

POND B PURPOSE:

- DETAIN AREAS H1 & H3
- DETAIN THE UNDEVELOPED H2 FLOW TO COMPENSATE FOR UNDETAINED AREAS G1, G2 & G3.

REQUIREMENTS:

- AREA H2 MUST BE DETAINED IN THE FUTURE PHASE III DEVELOPMENT.
- OFFSITE "A" WILL BYPASS THE POND ALONG THE EXISTING BAR DITCH

POND INFLOW

- H1 0.76 AC x 0.5
- H2 2.50 AC x .35
- H3 0.71 AC x 0.5
- TOTAL 3.97 AC**

10-YEAR

- A. TOTAL AREA (G1-G3 & H1-H3) = 3.57 AC + 3.97 AC = 7.54 AC
- B. ALLOWABLE DISCHARGE = CIA = (0.35)(7.54) = 2.64 CFS
- C. UNDETAINED AREAS (G1-G3) = 3.57 AC
- D. UNDETAINED RUNOFF = CIA = (0.47)(3.57) = 1.68 CFS
- E. ALLOWABLE DISCHARGE FROM POND Q_o = (B-D) = 2.64 - 1.68 = 0.96 CFS

Determine Qp for Area H2

Tc	A	C	I	Qp
Area H2 not allowed to release Tc < 20 min				
20	2.5	0.35	5.90	5.16
30	2.5	0.35	4.90	4.29
40	2.5	0.35	4.00	3.50
50	2.5	0.35	3.50	3.08
60	2.5	0.35	3.00	2.63
70	2.5	0.35	2.70	2.36
80	2.5	0.35	2.45	2.14

Determine Qp for Areas H1 & H3

Tc	A	C	I	Qp
10	1.47	0.50	7.20	5.29
20	1.47	0.50	5.90	4.34
30	1.47	0.50	4.90	3.60
40	1.47	0.50	4.30	2.94
50	1.47	0.50	3.80	2.57
60	1.47	0.50	3.00	2.21
70	1.47	0.50	2.70	1.98
80	1.47	0.50	2.45	1.80

Determine Storage Volume Required

Q_a = 3.40

T_c = 10

Time	Inflow = T _c Q _a ^{1.483}	Outflow = 0.5(T _c +10)Q _a ^{1.483}	Storage
10	3175	2040	1135
20	11399	3060	8339
30	14200	4080	10120
40	15456	5100	10366
50	16905	6120	10785
60	17388	7140	10248
70	18257	8160	10097
80	18934	9180	9754

Determine Water Surface Elev.

Pond Overflow Elevation = 543.00

Layer	Surface	Average	Volume	100-year	100-year
Elevation	Area (sf)	Area (sf)	Volume (cf)	Volume (cf)	WSEL
543.00	4917	4863	4863	15733	
542.00	4809	4434	4434	10870	
541.00	4059	3536	3536	6436	541.98
540.00	3012	2552	2552	2901	
539.00	2092	697	349	349	
538.50	0	0	0	0	

50-YEAR

- A. TOTAL AREA (G1-G3 & H1-H3) = 3.57 AC + 3.97 AC = 7.54 AC
- B. ALLOWABLE DISCHARGE = CIA = (0.35)(7.54) = 2.64 CFS
- C. UNDETAINED AREAS (G1-G3) = 3.57 AC
- D. UNDETAINED RUNOFF = CIA = (0.47)(3.57) = 1.68 CFS
- E. ALLOWABLE DISCHARGE FROM POND Q_o = (B-D) = 2.64 - 1.68 = 0.96 CFS

Determine Qp for Area H2

Tc	A	C	I	Qp
Area H2 not allowed to release Tc < 20 min				
20	2.5	0.35	7.40	6.48
30	2.5	0.35	6.10	5.34
40	2.5	0.35	5.20	4.55
50	2.5	0.35	4.50	3.94
60	2.5	0.35	3.90	3.41
70	2.5	0.35	3.50	3.06
80	2.5	0.35	3.20	2.80

Determine Qp for Areas H1 & H3

Tc	A	C	I	Qp
10	1.47	0.50	9.00	6.82
20	1.47	0.50	7.40	5.44
30	1.47	0.50	6.10	4.48
40	1.47	0.50	5.20	3.82
50	1.47	0.50	4.50	3.31
60	1.47	0.50	3.90	2.87
70	1.47	0.50	3.50	2.57
80	1.47	0.50	3.20	2.35

Determine Storage Volume Required

Q_a = 4.32

T_c = 10

Time	Inflow = T _c Q _a ^{1.483}	Outflow = 0.5(T _c +10)Q _a ^{1.483}	Storage
10	3980	2592	1377
20	14297	3888	10409
30	17678	5184	12494
40	20093	6480	13613
50	21735	7776	13959
60	22694	9072	13532
70	23667	10368	13359
80	24730	11664	13066

Determine Water Surface Elev.

Pond Overflow Elevation = 543.00

Layer	Surface	Average	Volume	100-year	100-year
Elevation	Area (sf)	Area (sf)	Volume (cf)	Volume (cf)	WSEL
543.00	4917	4863	4863	15733	
542.00	4809	4434	4434	10870	
541.00	4059	3536	3536	6436	542.64
540.00	3012	2552	2552	2901	
539.00	2092	697	349	349	
538.50	0	0	0	0	

25-YEAR

- A. TOTAL AREA (G1-G3 & H1-H3) = 3.57 AC + 3.97 AC = 7.54 AC
- B. ALLOWABLE DISCHARGE = CIA = (0.35)(7.54) = 2.64 CFS
- C. UNDETAINED AREAS (G1-G3) = 3.57 AC
- D. UNDETAINED RUNOFF = CIA = (0.47)(3.57) = 1.68 CFS
- E. ALLOWABLE DISCHARGE FROM POND Q_o = (B-D) = 2.64 - 1.68 = 0.96 CFS

Determine Qp for Area H2

Tc	A	C	I	Qp
Area H2 not allowed to release Tc < 20 min				
20	2.5	0.35	6.70	5.86
30	2.5	0.35	5.50	4.81
40	2.5	0.35	4.65	4.07
50	2.5	0.35	4.00	3.50
60	2.5	0.35	3.55	3.11
70	2.5	0.35	3.20	2.80
80	2.5	0.35	2.85	2.49

Determine Qp for Areas H1 & H3

Tc	A	C	I	Qp
10	1.47	0.50	8.30	6.10
20	1.47	0.50	6.70	4.92
30	1.47	0.50	5.50	4.04
40	1.47	0.50	4.65	3.42
50	1.47	0.50	4.00	2.94
60	1.47	0.50	3.55	2.61
70	1.47	0.50	3.20	2.35
80	1.47	0.50	2.85	2.09

Determine Storage Volume Required

Q_a = 3.65

T_c = 10

Time	Inflow = T _c Q _a ^{1.483}	Outflow = 0.5(T _c +10)Q _a ^{1.483}	Storage
10	3660	2180	1470
20	12944	3285	9659
30	15939	4380	11569
40	17988	5475	12493
50	19320	6570	12750
60	20576	7665	12911
70	21638	8760	12878
80	22025	9855	12170

Determine Water Surface Elev.

Pond Overflow Elevation = 543.00

Layer	Surface	Average	Volume	100-year	100-year
Elevation	Area (sf)	Area (sf)	Volume (cf)	Volume (cf)	WSEL
543.00	4917	4863	4863	15733	
542.00	4809	4434	4434	10870	
541.00	4059	3536	3536	6436	542.42
540.00	3012	2552	2552	2901	
539.00	2092	697	349	349	
538.50	0	0	0	0	

100-YEAR

- A. TOTAL AREA (G1-G3 & H1-H3) = 3.57 AC + 3.97 AC = 7.54 AC
- B. ALLOWABLE DISCHARGE = CIA = (0.35)(7.54) = 2.64 CFS
- C. UNDETAINED AREAS (G1-G3) = 3.57 AC
- D. UNDETAINED RUNOFF = CIA = (0.47)(3.57) = 1.68 CFS
- E. ALLOWABLE DISCHARGE FROM POND Q_o = (B-D) = 2.64 - 1.68 = 0.96 CFS

Determine Qp for Area H2

Tc	A	C	I	Qp
Area H2 not allowed to release Tc < 20 min				
20	2.5	0.35	8.30	7.26
30	2.5	0.35	6.90	6.04
40	2.5	0.35	5.80	5.08
50	2.5	0.35	5.00	4.38
60	2.5	0.35	4.50	3.94
70	2.5	0.35	4.00	3.50
80	2.5	0.35	3.75	3.28

Determine Qp for Areas H1 & H3

Tc	A	C	I	Qp
10	1.47	0.50	9.80	7.20
20	1.47	0.50	8.30	6.10
30	1.47	0.50	6.90	5.07
40	1.47	0.50	5.80	4.26
50	1.47	0.50	5.00	3.68
60	1.47	0.50	4.50	3.31
70	1.47	0.50	4.00	2.94
80	1.47	0.50	3.75	2.76

Determine Storage Volume Required

Q_a = 5.46

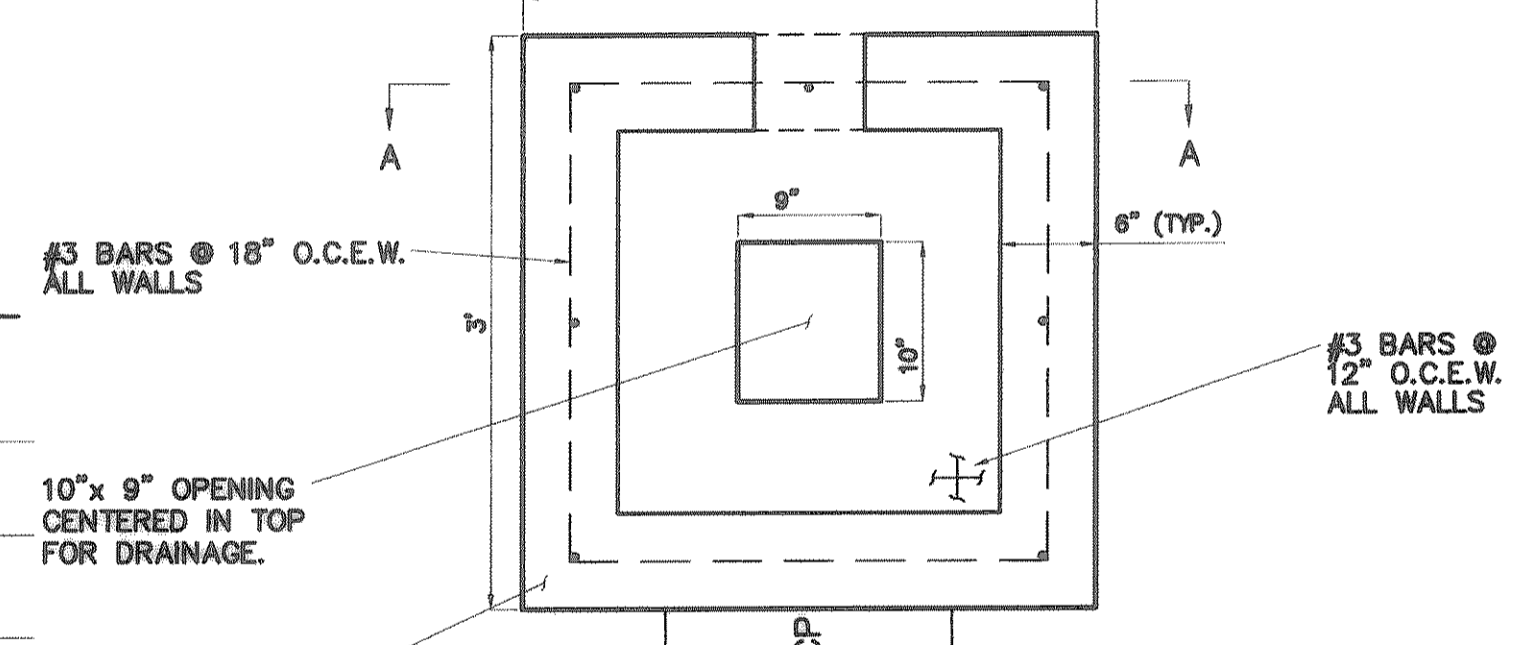
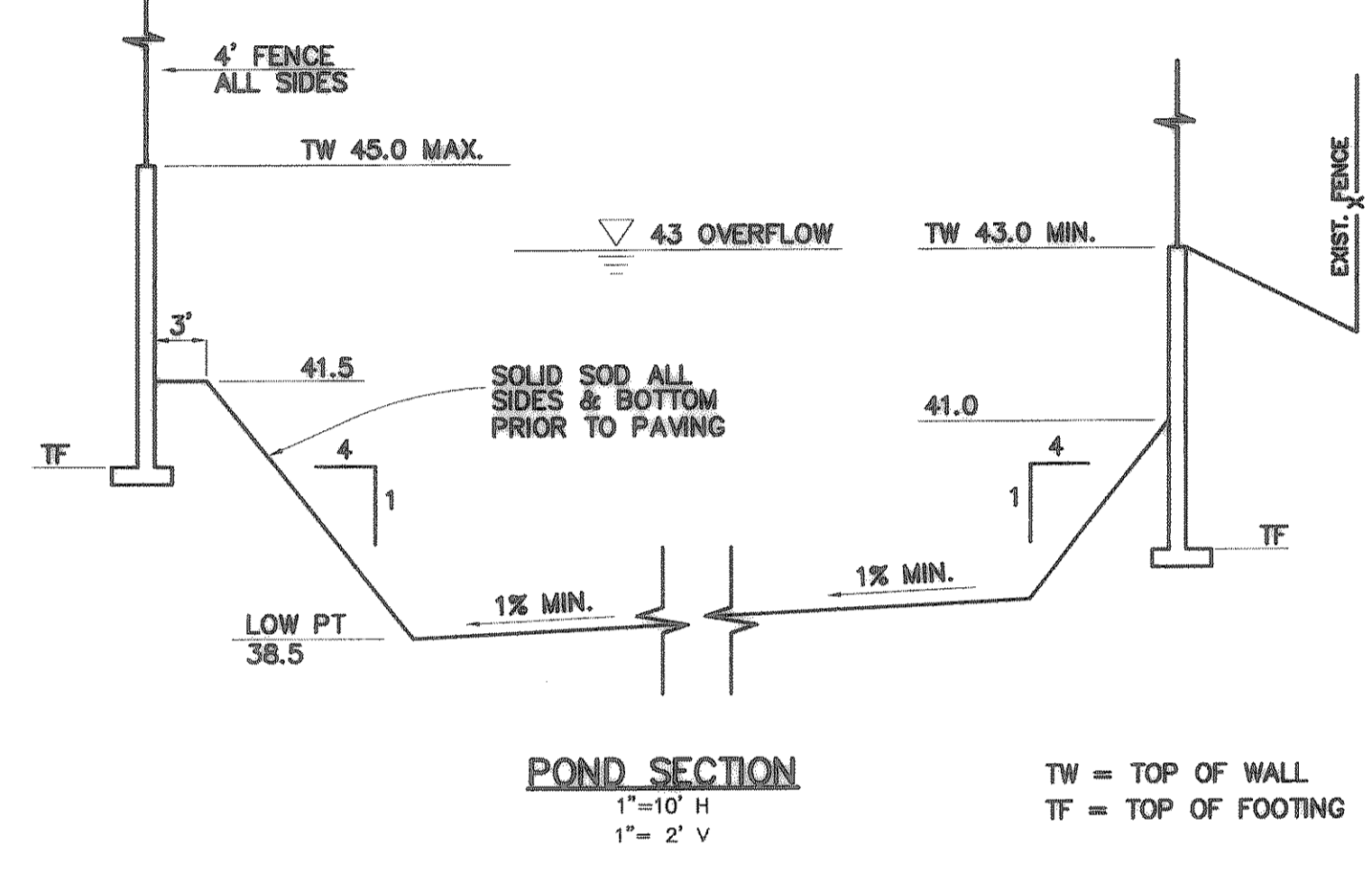
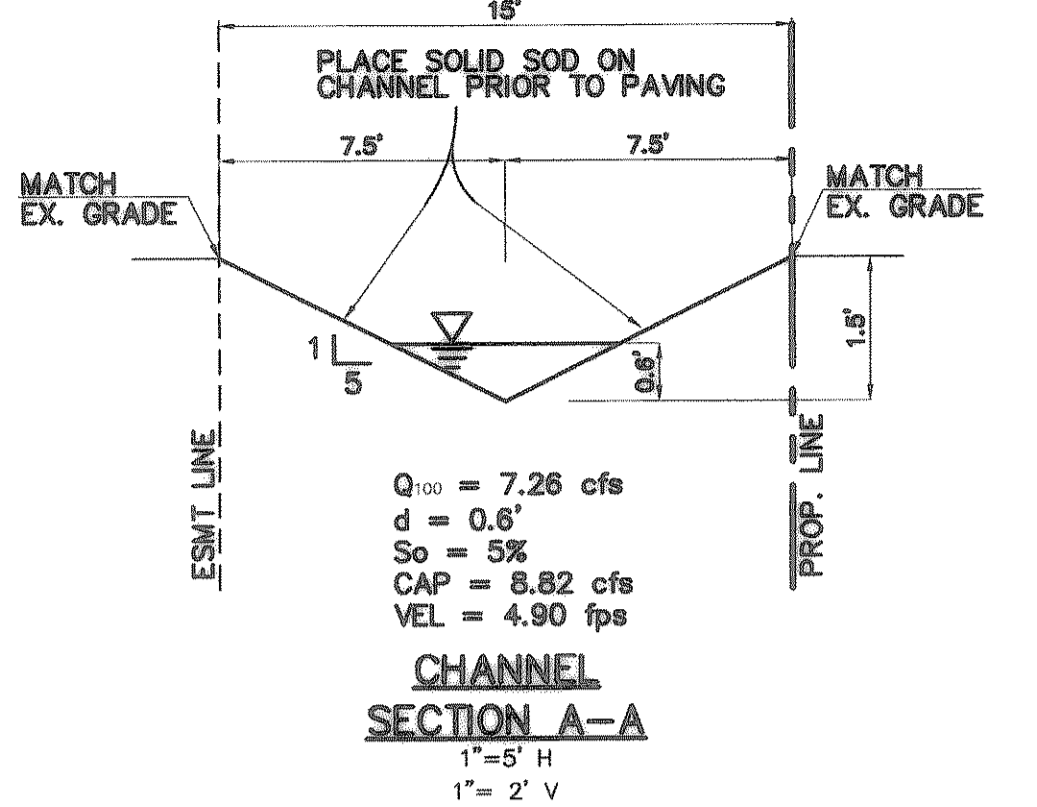
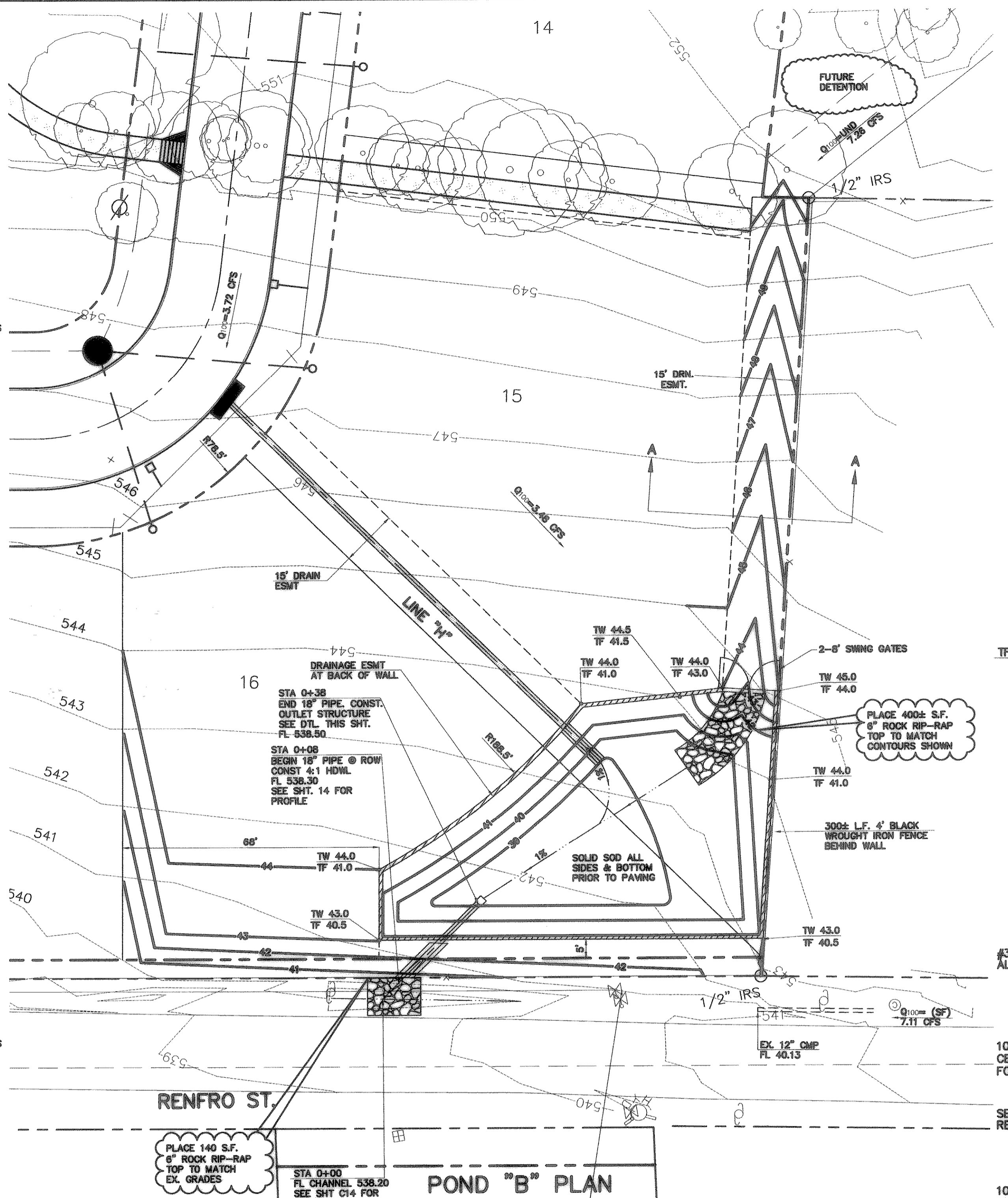
T_c = 10

Time	Inflow = T _c Q _a ^{1.483}	Outflow = 0.5(T _c +10)Q _a ^{1.483}	Storage
10	4322	2776	1046
20	16036	4914	11122
30	19996	6552	13444
40	22411	8190	14221
50	24150	9828	14322
60	25682	11466	14616
70	27048	13104	13944
80	28980	14742	14238

Determine Water Surface Elev.

Pond Overflow Elevation = 543.00

Layer	Surface	Average	Volume	100-year	100-year
Elevation	Area (sf)	Area (sf)	Volume (cf)	Volume (cf)	WSEL
543.00	4917	4863	4863	15733	
542.00	4809	4434	4434	10870	
541.00	4059	3536	3536	6436	542.77
540.00	3012	2552	2552	2901	
539.00	2092	697	349	349	
538.50	0	0	0	0	



Orifice Calculation - 10YR

Flowline Elevation	538.50	feet
Orifice size "L"	7.00	inches
Orifice size "H"	8.00	inches
10-yr WSEL	541.98	feet
Exit Coefficient "C"	0.60	
Area of Opening	0.39	square feet
Q=CA(2gh) ^{1/2}	3.32	cfs
Total 10yr	3.32	cfs

Orifice Calculation - 100YR

Flowline Elevation	538.50	feet
Orifice size "L"	7.00	inches
Orifice size "H"	8.00	inches
100-yr WSEL	542.77	feet
Exit Coefficient "C"	0.60	
Area of Opening	0.39	square feet
Q=CA(2gh) ^{1/2}	3.72	cfs
Total 100yr	3.72	cfs

Orifice Calculation - 25YR

Flowline Elevation	538.50	feet
Orifice size "L"	7.00	inches
Orifice size "H"	8.00	inches
25-yr WSEL	542.42	feet
Exit Coefficient "C"	0.60	
Area of Opening	0.39	square feet
Q=CA(2gh) ^{1/2}	3.55	cfs
Total 25yr	3.55	cfs

Orifice Calculation - 50YR

Flowline Elevation	538.50	feet
Orifice size "L"	7.50	inches
Orifice size "H"	8.00	inches
50-yr WSEL	542.64	feet
Exit Coefficient "C"	0.60	
Area of Opening	0.39	square feet
Q=CA(2gh) ^{1/2}	3.65	cfs
Total 50yr	3.65	cfs

DISCHARGE FROM POND

EVENT	TOTAL ALLOW. RELEASE FROM POND(CFS)	ACTUAL RELEASE FROM POND (CFS)
10-YEAR	3.40	3.32
25-YEAR	3.65	3.55
50-YEAR	4.32	5.08
100-YEAR	5.46	5.50

DUE TO THE SMALL DIFF. BETWEEN THE 50 YR. & 100 YR. WSEL THE 50 YR. RELEASE IS NOT CONTROLLED.

Orifice Calculation - 50YR

Flowline Elevation	542.42	feet
Orifice size "L"	9.00	inches
Orifice size "H"	10.00	inches
50-yr WSEL	542.64	feet
Exit Coefficient "C"	0.60	
Area of Opening	0.63	square feet
Q=CA(2gh) ^{1/2}	1.41	cfs
Total 50yr	5.05	cfs

CONSTRUCTION RECORDS

DATE: 11/2/06 BY: TPJ

THIS DRAWING INDICATES THE WORK COMPLETED PER INFORMATION SUPPLIED BY THE CONTRACTOR. ACTUAL ON THE