
4,095	70	Woods, Good, HSG C
2,085	98	Paved parking, HSG A
15,431	55	Weighted Average
13,346		86.49% Pervious Area
2,085		13.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0300	0.17		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 3.07"
0.7	101	0.1240	2.46		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
5.6	151	Total			

Subcatchment ES11: South-center portion of easterly lot



Summary for Subcatchment ES12: Southeast portion of middle lot

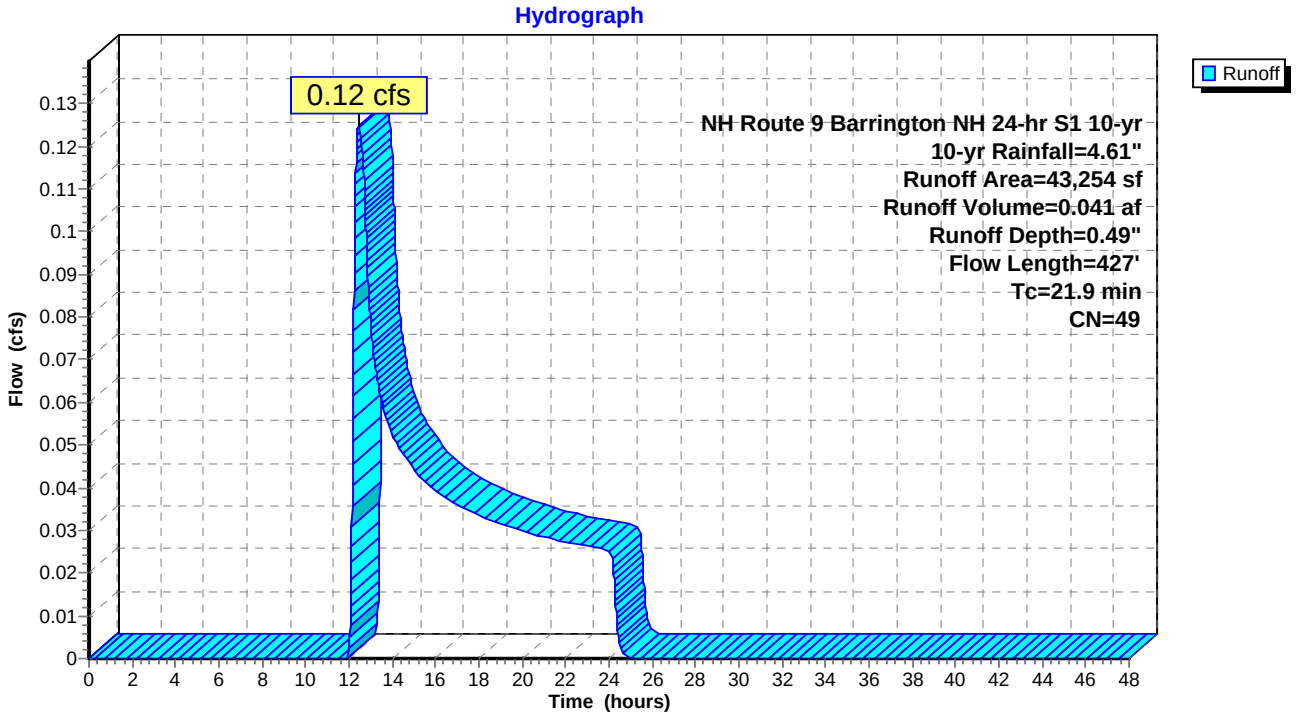
Runoff = 0.12 cfs @ 12.44 hrs, Volume= 0.041 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
9,469	39	>75% Grass cover, Good, HSG A
1,648	61	>75% Grass cover, Good, HSG B
16,115	30	Woods, Good, HSG A
1,651	55	Woods, Good, HSG B
12,250	70	Woods, Good, HSG C
2,121	98	Paved parking, HSG A
43,254	49	Weighted Average
41,133		95.10% Pervious Area
2,121		4.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	50	0.0100	0.05		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.07"
3.0	160	0.0313	0.88		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
2.3	217	0.0507	1.58		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
21.9	427	Total			

Subcatchment ES12: Southeast portion of middle lot



Summary for Subcatchment ES13: South-center portion of middle lot

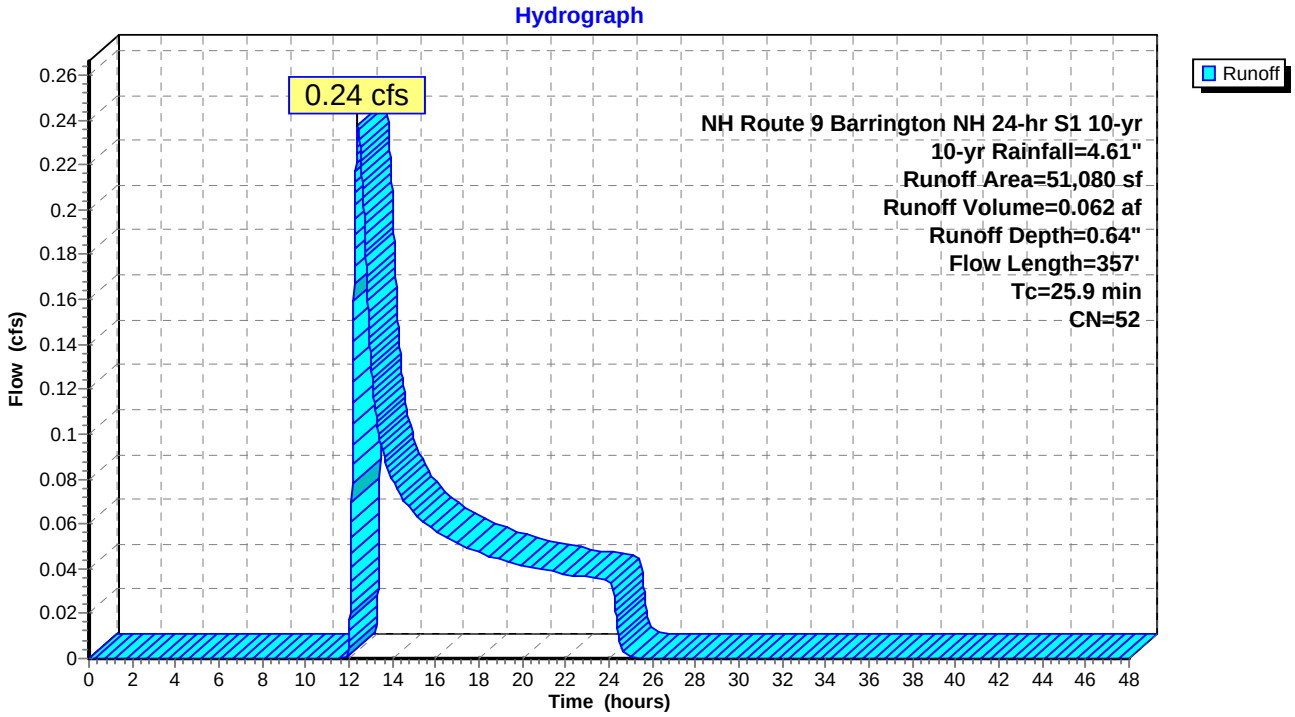
Runoff = 0.24 cfs @ 12.41 hrs, Volume= 0.062 af, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
9,045	39	>75% Grass cover, Good, HSG A
2,932	61	>75% Grass cover, Good, HSG B
17,458	30	Woods, Good, HSG A
18,383	70	Woods, Good, HSG C
2,266	98	Paved parking, HSG A
996	98	Paved parking, HSG B
51,080	52	Weighted Average
47,818		93.61% Pervious Area
3,262		6.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.9	50	0.0050	0.04		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.07"
1.8	100	0.0350	0.94		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
0.6	79	0.2280	2.39		**Shallow Concentrated Flow, steep woods** Woodland Kv= 5.0 fps
1.6	128	0.0352	1.31		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
25.9	357	Total			

Subcatchment ES13: South-center portion of middle lot



Summary for Subcatchment ES14: Southwest portion of middle & westernly lot

Revised areas for grass and woods cover 11-26-19

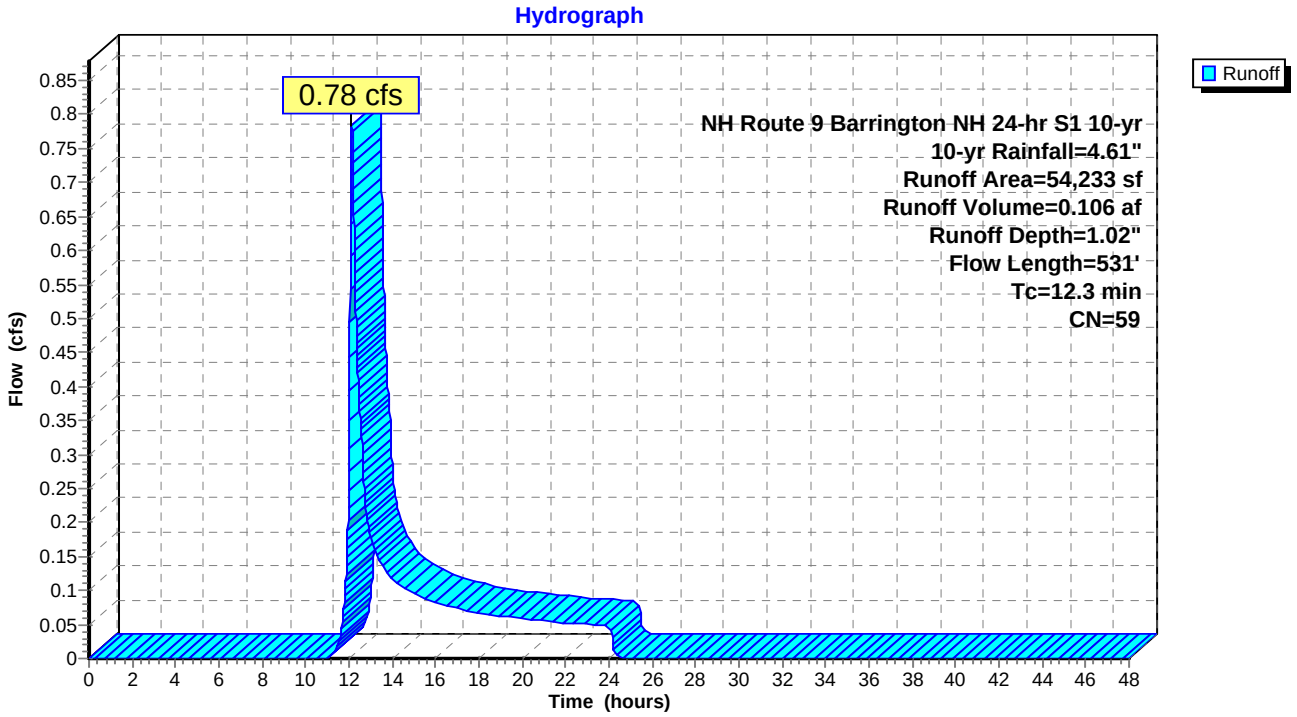
Runoff = 0.78 cfs @ 12.14 hrs, Volume= 0.106 af, Depth= 1.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
13,418	39	>75% Grass cover, Good, HSG A
26,352	70	Woods, Good, HSG C
5,681	98	Paved parking, HSG A
8,782	30	Woods, Good, HSG A
54,233	59	Weighted Average
48,552		89.52% Pervious Area
5,681		10.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	50	0.0500	0.10		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.07"
2.1	127	0.0394	0.99		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
1.0	110	0.0677	1.82		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.5	244	0.0287	8.72	401.21	**Trap/Vee/Rect Channel Flow, Swale flow** Bot.W=12.00' D=2.00' Z= 8.0 & 3.0 '/' Top.W=34.00' n= 0.035 Earth, dense weeds
12.3	531	Total			

Subcatchment ES14: Southwest portion of middle & westernly lot



Summary for Subcatchment ES15: 1/2 South-center portion of westernly lot; Flowing to L200

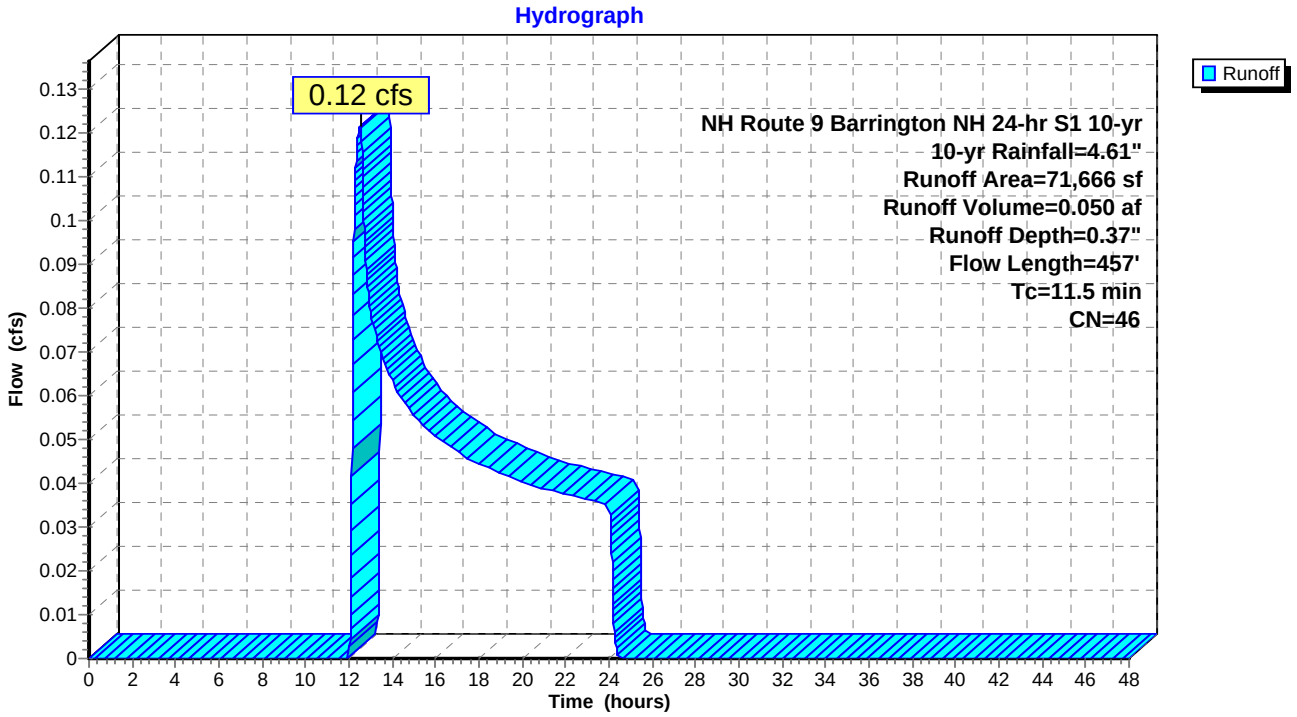
Runoff = 0.12 cfs @ 12.53 hrs, Volume= 0.050 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
43,592	30	Woods, Good, HSG A
27,802	70	Woods, Good, HSG C
272	98	Paved parking, HSG A
71,666	46	Weighted Average
71,394		99.62% Pervious Area
272		0.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0800	0.12		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.07"
0.3	35	0.1710	2.07		**Shallow Concentrated Flow, steep woods** Woodland Kv= 5.0 fps
2.7	147	0.0340	0.92		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
0.1	31	0.2500	3.50		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.1	72	0.1110	9.63	616.02	**Trap/Vee/Rect Channel Flow, Swale flow** Bot.W=14.00' D=1.00' Z= 50.0 '/' Top.W=114.00' n= 0.035
0.5	72	0.0833	2.23		**Sheet Flow, Gravel drive flow** Smooth surfaces n= 0.011 P2= 3.07"
0.6	50	0.0400	1.40		**Shallow Concentrated Flow, Grass flow** Short Grass Pasture Kv= 7.0 fps
11.5	457	Total			

Subcatchment ES15: 1/2 South-center portion of westerly lot; Flowing to L200



Summary for Subcatchment ES16: Southwest portion of westerly lot

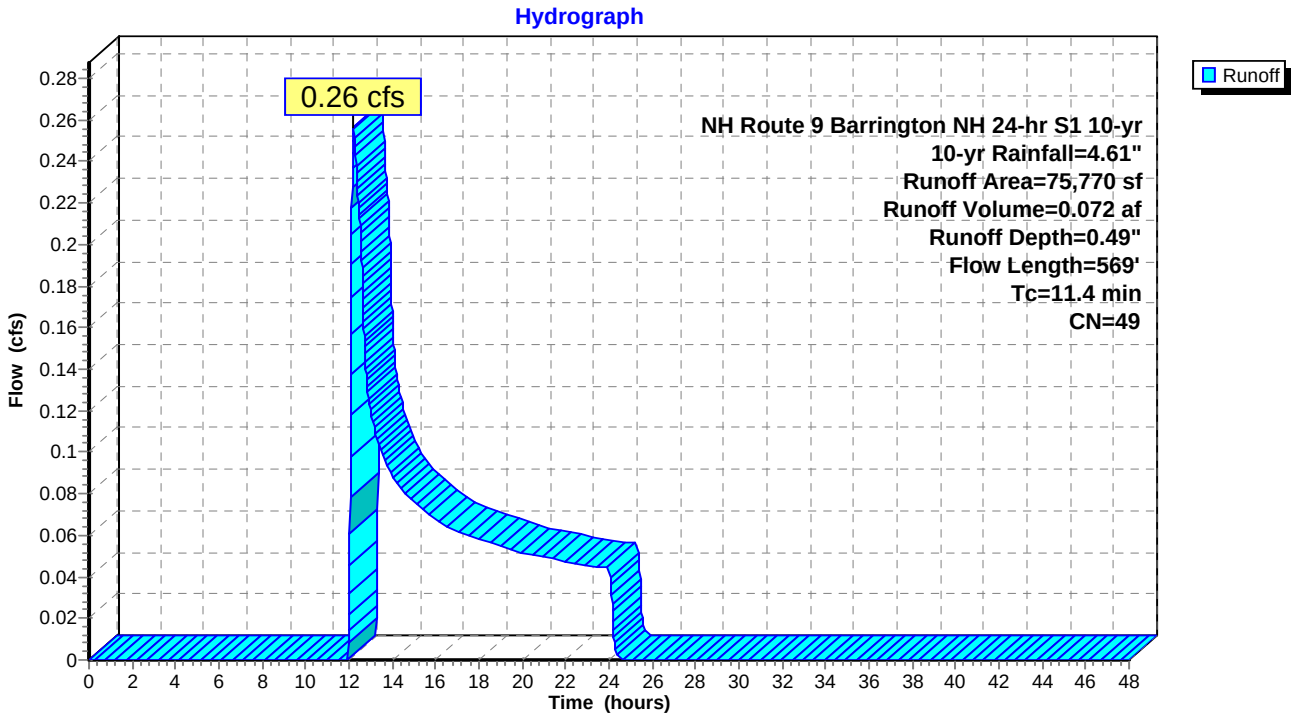
Runoff = 0.26 cfs @ 12.20 hrs, Volume= 0.072 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
13,397	39	>75% Grass cover, Good, HSG A
29,498	30	Woods, Good, HSG A
32,875	70	Woods, Good, HSG C
75,770	49	Weighted Average
75,770		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0300	0.17		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 3.07"
3.0	370	0.0875	2.07		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
3.5	149	0.0201	0.71		**Shallow Concentrated Flow, Woods/wetlands flow** Woodland Kv= 5.0 fps
11.4	569	Total			

Subcatchment ES16: Southwest portion of westerly lot



Summary for Subcatchment ES3: Northern corner portion of westerly lot

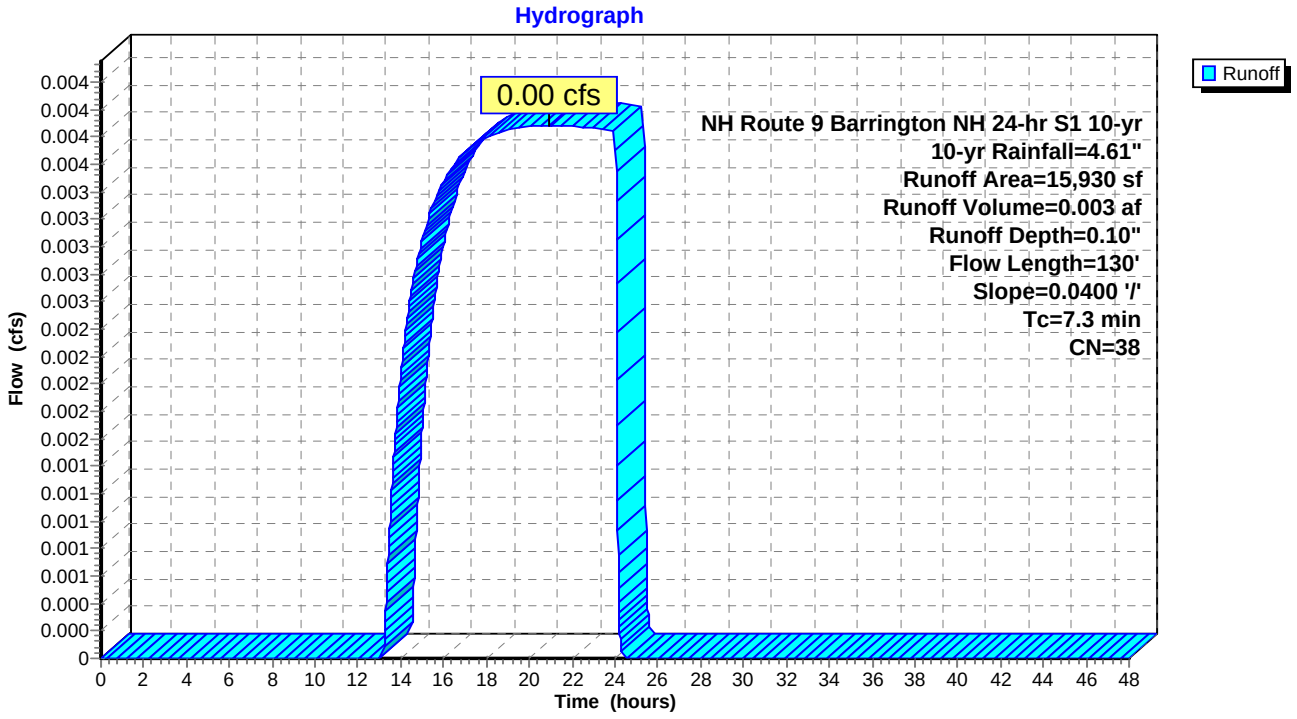
Runoff = 0.00 cfs @ 20.95 hrs, Volume= 0.003 af, Depth= 0.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
12,689	30	Woods, Good, HSG A
3,241	70	Woods, Good, HSG C
15,930	38	Weighted Average
15,930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.0400	0.13		**Sheet Flow, Grass Flow** Grass: Dense n= 0.240 P2= 3.07"
1.0	80	0.0400	1.40		**Shallow Concentrated Flow, Grass Flow** Short Grass Pasture Kv= 7.0 fps
7.3	130	Total			

Subcatchment ES3: Northern corner portion of westerly lot



Summary for Subcatchment ES4: North of gravel drive portion of westerly lot

[45] Hint: Runoff=Zero

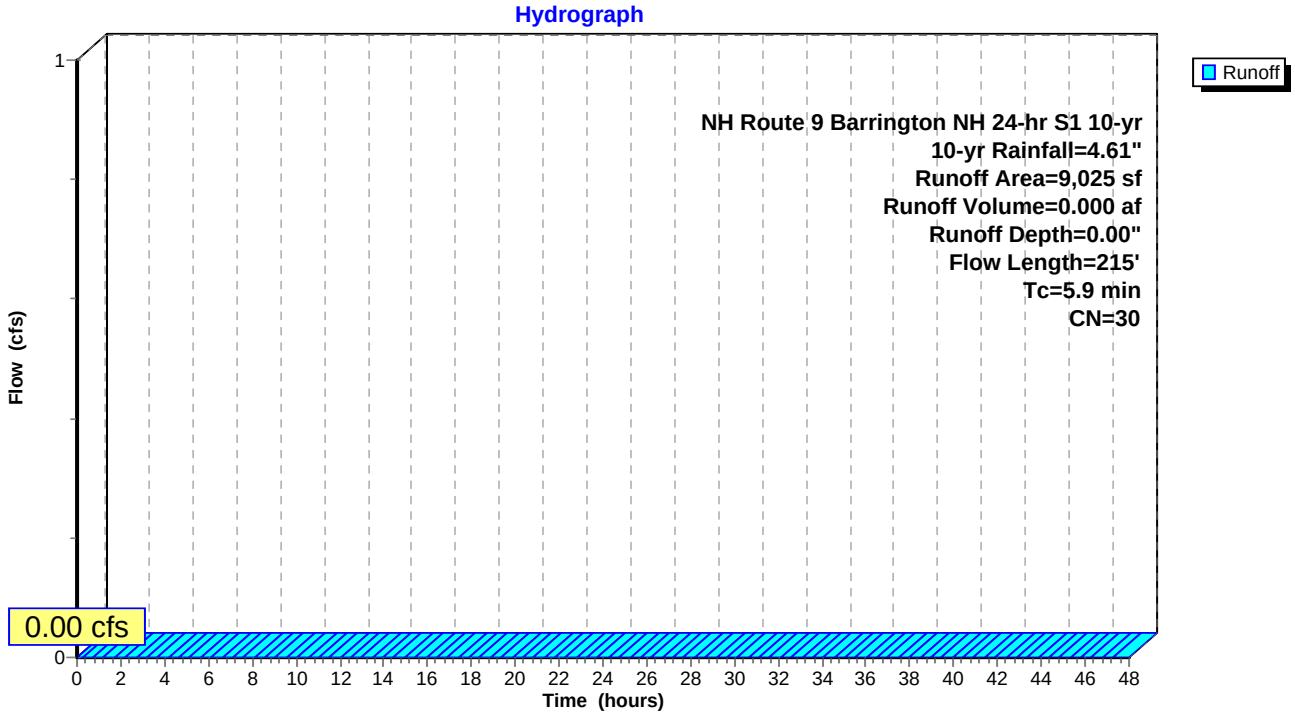
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
9,025	30	Woods, Good, HSG A
9,025		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	50	0.0500	0.21		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.07"
1.6	125	0.0360	1.33		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.3	40	0.0250	2.55		**Shallow Concentrated Flow, Gravel** Unpaved Kv= 16.1 fps
5.9	215	Total			

Subcatchment ES4: North of gravel drive portion of westerly lot



Summary for Subcatchment ES5: Northwest of gravel drive portion of westerly lot

[45] Hint: Runoff=Zero

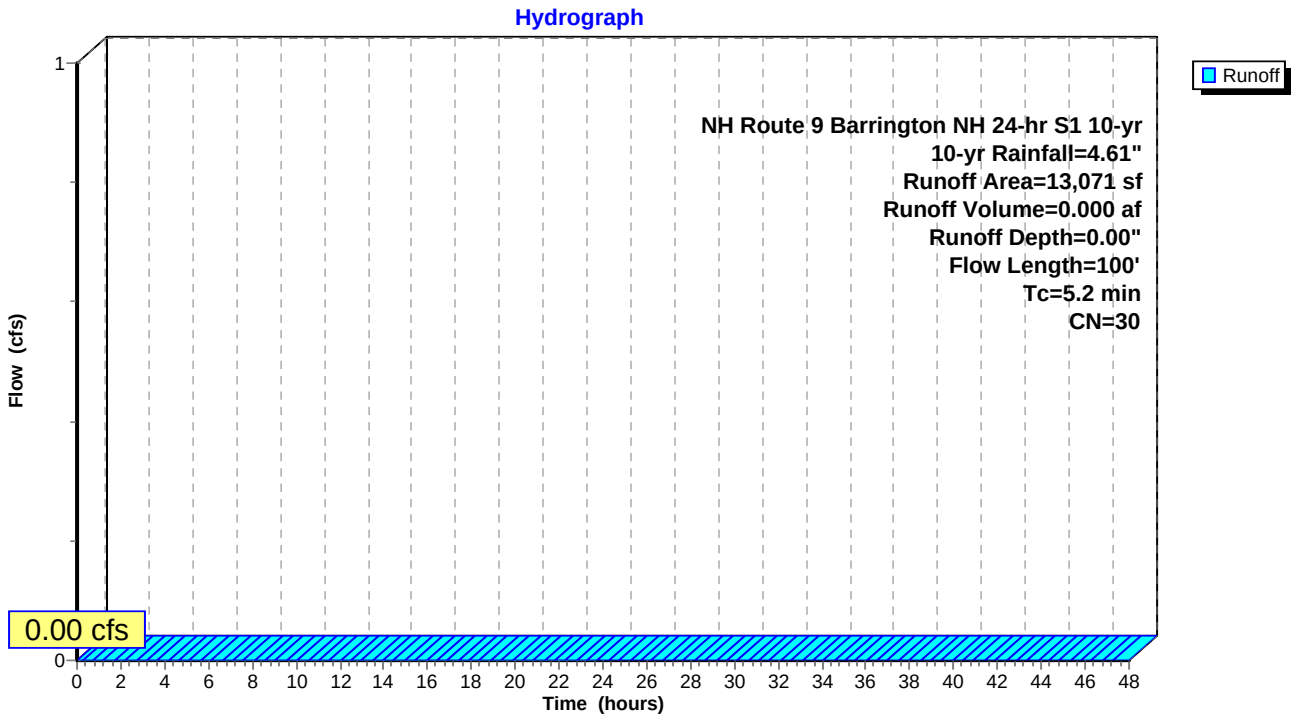
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
13,071	30	Woods, Good, HSG A
13,071		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0300	0.17		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.07"
0.3	50	0.1200	2.42		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
5.2	100	Total			

Subcatchment ES5: Northwest of gravel drive portion of westerly lot



Summary for Subcatchment ES6: East-center portion of westernly lot

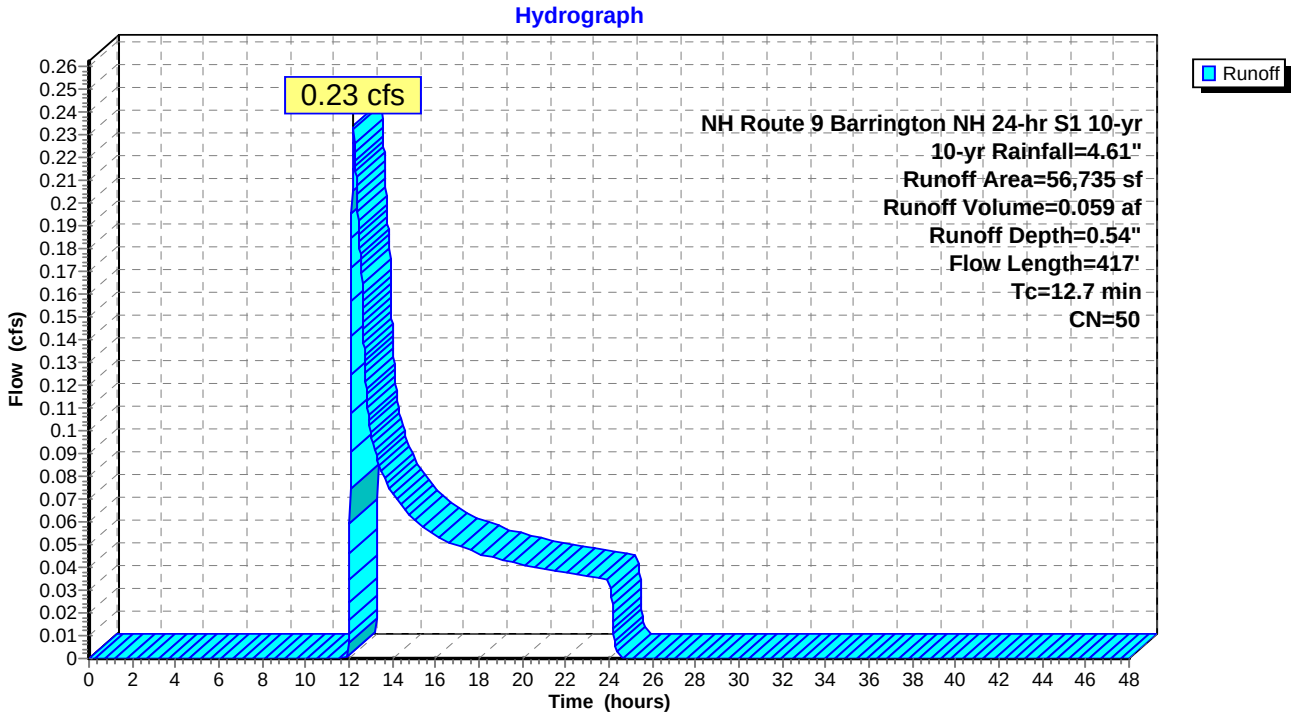
Runoff = 0.23 cfs @ 12.21 hrs, Volume= 0.059 af, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
26,865	30	Woods, Good, HSG A
3,861	55	Woods, Good, HSG B
26,009	70	Woods, Good, HSG C
56,735	50	Weighted Average
56,735		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	50	0.0400	0.09		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.07"
1.0	125	0.1680	2.05		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
1.4	122	0.0410	1.42		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.3	70	0.0571	3.85		**Shallow Concentrated Flow, gravel** Unpaved Kv= 16.1 fps
0.5	50	0.0600	1.71		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
12.7	417	Total			

Subcatchment ES6: East-center portion of westerly lot



Summary for Subcatchment ES7: Northwest portion of middle lot

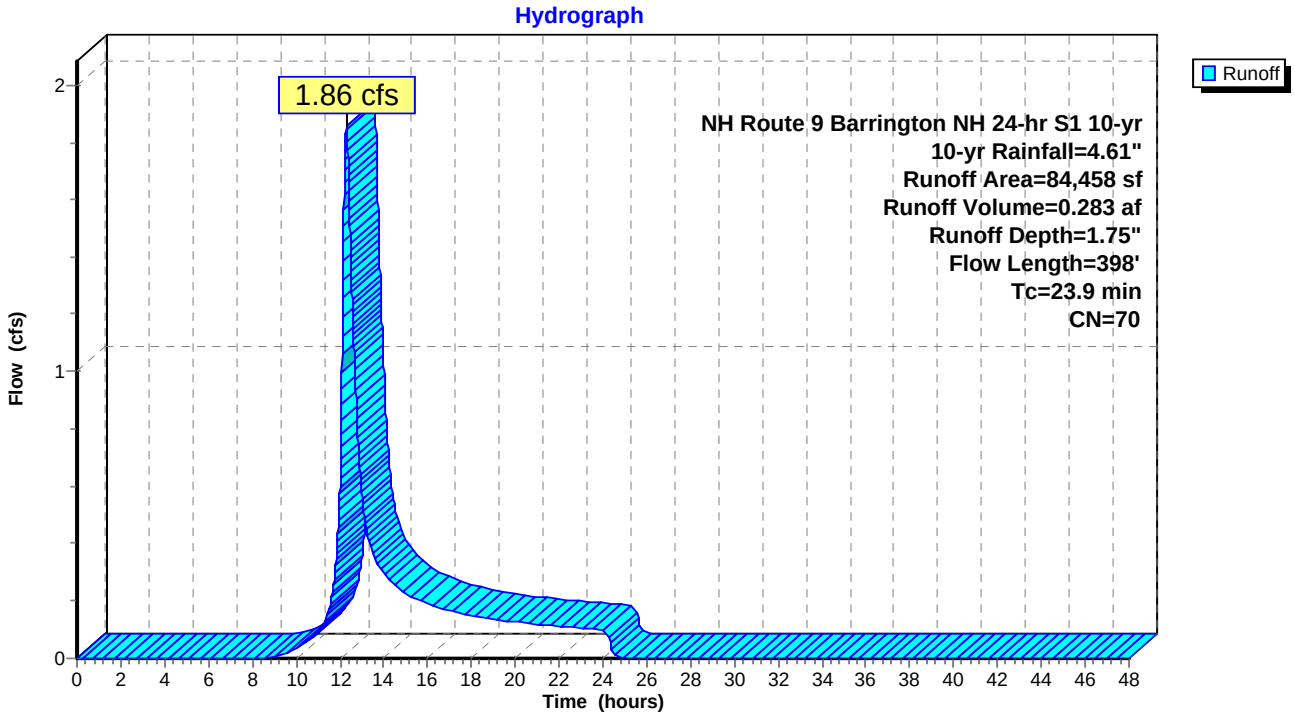
Runoff = 1.86 cfs @ 12.29 hrs, Volume= 0.283 af, Depth= 1.75"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
84,458	70	Woods, Good, HSG C
84,458		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.6	50	0.0200	0.07		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.07"
1.1	82	0.0610	1.23		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
10.2	266	0.0075	0.43		**Shallow Concentrated Flow, Wetland flow** Woodland Kv= 5.0 fps
23.9	398	Total			

Subcatchment ES7: Northwest portion of middle lot



Summary for Subcatchment ES9: West portion of easterly lot

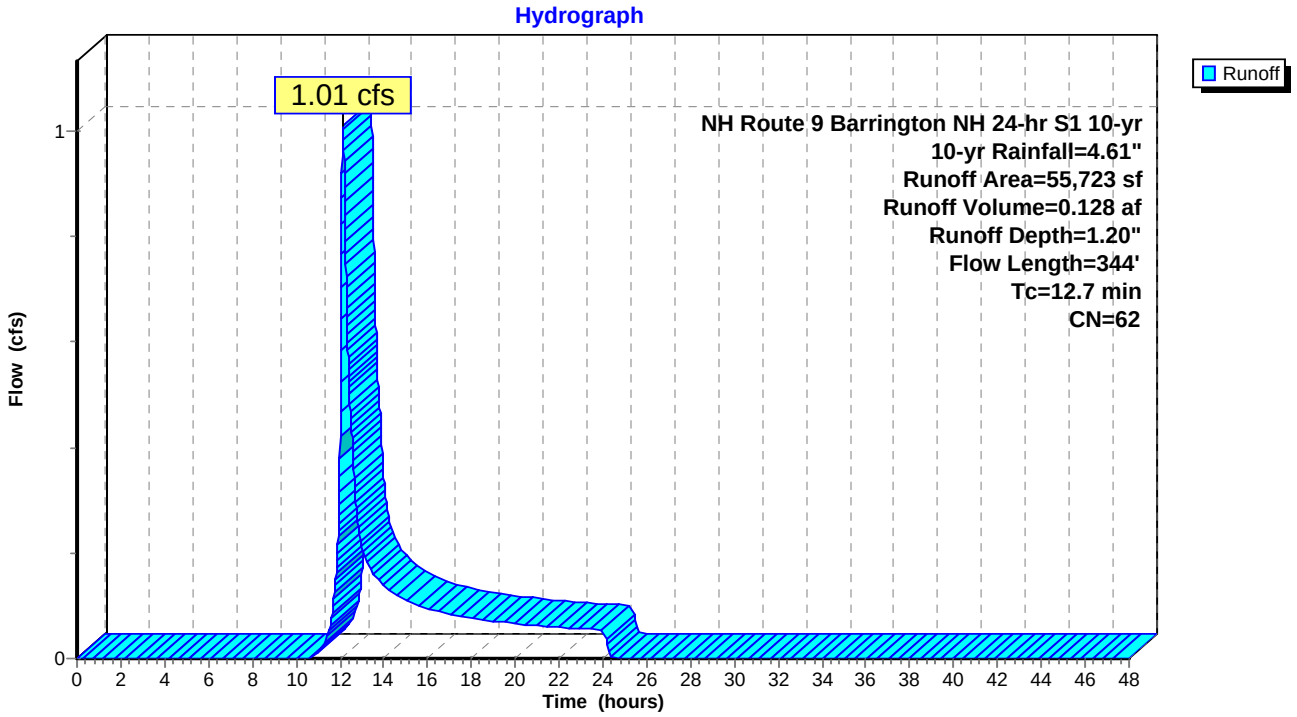
Runoff = 1.01 cfs @ 12.14 hrs, Volume= 0.128 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
9,841	39	>75% Grass cover, Good, HSG A
2,369	30	Woods, Good, HSG A
24,652	70	Woods, Good, HSG C
5,551	98	Paved parking, HSG A
13,310	55	Woods, Good, HSG B
55,723	62	Weighted Average
50,172		90.04% Pervious Area
5,551		9.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	50	0.0500	0.10		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.07"
1.5	105	0.0524	1.14		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
1.9	99	0.0303	0.87		**Shallow Concentrated Flow, Wetland flow** Woodland Kv= 5.0 fps
0.6	90	0.1440	2.66		**Shallow Concentrated Flow, Grass flow** Short Grass Pasture Kv= 7.0 fps
12.7	344	Total			

Subcatchment ES9: West portion of easterly lot



Summary for Reach ER70: Wetlands Starting North Flowing Southeast

Inflow Area = 0.366 ac, 0.00% Impervious, Inflow Depth = 0.10" for 10-yr event
Inflow = 0.00 cfs @ 20.95 hrs, Volume= 0.003 af
Outflow = 0.00 cfs @ 21.27 hrs, Volume= 0.003 af, Atten= 0%, Lag= 19.4 min

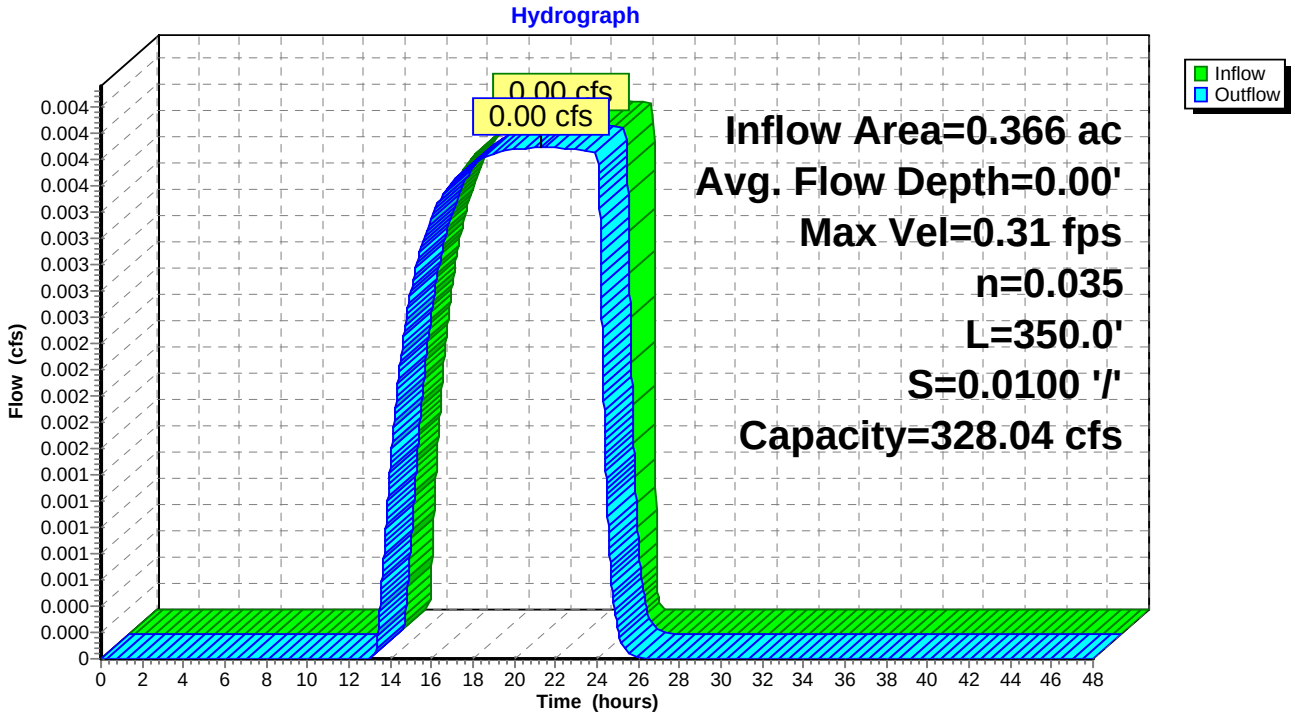
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.31 fps, Min. Travel Time= 18.8 min
Avg. Velocity = 0.31 fps, Avg. Travel Time= 18.8 min

Peak Storage= 4 cf @ 21.27 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 2.00' Flow Area= 64.0 sf, Capacity= 328.04 cfs

16.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 8.0 '/' Top Width= 48.00'
Length= 350.0' Slope= 0.0100 '/'
Inlet Invert= 226.00', Outlet Invert= 222.50'

‡

Reach ER70: Wetlands Starting North Flowing Southeast



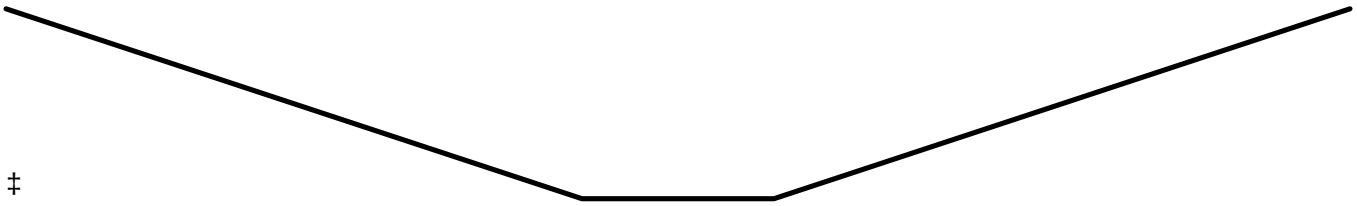
Summary for Reach ER71: Sheet Flow on Eastern Gravel Path

Inflow Area = 0.507 ac, 0.00% Impervious, Inflow Depth = 0.00" for 10-yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

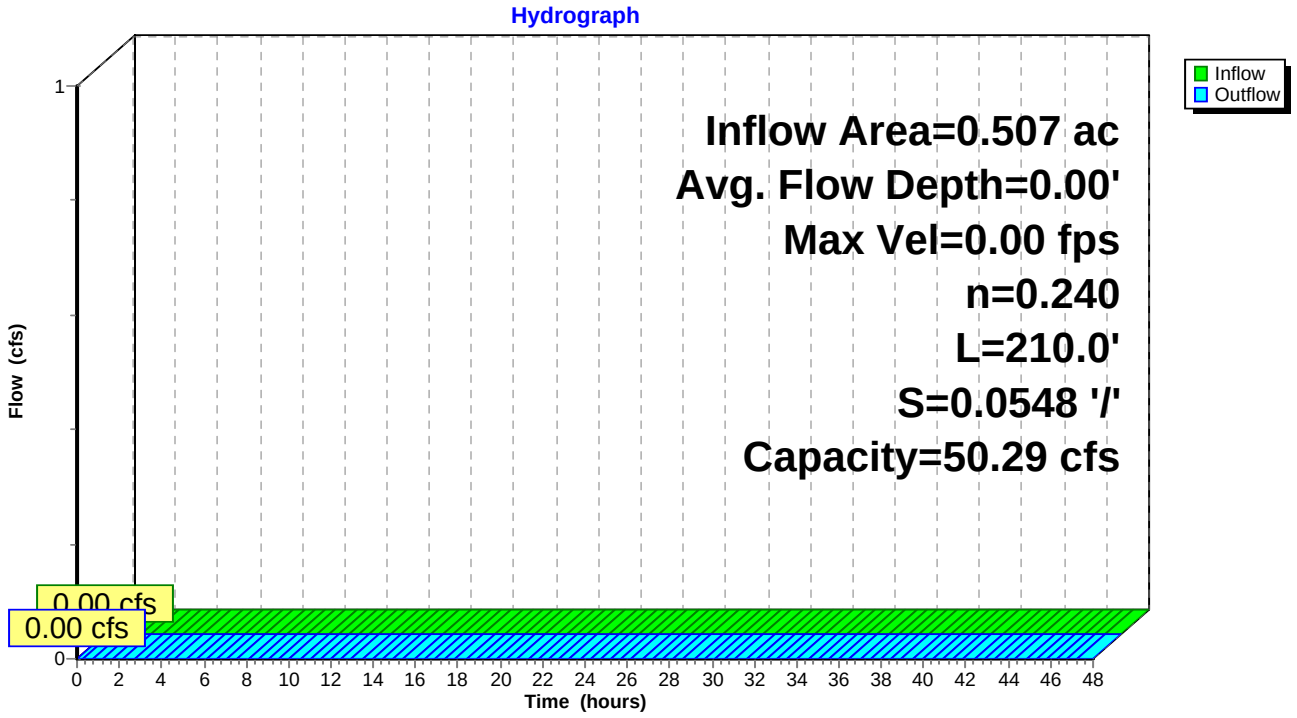
Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 50.29 cfs

4.00' x 2.00' deep channel, n= 0.240 Sheet flow over Dense Grass
Side Slope Z-value= 6.0 '/' Top Width= 28.00'
Length= 210.0' Slope= 0.0548 '/'
Inlet Invert= 233.50', Outlet Invert= 222.00'



‡

Reach ER71: Sheet Flow on Eastern Gravel Path



Summary for Reach ER72: Northwest Wetlands Flowing Southeast to Redemption Rd

[62] Hint: Exceeded Reach ER70 OUTLET depth by 0.02' @ 12.58 hrs
[62] Hint: Exceeded Reach ER71 OUTLET depth by 0.52' @ 12.58 hrs

Inflow Area = 3.201 ac, 0.00% Impervious, Inflow Depth = 0.31" for 10-yr event
Inflow = 0.21 cfs @ 12.48 hrs, Volume= 0.082 af
Outflow = 0.20 cfs @ 12.58 hrs, Volume= 0.082 af, Atten= 2%, Lag= 6.5 min

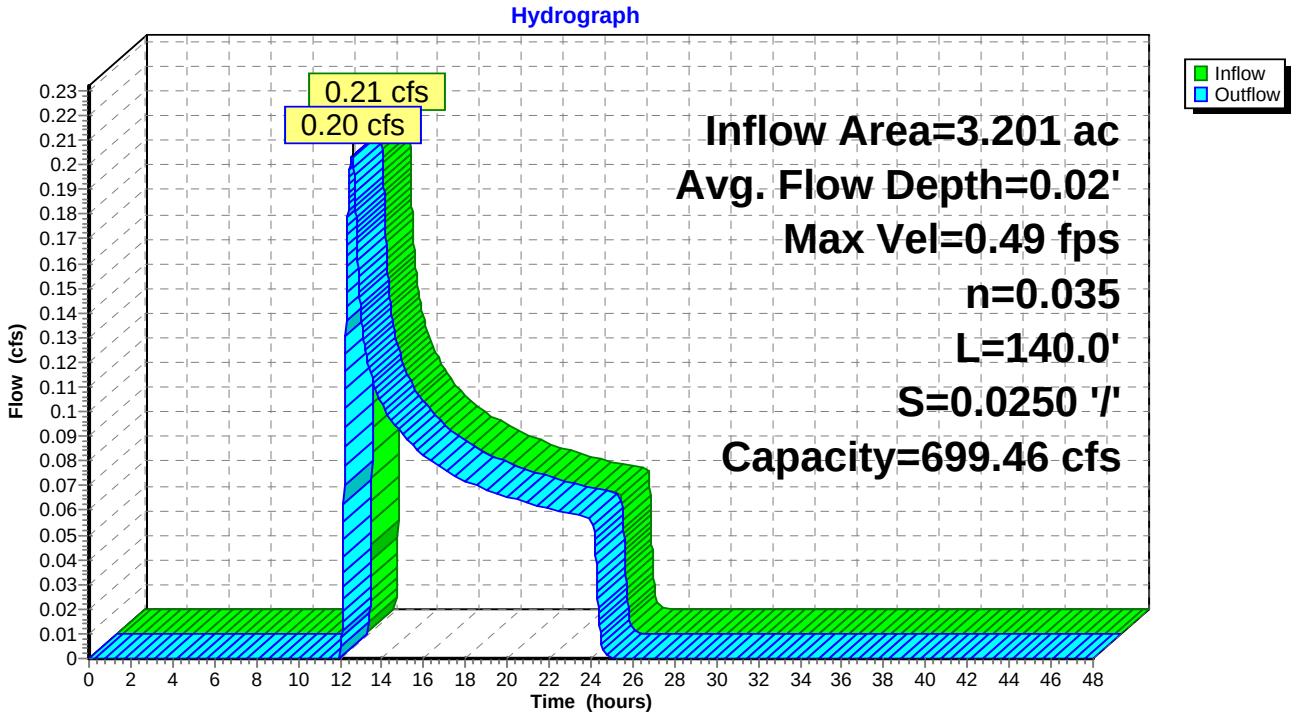
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.49 fps, Min. Travel Time= 4.7 min
Avg. Velocity = 0.49 fps, Avg. Travel Time= 4.7 min

Peak Storage= 58 cf @ 12.58 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 2.00' Flow Area= 82.0 sf, Capacity= 699.46 cfs

25.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 8.0 '/' Top Width= 57.00'
Length= 140.0' Slope= 0.0250 '/'
Inlet Invert= 222.50', Outlet Invert= 219.00'

‡

Reach ER72: Northwest Wetlands Flowing Southeast to Redemption Rd



Summary for Reach ER73: Wetlands Flowing on Map 234 Lot 1.2

[62] Hint: Exceeded Reach ER72 OUTLET depth by 0.01' @ 13.06 hrs

Inflow Area = 4.503 ac, 0.00% Impervious, Inflow Depth = 0.37" for 10-yr event
Inflow = 0.38 cfs @ 12.46 hrs, Volume= 0.141 af
Outflow = 0.38 cfs @ 12.57 hrs, Volume= 0.141 af, Atten= 2%, Lag= 6.6 min

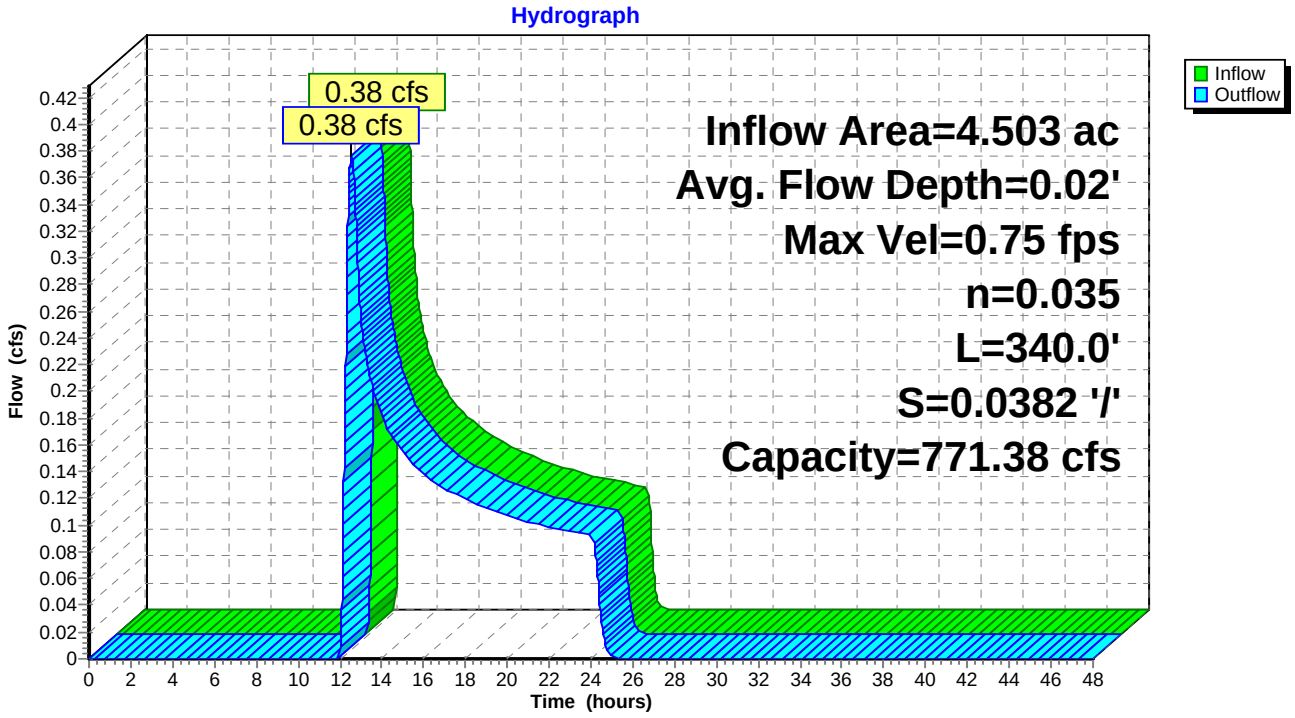
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.75 fps, Min. Travel Time= 7.6 min
Avg. Velocity = 0.61 fps, Avg. Travel Time= 9.2 min

Peak Storage= 171 cf @ 12.57 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 2.00' Flow Area= 76.0 sf, Capacity= 771.38 cfs

20.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 9.0 '/' Top Width= 56.00'
Length= 340.0' Slope= 0.0382 '/'
Inlet Invert= 219.00', Outlet Invert= 206.00'

‡

Reach ER73: Wetlands Flowing on Map 234 Lot 1.2



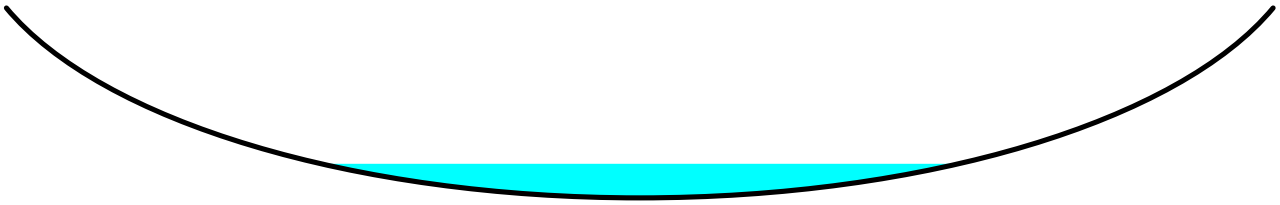
Summary for Reach ER81: SE Portion of Middle Lot Wetlands

Inflow Area = 1.939 ac, 0.00% Impervious, Inflow Depth > 1.17" for 10-yr event
Inflow = 0.42 cfs @ 13.30 hrs, Volume= 0.189 af
Outflow = 0.31 cfs @ 14.38 hrs, Volume= 0.189 af, Atten= 25%, Lag= 64.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.11 fps, Min. Travel Time= 54.7 min
Avg. Velocity = 0.05 fps, Avg. Travel Time= 123.2 min

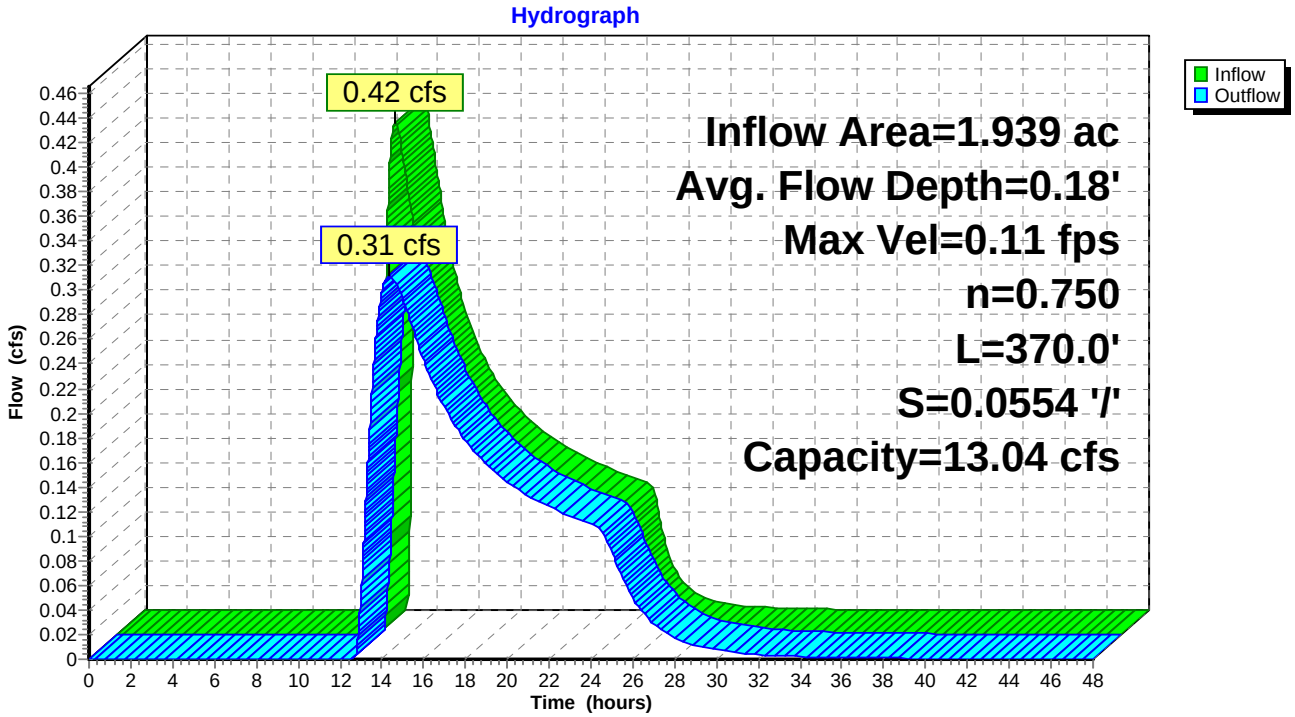
Peak Storage= 1,023 cf @ 14.38 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 1.00' Flow Area= 36.7 sf, Capacity= 13.04 cfs

55.00' x 1.00' deep Parabolic Channel, n= 0.750
Length= 370.0' Slope= 0.0554 '/'
Inlet Invert= 233.00', Outlet Invert= 212.50'



‡

Reach ER81: SE Portion of Middle Lot Wetlands



Summary for Reach ER83: Swale Located on North Side of Redemption Rd Flowing Northeast

Inflow Area = 1.173 ac, 6.39% Impervious, Inflow Depth = 0.64" for 10-yr event
Inflow = 0.24 cfs @ 12.41 hrs, Volume= 0.062 af
Outflow = 0.23 cfs @ 12.48 hrs, Volume= 0.062 af, Atten= 2%, Lag= 4.2 min

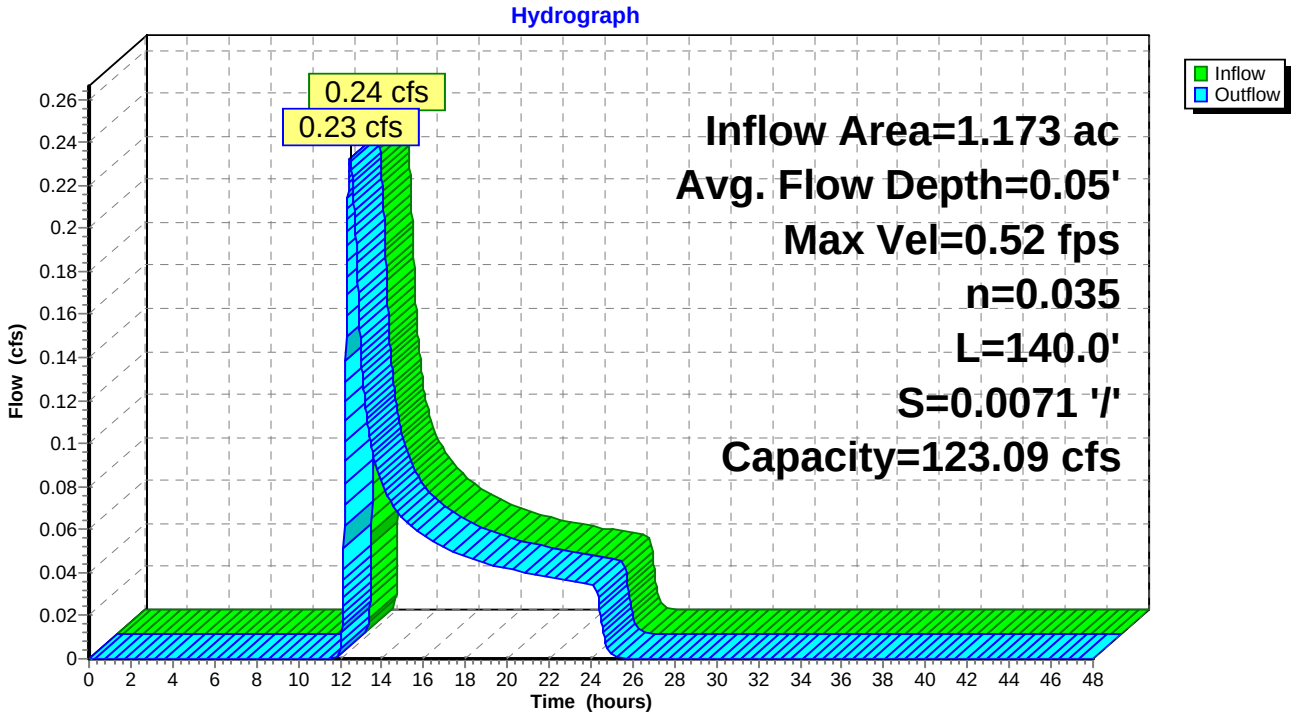
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.52 fps, Min. Travel Time= 4.5 min
Avg. Velocity = 0.30 fps, Avg. Travel Time= 7.8 min

Peak Storage= 63 cf @ 12.48 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 2.00' Flow Area= 28.0 sf, Capacity= 123.09 cfs

8.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 3.0 '/' Top Width= 20.00'
Length= 140.0' Slope= 0.0071 '/'
Inlet Invert= 214.00', Outlet Invert= 213.00'

‡

Reach ER83: Swale Located on North Side of Redemption Rd Flowing Northeast



Summary for Reach ER84: Swale Located on North Side of Redemption Rd Flowing Northeast

Inflow Area = 2.166 ac, 5.71% Impervious, Inflow Depth = 0.57" for 10-yr event
Inflow = 0.36 cfs @ 12.48 hrs, Volume= 0.103 af
Outflow = 0.35 cfs @ 12.52 hrs, Volume= 0.103 af, Atten= 1%, Lag= 2.8 min

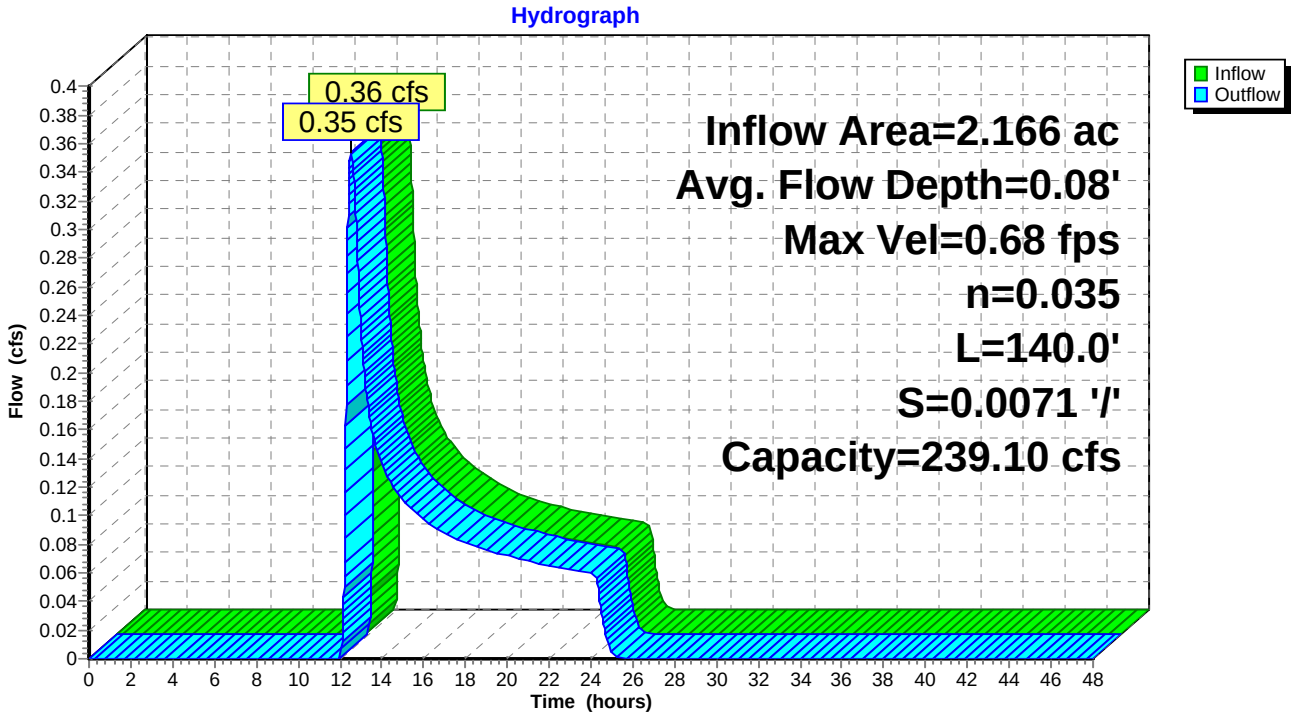
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.68 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 0.40 fps, Avg. Travel Time= 5.8 min

Peak Storage= 73 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 3.00' Flow Area= 45.0 sf, Capacity= 239.10 cfs

6.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 3.0 '/' Top Width= 24.00'
Length= 140.0' Slope= 0.0071 '/'
Inlet Invert= 212.00', Outlet Invert= 211.00'

‡

Reach ER84: Swale Located on North Side of Redemption Rd Flowing Northeast



Summary for Reach ER85: End of Swale located North of Redemption Rd Circle

[62] Hint: Exceeded Reach ER84 OUTLET depth by 0.16' @ 12.13 hrs

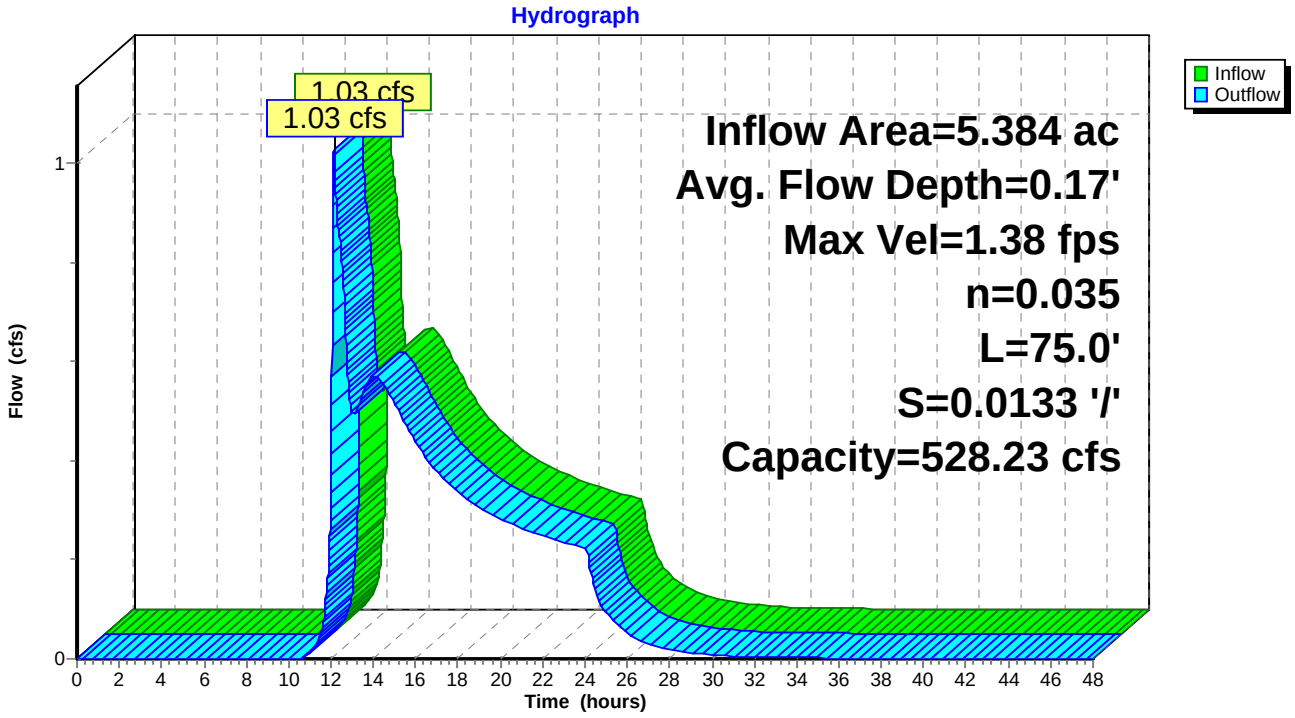
Inflow Area = 5.384 ac, 4.66% Impervious, Inflow Depth > 0.94" for 10-yr event
Inflow = 1.03 cfs @ 12.15 hrs, Volume= 0.421 af
Outflow = 1.03 cfs @ 12.15 hrs, Volume= 0.421 af, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 1.38 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 0.69 fps, Avg. Travel Time= 1.8 min

Peak Storage= 56 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 4.00' Flow Area= 64.0 sf, Capacity= 528.23 cfs

4.00' x 4.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 3.0 '/' Top Width= 28.00'
Length= 75.0' Slope= 0.0133 '/'
Inlet Invert= 211.00', Outlet Invert= 210.00'

Reach ER85: End of Swale located North of Redemption Rd Circle



Summary for Pond EP81: Middle Portion of Wetland

Inflow Area = 1.939 ac, 0.00% Impervious, Inflow Depth = 1.75" for 10-yr event
Inflow = 1.86 cfs @ 12.29 hrs, Volume= 0.283 af
Outflow = 0.42 cfs @ 13.30 hrs, Volume= 0.189 af, Atten= 78%, Lag= 60.2 min
Primary = 0.42 cfs @ 13.30 hrs, Volume= 0.189 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 233.68' @ 13.30 hrs Surf.Area= 5,837 sf Storage= 5,093 cf

Plug-Flow detention time= 278.2 min calculated for 0.189 af (67% of inflow)
Center-of-Mass det. time= 144.7 min (1,053.2 - 908.5)

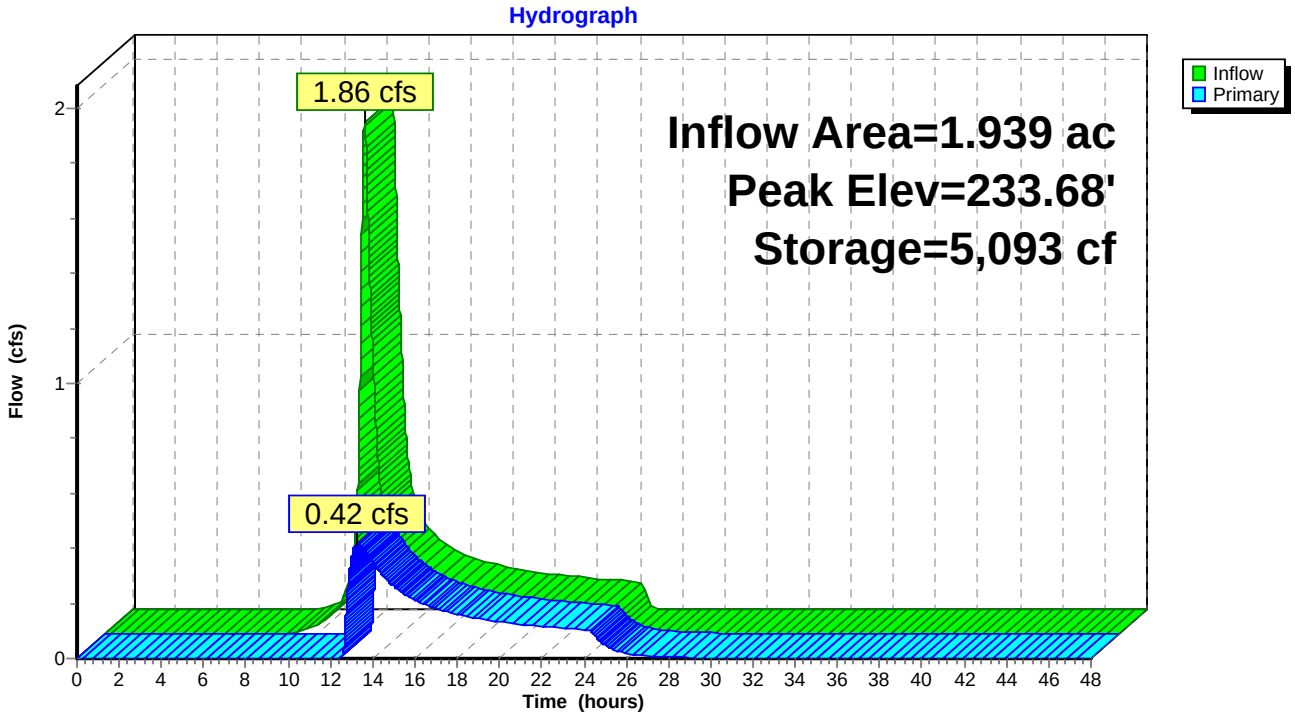
Volume	Invert	Avail.Storage	Storage Description
#1	232.00'	7,132 cf	**Wetland Low Point (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
232.00	520	90.0	0	0	520
233.00	3,700	245.0	1,869	1,869	4,655
234.00	7,000	381.0	5,263	7,132	11,438

Device	Routing	Invert	Outlet Devices
#1	Primary	233.50'	**2.0' long x 21.0' breadth Weir Between ES8-ES9**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.42 cfs @ 13.30 hrs HW=233.68' TW=233.13' (Dynamic Tailwater)
↑—**1=Weir Between ES8-ES9** (Weir Controls 0.42 cfs @ 1.14 fps)

Pond EP81: Middle Portion of Wetland

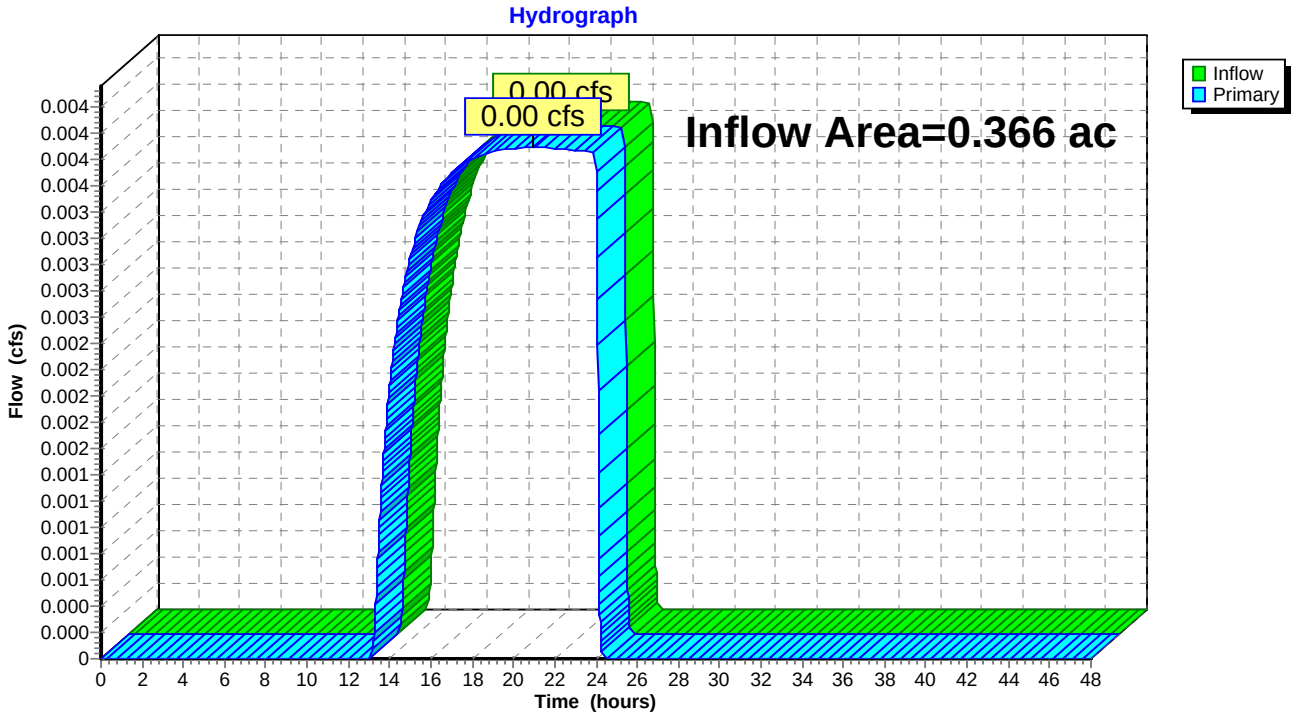


Summary for Link L100: Northern Wetlands & North of Site

Inflow Area = 0.366 ac, 0.00% Impervious, Inflow Depth = 0.10" for 10-yr event
Inflow = 0.00 cfs @ 20.95 hrs, Volume= 0.003 af
Primary = 0.00 cfs @ 20.95 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

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

Link L100: Northern Wetlands & North of Site

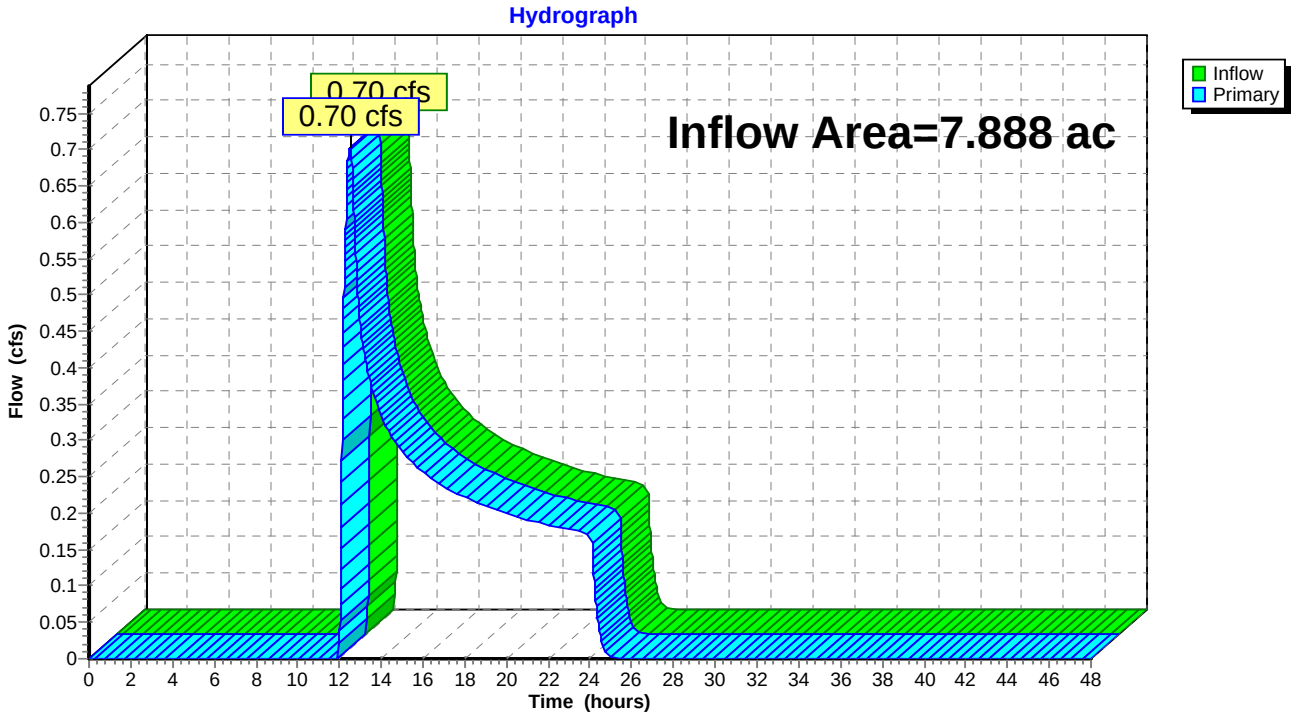


Summary for Link L200: Inlet at Start of Redemption Rd; West Side

Inflow Area = 7.888 ac, 0.08% Impervious, Inflow Depth = 0.40" for 10-yr event
Inflow = 0.70 cfs @ 12.51 hrs, Volume= 0.262 af
Primary = 0.70 cfs @ 12.51 hrs, Volume= 0.262 af, Atten= 0%, Lag= 0.0 min

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

Link L200: Inlet at Start of Redemption Rd; West Side

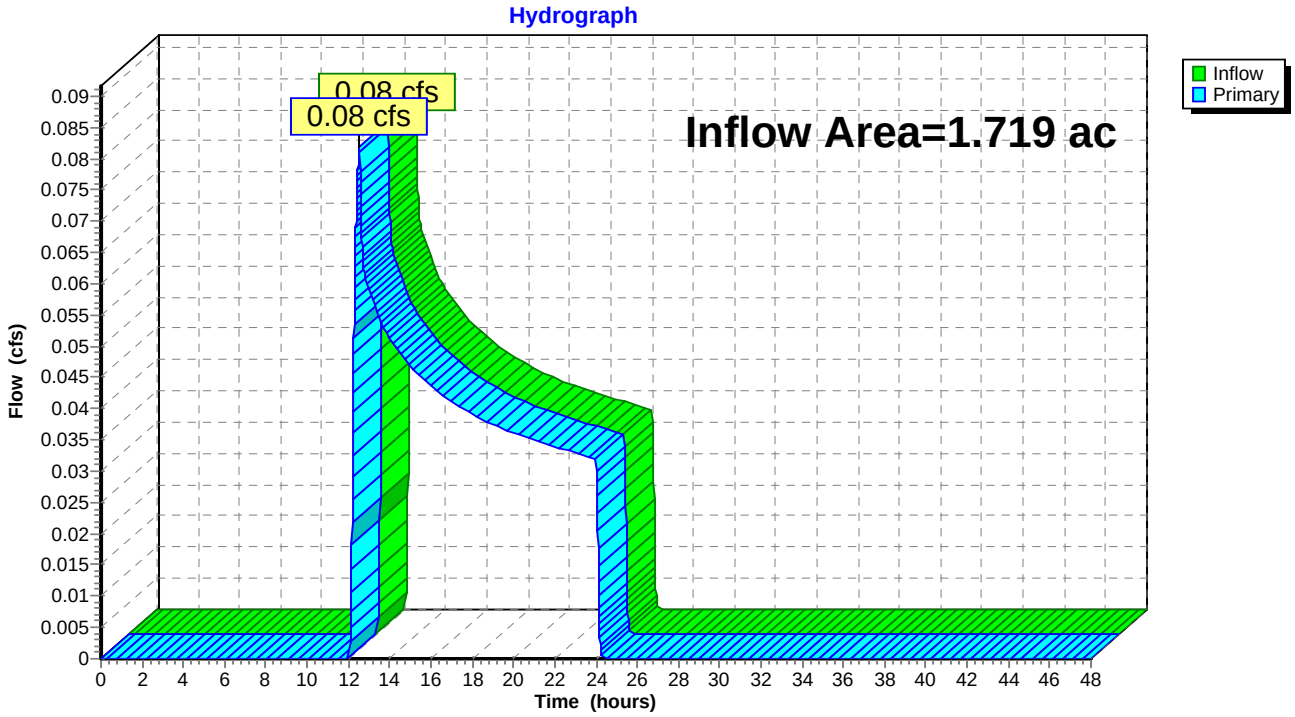


Summary for Link L300: Southwest Corner of Far-East Lot; Bottom of Hill

Inflow Area = 1.719 ac, 0.00% Impervious, Inflow Depth = 0.29" for 10-yr event
Inflow = 0.08 cfs @ 12.54 hrs, Volume= 0.041 af
Primary = 0.08 cfs @ 12.54 hrs, Volume= 0.041 af, Atten= 0%, Lag= 0.0 min

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

Link L300: Southwest Corner of Far-East Lot; Bottom of Hill

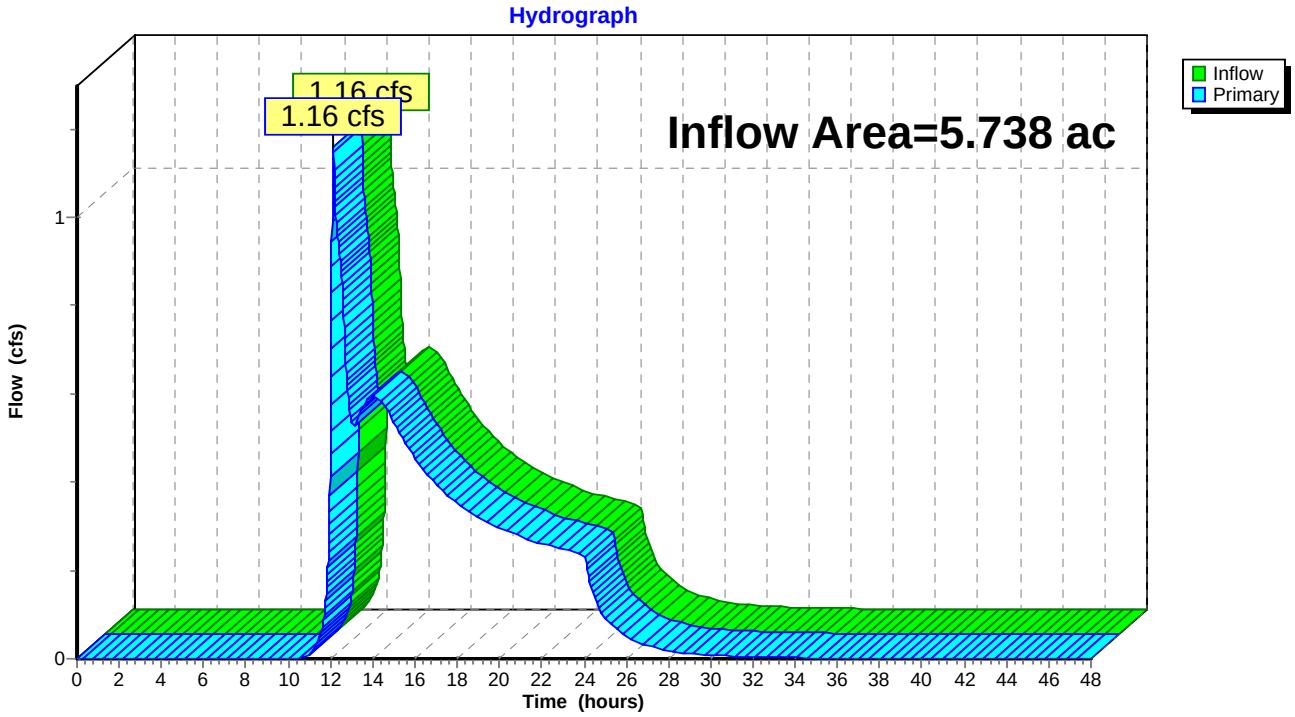


Summary for Link L400: Southwest Corner of Far-East Lot; Bottom of Hill

Inflow Area = 5.738 ac, 5.21% Impervious, Inflow Depth > 0.93" for 10-yr event
Inflow = 1.16 cfs @ 12.15 hrs, Volume= 0.444 af
Primary = 1.16 cfs @ 12.15 hrs, Volume= 0.444 af, Atten= 0%, Lag= 0.0 min

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

Link L400: Southwest Corner of Far-East Lot; Bottom of Hill

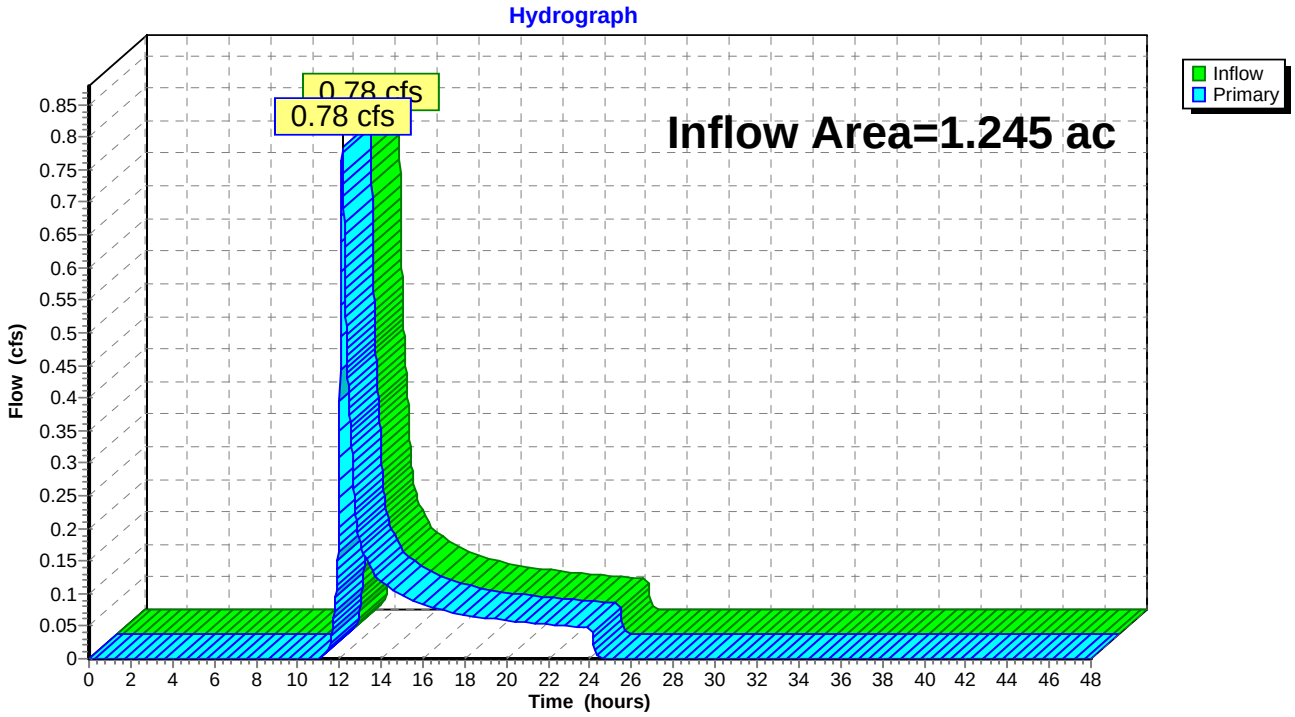


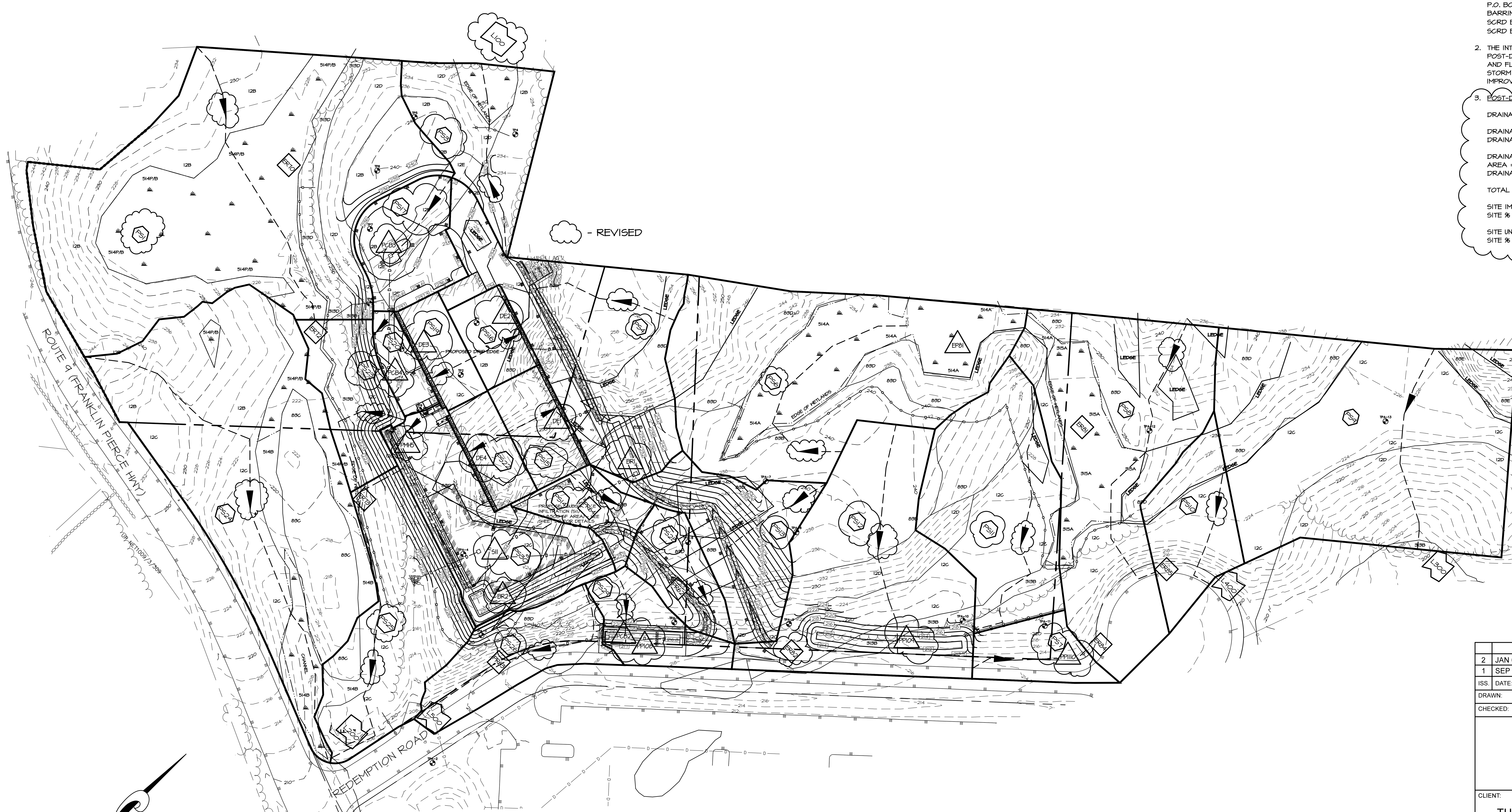
Summary for Link L500: Inlet at Start of Gravel Drive; East Side

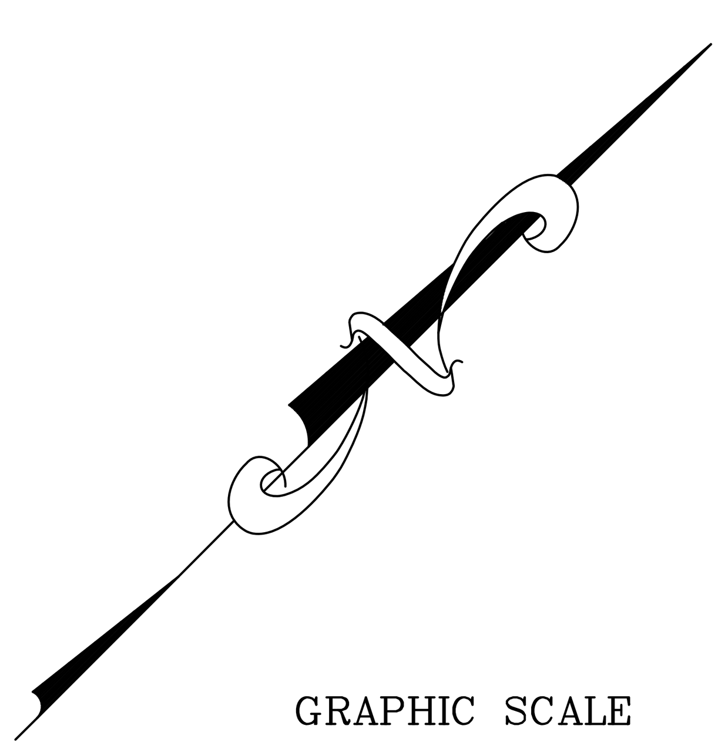
Inflow Area = 1.245 ac, 10.48% Impervious, Inflow Depth = 1.02" for 10-yr event
Inflow = 0.78 cfs @ 12.14 hrs, Volume= 0.106 af
Primary = 0.78 cfs @ 12.14 hrs, Volume= 0.106 af, Atten= 0%, Lag= 0.0 min

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

Link L500: Inlet at Start of Gravel Drive; East Side







GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

NOTES:

1. OWNER OF RECORD:
   TAX MAP 233 LOT 77 & TAX MAP 234 LOTS 1.2 & 1.4
   TOWN OF BARRINGTON
   P.O. BOX 660
   BARRINGTON, NH 03825
   SCRD BK4342 PG0049 (MAP 233 LOT 77)
   SCRD BK2326 PG0758 (MAP 234 LOT 1.2)

2. THE INTENT OF THIS PLAN IS TO CALCULATE POST-DEVELOPMENT SUBCATCHMENT AREAS AND FLOW PATHS FOR MODELING VARIOUS STORM EVENTS IN PREPARATION FOR SITE IMPROVEMENTS.

3. <u>POST-DEVELOPMENT DRAINAGE AREA CALCS</u>:

   DRAINAGE ANALYSIS TOTAL AREA = 722,655 SF

   DRAINAGE ANALYSIS IMPERVIOUS = 106,896 SF
   DRAINAGE ANALYSIS % IMPERVIOUS = 14.79%

   DRAINAGE ANALYSIS UNDISTURBED AREA = ± 501,105 SF
   DRAINAGE ANALYSIS % UNDISTURBED = 69.34%

   TOTAL AREA OF SITE = 559,579 SF

   SITE IMPERVIOUS AREA = 87,925 SF
   SITE % IMPERVIOUS = 15.71%

   SITE UNDISTURBED AREA = ± 338,029 SF
   SITE % UNDISTURBED = 60.41%

ISS.	DATE:	DESCRIPTION OF ISSUE:	CHK.
2	JAN 6, 2020	FOR APPROVAL	
1	SEP 13, 2019	FOR APPROVAL	

DRAWN:	MCV/JJM	DESIGN:	MCV
CHECKED:	BDS	CHECKED:	BDS

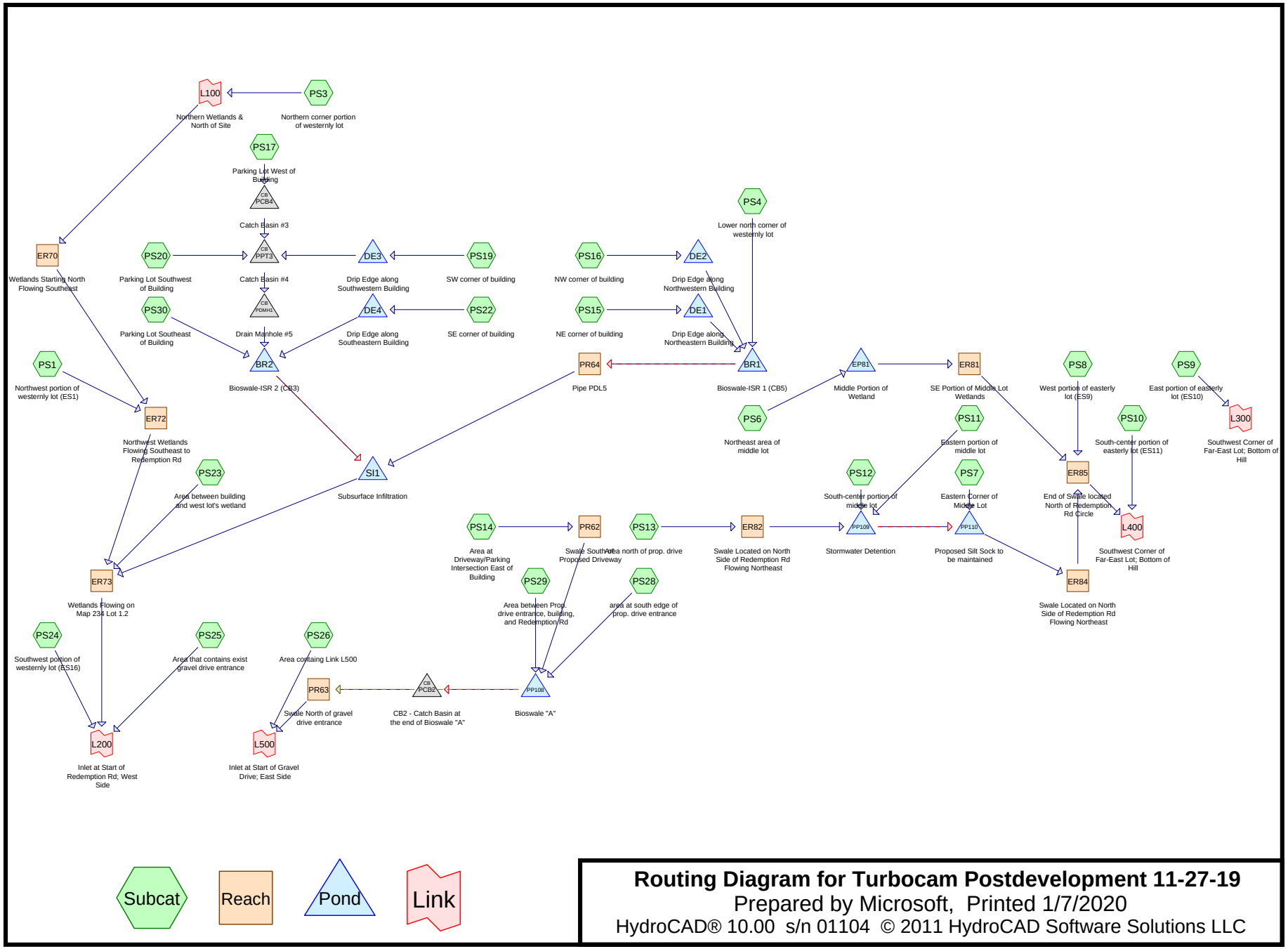
EMANUEL ENGINEERING
civil & structural consultants, land planners
118 PORTSMOUTH AVENUE, A202
STRATHAM, NH 03885
P: 603-772-4400 F: 603-772-4487
WWW.EMANUELENGINEERING.COM

CLIENT:
TURBOCAM INTERNATIONAL
607 CALEF HIGHWAY
BARRINGTON, NH 03825

SEAL:

TITLE:
POST-DEVELOPMENT
DRAINAGE PLAN
FOR
TAX MAP 233 LOTS 1.2, 1.4, AND 77
TURBOCAM INTERNATIONAL
ROUTE 9 (SITE)
BARRINGTON, NH 03825
& TOWN OF BARRINGTON
PO BOX 660
BARRINGTON, NH 03825

PROJECT:	SCALE:	SHEET:
19-020	1"=60'	SW2



Routing Diagram for Turbocam Postdevelopment 11-27-19

Prepared by Microsoft, Printed 1/7/2020

HydroCAD® 10.00 s/n 01104 © 2011 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.680	30	Woods, Good, HSG A (PS1, PS11, PS23, PS24, PS25, PS26, PS29, PS3, PS8, PS9)
4.299	39	>75% Grass cover, Good, HSG A (PS1, PS10, PS11, PS12, PS13, PS17, PS20, PS23, PS24, PS25, PS26, PS28, PS29, PS3, PS30, PS4, PS7, PS8, PS9)
0.472	55	Woods, Good, HSG B (PS1, PS11, PS23, PS8)
0.250	61	>75% Grass cover, Good, HSG B (PS1, PS11, PS12, PS23)
5.050	70	Woods, Good, HSG C (PS1, PS10, PS11, PS23, PS24, PS25, PS26, PS29, PS3, PS4, PS6, PS8, PS9)
1.343	74	>75% Grass cover, Good, HSG C (PS11, PS12, PS13, PS14, PS26, PS28, PS30, PS4, PS6)
0.033	96	Gravel surface, HSG A (PS25)
1.259	98	Paved parking, HSG A (PS10, PS12, PS13, PS17, PS20, PS25, PS26, PS28, PS29, PS30, PS4, PS7, PS8)
0.023	98	Paved parking, HSG B (PS12)
0.502	98	Paved parking, HSG C (PS13, PS14, PS28, PS30, PS4)
0.286	98	Roofs, HSG A (PS16, PS19, PS22, PS4)
0.350	98	Roofs, HSG C (PS15, PS16, PS22)
0.016	98	Water Surface, 0% imp, HSG A (PS16, PS19)
0.027	98	Water Surface, 0% imp, HSG C (PS15, PS16, PS22)
16.590	**59**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
8.573	HSG A	PS1, PS10, PS11, PS12, PS13, PS16, PS17, PS19, PS20, PS22, PS23, PS24, PS25, PS26, PS28, PS29, PS3, PS30, PS4, PS7, PS8, PS9
0.744	HSG B	PS1, PS11, PS12, PS23, PS8
7.273	HSG C	PS1, PS10, PS11, PS12, PS13, PS14, PS15, PS16, PS22, PS23, PS24, PS25, PS26, PS28, PS29, PS3, PS30, PS4, PS6, PS8, PS9
0.000	HSG D	
0.000	Other	
16.590		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
4.299	0.250	1.343	0.000	0.000	5.892	>75% Grass cover, Good	PS1, PS10, PS11, PS12, PS13, PS14, PS17, PS20, PS23, PS24, PS25, PS26, PS28, PS29, PS3, PS30, PS4, PS6, PS7, PS8, PS9
1.259	0.023	0.502	0.000	0.000	1.785	Paved parking	PS10, PS12, PS13, PS14, PS17, PS20, PS25, PS26, PS28, PS29, PS30, PS4, PS7, PS8
0.286	0.000	0.350	0.000	0.000	0.636	Roofs	PS15, PS16, PS19, PS22, PS4
0.033	0.000	0.000	0.000	0.000	0.033	Gravel surface	PS25
2.680	0.472	5.050	0.000	0.000	8.201	Woods, Good	PS1, PS10, PS11, PS23, PS24, PS25, PS26,

Ground Covers (all nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.016	0.000	0.027	0.000	0.000	0.043	Water Surface, 0% imp	PS15, PS16, PS19, PS22
8.573	**0.744**	**7.273**	**0.000**	**0.000**	**16.590**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	PR64	227.67	226.20	170.0	0.0086	0.010	12.0	0.0	0.0
2	DE1	232.60	232.30	35.0	0.0086	0.010	6.0	0.0	0.0
3	DE2	232.50	232.40	40.0	0.0025	0.010	6.0	0.0	0.0
4	DE3	235.37	235.37	40.0	0.0000	0.010	8.0	0.0	0.0
5	DE4	234.37	234.37	100.0	0.0000	0.010	8.0	0.0	0.0
6	PCB2	212.60	212.00	85.0	0.0071	0.013	12.0	0.0	0.0
7	PCB4	232.37	232.03	135.0	0.0025	0.010	15.0	0.0	0.0
8	PDMH1	231.91	231.40	205.0	0.0025	0.010	15.0	0.0	0.0
9	PP108	212.70	212.70	80.0	0.0000	0.013	6.0	0.0	0.0
10	PPT3	232.03	231.91	50.0	0.0024	0.010	15.0	0.0	0.0
11	SI1	227.15	221.00	70.0	0.0879	0.010	12.0	0.0	0.0

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PS1: Northwest portion of Runoff Area=101,958 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=373' Tc=15.4 min CN=48 Runoff=0.00 cfs 0.000 af

Subcatchment PS10: South-center portion Runoff Area=15,431 sf 13.51% Impervious Runoff Depth=0.00"
Flow Length=151' Tc=5.6 min CN=55 Runoff=0.00 cfs 0.000 af

Subcatchment PS11: Eastern portion of Runoff Area=35,131 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=335' Tc=20.7 min CN=50 Runoff=0.00 cfs 0.000 af

Subcatchment PS12: South-center portion Runoff Area=47,403 sf 8.55% Impervious Runoff Depth=0.00"
Flow Length=348' Tc=13.1 min CN=58 Runoff=0.00 cfs 0.000 af

Subcatchment PS13: Area north of prop. Runoff Area=21,222 sf 17.10% Impervious Runoff Depth=0.02"
Flow Length=245' Tc=8.9 min CN=73 Runoff=0.00 cfs 0.001 af

Subcatchment PS14: Area at Runoff Area=7,728 sf 70.54% Impervious Runoff Depth=0.36"
Flow Length=107' Tc=3.4 min CN=91 Runoff=0.08 cfs 0.005 af

Subcatchment PS15: NE corner of building Runoff Area=8,288 sf 93.93% Impervious Runoff Depth=0.79"
Flow Length=62' Slope=0.1000 '/' Tc=0.4 min CN=98 Runoff=0.19 cfs 0.013 af

Subcatchment PS16: NW corner of building Runoff Area=6,627 sf 93.98% Impervious Runoff Depth=0.79"
Flow Length=62' Slope=0.1000 '/' Tc=0.4 min CN=98 Runoff=0.16 cfs 0.010 af

Subcatchment PS17: Parking Lot West of Runoff Area=13,293 sf 91.70% Impervious Runoff Depth=0.45"
Flow Length=110' Tc=1.1 min CN=93 Runoff=0.19 cfs 0.011 af

Subcatchment PS19: SW corner of building Runoff Area=6,734 sf 92.81% Impervious Runoff Depth=0.79"
Flow Length=50' Slope=0.1000 '/' Tc=0.4 min CN=98 Runoff=0.16 cfs 0.010 af

Subcatchment PS20: Parking Lot Runoff Area=4,622 sf 81.03% Impervious Runoff Depth=0.22"
Flow Length=88' Slope=0.0170 '/' Tc=1.0 min CN=87 Runoff=0.03 cfs 0.002 af

Subcatchment PS22: SE corner of building Runoff Area=6,730 sf 92.87% Impervious Runoff Depth=0.79"
Flow Length=50' Slope=0.1000 '/' Tc=0.4 min CN=98 Runoff=0.16 cfs 0.010 af

Subcatchment PS23: Area between building Runoff Area=13,335 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=157' Tc=3.7 min CN=53 Runoff=0.00 cfs 0.000 af

Subcatchment PS24: Southwest portion of Runoff Area=75,770 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=569' Tc=11.4 min CN=49 Runoff=0.00 cfs 0.000 af

Subcatchment PS25: Area that contains Runoff Area=30,280 sf 1.00% Impervious Runoff Depth=0.00"
Flow Length=386' Tc=7.5 min CN=44 Runoff=0.00 cfs 0.000 af

Subcatchment PS26: Area containg Link Runoff Area=16,294 sf 25.02% Impervious Runoff Depth=0.00"
Flow Length=252' Tc=5.0 min CN=58 Runoff=0.00 cfs 0.000 af

Subcatchment PS28: area at south edge of Runoff Area=9,699 sf 56.14% Impervious Runoff Depth=0.05"
Flow Length=168' Tc=0.9 min CN=77 Runoff=0.00 cfs 0.001 af

Subcatchment PS29: Area between Prop. Runoff Area=10,273 sf 22.32% Impervious Runoff Depth=0.00"
Flow Length=82' Tc=5.3 min CN=55 Runoff=0.00 cfs 0.000 af

Subcatchment PS3: Northern corner portion Runoff Area=20,440 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=222' Slope=0.0100 '/' Tc=11.7 min CN=44 Runoff=0.00 cfs 0.000 af

Subcatchment PS30: Parking Lot Runoff Area=26,697 sf 62.68% Impervious Runoff Depth=0.11"
Flow Length=248' Tc=1.5 min CN=82 Runoff=0.05 cfs 0.006 af

Subcatchment PS4: Lower north corner of Runoff Area=40,570 sf 27.77% Impervious Runoff Depth=0.06"
Flow Length=325' Tc=12.0 min CN=78 Runoff=0.01 cfs 0.005 af

Subcatchment PS6: Northeast area of Runoff Area=64,817 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=294' Tc=23.9 min CN=70 Runoff=0.00 cfs 0.001 af

Subcatchment PS7: Eastern Corner of Runoff Area=8,718 sf 24.33% Impervious Runoff Depth=0.00"
Flow Length=135' Tc=7.7 min CN=53 Runoff=0.00 cfs 0.000 af

Subcatchment PS8: West portion of Runoff Area=55,723 sf 9.96% Impervious Runoff Depth=0.00"
Flow Length=344' Tc=12.7 min CN=62 Runoff=0.00 cfs 0.000 af

Subcatchment PS9: East portion of easterly Runoff Area=74,872 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=235' Tc=7.5 min CN=44 Runoff=0.00 cfs 0.000 af

Reach ER70: Wetlands Starting North Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=350.0' S=0.0100 '/' Capacity=328.04 cfs Outflow=0.00 cfs 0.000 af

Reach ER72: Northwest Wetlands Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=221.0' S=0.0158 '/' Capacity=556.72 cfs Outflow=0.00 cfs 0.000 af

Reach ER73: Wetlands Flowing on Map Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=320.0' S=0.0406 '/' Capacity=795.12 cfs Outflow=0.00 cfs 0.000 af

Reach ER81: SE Portion of Middle Lot Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.750 L=370.0' S=0.0554 '/' Capacity=13.04 cfs Outflow=0.00 cfs 0.000 af

Reach ER82: Swale Located on North Avg. Flow Depth=0.00' Max Vel=0.49 fps Inflow=0.00 cfs 0.001 af
n=0.035 L=80.0' S=0.0250 '/' Capacity=296.49 cfs Outflow=0.00 cfs 0.001 af

Reach ER84: Swale Located on North Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=140.0' S=0.0071 '/' Capacity=239.10 cfs Outflow=0.00 cfs 0.000 af

Reach ER85: End of Swale located Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=75.0' S=0.0133 '/' Capacity=528.23 cfs Outflow=0.00 cfs 0.000 af

Reach PR62: Swale South of Proposed Avg. Flow Depth=0.10' Max Vel=1.99 fps Inflow=0.08 cfs 0.005 af
n=0.022 L=130.0' S=0.0500 '/' Capacity=37.30 cfs Outflow=0.08 cfs 0.005 af

Reach PR63: Swale North of gravel Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.022 L=80.0' S=0.0500 '/' Capacity=50.13 cfs Outflow=0.00 cfs 0.000 af

Reach PR64: Pipe PDL5 Avg. Flow Depth=0.04' Max Vel=1.15 fps Inflow=0.01 cfs 0.005 af
12.0" Round Pipe n=0.010 L=170.0' S=0.0086 '/' Capacity=4.31 cfs Outflow=0.01 cfs 0.005 af

Pond BR1: Bioswale-ISR 1 (CB5) Peak Elev=227.86' Storage=909 cf Inflow=0.31 cfs 0.026 af
Primary=0.01 cfs 0.005 af Secondary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.005 af

Pond BR2: Bioswale-ISR 2 (CB3) Peak Elev=227.12' Storage=1,223 cf Inflow=0.50 cfs 0.038 af
Primary=0.02 cfs 0.011 af Secondary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.011 af

Pond DE1: Drip Edge along Northeastern Peak Elev=232.78' Storage=76 cf Inflow=0.19 cfs 0.013 af
6.0" Round Culvert x 2.00 n=0.010 L=35.0' S=0.0086 '/' Outflow=0.18 cfs 0.012 af

Pond DE2: Drip Edge along Northwestern Peak Elev=232.77' Storage=71 cf Inflow=0.16 cfs 0.010 af
6.0" Round Culvert n=0.010 L=40.0' S=0.0025 '/' Outflow=0.13 cfs 0.009 af

Pond DE3: Drip Edge along Southwestern Peak Elev=235.67' Storage=92 cf Inflow=0.16 cfs 0.010 af
8.0" Round Culvert n=0.010 L=40.0' S=0.0000 '/' Outflow=0.12 cfs 0.009 af

Pond DE4: Drip Edge along Southeastern Peak Elev=234.71' Storage=97 cf Inflow=0.16 cfs 0.010 af
8.0" Round Culvert n=0.010 L=100.0' S=0.0000 '/' Outflow=0.11 cfs 0.009 af

Pond EP81: Middle Portion of Wetland Peak Elev=232.04' Storage=25 cf Inflow=0.00 cfs 0.001 af
Outflow=0.00 cfs 0.000 af

Pond PCB2: CB2 - Catch Basin at the end of Bioswale "A" Peak Elev=212.60' Inflow=0.00 cfs 0.000 af
12.0" Round Culvert n=0.013 L=85.0' S=0.0071 '/' Outflow=0.00 cfs 0.000 af

Pond PCB4: Catch Basin #3 Peak Elev=232.64' Inflow=0.19 cfs 0.011 af
15.0" Round Culvert n=0.010 L=135.0' S=0.0025 '/' Outflow=0.19 cfs 0.011 af

Pond PDMH1: Drain Manhole #5 Peak Elev=232.23' Inflow=0.34 cfs 0.023 af
15.0" Round Culvert n=0.010 L=205.0' S=0.0025 '/' Outflow=0.34 cfs 0.023 af

Pond PP108: Bioswale "A" Peak Elev=212.46' Storage=2 cf Inflow=0.08 cfs 0.006 af
cfs 0.006 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.006 af

Pond PP109: Stormwater Detention Peak Elev=212.00' Storage=0 cf Inflow=0.00 cfs 0.001 af
Discarded=0.00 cfs 0.001 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.001 af

Pond PP110: Proposed Silt Sock to be Peak Elev=212.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond PPT3: Catch Basin #4 Peak Elev=232.39' Inflow=0.34 cfs 0.023 af
15.0" Round Culvert n=0.010 L=50.0' S=0.0024 '/' Outflow=0.34 cfs 0.023 af

Pond SI1: Subsurface Infiltration Peak Elev=224.17' Storage=15 cf Inflow=0.03 cfs 0.016 af
Discarded=0.03 cfs 0.016 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.016 af

Link L100: Northern Wetlands & North of Site Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link L200: Inlet at Start of Redemption Rd; West Side Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link L300: Southwest Corner of Far-East Lot; Bottom of Hill Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link L400: Southwest Corner of Far-East Lot; Bottom of Hill Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link L500: Inlet at Start of Gravel Drive; East Side Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 16.590 ac Runoff Volume = 0.074 af Average Runoff Depth = 0.05"
85.41% Pervious = 14.169 ac 14.59% Impervious = 2.421 ac

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PS1: Northwest portion of Runoff Area=101,958 sf 0.00% Impervious Runoff Depth=0.07"
Flow Length=373' Tc=15.4 min CN=48 Runoff=0.02 cfs 0.014 af

Subcatchment PS10: South-center portion Runoff Area=15,431 sf 13.51% Impervious Runoff Depth=0.21"
Flow Length=151' Tc=5.6 min CN=55 Runoff=0.02 cfs 0.006 af

Subcatchment PS11: Eastern portion of Runoff Area=35,131 sf 0.00% Impervious Runoff Depth=0.10"
Flow Length=335' Tc=20.7 min CN=50 Runoff=0.01 cfs 0.007 af

Subcatchment PS12: South-center portion Runoff Area=47,403 sf 8.55% Impervious Runoff Depth=0.30"
Flow Length=348' Tc=13.1 min CN=58 Runoff=0.09 cfs 0.027 af

Subcatchment PS13: Area north of prop. Runoff Area=21,222 sf 17.10% Impervious Runoff Depth=0.90"
Flow Length=245' Tc=8.9 min CN=73 Runoff=0.40 cfs 0.037 af

Subcatchment PS14: Area at Runoff Area=7,728 sf 70.54% Impervious Runoff Depth=2.14"
Flow Length=107' Tc=3.4 min CN=91 Runoff=0.49 cfs 0.032 af

Subcatchment PS15: NE corner of building Runoff Area=8,288 sf 93.93% Impervious Runoff Depth=2.84"
Flow Length=62' Slope=0.1000 '/' Tc=0.4 min CN=98 Runoff=0.66 cfs 0.045 af

Subcatchment PS16: NW corner of building Runoff Area=6,627 sf 93.98% Impervious Runoff Depth=2.84"
Flow Length=62' Slope=0.1000 '/' Tc=0.4 min CN=98 Runoff=0.53 cfs 0.036 af

Subcatchment PS17: Parking Lot West of Runoff Area=13,293 sf 91.70% Impervious Runoff Depth=2.32"
Flow Length=110' Tc=1.1 min CN=93 Runoff=0.95 cfs 0.059 af

Subcatchment PS19: SW corner of building Runoff Area=6,734 sf 92.81% Impervious Runoff Depth=2.84"
Flow Length=50' Slope=0.1000 '/' Tc=0.4 min CN=98 Runoff=0.54 cfs 0.037 af

Subcatchment PS20: Parking Lot Runoff Area=4,622 sf 81.03% Impervious Runoff Depth=1.80"
Flow Length=88' Slope=0.0170 '/' Tc=1.0 min CN=87 Runoff=0.27 cfs 0.016 af

Subcatchment PS22: SE corner of building Runoff Area=6,730 sf 92.87% Impervious Runoff Depth=2.84"
Flow Length=50' Slope=0.1000 '/' Tc=0.4 min CN=98 Runoff=0.54 cfs 0.037 af

Subcatchment PS23: Area between building Runoff Area=13,335 sf 0.00% Impervious Runoff Depth=0.17"
Flow Length=157' Tc=3.7 min CN=53 Runoff=0.01 cfs 0.004 af

Subcatchment PS24: Southwest portion of Runoff Area=75,770 sf 0.00% Impervious Runoff Depth=0.09"
Flow Length=569' Tc=11.4 min CN=49 Runoff=0.01 cfs 0.012 af

Subcatchment PS25: Area that contains Runoff Area=30,280 sf 1.00% Impervious Runoff Depth=0.02"
Flow Length=386' Tc=7.5 min CN=44 Runoff=0.00 cfs 0.001 af

Subcatchment PS26: Area containg Link Runoff Area=16,294 sf 25.02% Impervious Runoff Depth=0.30"
Flow Length=252' Tc=5.0 min CN=58 Runoff=0.04 cfs 0.009 af

Subcatchment PS28: area at south edge of Runoff Area=9,699 sf 56.14% Impervious Runoff Depth=1.12"
Flow Length=168' Tc=0.9 min CN=77 Runoff=0.35 cfs 0.021 af

Subcatchment PS29: Area between Prop. Runoff Area=10,273 sf 22.32% Impervious Runoff Depth=0.21"
Flow Length=82' Tc=5.3 min CN=55 Runoff=0.01 cfs 0.004 af

Subcatchment PS3: Northern corner portion Runoff Area=20,440 sf 0.00% Impervious Runoff Depth=0.02"
Flow Length=222' Slope=0.0100 '/' Tc=11.7 min CN=44 Runoff=0.00 cfs 0.001 af

Subcatchment PS30: Parking Lot Runoff Area=26,697 sf 62.68% Impervious Runoff Depth=1.43"
Flow Length=248' Tc=1.5 min CN=82 Runoff=1.22 cfs 0.073 af

Subcatchment PS4: Lower north corner of Runoff Area=40,570 sf 27.77% Impervious Runoff Depth=1.18"
Flow Length=325' Tc=12.0 min CN=78 Runoff=0.93 cfs 0.092 af

Subcatchment PS6: Northeast area of Runoff Area=64,817 sf 0.00% Impervious Runoff Depth=0.75"
Flow Length=294' Tc=23.9 min CN=70 Runoff=0.60 cfs 0.093 af

Subcatchment PS7: Eastern Corner of Runoff Area=8,718 sf 24.33% Impervious Runoff Depth=0.17"
Flow Length=135' Tc=7.7 min CN=53 Runoff=0.01 cfs 0.003 af

Subcatchment PS8: West portion of Runoff Area=55,723 sf 9.96% Impervious Runoff Depth=0.43"
Flow Length=344' Tc=12.7 min CN=62 Runoff=0.26 cfs 0.045 af

Subcatchment PS9: East portion of easterly Runoff Area=74,872 sf 0.00% Impervious Runoff Depth=0.02"
Flow Length=235' Tc=7.5 min CN=44 Runoff=0.01 cfs 0.003 af

Reach ER70: Wetlands Starting North Avg. Flow Depth=0.00' Max Vel=0.31 fps Inflow=0.00 cfs 0.001 af
n=0.035 L=350.0' S=0.0100 '/' Capacity=328.04 cfs Outflow=0.00 cfs 0.001 af

Reach ER72: Northwest Wetlands Avg. Flow Depth=0.00' Max Vel=0.39 fps Inflow=0.02 cfs 0.014 af
n=0.035 L=221.0' S=0.0158 '/' Capacity=556.72 cfs Outflow=0.02 cfs 0.014 af

Reach ER73: Wetlands Flowing on Map Avg. Flow Depth=0.00' Max Vel=0.63 fps Inflow=0.02 cfs 0.019 af
n=0.035 L=320.0' S=0.0406 '/' Capacity=795.12 cfs Outflow=0.02 cfs 0.019 af

Reach ER81: SE Portion of Middle Lot Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.750 L=370.0' S=0.0554 '/' Capacity=13.04 cfs Outflow=0.00 cfs 0.000 af

Reach ER82: Swale Located on North Avg. Flow Depth=0.04' Max Vel=0.85 fps Inflow=0.40 cfs 0.037 af
n=0.035 L=80.0' S=0.0250 '/' Capacity=296.49 cfs Outflow=0.39 cfs 0.037 af

Reach ER84: Swale Located on North Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=140.0' S=0.0071 '/' Capacity=239.10 cfs Outflow=0.00 cfs 0.000 af

Reach ER85: End of Swale located Avg. Flow Depth=0.07' Max Vel=0.84 fps Inflow=0.26 cfs 0.045 af
n=0.035 L=75.0' S=0.0133 '/' Capacity=528.23 cfs Outflow=0.26 cfs 0.045 af

Reach PR62: Swale South of Proposed Avg. Flow Depth=0.20' Max Vel=3.16 fps Inflow=0.49 cfs 0.032 af
n=0.022 L=130.0' S=0.0500 '/' Capacity=37.30 cfs Outflow=0.49 cfs 0.032 af

Reach PR63: Swale North of gravel Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.022 L=80.0' S=0.0500 '/' Capacity=50.13 cfs Outflow=0.00 cfs 0.000 af

Reach PR64: Pipe PDL5 Avg. Flow Depth=0.38' Max Vel=4.85 fps Inflow=1.35 cfs 0.151 af
12.0" Round Pipe n=0.010 L=170.0' S=0.0086 '/' Capacity=4.31 cfs Outflow=1.35 cfs 0.151 af

Pond BR1: Bioswale-ISR 1 (CB5) Peak Elev=229.04' Storage=1,730 cf Inflow=1.53 cfs 0.171 af
Primary=0.03 cfs 0.039 af Secondary=1.33 cfs 0.111 af Outflow=1.35 cfs 0.151 af

Pond BR2: Bioswale-ISR 2 (CB3) Peak Elev=230.03' Storage=3,193 cf Inflow=3.40 cfs 0.220 af
Primary=0.18 cfs 0.140 af Secondary=1.24 cfs 0.053 af Outflow=1.42 cfs 0.192 af

Pond DE1: Drip Edge along Northeastern Peak Elev=232.97' Storage=115 cf Inflow=0.66 cfs 0.045 af
6.0" Round Culvert x 2.00 n=0.010 L=35.0' S=0.0086 '/' Outflow=0.65 cfs 0.044 af

Pond DE2: Drip Edge along Northwestern Peak Elev=233.14' Storage=130 cf Inflow=0.53 cfs 0.036 af
6.0" Round Culvert n=0.010 L=40.0' S=0.0025 '/' Outflow=0.45 cfs 0.035 af

Pond DE3: Drip Edge along Southwestern Peak Elev=235.99' Storage=154 cf Inflow=0.54 cfs 0.037 af
8.0" Round Culvert n=0.010 L=40.0' S=0.0000 '/' Outflow=0.49 cfs 0.036 af

Pond DE4: Drip Edge along Southeastern Peak Elev=235.06' Storage=166 cf Inflow=0.54 cfs 0.037 af
8.0" Round Culvert n=0.010 L=100.0' S=0.0000 '/' Outflow=0.47 cfs 0.036 af

Pond EP81: Middle Portion of Wetland Peak Elev=233.50' Storage=4,070 cf Inflow=0.60 cfs 0.093 af
Outflow=0.00 cfs 0.000 af

Pond PCB2: CB2 - Catch Basin at the end of Bioswale "A" Peak Elev=212.60' Inflow=0.00 cfs 0.000 af
12.0" Round Culvert n=0.013 L=85.0' S=0.0071 '/' Outflow=0.00 cfs 0.000 af

Pond PCB4: Catch Basin #3 Peak Elev=233.09' Inflow=0.95 cfs 0.059 af
15.0" Round Culvert n=0.010 L=135.0' S=0.0025 '/' Outflow=0.95 cfs 0.059 af

Pond PDMH1: Drain Manhole #5 Peak Elev=232.67' Inflow=1.71 cfs 0.111 af
15.0" Round Culvert n=0.010 L=205.0' S=0.0025 '/' Outflow=1.71 cfs 0.111 af

Pond PP108: Bioswale "A" Peak Elev=214.95' Storage=690 cf Inflow=0.82 cfs 0.057 af
cfs 0.057 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.057 af

Pond PP109: Stormwater Detention Peak Elev=212.37' Storage=850 cf Inflow=0.43 cfs 0.070 af
Discarded=0.06 cfs 0.070 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.070 af

Pond PP110: Proposed Silt Sock to be Peak Elev=212.59' Storage=120 cf Inflow=0.01 cfs 0.003 af
Outflow=0.00 cfs 0.000 af

Pond PPT3: Catch Basin #4 Peak Elev=232.90' Inflow=1.71 cfs 0.111 af
15.0" Round Culvert n=0.010 L=50.0' S=0.0024 '/' Outflow=1.71 cfs 0.111 af

Pond SI1: Subsurface Infiltration Peak Elev=225.13' Storage=3,253 cf Inflow=2.76 cfs 0.343 af
Discarded=0.61 cfs 0.343 af Primary=0.00 cfs 0.000 af Outflow=0.61 cfs 0.343 af

Link L100: Northern Wetlands & North of Site Inflow=0.00 cfs 0.001 af
Primary=0.00 cfs 0.001 af

Link L200: Inlet at Start of Redemption Rd; West Side Inflow=0.04 cfs 0.032 af
Primary=0.04 cfs 0.032 af

Link L300: Southwest Corner of Far-East Lot; Bottom of Hill Inflow=0.01 cfs 0.003 af
Primary=0.01 cfs 0.003 af

Link L400: Southwest Corner of Far-East Lot; Bottom of Hill Inflow=0.27 cfs 0.052 af
Primary=0.27 cfs 0.052 af

Link L500: Inlet at Start of Gravel Drive; East Side Inflow=0.04 cfs 0.009 af
Primary=0.04 cfs 0.009 af

Total Runoff Area = 16.590 ac Runoff Volume = 0.713 af Average Runoff Depth = 0.52"
85.41% Pervious = 14.169 ac 14.59% Impervious = 2.421 ac

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PS1: Northwest portion of Runoff Area=101,958 sf 0.00% Impervious Runoff Depth=0.45"
Flow Length=373' Tc=15.4 min CN=48 Runoff=0.26 cfs 0.088 af

Subcatchment PS10: South-center portion Runoff Area=15,431 sf 13.51% Impervious Runoff Depth=0.79"
Flow Length=151' Tc=5.6 min CN=55 Runoff=0.20 cfs 0.023 af

Subcatchment PS11: Eastern portion of Runoff Area=35,131 sf 0.00% Impervious Runoff Depth=0.54"
Flow Length=335' Tc=20.7 min CN=50 Runoff=0.12 cfs 0.036 af

Subcatchment PS12: South-center portion Runoff Area=47,403 sf 8.55% Impervious Runoff Depth=0.96"
Flow Length=348' Tc=13.1 min CN=58 Runoff=0.61 cfs 0.087 af

Subcatchment PS13: Area north of prop. Runoff Area=21,222 sf 17.10% Impervious Runoff Depth=1.98"
Flow Length=245' Tc=8.9 min CN=73 Runoff=0.83 cfs 0.080 af

Subcatchment PS14: Area at Runoff Area=7,728 sf 70.54% Impervious Runoff Depth=3.60"
Flow Length=107' Tc=3.4 min CN=91 Runoff=0.70 cfs 0.053 af

Subcatchment PS15: NE corner of building Runoff Area=8,288 sf 93.93% Impervious Runoff Depth=4.37"
Flow Length=62' Slope=0.1000 '/' Tc=0.4 min CN=98 Runoff=0.86 cfs 0.069 af

Subcatchment PS16: NW corner of building Runoff Area=6,627 sf 93.98% Impervious Runoff Depth=4.37"
Flow Length=62' Slope=0.1000 '/' Tc=0.4 min CN=98 Runoff=0.68 cfs 0.055 af

Subcatchment PS17: Parking Lot West of Runoff Area=13,293 sf 91.70% Impervious Runoff Depth=3.82"
Flow Length=110' Tc=1.1 min CN=93 Runoff=1.29 cfs 0.097 af

Subcatchment PS19: SW corner of building Runoff Area=6,734 sf 92.81% Impervious Runoff Depth=4.37"
Flow Length=50' Slope=0.1000 '/' Tc=0.4 min CN=98 Runoff=0.70 cfs 0.056 af

Subcatchment PS20: Parking Lot Runoff Area=4,622 sf 81.03% Impervious Runoff Depth=3.20"
Flow Length=88' Slope=0.0170 '/' Tc=1.0 min CN=87 Runoff=0.40 cfs 0.028 af

Subcatchment PS22: SE corner of building Runoff Area=6,730 sf 92.87% Impervious Runoff Depth=4.37"
Flow Length=50' Slope=0.1000 '/' Tc=0.4 min CN=98 Runoff=0.70 cfs 0.056 af

Subcatchment PS23: Area between building Runoff Area=13,335 sf 0.00% Impervious Runoff Depth=0.69"
Flow Length=157' Tc=3.7 min CN=53 Runoff=0.15 cfs 0.018 af

Subcatchment PS24: Southwest portion of Runoff Area=75,770 sf 0.00% Impervious Runoff Depth=0.49"
Flow Length=569' Tc=11.4 min CN=49 Runoff=0.26 cfs 0.072 af

Subcatchment PS25: Area that contains Runoff Area=30,280 sf 1.00% Impervious Runoff Depth=0.29"
Flow Length=386' Tc=7.5 min CN=44 Runoff=0.03 cfs 0.017 af

Subcatchment PS26: Area containg Link Runoff Area=16,294 sf 25.02% Impervious Runoff Depth=0.96"
Flow Length=252' Tc=5.0 min CN=58 Runoff=0.30 cfs 0.030 af

Subcatchment PS28: area at south edge of Runoff Area=9,699 sf 56.14% Impervious Runoff Depth=2.30"
Flow Length=168' Tc=0.9 min CN=77 Runoff=0.62 cfs 0.043 af

Subcatchment PS29: Area between Prop. Runoff Area=10,273 sf 22.32% Impervious Runoff Depth=0.79"
Flow Length=82' Tc=5.3 min CN=55 Runoff=0.13 cfs 0.016 af

Subcatchment PS3: Northern corner portion Runoff Area=20,440 sf 0.00% Impervious Runoff Depth=0.29"
Flow Length=222' Slope=0.0100 '/' Tc=11.7 min CN=44 Runoff=0.02 cfs 0.011 af

Subcatchment PS30: Parking Lot Runoff Area=26,697 sf 62.68% Impervious Runoff Depth=2.73"
Flow Length=248' Tc=1.5 min CN=82 Runoff=1.99 cfs 0.140 af

Subcatchment PS4: Lower north corner of Runoff Area=40,570 sf 27.77% Impervious Runoff Depth=2.38"
Flow Length=325' Tc=12.0 min CN=78 Runoff=1.73 cfs 0.185 af

Subcatchment PS6: Northeast area of Runoff Area=64,817 sf 0.00% Impervious Runoff Depth=1.75"
Flow Length=294' Tc=23.9 min CN=70 Runoff=1.43 cfs 0.217 af

Subcatchment PS7: Eastern Corner of Runoff Area=8,718 sf 24.33% Impervious Runoff Depth=0.69"
Flow Length=135' Tc=7.7 min CN=53 Runoff=0.07 cfs 0.011 af

Subcatchment PS8: West portion of Runoff Area=55,723 sf 9.96% Impervious Runoff Depth=1.20"
Flow Length=344' Tc=12.7 min CN=62 Runoff=1.01 cfs 0.128 af

Subcatchment PS9: East portion of easterly Runoff Area=74,872 sf 0.00% Impervious Runoff Depth=0.29"
Flow Length=235' Tc=7.5 min CN=44 Runoff=0.08 cfs 0.041 af

Reach ER70: Wetlands Starting North Avg. Flow Depth=0.00' Max Vel=0.31 fps Inflow=0.02 cfs 0.011 af
n=0.035 L=350.0' S=0.0100 '/' Capacity=328.04 cfs Outflow=0.02 cfs 0.011 af

Reach ER72: Northwest Wetlands Avg. Flow Depth=0.02' Max Vel=0.45 fps Inflow=0.26 cfs 0.099 af
n=0.035 L=221.0' S=0.0158 '/' Capacity=556.72 cfs Outflow=0.25 cfs 0.099 af

Reach ER73: Wetlands Flowing on Map Avg. Flow Depth=0.02' Max Vel=0.66 fps Inflow=0.30 cfs 0.117 af
n=0.035 L=320.0' S=0.0406 '/' Capacity=795.12 cfs Outflow=0.28 cfs 0.117 af

Reach ER81: SE Portion of Middle Lot Avg. Flow Depth=0.14' Max Vel=0.09 fps Inflow=0.21 cfs 0.123 af
n=0.750 L=370.0' S=0.0554 '/' Capacity=13.04 cfs Outflow=0.17 cfs 0.123 af

Reach ER82: Swale Located on North Avg. Flow Depth=0.07' Max Vel=1.13 fps Inflow=0.83 cfs 0.080 af
n=0.035 L=80.0' S=0.0250 '/' Capacity=296.49 cfs Outflow=0.82 cfs 0.080 af

Reach ER84: Swale Located on North Avg. Flow Depth=0.03' Max Vel=0.40 fps Inflow=0.09 cfs 0.030 af
n=0.035 L=140.0' S=0.0071 '/' Capacity=239.10 cfs Outflow=0.09 cfs 0.030 af

Reach ER85: End of Swale located Avg. Flow Depth=0.16' Max Vel=1.37 fps Inflow=1.01 cfs 0.282 af
n=0.035 L=75.0' S=0.0133 '/' Capacity=528.23 cfs Outflow=1.01 cfs 0.282 af

Reach PR62: Swale South of Proposed Avg. Flow Depth=0.22' Max Vel=3.45 fps Inflow=0.70 cfs 0.053 af
n=0.022 L=130.0' S=0.0500 '/' Capacity=37.30 cfs Outflow=0.70 cfs 0.053 af

Reach PR63: Swale North of gravel Avg. Flow Depth=0.02' Max Vel=1.09 fps Inflow=0.02 cfs 0.004 af
n=0.022 L=80.0' S=0.0500 '/' Capacity=50.13 cfs Outflow=0.02 cfs 0.004 af

Reach PR64: Pipe PDL5 Avg. Flow Depth=0.52' Max Vel=5.59 fps Inflow=2.32 cfs 0.288 af
12.0" Round Pipe n=0.010 L=170.0' S=0.0086 '/' Capacity=4.31 cfs Outflow=2.32 cfs 0.288 af

Pond BR1: Bioswale-ISR 1 (CB5) Peak Elev=229.19' Storage=1,891 cf Inflow=2.43 cfs 0.308 af
Primary=0.03 cfs 0.044 af Secondary=2.30 cfs 0.244 af Outflow=2.32 cfs 0.288 af

Pond BR2: Bioswale-ISR 2 (CB3) Peak Elev=230.32' Storage=3,858 cf Inflow=4.93 cfs 0.376 af
Primary=0.19 cfs 0.204 af Secondary=3.32 cfs 0.145 af Outflow=3.51 cfs 0.349 af

Pond DE1: Drip Edge along Northeastern Peak Elev=233.05' Storage=130 cf Inflow=0.86 cfs 0.069 af
6.0" Round Culvert x 2.00 n=0.010 L=35.0' S=0.0086 '/' Outflow=0.84 cfs 0.068 af

Pond DE2: Drip Edge along Northwestern Peak Elev=233.35' Storage=163 cf Inflow=0.68 cfs 0.055 af
6.0" Round Culvert n=0.010 L=40.0' S=0.0025 '/' Outflow=0.58 cfs 0.055 af

Pond DE3: Drip Edge along Southwestern Peak Elev=236.12' Storage=177 cf Inflow=0.70 cfs 0.056 af
8.0" Round Culvert n=0.010 L=40.0' S=0.0000 '/' Outflow=0.64 cfs 0.056 af

Pond DE4: Drip Edge along Southeastern Peak Elev=235.22' Storage=195 cf Inflow=0.70 cfs 0.056 af
8.0" Round Culvert n=0.010 L=100.0' S=0.0000 '/' Outflow=0.59 cfs 0.056 af

Pond EP81: Middle Portion of Wetland Peak Elev=233.61' Storage=4,706 cf Inflow=1.43 cfs 0.217 af
Outflow=0.21 cfs 0.123 af

Pond PCB2: CB2 - Catch Basin at the end of Bioswale "A" Peak Elev=212.69' Inflow=0.02 cfs 0.004 af
12.0" Round Culvert n=0.013 L=85.0' S=0.0071 '/' Outflow=0.02 cfs 0.004 af

Pond PCB4: Catch Basin #3 Peak Elev=233.27' Inflow=1.29 cfs 0.097 af
15.0" Round Culvert n=0.010 L=135.0' S=0.0025 '/' Outflow=1.29 cfs 0.097 af

Pond PDMH1: Drain Manhole #5 Peak Elev=232.82' Inflow=2.33 cfs 0.181 af
15.0" Round Culvert n=0.010 L=205.0' S=0.0025 '/' Outflow=2.33 cfs 0.181 af

Pond PP108: Bioswale "A" Peak Elev=216.13' Storage=1,353 cf Inflow=1.40 cfs 0.112 af
cfs 0.108 af Primary=0.02 cfs 0.004 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.112 af

Pond PP109: Stormwater Detention Peak Elev=213.56' Storage=3,608 cf Inflow=1.40 cfs 0.204 af
Discarded=0.10 cfs 0.182 af Primary=0.07 cfs 0.022 af Secondary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.204 af

Pond PP110: Proposed Silt Sock to be Peak Elev=212.69' Storage=153 cf Inflow=0.09 cfs 0.034 af
Outflow=0.09 cfs 0.030 af

Pond PPT3: Catch Basin #4 Peak Elev=233.08' Inflow=2.33 cfs 0.181 af
15.0" Round Culvert n=0.010 L=50.0' S=0.0024 '/' Outflow=2.33 cfs 0.181 af

Pond SI1: Subsurface Infiltration Peak Elev=226.73' Storage=8,697 cf Inflow=5.47 cfs 0.636 af
Discarded=0.65 cfs 0.636 af Primary=0.00 cfs 0.000 af Outflow=0.65 cfs 0.636 af

Link L100: Northern Wetlands & North of Site Inflow=0.02 cfs 0.011 af
Primary=0.02 cfs 0.011 af

Link L200: Inlet at Start of Redemption Rd; West Side Inflow=0.51 cfs 0.205 af
Primary=0.51 cfs 0.205 af

Link L300: Southwest Corner of Far-East Lot; Bottom of Hill Inflow=0.08 cfs 0.041 af
Primary=0.08 cfs 0.041 af

Link L400: Southwest Corner of Far-East Lot; Bottom of Hill Inflow=1.14 cfs 0.305 af
Primary=1.14 cfs 0.305 af

Link L500: Inlet at Start of Gravel Drive; East Side Inflow=0.30 cfs 0.034 af
Primary=0.30 cfs 0.034 af

Total Runoff Area = 16.590 ac Runoff Volume = 1.659 af Average Runoff Depth = 1.20"
85.41% Pervious = 14.169 ac 14.59% Impervious = 2.421 ac

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PS1: Northwest portion of Runoff Area=101,958 sf 0.00% Impervious Runoff Depth=0.93"
Flow Length=373' Tc=15.4 min CN=48 Runoff=0.93 cfs 0.181 af

Subcatchment PS10: South-center portion Runoff Area=15,431 sf 13.51% Impervious Runoff Depth=1.42"
Flow Length=151' Tc=5.6 min CN=55 Runoff=0.42 cfs 0.042 af

Subcatchment PS11: Eastern portion of Runoff Area=35,131 sf 0.00% Impervious Runoff Depth=1.06"
Flow Length=335' Tc=20.7 min CN=50 Runoff=0.36 cfs 0.071 af

Subcatchment PS12: South-center portion Runoff Area=47,403 sf 8.55% Impervious Runoff Depth=1.65"
Flow Length=348' Tc=13.1 min CN=58 Runoff=1.14 cfs 0.150 af

Subcatchment PS13: Area north of prop. Runoff Area=21,222 sf 17.10% Impervious Runoff Depth=2.95"
Flow Length=245' Tc=8.9 min CN=73 Runoff=1.20 cfs 0.120 af

Subcatchment PS14: Area at Runoff Area=7,728 sf 70.54% Impervious Runoff Depth=4.79"
Flow Length=107' Tc=3.4 min CN=91 Runoff=0.87 cfs 0.071 af

Subcatchment PS15: NE corner of building Runoff Area=8,288 sf 93.93% Impervious Runoff Depth=5.59"
Flow Length=62' Slope=0.1000 '/' Tc=0.4 min CN=98 Runoff=1.03 cfs 0.089 af

Subcatchment PS16: NW corner of building Runoff Area=6,627 sf 93.98% Impervious Runoff Depth=5.59"
Flow Length=62' Slope=0.1000 '/' Tc=0.4 min CN=98 Runoff=0.82 cfs 0.071 af

Subcatchment PS17: Parking Lot West of Runoff Area=13,293 sf 91.70% Impervious Runoff Depth=5.01"
Flow Length=110' Tc=1.1 min CN=93 Runoff=1.58 cfs 0.128 af

Subcatchment PS19: SW corner of building Runoff Area=6,734 sf 92.81% Impervious Runoff Depth=5.59"
Flow Length=50' Slope=0.1000 '/' Tc=0.4 min CN=98 Runoff=0.83 cfs 0.072 af

Subcatchment PS20: Parking Lot Runoff Area=4,622 sf 81.03% Impervious Runoff Depth=4.35"
Flow Length=88' Slope=0.0170 '/' Tc=1.0 min CN=87 Runoff=0.50 cfs 0.039 af

Subcatchment PS22: SE corner of building Runoff Area=6,730 sf 92.87% Impervious Runoff Depth=5.59"
Flow Length=50' Slope=0.1000 '/' Tc=0.4 min CN=98 Runoff=0.83 cfs 0.072 af

Subcatchment PS23: Area between building Runoff Area=13,335 sf 0.00% Impervious Runoff Depth=1.27"
Flow Length=157' Tc=3.7 min CN=53 Runoff=0.34 cfs 0.032 af

Subcatchment PS24: Southwest portion of Runoff Area=75,770 sf 0.00% Impervious Runoff Depth=0.99"
Flow Length=569' Tc=11.4 min CN=49 Runoff=0.88 cfs 0.144 af

Subcatchment PS25: Area that contains Runoff Area=30,280 sf 1.00% Impervious Runoff Depth=0.67"
Flow Length=386' Tc=7.5 min CN=44 Runoff=0.16 cfs 0.039 af

Subcatchment PS26: Area containg Link Runoff Area=16,294 sf 25.02% Impervious Runoff Depth=1.65"
Flow Length=252' Tc=5.0 min CN=58 Runoff=0.56 cfs 0.051 af

Subcatchment PS28: area at south edge of Runoff Area=9,699 sf 56.14% Impervious Runoff Depth=3.33"
Flow Length=168' Tc=0.9 min CN=77 Runoff=0.84 cfs 0.062 af

Subcatchment PS29: Area between Prop. Runoff Area=10,273 sf 22.32% Impervious Runoff Depth=1.42"
Flow Length=82' Tc=5.3 min CN=55 Runoff=0.28 cfs 0.028 af

Subcatchment PS3: Northern corner portion Runoff Area=20,440 sf 0.00% Impervious Runoff Depth=0.67"
Flow Length=222' Slope=0.0100 '/' Tc=11.7 min CN=44 Runoff=0.10 cfs 0.026 af

Subcatchment PS30: Parking Lot Runoff Area=26,697 sf 62.68% Impervious Runoff Depth=3.83"
Flow Length=248' Tc=1.5 min CN=82 Runoff=2.62 cfs 0.196 af

Subcatchment PS4: Lower north corner of Runoff Area=40,570 sf 27.77% Impervious Runoff Depth=3.43"
Flow Length=325' Tc=12.0 min CN=78 Runoff=2.37 cfs 0.266 af

Subcatchment PS6: Northeast area of Runoff Area=64,817 sf 0.00% Impervious Runoff Depth=2.67"
Flow Length=294' Tc=23.9 min CN=70 Runoff=2.14 cfs 0.331 af

Subcatchment PS7: Eastern Corner of Runoff Area=8,718 sf 24.33% Impervious Runoff Depth=1.27"
Flow Length=135' Tc=7.7 min CN=53 Runoff=0.18 cfs 0.021 af

Subcatchment PS8: West portion of Runoff Area=55,723 sf 9.96% Impervious Runoff Depth=1.98"
Flow Length=344' Tc=12.7 min CN=62 Runoff=1.71 cfs 0.211 af

Subcatchment PS9: East portion of easterly Runoff Area=74,872 sf 0.00% Impervious Runoff Depth=0.67"
Flow Length=235' Tc=7.5 min CN=44 Runoff=0.41 cfs 0.097 af

Reach ER70: Wetlands Starting North Avg. Flow Depth=0.01' Max Vel=0.31 fps Inflow=0.10 cfs 0.026 af
n=0.035 L=350.0' S=0.0100 '/' Capacity=328.04 cfs Outflow=0.07 cfs 0.026 af

Reach ER72: Northwest Wetlands Avg. Flow Depth=0.05' Max Vel=0.72 fps Inflow=0.96 cfs 0.207 af
n=0.035 L=221.0' S=0.0158 '/' Capacity=556.72 cfs Outflow=0.90 cfs 0.207 af

Reach ER73: Wetlands Flowing on Map Avg. Flow Depth=0.05' Max Vel=1.23 fps Inflow=1.40 cfs 0.311 af
n=0.035 L=320.0' S=0.0406 '/' Capacity=795.12 cfs Outflow=1.38 cfs 0.311 af

Reach ER81: SE Portion of Middle Lot Avg. Flow Depth=0.22' Max Vel=0.13 fps Inflow=0.71 cfs 0.237 af
n=0.750 L=370.0' S=0.0554 '/' Capacity=13.04 cfs Outflow=0.48 cfs 0.237 af

Reach ER82: Swale Located on North Avg. Flow Depth=0.09' Max Vel=1.30 fps Inflow=1.20 cfs 0.120 af
n=0.035 L=80.0' S=0.0250 '/' Capacity=296.49 cfs Outflow=1.19 cfs 0.120 af

Reach ER84: Swale Located on North Avg. Flow Depth=0.13' Max Vel=0.90 fps Inflow=0.76 cfs 0.166 af
n=0.035 L=140.0' S=0.0071 '/' Capacity=239.10 cfs Outflow=0.76 cfs 0.166 af

Reach ER85: End of Swale located Avg. Flow Depth=0.22' Max Vel=1.64 fps Inflow=1.71 cfs 0.613 af
n=0.035 L=75.0' S=0.0133 '/' Capacity=528.23 cfs Outflow=1.71 cfs 0.613 af

Reach PR62: Swale South of Proposed Avg. Flow Depth=0.24' Max Vel=3.64 fps Inflow=0.87 cfs 0.071 af
n=0.022 L=130.0' S=0.0500 '/' Capacity=37.30 cfs Outflow=0.86 cfs 0.071 af

Reach PR63: Swale North of gravel Avg. Flow Depth=0.11' Max Vel=2.81 fps Inflow=0.42 cfs 0.023 af
n=0.022 L=80.0' S=0.0500 '/' Capacity=50.13 cfs Outflow=0.42 cfs 0.023 af

Reach PR64: Pipe PDL5 Avg. Flow Depth=0.63' Max Vel=5.97 fps Inflow=3.11 cfs 0.404 af
12.0" Round Pipe n=0.010 L=170.0' S=0.0086 '/' Capacity=4.31 cfs Outflow=3.11 cfs 0.404 af

Pond BR1: Bioswale-ISR 1 (CB5) Peak Elev=229.30' Storage=2,004 cf Inflow=3.24 cfs 0.424 af
Primary=0.03 cfs 0.047 af Secondary=3.08 cfs 0.357 af Outflow=3.11 cfs 0.404 af

Pond BR2: Bioswale-ISR 2 (CB3) Peak Elev=230.44' Storage=4,151 cf Inflow=6.18 cfs 0.504 af
Primary=0.19 cfs 0.241 af Secondary=4.44 cfs 0.236 af Outflow=4.63 cfs 0.477 af

Pond DE1: Drip Edge along Northeastern Peak Elev=233.13' Storage=148 cf Inflow=1.03 cfs 0.089 af
6.0" Round Culvert x 2.00 n=0.010 L=35.0' S=0.0086 '/' Outflow=1.01 cfs 0.088 af

Pond DE2: Drip Edge along Northwestern Peak Elev=233.52' Storage=190 cf Inflow=0.82 cfs 0.071 af
6.0" Round Culvert n=0.010 L=40.0' S=0.0025 '/' Outflow=0.68 cfs 0.070 af

Pond DE3: Drip Edge along Southwestern Peak Elev=236.23' Storage=199 cf Inflow=0.83 cfs 0.072 af
8.0" Round Culvert n=0.010 L=40.0' S=0.0000 '/' Outflow=0.74 cfs 0.071 af

Pond DE4: Drip Edge along Southeastern Peak Elev=235.37' Storage=224 cf Inflow=0.83 cfs 0.072 af
8.0" Round Culvert n=0.010 L=100.0' S=0.0000 '/' Outflow=0.71 cfs 0.071 af

Pond EP81: Middle Portion of Wetland Peak Elev=233.76' Storage=5,557 cf Inflow=2.14 cfs 0.331 af
Outflow=0.71 cfs 0.237 af

Pond PCB2: CB2 - Catch Basin at the end of Bioswale "A" Peak Elev=212.95' Inflow=0.42 cfs 0.023 af
12.0" Round Culvert n=0.013 L=85.0' S=0.0071 '/' Outflow=0.42 cfs 0.023 af

Pond PCB4: Catch Basin #3 Peak Elev=233.41' Inflow=1.58 cfs 0.128 af
15.0" Round Culvert n=0.010 L=135.0' S=0.0025 '/' Outflow=1.58 cfs 0.128 af

Pond PDMH1: Drain Manhole #5 Peak Elev=232.94' Inflow=2.83 cfs 0.237 af
15.0" Round Culvert n=0.010 L=205.0' S=0.0025 '/' Outflow=2.83 cfs 0.237 af

Pond PP108: Bioswale "A" Peak Elev=216.40' Storage=1,684 cf Inflow=1.92 cfs 0.161 af
cfs 0.138 af Primary=0.04 cfs 0.009 af Secondary=0.38 cfs 0.014 af Tertiary=0.00 cfs 0.000 af Outflow=0.58 cfs 0.161 af

Pond PP109: Stormwater Detention Peak Elev=213.77' Storage=4,102 cf Inflow=2.44 cfs 0.341 af
Discarded=0.11 cfs 0.193 af Primary=0.72 cfs 0.148 af Secondary=0.00 cfs 0.000 af Outflow=0.82 cfs 0.341 af

Pond PP110: Proposed Silt Sock to be Peak Elev=212.77' Storage=180 cf Inflow=0.76 cfs 0.169 af
Outflow=0.76 cfs 0.166 af

Pond PPT3: Catch Basin #4 Peak Elev=233.22' Inflow=2.83 cfs 0.237 af
15.0" Round Culvert n=0.010 L=50.0' S=0.0024 '/' Outflow=2.83 cfs 0.237 af

Pond SI1: Subsurface Infiltration Peak Elev=227.60' Storage=11,665 cf Inflow=7.18 cfs 0.881 af
Discarded=0.67 cfs 0.809 af Primary=0.79 cfs 0.072 af Outflow=1.45 cfs 0.881 af

Link L100: Northern Wetlands & North of Site Inflow=0.10 cfs 0.026 af
Primary=0.10 cfs 0.026 af

Link L200: Inlet at Start of Redemption Rd; West Side Inflow=1.76 cfs 0.494 af
Primary=1.76 cfs 0.494 af

Link L300: Southwest Corner of Far-East Lot; Bottom of Hill Inflow=0.41 cfs 0.097 af
Primary=0.41 cfs 0.097 af

Link L400: Southwest Corner of Far-East Lot; Bottom of Hill Inflow=1.97 cfs 0.655 af
Primary=1.97 cfs 0.655 af

Link L500: Inlet at Start of Gravel Drive; East Side Inflow=0.65 cfs 0.074 af
Primary=0.65 cfs 0.074 af

Total Runoff Area = 16.590 ac Runoff Volume = 2.608 af Average Runoff Depth = 1.89"
85.41% Pervious = 14.169 ac 14.59% Impervious = 2.421 ac

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PS1: Northwest portion of Runoff Area=101,958 sf 0.00% Impervious Runoff Depth=1.48"
Flow Length=373' Tc=15.4 min CN=48 Runoff=1.73 cfs 0.288 af

Subcatchment PS10: South-center portion Runoff Area=15,431 sf 13.51% Impervious Runoff Depth=2.10"
Flow Length=151' Tc=5.6 min CN=55 Runoff=0.63 cfs 0.062 af

Subcatchment PS11: Eastern portion of Runoff Area=35,131 sf 0.00% Impervious Runoff Depth=1.65"
Flow Length=335' Tc=20.7 min CN=50 Runoff=0.62 cfs 0.111 af

Subcatchment PS12: South-center portion Runoff Area=47,403 sf 8.55% Impervious Runoff Depth=2.39"
Flow Length=348' Tc=13.1 min CN=58 Runoff=1.66 cfs 0.217 af

Subcatchment PS13: Area north of prop. Runoff Area=21,222 sf 17.10% Impervious Runoff Depth=3.91"
Flow Length=245' Tc=8.9 min CN=73 Runoff=1.51 cfs 0.159 af

Subcatchment PS14: Area at Runoff Area=7,728 sf 70.54% Impervious Runoff Depth=5.91"
Flow Length=107' Tc=3.4 min CN=91 Runoff=1.00 cfs 0.087 af

Subcatchment PS15: NE corner of building Runoff Area=8,288 sf 93.93% Impervious Runoff Depth=6.73"
Flow Length=62' Slope=0.1000 '/' Tc=0.4 min CN=98 Runoff=1.16 cfs 0.107 af

Subcatchment PS16: NW corner of building Runoff Area=6,627 sf 93.98% Impervious Runoff Depth=6.73"
Flow Length=62' Slope=0.1000 '/' Tc=0.4 min CN=98 Runoff=0.93 cfs 0.085 af

Subcatchment PS17: Parking Lot West of Runoff Area=13,293 sf 91.70% Impervious Runoff Depth=6.14"
Flow Length=110' Tc=1.1 min CN=93 Runoff=1.80 cfs 0.156 af

Subcatchment PS19: SW corner of building Runoff Area=6,734 sf 92.81% Impervious Runoff Depth=6.73"
Flow Length=50' Slope=0.1000 '/' Tc=0.4 min CN=98 Runoff=0.94 cfs 0.087 af

Subcatchment PS20: Parking Lot Runoff Area=4,622 sf 81.03% Impervious Runoff Depth=5.45"
Flow Length=88' Slope=0.0170 '/' Tc=1.0 min CN=87 Runoff=0.58 cfs 0.048 af

Subcatchment PS22: SE corner of building Runoff Area=6,730 sf 92.87% Impervious Runoff Depth=6.73"
Flow Length=50' Slope=0.1000 '/' Tc=0.4 min CN=98 Runoff=0.94 cfs 0.087 af

Subcatchment PS23: Area between building Runoff Area=13,335 sf 0.00% Impervious Runoff Depth=1.92"
Flow Length=157' Tc=3.7 min CN=53 Runoff=0.53 cfs 0.049 af

Subcatchment PS24: Southwest portion of Runoff Area=75,770 sf 0.00% Impervious Runoff Depth=1.56"
Flow Length=569' Tc=11.4 min CN=49 Runoff=1.58 cfs 0.226 af

Subcatchment PS25: Area that contains Runoff Area=30,280 sf 1.00% Impervious Runoff Depth=1.14"
Flow Length=386' Tc=7.5 min CN=44 Runoff=0.43 cfs 0.066 af

Subcatchment PS26: Area containg Link Runoff Area=16,294 sf 25.02% Impervious Runoff Depth=2.39"
Flow Length=252' Tc=5.0 min CN=58 Runoff=0.80 cfs 0.074 af

Subcatchment PS28: area at south edge of Runoff Area=9,699 sf 56.14% Impervious Runoff Depth=4.34"
Flow Length=168' Tc=0.9 min CN=77 Runoff=1.02 cfs 0.081 af

Subcatchment PS29: Area between Prop. Runoff Area=10,273 sf 22.32% Impervious Runoff Depth=2.10"
Flow Length=82' Tc=5.3 min CN=55 Runoff=0.43 cfs 0.041 af

Subcatchment PS3: Northern corner portion Runoff Area=20,440 sf 0.00% Impervious Runoff Depth=1.14"
Flow Length=222' Slope=0.0100 '/' Tc=11.7 min CN=44 Runoff=0.25 cfs 0.045 af

Subcatchment PS30: Parking Lot Runoff Area=26,697 sf 62.68% Impervious Runoff Depth=4.89"
Flow Length=248' Tc=1.5 min CN=82 Runoff=3.10 cfs 0.250 af

Subcatchment PS4: Lower north corner of Runoff Area=40,570 sf 27.77% Impervious Runoff Depth=4.45"
Flow Length=325' Tc=12.0 min CN=78 Runoff=2.92 cfs 0.345 af

Subcatchment PS6: Northeast area of Runoff Area=64,817 sf 0.00% Impervious Runoff Depth=3.59"
Flow Length=294' Tc=23.9 min CN=70 Runoff=2.79 cfs 0.446 af

Subcatchment PS7: Eastern Corner of Runoff Area=8,718 sf 24.33% Impervious Runoff Depth=1.92"
Flow Length=135' Tc=7.7 min CN=53 Runoff=0.28 cfs 0.032 af

Subcatchment PS8: West portion of Runoff Area=55,723 sf 9.96% Impervious Runoff Depth=2.78"
Flow Length=344' Tc=12.7 min CN=62 Runoff=2.36 cfs 0.296 af

Subcatchment PS9: East portion of easterly Runoff Area=74,872 sf 0.00% Impervious Runoff Depth=1.14"
Flow Length=235' Tc=7.5 min CN=44 Runoff=1.07 cfs 0.163 af

Reach ER70: Wetlands Starting North Avg. Flow Depth=0.03' Max Vel=0.39 fps Inflow=0.25 cfs 0.045 af
n=0.035 L=350.0' S=0.0100 '/' Capacity=328.04 cfs Outflow=0.17 cfs 0.045 af

Reach ER72: Northwest Wetlands Avg. Flow Depth=0.07' Max Vel=0.94 fps Inflow=1.84 cfs 0.332 af
n=0.035 L=221.0' S=0.0158 '/' Capacity=556.72 cfs Outflow=1.77 cfs 0.332 af

Reach ER73: Wetlands Flowing on Map Avg. Flow Depth=0.10' Max Vel=1.78 fps Inflow=3.69 cfs 0.576 af
n=0.035 L=320.0' S=0.0406 '/' Capacity=795.12 cfs Outflow=3.66 cfs 0.576 af

Reach ER81: SE Portion of Middle Lot Avg. Flow Depth=0.30' Max Vel=0.16 fps Inflow=1.40 cfs 0.352 af
n=0.750 L=370.0' S=0.0554 '/' Capacity=13.04 cfs Outflow=0.95 cfs 0.352 af

Reach ER82: Swale Located on North Avg. Flow Depth=0.10' Max Vel=1.42 fps Inflow=1.51 cfs 0.159 af
n=0.035 L=80.0' S=0.0250 '/' Capacity=296.49 cfs Outflow=1.50 cfs 0.159 af

Reach ER84: Swale Located on North Avg. Flow Depth=0.23' Max Vel=1.26 fps Inflow=1.98 cfs 0.314 af
n=0.035 L=140.0' S=0.0071 '/' Capacity=239.10 cfs Outflow=1.97 cfs 0.314 af

Reach ER85: End of Swale located Avg. Flow Depth=0.32' Max Vel=2.02 fps Inflow=3.21 cfs 0.962 af
n=0.035 L=75.0' S=0.0133 '/' Capacity=528.23 cfs Outflow=3.20 cfs 0.962 af

Reach PR62: Swale South of Proposed Avg. Flow Depth=0.26' Max Vel=3.76 fps Inflow=1.00 cfs 0.087 af
n=0.022 L=130.0' S=0.0500 '/' Capacity=37.30 cfs Outflow=0.99 cfs 0.087 af

Reach PR63: Swale North of gravel Avg. Flow Depth=0.19' Max Vel=3.83 fps Inflow=1.23 cfs 0.049 af
n=0.022 L=80.0' S=0.0500 '/' Capacity=50.13 cfs Outflow=1.23 cfs 0.049 af

Reach PR64: Pipe PDL5 Avg. Flow Depth=0.72' Max Vel=6.18 fps Inflow=3.77 cfs 0.515 af
12.0" Round Pipe n=0.010 L=170.0' S=0.0086 '/' Capacity=4.31 cfs Outflow=3.77 cfs 0.515 af

Pond BR1: Bioswale-ISR 1 (CB5) Peak Elev=229.37' Storage=2,091 cf Inflow=3.91 cfs 0.536 af
Primary=0.03 cfs 0.049 af Secondary=3.75 cfs 0.466 af Outflow=3.77 cfs 0.515 af

Pond BR2: Bioswale-ISR 2 (CB3) Peak Elev=230.53' Storage=4,374 cf Inflow=7.18 cfs 0.626 af
Primary=0.19 cfs 0.265 af Secondary=5.26 cfs 0.334 af Outflow=5.46 cfs 0.598 af

Pond DE1: Drip Edge along Northeastern Peak Elev=233.20' Storage=162 cf Inflow=1.16 cfs 0.107 af
6.0" Round Culvert x 2.00 n=0.010 L=35.0' S=0.0086 '/' Outflow=1.13 cfs 0.106 af

Pond DE2: Drip Edge along Northwestern Peak Elev=233.66' Storage=212 cf Inflow=0.93 cfs 0.085 af
6.0" Round Culvert n=0.010 L=40.0' S=0.0025 '/' Outflow=0.75 cfs 0.085 af

Pond DE3: Drip Edge along Southwestern Peak Elev=236.33' Storage=218 cf Inflow=0.94 cfs 0.087 af
8.0" Round Culvert n=0.010 L=40.0' S=0.0000 '/' Outflow=0.85 cfs 0.086 af

Pond DE4: Drip Edge along Southeastern Peak Elev=235.46' Storage=243 cf Inflow=0.94 cfs 0.087 af
8.0" Round Culvert n=0.010 L=100.0' S=0.0000 '/' Outflow=0.81 cfs 0.086 af

Pond EP81: Middle Portion of Wetland Peak Elev=233.91' Storage=6,500 cf Inflow=2.79 cfs 0.446 af
Outflow=1.40 cfs 0.352 af

Pond PCB2: CB2 - Catch Basin at the end of Bioswale "A" Peak Elev=213.23' Inflow=1.23 cfs 0.049 af
12.0" Round Culvert n=0.013 L=85.0' S=0.0071 '/' Outflow=1.23 cfs 0.049 af

Pond PCB4: Catch Basin #3 Peak Elev=233.52' Inflow=1.80 cfs 0.156 af
15.0" Round Culvert n=0.010 L=135.0' S=0.0025 '/' Outflow=1.80 cfs 0.156 af

Pond PDMH1: Drain Manhole #5 Peak Elev=233.04' Inflow=3.26 cfs 0.290 af
15.0" Round Culvert n=0.010 L=205.0' S=0.0025 '/' Outflow=3.26 cfs 0.290 af

Pond PP108: Bioswale "A" Peak Elev=216.50' Storage=1,833 cf Inflow=2.36 cfs 0.209 af
cfs 0.160 af Primary=0.05 cfs 0.012 af Secondary=1.19 cfs 0.037 af Tertiary=0.00 cfs 0.000 af Outflow=1.40 cfs 0.209 af

Pond PP109: Stormwater Detention Peak Elev=214.00' Storage=4,625 cf Inflow=3.46 cfs 0.486 af
Discarded=0.11 cfs 0.201 af Primary=1.87 cfs 0.286 af Secondary=0.01 cfs 0.000 af Outflow=1.98 cfs 0.486 af

Pond PP110: Proposed Silt Sock to be Peak Elev=212.86' Storage=216 cf Inflow=1.98 cfs 0.318 af
Outflow=1.98 cfs 0.314 af

Pond PPT3: Catch Basin #4 Peak Elev=233.35' Inflow=3.26 cfs 0.290 af
15.0" Round Culvert n=0.010 L=50.0' S=0.0024 '/' Outflow=3.26 cfs 0.290 af

Pond SI1: Subsurface Infiltration Peak Elev=228.00' Storage=13,038 cf Inflow=8.53 cfs 1.114 af
Discarded=0.68 cfs 0.919 af Primary=2.25 cfs 0.195 af Outflow=2.93 cfs 1.114 af

Link L100: Northern Wetlands & North of Site Inflow=0.25 cfs 0.045 af
Primary=0.25 cfs 0.045 af

Link L200: Inlet at Start of Redemption Rd; West Side Inflow=4.64 cfs 0.869 af
Primary=4.64 cfs 0.869 af

Link L300: Southwest Corner of Far-East Lot; Bottom of Hill Inflow=1.07 cfs 0.163 af
Primary=1.07 cfs 0.163 af

Link L400: Southwest Corner of Far-East Lot; Bottom of Hill Inflow=3.41 cfs 1.024 af
Primary=3.41 cfs 1.024 af

Link L500: Inlet at Start of Gravel Drive; East Side Inflow=1.89 cfs 0.123 af
Primary=1.89 cfs 0.123 af

Total Runoff Area = 16.590 ac Runoff Volume = 3.608 af Average Runoff Depth = 2.61"
85.41% Pervious = 14.169 ac 14.59% Impervious = 2.421 ac

Summary for Subcatchment PS1: Northwest portion of westernly lot (ES1)

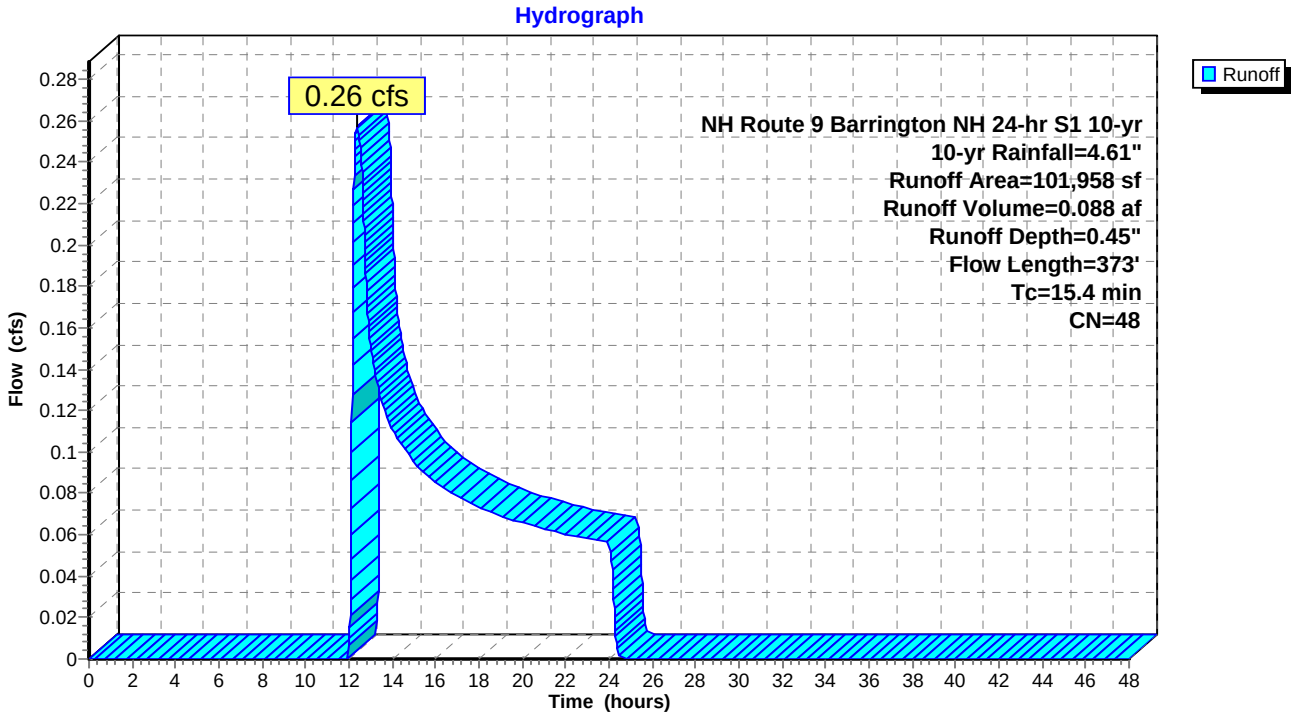
Runoff = 0.26 cfs @ 12.37 hrs, Volume= 0.088 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
39,435	30	Woods, Good, HSG A
3,580	55	Woods, Good, HSG B
36,257	70	Woods, Good, HSG C
18,898	39	>75% Grass cover, Good, HSG A
3,788	61	>75% Grass cover, Good, HSG B
101,958	48	Weighted Average
101,958		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	50	0.0700	0.11		**Sheet Flow, Woodland Flow** Woods: Light underbrush n= 0.400 P2= 3.07"
0.9	65	0.0600	1.22		**Shallow Concentrated Flow, Woodland Flow** Woodland Kv= 5.0 fps
6.9	258	0.0155	0.62		**Shallow Concentrated Flow, Wetland flow** Woodland Kv= 5.0 fps
15.4	373	Total			

Subcatchment PS1: Northwest portion of westernly lot (ES1)



Summary for Subcatchment PS10: South-center portion of easterly lot (ES11)

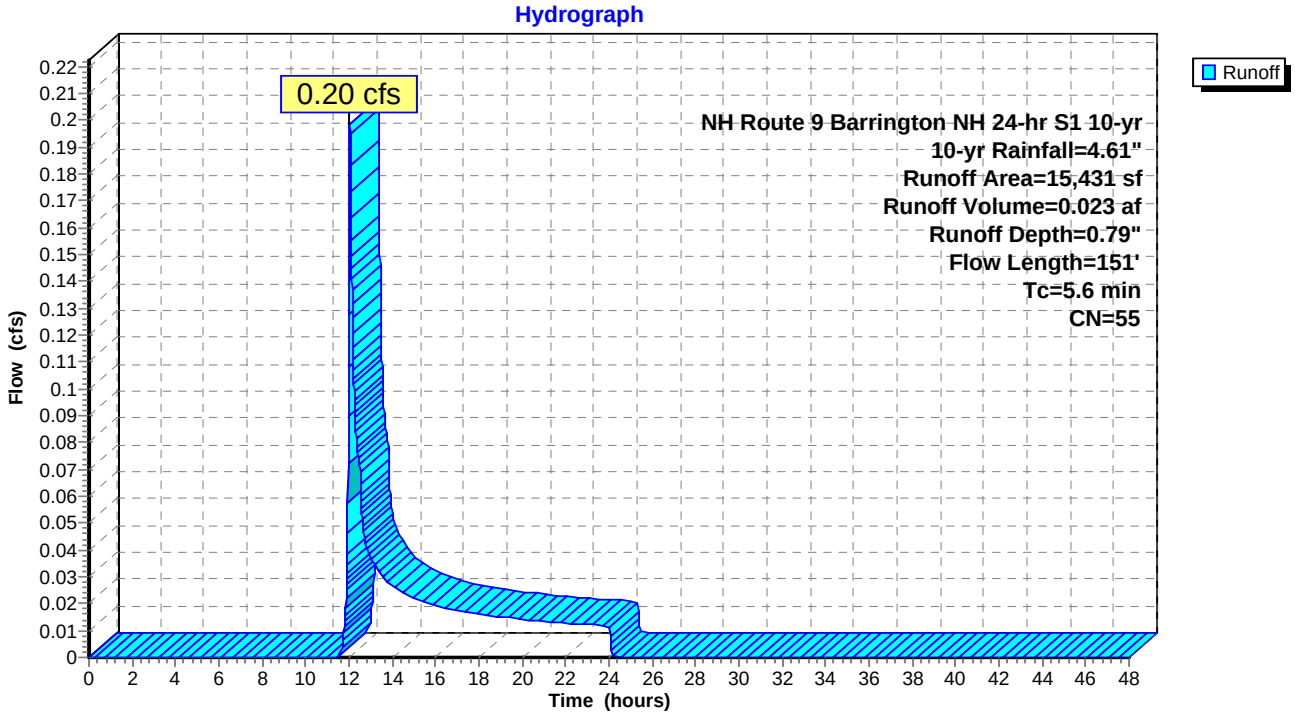
Runoff = 0.20 cfs @ 12.05 hrs, Volume= 0.023 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
9,251	39	>75% Grass cover, Good, HSG A
4,095	70	Woods, Good, HSG C
2,085	98	Paved parking, HSG A
15,431	55	Weighted Average
13,346		86.49% Pervious Area
2,085		13.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0300	0.17		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 3.07"
0.7	101	0.1240	2.46		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
5.6	151	Total			

Subcatchment PS10: South-center portion of easterly lot (ES11)



Summary for Subcatchment PS11: Eastern portion of middle lot

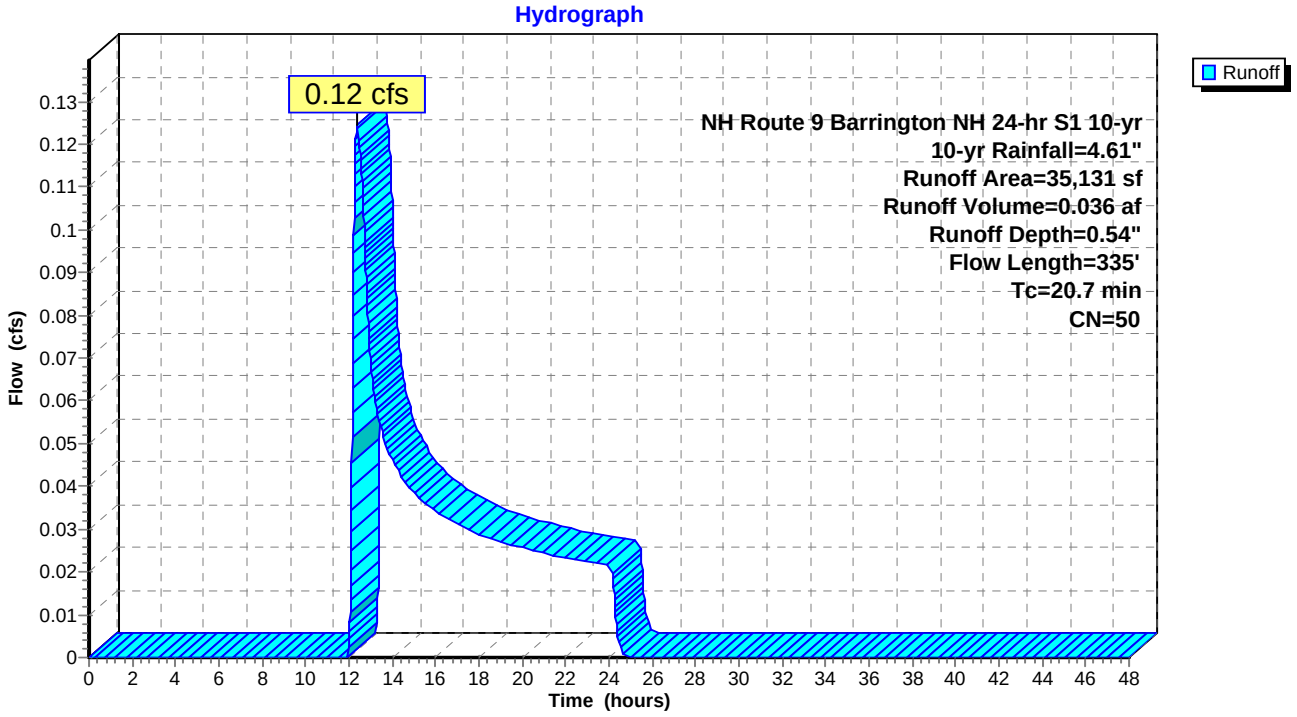
Runoff = 0.12 cfs @ 12.35 hrs, Volume= 0.036 af, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
11,193	39	>75% Grass cover, Good, HSG A
1,648	61	>75% Grass cover, Good, HSG B
8,273	74	>75% Grass cover, Good, HSG C
8,389	30	Woods, Good, HSG A
1,651	55	Woods, Good, HSG B
3,977	70	Woods, Good, HSG C
35,131	50	Weighted Average
35,131		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	50	0.0100	0.05		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.07"
3.0	160	0.0313	0.88		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
1.1	125	0.0700	1.85		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
20.7	335	Total			

Subcatchment PS11: Eastern portion of middle lot



Summary for Subcatchment PS12: South-center portion of middle lot

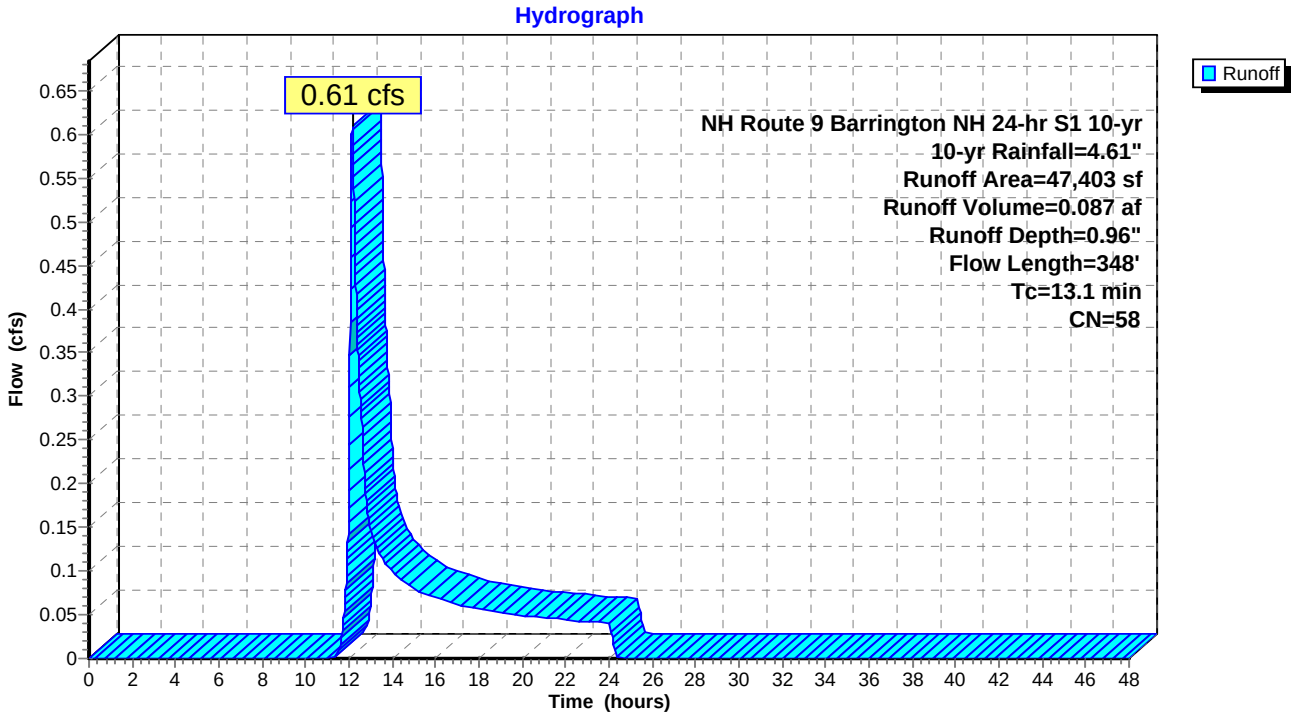
Runoff = 0.61 cfs @ 12.15 hrs, Volume= 0.087 af, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
22,740	39	>75% Grass cover, Good, HSG A
2,934	61	>75% Grass cover, Good, HSG B
17,678	74	>75% Grass cover, Good, HSG C
3,055	98	Paved parking, HSG A
996	98	Paved parking, HSG B
47,403	58	Weighted Average
43,352		91.45% Pervious Area
4,051		8.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	50	0.0050	0.08		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 3.07"
1.3	100	0.0350	1.31		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.4	79	0.2280	3.34		**Shallow Concentrated Flow, steep grass** Short Grass Pasture Kv= 7.0 fps
1.4	119	0.0420	1.43		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
13.1	348	Total			

Subcatchment PS12: South-center portion of middle lot



Summary for Subcatchment PS13: Area north of prop. drive

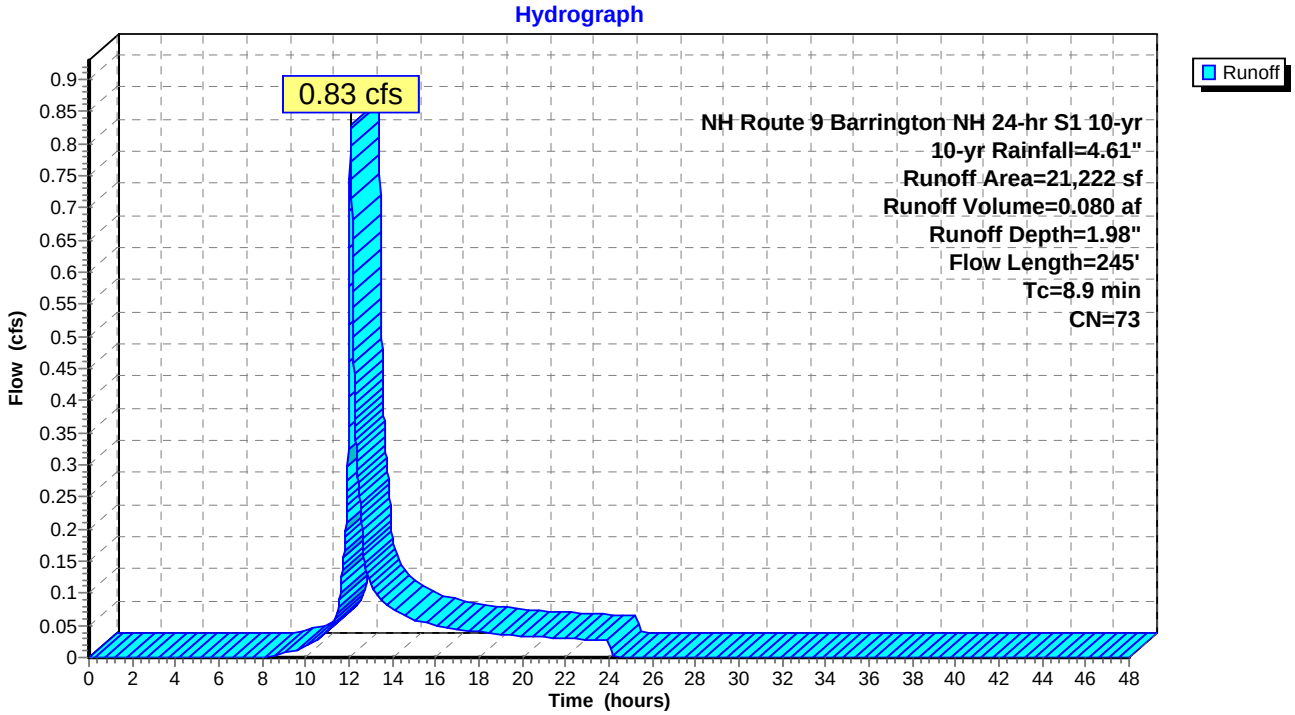
Runoff = 0.83 cfs @ 12.08 hrs, Volume= 0.080 af, Depth= 1.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
2,871	39	>75% Grass cover, Good, HSG A
14,723	74	>75% Grass cover, Good, HSG C
1,307	98	Paved parking, HSG A
2,321	98	Paved parking, HSG C
21,222	73	Weighted Average
17,594		82.90% Pervious Area
3,628		17.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0600	0.10		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.07"
0.6	82	0.1100	2.32		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	113	0.0500	10.74	57.05	**Trap/Vee/Rect Channel Flow, Swale flow** Bot.W=0.00' D=1.25' Z= 3.4 '/' Top.W=8.50' n= 0.022
8.9	245	Total			

Subcatchment PS13: Area north of prop. drive



Summary for Subcatchment PS14: Area at Driveway/Parking Intersection East of Building

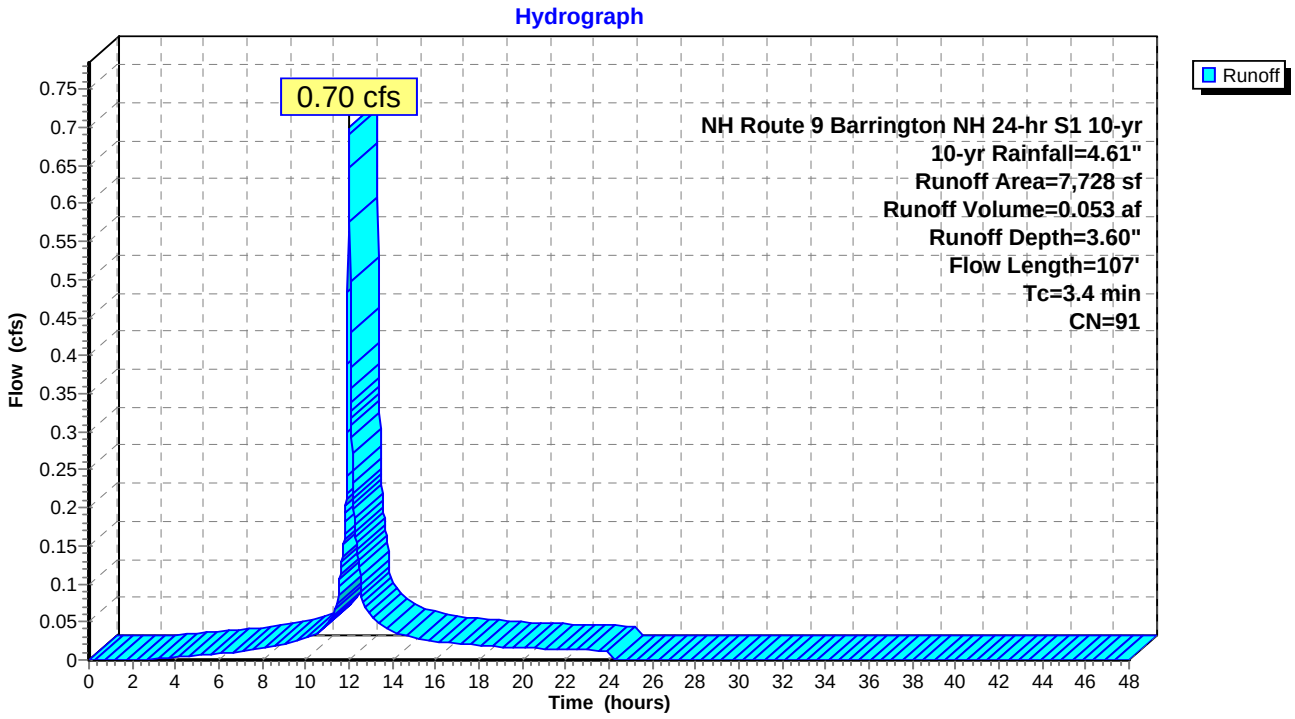
Runoff = 0.70 cfs @ 12.01 hrs, Volume= 0.053 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
2,277	74	>75% Grass cover, Good, HSG C
5,451	98	Paved parking, HSG C
7,728	91	Weighted Average
2,277		29.46% Pervious Area
5,451		70.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	22	0.0200	0.12		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.07"
0.3	70	0.0400	4.06		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
0.1	15	0.0400	3.00		**Shallow Concentrated Flow, Grass** Grassed Waterway Kv= 15.0 fps
3.4	107	Total			

Subcatchment PS14: Area at Driveway/Parking Intersection East of Building



Summary for Subcatchment PS15: NE corner of building

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

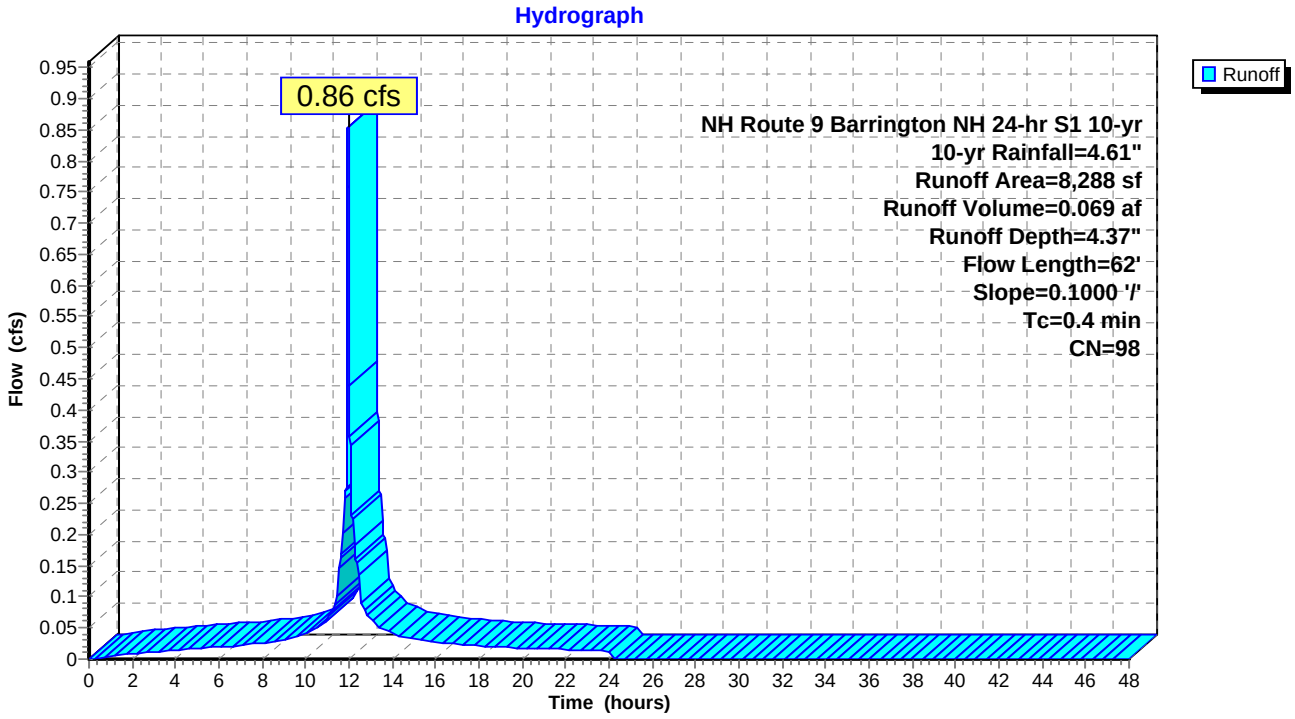
Runoff = 0.86 cfs @ 11.99 hrs, Volume= 0.069 af, Depth= 4.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
503	98	Water Surface, 0% imp, HSG C
7,785	98	Roofs, HSG C
8,288	98	Weighted Average
503		6.07% Pervious Area
7,785		93.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	62	0.1000	2.33		**Sheet Flow, Roof** Smooth surfaces n= 0.011 P2= 3.07"

Subcatchment PS15: NE corner of building



Summary for Subcatchment PS16: NW corner of building

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

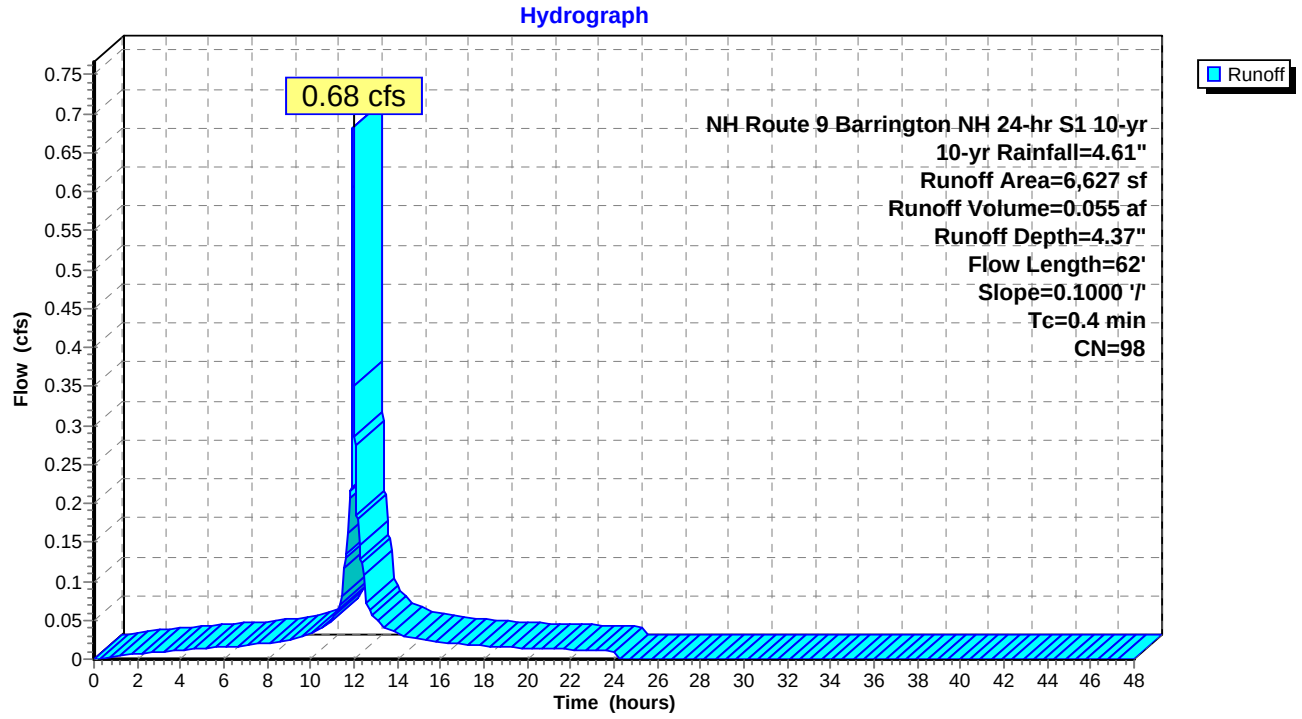
Runoff = 0.68 cfs @ 11.99 hrs, Volume= 0.055 af, Depth= 4.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
195	98	Water Surface, 0% imp, HSG C
1,330	98	Roofs, HSG C
4,898	98	Roofs, HSG A
204	98	Water Surface, 0% imp, HSG A
6,627	98	Weighted Average
399		6.02% Pervious Area
6,228		93.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	62	0.1000	2.33		**Sheet Flow, Roof** Smooth surfaces n= 0.011 P2= 3.07"

Subcatchment PS16: NW corner of building



Summary for Subcatchment PS17: Parking Lot West of Building

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

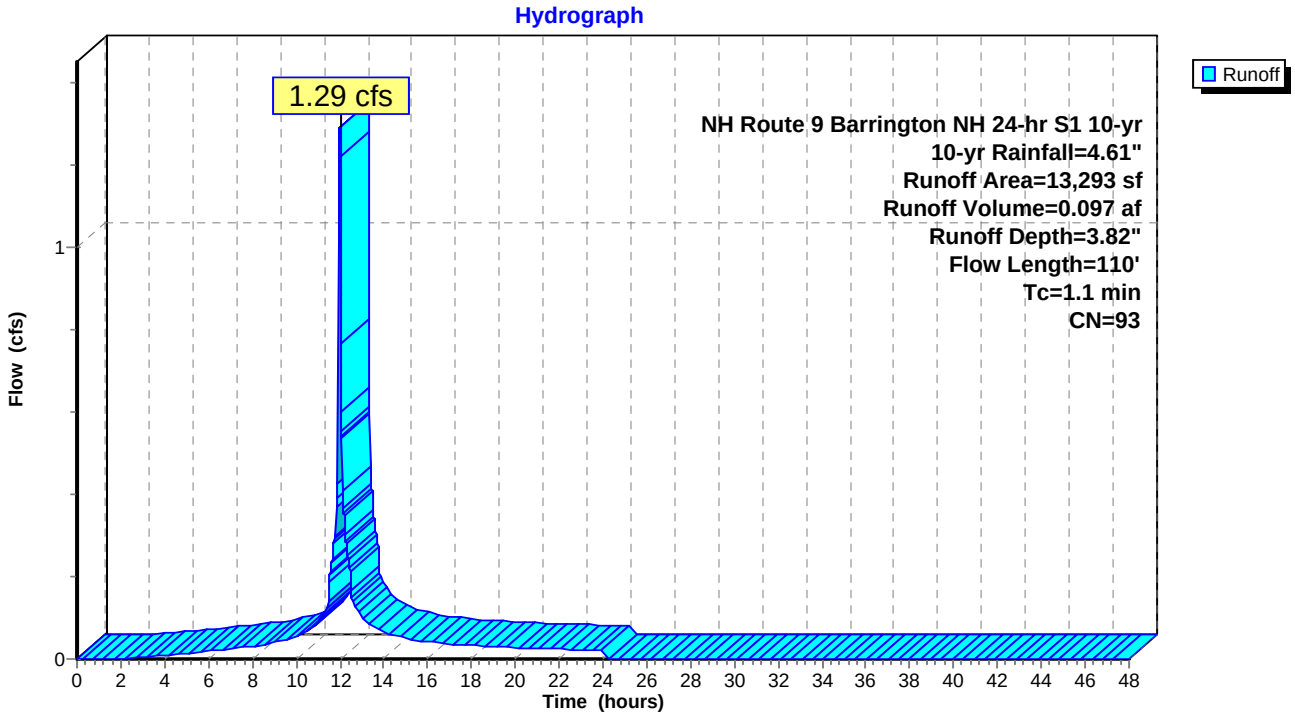
Runoff = 1.29 cfs @ 12.00 hrs, Volume= 0.097 af, Depth= 3.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
12,190	98	Paved parking, HSG A
1,103	39	>75% Grass cover, Good, HSG A
13,293	93	Weighted Average
1,103		8.30% Pervious Area
12,190		91.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.0100	2.03		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
0.3	35	0.0100	2.03		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
0.4	25	0.0200	0.99		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
1.1	110	Total			

Subcatchment PS17: Parking Lot West of Building



Summary for Subcatchment PS19: SW corner of building

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

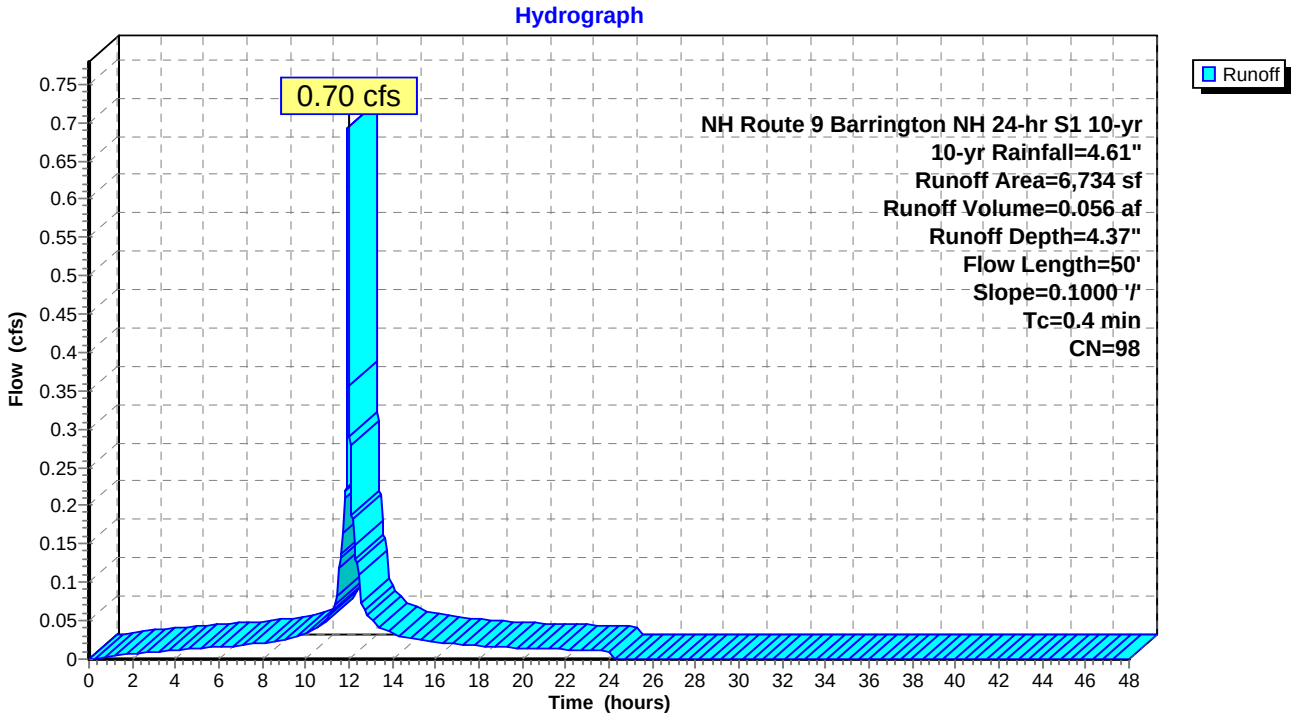
Runoff = 0.70 cfs @ 11.99 hrs, Volume= 0.056 af, Depth= 4.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
6,250	98	Roofs, HSG A
484	98	Water Surface, 0% imp, HSG A
6,734	98	Weighted Average
484		7.19% Pervious Area
6,250		92.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.1000	2.23		**Sheet Flow, Roof** Smooth surfaces n= 0.011 P2= 3.07"

Subcatchment PS19: SW corner of building



Summary for Subcatchment PS20: Parking Lot Southwest of Building

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

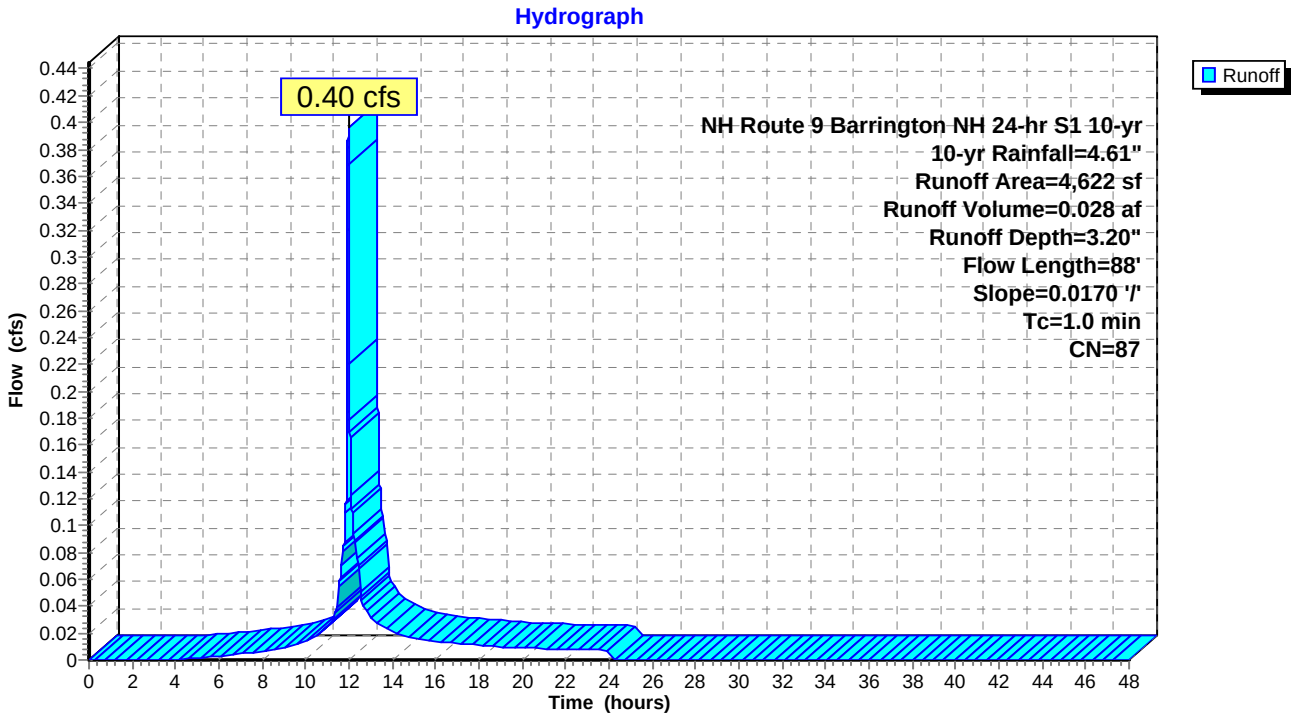
Runoff = 0.40 cfs @ 12.00 hrs, Volume= 0.028 af, Depth= 3.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
3,745	98	Paved parking, HSG A
877	39	>75% Grass cover, Good, HSG A
4,622	87	Weighted Average
877		18.97% Pervious Area
3,745		81.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0170	1.10		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.07"
0.2	38	0.0170	2.65		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
1.0	88	Total			

Subcatchment PS20: Parking Lot Southwest of Building



Summary for Subcatchment PS22: SE corner of building

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

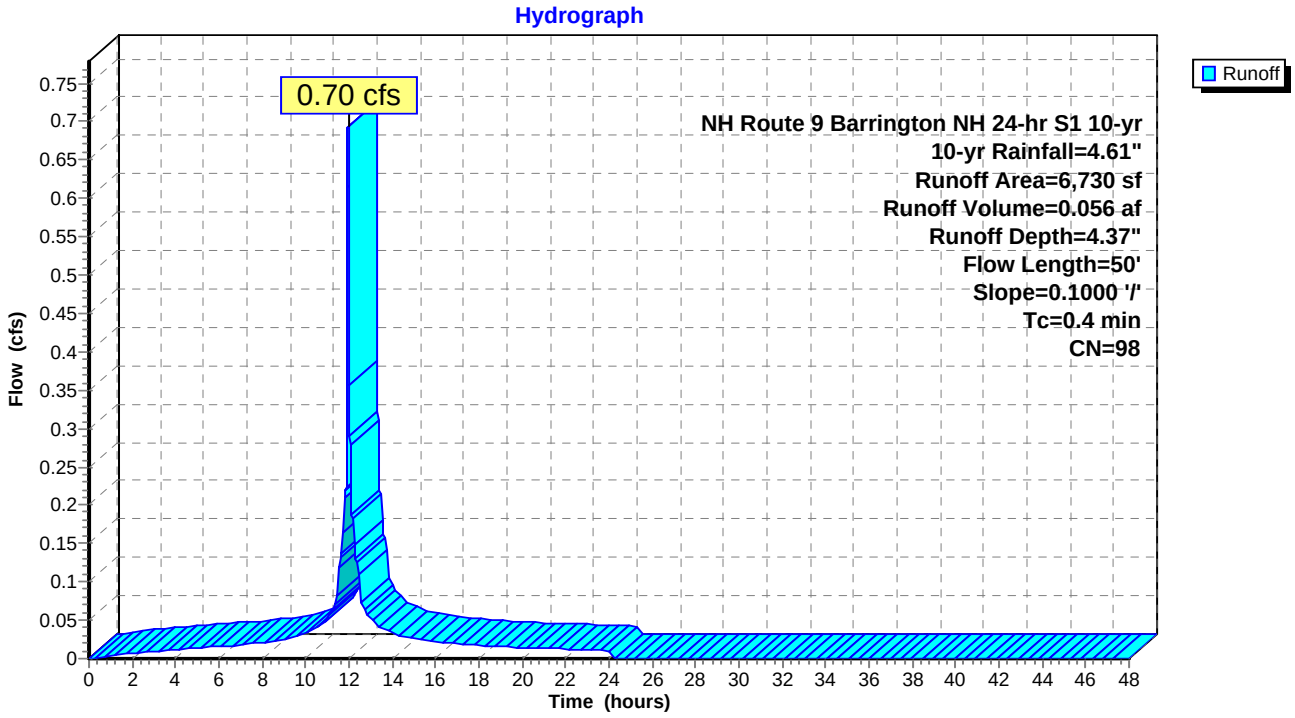
Runoff = 0.70 cfs @ 11.99 hrs, Volume= 0.056 af, Depth= 4.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
103	98	Roofs, HSG A
6,147	98	Roofs, HSG C
480	98	Water Surface, 0% imp, HSG C
6,730	98	Weighted Average
480		7.13% Pervious Area
6,250		92.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.1000	2.23		**Sheet Flow, Roof** Smooth surfaces n= 0.011 P2= 3.07"

Subcatchment PS22: SE corner of building



Summary for Subcatchment PS23: Area between building and west lot's wetland

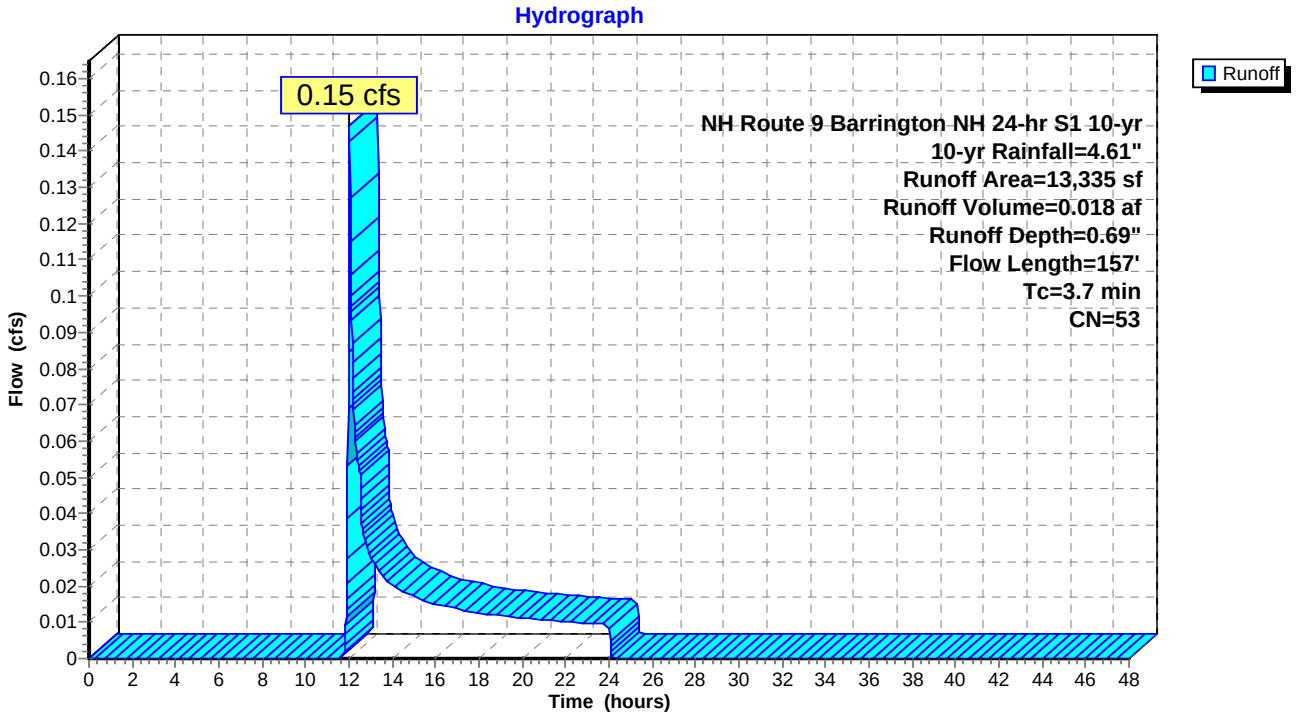
Runoff = 0.15 cfs @ 12.03 hrs, Volume= 0.018 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
4,828	39	>75% Grass cover, Good, HSG A
2,502	61	>75% Grass cover, Good, HSG B
603	30	Woods, Good, HSG A
2,009	55	Woods, Good, HSG B
3,393	70	Woods, Good, HSG C
13,335	53	Weighted Average
13,335		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	10	0.1500	0.24		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.07"
0.2	40	0.3330	4.04		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.3	25	0.0800	1.41		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
2.5	82	0.0122	0.55		**Shallow Concentrated Flow, Wetland flow** Woodland Kv= 5.0 fps
3.7	157	Total			

Subcatchment PS23: Area between building and west lot's wetland



Summary for Subcatchment PS24: Southwest portion of westerly lot (ES16)

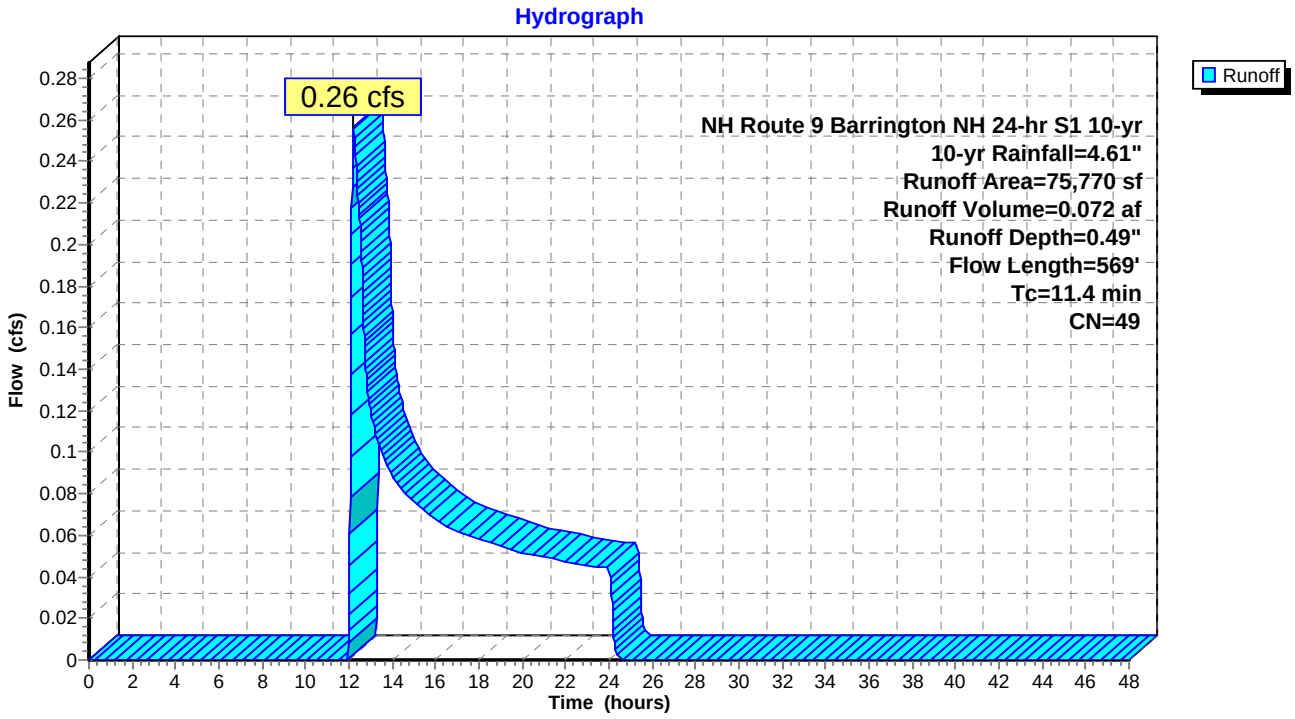
Runoff = 0.26 cfs @ 12.20 hrs, Volume= 0.072 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
13,397	39	>75% Grass cover, Good, HSG A
29,498	30	Woods, Good, HSG A
32,875	70	Woods, Good, HSG C
75,770	49	Weighted Average
75,770		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0300	0.17		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 3.07"
3.0	370	0.0875	2.07		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
3.5	149	0.0201	0.71		**Shallow Concentrated Flow, Woods/wetlands flow** Woodland Kv= 5.0 fps
11.4	569	Total			

Subcatchment PS24: Southwest portion of westerly lot (ES16)



Summary for Subcatchment PS25: Area that contains exist gravel drive entrance

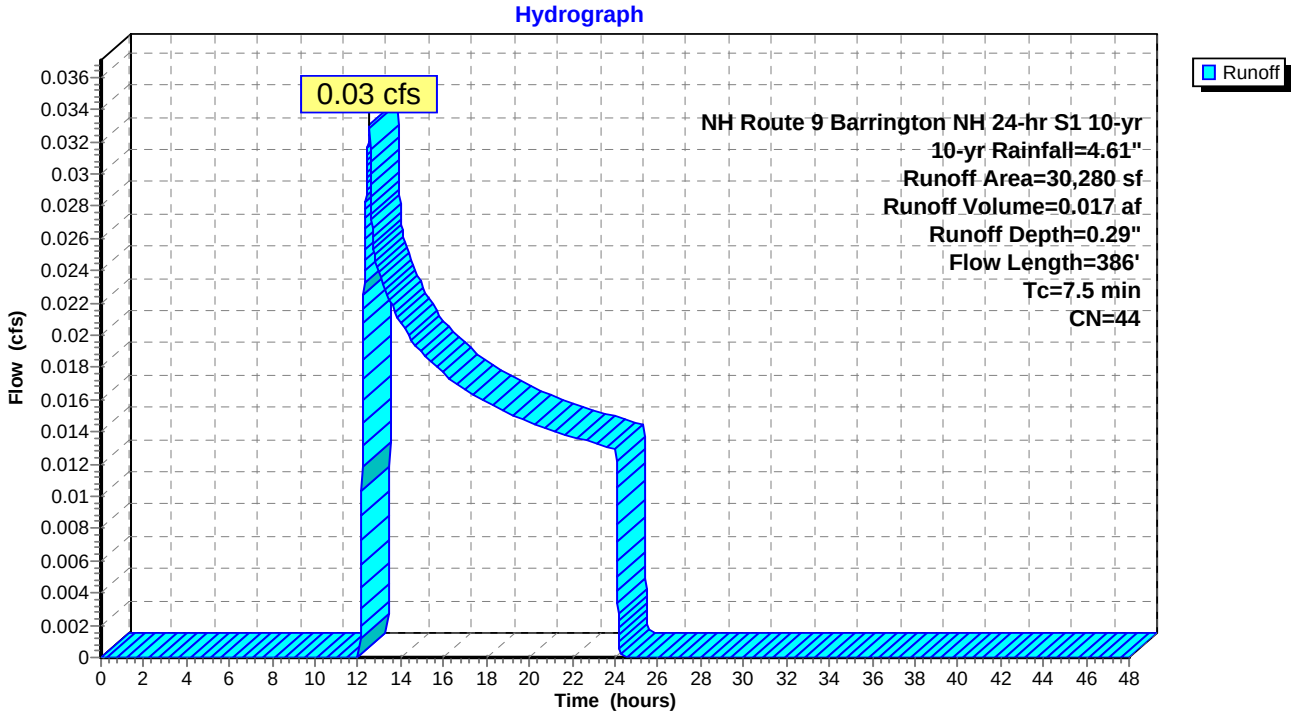
Runoff = 0.03 cfs @ 12.54 hrs, Volume= 0.017 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
15,044	39	>75% Grass cover, Good, HSG A
8,960	30	Woods, Good, HSG A
4,533	70	Woods, Good, HSG C
1,441	96	Gravel surface, HSG A
302	98	Paved parking, HSG A
30,280	44	Weighted Average
29,978		99.00% Pervious Area
302		1.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	50	0.3200	0.44		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 3.07"
5.6	336	0.0400	1.00		**Shallow Concentrated Flow, Grass swale/Wetland flow** Woodland Kv= 5.0 fps
7.5	386	Total			

Subcatchment PS25: Area that contains exist gravel drive entrance



Summary for Subcatchment PS26: Area containg Link L500

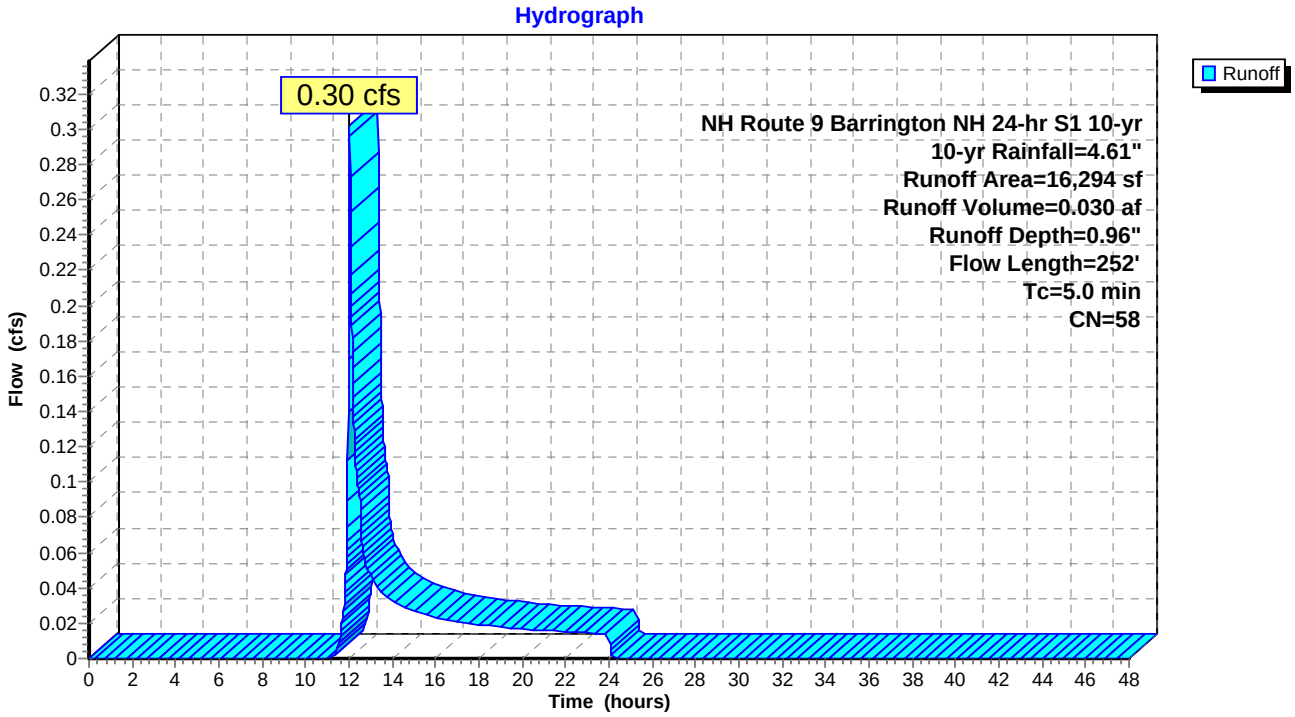
Runoff = 0.30 cfs @ 12.04 hrs, Volume= 0.030 af, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
9,291	39	>75% Grass cover, Good, HSG A
179	74	>75% Grass cover, Good, HSG C
2,046	70	Woods, Good, HSG C
4,077	98	Paved parking, HSG A
701	30	Woods, Good, HSG A
16,294	58	Weighted Average
12,217		74.98% Pervious Area
4,077		25.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	22	0.2000	0.08		**Sheet Flow, Woods** Woods: Dense underbrush n= 0.800 P2= 3.07"
0.1	30	0.5000	4.95		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.4	200	0.0500	9.19	27.56	**Trap/Vee/Rect Channel Flow, Grass Swale** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.022 Earth, clean & straight
5.0	252	Total			

Subcatchment PS26: Area containg Link L500



Summary for Subcatchment PS28: area at south edge of prop. drive entrance

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

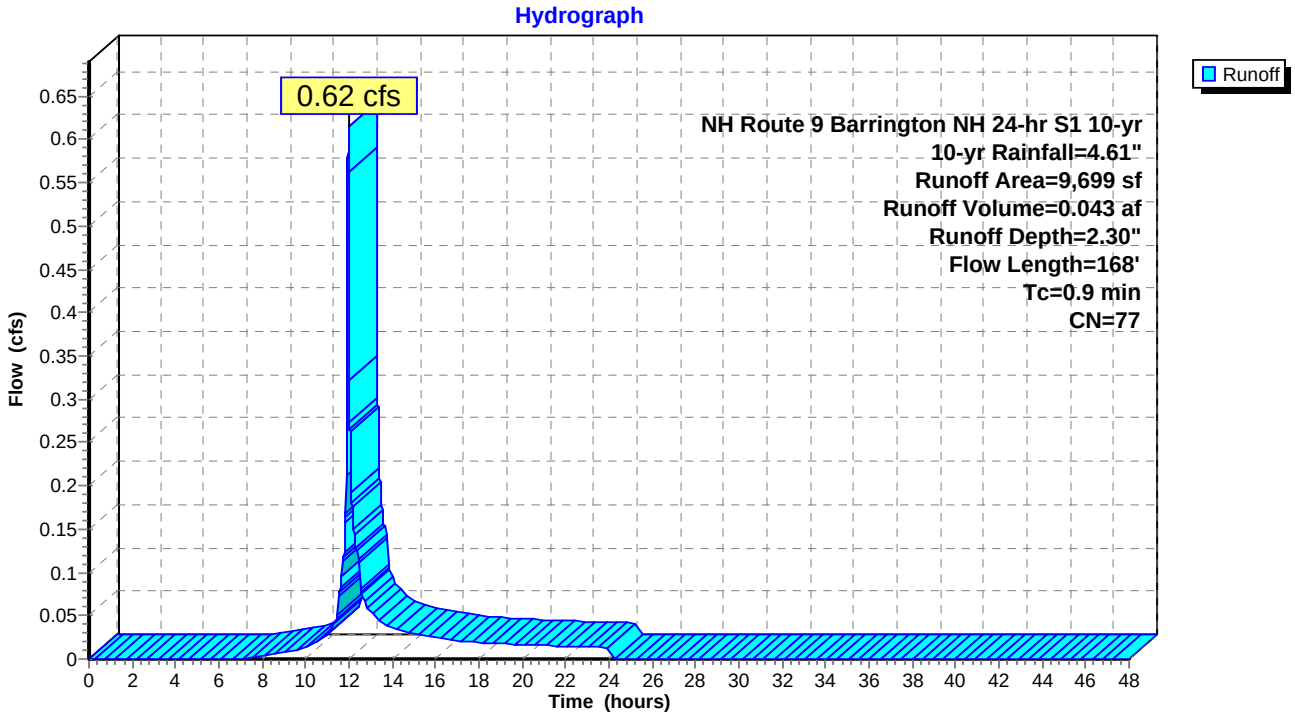
Runoff = 0.62 cfs @ 12.00 hrs, Volume= 0.043 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
2,867	39	>75% Grass cover, Good, HSG A
1,387	74	>75% Grass cover, Good, HSG C
1,756	98	Paved parking, HSG A
3,689	98	Paved parking, HSG C
9,699	77	Weighted Average
4,254		43.86% Pervious Area
5,445		56.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0500	1.69		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.07"
0.4	118	0.0700	5.37		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
0.9	168	Total			

Subcatchment PS28: area at south edge of prop. drive entrance



Summary for Subcatchment PS29: Area between Prop. drive entrance, building, and Redemption Rd

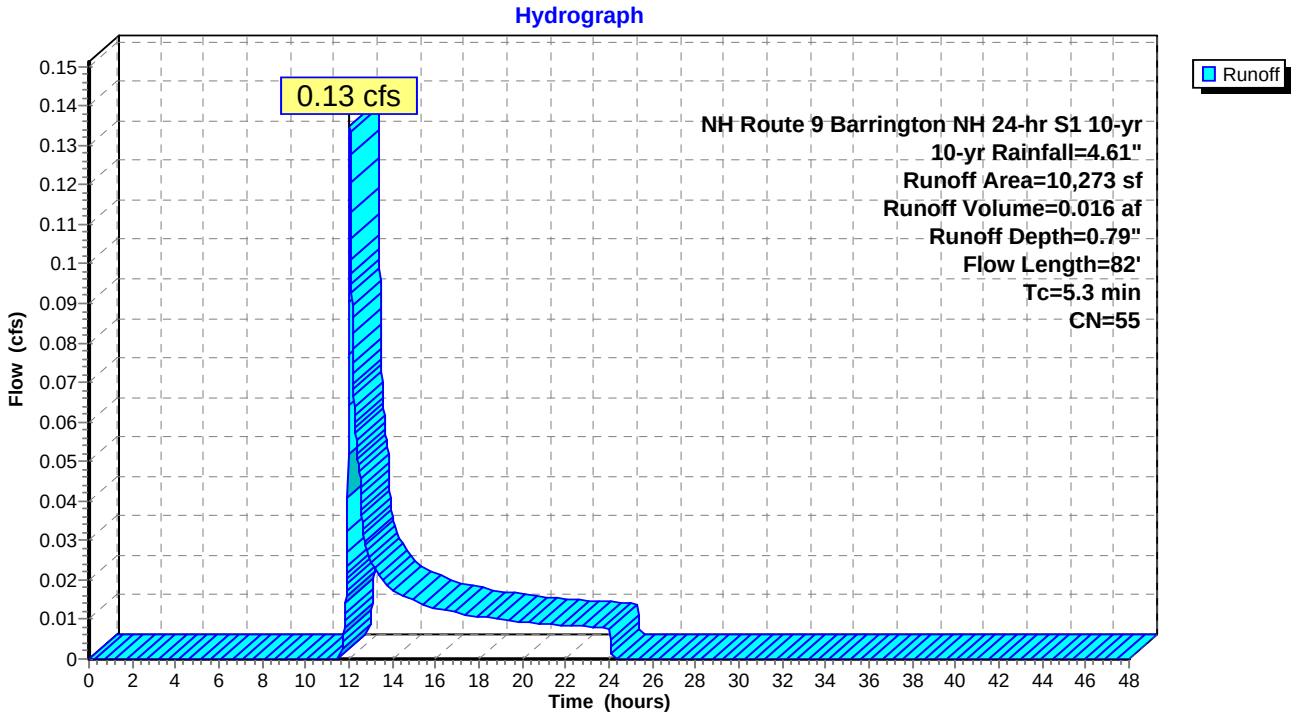
Runoff = 0.13 cfs @ 12.04 hrs, Volume= 0.016 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
3,827	39	>75% Grass cover, Good, HSG A
2,526	30	Woods, Good, HSG A
1,627	70	Woods, Good, HSG C
2,293	98	Paved parking, HSG A
10,273	55	Weighted Average
7,980		77.68% Pervious Area
2,293		22.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.1900	0.16		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.07"
0.1	12	0.1667	2.04		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.1	20	0.2500	3.50		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
5.3	82	Total			

Subcatchment PS29: Area between Prop. drive entrance, building, and Redemption Rd



Summary for Subcatchment PS3: Northern corner portion of westerly lot

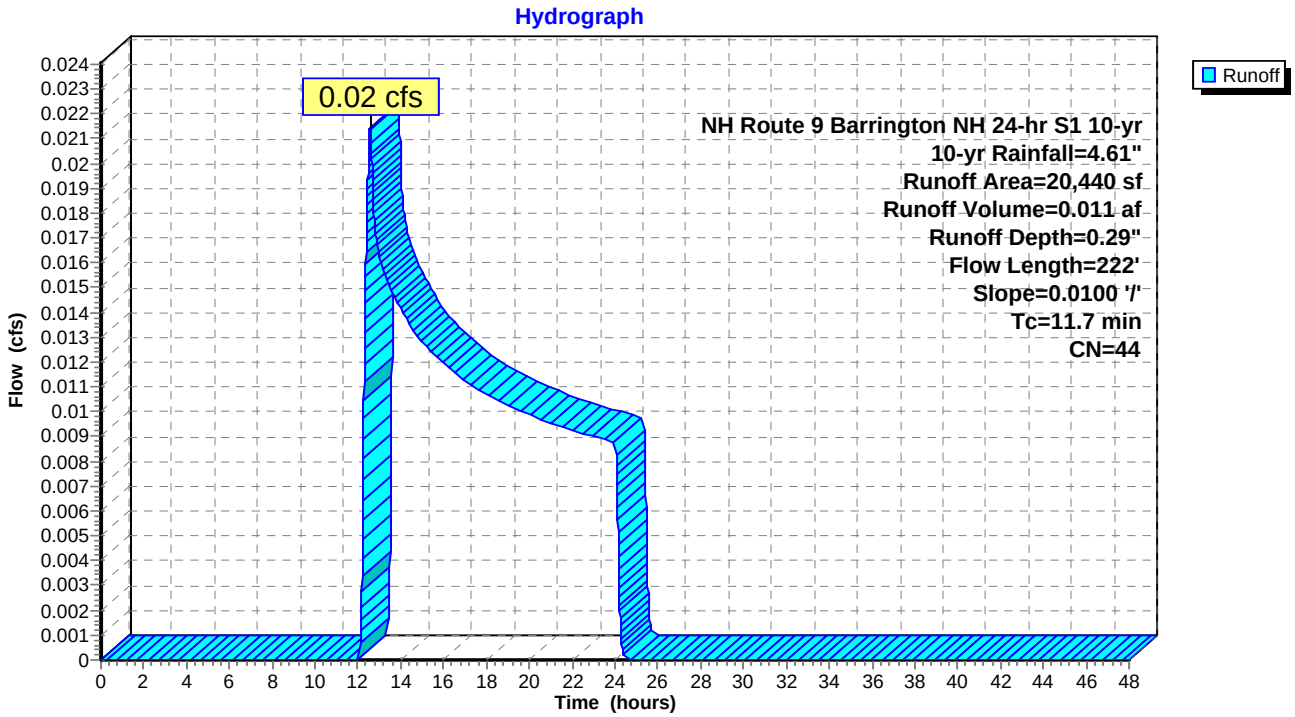
Runoff = 0.02 cfs @ 12.57 hrs, Volume= 0.011 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
16,928	39	>75% Grass cover, Good, HSG A
271	30	Woods, Good, HSG A
3,241	70	Woods, Good, HSG C
20,440	44	Weighted Average
20,440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	50	0.0100	0.11		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 3.07"
2.4	102	0.0100	0.70		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.7	70	0.0100	0.70		**Shallow Concentrated Flow, Wetland/Grass Flow** Short Grass Pasture Kv= 7.0 fps
11.7	222	Total			

Subcatchment PS3: Northern corner portion of westerly lot



Summary for Subcatchment PS30: Parking Lot Southeast of Building

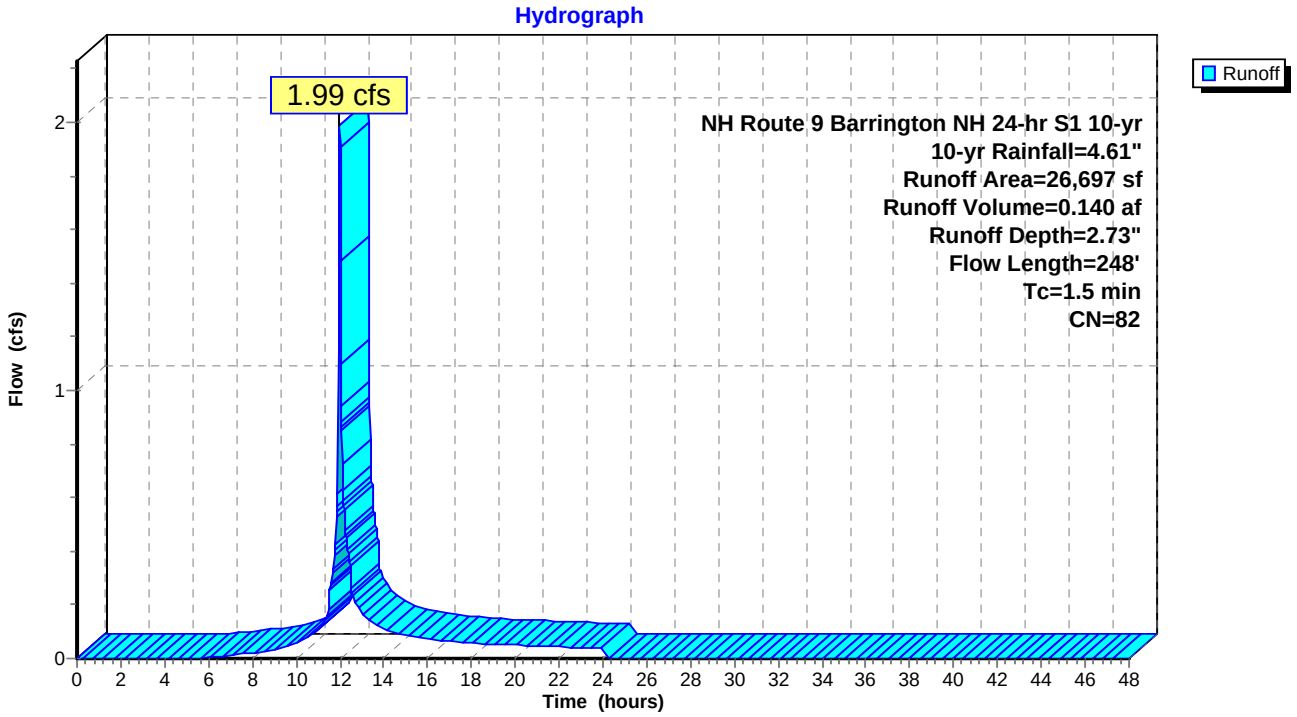
Runoff = 1.99 cfs @ 12.00 hrs, Volume= 0.140 af, Depth= 2.73"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
5,352	39	>75% Grass cover, Good, HSG A
4,610	74	>75% Grass cover, Good, HSG C
11,054	98	Paved parking, HSG A
5,681	98	Paved parking, HSG C
26,697	82	Weighted Average
9,962		37.32% Pervious Area
16,735		62.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.17		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.07"
0.1	13	0.0200	2.87		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
0.1	5	0.0300	1.21		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.6	180	0.0130	4.68	14.05	**Trap/Vee/Rect Channel Flow, Swale** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.022 Earth, clean & straight
1.5	248	Total			

Subcatchment PS30: Parking Lot Southeast of Building



Summary for Subcatchment PS4: Lower north corner of westernly lot

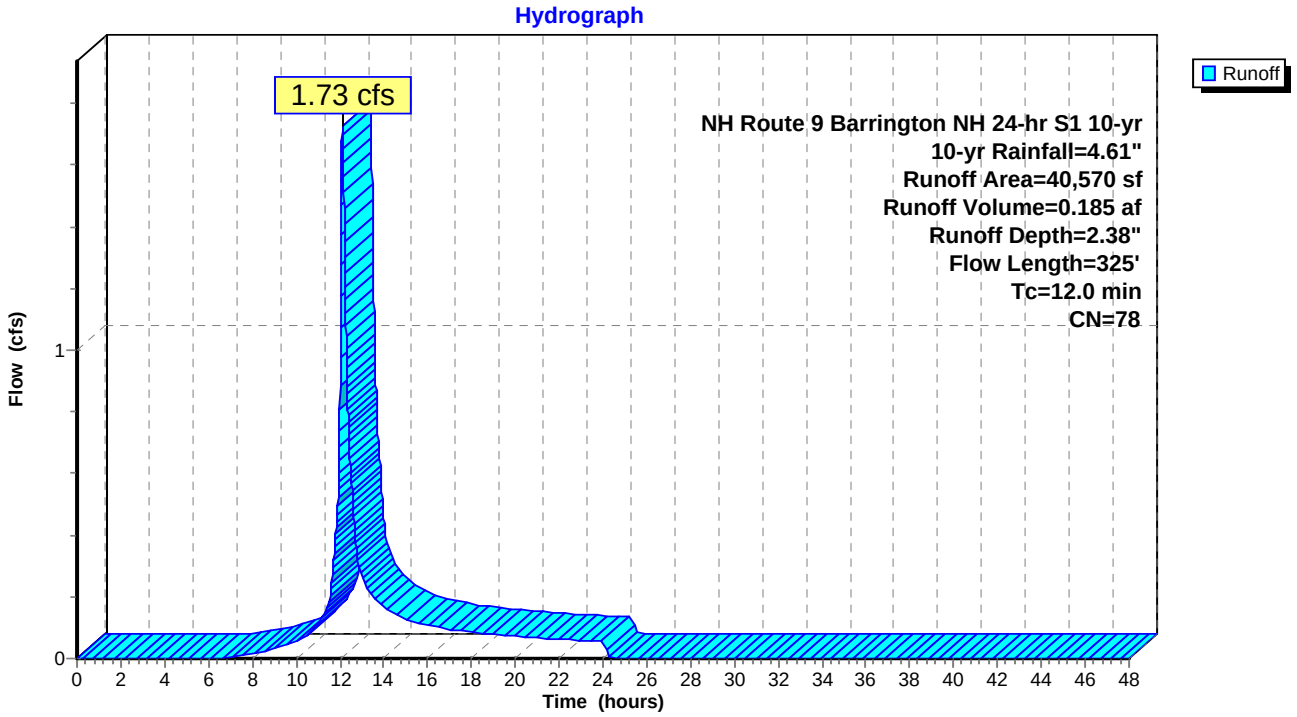
Runoff = 1.73 cfs @ 12.12 hrs, Volume= 0.185 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
1,166	39	>75% Grass cover, Good, HSG A
6,755	74	>75% Grass cover, Good, HSG C
21,381	70	Woods, Good, HSG C
5,324	98	Paved parking, HSG A
4,744	98	Paved parking, HSG C
1,200	98	Roofs, HSG A
40,570	78	Weighted Average
29,302		72.23% Pervious Area
11,268		27.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	50	0.0400	0.09		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.07"
0.8	39	0.0256	0.80		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
0.4	74	0.2200	3.28		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.3	162	0.0025	2.05	6.16	**Trap/Vee/Rect Channel Flow, Swale** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.022 Earth, clean & straight
12.0	325	Total			

Subcatchment PS4: Lower north corner of westerly lot



Summary for Subcatchment PS6: Northeast area of middle lot

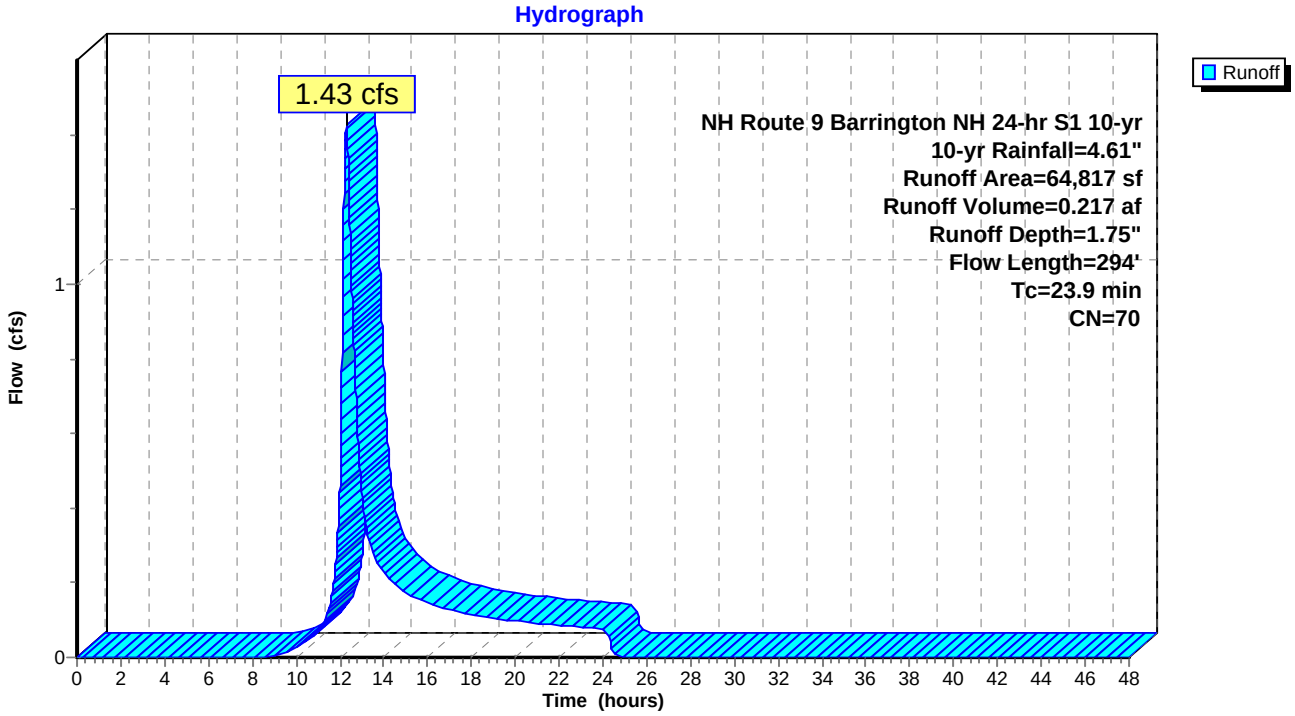
Runoff = 1.43 cfs @ 12.29 hrs, Volume= 0.217 af, Depth= 1.75"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
62,199	70	Woods, Good, HSG C
2,618	74	>75% Grass cover, Good, HSG C
64,817	70	Weighted Average
64,817		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	50	0.0100	0.05		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.07"
0.5	42	0.0833	1.44		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
6.8	202	0.0099	0.50		**Shallow Concentrated Flow, Wetland flow** Woodland Kv= 5.0 fps
23.9	294	Total			

Subcatchment PS6: Northeast area of middle lot



Summary for Subcatchment PS7: Eastern Corner of Middle Lot

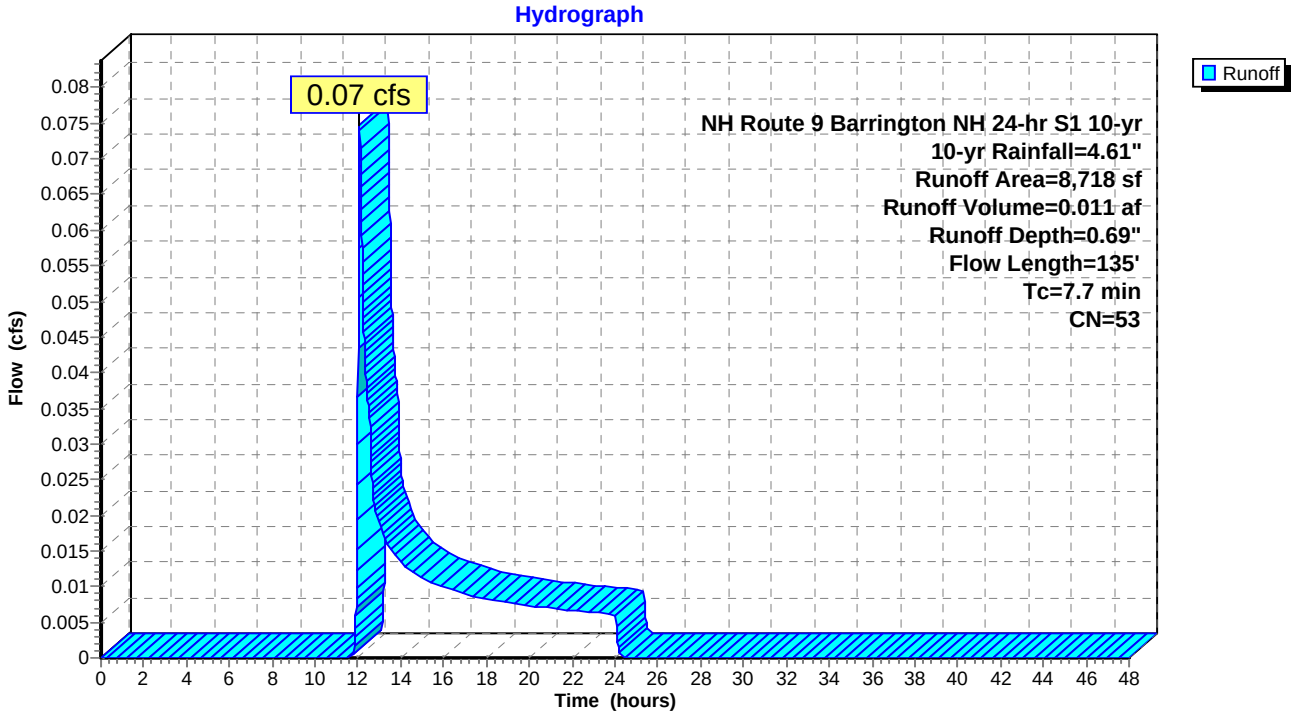
Runoff = 0.07 cfs @ 12.08 hrs, Volume= 0.011 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
6,597	39	>75% Grass cover, Good, HSG A
2,121	98	Paved parking, HSG A
8,718	53	Weighted Average
6,597		75.67% Pervious Area
2,121		24.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.07"
2.0	85	0.0100	0.70		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
7.7	135	Total			

Subcatchment PS7: Eastern Corner of Middle Lot



Summary for Subcatchment PS8: West portion of easterly lot (ES9)

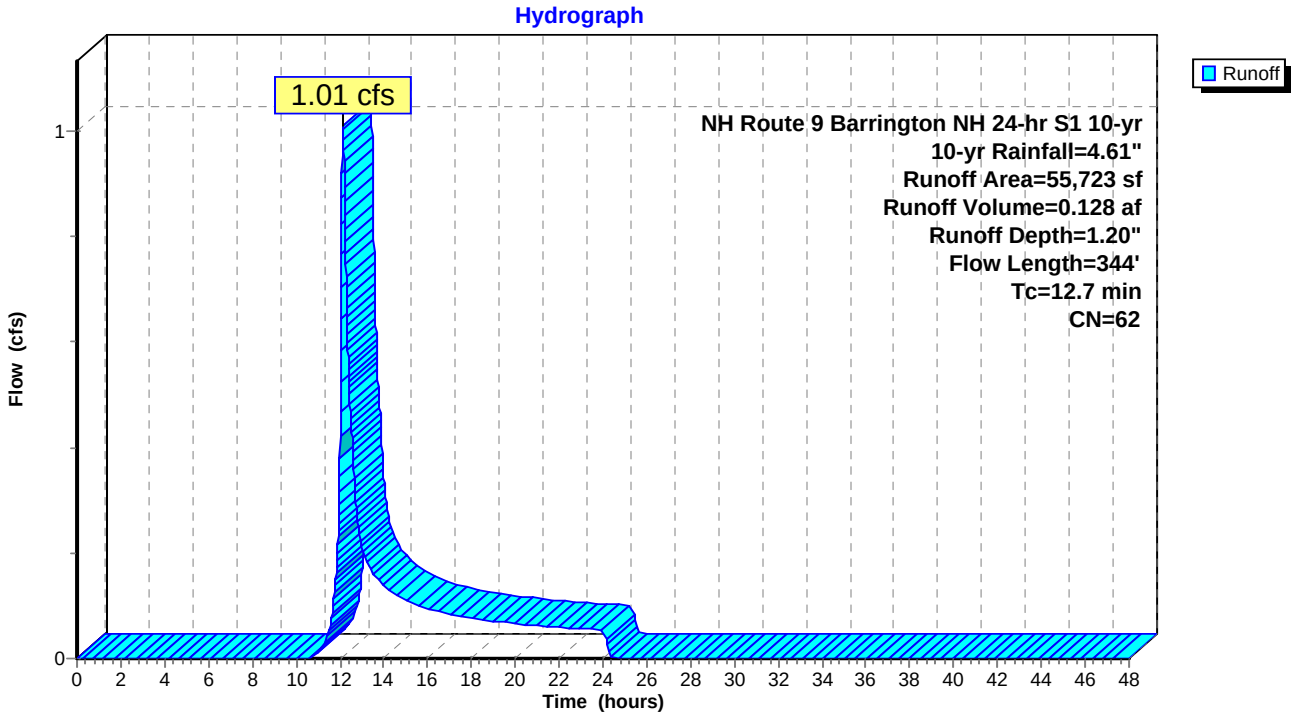
Runoff = 1.01 cfs @ 12.14 hrs, Volume= 0.128 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
9,841	39	>75% Grass cover, Good, HSG A
2,369	30	Woods, Good, HSG A
13,310	55	Woods, Good, HSG B
24,652	70	Woods, Good, HSG C
5,551	98	Paved parking, HSG A
55,723	62	Weighted Average
50,172		90.04% Pervious Area
5,551		9.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	50	0.0500	0.10		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.07"
1.5	105	0.0524	1.14		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
1.9	99	0.0303	0.87		**Shallow Concentrated Flow, Wetland flow** Woodland Kv= 5.0 fps
0.6	90	0.1440	2.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.7	344	Total			

Subcatchment PS8: West portion of easterly lot (ES9)



Summary for Subcatchment PS9: East portion of easterly lot (ES10)

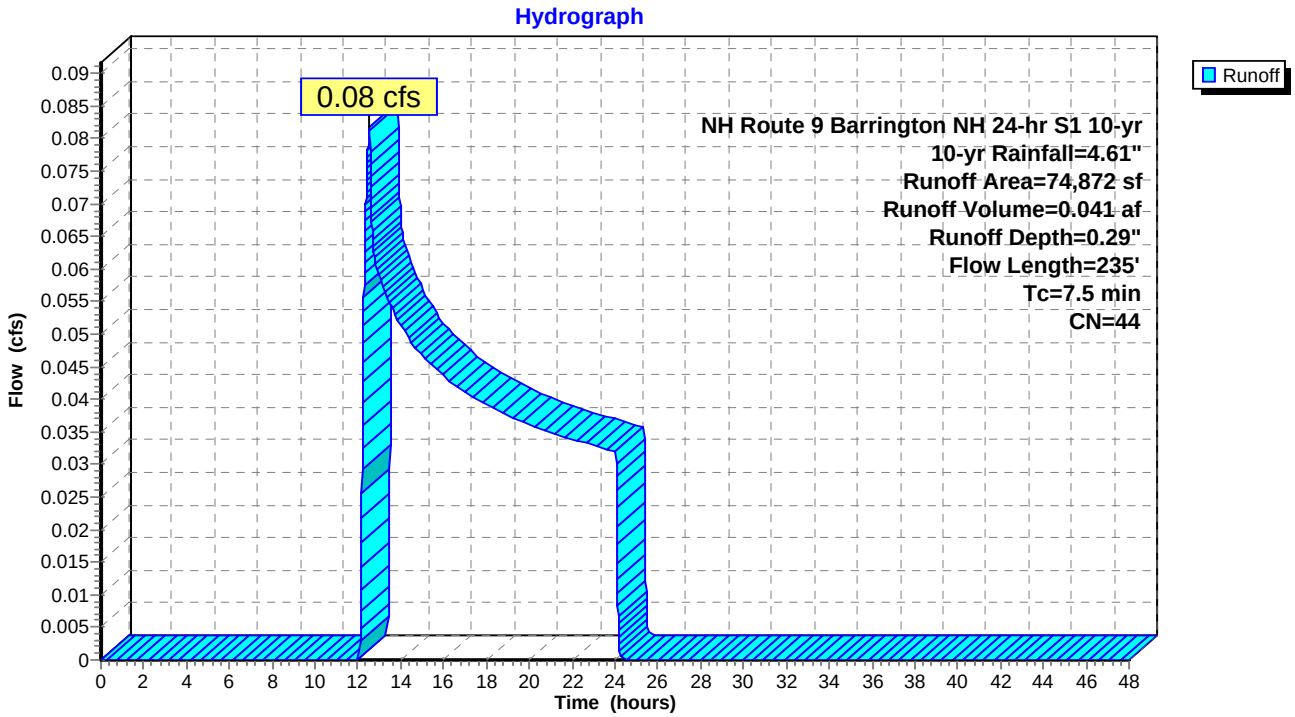
Runoff = 0.08 cfs @ 12.54 hrs, Volume= 0.041 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NH Route 9 Barrington NH 24-hr S1 10-yr 10-yr Rainfall=4.61"

Area (sf)	CN	Description
31,198	39	>75% Grass cover, Good, HSG A
23,985	30	Woods, Good, HSG A
19,689	70	Woods, Good, HSG C
74,872	44	Weighted Average
74,872		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 3.07"
0.8	50	0.0200	0.99		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.0	135	0.1850	2.15		**Shallow Concentrated Flow, steep woods** Woodland Kv= 5.0 fps
7.5	235	Total			

Subcatchment PS9: East portion of easterly lot (ES10)



Summary for Reach ER70: Wetlands Starting North Flowing Southeast

Inflow Area = 0.469 ac, 0.00% Impervious, Inflow Depth = 0.29" for 10-yr event
Inflow = 0.02 cfs @ 12.57 hrs, Volume= 0.011 af
Outflow = 0.02 cfs @ 13.05 hrs, Volume= 0.011 af, Atten= 25%, Lag= 28.8 min

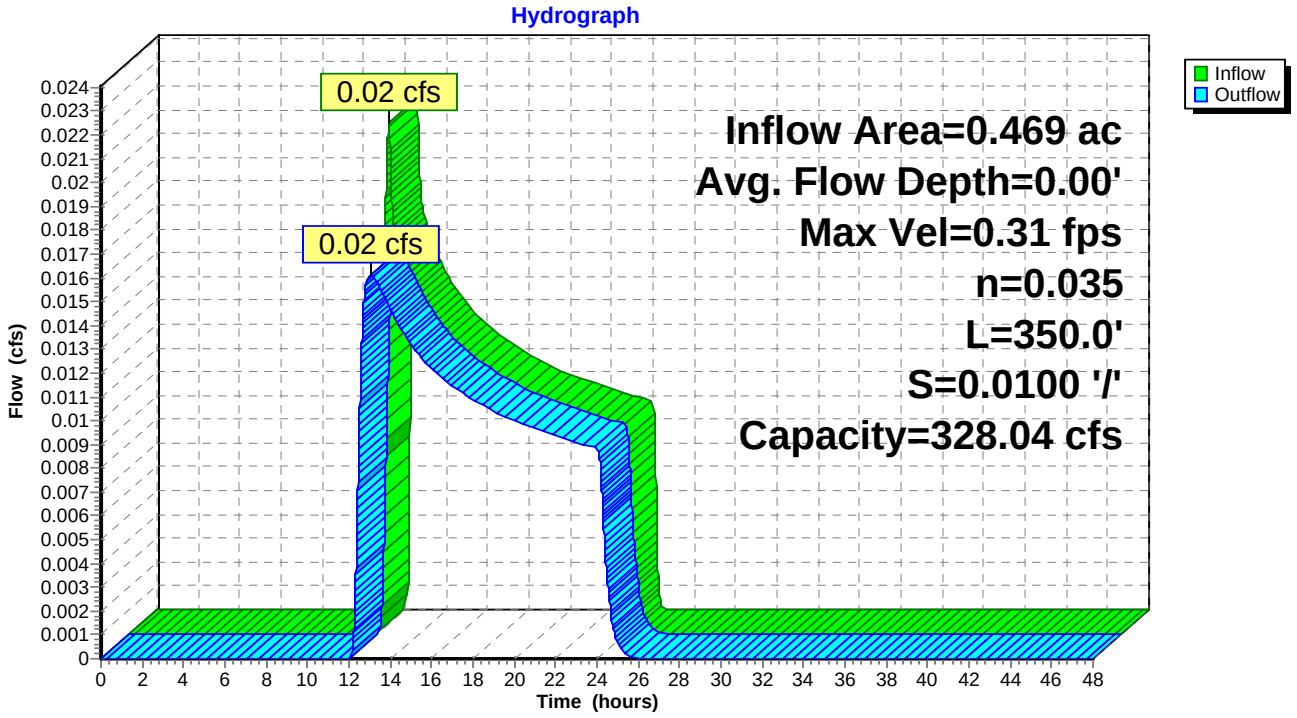
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.31 fps, Min. Travel Time= 18.8 min
Avg. Velocity = 0.31 fps, Avg. Travel Time= 18.8 min

Peak Storage= 18 cf @ 13.05 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 2.00' Flow Area= 64.0 sf, Capacity= 328.04 cfs

16.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 8.0 '/' Top Width= 48.00'
Length= 350.0' Slope= 0.0100 '/'
Inlet Invert= 226.00', Outlet Invert= 222.50'

‡

Reach ER70: Wetlands Starting North Flowing Southeast



Summary for Reach ER72: Northwest Wetlands Flowing Southeast to Redemption Rd

[62] Hint: Exceeded Reach ER70 OUTLET depth by 0.02' @ 12.50 hrs

Inflow Area = 2.810 ac, 0.00% Impervious, Inflow Depth = 0.42" for 10-yr event
Inflow = 0.26 cfs @ 12.37 hrs, Volume= 0.099 af
Outflow = 0.25 cfs @ 12.58 hrs, Volume= 0.099 af, Atten= 3%, Lag= 12.3 min

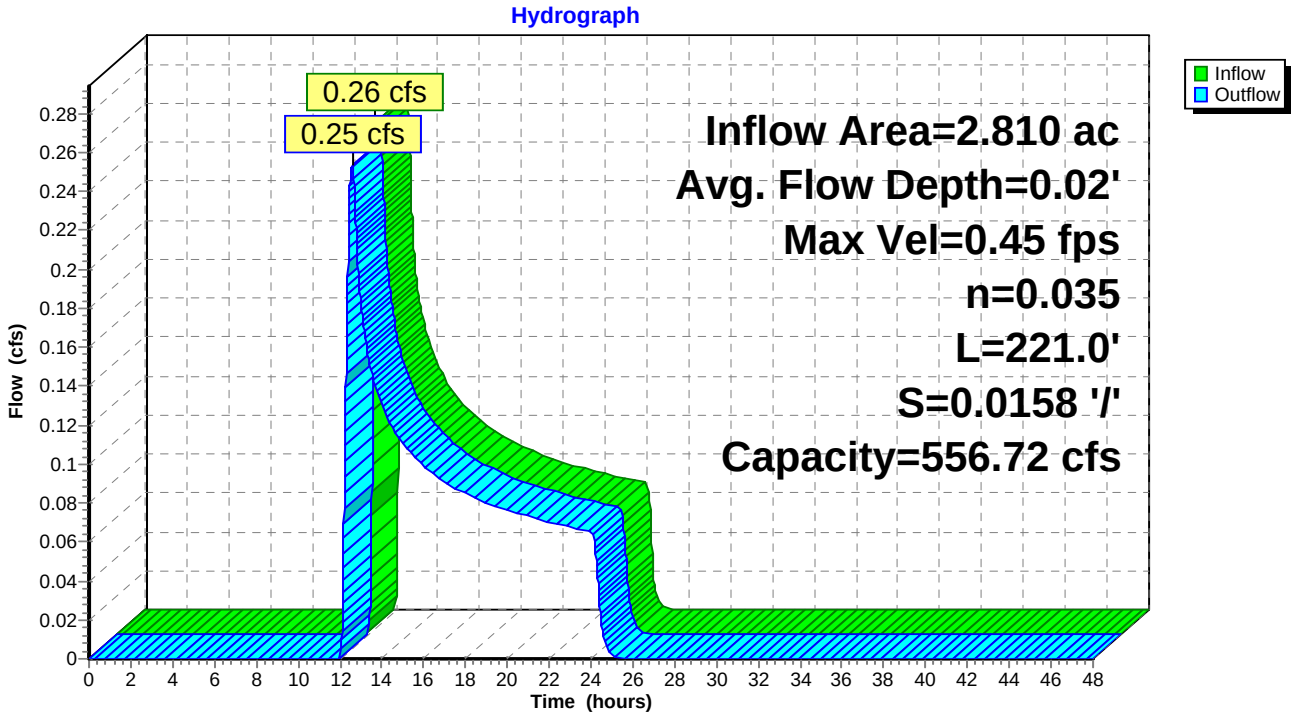
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.45 fps, Min. Travel Time= 8.3 min
Avg. Velocity = 0.39 fps, Avg. Travel Time= 9.4 min

Peak Storage= 126 cf @ 12.58 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 2.00' Flow Area= 82.0 sf, Capacity= 556.72 cfs

25.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 8.0 '/' Top Width= 57.00'
Length= 221.0' Slope= 0.0158 '/'
Inlet Invert= 222.50', Outlet Invert= 219.00'

‡

Reach ER72: Northwest Wetlands Flowing Southeast to Redemption Rd



Summary for Reach ER73: Wetlands Flowing on Map 234 Lot 1.2

[62] Hint: Exceeded Reach ER72 OUTLET depth by 0.01' @ 12.07 hrs

Inflow Area = 5.723 ac, 28.26% Impervious, Inflow Depth = 0.24" for 10-yr event
Inflow = 0.30 cfs @ 12.52 hrs, Volume= 0.117 af
Outflow = 0.28 cfs @ 12.65 hrs, Volume= 0.117 af, Atten= 6%, Lag= 7.7 min

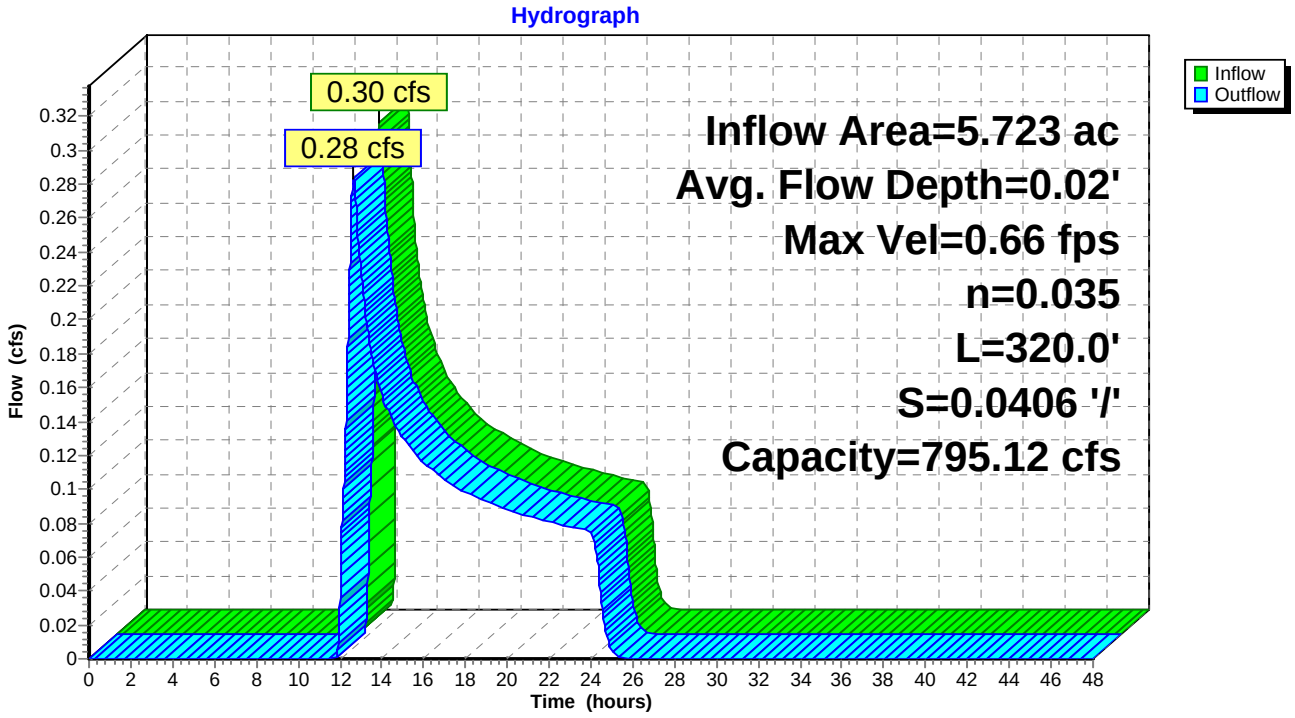
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.66 fps, Min. Travel Time= 8.0 min
Avg. Velocity = 0.63 fps, Avg. Travel Time= 8.5 min

Peak Storage= 136 cf @ 12.65 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 2.00' Flow Area= 76.0 sf, Capacity= 795.12 cfs

20.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 9.0 '/' Top Width= 56.00'
Length= 320.0' Slope= 0.0406 '/'
Inlet Invert= 219.00', Outlet Invert= 206.00'

‡

Reach ER73: Wetlands Flowing on Map 234 Lot 1.2



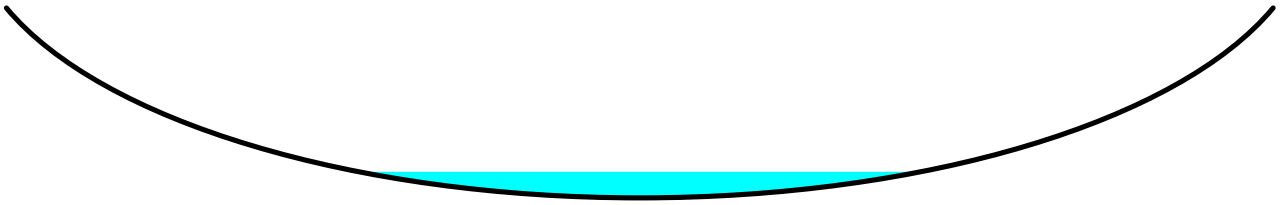
Summary for Reach ER81: SE Portion of Middle Lot Wetlands

Inflow Area = 1.488 ac, 0.00% Impervious, Inflow Depth > 0.99" for 10-yr event
Inflow = 0.21 cfs @ 14.29 hrs, Volume= 0.123 af
Outflow = 0.17 cfs @ 15.64 hrs, Volume= 0.123 af, Atten= 17%, Lag= 80.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.09 fps, Min. Travel Time= 65.5 min
Avg. Velocity = 0.05 fps, Avg. Travel Time= 136.2 min

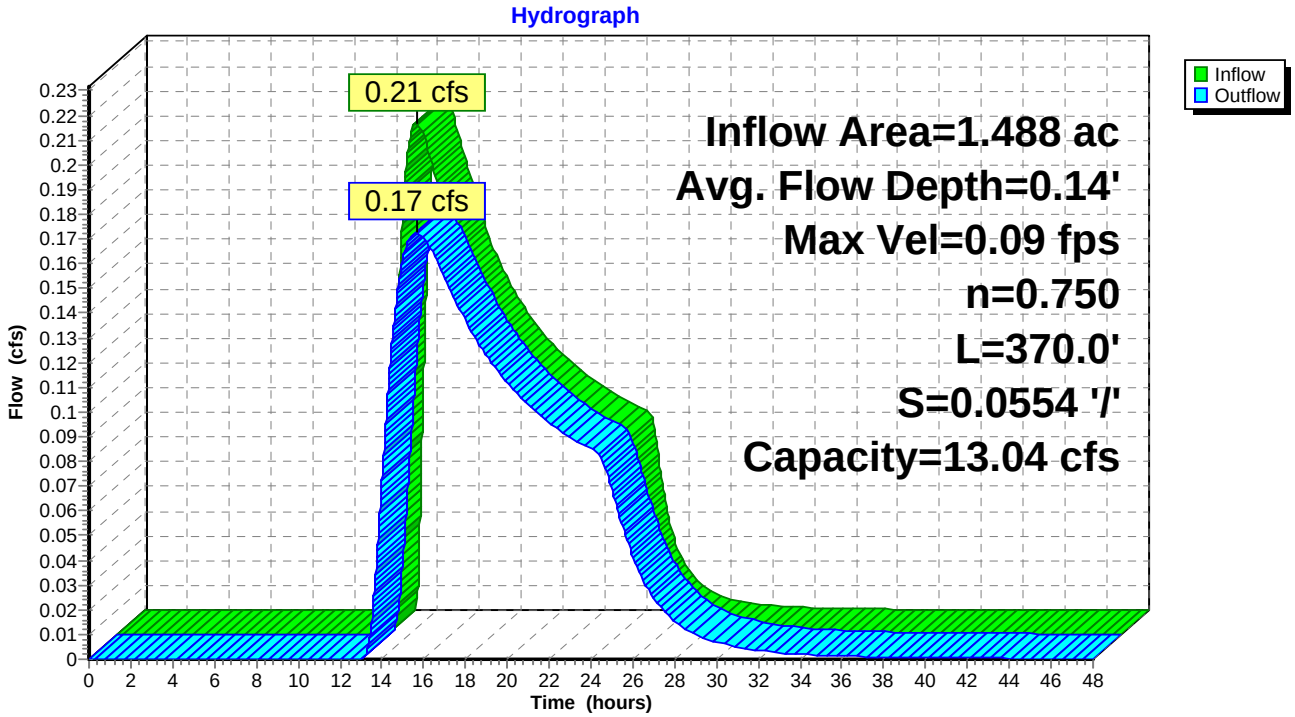
Peak Storage= 679 cf @ 15.64 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 1.00' Flow Area= 36.7 sf, Capacity= 13.04 cfs

55.00' x 1.00' deep Parabolic Channel, n= 0.750
Length= 370.0' Slope= 0.0554 '/'
Inlet Invert= 233.00', Outlet Invert= 212.50'



‡

Reach ER81: SE Portion of Middle Lot Wetlands



Summary for Reach ER82: Swale Located on North Side of Redemption Rd Flowing Northeast

Inflow Area = 0.487 ac, 17.10% Impervious, Inflow Depth = 1.98" for 10-yr event
Inflow = 0.83 cfs @ 12.08 hrs, Volume= 0.080 af
Outflow = 0.82 cfs @ 12.09 hrs, Volume= 0.080 af, Atten= 1%, Lag= 0.8 min

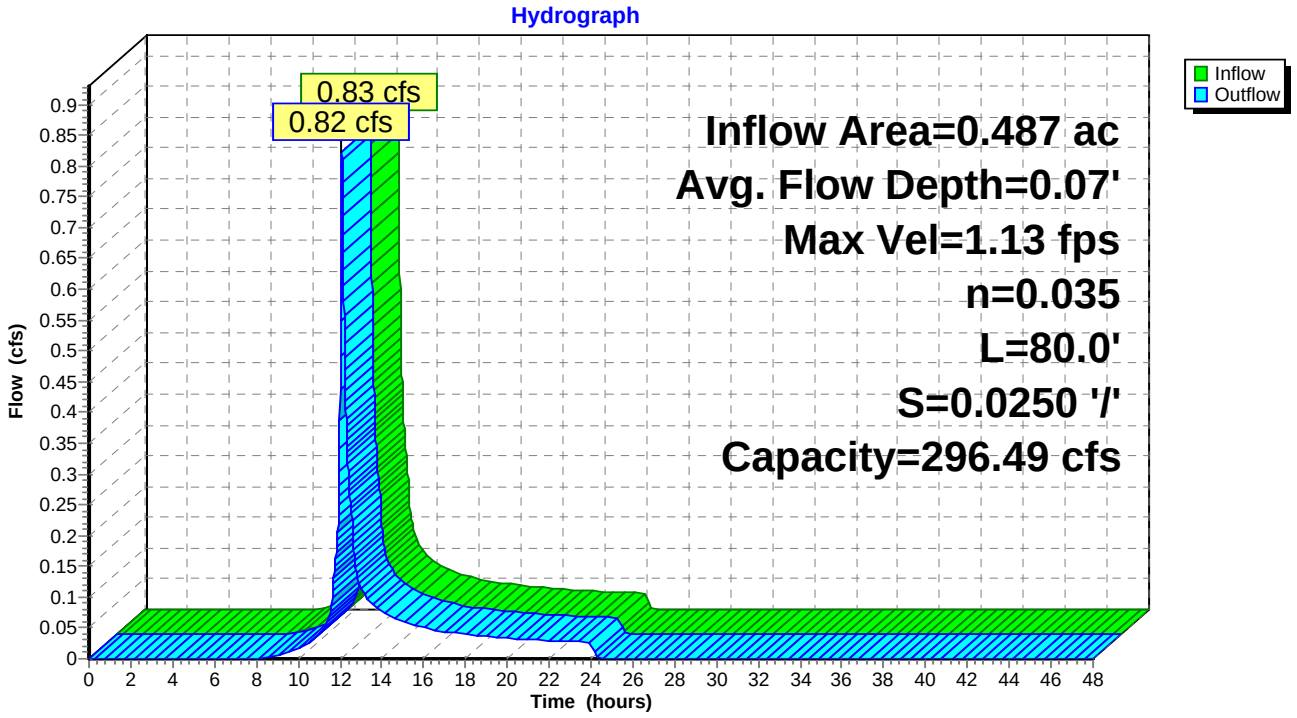
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 1.13 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.51 fps, Avg. Travel Time= 2.6 min

Peak Storage= 58 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 2.00' Flow Area= 36.0 sf, Capacity= 296.49 cfs

10.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 4.0 '/' Top Width= 26.00'
Length= 80.0' Slope= 0.0250 '/'
Inlet Invert= 217.00', Outlet Invert= 215.00'

‡

Reach ER82: Swale Located on North Side of Redemption Rd Flowing Northeast



Summary for Reach ER84: Swale Located on North Side of Redemption Rd Flowing Northeast

Inflow Area = 2.582 ac, 8.71% Impervious, Inflow Depth = 0.14" for 10-yr event
Inflow = 0.09 cfs @ 15.19 hrs, Volume= 0.030 af
Outflow = 0.09 cfs @ 15.25 hrs, Volume= 0.030 af, Atten= 0%, Lag= 3.6 min

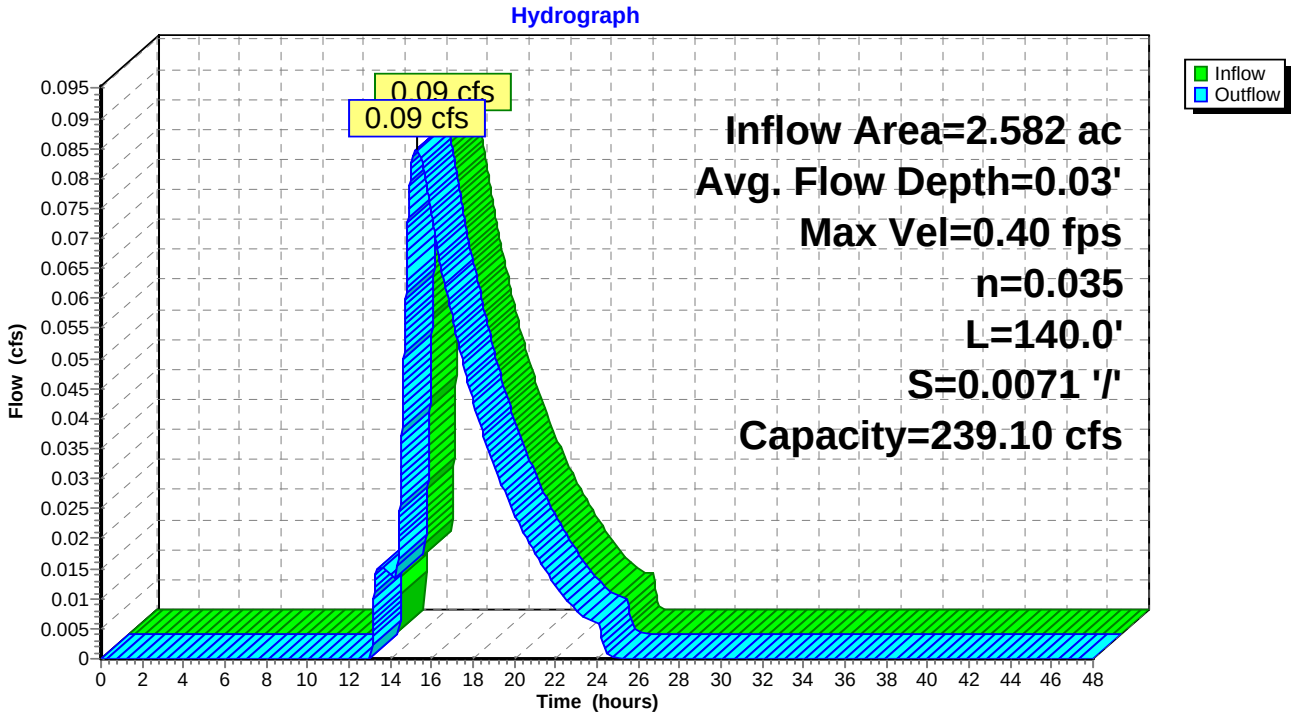
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.40 fps, Min. Travel Time= 5.9 min
Avg. Velocity = 0.35 fps, Avg. Travel Time= 6.7 min

Peak Storage= 30 cf @ 15.25 hrs
Average Depth at Peak Storage= 0.03'
Bank-Full Depth= 3.00' Flow Area= 45.0 sf, Capacity= 239.10 cfs

6.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 3.0 '/' Top Width= 24.00'
Length= 140.0' Slope= 0.0071 '/'
Inlet Invert= 212.00', Outlet Invert= 211.00'

‡

Reach ER84: Swale Located on North Side of Redemption Rd Flowing Northeast



Summary for Reach ER85: End of Swale located North of Redemption Rd Circle

[62] Hint: Exceeded Reach ER84 OUTLET depth by 0.16' @ 12.15 hrs

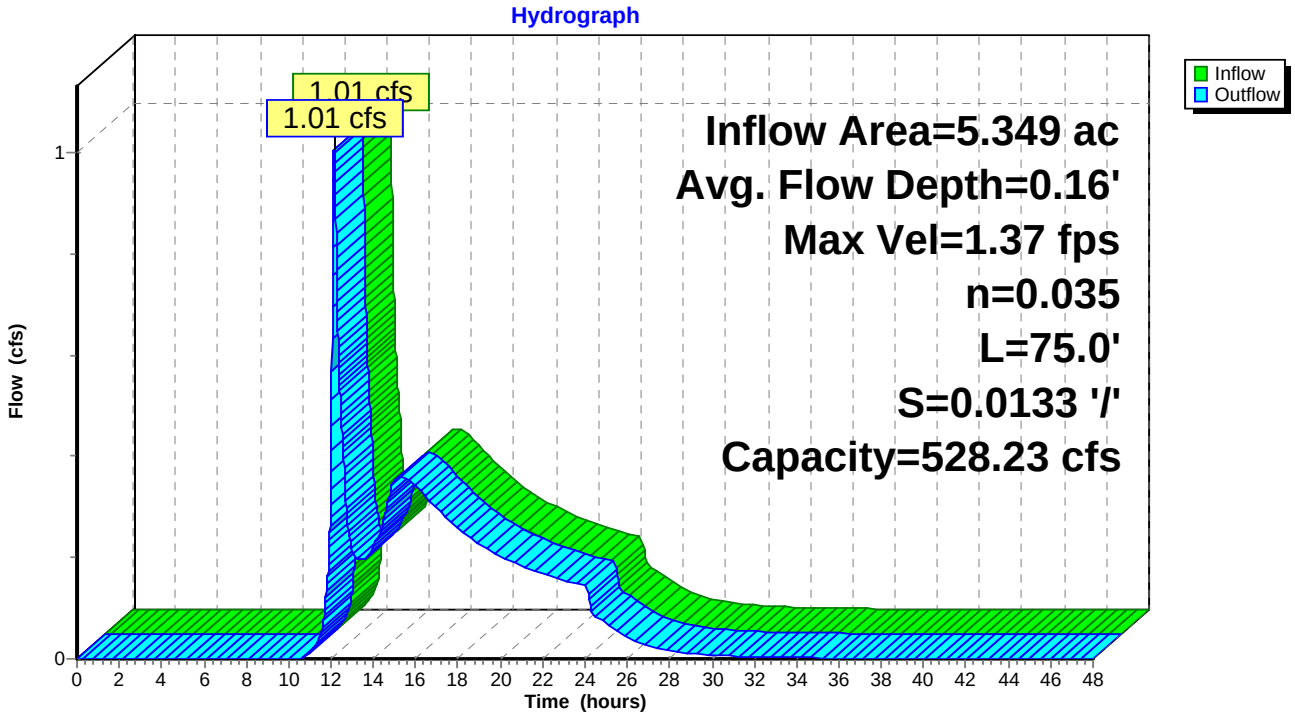
Inflow Area = 5.349 ac, 6.59% Impervious, Inflow Depth > 0.63" for 10-yr event
Inflow = 1.01 cfs @ 12.14 hrs, Volume= 0.282 af
Outflow = 1.01 cfs @ 12.15 hrs, Volume= 0.282 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 1.37 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 1.9 min

Peak Storage= 55 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 4.00' Flow Area= 64.0 sf, Capacity= 528.23 cfs

4.00' x 4.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 3.0 '/' Top Width= 28.00'
Length= 75.0' Slope= 0.0133 '/'
Inlet Invert= 211.00', Outlet Invert= 210.00'

Reach ER85: End of Swale located North of Redemption Rd Circle



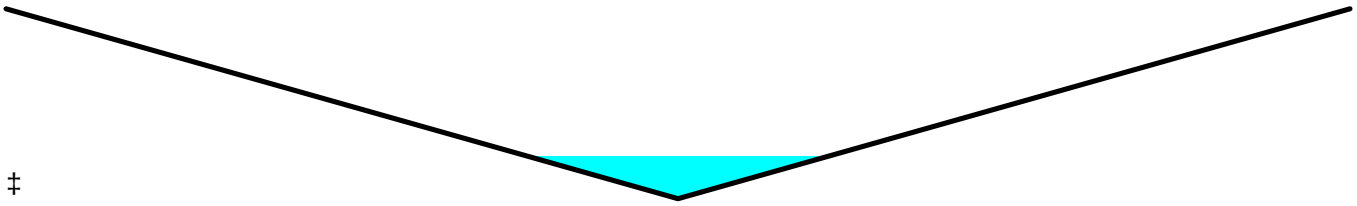
Summary for Reach PR62: Swale South of Proposed Driveway

Inflow Area = 0.177 ac, 70.54% Impervious, Inflow Depth = 3.60" for 10-yr event
Inflow = 0.70 cfs @ 12.01 hrs, Volume= 0.053 af
Outflow = 0.70 cfs @ 12.02 hrs, Volume= 0.053 af, Atten= 1%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 3.45 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.41 fps, Avg. Travel Time= 1.5 min

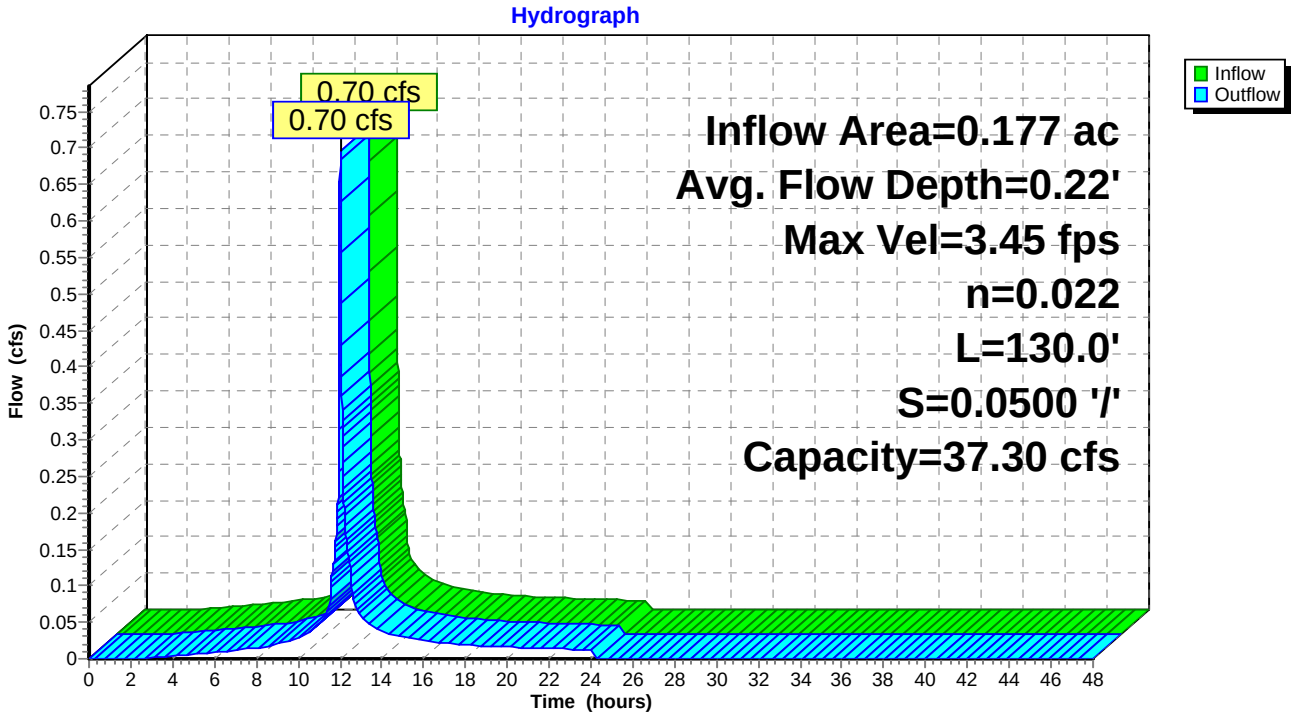
Peak Storage= 26 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 37.30 cfs

0.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 4.0 '/' Top Width= 8.00'
Length= 130.0' Slope= 0.0500 '/'
Inlet Invert= 224.00', Outlet Invert= 217.50'



‡

Reach PR62: Swale South of Proposed Driveway



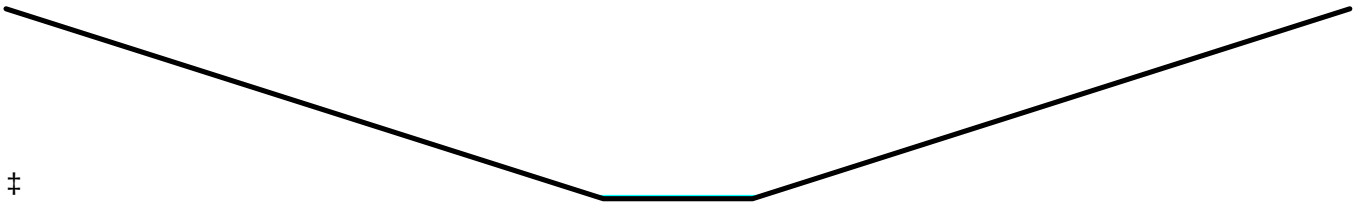
Summary for Reach PR63: Swale North of gravel drive entrance

Inflow Area = 0.636 ac, 47.61% Impervious, Inflow Depth = 0.07" for 10-yr event
Inflow = 0.02 cfs @ 12.71 hrs, Volume= 0.004 af
Outflow = 0.02 cfs @ 12.72 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 1.09 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.91 fps, Avg. Travel Time= 1.5 min

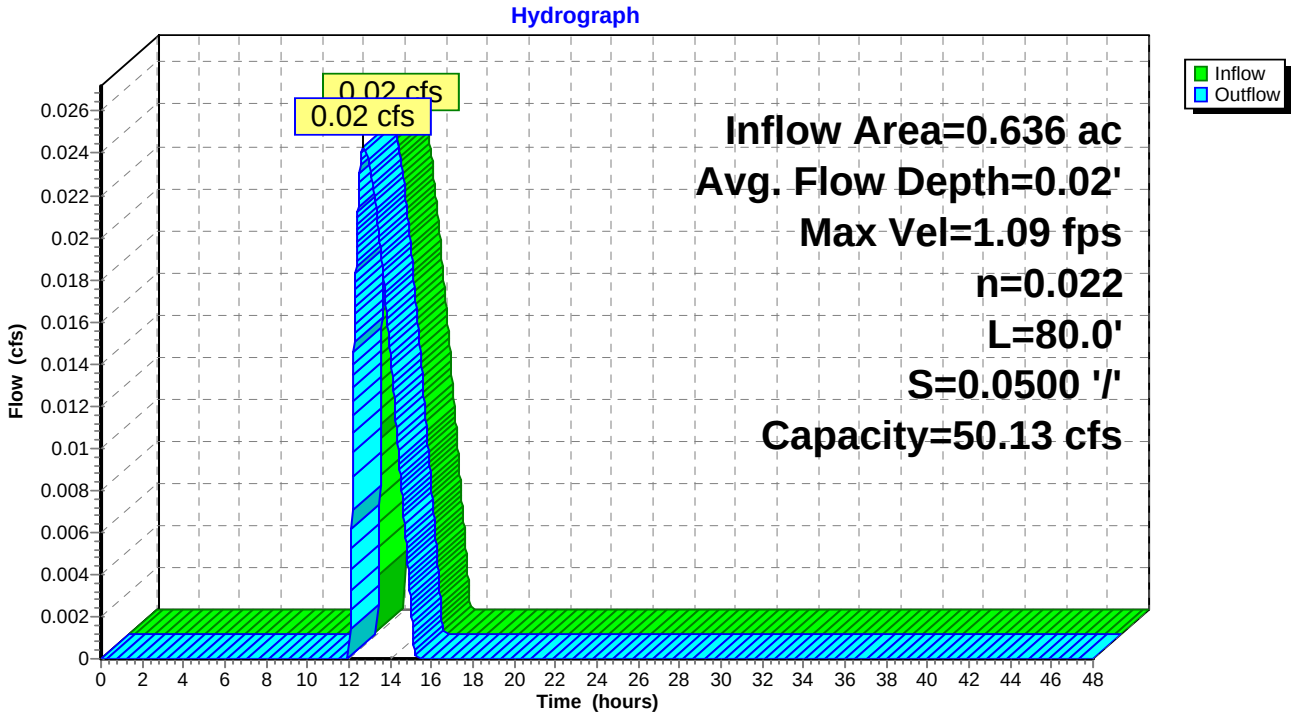
Peak Storage= 2 cf @ 12.72 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 50.13 cfs

1.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 4.0 '/' Top Width= 9.00'
Length= 80.0' Slope= 0.0500 '/'
Inlet Invert= 210.00', Outlet Invert= 206.00'



‡

Reach PR63: Swale North of gravel drive entrance



Summary for Reach PR64: Pipe PDL5

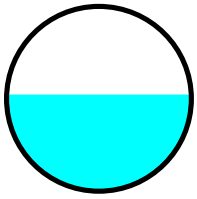
[52] Hint: Inlet/Outlet conditions not evaluated
[80] Warning: Exceeded Pond BR1 by 4.92' @ 0.00 hrs (0.03 cfs 0.024 af)

Inflow Area = 1.274 ac, 45.56% Impervious, Inflow Depth = 2.71" for 10-yr event
Inflow = 2.32 cfs @ 12.12 hrs, Volume= 0.288 af
Outflow = 2.32 cfs @ 12.13 hrs, Volume= 0.288 af, Atten= 0%, Lag= 0.4 min

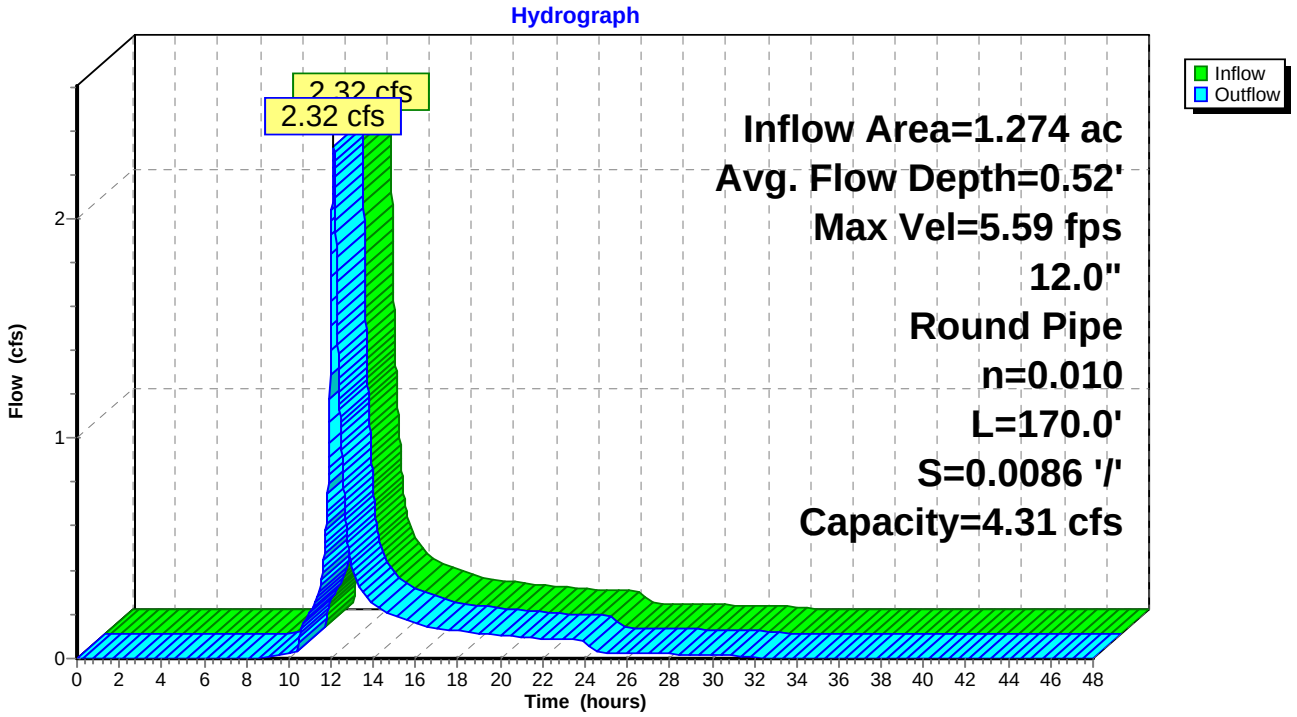
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 5.59 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.99 fps, Avg. Travel Time= 1.4 min

Peak Storage= 71 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.52'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.31 cfs

12.0" Round Pipe
n= 0.010
Length= 170.0' Slope= 0.0086 '/'
Inlet Invert= 227.67', Outlet Invert= 226.20'



Reach PR64: Pipe PDL5



Summary for Pond BR1: Bioswale-ISR 1 (CB5)

Inflow Area = 1.274 ac, 45.56% Impervious, Inflow Depth = 2.90" for 10-yr event
Inflow = 2.43 cfs @ 12.10 hrs, Volume= 0.308 af
Outflow = 2.32 cfs @ 12.12 hrs, Volume= 0.288 af, Atten= 4%, Lag= 1.5 min
Primary = 0.03 cfs @ 12.01 hrs, Volume= 0.044 af
Secondary = 2.30 cfs @ 12.12 hrs, Volume= 0.244 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 229.19' @ 12.12 hrs Surf.Area= 2,128 sf Storage= 1,891 cf
Flood Elev= 230.00' Surf.Area= 2,520 sf Storage= 2,932 cf

Plug-Flow detention time= 117.5 min calculated for 0.288 af (93% of inflow)
Center-of-Mass det. time= 79.4 min (905.1 - 825.8)

Volume	Invert	Avail.Storage	Storage Description
#1	228.00'	2,005 cf	**Ponding Area (Prismatic)**Listed below (Recalc)
#2	226.00'	258 cf	**24" Bioretention Mix (Prismatic)**Listed below (Recalc) 1,030 cf Overall x 25.0% Voids
#3	222.75'	670 cf	**Gravel Reservoir (Prismatic)**Listed below (Recalc) 1,674 cf Overall x 40.0% Voids
		2,932 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
228.00	515	0	0
230.00	1,490	2,005	2,005

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
226.00	515	0	0
228.00	515	1,030	1,030

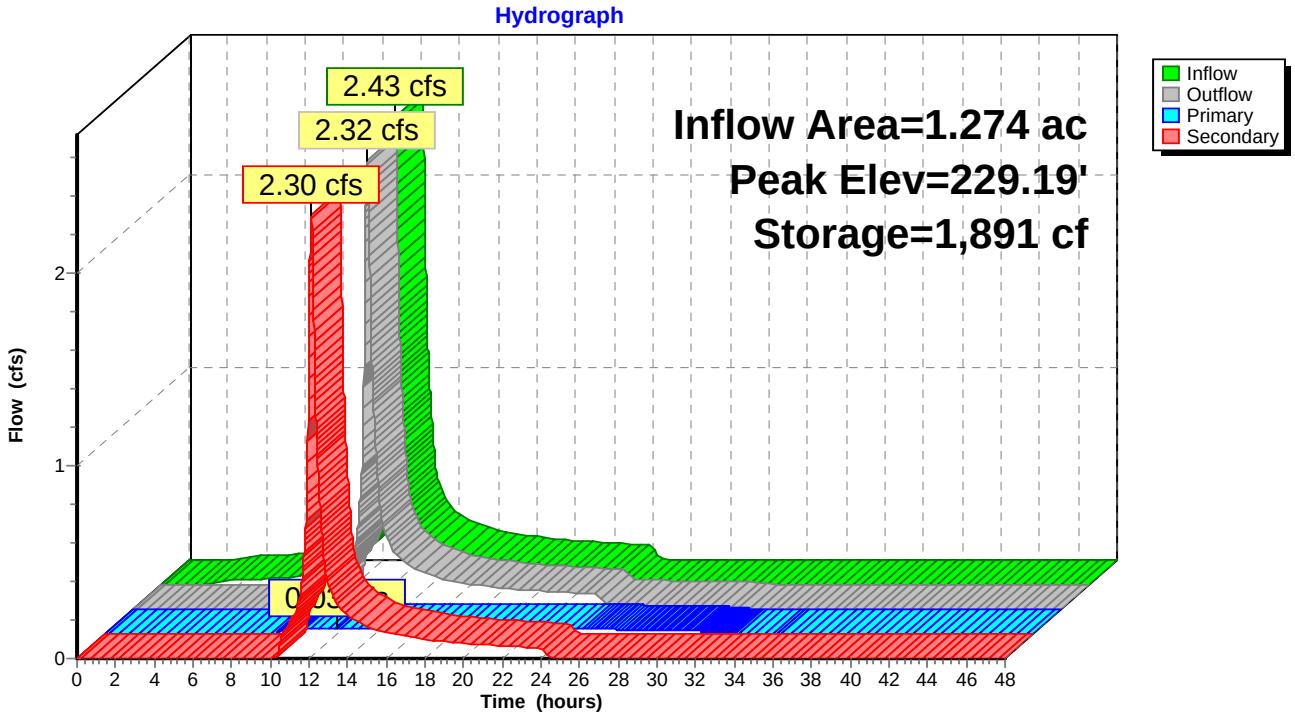
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
222.75	515	0	0
226.00	515	1,674	1,674

Device	Routing	Invert	Outlet Devices
#1	Primary	226.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#2	Secondary	228.67'	**2.0' long x 0.5' breadth Bypass Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.03 cfs @ 12.01 hrs HW=229.13' TW=228.12' (Dynamic Tailwater)
↑—**1=Orifice/Grate** (Orifice Controls 0.03 cfs @ 4.83 fps)

Secondary OutFlow Max=2.30 cfs @ 12.12 hrs HW=229.19' TW=228.19' (Dynamic Tailwater)
↑—**2=Bypass Weir** (Weir Controls 2.30 cfs @ 2.19 fps)

Pond BR1: Bioswale-ISR 1 (CB5)



Summary for Pond BR2: Bioswale-ISR 2 (CB3)

Inflow Area = 1.333 ac, 77.78% Impervious, Inflow Depth = 3.38" for 10-yr event
Inflow = 4.93 cfs @ 12.00 hrs, Volume= 0.376 af
Outflow = 3.51 cfs @ 12.02 hrs, Volume= 0.349 af, Atten= 29%, Lag= 1.6 min
Primary = 0.19 cfs @ 12.02 hrs, Volume= 0.204 af
Secondary = 3.32 cfs @ 12.02 hrs, Volume= 0.145 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 230.32' @ 12.02 hrs Surf.Area= 4,246 sf Storage= 3,858 cf
Flood Elev= 230.90' Surf.Area= 4,893 sf Storage= 5,430 cf

Plug-Flow detention time= 137.5 min calculated for 0.348 af (93% of inflow)
Center-of-Mass det. time= 95.0 min (900.8 - 805.8)

Volume	Invert	Avail.Storage	Storage Description
#1	229.00'	4,085 cf	**Ponding Area (Prismatic)**Listed below (Recalc)
#2	227.00'	460 cf	**24" Bioretention Mix (Prismatic)**Listed below (Recalc) 1,840 cf Overall x 25.0% Voids
#3	223.75'	1,196 cf	**Gravel Reservoir (Prismatic)**Listed below (Recalc) 2,990 cf Overall x 40.0% Voids
		5,741 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
229.00	920	0	0
231.00	3,165	4,085	4,085

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
227.00	920	0	0
229.00	920	1,840	1,840

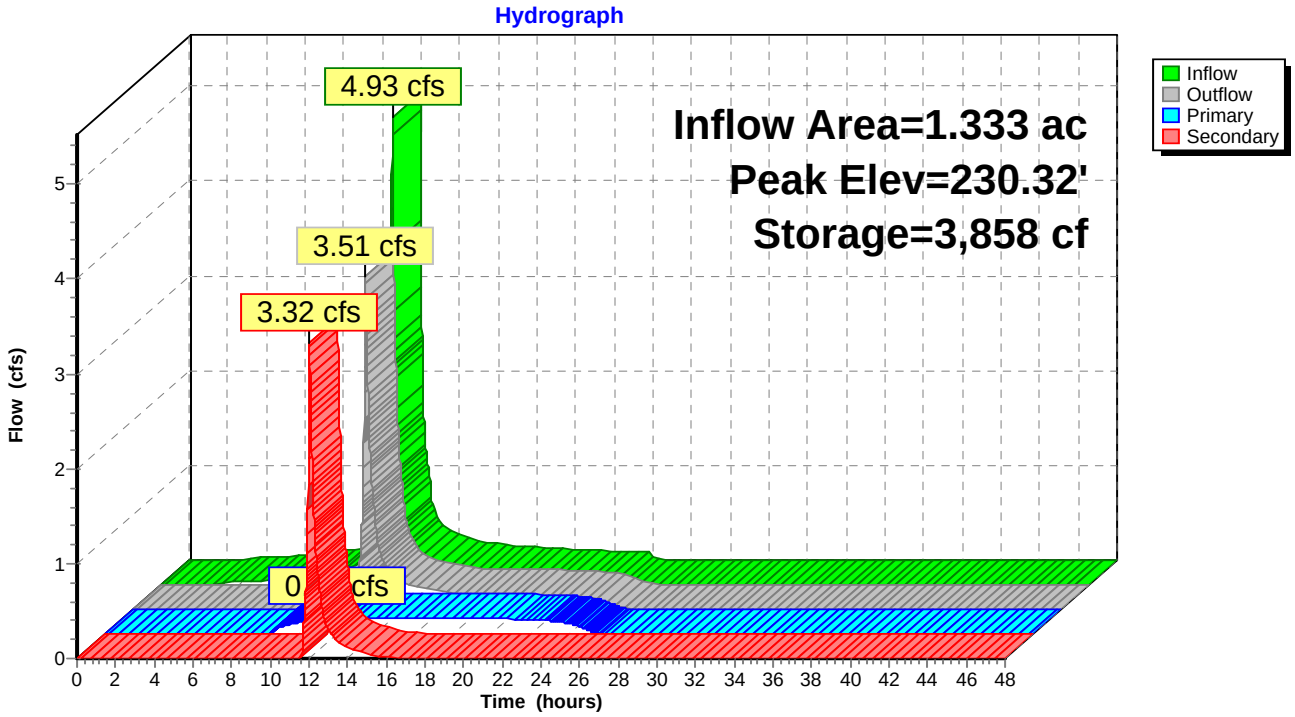
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
223.75	920	0	0
227.00	920	2,990	2,990

Device	Routing	Invert	Outlet Devices
#1	Primary	227.00'	**2.0" Vert. Orifice/Grate** C= 0.600
#2	Secondary	229.67'	**2.0' long x 0.5' breadth Bypass Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.19 cfs @ 12.02 hrs HW=230.32' TW=224.84' (Dynamic Tailwater)
↑—**1=Orifice/Grate** (Orifice Controls 0.19 cfs @ 8.67 fps)

Secondary OutFlow Max=3.31 cfs @ 12.02 hrs HW=230.32' TW=224.84' (Dynamic Tailwater)
↑—**2=Bypass Weir** (Weir Controls 3.31 cfs @ 2.54 fps)

Pond BR2: Bioswale-ISR 2 (CB3)



Summary for Pond DE1: Drip Edge along Northeastern Building

Inflow Area = 0.190 ac, 93.93% Impervious, Inflow Depth = 4.37" for 10-yr event
Inflow = 0.86 cfs @ 11.99 hrs, Volume= 0.069 af
Outflow = 0.84 cfs @ 12.00 hrs, Volume= 0.068 af, Atten= 2%, Lag= 0.6 min
Primary = 0.84 cfs @ 12.00 hrs, Volume= 0.068 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 233.05' @ 12.00 hrs Surf.Area= 503 sf Storage= 130 cf

Plug-Flow detention time= 24.2 min calculated for 0.068 af (99% of inflow)
Center-of-Mass det. time= 15.1 min (761.4 - 746.4)

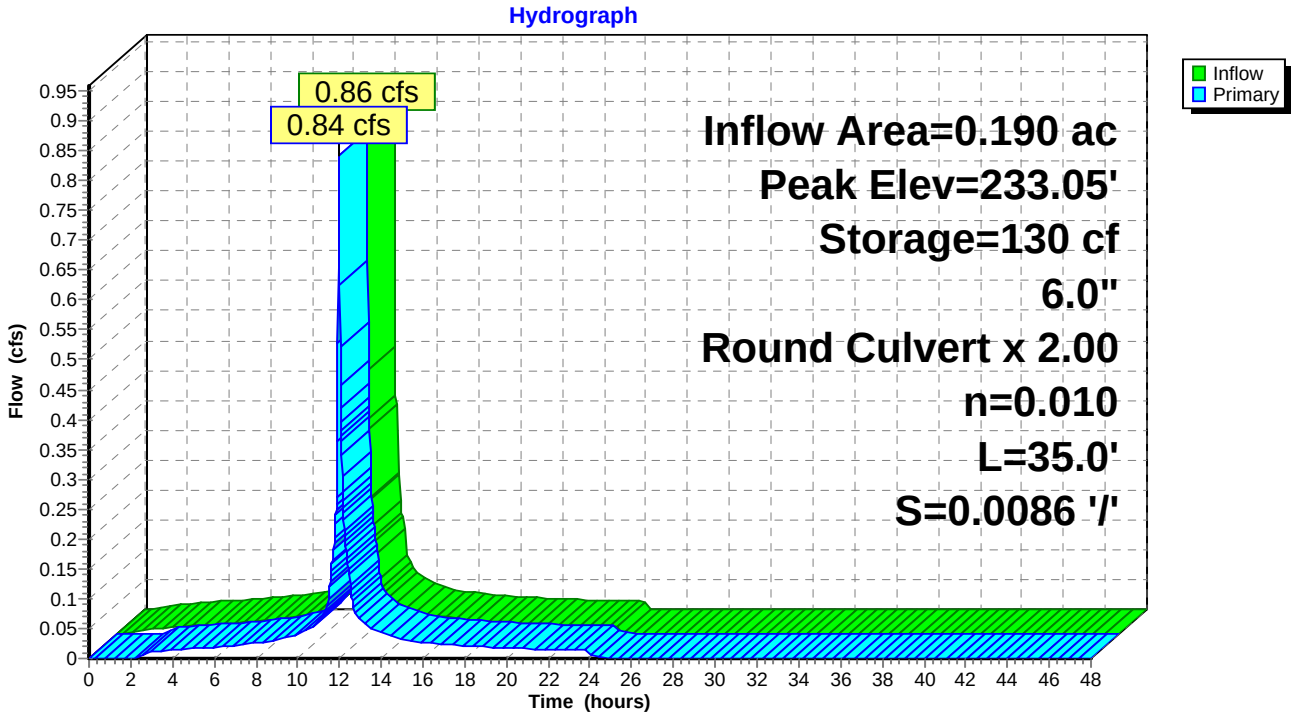
Volume	Invert	Avail.Storage	Storage Description
#1	232.40'	322 cf	**18" Thick Drip Edge (Prismatic)**Listed below (Recalc) 805 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
232.40	503	0	0
234.00	503	805	805

Device	Routing	Invert	Outlet Devices
#1	Primary	232.60'	**6.0" Round (2) 6" Underdrains X 2.00** L= 35.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 232.60' / 232.30' S= 0.0086 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.84 cfs @ 12.00 hrs HW=233.05' TW=229.12' (Dynamic Tailwater)
↑—**1=(2) 6" Underdrains** (Inlet Controls 0.84 cfs @ 2.28 fps)

Pond DE1: Drip Edge along Northeastern Building



Summary for Pond DE2: Drip Edge along Northwestern Building

Inflow Area = 0.152 ac, 93.98% Impervious, Inflow Depth = 4.37" for 10-yr event
Inflow = 0.68 cfs @ 11.99 hrs, Volume= 0.055 af
Outflow = 0.58 cfs @ 12.00 hrs, Volume= 0.055 af, Atten= 16%, Lag= 0.7 min
Primary = 0.58 cfs @ 12.00 hrs, Volume= 0.055 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 233.35' @ 12.00 hrs Surf.Area= 399 sf Storage= 163 cf

Plug-Flow detention time= 25.7 min calculated for 0.055 af (99% of inflow)
Center-of-Mass det. time= 17.9 min (764.3 - 746.4)

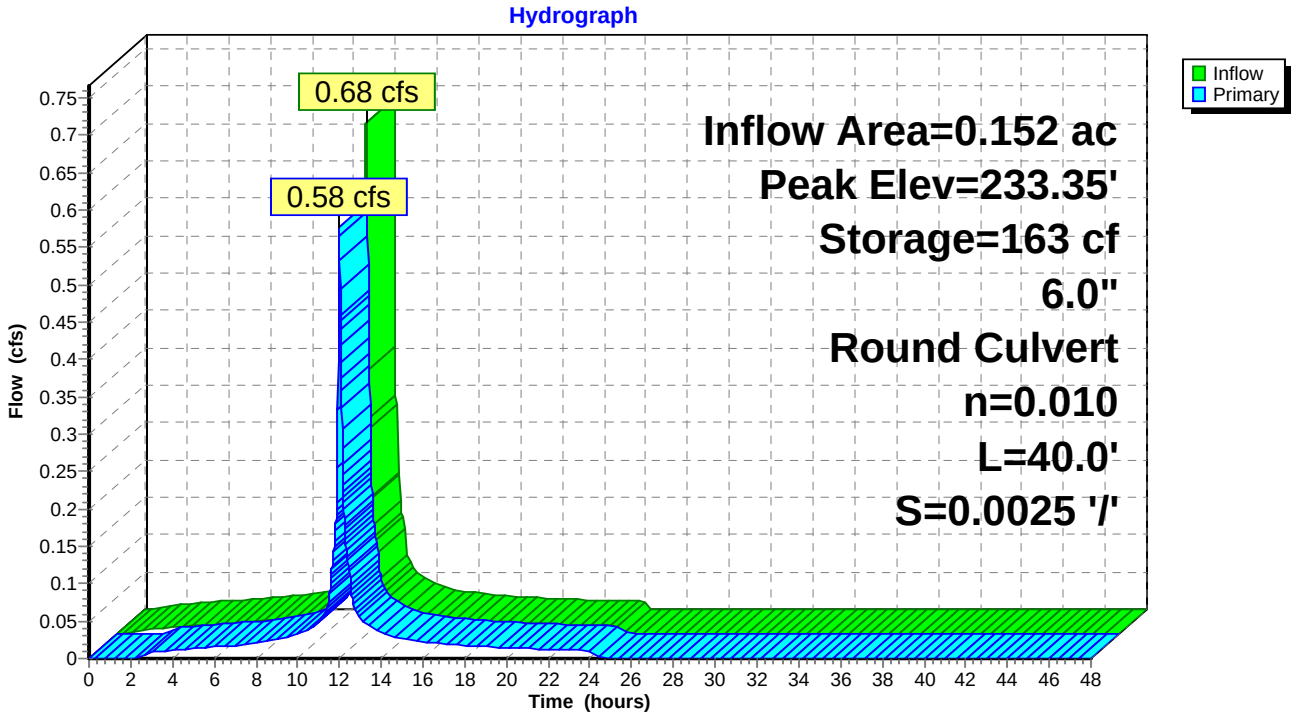
Volume	Invert	Avail.Storage	Storage Description
#1	232.33'	267 cf	**Drip Edge (Prismatic)**Listed below (Recalc) 666 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
232.33	399	0	0
234.00	399	666	666

Device	Routing	Invert	Outlet Devices
#1	Primary	232.50'	**6.0" Round (1) 6" Underdrains** L= 40.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 232.50' / 232.40' S= 0.0025 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.57 cfs @ 12.00 hrs HW=233.35' TW=229.12' (Dynamic Tailwater)
1=(1) 6" Underdrains (Barrel Controls 0.57 cfs @ 2.92 fps)

Pond DE2: Drip Edge along Northwestern Building



Summary for Pond DE3: Drip Edge along Southwestern Building

Inflow Area = 0.155 ac, 92.81% Impervious, Inflow Depth = 4.37" for 10-yr event
Inflow = 0.70 cfs @ 11.99 hrs, Volume= 0.056 af
Outflow = 0.64 cfs @ 12.00 hrs, Volume= 0.056 af, Atten= 8%, Lag= 0.5 min
Primary = 0.64 cfs @ 12.00 hrs, Volume= 0.056 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 236.12' @ 12.00 hrs Surf.Area= 484 sf Storage= 177 cf

Plug-Flow detention time= 34.2 min calculated for 0.056 af (99% of inflow)
Center-of-Mass det. time= 24.7 min (771.1 - 746.4)

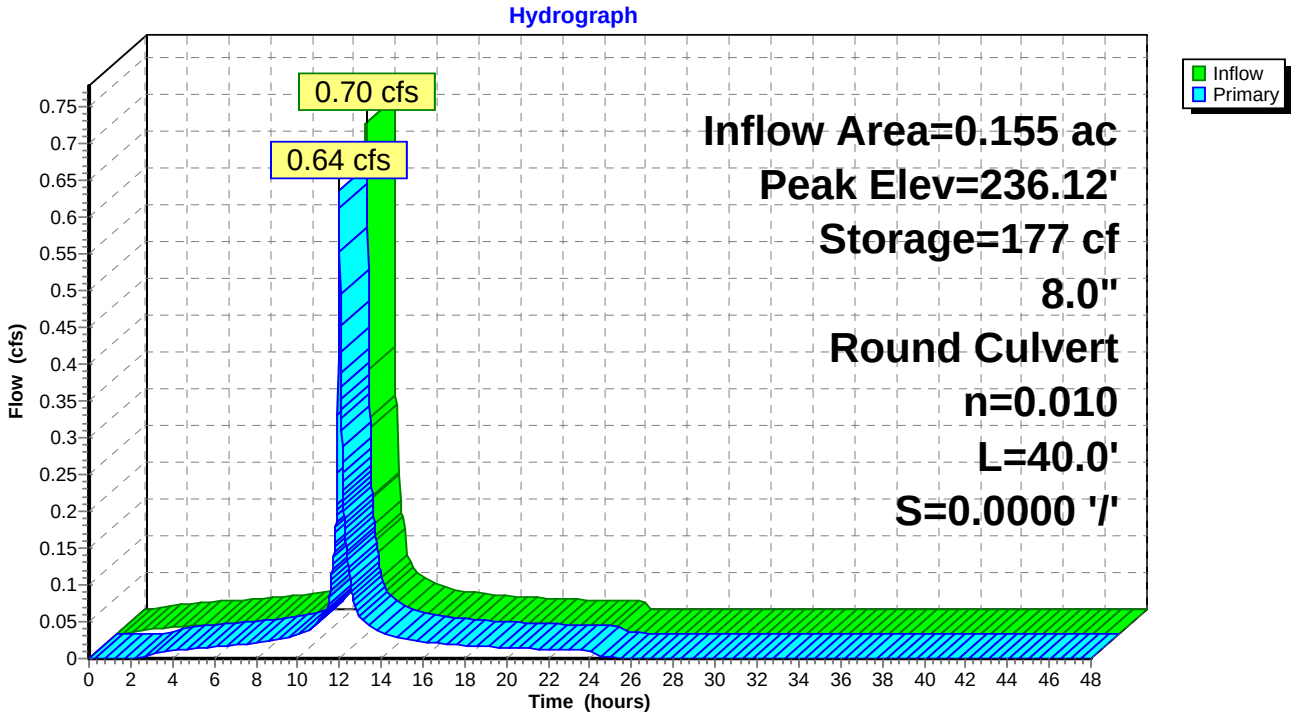
Volume	Invert	Avail.Storage	Storage Description
#1	235.20'	290 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 726 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
235.20	484	0	0
236.70	484	726	726

Device	Routing	Invert	Outlet Devices
#1	Primary	235.37'	**8.0" Round 8" Underdrain** L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 235.37' / 235.37' S= 0.0000 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.63 cfs @ 12.00 hrs HW=236.11' TW=233.08' (Dynamic Tailwater)
↑—**1=8" Underdrain** (Barrel Controls 0.63 cfs @ 2.04 fps)

Pond DE3: Drip Edge along Southwestern Building



Summary for Pond DE4: Drip Edge along Southeastern Building

Inflow Area = 0.154 ac, 92.87% Impervious, Inflow Depth = 4.37" for 10-yr event
Inflow = 0.70 cfs @ 11.99 hrs, Volume= 0.056 af
Outflow = 0.59 cfs @ 12.00 hrs, Volume= 0.056 af, Atten= 15%, Lag= 0.6 min
Primary = 0.59 cfs @ 12.00 hrs, Volume= 0.056 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 235.22' @ 12.00 hrs Surf.Area= 480 sf Storage= 195 cf

Plug-Flow detention time= 36.5 min calculated for 0.056 af (99% of inflow)
Center-of-Mass det. time= 27.0 min (773.4 - 746.4)

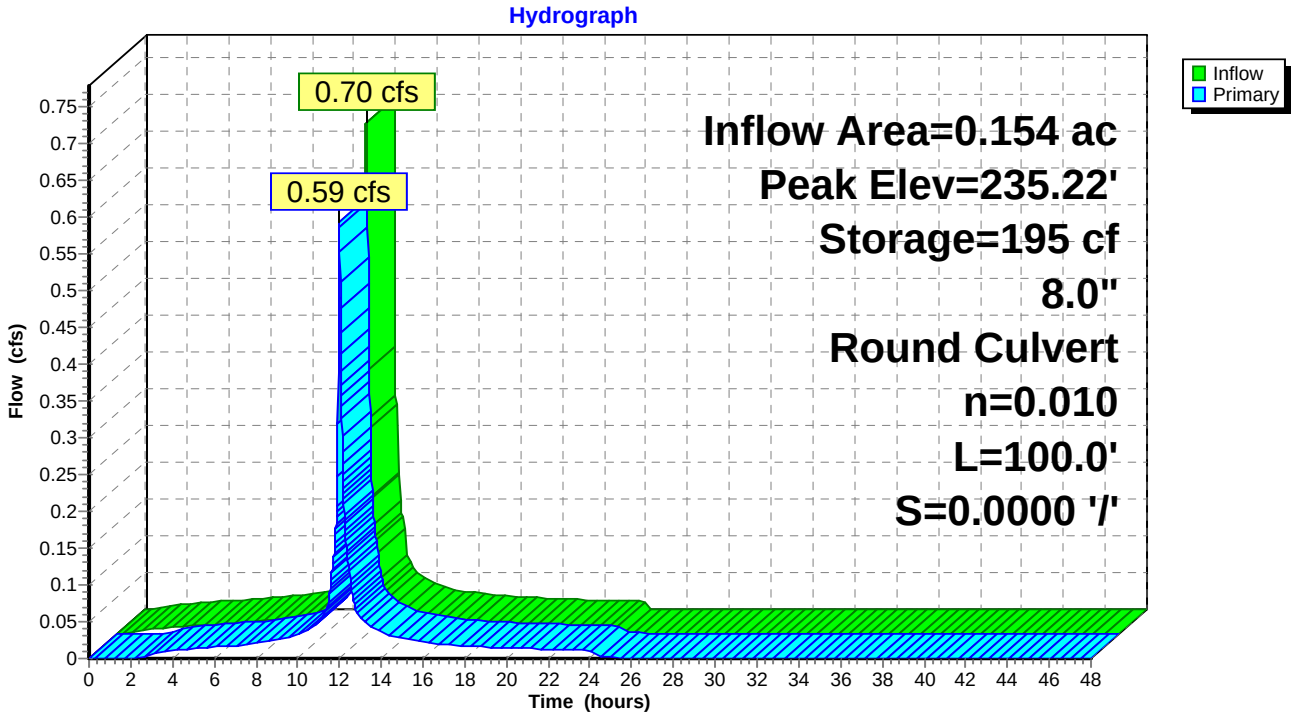
Volume	Invert	Avail.Storage	Storage Description
#1	234.20'	288 cf	**Drip Edge (Prismatic)**Listed below (Recalc) 720 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
234.20	480	0	0
235.70	480	720	720

Device	Routing	Invert	Outlet Devices
#1	Primary	234.37'	**8.0" Round 8" Under Drain** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 234.37' / 234.37' S= 0.0000 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.59 cfs @ 12.00 hrs HW=235.21' TW=230.30' (Dynamic Tailwater)
1=8" Under Drain (Barrel Controls 0.59 cfs @ 1.73 fps)

Pond DE4: Drip Edge along Southeastern Building



Summary for Pond EP81: Middle Portion of Wetland

Inflow Area = 1.488 ac, 0.00% Impervious, Inflow Depth = 1.75" for 10-yr event
Inflow = 1.43 cfs @ 12.29 hrs, Volume= 0.217 af
Outflow = 0.21 cfs @ 14.29 hrs, Volume= 0.123 af, Atten= 86%, Lag= 120.1 min
Primary = 0.21 cfs @ 14.29 hrs, Volume= 0.123 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 233.61' @ 14.29 hrs Surf.Area= 5,603 sf Storage= 4,706 cf

Plug-Flow detention time= 349.8 min calculated for 0.123 af (57% of inflow)
Center-of-Mass det. time= 194.1 min (1,102.6 - 908.5)

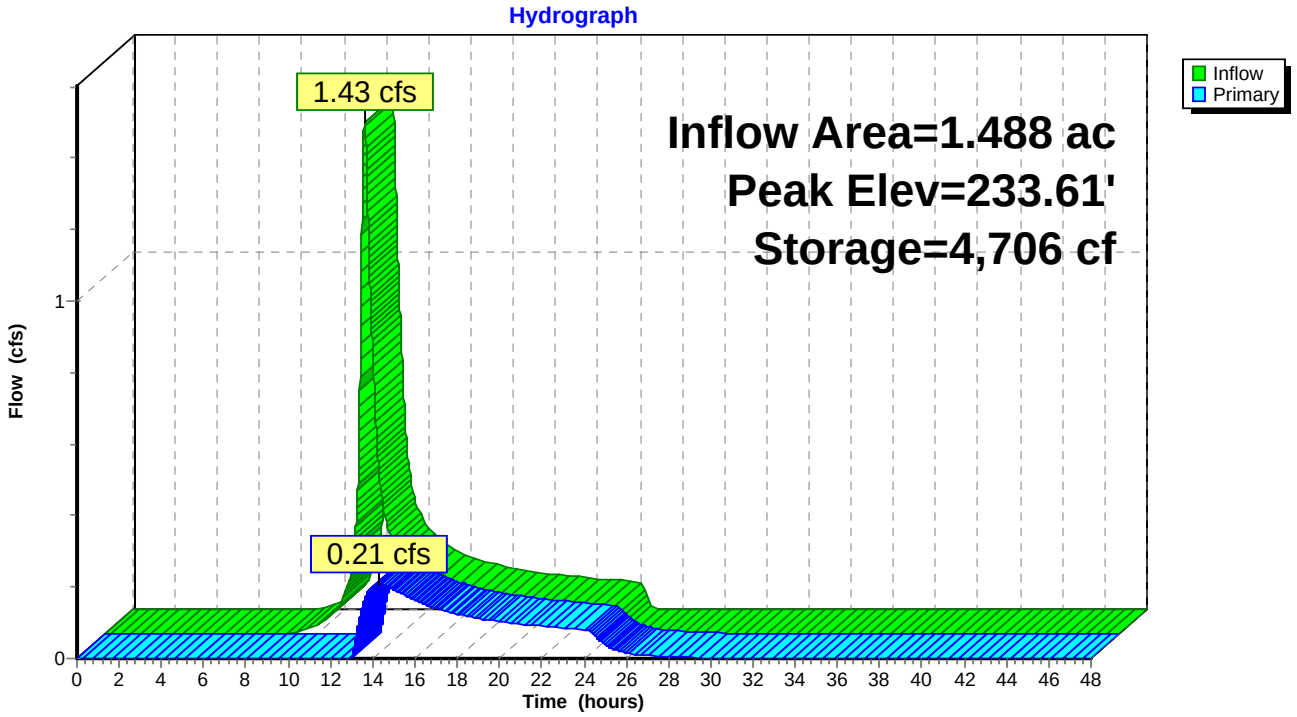
Volume	Invert	Avail.Storage	Storage Description
#1	232.00'	7,132 cf	**Wetland Low Point (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
232.00	520	90.0	0	0	520
233.00	3,700	245.0	1,869	1,869	4,655
234.00	7,000	381.0	5,263	7,132	11,438

Device	Routing	Invert	Outlet Devices
#1	Primary	233.50'	**2.0' long x 21.0' breadth Weir Between ES8-ES9**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.21 cfs @ 14.29 hrs HW=233.61' TW=233.11' (Dynamic Tailwater)
↑—**1=Weir Between ES8-ES9** (Weir Controls 0.21 cfs @ 0.91 fps)

Pond EP81: Middle Portion of Wetland



Summary for Pond PCB2: CB2 - Catch Basin at the end of Bioswale "A"

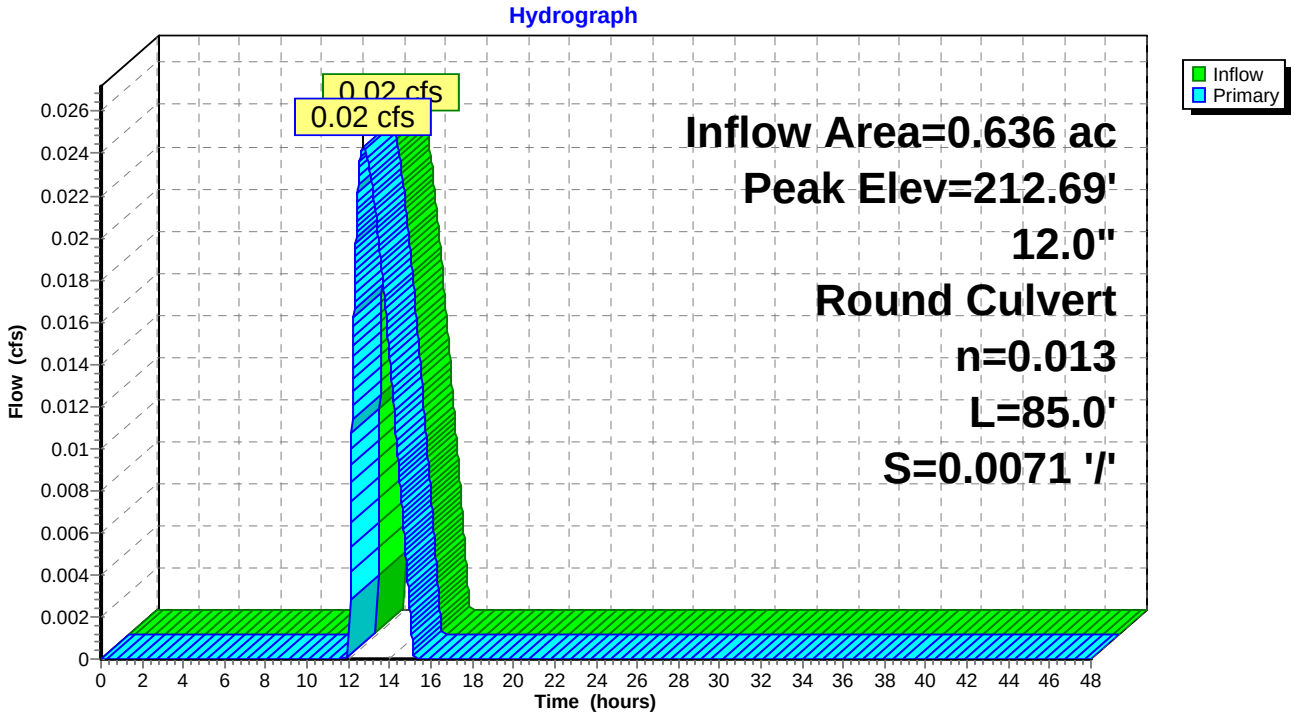
Inflow Area = 0.636 ac, 47.61% Impervious, Inflow Depth = 0.07" for 10-yr event
Inflow = 0.02 cfs @ 12.71 hrs, Volume= 0.004 af
Outflow = 0.02 cfs @ 12.71 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min
Primary = 0.02 cfs @ 12.71 hrs, Volume= 0.004 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 212.69' @ 12.71 hrs
Flood Elev= 214.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	212.60'	**12.0" Round 12" HDPE Pipe** L= 85.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 212.60' / 212.00' S= 0.0071 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.02 cfs @ 12.71 hrs HW=212.69' TW=210.02' (Dynamic Tailwater)
└**1=12" HDPE Pipe** (Barrel Controls 0.02 cfs @ 1.14 fps)

Pond PCB2: CB2 - Catch Basin at the end of Bioswale "A"



Summary for Pond PCB4: Catch Basin #3

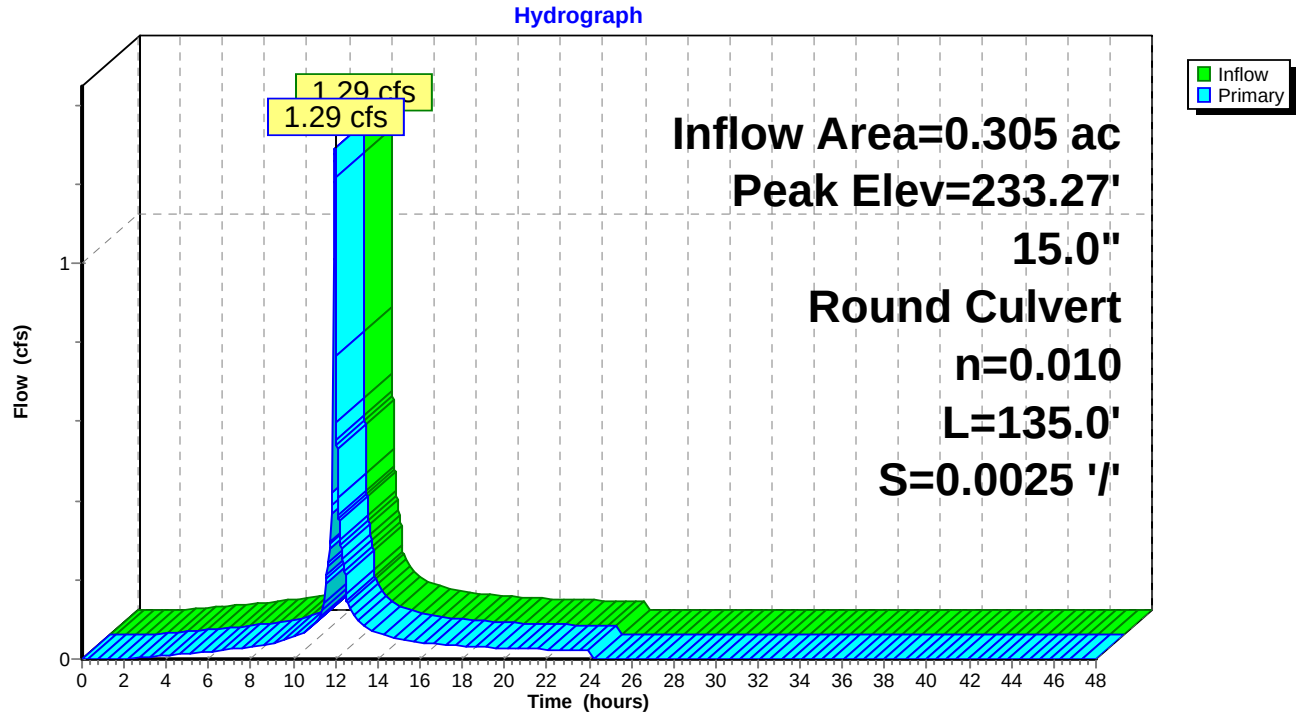
Inflow Area = 0.305 ac, 91.70% Impervious, Inflow Depth = 3.82" for 10-yr event
Inflow = 1.29 cfs @ 12.00 hrs, Volume= 0.097 af
Outflow = 1.29 cfs @ 12.00 hrs, Volume= 0.097 af, Atten= 0%, Lag= 0.0 min
Primary = 1.29 cfs @ 12.00 hrs, Volume= 0.097 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 233.27' @ 12.00 hrs
Flood Elev= 235.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	232.37'	**15.0" Round 15" HDPE Pipe** L= 135.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 232.37' / 232.03' S= 0.0025 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.29 cfs @ 12.00 hrs HW=233.27' TW=233.08' (Dynamic Tailwater)
└**1=15" HDPE Pipe** (Outlet Controls 1.29 cfs @ 1.92 fps)

Pond PCB4: Catch Basin #3



Summary for Pond PDMH1: Drain Manhole #5

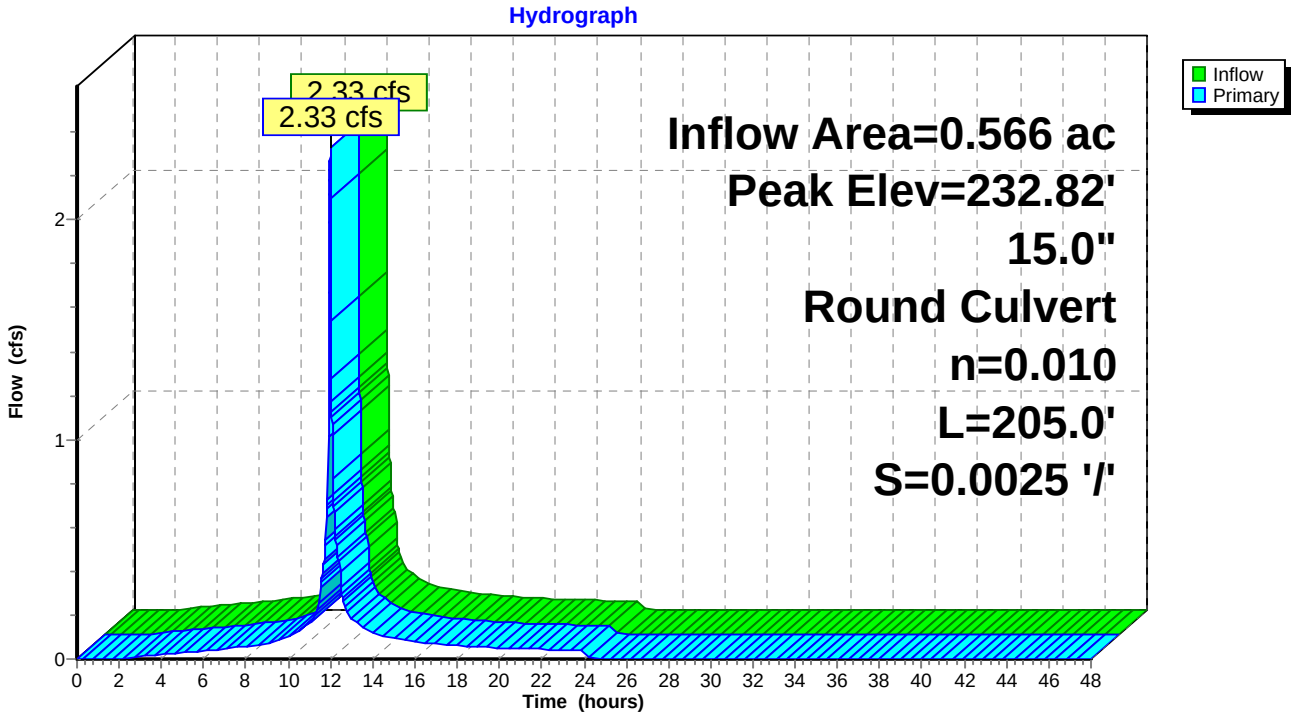
Inflow Area = 0.566 ac, 90.00% Impervious, Inflow Depth = 3.84" for 10-yr event
Inflow = 2.33 cfs @ 12.00 hrs, Volume= 0.181 af
Outflow = 2.33 cfs @ 12.00 hrs, Volume= 0.181 af, Atten= 0%, Lag= 0.0 min
Primary = 2.33 cfs @ 12.00 hrs, Volume= 0.181 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 232.82' @ 12.00 hrs
Flood Elev= 236.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	231.91'	**15.0" Round 15" HDPE Pipe** L= 205.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 231.91' / 231.40' S= 0.0025 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.33 cfs @ 12.00 hrs HW=232.82' TW=230.29' (Dynamic Tailwater)
↑—**1=15" HDPE Pipe** (Barrel Controls 2.33 cfs @ 3.39 fps)

Pond PDMH1: Drain Manhole #5



Summary for Pond PP108: Bioswale "A"

Inflow Area = 0.636 ac, 47.61% Impervious, Inflow Depth = 2.10" for 10-yr event
Inflow = 1.40 cfs @ 12.00 hrs, Volume= 0.112 af
Outflow = 0.17 cfs @ 12.71 hrs, Volume= 0.112 af, Atten= 88%, Lag= 42.6 min
Discarded = 0.15 cfs @ 12.71 hrs, Volume= 0.108 af
Primary = 0.02 cfs @ 12.71 hrs, Volume= 0.004 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 216.13' @ 12.71 hrs Surf.Area= 2,102 sf Storage= 1,353 cf
Flood Elev= 216.70' Surf.Area= 2,445 sf Storage= 2,120 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 124.8 min (971.4 - 846.6)

Volume	Invert	Avail.Storage	Storage Description
#1	212.45'	897 cf	**Bioretention Media (Prismatic)**Listed below 2,990 cf Overall x 30.0% Voids
#2	215.70'	1,223 cf	**Open Swale (Prismatic)**Listed below (Recalc)
		2,120 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
212.45	920	0	0
215.70	920	2,990	2,990

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
215.70	920	0	0
216.70	1,525	1,223	1,223

Device	Routing	Invert	Outlet Devices
#1	Primary	212.70'	**6.0" Round 6" Underdrain** L= 80.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 212.70' / 212.70' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	215.70'	**4.000 in/hr Exfiltration through Bioretention Media over Surface area above 2** Excluded Surface area = 1,840 sf
#3	Secondary	216.30'	**24.0" W x 4.0" H Vert. Knockouts in Catch Basin X 2.00** C= 0.600
#4	Tertiary	216.60'	**4.0' long x 10.0' breadth Overflow** 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
#5	Discarded	212.45'	**3.000 in/hr Exfiltration into Groundwater over Surface area**

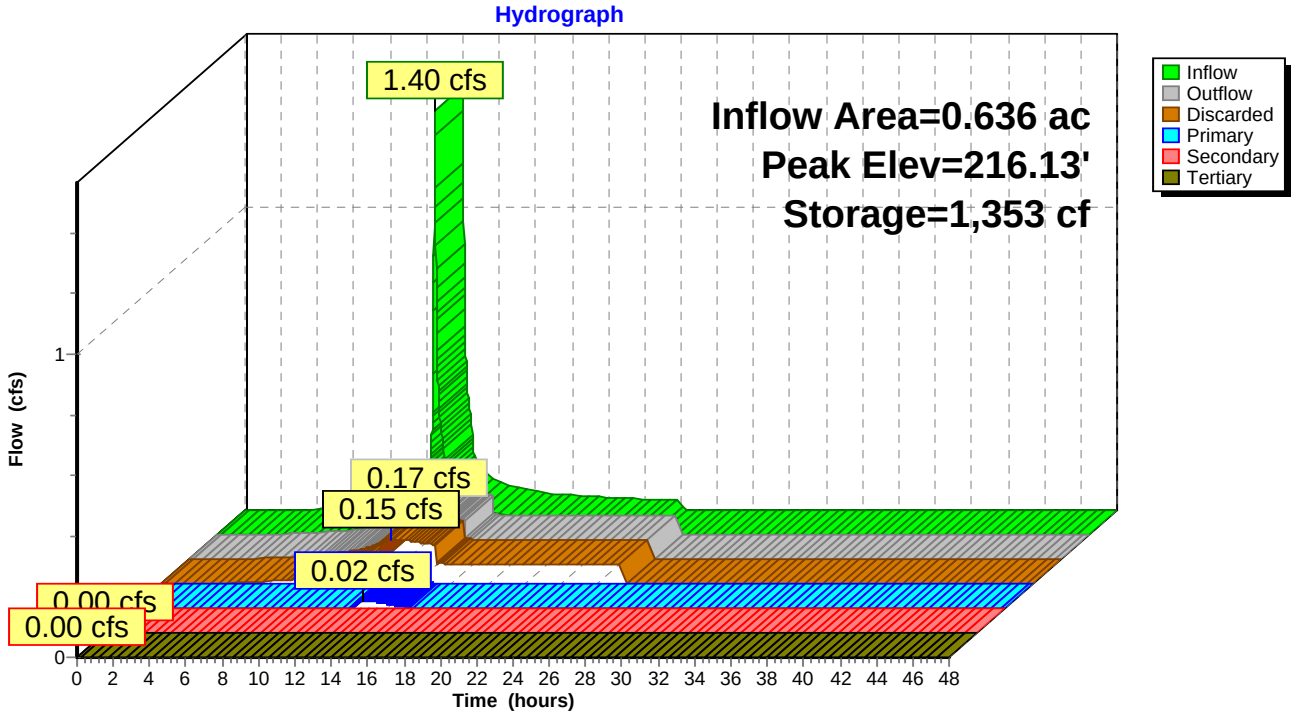
Discarded OutFlow Max=0.15 cfs @ 12.71 hrs HW=216.13' (Free Discharge)
└**5=Exfiltration into Groundwater** (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=0.02 cfs @ 12.71 hrs HW=216.13' TW=212.69' (Dynamic Tailwater)
└**1=6" Underdrain** (Passes 0.02 cfs of 0.94 cfs potential flow)
└**2=Exfiltration through Bioretention Media** (Exfiltration Controls 0.02 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=212.45' TW=212.60' (Dynamic Tailwater)
└**3=Knockouts in Catch Basin** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=212.45' TW=210.00' (Dynamic Tailwater)
└**4=Overflow** (Controls 0.00 cfs)

Pond PP108: Bioswale "A"



Summary for Pond PP109: Stormwater Detention

Inflow Area = 2.382 ac, 7.40% Impervious, Inflow Depth = 1.03" for 10-yr event
Inflow = 1.40 cfs @ 12.11 hrs, Volume= 0.204 af
Outflow = 0.17 cfs @ 15.20 hrs, Volume= 0.204 af, Atten= 88%, Lag= 185.0 min
Discarded = 0.10 cfs @ 15.20 hrs, Volume= 0.182 af
Primary = 0.07 cfs @ 15.20 hrs, Volume= 0.022 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 213.56' @ 15.20 hrs Surf.Area= 2,827 sf Storage= 3,608 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 422.9 min (1,355.8 - 932.8)

Volume	Invert	Avail.Storage	Storage Description
#1	212.00'	5,200 cf	**Custom Stage Data (Conic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
212.00	1,300	0	0	1,300
214.25	3,500	5,200	5,200	3,533

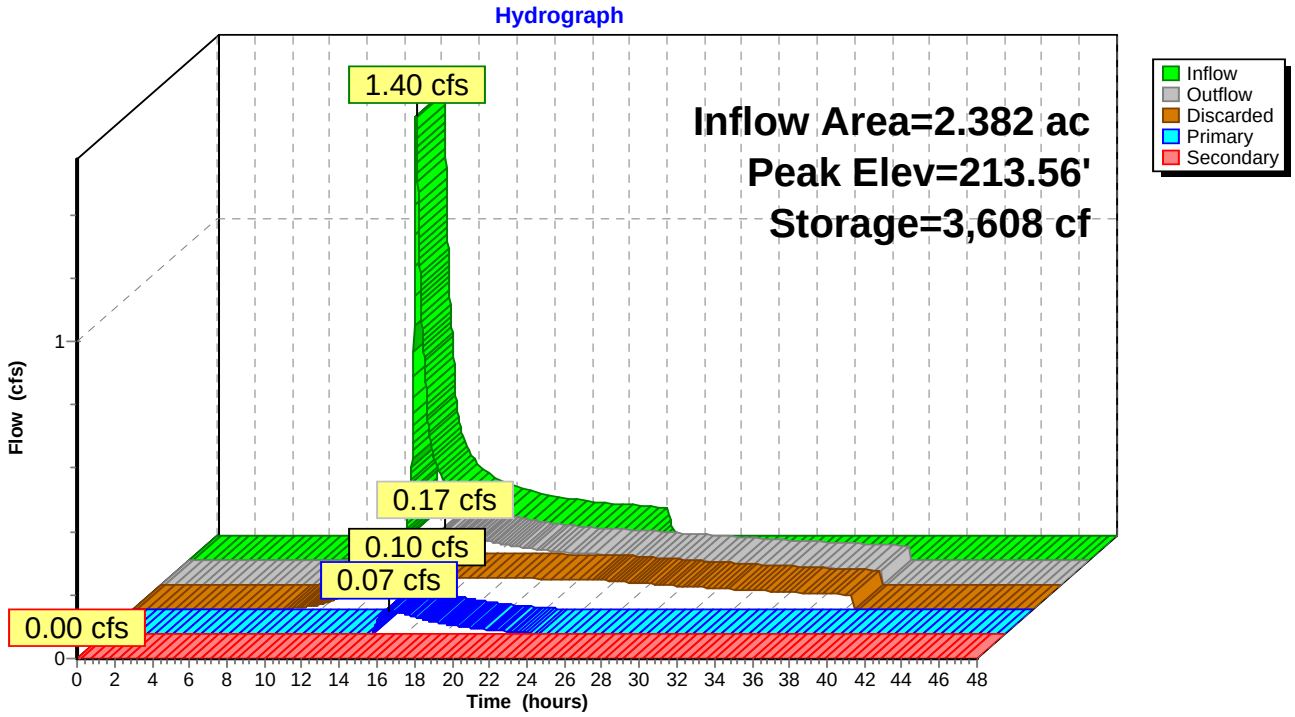
Device	Routing	Invert	Outlet Devices
#1	Primary	213.50'	**2.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Secondary	214.00'	**60.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#3	Discarded	212.00'	**1.500 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.10 cfs @ 15.20 hrs HW=213.56' (Free Discharge)
3=Exfiltration (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.07 cfs @ 15.20 hrs HW=213.56' TW=212.69' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 0.07 cfs @ 0.60 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=212.00' TW=212.00' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond PP109: Stormwater Detention



Summary for Pond PP110: Proposed Silt Sock to be maintained

Inflow Area = 2.582 ac, 8.71% Impervious, Inflow Depth = 0.16" for 10-yr event
Inflow = 0.09 cfs @ 15.17 hrs, Volume= 0.034 af
Outflow = 0.09 cfs @ 15.19 hrs, Volume= 0.030 af, Atten= 0%, Lag= 1.3 min
Primary = 0.09 cfs @ 15.19 hrs, Volume= 0.030 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 212.69' @ 15.19 hrs Surf.Area= 330 sf Storage= 153 cf

Plug-Flow detention time= 65.0 min calculated for 0.030 af (90% of inflow)
Center-of-Mass det. time= 30.5 min (1,031.7 - 1,001.3)

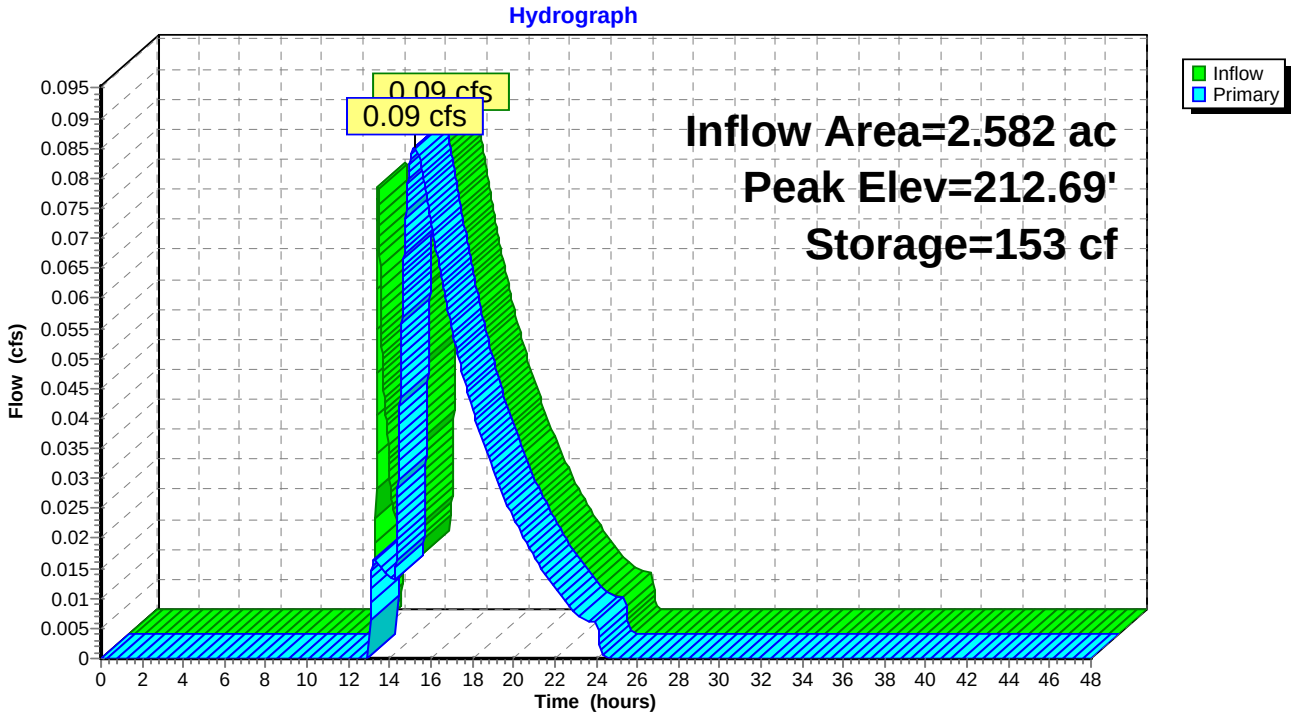
Volume	Invert	Avail.Storage	Storage Description
#1	212.00'	440 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
212.00	120	0	0
212.67	315	146	146
213.25	700	294	440

Device	Routing	Invert	Outlet Devices
#1	Primary	212.67'	**7.5' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)

Primary OutFlow Max=0.09 cfs @ 15.19 hrs HW=212.69' TW=212.03' (Dynamic Tailwater)
↑—**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.09 cfs @ 0.50 fps)

Pond PP110: Proposed Silt Sock to be maintained



Summary for Pond PPT3: Catch Basin #4

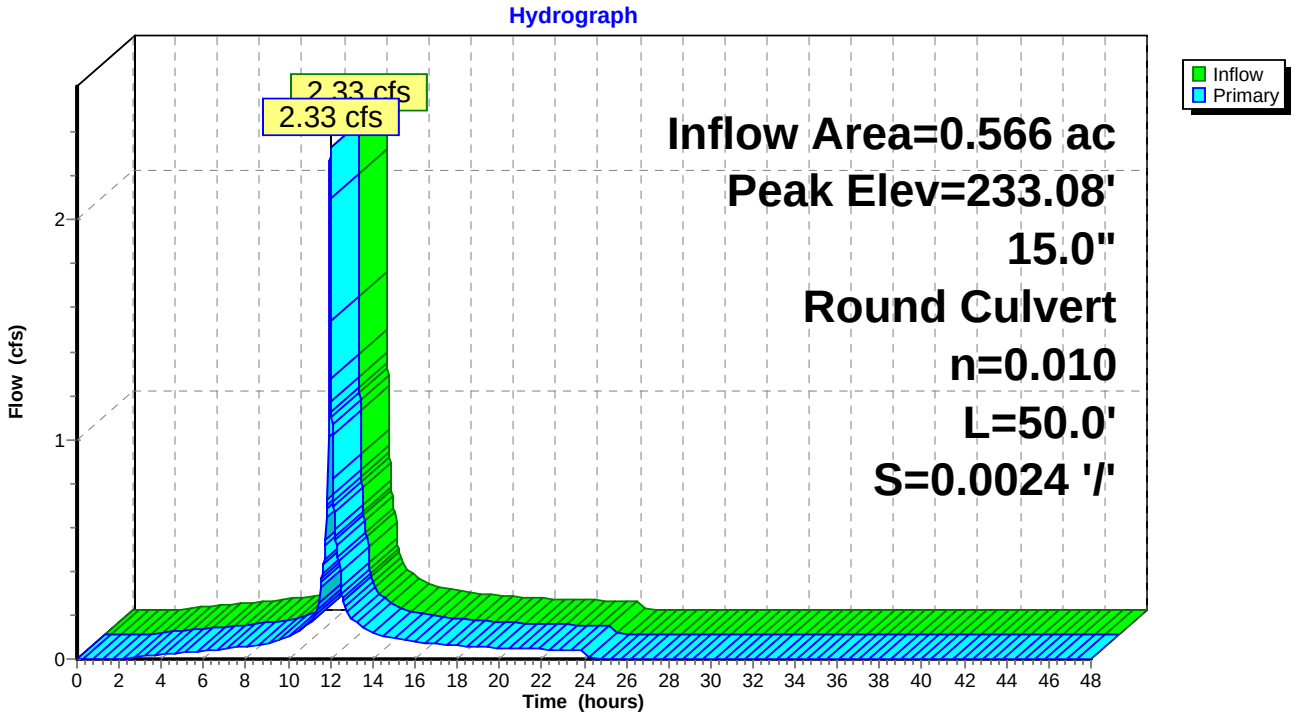
Inflow Area = 0.566 ac, 90.00% Impervious, Inflow Depth = 3.84" for 10-yr event
Inflow = 2.33 cfs @ 12.00 hrs, Volume= 0.181 af
Outflow = 2.33 cfs @ 12.00 hrs, Volume= 0.181 af, Atten= 0%, Lag= 0.0 min
Primary = 2.33 cfs @ 12.00 hrs, Volume= 0.181 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 233.08' @ 12.00 hrs
Flood Elev= 235.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	232.03'	**15.0" Round 15" HDPE Pipe** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 232.03' / 231.91' S= 0.0024 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.33 cfs @ 12.00 hrs HW=233.08' TW=232.82' (Dynamic Tailwater)
└**1=15" HDPE Pipe** (Outlet Controls 2.33 cfs @ 2.85 fps)

Pond PPT3: Catch Basin #4



Summary for Pond SI1: Subsurface Infiltration

[62] Hint: Exceeded Reach PR64 OUTLET depth by 0.35' @ 13.65 hrs

Inflow Area = 2.607 ac, 62.04% Impervious, Inflow Depth = 2.93" for 10-yr event
Inflow = 5.47 cfs @ 12.03 hrs, Volume= 0.636 af
Outflow = 0.65 cfs @ 13.52 hrs, Volume= 0.636 af, Atten= 88%, Lag= 89.7 min
Discarded = 0.65 cfs @ 13.52 hrs, Volume= 0.636 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 226.73' @ 13.52 hrs Surf.Area= 8,500 sf Storage= 8,697 cf
Flood Elev= 230.17' Surf.Area= 8,500 sf Storage= 20,126 cf

Plug-Flow detention time= 115.0 min calculated for 0.636 af (100% of inflow)
Center-of-Mass det. time= 115.0 min (1,018.2 - 903.2)

Volume	Invert	Avail.Storage	Storage Description
#1	224.17'	20,056 cf	**Subsurface Infiltration Reservoir (Conic)** Listed below (Recalc) 50,235 cf Overall - 96 cf Embedded = 50,139 cf x 40.0% Voids
#2	228.90'	71 cf	**12.0" D x 90.0'L Pipe Storage** Inside #1 96 cf Overall - 1.0" Wall Thickness = 71 cf
		20,126 cf	Total Available Storage

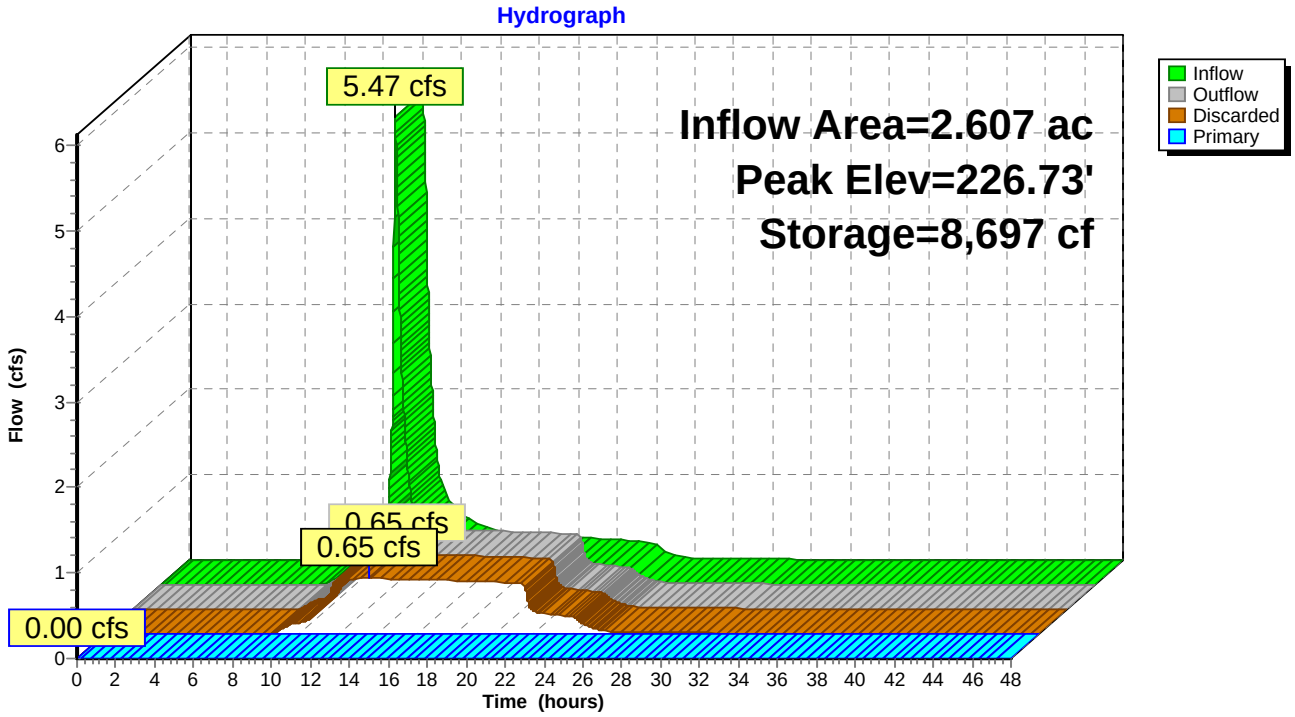
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
224.17	8,500	0	0	8,500
230.08	8,500	50,235	50,235	10,432

Device	Routing	Invert	Outlet Devices
#1	Discarded	224.17'	**3.000 in/hr Exfiltration over Wetted area** Phase-In= 0.10'
#2	Primary	227.15'	**12.0" Round DMH/P5-Overflow** L= 70.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 227.15' / 221.00' S= 0.0879 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.65 cfs @ 13.52 hrs HW=226.73' (Free Discharge)
↑└**1=Exfiltration** (Exfiltration Controls 0.65 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=224.17' TW=219.00' (Dynamic Tailwater)
↑└**2=DMH/P5-Overflow** (Controls 0.00 cfs)

Pond SI1: Subsurface Infiltration

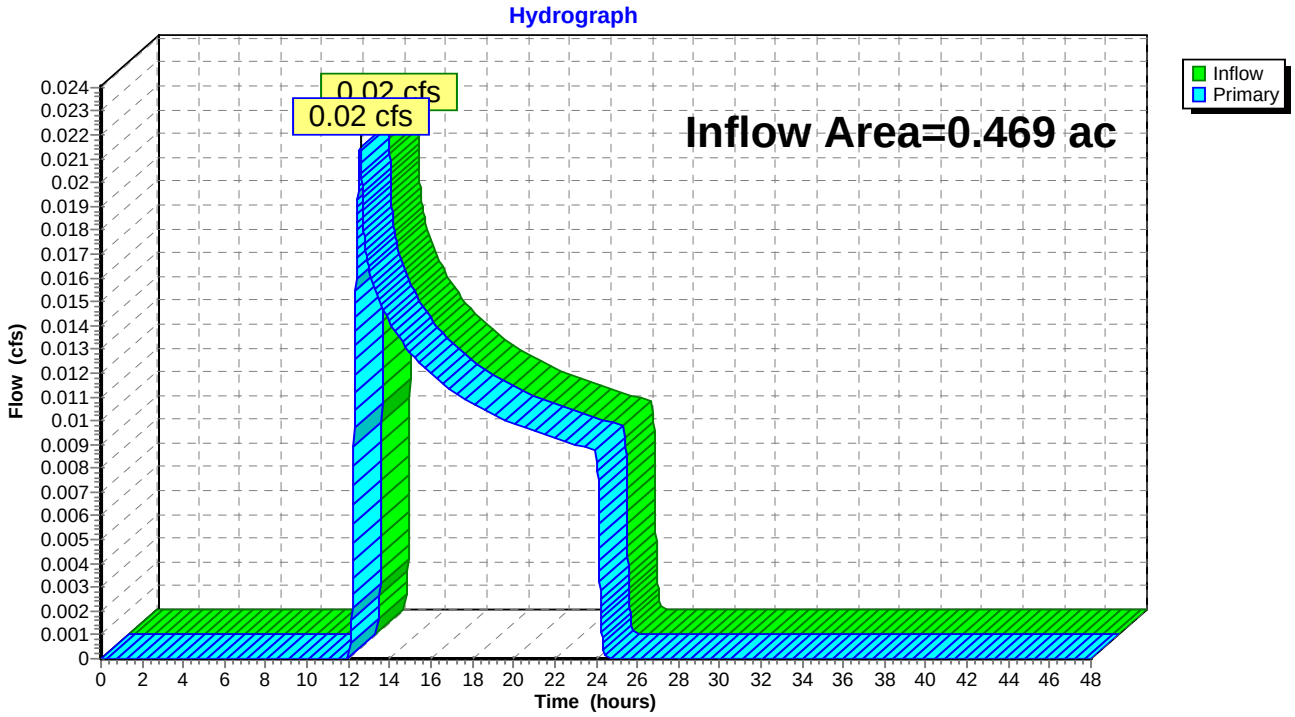


Summary for Link L100: Northern Wetlands & North of Site

Inflow Area = 0.469 ac, 0.00% Impervious, Inflow Depth = 0.29" for 10-yr event
Inflow = 0.02 cfs @ 12.57 hrs, Volume= 0.011 af
Primary = 0.02 cfs @ 12.57 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min

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

Link L100: Northern Wetlands & North of Site

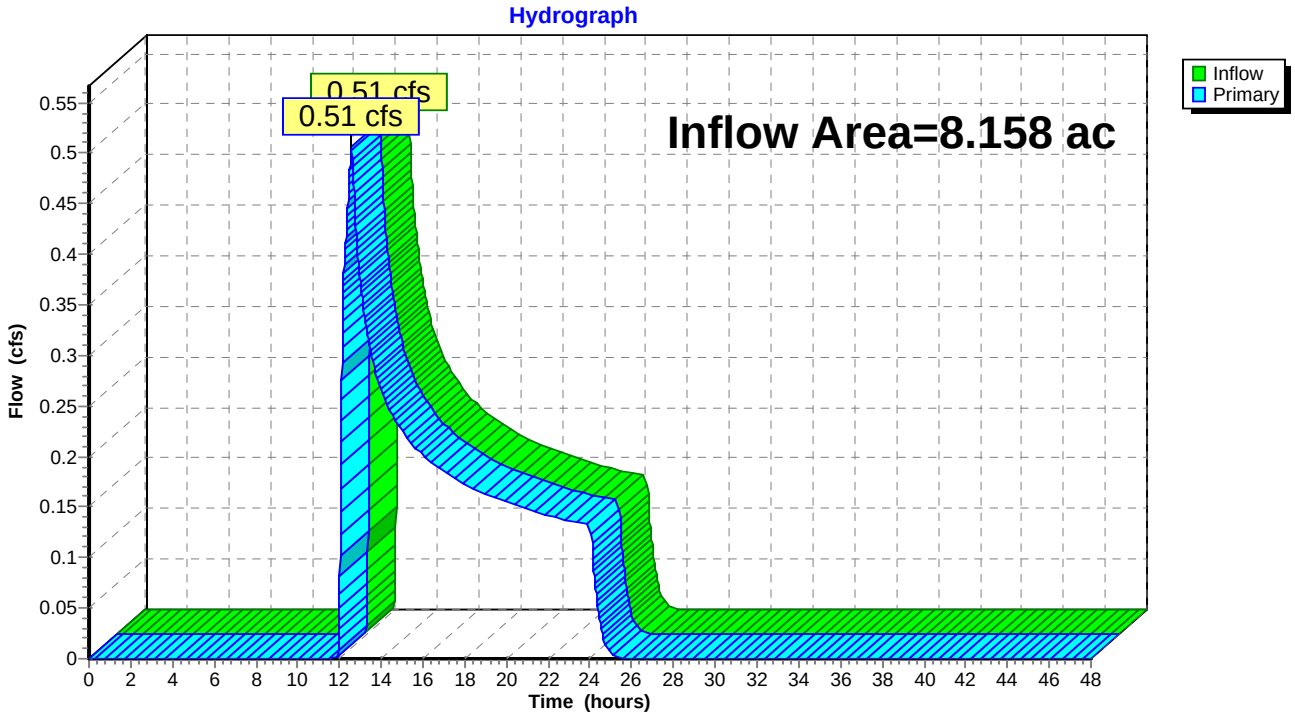


Summary for Link L200: Inlet at Start of Redemption Rd; West Side

Inflow Area = 8.158 ac, 19.91% Impervious, Inflow Depth = 0.30" for 10-yr event
Inflow = 0.51 cfs @ 12.57 hrs, Volume= 0.205 af
Primary = 0.51 cfs @ 12.57 hrs, Volume= 0.205 af, Atten= 0%, Lag= 0.0 min

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

Link L200: Inlet at Start of Redemption Rd; West Side

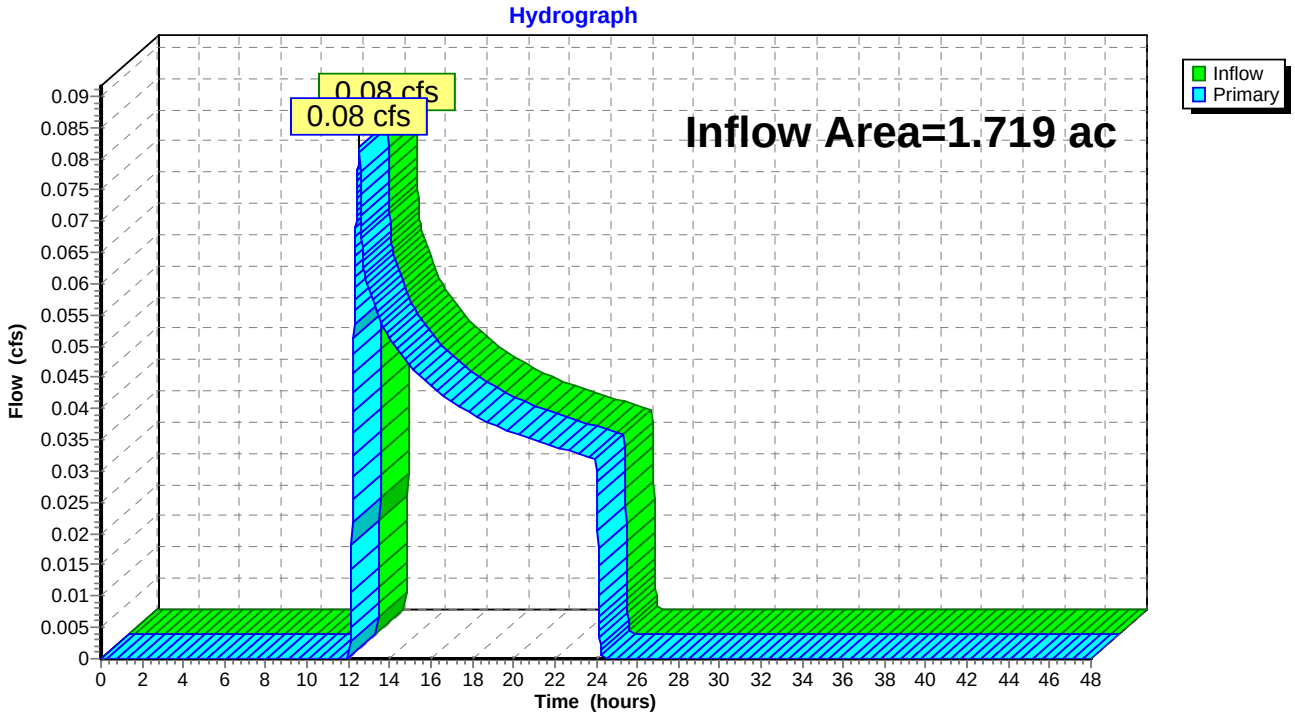


Summary for Link L300: Southwest Corner of Far-East Lot; Bottom of Hill

Inflow Area = 1.719 ac, 0.00% Impervious, Inflow Depth = 0.29" for 10-yr event
Inflow = 0.08 cfs @ 12.54 hrs, Volume= 0.041 af
Primary = 0.08 cfs @ 12.54 hrs, Volume= 0.041 af, Atten= 0%, Lag= 0.0 min

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

Link L300: Southwest Corner of Far-East Lot; Bottom of Hill

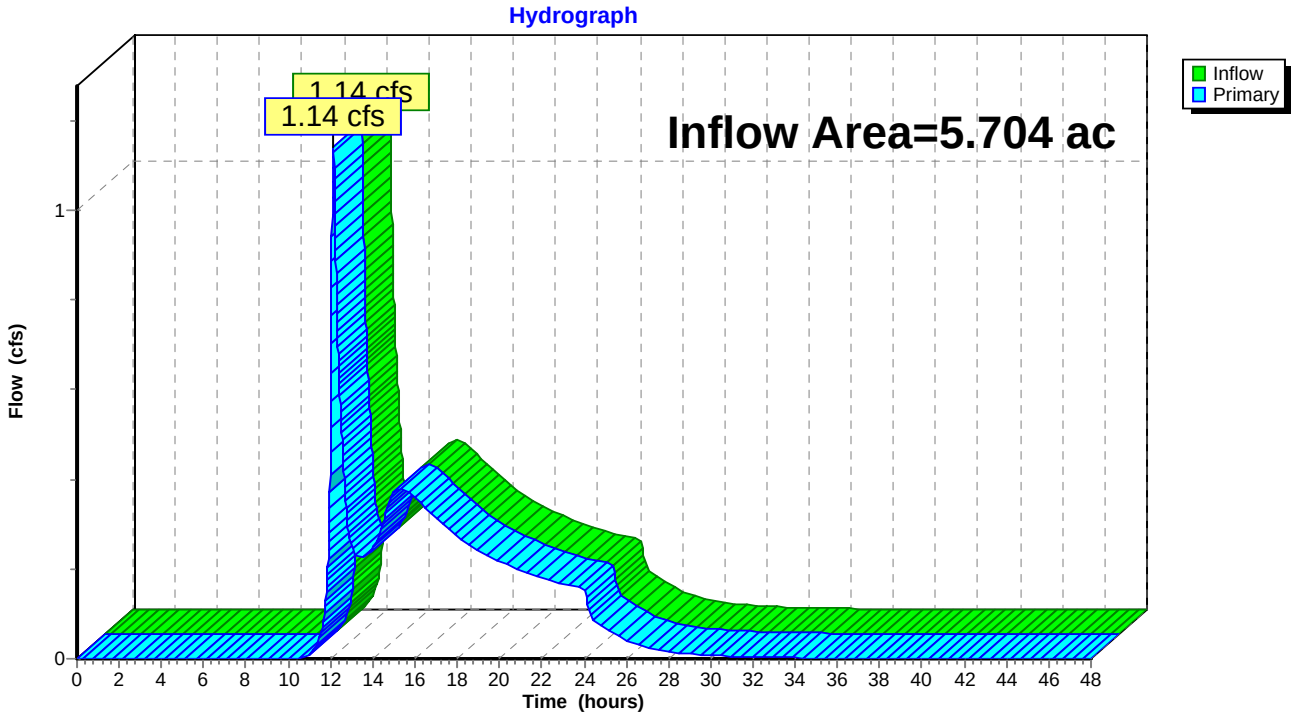


Summary for Link L400: Southwest Corner of Far-East Lot; Bottom of Hill

Inflow Area = 5.704 ac, 7.02% Impervious, Inflow Depth > 0.64" for 10-yr event
Inflow = 1.14 cfs @ 12.14 hrs, Volume= 0.305 af
Primary = 1.14 cfs @ 12.14 hrs, Volume= 0.305 af, Atten= 0%, Lag= 0.0 min

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

Link L400: Southwest Corner of Far-East Lot; Bottom of Hill

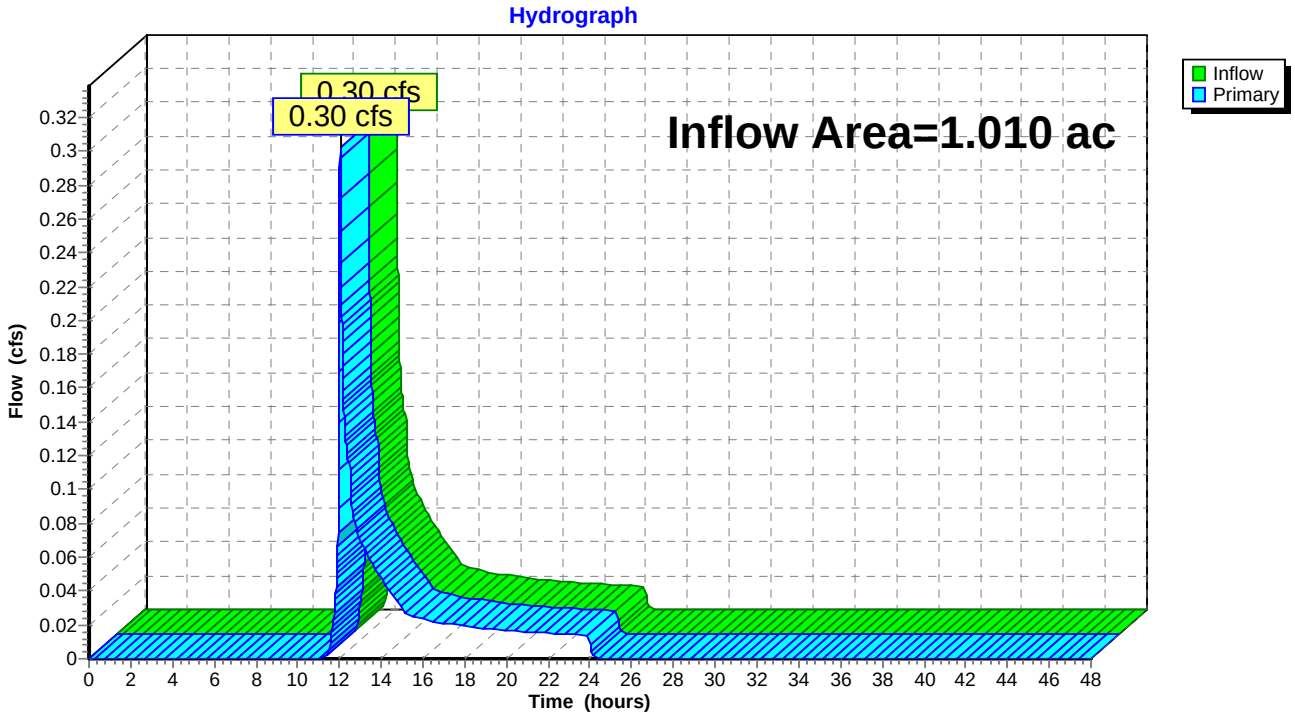


Summary for Link L500: Inlet at Start of Gravel Drive; East Side

Inflow Area = 1.010 ac, 39.25% Impervious, Inflow Depth = 0.40" for 10-yr event
Inflow = 0.30 cfs @ 12.04 hrs, Volume= 0.034 af
Primary = 0.30 cfs @ 12.04 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min

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

Link L500: Inlet at Start of Gravel Drive; East Side



PIPE OUTLET PROTECTION APRON DESIGN & d_{50} RIPRAP SIZING

Pipe PDL7 (Node SI1)

EMANUEL ENGINEERING, INC.
CIVIL & STRUCTURAL CONSULTANTS
118 PORTSMOUTH AVE.
STRATHAM, NH 03885
Tel: (603) 772-4400
Fax: (603) 772-4487

PROJECT NAME :	CFA - TurboCAM		
PROJECT # :	19-020		
BY :	JJM	CHECKED BY :	BDS
DATE :	1/7/2020	DATE :	1/7/2020

DOWNSTREAM CHANNEL (OR SPREADER) HYDRAULICS

Peak Discharge Required =	2.3	cfs	(major outet - use 50-year storm)
Channel Bottom Width =	3.0	Feet	
Hydraulic Gradient =	0.08790	Feet/Feet	
Left Side Slope =	10.0	:1(h:v)	
Right Side Slope =	10.0	:1(h:v)	
Depth of Flow =	1.000	Feet	
Manning's "n" =	0.0400		
Area =	13.00	Square Feet	
Wetted Perimeter =	23.10	Feet	
Hydraulic Radius =	0.56	Feet	
Top Width =	23.00	Feet	
Velocity =	7.51	Feet/Second	
Peak Discharge Determined =	97.6	cfs	

La AND W CALCULATIONS:

Culvert Diameter (Do) =	12.0	Inches
Tail Water Depth (TW)* =	0.20	Feet
Length of Apron (La) =	11	Feet
Width of Apron @ D.S End (W) =	14	Feet
Width of D.S. Apron if Channel (W) =	3.0	Feet

Assumes Channel Bottom at the Culvert Equals the Invert Outlet Elevation of the Pipe. If this is not the case, the calculations involving the Tailwater will have to be calculated by hand.

*If outletting to flat area use TW depth = 0.2 x Do

ROCK RIPRAP SIZE

d_{50} = 0.29 Feet or 3.54 Inches

$d_{50} = (0.02 \times Q^{4/3})/(Tw \times Do)$

Use D50=6", 18" deep

ROCK RIPRAP GRADATION (TABLE 7-24 OF NHDES HANDBOOK)

% of Weight Smaller Than The Given Size	Size of Stone in Inches		
100	5.3	to	7.1
85	4.6	to	6.4
50	3.5	to	5.3
15	1.1	to	1.8

Minimum Rock Riprap Blanket Thickness = 10.6 Inches

Minimum Six inch Sand/Gravel Bedding or Geotextile Fabric Required Under All Rock Riprap

FORMULAS USED (Reference NHDES HANDBOOK, Pages 7-114, 7-115)

Manning's Uniform Channel Flow -	Q = (A x 1.486 x R^(2/3) x S^(1/2))/"n"
Length of Apron (La) TW< Do/2 -	La = (1.8 x Q/Do^1.5) + 7 x Do
Length of Apron (La) TW>= Do/2 -	La = 3.0 x Q/Do^1.5 + 7 x Do
Width of Apron @ D.S End TW < Do/2 -	W = 3xDo + La
Width of Apron @ D.S End TW >= Do/2 -	W = 3xDo + 0.4 x La
Width of D.S. Apron if in Channel -	W = Channel Bottom Width
Width of Apron @ Culvert -	Wc = 3 x Do

PIPE OUTLET PROTECTION APRON DESIGN & d_{50} RIPRAP SIZING

Pipe PDL2 (Node PCB2)

EMANUEL ENGINEERING, INC.
CIVIL & STRUCTURAL CONSULTANTS
118 PORTSMOUTH AVE.
STRATHAM, NH 03885
Tel: (603) 772-4400
Fax: (603) 772-4487

PROJECT NAME :	CFA - TurboCAM		
PROJECT # :	19-020		
BY :	JJM	CHECKED BY :	BDS
DATE :	1/7/2020	DATE :	1/7/2020

DOWNSTREAM CHANNEL (OR SPREADER) HYDRAULICS

Peak Discharge Required =	0.0	cfs	(10-year storm)
Channel Bottom Width =	3.0	Feet	
Hydraulic Gradient =	0.00710	Feet/Feet	
Left Side Slope =	4.0	:1(h:v)	
Right Side Slope =	4.0	:1(h:v)	
Depth of Flow =	0.083	Feet	
Manning's "n" =	0.0400		
Area =	0.28	Square Feet	
Wetted Perimeter =	3.69	Feet	
Hydraulic Radius =	0.08	Feet	
Top Width =	3.67	Feet	
Velocity =	0.56	Feet/Second	
Peak Discharge Determined =	0.2	cfs	

La AND W CALCULATIONS:

Culvert Diameter (Do) =	12.0	Inches
Tail Water Depth (TW)* =	0.20	Feet
Length of Apron (La) =	7	Feet
Width of Apron @ D.S End (W) =	10	Feet
Width of D.S. Apron if Channel (W) =	3.0	Feet

Assumes Channel Bottom at the Culvert Equals the Invert Outlet Elevation of the Pipe. If this is not the case, the calculations involving the Tailwater will have to be calculated by hand.

*If outletting to flat area use TW depth = 0.2 x Do

ROCK RIPRAP SIZE

d_{50} = 0.00 Feet or 0.01 Inches

$d_{50} = (0.02 \times Q^{4/3})/(Tw \times Do)$

Use D50=4", 10' Long, 4' Wide, 12" Deep

ROCK RIPRAP GRADATION (TABLE 7-24 OF NHDES HANDBOOK)

% of Weight Smaller Than The Given Size	Size of Stone in Inches		
100	0.0	to	0.0
85	0.0	to	0.0
50	0.0	to	0.0
15	0.0	to	0.0

Minimum Rock Riprap Blanket Thickness = 6.0 Inches

Minimum Six inch Sand/Gravel Bedding or Geotextile Fabric Required Under All Rock Riprap

FORMULAS USED (Reference NHDES HANDBOOK, Pages 7-114, 7-115)

Manning's Uniform Channel Flow -	Q = (A x 1.486 x R^(2/3) x S^(1/2))/"n"
Length of Apron (La) TW< Do/2 -	La = (1.8 x Q/Do^1.5) + 7 x Do
Length of Apron (La) TW>= Do/2 -	La = 3.0 x Q/Do^1.5 + 7 x Do
Width of Apron @ D.S End TW < Do/2 -	W = 3xDo + La
Width of Apron @ D.S End TW >= Do/2 -	W = 3xDo + 0.4 x La
Width of D.S. Apron if in Channel -	W = Channel Bottom Width
Width of Apron @ Culvert -	Wc = 3 x Do