



EXISTING POND OUTFALL STRUCTURE CONSTRUCTED WITH STONE CREEK RETAIL ADDITION MODIFY PER DETAILS THIS SHEET

EXISTING DETENTION POND

LIMITS OF 100 YEAR WATER SURFACE ELEVATION - 530.50

DETENTION POND CALCULATIONS
SEE MEMORANDUM TO CITY OF ROCKWALL FROM CORWIN ENGINEERING, INC. DATED JUNE 17, 2014, FOR MORE DETAILED EXPLANATION OF THE NEED FOR UPDATED DETENTION CALCULATIONS.

REVISED DRAINAGE AREAS TO POND

RUNOFF CALCULATIONS - DEVELOPED CONDITIONS

Area ID	Area (sf)	Area (acres)	Proposed Use	Runoff Coefficient	CA	Tc (min)	Rainfall Intensity (in/hr)	Q (cfs)	Comment
A	941551	21.62	Commercial	0.90	18.45	10	9.6	190.6	To Detention Pond
B	607116	13.81	Single-Family	0.50	6.91	10	9.6	67.7	To Detention Pond
C	207002	4.73	Park	0.35	1.68	20	8.3	13.8	To Detention Pond
D	165086	3.79	Park	0.35	1.33	20	8.3	11.0	Bypass
E	103946	2.39	Single-Family	0.50	1.19	10	9.6	11.7	Bypass
F	66788	1.51	Single-Family	0.50	0.76	10	9.6	7.4	Bypass
G	149476	3.43	School	0.70	2.40	10	9.6	23.5	To Detention Pond
H	285440	6.56	Single-Family	0.50	2.93	10	9.6	28.7	To Detention Pond
Area to Detention Pond				49.48	CA to Detention Pond	33.36	Weighted Cc = 0.67		

100 Year Downstream Culvert Capacity = 148.0 cfs
Bypass flow = 11.0 cfs
11.7 cfs
7.4 cfs
118.9 cfs

100-Year Pond Release Rate

50 Year Downstream Culvert Capacity = 134.6 cfs
Bypass flow = 9.9 cfs
10.7 cfs
6.8 cfs
107.1 cfs

50-Year Pond Release Rate

25 Year Downstream Culvert Capacity = 118.4 cfs
Bypass flow = 8.8 cfs
9.9 cfs
6.3 cfs
93.5 cfs

25-Year Pond Release Rate

10 Year Downstream Culvert Capacity = 105.9 cfs
Bypass flow = 7.8 cfs
8.5 cfs
5.4 cfs
84.2 cfs

10-Year Pond Release Rate

Elevation/Storage Table From Topographic Survey

Elevation (ft)	Area (sq. ft.)	Incremental Volume (cu. ft.)	Cumulative Volume (cu. ft.)
525	0	0	0
526	18907	9454	9454
527	41042	29975	39429
528	60891	50867	90296
529	70597	69644	159940
530	99043	88820	248760
531	120391	109717	358477
532	142155	131273	489750

Office #1 42" Wide x 35" tall, FL=525.0
Office #2 40" Wide x 8.5" Tall, FL=529.66
Office #3 11" Wide by 1" Tall, FL=530.0

Stage-Discharge Table

Stage	Area	Discharge	H	Area	Discharge	H	Area	Discharge	Total Discharge	Allowable Discharge	Above (Below)
525.00	0	0	-	-	-	-	-	-	0.0	-	-
526.00	0.50	3.50	11.9	-	-	-	-	-	11.9	-	-
527.00	1.00	7.00	33.7	-	-	-	-	-	33.7	-	-
528.00	1.46	10.20	99.3	-	-	-	-	-	99.3	-	-
529.00	2.46	19.20	171.0	-	-	-	-	-	171.0	-	-
529.45	2.91	10.20	63.7	-	-	-	-	-	63.7	84.2 (0.53)	10-year
529.66	3.12	10.20	66.8	-	-	-	-	-	66.8	-	-
529.97	3.43	10.20	91.0	0.16	1.03	2.0	-	-	92.9	93.5 (0.56)	25-year
530.00	3.46	10.20	91.4	0.17	1.13	2.2	-	-	93.6	-	-
530.26	3.72	10.20	94.8	0.25	2.98	5.7	0.13	2.90	5.1	106.6	107.1 (1.53)
530.50	3.96	10.20	97.7	0.49	2.36	8.0	0.25	5.50	13.2	116.9	118.9 0.00
531.00	4.46	10.20	103.7	0.99	2.36	11.3	0.50	11.00	37.5	152.5	-
531.50	4.95	10.20	109.4	1.49	2.36	13.9	1.00	11.00	53.0	176.2	-

Elevation Calculations

Event	Allowed Release Rate	Actual Release Rate	Storage Requirement	Occurs at Elevation
10-year	84.2	83.7	196680	529.45
25-year	93.5	92.9	245485	529.97
50-year	107.1	105.6	277682	530.26
100-year	118.9	118.9	303347	530.50

POND STORAGE CALCULATIONS

DETENTION CALCULATIONS - 10 Year

Storm Duration	Outflow Duration	Area (AC)	Future "C"	Future "KF"	Future "CA"	Rainfall Intensity	Inflow (cfs)	Volume (cu. ft.)	Volume (cu. ft.)	Volume (cu. ft.)	Volume (acre-ft.)	Outflow (cfs)
10	20	49.48	0.67	1.00	33.36	7.10	236.8	142103	50225	91878	2.11	83.7
20	30	49.48	0.67	1.00	33.36	5.90	186.6	236772	75537	160334	3.69	83.7
30	40	49.48	0.67	1.00	33.36	4.80	161.1	289210	100450	187760	4.31	83.7
40	50	49.48	0.67	1.00	33.36	4.00	133.4	320233	125662	194671	4.47	83.7
50	60	49.48	0.67	1.00	33.36	3.50	116.8	350255	150675	199580	4.58	83.7
60	70	49.48	0.67	1.00	33.36	3.00	100.1	360262	175767	184475	4.23	83.7
70	80	49.48	0.67	1.00	33.36	2.80	93.4	392285	200899	191386	4.39	83.7
80	90	49.48	0.67	1.00	33.36	2.60	86.7	416503	225912	190391	4.37	83.7
90	100	49.48	0.67	1.00	33.36	2.50	83.4	450327	251124	199203	4.57	83.7
100	110	49.48	0.67	1.00	33.36	2.30	76.7	460335	276237	184098	4.23	83.7
110	120	49.48	0.67	1.00	33.36	2.20	73.4	484352	301349	183903	4.20	83.7
120	130	49.48	0.67	1.00	33.36	2.10	70.1	504367	326462	177905	4.08	83.7
130	140	49.48	0.67	1.00	33.36	2.00	66.7	520378	351574	168904	3.98	83.7
140	150	49.48	0.67	1.00	33.36	1.90	63.4	532387	376686	159580	3.57	83.7

DETENTION CALCULATIONS - 25 Year

Storm Duration	Outflow Duration	Area (AC)	Future "C"	Future "KF"	Future "CA"	Rainfall Intensity	Inflow (cfs)	Volume (cu. ft.)	Volume (cu. ft.)	Volume (cu. ft.)	Volume (acre-ft.)	Outflow (cfs)
10	20	49.48	0.67	1.00	33.36	8.30	276.9	165121	55750	110971	2.53	92.9
20	30	49.48	0.67	1.00	33.36	6.80	220.2	264192	83650	180567	4.15	92.9
30	40	49.48	0.67	1.00	33.36	5.50	183.5	350240	115500	219740	5.02	92.9
40	50	49.48	0.67	1.00	33.36	4.60	153.4	368268	139375	228892	5.25	92.9
50	60	49.48	0.67	1.00	33.36	4.00	133.4	400291	167251	233041	5.35	92.9
60	70	49.48	0.67	1.00	33.36	3.50	116.8	423356	195260	225160	5.17	92.9
70	80	49.48	0.67	1.00	33.36	3.00	100.1	452338	223501	239338	5.49	92.9
80	90	49.48	0.67	1.00	33.36	3.10	103.4	496361	250876	245485	5.64	92.9
90	100	49.48	0.67	1.00	33.36	2.90	96.7	522380	278751	243629	5.59	92.9
100	110	49.48	0.67	1.00	33.36	2.70	90.1	540393	305620	233767	5.37	92.9
110	120	49.48	0.67	1.00	33.36	2.50	83.4	550400	334501	215899	4.96	92.9
120	130	49.48	0.67	1.00	33.36	2.40	80.1	576419	362376	214043	4.91	92.9
130	140	49.48	0.67	1.00	33.36	2.30	76.7	598435	390251	208184	4.78	92.9
140	150	49.48	0.67	1.00	33.36	2.20	73.4	616448	418128	188322	4.55	92.9

DETENTION CALCULATIONS - 50 Year

Storm Duration	Outflow Duration	Area (AC)	Future "C"	Future "KF"	Future "CA"	Rainfall Intensity	Inflow (cfs)	Volume (cu. ft.)	Volume (cu. ft.)	Volume (cu. ft.)	Volume (acre-ft.)	Outflow (cfs)
10	20	49.48	0.67	1.00	33.36	9.00	300.2	180131	63350	116781	2.68	105.6
20	30	49.48	0.67	1.00	33.36	7.50	250.2	300218	95025	205193	4.71	105.6
30	40	49.48	0.67	1.00	33.36	6.10	203.5	366266	126700	236566	5.50	105.6
40	50	49.48	0.67	1.00	33.36	5.20	173.5	416303	158375	257929	5.92	105.6
50	60	49.48	0.67	1.00	33.36	4.50	150.1	450327	193350	260278	5.98	105.6
60	70	49.48	0.67	1.00	33.36	3.80	130.1	488341	221725	246416	5.69	105.6
70	80	49.48	0.67	1.00	33.36	3.70	123.4	518377	253400	248977	6.08	105.6
80	90	49.48	0.67	1.00	33.36	3.50	116.8	560408	285075	275333	6.32	105.6
90	100	49.48	0.67	1.00	33.36	3.30	110.1	594432	316750	277682	6.37	105.6
100	110	49.48	0.67	1.00	33.36	3.00	100.1	600437	348425	252972	5.79	105.6
110	120	49.48	0.67	1.00	33.36	2.80	93.4	616448	380100	236348	5.43	105.6
120	130	49.48	0.67	1.00	33.36	2.70	90.1	648472	411775	236697	5.43	105.6
130	140	49.48	0.67	1.00	33.36	2.60	86.7	676492	443450	233042	5.35	105.6
140	150	49.48	0.67	1.00	33.36	2.40	80.1	672489	475125	197364	4.53	105.6

DETENTION CALCULATIONS - 100 Year

Storm Duration	Outflow Duration	Area (AC)	Future "C"	Future "KF"	Future "CA"	Rainfall Intensity	Inflow (cfs)	Volume (cu. ft.)	Volume (cu. ft.)	Volume (cu. ft.)	Volume (acre-ft.)	Outflow (cfs)
10	20	49.48	0.67	1.00	33.36	9.80	326.9	196143	63350	116781	2.68	118.9
20	30	49.48	0.67	1.00	33.36	8.30	276.9	332242	107036	225206	5.17	118.9
30	40	49.48	0.67	1.00	33.36	6.90	230.2	414301	142714	271567	6.23	118.9
40	50	49.48	0.67	1.00	33.36	5.80	193.5	464335	175933	285045	6.56	118.9
50	60	49.48	0.67	1.00	33.36	5.00	166.8	500364	214072	286292	6.57	118.9
60	70	49.48	0.67	1.00	33.36	4.50	150.1	540393	249750	290443	6.67	118.9
70	80	49.48	0.67	1.00	33.36	4.10	136.8	574419	285429	288989	6.63	118.9
80	90	49.48	0.67	1.00	33.36	3.90	130.1	624454	321107	303347	6.98	118.9
90	100</											