4 SEASONS SITE & DEMO

STORM WATER CALCULATIONS

(PRELIMINARY – NOT RELEASED FOR CONSTRUCTION)

Revised 12/14/16

Final SW Calcs
SWP2017001
1/23/17
Rae

Port City Consulting Engineer, PLLC
6216 Stonebridge road
Wilmington, NC 28409
910-599-1744
NC PE Firm License # P-1032

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STORM WATER NARRATIVE

4 SEASONS SITE & DEMO
WILMINGTON, NC

The address of the site is 4004 River Road, Wilmington, NC. The site encompasses 5.0 acres. The project involves constructing two new office buildings and a wet pond to meet the City's storm water requirments. The project will be permitted as a high density project. The site drains to the Cape Fear River that is classified as SC. Calculations are provided for sizing the wet pond to limit outflow to predevelopment conditions for the 2-yr, 10-yr and 25-year storms.

The disturbed area for this project totals 5.0 acres. The on-site culverts were sized for the 10-yr storm as well as the grassed swales. They were checked for the 25-yr and 50 storm events also. The percent imperviousness for this project is 56% with most of the site used for a construction storage area and parking. The soils for the site are Baymeade Fine Sand (Soild Group A, CN=39) and Borrow Pit (Soil Group B, CN=55).

Calculations are provided for sizing the wet pond to limit outflow to pre development conditions for the 2-yr, 10-yr and 25-yr storms. The pre and post development flows are:

Wet Pond

Storm Event	2 - Year	10 - Year	25 - Year
Pre Development Flow	0.56	4.22	7.31
Post Development Flow	0.40	0.97	1.21

An emergency spillway is provided that can handle the 50 yr storm events. Calculations are provided assuming the principal spillway is working and obstructed.

4 Seasons Site & Demo

Total Area Draining to Pond = 164,615 SF = 3.78 AC

Total Proposed Impervious Surface Area Draining to Pond:

Existing Bldg	=	1,614 sf
Existing ABC Stone	=	6,204 sf
Existing Concrete Parking	=	434 sf
Proposed Bldgs	=	8,956 sf
Proposed Asphalt & ABC Stone	=	104,862 sf
Proposed Concrete	=	650 sf
	=	122,720 sf = 2.82 AC

% Impervious draining to pond = 122,720/164,615 = 74.6%

Required Storage for 1.5-Inch of Runoff For Pond: (use Schueler Method)

= 0.05 + 0.009 (I)
= 0.05 + 0.009(74.6) = 0.721
= (1.5″)(0.721)(1/12)(164,615)
= **14,835 cf** (17,862 cf provided @ elevation 7.5)

POND DEPTH (FT)	SA/DA %	POND SURFACE AREA (MIN.) (SF)
3.0 (avg)	**9.01**	**14,832**
~~**2.81**~~ **calculated** 3.01 RAC		

If Avg Pond Depth = 3.0 ft, minimum surface area = 14,832 sf

Used 90% TSS chart to size pond

Area @ elevation 3.0 = 15,057 SF > 14,832 sf

Required storage for forebay: 20% of total permanent pool volume
= (0.2)(33,823 cf)
= ~~6,518 cf~~ 6,765 cf RAC (6,540 CF PROVIDED ~ 19.3%)

Average Depth Calculations:
Area Bottom Shelf – 11,651 sf
Area Permanent Pool – 15,057 sf
Area Bottom of Pond – 345
Depth – 5 ft

Normal Pool Elev – 6.50
Bottom of Pond Elev – 1.0
Bottom of Shelf Elev – 6.0

Avg Depth = [0.25 (1+(11,651/15,057)] + [(~~11,561~~ 11,651 + 345)/2)x(5/~~11,561~~ 11,651 RAC)]
=0.44 + 2.57
= 3.01 ft

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ENGINEERING RAC

Pond Volume

	Contour Elevation (ft)	Area (sf)	Incremental Volume (cf)	Cumulative Volume (cf)
Pond Bottom	0.00	58	0	0
Sediment Storage	1.00	345	0	0
	2.00	2,123	1,234	1,234
	3.00	3,618	2,871	4,105
	4.00	5,193	4,406	8,510
	5.00	6,845	6,019	14,529
	6.00	8,566	7,706	22,235
Permanent Pool	6.50	11,626	5,048	27,283

Forebay Volume

	Contour Elevation (ft)	Area (sf)	Incremental Volume (cf)	Cumulative Volume (cf)
Forebay Bottom	3.00	1,356	0	0
Sediment Storage	4.00	1,861	0	0
	5.00	2,438	2,150	2,150
	6.00	3,085	2,762	4,911
Permanent Pool	6.50	3,431	1,629	6,540

Forebay Volume is

19.3%

of Total Pond Volume

1.5" STORAGE VOLUME

	Contour Elevation (ft)	Area (sf)	Incremental Volume (cf)	Cumulative Volume (cf)
Normal Pool	6.50	15,057	0	0
	7.00	18,389	8,362	8,362
1.5" Storage Level	7.50	19,611	9,500	17,862

POND RELEASE TIME FOR CONTROL PIPE: POND

ELEV. *(FT)*	EFF. STORAGE *(CF)*	VOL. RELEASED *(CF)*	OUTFLOW RATE *(CFS)*	RELEASE TIME *(HOURS)*
7.50	17,862	17,862	0.061	81.8
6.50	0		**TOTAL HOURS**	**81.8**
			DAYS	**3.4**

CONTROL PIPE : 2 INCH ORIFICE HOLE

USED ORIFICE EQUATION TO DETERMINE OUTFLOW RATE

$Q = Cd*A*(2gh)^{1/2}$

4 Seasons Site & Demo

Curve Number Calculations:

Existing Conditions

Soils: Use Woods in Good Condition

Be (Baymeade Fine Sand) – 50%	Type A	39 – Woods
Bp (Borrow Pit) – 50%	Type B	55 – Woods Good Condition

Cn : (50)(39) + (50)(5) / 100

Cn = 47

Proposed:

Imperviou Area: 98
Pervious Area: 39 grassed areas

Cn = (98)(2.82 ac) + (0.96)(39) / 3.78 = 83.0

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 Tuesday, 12 / 6 / 2016

Hyd. No. 1

Post Flow

Hydrograph type	= SCS Runoff	Peak discharge	= 10.47 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 34,947 cuft
Drainage area	= 3.780 ac	Curve number	= 83.000*
Basin Slope	= 0.5 %	Hydraulic length	= 774 ft
Tc method	= User	Time of conc. (Tc)	= 5.0 min
Total precip.	= 4.49 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.960 x 39) + (2.820 x 98)] / 3.780

Hydrograph Discharge Table

(Printed values >= 50.00% of Qp.)

Time -- Outflow (hrs cfs)		
12.00	6.943	
12.05	9.565	
12.10	10.47	<<
12.15	9.089	
12.20	6.997	
12.25	5.509	

...End

Hydrograph Report

Hyd. No. 2

Pond Routing

Hydrograph type	= Reservoir	Peak discharge	= 0.399 cfs
Storm frequency	= 2 yrs	Time to peak	= 15.85 hrs
Time interval	= 3 min	Hyd. volume	= 34,187 cuft
Inflow hyd. No.	= 1 - Post Flow	Reservoir name	= Pond
Max. Elevation	= 7.84 ft	Max. Storage	= 24,738 cuft

Storage Indication method used.

Hydrograph Discharge Table

(Printed values >= 50.00% of Qp.)

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
13.00	1.085	7.680	0.108	0.107	0.094	----	----	----	----	----	----	0.201
13.05	1.030	7.688	0.108	0.108	0.101	----	----	----	----	----	----	0.208
13.10	0.988	7.695	0.108	0.108	0.107	----	----	----	----	----	----	0.215
13.15	0.961	7.702	0.109	0.108	0.114	----	----	----	----	----	----	0.222
13.20	0.943	7.708	0.110	0.109	0.121	----	----	----	----	----	----	0.230
13.25	0.928	7.714	0.111	0.109	0.128	----	----	----	----	----	----	0.237
13.30	0.913	7.721	0.112	0.109	0.135	----	----	----	----	----	----	0.244
13.35	0.898	7.726	0.113	0.109	0.142	----	----	----	----	----	----	0.251
13.40	0.883	7.732	0.114	0.110	0.148	----	----	----	----	----	----	0.258
13.45	0.868	7.738	0.115	0.110	0.154	----	----	----	----	----	----	0.264
13.50	0.852	7.743	0.116	0.110	0.160	----	----	----	----	----	----	0.270
13.55	0.837	7.748	0.117	0.110	0.166	----	----	----	----	----	----	0.276
13.60	0.822	7.753	0.118	0.111	0.171	----	----	----	----	----	----	0.282
13.65	0.806	7.758	0.118	0.111	0.177	----	----	----	----	----	----	0.288
13.70	0.791	7.762	0.119	0.111	0.182	----	----	----	----	----	----	0.293
13.75	0.775	7.767	0.119	0.111	0.188	----	----	----	----	----	----	0.299
13.80	0.760	7.771	0.119	0.112	0.193	----	----	----	----	----	----	0.305
13.85	0.744	7.775	0.119	0.112	0.198	----	----	----	----	----	----	0.310
13.90	0.728	7.779	0.119	0.112	0.203	----	----	----	----	----	----	0.315
13.95	0.713	7.782	0.119	0.112	0.208	----	----	----	----	----	----	0.320

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Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
14.00	0.697	7.786	0.119	0.112	0.212	---	---	---	---	---	---	0.324
14.05	0.682	7.789	0.119	0.112	0.216	---	---	---	---	---	---	0.328
14.10	0.669	7.792	0.119	0.113	0.220	---	---	---	---	---	---	0.333
14.15	0.660	7.795	0.119	0.113	0.224	---	---	---	---	---	---	0.336
14.20	0.652	7.798	0.119	0.113	0.227	---	---	---	---	---	---	0.340
14.25	0.644	7.800	0.119	0.113	0.231	---	---	---	---	---	---	0.344
14.30	0.637	7.803	0.119	0.113	0.234	---	---	---	---	---	---	0.347
14.35	0.630	7.806	0.119	0.113	0.237	---	---	---	---	---	---	0.351
14.40	0.622	7.808	0.119	0.113	0.241	---	---	---	---	---	---	0.354
14.45	0.615	7.810	0.119	0.113	0.244	---	---	---	---	---	---	0.357
14.50	0.607	7.813	0.119	0.114	0.246	---	---	---	---	---	---	0.360
14.55	0.600	7.815	0.119	0.114	0.249	---	---	---	---	---	---	0.363
14.60	0.592	7.817	0.119	0.114	0.252	---	---	---	---	---	---	0.366
14.65	0.585	7.819	0.119	0.114	0.254	---	---	---	---	---	---	0.368
14.70	0.577	7.821	0.119	0.114	0.257	---	---	---	---	---	---	0.371
14.75	0.570	7.823	0.119	0.114	0.259	---	---	---	---	---	---	0.373
14.80	0.562	7.824	0.119	0.114	0.262	---	---	---	---	---	---	0.376
14.85	0.554	7.826	0.119	0.114	0.264	---	---	---	---	---	---	0.378
14.90	0.547	7.827	0.119	0.114	0.266	---	---	---	---	---	---	0.380
14.95	0.539	7.829	0.119	0.114	0.268	---	---	---	---	---	---	0.382
15.00	0.531	7.830	0.119	0.114	0.270	---	---	---	---	---	---	0.384
15.05	0.524	7.832	0.119	0.114	0.271	---	---	---	---	---	---	0.386
15.10	0.516	7.833	0.119	0.115	0.273	---	---	---	---	---	---	0.387
15.15	0.508	7.834	0.119	0.115	0.274	---	---	---	---	---	---	0.389
15.20	0.501	7.835	0.119	0.115	0.276	---	---	---	---	---	---	0.390
15.25	0.493	7.836	0.119	0.115	0.277	---	---	---	---	---	---	0.392
15.30	0.485	7.837	0.119	0.115	0.278	---	---	---	---	---	---	0.393
15.35	0.478	7.838	0.119	0.115	0.279	---	---	---	---	---	---	0.394

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Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
15.40	0.470	7.838	0.119	0.115	0.280	---	---	---	---	---	---	0.395
15.45	0.462	7.839	0.119	0.115	0.281	---	---	---	---	---	---	0.396
15.50	0.454	7.839	0.119	0.115	0.282	---	---	---	---	---	---	0.397
15.55	0.447	7.840	0.119	0.115	0.282	---	---	---	---	---	---	0.397
15.60	0.439	7.840	0.119	0.115	0.283	---	---	---	---	---	---	0.398
15.65	0.431	7.841	0.119	0.115	0.283	---	---	---	---	---	---	0.398
15.70	0.423	7.841	0.119	0.115	0.284	---	---	---	---	---	---	0.399
15.75	0.415	7.841	0.119	0.115	0.284	---	---	---	---	---	---	0.399
15.80	0.408	7.841	0.119	0.115	0.284	---	---	---	---	---	---	0.399
15.85	0.400	7.841 <<	0.119	0.115	0.284	---	---	---	---	---	---	0.399
15.90	0.392	7.841	0.119	0.115	0.284	---	---	---	---	---	---	0.399
15.95	0.384	7.841	0.119	0.115	0.284	---	---	---	---	---	---	0.399
16.00	0.376	7.841	0.119	0.115	0.284	---	---	---	---	---	---	0.399
16.05	0.369	7.841	0.119	0.115	0.283	---	---	---	---	---	---	0.398
16.10	0.363	7.840	0.119	0.115	0.283	---	---	---	---	---	---	0.398
16.15	0.358	7.840	0.119	0.115	0.283	---	---	---	---	---	---	0.398
16.20	0.354	7.840	0.119	0.115	0.282	---	---	---	---	---	---	0.397
16.25	0.351	7.839	0.119	0.115	0.282	---	---	---	---	---	---	0.396
16.30	0.348	7.839	0.119	0.115	0.281	---	---	---	---	---	---	0.396
16.35	0.344	7.838	0.119	0.115	0.280	---	---	---	---	---	---	0.395
16.40	0.341	7.838	0.119	0.115	0.280	---	---	---	---	---	---	0.395
16.45	0.337	7.837	0.119	0.115	0.279	---	---	---	---	---	---	0.394
16.50	0.334	7.837	0.119	0.115	0.278	---	---	---	---	---	---	0.393
16.55	0.331	7.836	0.119	0.115	0.278	---	---	---	---	---	---	0.392
16.60	0.327	7.836	0.119	0.115	0.277	---	---	---	---	---	---	0.392
16.65	0.324	7.835	0.119	0.115	0.276	---	---	---	---	---	---	0.391
16.70	0.321	7.835	0.119	0.115	0.275	---	---	---	---	---	---	0.390

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Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
16.75	0.317	7.834	0.119	0.115	0.275	----	----	----	----	----	----	0.389
16.80	0.314	7.833	0.119	0.115	0.274	----	----	----	----	----	----	0.388
16.85	0.310	7.833	0.119	0.115	0.273	----	----	----	----	----	----	0.387
16.90	0.307	7.832	0.119	0.115	0.272	----	----	----	----	----	----	0.386
16.95	0.303	7.831	0.119	0.114	0.271	----	----	----	----	----	----	0.385
17.00	0.300	7.831	0.119	0.114	0.270	----	----	----	----	----	----	0.384
17.05	0.297	7.830	0.119	0.114	0.269	----	----	----	----	----	----	0.383
17.10	0.293	7.829	0.119	0.114	0.268	----	----	----	----	----	----	0.382
17.15	0.290	7.828	0.119	0.114	0.267	----	----	----	----	----	----	0.381
17.20	0.286	7.827	0.119	0.114	0.266	----	----	----	----	----	----	0.380
17.25	0.283	7.826	0.119	0.114	0.264	----	----	----	----	----	----	0.379
17.30	0.279	7.826	0.119	0.114	0.263	----	----	----	----	----	----	0.377
17.35	0.276	7.825	0.119	0.114	0.262	----	----	----	----	----	----	0.376
17.40	0.273	7.824	0.119	0.114	0.261	----	----	----	----	----	----	0.375
17.45	0.269	7.823	0.119	0.114	0.260	----	----	----	----	----	----	0.374
17.50	0.266	7.822	0.119	0.114	0.258	----	----	----	----	----	----	0.372
17.55	0.262	7.821	0.119	0.114	0.257	----	----	----	----	----	----	0.371
17.60	0.259	7.820	0.119	0.114	0.256	----	----	----	----	----	----	0.370
17.65	0.255	7.819	0.119	0.114	0.254	----	----	----	----	----	----	0.368
17.70	0.252	7.818	0.119	0.114	0.253	----	----	----	----	----	----	0.367
17.75	0.248	7.817	0.119	0.114	0.252	----	----	----	----	----	----	0.366
17.80	0.245	7.816	0.119	0.114	0.250	----	----	----	----	----	----	0.364
17.85	0.242	7.815	0.119	0.114	0.249	----	----	----	----	----	----	0.363
17.90	0.238	7.814	0.119	0.114	0.248	----	----	----	----	----	----	0.361
17.95	0.235	7.813	0.119	0.114	0.246	----	----	----	----	----	----	0.360
18.00	0.231	7.811	0.119	0.114	0.245	----	----	----	----	----	----	0.358
18.05	0.228	7.810	0.119	0.113	0.243	----	----	----	----	----	----	0.357
18.10	0.225	7.809	0.119	0.113	0.242	----	----	----	----	----	----	0.355

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Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
18.15	0.224	7.808	0.119	0.113	0.240	----	----	----	----	----	----	0.354
18.20	0.223	7.807	0.119	0.113	0.239	----	----	----	----	----	----	0.352
18.25	0.222	7.806	0.119	0.113	0.237	----	----	----	----	----	----	0.351
18.30	0.221	7.805	0.119	0.113	0.236	----	----	----	----	----	----	0.349
18.35	0.220	7.803	0.119	0.113	0.235	----	----	----	----	----	----	0.348
18.40	0.218	7.802	0.119	0.113	0.233	----	----	----	----	----	----	0.346
18.45	0.217	7.801	0.119	0.113	0.232	----	----	----	----	----	----	0.345
18.50	0.216	7.800	0.119	0.113	0.230	----	----	----	----	----	----	0.343
18.55	0.215	7.799	0.119	0.113	0.229	----	----	----	----	----	----	0.342
18.60	0.214	7.798	0.119	0.113	0.227	----	----	----	----	----	----	0.340
18.65	0.213	7.797	0.119	0.113	0.226	----	----	----	----	----	----	0.339
18.70	0.212	7.795	0.119	0.113	0.224	----	----	----	----	----	----	0.337
18.75	0.211	7.794	0.119	0.113	0.223	----	----	----	----	----	----	0.336
18.80	0.210	7.793	0.119	0.113	0.222	----	----	----	----	----	----	0.334
18.85	0.209	7.792	0.119	0.113	0.220	----	----	----	----	----	----	0.333
18.90	0.208	7.791	0.119	0.113	0.219	----	----	----	----	----	----	0.331
18.95	0.207	7.790	0.119	0.112	0.217	----	----	----	----	----	----	0.330
19.00	0.206	7.789	0.119	0.112	0.216	----	----	----	----	----	----	0.328
19.05	0.205	7.788	0.119	0.112	0.215	----	----	----	----	----	----	0.327
19.10	0.204	7.787	0.119	0.112	0.213	----	----	----	----	----	----	0.326
19.15	0.203	7.786	0.119	0.112	0.212	----	----	----	----	----	----	0.324
19.20	0.202	7.784	0.119	0.112	0.210	----	----	----	----	----	----	0.323
19.25	0.201	7.783	0.119	0.112	0.209	----	----	----	----	----	----	0.321
19.30	0.200	7.782	0.119	0.112	0.208	----	----	----	----	----	----	0.320
19.35	0.199	7.781	0.119	0.112	0.206	----	----	----	----	----	----	0.318
19.40	0.198	7.780	0.119	0.112	0.205	----	----	----	----	----	----	0.317
19.45	0.197	7.779	0.119	0.112	0.204	----	----	----	----	----	----	0.316
19.50	0.196	7.778	0.119	0.112	0.202	----	----	----	----	----	----	0.314

Continues on next page...

Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
19.55	0.195	7.777	0.119	0.112	0.201	---	---	---	---	---	---	0.313
19.60	0.194	7.776	0.119	0.112	0.200	---	---	---	---	---	---	0.311
19.65	0.193	7.775	0.119	0.112	0.198	---	---	---	---	---	---	0.310
19.70	0.192	7.774	0.119	0.112	0.197	---	---	---	---	---	---	0.309
19.75	0.191	7.773	0.119	0.112	0.196	---	---	---	---	---	---	0.307
19.80	0.190	7.772	0.119	0.112	0.194	---	---	---	---	---	---	0.306
19.85	0.189	7.771	0.119	0.112	0.193	---	---	---	---	---	---	0.305
19.90	0.188	7.770	0.119	0.111	0.192	---	---	---	---	---	---	0.303
19.95	0.187	7.769	0.119	0.111	0.190	---	---	---	---	---	---	0.302
20.00	0.186	7.768	0.119	0.111	0.189	---	---	---	---	---	---	0.300
20.05	0.185	7.767	0.119	0.111	0.188	---	---	---	---	---	---	0.299
20.10	0.184	7.766	0.119	0.111	0.186	---	---	---	---	---	---	0.298
20.15	0.183	7.765	0.119	0.111	0.185	---	---	---	---	---	---	0.296
20.20	0.181	7.764	0.119	0.111	0.184	---	---	---	---	---	---	0.295
20.25	0.180	7.763	0.119	0.111	0.183	---	---	---	---	---	---	0.294
20.30	0.179	7.762	0.119	0.111	0.181	---	---	---	---	---	---	0.292
20.35	0.178	7.761	0.119	0.111	0.180	---	---	---	---	---	---	0.291
20.40	0.177	7.760	0.119	0.111	0.179	---	---	---	---	---	---	0.290
20.45	0.176	7.759	0.119	0.111	0.178	---	---	---	---	---	---	0.289
20.50	0.175	7.758	0.118	0.111	0.177	---	---	---	---	---	---	0.287
20.55	0.174	7.757	0.118	0.111	0.175	---	---	---	---	---	---	0.286
20.60	0.173	7.756	0.118	0.111	0.174	---	---	---	---	---	---	0.285
20.65	0.172	7.755	0.118	0.111	0.173	---	---	---	---	---	---	0.284
20.70	0.171	7.754	0.118	0.111	0.172	---	---	---	---	---	---	0.283
20.75	0.170	7.753	0.117	0.111	0.171	---	---	---	---	---	---	0.282
20.80	0.169	7.752	0.117	0.111	0.170	---	---	---	---	---	---	0.280
20.85	0.168	7.751	0.117	0.111	0.169	---	---	---	---	---	---	0.279
20.90	0.167	7.750	0.117	0.111	0.168	---	---	---	---	---	---	0.278

Continues on next page...

Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
20.95	0.166	7.749	0.117	0.110	0.166	---	---	---	---	---	---	0.277
21.00	0.165	7.748	0.117	0.110	0.165	---	---	---	---	---	---	0.276
21.05	0.164	7.747	0.116	0.110	0.164	---	---	---	---	---	---	0.275
21.10	0.163	7.746	0.116	0.110	0.163	---	---	---	---	---	---	0.273
21.15	0.162	7.745	0.116	0.110	0.162	---	---	---	---	---	---	0.272
21.20	0.161	7.744	0.116	0.110	0.161	---	---	---	---	---	---	0.271
21.25	0.160	7.743	0.116	0.110	0.160	---	---	---	---	---	---	0.270
21.30	0.159	7.742	0.116	0.110	0.159	---	---	---	---	---	---	0.269
21.35	0.158	7.741	0.115	0.110	0.157	---	---	---	---	---	---	0.268
21.40	0.156	7.740	0.115	0.110	0.156	---	---	---	---	---	---	0.266
21.45	0.155	7.739	0.115	0.110	0.155	---	---	---	---	---	---	0.265
21.50	0.154	7.738	0.115	0.110	0.154	---	---	---	---	---	---	0.264
21.55	0.153	7.737	0.115	0.110	0.153	---	---	---	---	---	---	0.263
21.60	0.152	7.736	0.115	0.110	0.152	---	---	---	---	---	---	0.262
21.65	0.151	7.735	0.114	0.110	0.151	---	---	---	---	---	---	0.261
21.70	0.150	7.734	0.114	0.110	0.150	---	---	---	---	---	---	0.260
21.75	0.149	7.733	0.114	0.110	0.149	---	---	---	---	---	---	0.258
21.80	0.148	7.732	0.114	0.110	0.148	---	---	---	---	---	---	0.257
21.85	0.147	7.731	0.114	0.110	0.146	---	---	---	---	---	---	0.256
21.90	0.146	7.730	0.114	0.110	0.145	---	---	---	---	---	---	0.255
21.95	0.145	7.729	0.113	0.110	0.144	---	---	---	---	---	---	0.254
22.00	0.144	7.728	0.113	0.110	0.143	---	---	---	---	---	---	0.253
22.05	0.188	7.727	0.113	0.110	0.142	---	---	---	---	---	---	0.252
22.10	0.234	7.727	0.113	0.109	0.142	---	---	---	---	---	---	0.251
22.15	0.207	7.726	0.113	0.109	0.142	---	---	---	---	---	---	0.251
22.20	0.179	7.726	0.113	0.109	0.141	---	---	---	---	---	---	0.250
22.25	0.150	7.725	0.113	0.109	0.140	---	---	---	---	---	---	0.250
22.30	0.149	7.724	0.113	0.109	0.139	---	---	---	---	---	---	0.249

Continues on next page...

Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
22.35	0.149	7.723	0.112	0.109	0.138	----	----	----	----	----	----	0.247
22.40	0.148	7.723	0.112	0.109	0.137	----	----	----	----	----	----	0.246
22.45	0.147	7.722	0.112	0.109	0.136	----	----	----	----	----	----	0.245
22.50	0.146	7.721	0.112	0.109	0.135	----	----	----	----	----	----	0.244
22.55	0.145	7.720	0.112	0.109	0.134	----	----	----	----	----	----	0.243
22.60	0.145	7.719	0.112	0.109	0.133	----	----	----	----	----	----	0.242
22.65	0.144	7.718	0.111	0.109	0.132	----	----	----	----	----	----	0.241
22.70	0.143	7.717	0.111	0.109	0.131	----	----	----	----	----	----	0.240
22.75	0.142	7.716	0.111	0.109	0.130	----	----	----	----	----	----	0.239
22.80	0.142	7.716	0.111	0.109	0.129	----	----	----	----	----	----	0.238
22.85	0.141	7.715	0.111	0.109	0.128	----	----	----	----	----	----	0.237
22.90	0.140	7.714	0.111	0.109	0.127	----	----	----	----	----	----	0.236
22.95	0.139	7.713	0.111	0.109	0.126	----	----	----	----	----	----	0.235
23.00	0.138	7.712	0.110	0.109	0.125	----	----	----	----	----	----	0.234
23.05	0.138	7.711	0.110	0.109	0.124	----	----	----	----	----	----	0.233
23.10	0.137	7.710	0.110	0.109	0.123	----	----	----	----	----	----	0.232
23.15	0.136	7.710	0.110	0.109	0.122	----	----	----	----	----	----	0.231
23.20	0.135	7.709	0.110	0.109	0.122	----	----	----	----	----	----	0.230
23.25	0.134	7.708	0.110	0.109	0.121	----	----	----	----	----	----	0.229
23.30	0.134	7.707	0.110	0.109	0.120	----	----	----	----	----	----	0.228
23.35	0.133	7.706	0.109	0.109	0.119	----	----	----	----	----	----	0.227
23.40	0.132	7.705	0.109	0.109	0.118	----	----	----	----	----	----	0.226
23.45	0.131	7.704	0.109	0.108	0.117	----	----	----	----	----	----	0.225
23.50	0.131	7.704	0.109	0.108	0.116	----	----	----	----	----	----	0.224
23.55	0.130	7.703	0.109	0.108	0.115	----	----	----	----	----	----	0.223
23.60	0.129	7.702	0.109	0.108	0.114	----	----	----	----	----	----	0.222
23.65	0.128	7.701	0.109	0.108	0.113	----	----	----	----	----	----	0.221
23.70	0.127	7.700	0.108	0.108	0.112	----	----	----	----	----	----	0.220

Continues on next page...

Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
23.75	0.127	7.699	0.108	0.108	0.111	----	----	----	----	----	----	0.220
23.80	0.126	7.699	0.108	0.108	0.110	----	----	----	----	----	----	0.219
23.85	0.125	7.698	0.108	0.108	0.110	----	----	----	----	----	----	0.218
23.90	0.124	7.697	0.108	0.108	0.109	----	----	----	----	----	----	0.217
23.95	0.123	7.696	0.108	0.108	0.108	----	----	----	----	----	----	0.216
24.00	0.123	7.695	0.108	0.108	0.107	----	----	----	----	----	----	0.216
24.05	0.098	7.694	0.108	0.108	0.107	----	----	----	----	----	----	0.215
24.10	0.049	7.693	0.108	0.108	0.105	----	----	----	----	----	----	0.213
24.15	0.016	7.691	0.108	0.108	0.104	----	----	----	----	----	----	0.212
24.20	0.000	7.690	0.108	0.108	0.102	----	----	----	----	----	----	0.210
24.25	0.000	7.688	0.108	0.108	0.101	----	----	----	----	----	----	0.208
24.30	0.000	7.686	0.108	0.108	0.099	----	----	----	----	----	----	0.207
24.35	0.000	7.684	0.108	0.107	0.097	----	----	----	----	----	----	0.205
24.40	0.000	7.682	0.108	0.107	0.096	----	----	----	----	----	----	0.203
24.45	0.000	7.680	0.108	0.107	0.094	----	----	----	----	----	----	0.201
24.50	0.000	7.679	0.108	0.107	0.092	----	----	----	----	----	----	0.200

...End

Pond Report

Pond No. 1 - Pond

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 6.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	6.50	14,857	0	0
0.50	7.00	18,389	8,312	8,312
0.90	7.40	19,366	7,551	15,863
1.50	8.00	20,869	12,071	27,933
2.50	9.00	23,404	22,137	50,070
3.50	10.00	25,994	24,699	74,769

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	2.00	6.00	0.00
Span (in)	= 18.00	2.00	6.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 6.50	6.50	7.50	0.00
Length (ft)	= 202.00	0.00	0.00	0.00
Slope (%)	= 0.37	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

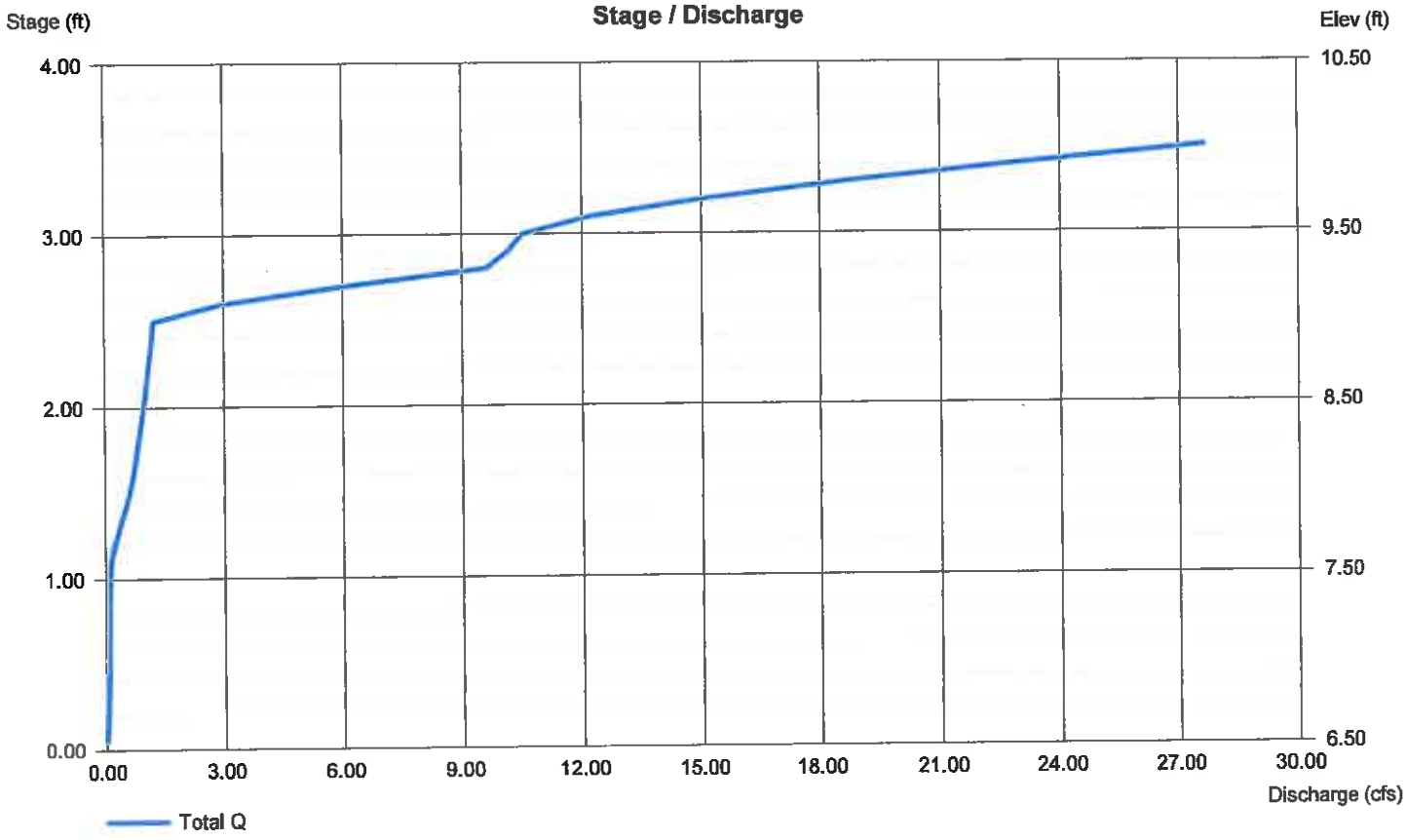
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	15.00	0.00	0.00
Crest El. (ft)	= 9.00	9.50	0.00	0.00
Weir Coeff.	= 3.33	3.00	3.33	3.33
Weir Type	= 1	Broad	—	—
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Hydrograph Report

Hyd. No. 3

Predevelopment Flow

Hydrograph type	= SCS Runoff	Peak discharge	= 0.564 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.30 hrs
Time interval	= 2 min	Hyd. volume	= 4,754 cuft
Drainage area	= 3.780 ac	Curve number	= 47.000*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.0 min
Total precip.	= 4.49 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.890 x 35) + (1.890 x 56)] / 3.780

Hydrograph Discharge Table

(Printed values >= 50.00% of Qp.)

Time -- Outflow (hrs cfs)	
12.10	0.362
12.13	0.470
12.17	0.510
12.20	0.527
12.23	0.546
12.27	0.562
12.30	0.564
<<	
12.33	0.555
12.37	0.536
12.40	0.507
12.43	0.470
12.47	0.426
12.50	0.375
12.53	0.325
12.57	0.289

...End

Hydrograph Report

Hyd. No. 1

Post Flow

Hydrograph type	= SCS Runoff	Peak discharge	= 18.04 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 61,284 cuft
Drainage area	= 3.780 ac	Curve number	= 83.000*
Basin Slope	= 0.5 %	Hydraulic length	= 774 ft
Tc method	= User	Time of conc. (Tc)	= 5.0 min
Total precip.	= 6.72 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.960 x 39) + (2.820 x 98)] / 3.780

Hydrograph Discharge Table

(Printed values >= 50.00% of Qp.)

Time -- (hrs	Outflow cfs)	
12.00	12.29	
12.05	16.68	
12.10	18.04	<<
12.15	15.49	
12.20	11.81	
12.25	9.225	

...End

Hydrograph Report

Hyd. No. 2

Pond Routing

Hydrograph type	= Reservoir	Peak discharge	= 0.970 cfs
Storm frequency	= 10 yrs	Time to peak	= 14.55 hrs
Time interval	= 3 min	Hyd. volume	= 60,472 cuft
Inflow hyd. No.	= 1 - Post Flow	Reservoir name	= Pond
Max. Elevation	= 8.51 ft	Max. Storage	= 39,333 cuft

Storage Indication method used.

Hydrograph Discharge Table

(Printed values >= 50.00% of Qp.)

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
12.20	11.81	7.993	0.129	0.122	0.466	-----	-----	-----	-----	-----	-----	0.587
12.25	9.225	8.074	0.130	0.125	0.537	-----	-----	-----	-----	-----	-----	0.662
12.30	7.910	8.138	0.130	0.128	0.588	-----	-----	-----	-----	-----	-----	0.716
12.35	7.024	8.193	0.131	0.130	0.629	-----	-----	-----	-----	-----	-----	0.759
12.40	6.121	8.240	0.135	0.132	0.661	-----	-----	-----	-----	-----	-----	0.793
12.45	5.204	8.279	0.140	0.134	0.687	-----	-----	-----	-----	-----	-----	0.821
12.50	4.277	8.311	0.142	0.135	0.708	-----	-----	-----	-----	-----	-----	0.843
12.55	3.427	8.336	0.142	0.136	0.723	-----	-----	-----	-----	-----	-----	0.859
12.60	2.826	8.354	0.142	0.137	0.734	-----	-----	-----	-----	-----	-----	0.871
12.65	2.505	8.368	0.142	0.137	0.743	-----	-----	-----	-----	-----	-----	0.880
12.70	2.353	8.381	0.142	0.138	0.751	-----	-----	-----	-----	-----	-----	0.888
12.75	2.257	8.393	0.142	0.138	0.758	-----	-----	-----	-----	-----	-----	0.896
12.80	2.160	8.403	0.142	0.139	0.764	-----	-----	-----	-----	-----	-----	0.903
12.85	2.062	8.413	0.142	0.139	0.769	-----	-----	-----	-----	-----	-----	0.909
12.90	1.965	8.422	0.142	0.140	0.775	-----	-----	-----	-----	-----	-----	0.914
12.95	1.867	8.430	0.142	0.140	0.779	-----	-----	-----	-----	-----	-----	0.919
13.00	1.769	8.437	0.143	0.140	0.783	-----	-----	-----	-----	-----	-----	0.923
13.05	1.678	8.444	0.143	0.140	0.787	-----	-----	-----	-----	-----	-----	0.927
13.10	1.608	8.450	0.143	0.141	0.790	-----	-----	-----	-----	-----	-----	0.931
13.15	1.564	8.455	0.143	0.141	0.793	-----	-----	-----	-----	-----	-----	0.934

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Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
13.20	1.534	8.460	0.143	0.141	0.796	----	----	----	----	----	----	0.937
13.25	1.509	8.465	0.143	0.141	0.799	----	----	----	----	----	----	0.940
13.30	1.484	8.469	0.143	0.141	0.801	----	----	----	----	----	----	0.943
13.35	1.458	8.474	0.143	0.142	0.804	----	----	----	----	----	----	0.945
13.40	1.433	8.478	0.143	0.142	0.806	----	----	----	----	----	----	0.948
13.45	1.408	8.481	0.143	0.142	0.808	----	----	----	----	----	----	0.950
13.50	1.382	8.485	0.143	0.142	0.810	----	----	----	----	----	----	0.952
13.55	1.357	8.488	0.143	0.142	0.812	----	----	----	----	----	----	0.954
13.60	1.332	8.492	0.143	0.142	0.814	----	----	----	----	----	----	0.956
13.65	1.306	8.495	0.143	0.142	0.816	----	----	----	----	----	----	0.958
13.70	1.280	8.497	0.143	0.142	0.817	----	----	----	----	----	----	0.960
13.75	1.255	8.500	0.143	0.143	0.818	----	----	----	----	----	----	0.961
13.80	1.229	8.502	0.143	0.143	0.820	----	----	----	----	----	----	0.962
13.85	1.203	8.504	0.143	0.143	0.821	----	----	----	----	----	----	0.964
13.90	1.178	8.506	0.143	0.143	0.822	----	----	----	----	----	----	0.965
13.95	1.152	8.508	0.144	0.143	0.823	----	----	----	----	----	----	0.965
14.00	1.126	8.509	0.144	0.143	0.823	----	----	----	----	----	----	0.966
14.05	1.101	8.510	0.144	0.143	0.824	----	----	----	----	----	----	0.967
14.10	1.081	8.511	0.144	0.143	0.825	----	----	----	----	----	----	0.968
14.15	1.065	8.512	0.144	0.143	0.825	----	----	----	----	----	----	0.968
14.20	1.052	8.513	0.144	0.143	0.825	----	----	----	----	----	----	0.968
14.25	1.040	8.513	0.144	0.143	0.826	----	----	----	----	----	----	0.969
14.30	1.027	8.514	0.144	0.143	0.826	----	----	----	----	----	----	0.969
14.35	1.015	8.514	0.144	0.143	0.826	----	----	----	----	----	----	0.969
14.40	1.003	8.515	0.144	0.143	0.826	----	----	----	----	----	----	0.969
14.45	0.990	8.515	0.144	0.143	0.827	----	----	----	----	----	----	0.970
14.50	0.978	8.515	0.145	0.143	0.827	----	----	----	----	----	----	0.970
14.55	0.966	8.515 <<	0.145	0.143	0.827	----	----	----	----	----	----	0.970

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Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
14.60	0.953	8.515	0.145	0.143	0.827	----	----	----	----	----	----	0.970
14.65	0.941	8.515	0.144	0.143	0.826	----	----	----	----	----	----	0.970
14.70	0.929	8.514	0.144	0.143	0.826	----	----	----	----	----	----	0.969
14.75	0.916	8.514	0.144	0.143	0.826	----	----	----	----	----	----	0.969
14.80	0.904	8.514	0.144	0.143	0.826	----	----	----	----	----	----	0.969
14.85	0.891	8.513	0.144	0.143	0.826	----	----	----	----	----	----	0.969
14.90	0.879	8.512	0.144	0.143	0.825	----	----	----	----	----	----	0.968
14.95	0.866	8.512	0.144	0.143	0.825	----	----	----	----	----	----	0.968
15.00	0.854	8.511	0.144	0.143	0.824	----	----	----	----	----	----	0.967
15.05	0.842	8.510	0.144	0.143	0.824	----	----	----	----	----	----	0.967
15.10	0.829	8.509	0.144	0.143	0.823	----	----	----	----	----	----	0.966
15.15	0.816	8.507	0.144	0.143	0.823	----	----	----	----	----	----	0.965
15.20	0.804	8.506	0.143	0.143	0.822	----	----	----	----	----	----	0.965
15.25	0.791	8.505	0.143	0.143	0.821	----	----	----	----	----	----	0.964
15.30	0.779	8.503	0.143	0.143	0.820	----	----	----	----	----	----	0.963
15.35	0.766	8.502	0.143	0.143	0.820	----	----	----	----	----	----	0.962
15.40	0.754	8.500	0.143	0.143	0.819	----	----	----	----	----	----	0.961
15.45	0.741	8.498	0.143	0.143	0.818	----	----	----	----	----	----	0.960
15.50	0.729	8.497	0.143	0.142	0.817	----	----	----	----	----	----	0.959
15.55	0.716	8.495	0.143	0.142	0.816	----	----	----	----	----	----	0.958
15.60	0.703	8.493	0.143	0.142	0.815	----	----	----	----	----	----	0.957
15.65	0.691	8.491	0.143	0.142	0.813	----	----	----	----	----	----	0.956
15.70	0.678	8.488	0.143	0.142	0.812	----	----	----	----	----	----	0.954
15.75	0.666	8.486	0.143	0.142	0.811	----	----	----	----	----	----	0.953
15.80	0.653	8.484	0.143	0.142	0.809	----	----	----	----	----	----	0.951
15.85	0.640	8.481	0.143	0.142	0.808	----	----	----	----	----	----	0.950
15.90	0.627	8.479	0.143	0.142	0.807	----	----	----	----	----	----	0.948
15.95	0.615	8.476	0.143	0.142	0.805	----	----	----	----	----	----	0.947

Continues on next page...

Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
16.00	0.602	8.473	0.143	0.142	0.804	---	---	---	---	---	---	0.945
16.05	0.590	8.470	0.143	0.141	0.802	---	---	---	---	---	---	0.943
16.10	0.580	8.468	0.143	0.141	0.800	---	---	---	---	---	---	0.942
16.15	0.573	8.465	0.143	0.141	0.799	---	---	---	---	---	---	0.940
16.20	0.567	8.462	0.143	0.141	0.797	---	---	---	---	---	---	0.938
16.25	0.562	8.459	0.143	0.141	0.795	---	---	---	---	---	---	0.936
16.30	0.556	8.456	0.143	0.141	0.794	---	---	---	---	---	---	0.934
16.35	0.551	8.452	0.143	0.141	0.792	---	---	---	---	---	---	0.932
16.40	0.545	8.449	0.143	0.141	0.790	---	---	---	---	---	---	0.931
16.45	0.540	8.446	0.143	0.140	0.788	---	---	---	---	---	---	0.929
16.50	0.534	8.443	0.143	0.140	0.786	---	---	---	---	---	---	0.927
16.55	0.529	8.440	0.143	0.140	0.785	---	---	---	---	---	---	0.925
16.60	0.523	8.437	0.143	0.140	0.783	---	---	---	---	---	---	0.923
16.65	0.518	8.433	0.142	0.140	0.781	---	---	---	---	---	---	0.921
16.70	0.512	8.430	0.142	0.140	0.779	---	---	---	---	---	---	0.919
16.75	0.507	8.427	0.142	0.140	0.777	---	---	---	---	---	---	0.917
16.80	0.501	8.423	0.142	0.140	0.775	---	---	---	---	---	---	0.915
16.85	0.496	8.420	0.142	0.139	0.773	---	---	---	---	---	---	0.913
16.90	0.490	8.417	0.142	0.139	0.771	---	---	---	---	---	---	0.911
16.95	0.485	8.413	0.142	0.139	0.770	---	---	---	---	---	---	0.909
17.00	0.479	8.410	0.142	0.139	0.768	---	---	---	---	---	---	0.907
17.05	0.474	8.406	0.142	0.139	0.766	---	---	---	---	---	---	0.904
17.10	0.468	8.403	0.142	0.139	0.764	---	---	---	---	---	---	0.902
17.15	0.463	8.399	0.142	0.139	0.762	---	---	---	---	---	---	0.900
17.20	0.457	8.396	0.142	0.138	0.759	---	---	---	---	---	---	0.898
17.25	0.452	8.392	0.142	0.138	0.757	---	---	---	---	---	---	0.896
17.30	0.446	8.388	0.142	0.138	0.755	---	---	---	---	---	---	0.893
17.35	0.440	8.385	0.142	0.138	0.753	---	---	---	---	---	---	0.891

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Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
17.40	0.435	8.381	0.142	0.138	0.751	---	---	---	---	---	---	0.888
17.45	0.429	8.377	0.142	0.138	0.748	---	---	---	---	---	---	0.886
17.50	0.424	8.374	0.142	0.138	0.746	---	---	---	---	---	---	0.884
17.55	0.418	8.370	0.142	0.137	0.744	---	---	---	---	---	---	0.881
17.60	0.413	8.366	0.142	0.137	0.741	---	---	---	---	---	---	0.879
17.65	0.407	8.362	0.142	0.137	0.739	---	---	---	---	---	---	0.876
17.70	0.402	8.358	0.142	0.137	0.737	---	---	---	---	---	---	0.874
17.75	0.396	8.355	0.142	0.137	0.734	---	---	---	---	---	---	0.871
17.80	0.391	8.351	0.142	0.137	0.732	---	---	---	---	---	---	0.869
17.85	0.385	8.347	0.142	0.137	0.730	---	---	---	---	---	---	0.866
17.90	0.380	8.343	0.142	0.136	0.727	---	---	---	---	---	---	0.864
17.95	0.374	8.339	0.142	0.136	0.725	---	---	---	---	---	---	0.861
18.00	0.368	8.335	0.142	0.136	0.722	---	---	---	---	---	---	0.858
18.05	0.363	8.331	0.142	0.136	0.720	---	---	---	---	---	---	0.856
18.10	0.359	8.327	0.142	0.136	0.717	---	---	---	---	---	---	0.853
18.15	0.357	8.323	0.142	0.136	0.715	---	---	---	---	---	---	0.851
18.20	0.355	8.319	0.142	0.135	0.713	---	---	---	---	---	---	0.848
18.25	0.353	8.315	0.142	0.135	0.710	---	---	---	---	---	---	0.845
18.30	0.351	8.311	0.142	0.135	0.708	---	---	---	---	---	---	0.843
18.35	0.350	8.307	0.142	0.135	0.705	---	---	---	---	---	---	0.840
18.40	0.348	8.303	0.142	0.135	0.703	---	---	---	---	---	---	0.838
18.45	0.346	8.299	0.142	0.135	0.700	---	---	---	---	---	---	0.835
18.50	0.345	8.295	0.142	0.134	0.698	---	---	---	---	---	---	0.832
18.55	0.343	8.291	0.141	0.134	0.695	---	---	---	---	---	---	0.829
18.60	0.341	8.287	0.141	0.134	0.692	---	---	---	---	---	---	0.827
18.65	0.340	8.283	0.140	0.134	0.690	---	---	---	---	---	---	0.824
18.70	0.338	8.279	0.140	0.134	0.687	---	---	---	---	---	---	0.821
18.75	0.337	8.275	0.140	0.134	0.685	---	---	---	---	---	---	0.818

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Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
18.80	0.335	8.271	0.139	0.133	0.682	----	----	----	----	----	----	0.815
18.85	0.333	8.267	0.139	0.133	0.679	----	----	----	----	----	----	0.813
18.90	0.332	8.264	0.138	0.133	0.677	----	----	----	----	----	----	0.810
18.95	0.330	8.260	0.138	0.133	0.674	----	----	----	----	----	----	0.807
19.00	0.328	8.256	0.137	0.133	0.671	----	----	----	----	----	----	0.804
19.05	0.327	8.252	0.137	0.133	0.669	----	----	----	----	----	----	0.802
19.10	0.325	8.248	0.136	0.133	0.666	----	----	----	----	----	----	0.799
19.15	0.323	8.244	0.136	0.132	0.664	----	----	----	----	----	----	0.796
19.20	0.322	8.240	0.135	0.132	0.661	----	----	----	----	----	----	0.793
19.25	0.320	8.237	0.135	0.132	0.659	----	----	----	----	----	----	0.791
19.30	0.318	8.233	0.135	0.132	0.656	----	----	----	----	----	----	0.788
19.35	0.317	8.229	0.134	0.132	0.653	----	----	----	----	----	----	0.785
19.40	0.315	8.225	0.134	0.132	0.651	----	----	----	----	----	----	0.783
19.45	0.313	8.221	0.133	0.132	0.648	----	----	----	----	----	----	0.780
19.50	0.312	8.218	0.133	0.131	0.646	----	----	----	----	----	----	0.777
19.55	0.310	8.214	0.132	0.131	0.643	----	----	----	----	----	----	0.775
19.60	0.308	8.210	0.132	0.131	0.641	----	----	----	----	----	----	0.772
19.65	0.307	8.206	0.131	0.131	0.638	----	----	----	----	----	----	0.769
19.70	0.305	8.202	0.131	0.131	0.636	----	----	----	----	----	----	0.767
19.75	0.303	8.199	0.131	0.131	0.633	----	----	----	----	----	----	0.764
19.80	0.302	8.195	0.131	0.130	0.630	----	----	----	----	----	----	0.761
19.85	0.300	8.191	0.131	0.130	0.628	----	----	----	----	----	----	0.758
19.90	0.298	8.188	0.131	0.130	0.625	----	----	----	----	----	----	0.755
19.95	0.297	8.184	0.131	0.130	0.622	----	----	----	----	----	----	0.752
20.00	0.295	8.180	0.131	0.130	0.619	----	----	----	----	----	----	0.749
20.05	0.293	8.176	0.131	0.130	0.616	----	----	----	----	----	----	0.746
20.10	0.292	8.173	0.131	0.130	0.614	----	----	----	----	----	----	0.743
20.15	0.290	8.169	0.131	0.129	0.611	----	----	----	----	----	----	0.740

Continues on next page...

Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
20.20	0.288	8.165	0.131	0.129	0.608	----	----	----	----	----	----	0.737
20.25	0.287	8.162	0.131	0.129	0.606	----	----	----	----	----	----	0.735
20.30	0.285	8.158	0.131	0.129	0.603	----	----	----	----	----	----	0.732
20.35	0.283	8.155	0.131	0.129	0.600	----	----	----	----	----	----	0.729
20.40	0.282	8.151	0.131	0.129	0.597	----	----	----	----	----	----	0.726
20.45	0.280	8.147	0.130	0.128	0.595	----	----	----	----	----	----	0.723
20.50	0.278	8.144	0.130	0.128	0.592	----	----	----	----	----	----	0.720
20.55	0.277	8.140	0.130	0.128	0.589	----	----	----	----	----	----	0.717
20.60	0.275	8.137	0.130	0.128	0.587	----	----	----	----	----	----	0.715
20.65	0.273	8.133	0.130	0.128	0.584	----	----	----	----	----	----	0.712
20.70	0.272	8.129	0.130	0.128	0.581	----	----	----	----	----	----	0.709
20.75	0.270	8.126	0.130	0.128	0.579	----	----	----	----	----	----	0.706
20.80	0.268	8.122	0.130	0.127	0.576	----	----	----	----	----	----	0.703
20.85	0.267	8.119	0.130	0.127	0.573	----	----	----	----	----	----	0.701
20.90	0.265	8.115	0.130	0.127	0.571	----	----	----	----	----	----	0.698
20.95	0.263	8.112	0.130	0.127	0.568	----	----	----	----	----	----	0.695
21.00	0.262	8.108	0.130	0.127	0.565	----	----	----	----	----	----	0.692
21.05	0.260	8.105	0.130	0.127	0.563	----	----	----	----	----	----	0.689
21.10	0.258	8.101	0.130	0.127	0.560	----	----	----	----	----	----	0.687
21.15	0.257	8.098	0.130	0.126	0.557	----	----	----	----	----	----	0.684
21.20	0.255	8.094	0.130	0.126	0.554	----	----	----	----	----	----	0.681
21.25	0.253	8.091	0.130	0.126	0.551	----	----	----	----	----	----	0.677
21.30	0.252	8.087	0.130	0.126	0.548	----	----	----	----	----	----	0.674
21.35	0.250	8.084	0.130	0.126	0.545	----	----	----	----	----	----	0.671
21.40	0.248	8.081	0.130	0.126	0.542	----	----	----	----	----	----	0.668
21.45	0.247	8.077	0.130	0.125	0.539	----	----	----	----	----	----	0.665
21.50	0.245	8.074	0.130	0.125	0.537	----	----	----	----	----	----	0.662
21.55	0.243	8.070	0.130	0.125	0.534	----	----	----	----	----	----	0.659

Continues on next page...

Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
21.60	0.242	8.067	0.130	0.125	0.531	—	—	—	—	—	—	0.656
21.65	0.240	8.064	0.130	0.125	0.528	—	—	—	—	—	—	0.653
21.70	0.238	8.060	0.130	0.125	0.525	—	—	—	—	—	—	0.650
21.75	0.237	8.057	0.130	0.125	0.522	—	—	—	—	—	—	0.647
21.80	0.235	8.054	0.130	0.124	0.519	—	—	—	—	—	—	0.644
21.85	0.233	8.050	0.130	0.124	0.516	—	—	—	—	—	—	0.640
21.90	0.232	8.047	0.130	0.124	0.513	—	—	—	—	—	—	0.637
21.95	0.230	8.044	0.130	0.124	0.511	—	—	—	—	—	—	0.634
22.00	0.228	8.040	0.130	0.124	0.508	—	—	—	—	—	—	0.631
22.05	0.298	8.037	0.130	0.124	0.505	—	—	—	—	—	—	0.629
22.10	0.370	8.035	0.130	0.124	0.503	—	—	—	—	—	—	0.627
22.15	0.329	8.033	0.130	0.123	0.501	—	—	—	—	—	—	0.625
22.20	0.284	8.030	0.130	0.123	0.499	—	—	—	—	—	—	0.622
22.25	0.238	8.027	0.130	0.123	0.496	—	—	—	—	—	—	0.620
22.30	0.237	8.024	0.130	0.123	0.494	—	—	—	—	—	—	0.617
22.35	0.236	8.021	0.130	0.123	0.491	—	—	—	—	—	—	0.614
22.40	0.234	8.018	0.130	0.123	0.488	—	—	—	—	—	—	0.611
22.45	0.233	8.015	0.130	0.123	0.486	—	—	—	—	—	—	0.608
22.50	0.232	8.012	0.130	0.123	0.483	—	—	—	—	—	—	0.606
22.55	0.231	8.009	0.130	0.122	0.480	—	—	—	—	—	—	0.603
22.60	0.229	8.006	0.130	0.122	0.478	—	—	—	—	—	—	0.600
22.65	0.228	8.003	0.130	0.122	0.475	—	—	—	—	—	—	0.597
22.70	0.227	8.000	0.130	0.122	0.473	—	—	—	—	—	—	0.595
22.75	0.226	7.997	0.130	0.122	0.469	—	—	—	—	—	—	0.591
22.80	0.224	7.993	0.129	0.122	0.466	—	—	—	—	—	—	0.588
22.85	0.223	7.990	0.128	0.122	0.463	—	—	—	—	—	—	0.584
22.90	0.222	7.987	0.128	0.121	0.460	—	—	—	—	—	—	0.581
22.95	0.221	7.984	0.127	0.121	0.457	—	—	—	—	—	—	0.578

Continues on next page...

Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
23.00	0.219	7.980	0.127	0.121	0.453	---	---	---	---	---	---	0.575
23.05	0.218	7.977	0.126	0.121	0.450	---	---	---	---	---	---	0.571
23.10	0.217	7.974	0.126	0.121	0.447	---	---	---	---	---	---	0.568
23.15	0.216	7.971	0.125	0.121	0.444	---	---	---	---	---	---	0.565
23.20	0.214	7.968	0.125	0.121	0.441	---	---	---	---	---	---	0.562
23.25	0.213	7.965	0.124	0.121	0.438	---	---	---	---	---	---	0.558
23.30	0.212	7.962	0.123	0.120	0.435	---	---	---	---	---	---	0.555
23.35	0.211	7.959	0.123	0.120	0.432	---	---	---	---	---	---	0.552
23.40	0.209	7.956	0.122	0.120	0.429	---	---	---	---	---	---	0.549
23.45	0.208	7.953	0.122	0.120	0.426	---	---	---	---	---	---	0.546
23.50	0.207	7.950	0.121	0.120	0.423	---	---	---	---	---	---	0.543
23.55	0.205	7.947	0.121	0.120	0.420	---	---	---	---	---	---	0.540
23.60	0.204	7.944	0.120	0.120	0.417	---	---	---	---	---	---	0.537
23.65	0.203	7.941	0.120	0.120	0.414	---	---	---	---	---	---	0.534
23.70	0.202	7.938	0.120	0.119	0.410	---	---	---	---	---	---	0.530
23.75	0.200	7.935	0.119	0.119	0.407	---	---	---	---	---	---	0.526
23.80	0.199	7.932	0.119	0.119	0.403	---	---	---	---	---	---	0.522
23.85	0.198	7.929	0.119	0.119	0.399	---	---	---	---	---	---	0.518
23.90	0.197	7.926	0.119	0.119	0.396	---	---	---	---	---	---	0.514
23.95	0.195	7.923	0.119	0.119	0.392	---	---	---	---	---	---	0.511
24.00	0.194	7.920	0.119	0.119	0.388	---	---	---	---	---	---	0.507
24.05	0.155	7.918	0.119	0.119	0.385	---	---	---	---	---	---	0.503
24.10	0.077	7.914	0.119	0.118	0.380	---	---	---	---	---	---	0.498
24.15	0.026	7.910	0.119	0.118	0.375	---	---	---	---	---	---	0.493
24.20	0.000	7.906	0.119	0.118	0.370	---	---	---	---	---	---	0.487

...End

Hydrograph Report

Hyd. No. 3

Predevelopment Flow

Hydrograph type	= SCS Runoff	Peak discharge	= 4.221 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 16,289 cuft
Drainage area	= 3.780 ac	Curve number	= 47.000*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.0 min
Total precip.	= 6.72 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.890 x 35) + (1.890 x 56)] / 3.780

Hydrograph Discharge Table

(Printed values >= 50.00% of Qp.)

Time -- (hrs)	Outflow cfs)	
12.00	2.296	
12.03	3.432	
12.07	4.206	
12.10	4.221	<<
12.13	3.673	
12.17	3.077	
12.20	2.741	
12.23	2.587	
12.27	2.490	
12.30	2.370	
12.33	2.232	

...End

Hydrograph Report

Hyd. No. 1

Post Flow

Hydrograph type	= SCS Runoff	Peak discharge	= 22.43 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 77,015 cuft
Drainage area	= 3.780 ac	Curve number	= 83.000*
Basin Slope	= 0.5 %	Hydraulic length	= 774 ft
Tc method	= User	Time of conc. (Tc)	= 5.0 min
Total precip.	= 8.01 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.960 x 39) + (2.820 x 98)] / 3.780

Hydrograph Discharge Table

(Printed values >= 50.00% of Qp.)

Time -- (hrs	Outflow cfs)	
12.00	15.42	
12.05	20.82	
12.10	22.43	<<
12.15	19.20	
12.20	14.59	
12.25	11.37	

...End

Hydrograph Report

Hyd. No. 2

Pond Routing

Hydrograph type	= Reservoir	Peak discharge	= 1.209 cfs
Storm frequency	= 25 yrs	Time to peak	= 14.45 hrs
Time interval	= 3 min	Hyd. volume	= 76,169 cuft
Inflow hyd. No.	= 1 - Post Flow	Reservoir name	= Pond
Max. Elevation	= 8.98 ft	Max. Storage	= 49,670 cuft

Storage Indication method used.

(Printed values >= 50.00% of Qp.)

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
12.10	22.43 <<	8.064	0.130	0.125	0.528	---	---	---	---	---	---	0.653
12.15	19.20	8.228	0.134	0.132	0.653	---	---	---	---	---	---	0.784
12.20	14.59	8.358	0.142	0.137	0.737	---	---	---	---	---	---	0.874
12.25	11.37	8.456	0.143	0.141	0.794	---	---	---	---	---	---	0.935
12.30	9.729	8.534	0.147	0.144	0.837	---	---	---	---	---	---	0.981
12.35	8.629	8.601	0.155	0.146	0.872	---	---	---	---	---	---	1.018
12.40	7.512	8.658	0.155	0.148	0.900	---	---	---	---	---	---	1.049
12.45	6.382	8.706	0.155	0.150	0.924	---	---	---	---	---	---	1.074
12.50	5.242	8.744	0.155	0.151	0.942	---	---	---	---	---	---	1.094
12.55	4.198	8.774	0.155	0.153	0.956	---	---	---	---	---	---	1.109
12.60	3.460	8.796	0.155	0.153	0.967	---	---	---	---	---	---	1.120
12.65	3.066	8.813	0.156	0.154	0.975	---	---	---	---	---	---	1.129
12.70	2.879	8.828	0.156	0.154	0.981	---	---	---	---	---	---	1.136
12.75	2.760	8.842	0.156	0.155	0.988	---	---	---	---	---	---	1.142
12.80	2.641	8.855	0.156	0.155	0.993	---	---	---	---	---	---	1.149
12.85	2.521	8.866	0.156	0.156	0.998	---	---	---	---	---	---	1.154
12.90	2.402	8.877	0.157	0.156	1.003	---	---	---	---	---	---	1.159
12.95	2.281	8.886	0.157	0.156	1.008	---	---	---	---	---	---	1.164
13.00	2.161	8.895	0.157	0.157	1.011	---	---	---	---	---	---	1.168
13.05	2.049	8.903	0.157	0.157	1.015	---	---	---	---	---	---	1.172

Continues on next page...

Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
13.10	1.964	8.909	0.158	0.157	1.018	---	---	---	---	---	---	1.175
13.15	1.909	8.916	0.159	0.157	1.020	---	---	---	---	---	---	1.178
13.20	1.873	8.921	0.160	0.158	1.023	---	---	---	---	---	---	1.181
13.25	1.842	8.927	0.160	0.158	1.025	---	---	---	---	---	---	1.183
13.30	1.811	8.932	0.161	0.158	1.028	---	---	---	---	---	---	1.186
13.35	1.780	8.937	0.162	0.158	1.030	---	---	---	---	---	---	1.188
13.40	1.749	8.942	0.162	0.158	1.032	---	---	---	---	---	---	1.190
13.45	1.718	8.946	0.163	0.158	1.034	---	---	---	---	---	---	1.192
13.50	1.686	8.950	0.163	0.159	1.035	---	---	---	---	---	---	1.194
13.55	1.655	8.954	0.164	0.159	1.037	---	---	---	---	---	---	1.196
13.60	1.624	8.958	0.164	0.159	1.039	---	---	---	---	---	---	1.197
13.65	1.592	8.961	0.164	0.159	1.040	---	---	---	---	---	---	1.199
13.70	1.561	8.964	0.165	0.159	1.041	---	---	---	---	---	---	1.200
13.75	1.530	8.967	0.165	0.159	1.043	---	---	---	---	---	---	1.202
13.80	1.498	8.969	0.166	0.159	1.044	---	---	---	---	---	---	1.203
13.85	1.467	8.972	0.166	0.159	1.045	---	---	---	---	---	---	1.204
13.90	1.435	8.974	0.166	0.159	1.046	---	---	---	---	---	---	1.205
13.95	1.403	8.975	0.166	0.159	1.046	---	---	---	---	---	---	1.206
14.00	1.372	8.977	0.166	0.159	1.047	---	---	---	---	---	---	1.206
14.05	1.342	8.978	0.167	0.160	1.047	---	---	---	---	---	---	1.207
14.10	1.317	8.979	0.167	0.160	1.048	---	---	---	---	---	---	1.207
14.15	1.297	8.980	0.167	0.160	1.048	---	---	---	---	---	---	1.208
14.20	1.281	8.981	0.167	0.160	1.048	---	---	---	---	---	---	1.208
14.25	1.266	8.981	0.167	0.160	1.049	---	---	---	---	---	---	1.208
14.30	1.251	8.981	0.167	0.160	1.049	---	---	---	---	---	---	1.209
14.35	1.236	8.982	0.167	0.160	1.049	---	---	---	---	---	---	1.209
14.40	1.221	8.982	0.167	0.160	1.049	---	---	---	---	---	---	1.209
14.45	1.206	8.982 <<	0.167	0.160	1.049	---	---	---	---	---	---	1.209

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Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
14.50	1.191	8.982	0.167	0.160	1.049	—	—	—	—	—	—	1.209
14.55	1.176	8.982	0.167	0.160	1.049	—	—	—	—	—	—	1.209
14.60	1.160	8.981	0.167	0.160	1.049	—	—	—	—	—	—	1.208
14.65	1.145	8.981	0.167	0.160	1.049	—	—	—	—	—	—	1.208
14.70	1.130	8.980	0.167	0.160	1.048	—	—	—	—	—	—	1.208
14.75	1.115	8.980	0.167	0.160	1.048	—	—	—	—	—	—	1.208
14.80	1.100	8.979	0.167	0.160	1.048	—	—	—	—	—	—	1.207
14.85	1.084	8.978	0.167	0.160	1.047	—	—	—	—	—	—	1.207
14.90	1.069	8.977	0.166	0.159	1.047	—	—	—	—	—	—	1.206
14.95	1.054	8.976	0.166	0.159	1.046	—	—	—	—	—	—	1.206
15.00	1.039	8.974	0.166	0.159	1.046	—	—	—	—	—	—	1.205
15.05	1.023	8.973	0.166	0.159	1.045	—	—	—	—	—	—	1.205
15.10	1.008	8.971	0.166	0.159	1.045	—	—	—	—	—	—	1.204
15.15	0.993	8.970	0.166	0.159	1.044	—	—	—	—	—	—	1.203
15.20	0.978	8.968	0.165	0.159	1.043	—	—	—	—	—	—	1.202
15.25	0.962	8.966	0.165	0.159	1.042	—	—	—	—	—	—	1.201
15.30	0.947	8.964	0.165	0.159	1.041	—	—	—	—	—	—	1.200
15.35	0.932	8.962	0.165	0.159	1.040	—	—	—	—	—	—	1.199
15.40	0.916	8.960	0.164	0.159	1.040	—	—	—	—	—	—	1.198
15.45	0.901	8.957	0.164	0.159	1.038	—	—	—	—	—	—	1.197
15.50	0.886	8.955	0.164	0.159	1.037	—	—	—	—	—	—	1.196
15.55	0.870	8.952	0.163	0.159	1.036	—	—	—	—	—	—	1.195
15.60	0.855	8.950	0.163	0.159	1.035	—	—	—	—	—	—	1.194
15.65	0.840	8.947	0.163	0.158	1.034	—	—	—	—	—	—	1.192
15.70	0.824	8.944	0.162	0.158	1.033	—	—	—	—	—	—	1.191
15.75	0.809	8.941	0.162	0.158	1.031	—	—	—	—	—	—	1.190
15.80	0.793	8.938	0.162	0.158	1.030	—	—	—	—	—	—	1.188
15.85	0.778	8.934	0.161	0.158	1.029	—	—	—	—	—	—	1.187

Continues on next page...

Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
15.90	0.762	8.931	0.161	0.158	1.027	---	---	---	---	---	---	1.185
15.95	0.747	8.928	0.160	0.158	1.026	---	---	---	---	---	---	1.183
16.00	0.732	8.924	0.160	0.158	1.024	---	---	---	---	---	---	1.182
16.05	0.717	8.920	0.159	0.158	1.022	---	---	---	---	---	---	1.180
16.10	0.705	8.916	0.159	0.157	1.021	---	---	---	---	---	---	1.178
16.15	0.696	8.913	0.159	0.157	1.019	---	---	---	---	---	---	1.176
16.20	0.689	8.909	0.158	0.157	1.017	---	---	---	---	---	---	1.175
16.25	0.682	8.905	0.158	0.157	1.016	---	---	---	---	---	---	1.173
16.30	0.675	8.901	0.157	0.157	1.014	---	---	---	---	---	---	1.171
16.35	0.669	8.897	0.157	0.157	1.012	---	---	---	---	---	---	1.169
16.40	0.662	8.893	0.157	0.157	1.010	---	---	---	---	---	---	1.167
16.45	0.655	8.888	0.157	0.157	1.008	---	---	---	---	---	---	1.165
16.50	0.649	8.884	0.157	0.156	1.007	---	---	---	---	---	---	1.163
16.55	0.642	8.880	0.157	0.156	1.005	---	---	---	---	---	---	1.161
16.60	0.635	8.876	0.157	0.156	1.003	---	---	---	---	---	---	1.159
16.65	0.629	8.872	0.157	0.156	1.001	---	---	---	---	---	---	1.157
16.70	0.622	8.867	0.156	0.156	0.999	---	---	---	---	---	---	1.155
16.75	0.615	8.863	0.156	0.156	0.997	---	---	---	---	---	---	1.153
16.80	0.609	8.858	0.156	0.155	0.995	---	---	---	---	---	---	1.150
16.85	0.602	8.854	0.156	0.155	0.993	---	---	---	---	---	---	1.148
16.90	0.595	8.850	0.156	0.155	0.991	---	---	---	---	---	---	1.146
16.95	0.588	8.845	0.156	0.155	0.989	---	---	---	---	---	---	1.144
17.00	0.582	8.841	0.156	0.155	0.987	---	---	---	---	---	---	1.142
17.05	0.575	8.836	0.156	0.155	0.985	---	---	---	---	---	---	1.140
17.10	0.568	8.831	0.156	0.155	0.983	---	---	---	---	---	---	1.137
17.15	0.562	8.827	0.156	0.154	0.981	---	---	---	---	---	---	1.135
17.20	0.555	8.822	0.156	0.154	0.979	---	---	---	---	---	---	1.133
17.25	0.548	8.817	0.156	0.154	0.976	---	---	---	---	---	---	1.131

Continues on next page...

Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
17.30	0.541	8.813	0.156	0.154	0.974	---	---	---	---	---	---	1.128
17.35	0.535	8.808	0.156	0.154	0.972	---	---	---	---	---	---	1.126
17.40	0.528	8.803	0.155	0.154	0.970	---	---	---	---	---	---	1.124
17.45	0.521	8.798	0.155	0.153	0.968	---	---	---	---	---	---	1.121
17.50	0.514	8.793	0.155	0.153	0.965	---	---	---	---	---	---	1.119
17.55	0.508	8.788	0.155	0.153	0.963	---	---	---	---	---	---	1.116
17.60	0.501	8.783	0.155	0.153	0.961	---	---	---	---	---	---	1.114
17.65	0.494	8.778	0.155	0.153	0.958	---	---	---	---	---	---	1.111
17.70	0.487	8.773	0.155	0.153	0.956	---	---	---	---	---	---	1.109
17.75	0.481	8.768	0.155	0.152	0.954	---	---	---	---	---	---	1.106
17.80	0.474	8.763	0.155	0.152	0.951	---	---	---	---	---	---	1.103
17.85	0.467	8.758	0.155	0.152	0.949	---	---	---	---	---	---	1.101
17.90	0.460	8.753	0.155	0.152	0.946	---	---	---	---	---	---	1.098
17.95	0.454	8.748	0.155	0.152	0.944	---	---	---	---	---	---	1.095
18.00	0.447	8.742	0.155	0.151	0.941	---	---	---	---	---	---	1.093
18.05	0.441	8.737	0.155	0.151	0.939	---	---	---	---	---	---	1.090
18.10	0.436	8.732	0.155	0.151	0.936	---	---	---	---	---	---	1.087
18.15	0.433	8.727	0.155	0.151	0.934	---	---	---	---	---	---	1.085
18.20	0.430	8.721	0.155	0.151	0.931	---	---	---	---	---	---	1.082
18.25	0.428	8.716	0.155	0.150	0.929	---	---	---	---	---	---	1.079
18.30	0.426	8.711	0.155	0.150	0.926	---	---	---	---	---	---	1.077
18.35	0.424	8.705	0.155	0.150	0.924	---	---	---	---	---	---	1.074
18.40	0.422	8.700	0.155	0.150	0.921	---	---	---	---	---	---	1.071
18.45	0.420	8.695	0.155	0.150	0.919	---	---	---	---	---	---	1.068
18.50	0.418	8.690	0.155	0.149	0.916	---	---	---	---	---	---	1.066
18.55	0.416	8.684	0.155	0.149	0.914	---	---	---	---	---	---	1.063
18.60	0.414	8.679	0.155	0.149	0.911	---	---	---	---	---	---	1.060
18.65	0.412	8.674	0.155	0.149	0.908	---	---	---	---	---	---	1.057

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Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
18.70	0.410	8.669	0.155	0.149	0.906	----	----	----	----	----	----	1.054
18.75	0.408	8.663	0.155	0.148	0.903	----	----	----	----	----	----	1.052
18.80	0.406	8.658	0.155	0.148	0.900	----	----	----	----	----	----	1.049
18.85	0.404	8.653	0.155	0.148	0.898	----	----	----	----	----	----	1.046
18.90	0.402	8.648	0.155	0.148	0.895	----	----	----	----	----	----	1.043
18.95	0.400	8.642	0.155	0.148	0.893	----	----	----	----	----	----	1.040
19.00	0.398	8.637	0.155	0.148	0.890	----	----	----	----	----	----	1.038
19.05	0.396	8.632	0.155	0.147	0.887	----	----	----	----	----	----	1.035
19.10	0.394	8.627	0.155	0.147	0.885	----	----	----	----	----	----	1.032
19.15	0.392	8.622	0.155	0.147	0.882	----	----	----	----	----	----	1.029
19.20	0.390	8.616	0.155	0.147	0.880	----	----	----	----	----	----	1.026
19.25	0.388	8.611	0.155	0.147	0.877	----	----	----	----	----	----	1.024
19.30	0.386	8.606	0.155	0.146	0.875	----	----	----	----	----	----	1.021
19.35	0.384	8.601	0.155	0.146	0.872	----	----	----	----	----	----	1.018
19.40	0.382	8.596	0.155	0.146	0.869	----	----	----	----	----	----	1.015
19.45	0.380	8.591	0.154	0.146	0.867	----	----	----	----	----	----	1.012
19.50	0.378	8.586	0.154	0.146	0.864	----	----	----	----	----	----	1.009
19.55	0.376	8.580	0.153	0.145	0.861	----	----	----	----	----	----	1.007
19.60	0.374	8.575	0.152	0.145	0.858	----	----	----	----	----	----	1.004
19.65	0.372	8.570	0.152	0.145	0.856	----	----	----	----	----	----	1.001
19.70	0.370	8.565	0.151	0.145	0.853	----	----	----	----	----	----	0.998
19.75	0.368	8.560	0.150	0.145	0.850	----	----	----	----	----	----	0.995
19.80	0.366	8.555	0.150	0.145	0.848	----	----	----	----	----	----	0.992
19.85	0.364	8.550	0.149	0.144	0.845	----	----	----	----	----	----	0.989
19.90	0.362	8.545	0.148	0.144	0.842	----	----	----	----	----	----	0.986
19.95	0.360	8.540	0.148	0.144	0.840	----	----	----	----	----	----	0.984
20.00	0.358	8.535	0.147	0.144	0.837	----	----	----	----	----	----	0.981
20.05	0.356	8.529	0.146	0.144	0.834	----	----	----	----	----	----	0.978

Continues on next page...

Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
20.10	0.354	8.524	0.146	0.143	0.832	----	----	----	----	----	----	0.975
20.15	0.352	8.519	0.145	0.143	0.829	----	----	----	----	----	----	0.972
20.20	0.350	8.514	0.144	0.143	0.826	----	----	----	----	----	----	0.969
20.25	0.348	8.509	0.144	0.143	0.824	----	----	----	----	----	----	0.966
20.30	0.346	8.504	0.143	0.143	0.821	----	----	----	----	----	----	0.964
20.35	0.344	8.499	0.143	0.143	0.818	----	----	----	----	----	----	0.961
20.40	0.342	8.494	0.143	0.142	0.815	----	----	----	----	----	----	0.958
20.45	0.340	8.489	0.143	0.142	0.813	----	----	----	----	----	----	0.955
20.50	0.338	8.484	0.143	0.142	0.810	----	----	----	----	----	----	0.952
20.55	0.336	8.479	0.143	0.142	0.807	----	----	----	----	----	----	0.949
20.60	0.333	8.474	0.143	0.142	0.804	----	----	----	----	----	----	0.946
20.65	0.331	8.469	0.143	0.141	0.801	----	----	----	----	----	----	0.943
20.70	0.329	8.464	0.143	0.141	0.798	----	----	----	----	----	----	0.940
20.75	0.327	8.459	0.143	0.141	0.796	----	----	----	----	----	----	0.937
20.80	0.325	8.454	0.143	0.141	0.793	----	----	----	----	----	----	0.934
20.85	0.323	8.449	0.143	0.141	0.790	----	----	----	----	----	----	0.931
20.90	0.321	8.445	0.143	0.140	0.787	----	----	----	----	----	----	0.928
20.95	0.319	8.440	0.143	0.140	0.785	----	----	----	----	----	----	0.925
21.00	0.317	8.435	0.142	0.140	0.782	----	----	----	----	----	----	0.922
21.05	0.315	8.430	0.142	0.140	0.779	----	----	----	----	----	----	0.919
21.10	0.313	8.425	0.142	0.140	0.776	----	----	----	----	----	----	0.916
21.15	0.311	8.420	0.142	0.139	0.773	----	----	----	----	----	----	0.913
21.20	0.309	8.415	0.142	0.139	0.771	----	----	----	----	----	----	0.910
21.25	0.307	8.410	0.142	0.139	0.768	----	----	----	----	----	----	0.907
21.30	0.305	8.405	0.142	0.139	0.765	----	----	----	----	----	----	0.904
21.35	0.303	8.400	0.142	0.139	0.762	----	----	----	----	----	----	0.901
21.40	0.301	8.396	0.142	0.138	0.759	----	----	----	----	----	----	0.898
21.45	0.299	8.391	0.142	0.138	0.756	----	----	----	----	----	----	0.895

Continues on next page...

Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
21.50	0.297	8.386	0.142	0.138	0.754	—	—	—	—	—	—	0.892
21.55	0.295	8.381	0.142	0.138	0.751	—	—	—	—	—	—	0.888
21.60	0.293	8.376	0.142	0.138	0.748	—	—	—	—	—	—	0.885
21.65	0.291	8.371	0.142	0.137	0.745	—	—	—	—	—	—	0.882
21.70	0.289	8.367	0.142	0.137	0.742	—	—	—	—	—	—	0.879
21.75	0.287	8.362	0.142	0.137	0.739	—	—	—	—	—	—	0.876
21.80	0.285	8.357	0.142	0.137	0.736	—	—	—	—	—	—	0.873
21.85	0.283	8.352	0.142	0.137	0.733	—	—	—	—	—	—	0.870
21.90	0.281	8.347	0.142	0.137	0.730	—	—	—	—	—	—	0.867
21.95	0.279	8.343	0.142	0.136	0.727	—	—	—	—	—	—	0.863
22.00	0.277	8.338	0.142	0.136	0.724	—	—	—	—	—	—	0.860
22.05	0.361	8.334	0.142	0.136	0.722	—	—	—	—	—	—	0.858
22.10	0.449	8.330	0.142	0.136	0.719	—	—	—	—	—	—	0.855
22.15	0.398	8.326	0.142	0.136	0.717	—	—	—	—	—	—	0.853
22.20	0.345	8.323	0.142	0.136	0.715	—	—	—	—	—	—	0.850
22.25	0.289	8.318	0.142	0.135	0.712	—	—	—	—	—	—	0.848
22.30	0.287	8.314	0.142	0.135	0.709	—	—	—	—	—	—	0.845
22.35	0.285	8.309	0.142	0.135	0.707	—	—	—	—	—	—	0.842
22.40	0.284	8.305	0.142	0.135	0.704	—	—	—	—	—	—	0.839
22.45	0.282	8.300	0.142	0.135	0.701	—	—	—	—	—	—	0.836
22.50	0.281	8.296	0.142	0.134	0.698	—	—	—	—	—	—	0.833
22.55	0.279	8.291	0.141	0.134	0.695	—	—	—	—	—	—	0.829
22.60	0.278	8.287	0.141	0.134	0.692	—	—	—	—	—	—	0.826
22.65	0.276	8.282	0.140	0.134	0.689	—	—	—	—	—	—	0.823
22.70	0.275	8.278	0.140	0.134	0.686	—	—	—	—	—	—	0.820
22.75	0.273	8.273	0.139	0.134	0.683	—	—	—	—	—	—	0.817
22.80	0.272	8.269	0.139	0.133	0.680	—	—	—	—	—	—	0.814
22.85	0.270	8.265	0.138	0.133	0.677	—	—	—	—	—	—	0.811

Continues on next page...

Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
22.90	0.269	8.260	0.138	0.133	0.674	---	---	---	---	---	---	0.807
22.95	0.267	8.256	0.137	0.133	0.671	---	---	---	---	---	---	0.804
23.00	0.266	8.251	0.137	0.133	0.669	---	---	---	---	---	---	0.801
23.05	0.264	8.247	0.136	0.133	0.666	---	---	---	---	---	---	0.798
23.10	0.263	8.243	0.136	0.132	0.663	---	---	---	---	---	---	0.795
23.15	0.261	8.238	0.135	0.132	0.660	---	---	---	---	---	---	0.792
23.20	0.260	8.234	0.135	0.132	0.657	---	---	---	---	---	---	0.789
23.25	0.258	8.230	0.134	0.132	0.654	---	---	---	---	---	---	0.786
23.30	0.257	8.226	0.134	0.132	0.651	---	---	---	---	---	---	0.783
23.35	0.255	8.221	0.133	0.132	0.648	---	---	---	---	---	---	0.780
23.40	0.253	8.217	0.133	0.131	0.645	---	---	---	---	---	---	0.777
23.45	0.252	8.213	0.132	0.131	0.643	---	---	---	---	---	---	0.774
23.50	0.250	8.208	0.132	0.131	0.640	---	---	---	---	---	---	0.771
23.55	0.249	8.204	0.131	0.131	0.637	---	---	---	---	---	---	0.768
23.60	0.247	8.200	0.131	0.131	0.634	---	---	---	---	---	---	0.765
23.65	0.246	8.196	0.131	0.131	0.631	---	---	---	---	---	---	0.762
23.70	0.244	8.192	0.131	0.130	0.628	---	---	---	---	---	---	0.758
23.75	0.243	8.187	0.131	0.130	0.625	---	---	---	---	---	---	0.755
23.80	0.241	8.183	0.131	0.130	0.622	---	---	---	---	---	---	0.752
23.85	0.240	8.179	0.131	0.130	0.619	---	---	---	---	---	---	0.748
23.90	0.238	8.175	0.131	0.130	0.615	---	---	---	---	---	---	0.745
23.95	0.237	8.171	0.131	0.129	0.612	---	---	---	---	---	---	0.742
24.00	0.235	8.167	0.131	0.129	0.609	---	---	---	---	---	---	0.739
24.05	0.187	8.163	0.131	0.129	0.606	---	---	---	---	---	---	0.735
24.10	0.093	8.158	0.131	0.129	0.602	---	---	---	---	---	---	0.731
24.15	0.031	8.152	0.131	0.129	0.598	---	---	---	---	---	---	0.727
24.20	0.000	8.147	0.130	0.128	0.594	---	---	---	---	---	---	0.723
24.25	0.000	8.141	0.130	0.128	0.590	---	---	---	---	---	---	0.718

Continues on next page...

Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
24.30	0.000	8.135	0.130	0.128	0.585	---	---	---	---	---	---	0.713
24.35	0.000	8.129	0.130	0.128	0.581	---	---	---	---	---	---	0.709
24.40	0.000	8.123	0.130	0.127	0.577	---	---	---	---	---	---	0.704
24.45	0.000	8.118	0.130	0.127	0.572	---	---	---	---	---	---	0.700
24.50	0.000	8.112	0.130	0.127	0.568	---	---	---	---	---	---	0.695
24.55	0.000	8.106	0.130	0.127	0.564	---	---	---	---	---	---	0.691
24.60	0.000	8.101	0.130	0.126	0.560	---	---	---	---	---	---	0.686
24.65	0.000	8.095	0.130	0.126	0.555	---	---	---	---	---	---	0.681
24.70	0.000	8.090	0.130	0.126	0.550	---	---	---	---	---	---	0.676
24.75	0.000	8.084	0.130	0.126	0.546	---	---	---	---	---	---	0.671
24.80	0.000	8.079	0.130	0.126	0.541	---	---	---	---	---	---	0.666
24.85	0.000	8.073	0.130	0.125	0.536	---	---	---	---	---	---	0.661
24.90	0.000	8.068	0.130	0.125	0.532	---	---	---	---	---	---	0.657
24.95	0.000	8.063	0.130	0.125	0.527	---	---	---	---	---	---	0.652
25.00	0.000	8.057	0.130	0.125	0.522	---	---	---	---	---	---	0.647
25.05	0.000	8.052	0.130	0.124	0.518	---	---	---	---	---	---	0.642
25.10	0.000	8.047	0.130	0.124	0.513	---	---	---	---	---	---	0.637
25.15	0.000	8.042	0.130	0.124	0.509	---	---	---	---	---	---	0.633
25.20	0.000	8.037	0.130	0.124	0.504	---	---	---	---	---	---	0.628
25.25	0.000	8.032	0.130	0.123	0.500	---	---	---	---	---	---	0.623
25.30	0.000	8.027	0.130	0.123	0.496	---	---	---	---	---	---	0.619
25.35	0.000	8.021	0.130	0.123	0.491	---	---	---	---	---	---	0.614
25.40	0.000	8.017	0.130	0.123	0.487	---	---	---	---	---	---	0.610
25.45	0.000	8.012	0.130	0.123	0.483	---	---	---	---	---	---	0.605

...End

Hydrograph Report

Hyd. No. 3

Predevelopment Flow

Hydrograph type	= SCS Runoff	Peak discharge	= 7.314 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 25,013 cuft
Drainage area	= 3.780 ac	Curve number	= 47.000*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.0 min
Total precip.	= 8.01 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.890 x 35) + (1.890 x 56)] / 3.780

Hydrograph Discharge Table

(Printed values >= 50.00% of Qp.)

Time -- (hrs	Outflow cfs)	
12.00	4.476	
12.03	6.264	
12.07	7.314	<<
12.10	7.081	
12.13	5.994	
12.17	4.918	
12.20	4.316	
12.23	4.031	
12.27	3.846	

...End

4 SEASONS SITE & DEMO

50 YR STORM WATER ROUTING CALCULATIONS

WITH OUTLET FUNCTIONING

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 — Tuesday, 12 / 6 / 2016

Hyd. No. 1

Post Flow

Hydrograph type	= SCS Runoff	Peak discharge	= 25.82 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 89,354 cuft
Drainage area	= 3.780 ac	Curve number	= 83.000*
Basin Slope	= 0.5 %	Hydraulic length	= 774 ft
Tc method	= User	Time of conc. (Tc)	= 5.0 min
Total precip.	= 9.01 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.960 x 39) + (2.820 x 98)] / 3.780

Hydrograph Discharge Table

(Printed values >= 40.00% of Qp.)

Time -- (hrs)	Outflow cfs)	
11.90	10.50	
11.95	12.76	
12.00	17.84	
12.05	24.02	
12.10	25.82	<<
12.15	22.06	
12.20	16.73	
12.25	13.02	
12.30	11.13	

...End

Hydrograph Report

Hyd. No. 2

Pond Routing

Hydrograph type	= Reservoir	Peak discharge	= 3.183 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.75 hrs
Time interval	= 3 min	Hyd. volume	= 88,499 cuft
Inflow hyd. No.	= 1 - Post Flow	Reservoir name	= Pond
Max. Elevation	= 9.11 ft	Max. Storage	= 52,740 cuft

Storage Indication method used.

Hydrograph Discharge Table

(Printed values >= 40.00% of Qp.)

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
12.45	7.290	9.037	0.784	0.156	1.072	----	0.621	----	----	----	----	1.849
12.50	5.986	9.070	1.332	0.152	1.086	----	1.175	----	----	----	----	2.412
12.55	4.792	9.090	1.672	0.149	1.094	----	1.519	----	----	----	----	2.762
12.60	3.949	9.101	1.871	0.148	1.099	----	1.719	----	----	----	----	2.966
12.65	3.499	9.106	2.023	0.147	1.101	----	1.872	----	----	----	----	3.120
12.70	3.284	9.108	2.077	0.147	1.101	----	1.927	----	----	----	----	3.175
12.75	3.148	9.108 <<	2.086	0.147	1.102	----	1.935	----	----	----	----	3.183
<<												
12.80	3.012	9.107	2.065	0.147	1.101	----	1.914	----	----	----	----	3.162
12.85	2.875	9.106	2.021	0.147	1.101	----	1.870	----	----	----	----	3.118
12.90	2.738	9.104	1.959	0.147	1.100	----	1.807	----	----	----	----	3.055
12.95	2.601	9.101	1.881	0.148	1.099	----	1.730	----	----	----	----	2.976
13.00	2.463	9.098	1.812	0.148	1.098	----	1.659	----	----	----	----	2.905
13.05	2.336	9.095	1.754	0.149	1.096	----	1.601	----	----	----	----	2.846
13.10	2.238	9.091	1.690	0.149	1.095	----	1.536	----	----	----	----	2.780
13.15	2.176	9.087	1.624	0.150	1.093	----	1.470	----	----	----	----	2.713
13.20	2.134	9.083	1.560	0.150	1.091	----	1.405	----	----	----	----	2.647
13.25	2.098	9.080	1.500	0.151	1.090	----	1.344	----	----	----	----	2.585
13.30	2.063	9.076	1.442	0.151	1.089	----	1.286	----	----	----	----	2.525
13.35	2.027	9.073	1.387	0.151	1.087	----	1.230	----	----	----	----	2.469
13.40	1.992	9.070	1.335	0.152	1.086	----	1.177	----	----	----	----	2.415

Continues on next page...

Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
13.45	1.956	9.067	1.284	0.152	1.085	—	1.126	—	—	—	—	2.363
13.50	1.921	9.064	1.236	0.153	1.083	—	1.077	—	—	—	—	2.313
13.55	1.885	9.061	1.189	0.153	1.082	—	1.030	—	—	—	—	2.265
13.60	1.849	9.058	1.143	0.153	1.081	—	0.984	—	—	—	—	2.218
13.65	1.813	9.056	1.099	0.154	1.080	—	0.939	—	—	—	—	2.173
13.70	1.777	9.053	1.056	0.154	1.079	—	0.895	—	—	—	—	2.128
13.75	1.741	9.051	1.013	0.154	1.078	—	0.853	—	—	—	—	2.085
13.80	1.705	9.048	0.972	0.154	1.077	—	0.811	—	—	—	—	2.042
13.85	1.669	9.046	0.931	0.155	1.076	—	0.770	—	—	—	—	2.001
13.90	1.633	9.043	0.892	0.155	1.075	—	0.730	—	—	—	—	1.960
13.95	1.597	9.041	0.852	0.155	1.074	—	0.690	—	—	—	—	1.919
14.00	1.561	9.039	0.813	0.156	1.073	—	0.651	—	—	—	—	1.879
14.05	1.527	9.036	0.775	0.156	1.072	—	0.612	—	—	—	—	1.840
14.10	1.498	9.034	0.738	0.156	1.071	—	0.574	—	—	—	—	1.801
14.15	1.476	9.032	0.702	0.156	1.070	—	0.538	—	—	—	—	1.764
14.20	1.458	9.030	0.668	0.157	1.069	—	0.503	—	—	—	—	1.729
14.25	1.440	9.028	0.636	0.157	1.068	—	0.471	—	—	—	—	1.696
14.30	1.423	9.026	0.605	0.157	1.068	—	0.440	—	—	—	—	1.665
14.35	1.406	9.024	0.577	0.157	1.067	—	0.412	—	—	—	—	1.636
14.40	1.389	9.023	0.549	0.158	1.066	—	0.384	—	—	—	—	1.608
14.45	1.372	9.021	0.523	0.158	1.066	—	0.358	—	—	—	—	1.581
14.50	1.354	9.020	0.498	0.158	1.065	—	0.332	—	—	—	—	1.555
14.55	1.337	9.018	0.474	0.158	1.064	—	0.308	—	—	—	—	1.531
14.60	1.320	9.017	0.451	0.158	1.064	—	0.285	—	—	—	—	1.507
14.65	1.303	9.016	0.429	0.158	1.063	—	0.262	—	—	—	—	1.484
14.70	1.285	9.014	0.407	0.159	1.063	—	0.240	—	—	—	—	1.462
14.75	1.268	9.013	0.386	0.159	1.062	—	0.219	—	—	—	—	1.440
14.80	1.251	9.012	0.365	0.159	1.062	—	0.198	—	—	—	—	1.419

Continues on next page...

Pond Routing

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
14.85	1.233	9.011	0.345	0.159	1.061	----	0.178	----	----	----	----	1.398
14.90	1.216	9.009	0.325	0.159	1.061	----	0.158	----	----	----	----	1.377
14.95	1.198	9.008	0.306	0.159	1.060	----	0.138	----	----	----	----	1.357
15.00	1.181	9.007	0.287	0.159	1.060	----	0.119	----	----	----	----	1.338
15.05	1.164	9.006	0.268	0.160	1.059	----	0.099	----	----	----	----	1.318
15.10	1.146	9.005	0.249	0.160	1.059	----	0.081	----	----	----	----	1.299
15.15	1.129	9.004	0.231	0.160	1.058	----	0.062	----	----	----	----	1.280

...End

Pond Report

Pond No. 1 - Pond

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 6.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	6.50	14,857	0	0
0.50	7.00	18,389	8,312	8,312
0.90	7.40	19,366	7,551	15,863
1.50	8.00	20,869	12,071	27,933
2.50	9.00	23,404	22,137	50,070
3.50	10.00	25,994	24,699	74,769

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	2.00	6.00	0.00
Span (in)	= 18.00	2.00	6.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 6.50	6.50	7.50	0.00
Length (ft)	= 202.00	0.00	0.00	0.00
Slope (%)	= 0.37	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

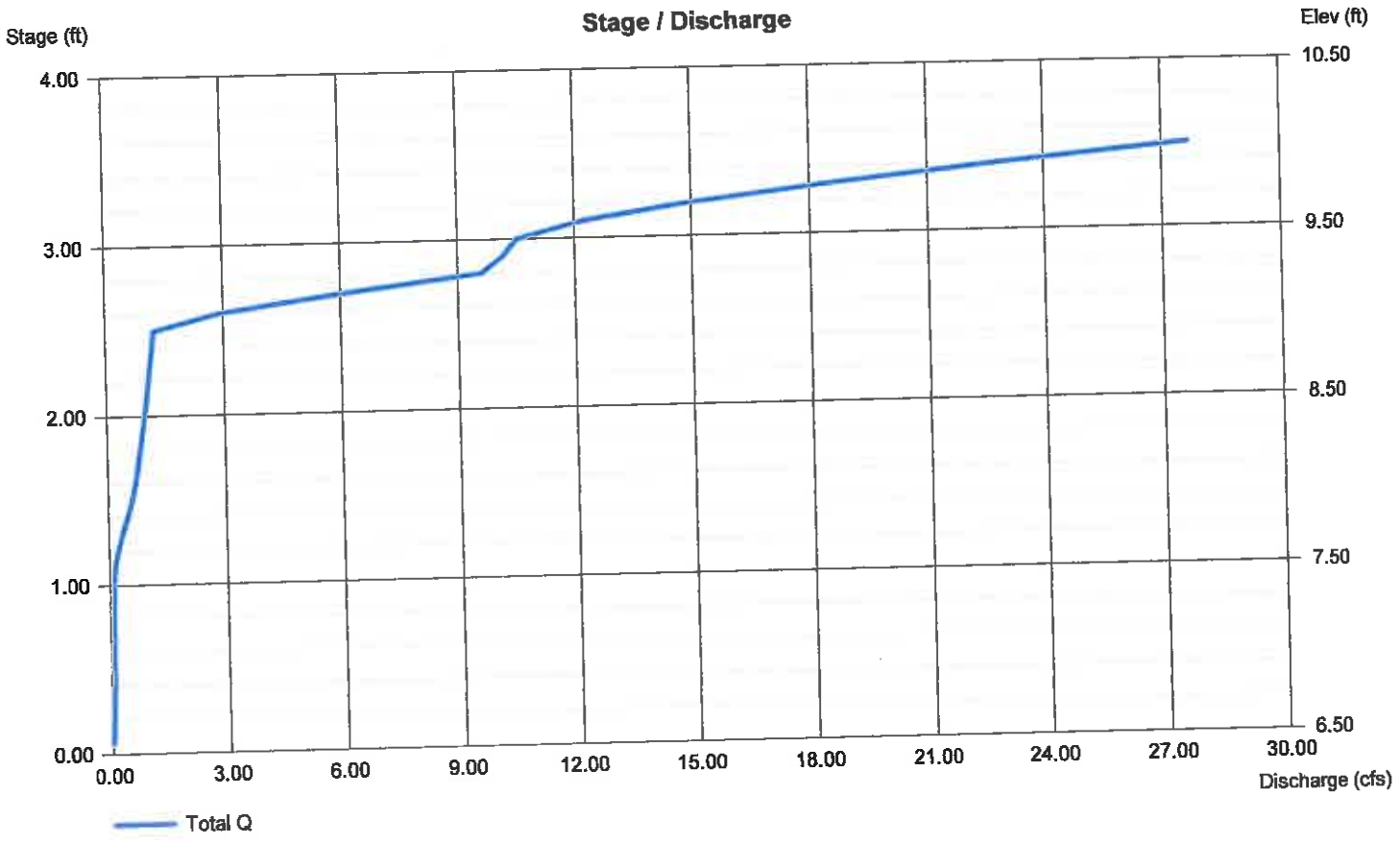
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	15.00	0.00	0.00
Crest El. (ft)	= 9.00	9.50	0.00	0.00
Weir Coeff.	= 3.33	3.00	3.33	3.33
Weir Type	= 1	Broad	—	—
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



4 SEASONS SITE & DEMO

50 YR STORM WATER ROUTING CALCULATIONS

WITH OUTLET NOT FUNCTIONING

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 — Tuesday, 12 / 6 / 2016

Hyd. No. 1

Post Flow

Hydrograph type	= SCS Runoff	Peak discharge	= 25.82 cfs
Storm frequency	= 50 yrs	Time to peak	= 726 min
Time interval	= 3 min	Hyd. volume	= 89,354 cuft
Drainage area	= 3.780 ac	Curve number	= 83.000*
Basin Slope	= 0.5 %	Hydraulic length	= 774 ft
Tc method	= User	Time of conc. (Tc)	= 5.0 min
Total precip.	= 9.01 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.960 x 39) + (2.820 x 98)] / 3.780

Hydrograph Discharge Table

(Printed values >= 40.00% of Qp.)

Time (min)	Outflow cfs)	
714	10.50	
717	12.76	
720	17.84	
723	24.02	
726	25.82	<<
729	22.06	
732	16.73	
735	13.02	
738	11.13	

...End

Hydrograph Report

Hyd. No. 2

Pond Routing

Hydrograph type	= Reservoir	Peak discharge	= 1.490 cfs
Storm frequency	= 50 yrs	Time to peak	= 846 min
Time interval	= 3 min	Hyd. volume	= 26,933 cuft
Inflow hyd. No.	= 1 - Post Flow	Reservoir name	= Pond
Max. Elevation	= 9.60 ft	Max. Storage	= 64,953 cuft

Storage Indication method used.

Hydrograph Discharge Table

(Printed values >= 40.00% of Qp.)

Time (min)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
801	2.027	9.544	---	---	---	---	---	0.621	---	---	---	0.621
804	1.992	9.553	---	---	---	---	---	0.758	---	---	---	0.758
807	1.956	9.562	---	---	---	---	---	0.878	---	---	---	0.878
810	1.921	9.569	---	---	---	---	---	0.982	---	---	---	0.982
813	1.885	9.575	---	---	---	---	---	1.073	---	---	---	1.073
816	1.849	9.581	---	---	---	---	---	1.151	---	---	---	1.151
819	1.813	9.586	---	---	---	---	---	1.218	---	---	---	1.218
822	1.777	9.590	---	---	---	---	---	1.275	---	---	---	1.275
825	1.741	9.593	---	---	---	---	---	1.323	---	---	---	1.323
828	1.705	9.596	---	---	---	---	---	1.363	---	---	---	1.363
831	1.669	9.598	---	---	---	---	---	1.395	---	---	---	1.395
834	1.633	9.600	---	---	---	---	---	1.420	---	---	---	1.420
837	1.597	9.601	---	---	---	---	---	1.451	---	---	---	1.451
840	1.561	9.602	---	---	---	---	---	1.473	---	---	---	1.473
843	1.527	9.602	---	---	---	---	---	1.486	---	---	---	1.486
846	1.498	9.603 <<	---	---	---	---	---	1.490	---	---	---	1.490
849	1.476	9.603	---	---	---	---	---	1.490	---	---	---	1.490
852	1.458	9.602	---	---	---	---	---	1.486	---	---	---	1.486
855	1.440	9.602	---	---	---	---	---	1.480	---	---	---	1.479
858	1.423	9.602	---	---	---	---	---	1.471	---	---	---	1.471

Continues on next page...

Pond Routing

Hydrograph Discharge Table

Time (min)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
861	1.406	9.601	---	---	---	---	---	1.461	---	---	---	1.461
864	1.389	9.601	---	---	---	---	---	1.450	---	---	---	1.450
867	1.372	9.601	---	---	---	---	---	1.438	---	---	---	1.438
870	1.354	9.600	---	---	---	---	---	1.425	---	---	---	1.425
873	1.337	9.600	---	---	---	---	---	1.416	---	---	---	1.416
876	1.320	9.599	---	---	---	---	---	1.408	---	---	---	1.408
879	1.303	9.598	---	---	---	---	---	1.398	---	---	---	1.398
882	1.285	9.598	---	---	---	---	---	1.388	---	---	---	1.388
885	1.268	9.597	---	---	---	---	---	1.377	---	---	---	1.377
888	1.251	9.596	---	---	---	---	---	1.365	---	---	---	1.365
891	1.233	9.595	---	---	---	---	---	1.353	---	---	---	1.353
894	1.216	9.594	---	---	---	---	---	1.341	---	---	---	1.341
897	1.198	9.593	---	---	---	---	---	1.327	---	---	---	1.327
900	1.181	9.592	---	---	---	---	---	1.314	---	---	---	1.314
903	1.164	9.591	---	---	---	---	---	1.300	---	---	---	1.300
906	1.146	9.590	---	---	---	---	---	1.286	---	---	---	1.286
909	1.129	9.589	---	---	---	---	---	1.271	---	---	---	1.271
912	1.111	9.588	---	---	---	---	---	1.256	---	---	---	1.256
915	1.094	9.587	---	---	---	---	---	1.241	---	---	---	1.241
918	1.077	9.586	---	---	---	---	---	1.226	---	---	---	1.226
921	1.059	9.585	---	---	---	---	---	1.210	---	---	---	1.210
924	1.042	9.584	---	---	---	---	---	1.194	---	---	---	1.194
927	1.024	9.583	---	---	---	---	---	1.178	---	---	---	1.178
930	1.007	9.582	---	---	---	---	---	1.162	---	---	---	1.162
933	0.989	9.581	---	---	---	---	---	1.146	---	---	---	1.146
936	0.972	9.579	---	---	---	---	---	1.130	---	---	---	1.130
939	0.954	9.578	---	---	---	---	---	1.113	---	---	---	1.113
942	0.937	9.577	---	---	---	---	---	1.097	---	---	---	1.097

Continues on next page...

Pond Routing

Hydrograph Discharge Table

Time (min)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
945	0.919	9.576	---	---	---	---	---	1.080	---	---	---	1.080
948	0.902	9.575	---	---	---	---	---	1.063	---	---	---	1.063
951	0.884	9.574	---	---	---	---	---	1.047	---	---	---	1.047
954	0.866	9.572	---	---	---	---	---	1.030	---	---	---	1.030
957	0.849	9.571	---	---	---	---	---	1.013	---	---	---	1.013
960	0.831	9.570	---	---	---	---	---	0.996	---	---	---	0.996
963	0.815	9.569	---	---	---	---	---	0.979	---	---	---	0.979
966	0.801	9.568	---	---	---	---	---	0.962	---	---	---	0.962
969	0.791	9.566	---	---	---	---	---	0.946	---	---	---	0.946
972	0.783	9.565	---	---	---	---	---	0.930	---	---	---	0.930
975	0.775	9.564	---	---	---	---	---	0.915	---	---	---	0.915
978	0.767	9.563	---	---	---	---	---	0.901	---	---	---	0.901
981	0.760	9.562	---	---	---	---	---	0.887	---	---	---	0.887
984	0.752	9.561	---	---	---	---	---	0.874	---	---	---	0.874
987	0.745	9.561	---	---	---	---	---	0.862	---	---	---	0.862
990	0.737	9.560	---	---	---	---	---	0.850	---	---	---	0.850
993	0.729	9.559	---	---	---	---	---	0.838	---	---	---	0.838
996	0.722	9.558	---	---	---	---	---	0.827	---	---	---	0.827
999	0.714	9.557	---	---	---	---	---	0.817	---	---	---	0.817
1002	0.707	9.557	---	---	---	---	---	0.806	---	---	---	0.806
1005	0.699	9.556	---	---	---	---	---	0.796	---	---	---	0.796
1008	0.691	9.555	---	---	---	---	---	0.786	---	---	---	0.786
1011	0.684	9.555	---	---	---	---	---	0.776	---	---	---	0.776
1014	0.676	9.554	---	---	---	---	---	0.767	---	---	---	0.767
1017	0.668	9.553	---	---	---	---	---	0.757	---	---	---	0.757
1020	0.661	9.553	---	---	---	---	---	0.748	---	---	---	0.748
1023	0.653	9.552	---	---	---	---	---	0.739	---	---	---	0.739
1026	0.645	9.551	---	---	---	---	---	0.730	---	---	---	0.730

Continues on next page...

Pond Routing

Hydrograph Discharge Table

Time (min)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
1029	0.638	9.551	---	---	---	---	---	0.722	---	---	---	0.722
1032	0.630	9.550	---	---	---	---	---	0.713	---	---	---	0.713
1035	0.623	9.550	---	---	---	---	---	0.704	---	---	---	0.704
1038	0.615	9.549	---	---	---	---	---	0.696	---	---	---	0.696
1041	0.607	9.548	---	---	---	---	---	0.688	---	---	---	0.688
1044	0.600	9.548	---	---	---	---	---	0.679	---	---	---	0.679
1047	0.592	9.547	---	---	---	---	---	0.671	---	---	---	0.671
1050	0.584	9.547	---	---	---	---	---	0.663	---	---	---	0.663
1053	0.577	9.546	---	---	---	---	---	0.655	---	---	---	0.655
1056	0.569	9.545	---	---	---	---	---	0.647	---	---	---	0.647
1059	0.561	9.545	---	---	---	---	---	0.639	---	---	---	0.639
1062	0.554	9.544	---	---	---	---	---	0.631	---	---	---	0.631
1065	0.546	9.544	---	---	---	---	---	0.623	---	---	---	0.623
1068	0.538	9.543	---	---	---	---	---	0.615	---	---	---	0.615
1071	0.531	9.543	---	---	---	---	---	0.607	---	---	---	0.607
1074	0.523	9.542	---	---	---	---	---	0.599	---	---	---	0.599

...End

Pond Report

Pond No. 1 - Pond

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 6.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	6.50	14,857	0	0
0.50	7.00	18,389	8,312	8,312
0.90	7.40	19,366	7,551	15,863
1.50	8.00	20,869	12,071	27,933
2.50	9.00	23,404	22,137	50,070
3.50	10.00	25,994	24,699	74,769

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

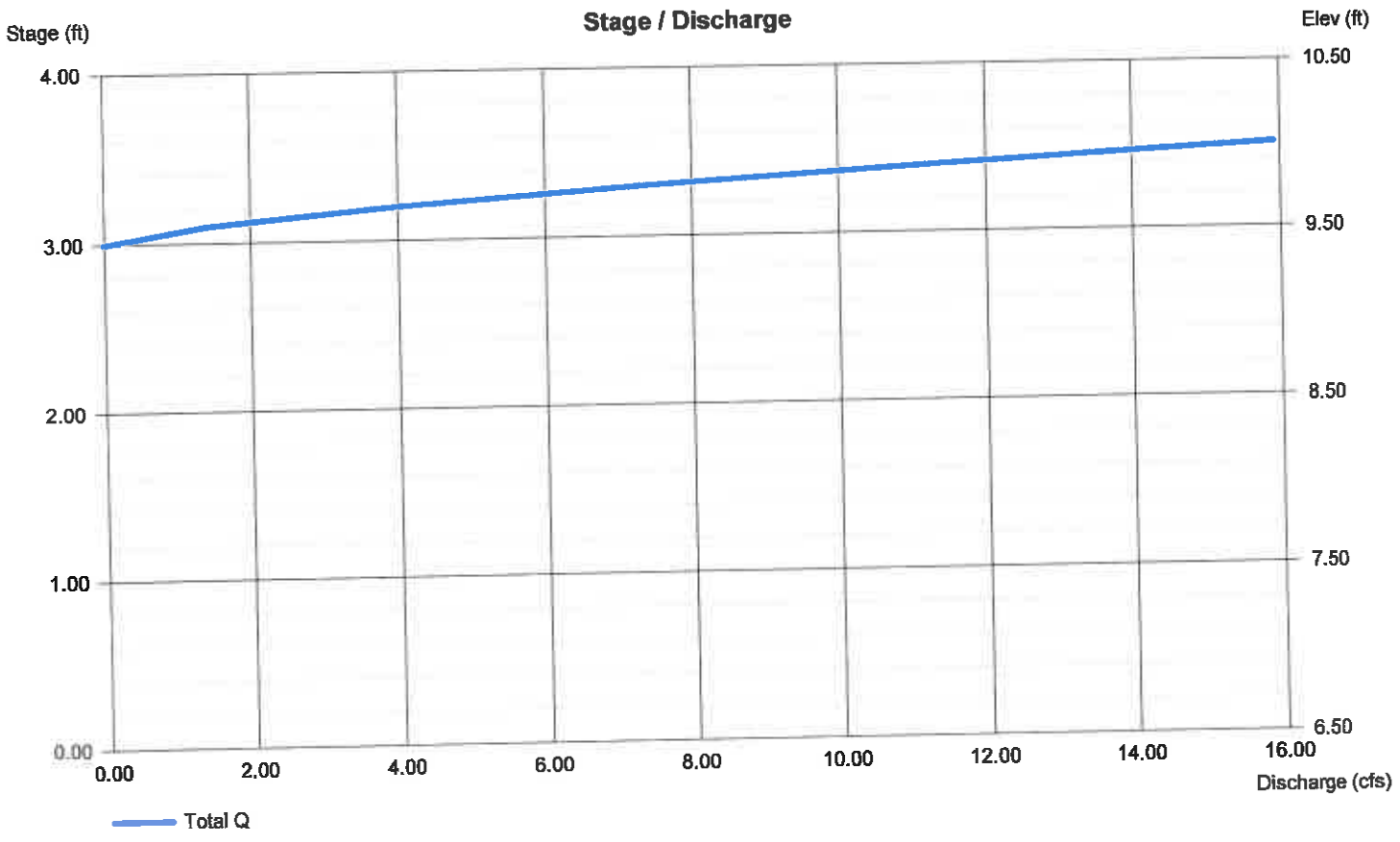
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	15.00	0.00	0.00
Crest El. (ft)	= 0.00	9.50	0.00	0.00
Weir Coeff.	= 3.33	3.00	3.33	3.33
Weir Type	= —	Broad	—	—
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



GRASSED SWALE CALCULATIONS

4 SEASONS SITE & DEMO

10 yr Storm Event

Swale #1
Calculations for flow to grassed swale:

Area = 66,002 sf ~ 1.52 acres
I = 7.2 – 10 yr storm
Impervious Area = 29,518 sf

Cc = (29,518)(0.95) + (36,484)(0.15) / 66,002 = 0.51

Cc = 0.51

Q = CIA = (0.51)(7.2)(1.52) = 5.58 cfs

Swale #2
Calculations for flow to grassed swale:

Area = 78,507 sf ~ 1.80 acres
I = 7.2 – 10 yr storm
Impervious Area = 29,518 sf

Cc = (29,518)(0.95) + (48,989)(0.15) / 78,507 = 0.45

Cc = 0.45

Q = CIA = (0.45)(7.2)(1.80) = 5.83 cfs + 0.97 cfs = 6.80 cfs
Q = 0.97 cfs from pond

Swale #3
Calculations for flow to grassed swale:

Area = 131,293 sf ~ 3.01 acres
I = 7.2 – 10 yr storm
Impervious Area = 43,167 sf

Cc = (59,617)(0.95) + (71,676)(0.15) / 131,293 = 0.51

Cc = 0.51

Q = CIA = (0.51)(7.2)(3.01) = 11.05 cfs

25 yr Storm Event

Swale #1
Calculations for flow to grassed swale:

Area =66,002 sf ~ 1.52 acres
I = 8.01 – 25 yr storm
Impervious Area = 29,518 sf

Cc = (29,518)(0.95) + (36,484)(0.15) / 66,002 = 0.51

Cc = 0.51

Q = CIA = (0.51)(8.01)(1.52) = 6.21 cfs

Swale #2
Calculations for flow to grassed swale:

Area = 78,507 sf ~ 1.80 acres
I = 8.01 – 25 yr storm
Impervious Area = 29,518 sf

Cc = (29,518)(0.95) + (48,989)(0.15) / 78,507 = 0.45

Cc = 0.45

Q = CIA = (0.45)(8.01)(1.80) = 6.49 cfs + 1.21 cfs = 7.70 cfs
Q = 1.21 cfs from pond

Swale #3
Calculations for flow to grassed swale:

Area = 131,293 sf ~ 3.01 acres
I = 8.01 – 25 yr storm
Impervious Area = 43,167 sf

Cc = (59,617)(0.95) + (71,676)(0.15) / 131,293 = 0.51

Cc = 0.51

Q = CIA = (0.51)(8.01)(3.01) = 12.30 cfs

50 yr Storm Event

Swale #1
Calculations for flow to grassed swale:

Area =66,002 sf ~ 1.52 acres
I = 9.01 – 50 yr storm
Impervious Area = 29,518 sf

Cc = (29,518)(0.95) + (36,484)(0.15) / 66,002 = 0.51

Cc = 0.51

Q = CIA = (0.51)(9.01)(1.52) = 6.98 cfs

Swale #2
Calculations for flow to grassed swale:

Area = 78,507 sf ~ 1.80 acres
I = 9.01 – 50 yr storm
Impervious Area = 29,518 sf

Cc = (29,518)(0.95) + (48,989)(0.15) / 78,507 = 0.45

Cc = 0.45

Q = CIA = (0.45)(9.01)(1.80) = 7.30 cfs + 3.18 cfs = 10.48 cfs
Q = 3.18 cfs from pond

Swale #3
Calculations for flow to grassed swale:

Area = 131,293 sf ~ 3.01 acres
I = 9.01 – 50 yr storm
Impervious Area = 43,167 sf

Cc = (59,617)(0.95) + (71,676)(0.15) / 131,293 = 0.51

Cc = 0.51

Q = CIA = (0.51)(9.01)(3.01) = 13.83 cfs

Hydraulic Analysis Report
Swale Calculations – 10 yr Storm

Project Data

Project Title: 4 Seasons Site & Demo

Channel Analysis: Swale 1

Notes:

Input Parameters

Channel Type: Triangular

Side Slope 1 (Z1): 3.0000 ft/ft

Side Slope 2 (Z2): 3.0000 ft/ft

Longitudinal Slope: 0.0169 ft/ft

Manning's n: 0.0300

Flow: 5.5600 cfs

Result Parameters

Depth: 0.7553 ft

Area of Flow: 1.7116 ft^2

Wetted Perimeter: 4.7772 ft

Hydraulic Radius: 0.3583 ft

Average Velocity: 3.2484 ft/s

Top Width: 4.5321 ft

Froude Number: 0.9315

Critical Depth: 0.7342 ft

Critical Velocity: 3.4381 ft/s

Critical Slope: 0.0197 ft/ft

Critical Top Width: 4.41 ft

Calculated Max Shear Stress: 0.7966 lb/ft^2

Calculated Avg Shear Stress: 0.3778 lb/ft^2

Channel Analysis: Swale 2

Notes:

Input Parameters

Channel Type: Triangular

Side Slope 1 (Z1): 3.0000 ft/ft

Side Slope 2 (Z2): 3.0000 ft/ft

Longitudinal Slope: 0.0030 ft/ft

Manning's n: 0.0300

Flow: 6.4300 cfs

Result Parameters

Depth: 1.1030 ft

Area of Flow: 3.6501 ft^2

Wetted Perimeter: 6.9762 ft

Hydraulic Radius: 0.5232 ft

Average Velocity: 1.7616 ft/s

Top Width: 6.6182 ft

Froude Number: 0.4180

Critical Depth: 0.7782 ft

Critical Velocity: 3.5396 ft/s

Critical Slope: 0.0193 ft/ft

Critical Top Width: 4.67 ft

Calculated Max Shear Stress: 0.2065 lb/ft^2

Calculated Avg Shear Stress: 0.0979 lb/ft^2

Channel Analysis: Swale 3

Notes:

Input Parameters

Channel Type: Triangular

Side Slope 1 (Z1): 3.0000 ft/ft

Side Slope 2 (Z2): 3.0000 ft/ft

Longitudinal Slope: 0.0063 ft/ft

Manning's n: 0.0300

Flow: 11.0500 cfs

Result Parameters

Depth: 1.1759 ft

Area of Flow: 4.1479 ft^2

Wetted Perimeter: 7.4368 ft

Hydraulic Radius: 0.5578 ft

Average Velocity: 2.6640 ft/s

Top Width: 7.0551 ft

Froude Number: 0.6123

Critical Depth: 0.9663 ft

Critical Velocity: 3.9444 ft/s

Critical Slope: 0.0179 ft/ft

Critical Top Width: 5.80 ft

Calculated Max Shear Stress: 0.4623 lb/ft^2

Calculated Avg Shear Stress: 0.2193 lb/ft^2

Hydraulic Analysis Report
Swale Calculations – 25 yr Storm

Project Data

Project Title: 4 Seasons Site & Demo

Channel Analysis: Swale 1

Notes:

Input Parameters

Channel Type: Triangular

Side Slope 1 (Z1): 3.0000 ft/ft

Side Slope 2 (Z2): 3.0000 ft/ft

Longitudinal Slope: 0.0169 ft/ft

Manning's n: 0.0300

Flow: 6.2100 cfs

Result Parameters

Depth: 0.7873 ft

Area of Flow: 1.8596 ft^2

Wetted Perimeter: 4.9794 ft

Hydraulic Radius: 0.3735 ft

Average Velocity: 3.3394 ft/s

Top Width: 4.7239 ft

Froude Number: 0.9380

Critical Depth: 0.7674 ft

Critical Velocity: 3.5150 ft/s

Critical Slope: 0.0194 ft/ft

Critical Top Width: 4.60 ft

Calculated Max Shear Stress: 0.8303 lb/ft^2

Calculated Avg Shear Stress: 0.3938 lb/ft^2

Channel Analysis: Swale 2

Notes:

Input Parameters

Channel Type: Triangular

Side Slope 1 (Z1): 3.0000 ft/ft

Side Slope 2 (Z2): 3.0000 ft/ft

Longitudinal Slope: 0.0030 ft/ft

Manning's n: 0.0300

Flow: 7.7000 cfs

Result Parameters

Depth: 1.1802 ft

Area of Flow: 4.1784 ft^2

Wetted Perimeter: 7.4640 ft

Hydraulic Radius: 0.5598 ft

Average Velocity: 1.8428 ft/s

Top Width: 7.0810 ft

Froude Number: 0.4228

Critical Depth: 0.8363 ft

Critical Velocity: 3.6695 ft/s

Critical Slope: 0.0188 ft/ft

Critical Top Width: 5.02 ft

Calculated Max Shear Stress: 0.2209 lb/ft^2

Calculated Avg Shear Stress: 0.1048 lb/ft^2

Channel Analysis: Swale 3

Notes:

Input Parameters

Channel Type: Triangular

Side Slope 1 (Z1): 3.0000 ft/ft

Side Slope 2 (Z2): 3.0000 ft/ft

Longitudinal Slope: 0.0063 ft/ft

Manning's n: 0.0300

Flow: 12.3000 cfs

Result Parameters

Depth: 1.2241 ft

Area of Flow: 4.4951 ft^2

Wetted Perimeter: 7.7417 ft

Hydraulic Radius: 0.5806 ft

Average Velocity: 2.7363 ft/s

Top Width: 7.3445 ft

Froude Number: 0.6164

Critical Depth: 1.0087 ft

Critical Velocity: 4.0298 ft/s

Critical Slope: 0.0177 ft/ft

Critical Top Width: 6.05 ft

Calculated Max Shear Stress: 0.4812 lb/ft^2

Calculated Avg Shear Stress: 0.2283 lb/ft^2

Hydraulic Analysis Report
Swale Calculations – 50 yr Storm

Project Data

Project Title: 4 Seasons Site & Demo

Channel Analysis: Swale 1

Notes:

Input Parameters

Channel Type: Triangular

Side Slope 1 (Z1): 3.0000 ft/ft

Side Slope 2 (Z2): 3.0000 ft/ft

Longitudinal Slope: 0.0169 ft/ft

Manning's n: 0.0300

Flow: 6.9800 cfs

Result Parameters

Depth: 0.8226 ft

Area of Flow: 2.0300 ft^2

Wetted Perimeter: 5.2026 ft

Hydraulic Radius: 0.3902 ft

Average Velocity: 3.4384 ft/s

Top Width: 4.9356 ft

Froude Number: 0.9448

Critical Depth: 0.8041 ft

Critical Velocity: 3.5981 ft/s

Critical Slope: 0.0191 ft/ft

Critical Top Width: 4.82 ft

Calculated Max Shear Stress: 0.8675 lb/ft^2

Calculated Avg Shear Stress: 0.4115 lb/ft^2

Channel Analysis: Swale 2

Notes:

Input Parameters

Channel Type: Triangular

Side Slope 1 (Z1): 3.0000 ft/ft

Side Slope 2 (Z2): 3.0000 ft/ft

Longitudinal Slope: 0.0030 ft/ft

Manning's n: 0.0300

Flow: 10.4800 cfs

Result Parameters

Depth: 1.3248 ft

Area of Flow: 5.2652 ft^2

Wetted Perimeter: 8.3787 ft

Hydraulic Radius: 0.6284 ft

Average Velocity: 1.9904 ft/s

Top Width: 7.9487 ft

Froude Number: 0.4310

Critical Depth: 0.9461 ft

Critical Velocity: 3.9028 ft/s

Critical Slope: 0.0181 ft/ft

Critical Top Width: 5.68 ft

Calculated Max Shear Stress: 0.2480 lb/ft^2

Calculated Avg Shear Stress: 0.1176 lb/ft^2

Channel Analysis: Swale 3

Notes:

Input Parameters

Channel Type: Triangular

Side Slope 1 (Z1): 3.0000 ft/ft

Side Slope 2 (Z2): 3.0000 ft/ft

Longitudinal Slope: 0.0063 ft/ft

Manning's n: 0.0300

Flow: 13.8300 cfs

Result Parameters

Depth: 1.2791 ft

Area of Flow: 4.9082 ft^2

Wetted Perimeter: 8.0897 ft

Hydraulic Radius: 0.6067 ft

Average Velocity: 2.8177 ft/s

Top Width: 7.6746 ft

Froude Number: 0.6209

Critical Depth: 1.0571 ft

Critical Velocity: 4.1254 ft/s

Critical Slope: 0.0174 ft/ft

Critical Top Width: 6.34 ft

Calculated Max Shear Stress: 0.5028 lb/ft^2

Calculated Avg Shear Stress: 0.2385 lb/ft^2

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(In/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	28.000	0.12	1.20	0.90	0.11	1.11	5.0	6.2	7.0	7.74	14.18	2.46	24	0.39	4.50	4.61	7.50	7.53	0.00	10.05	P-1
2	1	105.080	0.14	1.08	0.90	0.13	1.00	5.0	5.4	7.1	7.14	14.30	2.27	24	0.40	4.61	5.03	7.59	7.70	10.05	9.00	P-2
3	2	86.560	0.94	0.94	0.93	0.87	0.87	5.0	5.0	7.2	6.32	11.73	3.58	18	1.25	5.03	6.11	7.82	8.13	9.00	9.55	P-3

Project File: Culvert 1-3 10 yr.stm | Number of lines: 3 | Run Date: 12/6/2016

NOTES:Intensity = 121.80 / (Inlet time + 23.50) ^ 0.84 ; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	33.000	1.60	1.72	0.90	1.44	1.55	5.0	10.7	6.2	9.62	21.00	5.50	18	4.00	5.00	6.32	7.50	7.74	0.00	11.70	P-4
2	1	224.710	0.12	0.12	0.93	0.11	0.11	5.0	5.0	7.2	0.81	7.22	1.75	15	1.25	6.32	9.13	8.63	9.48	11.70	13.00	P-5

Project File: Culvert 4-5 10 yr.stm

Number of lines: 2

Run Date: 12/6/2016

NOTES:Intensity = 121.80 / (Inlet time + 23.50) ^ 0.84 ; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	60.000	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	6.80	5.75	3.85	18	0.30	4.41	4.59	5.91	6.16	0.00	0.00	P-6

Project File: Culvert 6 10 yr.stm

Number of lines: 1

Run Date: 12/6/2016

NOTES:Intensity = 121.80 / (Inlet time + 23.50) ^ 0.84 ; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	50.000	0.00	0.00	0.00	0.00	0.00	15.0	15.0	0.0	17.85	11.08	5.68	24	0.24	4.22	4.34	6.22	6.53	0.00	0.00	Existing Culvert

Project File: Existing Culvert 10 yr.stm

Number of lines: 1

Run Date: 12/6/2016

NOTES:Intensity = 121.80 / (Inlet time + 23.50) ^ 0.84 ; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	28.000	0.12	1.20	0.90	0.11	1.11	5.0	6.0	7.9	8.78	14.18	2.79	24	0.39	4.50	4.61	7.50	7.54	0.00	10.05	P-1
2	1	105.080	0.14	1.08	0.90	0.13	1.00	5.0	5.4	8.1	8.07	14.30	2.57	24	0.40	4.61	5.03	7.62	7.76	10.05	9.00	P-2
3	2	86.560	0.94	0.94	0.93	0.87	0.87	5.0	5.0	8.1	7.12	11.73	4.03	18	1.25	5.03	6.11	7.91	8.31	9.00	9.55	P-3

Project File: Culvert 1-3 25 yr.stm

Number of lines: 3

Run Date: 12/6/2016

NOTES:Intensity = 155.43 / (Inlet time + 26.20) ^ 0.86 ; Return period =Yrs. 25 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	33.000	1.60	1.72	0.90	1.44	1.55	5.0	10.1	7.2	11.11	21.00	6.29	18	4.00	5.00	6.32	7.50	7.82	0.00	11.70	P-4
2	1	224.710	0.12	0.12	0.93	0.11	0.11	5.0	5.0	8.1	0.91	7.22	1.84	15	1.25	6.32	9.13	8.96	9.50	11.70	13.00	P-5

Project File: Culvert 4-5 25 yr.stm

Number of lines: 2

Run Date: 12/6/2016

NOTES:Intensity = 155.43 / (Inlet time + 26.20) ^ 0.86 ; Return period =Yrs. 25 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	60.000	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	7.70	5.75	4.36	18	0.30	4.41	4.59	5.91	6.23	0.00	0.00	P-6

Project File: Culvert 6 25 yr.stm

Number of lines: 1

Run Date: 12/6/2016

NOTES:Intensity = 155.43 / (Inlet time + 26.20) ^ 0.86 ; Return period =Yrs. 25 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	50.000	0.00	0.00	0.00	0.00	0.00	15.0	15.0	0.0	17.85	11.08	5.68	24	0.24	4.22	4.34	6.22	6.53	0.00	0.00	Existing Culvert

Project File: Existing Culvert 25 yr.stm

Number of lines: 1

Run Date: 12/6/2016

NOTES:Intensity = 121.80 / (Inlet time + 23.50) ^ 0.84 ; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	28.000	0.12	1.20	0.90	0.11	1.11	5.0	6.0	8.6	9.58	14.18	3.05	24	0.39	4.50	4.61	7.50	7.55	0.00	10.05	P-1
2	1	105.080	0.14	1.08	0.90	0.13	1.00	5.0	5.3	8.8	8.79	14.30	2.80	24	0.40	4.61	5.03	7.65	7.80	10.05	9.00	P-2
3	2	86.560	0.94	0.94	0.93	0.87	0.87	5.0	5.0	8.9	7.75	11.73	4.39	18	1.25	5.03	6.11	7.99	8.46	9.00	9.55	P-3

Project File: Culvert 1-3 50 yr.stm | Number of lines: 3 | Run Date: 12/6/2016

NOTES:Intensity = 171.29 / (Inlet time + 27.30) ^ 0.85 ; Return period =Yrs. 50 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	33.000	1.60	1.72	0.90	1.44	1.55	5.0	9.6	7.9	12.27	21.00	6.94	18	4.00	5.00	6.32	7.50	7.95	0.00	11.70	P-4
2	1	224.710	0.12	0.12	0.93	0.11	0.11	5.0	5.0	8.9	0.99	7.22	1.58	15	1.25	6.32	9.13	9.35	9.60	11.70	13.00	P-5

Project File: Culvert 4-5 50 yr.stm | Number of lines: 2 | Run Date: 12/6/2016

NOTES:Intensity = 171.29 / (Inlet time + 27.30) ^ 0.85 ; Return period =Yrs. 50 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	60.000	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	10.48	5.75	5.93	18	0.30	4.41	4.59	5.91	6.51	0.00	0.00	P-6

Project File: Culvert 6 50 yr.stm

Number of lines: 1

Run Date: 12/6/2016

NOTES:Intensity = 171.29 / (Inlet time + 27.30) ^ 0.85 ; Return period =Yrs. 50 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	50.000	0.00	0.00	0.00	0.00	0.00	15.0	15.0	0.0	24.31	11.08	7.74	24	0.24	4.22	4.34	6.22	6.80	0.00	0.00	Existing Culvert

Project File: Existing Culvert 50 yr.stm

Number of lines: 1

Run Date: 12/6/2016

NOTES:Intensity = 171.29 / (Inlet time + 27.30) ^ 0.85 ; Return period =Yrs. 50 ; c = cir e = ellip b = box

4 Seasons Site & Demo

Velocity Control:

POND OUTLET – P - 6

Q = 6.80 cfs (See provided calculations from culvert sizing)

Culvert size = 18 inch

Velocity = 3.85 fps

New York DOT Dissipater Method For Use in Defined Channels: Zone 1

For 18-inch culvert
Upstream Width = 4.5 ft
Downstream Width = 6.0 ft
Length = 6.0 ft
Depth = 18 in

32 SF CLASS B RIPRAP PROVIDED

POND OUTLET – P - 7

Q = 0.97 cfs (See provided calculations pond routing)

Culvert size = 24 inch

V = Q/A
A = 3.14 sf
V = (0.97 cfs/3.14 sf)
Velocity = 0.31 fps

New York DOT Dissipater Method For Use in Defined Channels: Zone 1

For 24-inch culvert
Upstream Width = 6.0 ft
Downstream Width = 8.0 ft
Length = 8.0 ft
Depth = 18 in

56 SF CLASS B RIPRAP PROVIDED

EXISTING CULVERT

Q_{10} = 17.85 cfs (See provided calculations from culvert sizing)

Culvert size = 24 inch

Velocity = 5.68 fps

New York DOT Dissipater Method For Use in Defined Channels: Zone 1

For 24-inch culvert
Upstream Width = 6.0 ft
Downstream Width = 8.0 ft
Length = 8.0 ft
Depth = 18 in

56 SF CLASS B RIPRAP PROVIDED