

10-YEAR

- A. TOTAL BYPASS AREA = 6.78 AC
- B. DISCHARGE (BYPASS-DEVELOPED)= $Q_A=(0.90)(3.90)7.2= 25.27$  CFS
- C. DISCHARGE (BYPASS-UNDEVELOPED)= $Q_A=(0.35)(2.88)5.9 = 5.85$  CFS
- D. TOTAL ON-SITE AREA = 28.67 AC
- E. DISCHARGE (ON-SITE)= $Q_A=(0.35)(28.67)9.9 = 99.20$  CFS
- F. TOTAL ON-SITE BYPASS AREA (K1) = 1.29 AC
- G. DISCHARGE (ON-SITE BYPASS)= $Q_A=(0.50)(1.29)7.2= 4.84$  CFS
- H. ALLOWABLE ON-SITE DISCHARGE = 59.20-4.84=54.36 CFS
- I. ALLOWABLE DISCHARGE FROM POND=(B+C+H)=25.27+5.85+54.36=85.78 CFS

Determine Qp for developed off-site areas (Bypass) 3.90 ac

Tc	A	C	I	Qp
10	3.90	0.90	7.20	25.27
20	3.90	0.90	6.30	20.71
30	3.90	0.90	4.90	17.20
40	3.90	0.90	4.00	14.04
50	3.90	0.90	3.50	12.29
60	3.90	0.90	3.00	10.53
70	3.90	0.90	2.70	9.48
80	3.90	0.90	2.45	8.60

Determine Storage Volume Required for Bypass Areas

Time	Inflow = Tc*Qp*60	Outflow = 0.5*(Tc+10)Qa*60	Storage
10	15163	15162	1
20	24851	22743	2108
30	30958	30324	634
40	33696	37905	-4209
50	36855	45486	-8631
60	37906	53067	-15159
70	38653	60648	-20845
80	41278	68229	-26951

Determine Qp for undeveloped off-site areas (Bypass) 2.88 ac

Tc	A	C	I	Qp
20	2.88	0.35	5.90	5.95
30	2.88	0.35	4.90	4.94
40	2.88	0.35	4.00	4.03
50	2.88	0.35	3.50	3.53
60	2.88	0.35	3.00	3.02
70	2.88	0.35	2.70	2.72
80	2.88	0.35	2.45	2.47

Determine Storage Volume Required for Bypass Areas

Time	Inflow = Tc*Qp*60	Outflow = 0.5*(Tc+10)Qa*60	Storage
20	7137	5355	1782
30	8891	7140	1751
40	9677	8925	752
50	10584	10710	-126
60	10886	12495	-1609
70	11431	14280	-2849
80	11854	16065	-4211

Determine Qp for On-Site Areas

Tc	A	C	I	Qp
10	27.38	0.47	7.20	93.34
20	27.38	0.47	5.90	76.49
30	27.38	0.47	4.90	63.53
40	27.38	0.47	4.00	51.86
50	27.38	0.47	3.50	45.38
60	27.38	0.47	3.00	38.89
70	27.38	0.47	2.70	35.00
80	27.38	0.47	2.45	31.76

Determine Storage Volume Required for On-Site Areas

Time	Inflow = Tc*Qp*60	Outflow = 0.5*(Tc+10)Qa*60	Storage
10	56006	32736	23270
20	91788	49104	42684
30	114346	65472	48874
40	124489	81840	42619
50	136127	98208	37919
60	140016	114576	25440
70	147017	130944	16073
80	152462	147312	5150

Total Combined Storage Required at 30 min. = 51,259 CF

Determine Water Surface Elev.

Layer	Surface Area (sf)	Average Area (sf)	Layer Volume (cf)	Cumulative Volume (cf)	10-year Volume (cf)	10-year WSEL
527.00	28408					
526.00	24093	26251	26251	81469		
525.00	19032	21563	21563	55218		
524.00	13882	16457	16457	33666	51259	525.41
523.00	9593	11738	11738	17199		
522.00	997	5295	5295	5461		
521.50	0	332	166	166		

25-YEAR

- A. TOTAL BYPASS AREA = 6.78 AC
- B. DISCHARGE (BYPASS-DEVELOPED)= $Q_A=(0.90)(3.90)8.3 = 29.13$  CFS
- C. DISCHARGE (BYPASS-UNDEVELOPED)= $Q_A=(0.35)(2.88)6.7 = 6.75$  CFS
- D. TOTAL ON-SITE AREA = 28.67 AC
- E. DISCHARGE (ON-SITE)= $Q_A=(0.35)(28.67)8.7 = 87.23$  CFS
- F. TOTAL ON-SITE BYPASS AREA (K1) = 1.29 AC
- G. DISCHARGE (ON-SITE BYPASS)= $Q_A=(0.50)(1.29)8.3= 5.35$  CFS
- H. ALLOWABLE ON-SITE DISCHARGE = 67.23-5.35=61.88 CFS
- I. ALLOWABLE DISCHARGE FROM POND=(B+C+H)=29.13+6.75+61.88=97.78 CFS

Determine Qp for developed off-site areas (Bypass) 3.90 ac

Tc	A	C	I	Qp
10	3.90	0.90	8.30	29.13
20	3.90	0.90	6.70	23.52
30	3.90	0.90	5.50	19.31
40	3.90	0.90	4.65	16.32
50	3.90	0.90	4.00	14.04
60	3.90	0.90	3.55	12.46
70	3.90	0.90	3.20	11.23
80	3.90	0.90	2.85	10.00

Determine Storage Volume Required for Bypass Areas

Time	Inflow = Tc*Qp*60	Outflow = 0.5*(Tc+10)Qa*60	Storage
10	17480	17478	2
20	28220	26217	2003
30	34749	34956	-207
40	39172	43695	-4523
50	42120	52434	-10314
60	44858	61173	-16315
70	47174	69912	-22738
80	48017	78651	-30634

Determine Qp for undeveloped off-site areas (Bypass) 2.88 ac

Tc	A	C	I	Qp
20	2.88	0.35	6.70	6.75
30	2.88	0.35	5.50	5.54
40	2.88	0.35	4.65	4.69
50	2.88	0.35	4.00	4.03
60	2.88	0.35	3.55	3.58
70	2.88	0.35	3.20	3.23
80	2.88	0.35	2.85	2.87

Determine Storage Volume Required for Bypass Areas

Time	Inflow = Tc*Qp*60	Outflow = 0.5*(Tc+10)Qa*60	Storage
20	8104	6075	2029
30	9979	8100	1879
40	11249	10125	1124
50	12096	12150	-54
60	12892	14175	-1293
70	13548	16200	-2652
80	13789	18225	-4436

Determine Qp for On-Site Areas

Tc	A	C	I	Qp
10	27.38	0.47	8.30	107.60
20	27.38	0.47	6.70	86.86
30	27.38	0.47	5.50	71.30
40	27.38	0.47	4.65	60.28
50	27.38	0.47	4.00	51.86
60	27.38	0.47	3.55	46.02
70	27.38	0.47	3.20	41.49
80	27.38	0.47	2.85	36.95

Determine Storage Volume Required for On-Site Areas

Time	Inflow = Tc*Qp*60	Outflow = 0.5*(Tc+10)Qa*60	Storage
10	84563	37128	27435
20	104234	56692	48542
30	128348	74256	54092
40	144883	92820	51863
50	155573	111384	44189
60	166585	129948	35737
70	174242	148512	25730
80	177353	167076	10277

Total Combined Storage Required at 30 min. = 55,971 CF

Determine Water Surface Elev.

Layer	Surface Area (sf)	Average Area (sf)	Layer Volume (cf)	Cumulative Volume (cf)	25-year Volume (cf)	25-year WSEL
527.00	28408					
526.00	24093	26251	26251	81469	59971	526.01
525.00	19032	21563	21563	55218		
524.00	13882	16457	16457	33666		
523.00	9593	11738	11738	17199		
522.00	997	5295	5295	5461		
521.50	0	332	166	166		

50-YEAR

- A. TOTAL BYPASS AREA = 6.78 AC
- B. DISCHARGE (BYPASS-DEVELOPED)= $Q_A=(0.90)(3.90)9.0 = 31.59$  CFS
- C. DISCHARGE (BYPASS-UNDEVELOPED)= $Q_A=(0.35)(2.88)7.4 = 7.46$  CFS
- D. TOTAL ON-SITE AREA = 28.67 AC
- E. DISCHARGE (ON-SITE)= $Q_A=(0.35)(28.67)7.4 = 74.26$  CFS
- F. TOTAL ON-SITE BYPASS AREA (K1) = 1.29 AC
- G. DISCHARGE (ON-SITE BYPASS)= $Q_A=(0.50)(1.29)9.0= 5.81$  CFS
- H. ALLOWABLE ON-SITE DISCHARGE = 74.26-5.81=68.45 CFS
- I. ALLOWABLE DISCHARGE FROM POND=(B+C+H)=31.59+7.46+68.45=107.50 CFS

Determine Qp for developed off-site areas (Bypass) 3.90 ac

Tc	A	C	I	Qp
10	3.90	0.90	9.00	31.59
20	3.90	0.90	7.40	25.97
30	3.90	0.90	6.10	21.41
40	3.90	0.90	5.20	18.25
50	3.90	0.90	4.50	15.80
60	3.90	0.90	3.90	13.69
70	3.90	0.90	3.50	12.29
80	3.90	0.90	3.20	11.23

Determine Storage Volume Required for Bypass Areas

Time	Inflow = Tc*Qp*60	Outflow = 0.5*(Tc+10)Qa*60	Storage
10	18654	18654	0
20	31169	28431	2738
30	38540	37908	632
40	43905	47385	-3580
50	47385	56862	-9477
60	49680	66339	-17058
70	51597	75816	-24219
80	53014	85293	-31379

Determine Qp for undeveloped off-site areas (Bypass) 2.88 ac

Tc	A	C	I	Qp
20	2.88	0.35	7.40	7.46
30	2.88	0.35	6.10	6.15
40	2.88	0.35	5.20	5.24
50	2.88	0.35	4.50	4.54
60	2.88	0.35	3.90	3.93
70	2.88	0.35	3.50	3.53
80	2.88	0.35	3.20	3.23

Determine Storage Volume Required for Bypass Areas

Time	Inflow = Tc*Qp*60	Outflow = 0.5*(Tc+10)Qa*60	Storage
20	8951	6714	2237
30	11068	8952	2116
40	12580	11190	1390
50	13608	13428	180
60	14152	15666	-1514
70	14818	17904	-3086
80	15483	20142	-4656

Determine Qp for On-Site Areas

Tc	A	C	I	Qp
10	27.38	0.47	9.00	116.68
20	27.38	0.47	7.40	95.94
30	27.38	0.47	6.10	79.08
40	27.38	0.47	5.20	67.42
50	27.38	0.47	4.50	58.34
60	27.38	0.47	3.90	50.96
70	27.38	0.47	3.50	45.36
80	27.38	0.47	3.20	41.49

Determine Storage Volume Required for On-Site Areas

Time	Inflow = Tc*Qp*60	Outflow = 0.5*(Tc+10)Qa*60	Storage
10	70008	41070	28938
20	115124	61605	53519
30	142349	82140	60209
40	161796	102675	59121
50	175020	123210	51810
60	182021	143745	38276
70	190577	164280	26297
80	199134	184815	14319

Total Combined Storage Required at 30 min. = 62,957 CF

Determine Water Surface Elev.

Layer	Surface Area (sf)	Average Area (sf)	Layer Volume (cf)	Cumulative Volume (cf)	50-year Volume (cf)	50-year WSEL
527.00	28408					
526.00	24093	26251	26251	81469	62957	526.15
525.00	19032	21563	21563	55218		
524.00	13882	16457	16457	33666		
523.00	9593	11738	11738	17199		
522.00	997	5295	5295	5461		
521.50	0	332	166	166		

Orifice Calculation - 10YR

Flowline Elevation	521.30	feet
Orifice size "L"	44.13	inches