DETENTION CALCULATIONS - SOUTH TRIBUTARY UPSTREAM POND - INTERIM DESIGN

ALL CALCULATIONS ARE BASED ON THE POND BUILT IN STONE CREEK PHASE I. NO MODIFICATIONS TO THE EXISTING POND OR OUTFALL ARE NECESSARY BASED ON THESE CALCULATIONS.

ALLOWABLE RELEASE RATE CALCULATIONS

South Tributary Upstream Pond

2-Year Storm

Undeveloped Runoff Calculations

	Area	Area	Existing Runoff	Tc - Existing	Rainfall Intensity	Q - Undeveloped
Area #	(sf)	(acres)	Coefficient	(min)	(in/hr)	(cfs)
3	2951648	67.76	0.35	20	3.9	92.5
		67.76				**92.5**

Post-Development Runoff Calculations

	Area	Area	Existing Runoff	Tc - Existing	Rainfall Intensity	Q - Post Development	Difference between Pre and Post Development Conditions
Area #	(sf)	(acres)	Coefficient	(min)	(in/hr)	(cfs)	
7	3017581	69.3	0.41	10	5.3	149.4	
		69.27				**149.4**	**56.9**

10-Year Storm

Undeveloped Runoff Calculations

	Area	Area	Existing Runoff	Tc - Existing	Rainfall Intensity	Q - Undeveloped
Area #	(sf)	(acres)	Coefficient	(min)	(in/hr)	(cfs)
3	2951648	67.76	0.35	20	5.9	139.9
						139.9

Post-Development Runoff Calculations

	Area	Area	Existing Runoff	Tc - Existing	Rainfall Intensity	Q - Post Development	Difference between Pre and Post Development Conditions
Area #	(sf)	(acres)	Coefficient	(min)	(in/hr)	(cfs)	
7	3017581	69.3	0.41	10	7.1	200.1	
						200.1	**60.2**

25-Year Storm

Undeveloped Runoff Calculations

	Area	Area	Existing Runoff	Tc - Existing	Rainfall Intensity	Q - Undeveloped
Area #	(sf)	(acres)	Coefficient	(min)	(in/hr)	(cfs)
3	2951648	67.76	0.35	20	6.6	156.5
						156.5

Post-Development Runoff Calculations

	Area	Area	Existing Runoff	Tc - Existing	Rainfall Intensity	Q - Post Development	Difference between Pre and Post Development Conditions
Area #	(sf)	(acres)	Coefficient	(min)	(in/hr)	(cfs)	
4 (offsite)	892204	20.48	0.35	20	6.6	47.3	
7	3017581	69.3	0.41	10	8.3	233.9	
						281.2	**124.7**

50-Year Storm

Undeveloped Runoff Calculations

	Area	Area	Existing Runoff	Tc - Existing	Rainfall Intensity	Q - Undeveloped
Area #	(sf)	(acres)	Coefficient	(min)	(in/hr)	(cfs)
3	2951648	67.76	0.35	20	7.5	177.9
						177.9

Post-Development Runoff Calculations

	Area	Area	Existing Runoff	Tc - Existing	Rainfall Intensity	Q - Post Development	Difference between Pre and Post Development Conditions
Area #	(sf)	(acres)	Coefficient	(min)	(in/hr)	(cfs)	
7	3017581	69.3	0.41	10	9	253.6	
						253.6	**75.8**

100-Year Storm

Undeveloped Runoff Calculations

	Area	Area	Existing Runoff	Tc - Existing	Rainfall Intensity	Q - Undeveloped
Area #	(sf)	(acres)	Coefficient	(min)	(in/hr)	(cfs)
3	2951648	67.76	0.35	20	8.3	196.8
						196.8

Post-Development Runoff Calculations

	Area	Area	Existing Runoff	Tc - Existing	Rainfall Intensity	Q - Post Development	Difference between Pre and Post Development Conditions
Area #	(sf)	(acres)	Coefficient	(min)	(in/hr)	(cfs)	
7	3017581	69.3	0.41	10	9.8	276.2	
						276.2	**79.3**

DETENTION STORAGE REQUIREMENTS

DETENTION CALCULATIONS - 2 Year

Storm	Inflow	Area	Future	Future	Future	Rainfall	Inflow	Volume	Volume	Volume	Volume	Outflow
Duration	Duration	(AC.)	"C"	"Kf"	"CA"	intensity	(cfs)	(cubic ft.)	(cubic ft.)	(cubic ft.)	(acre-ft.)	(cfs)
10	20	69.27	0.41	1.00	28.18	5.30	149.4	89614	53843	**35771**	**0.82**	89.7
20	30	69.27	0.41	1.00	28.18	3.90	109.9	131885	80765	**51121**	**1.17**	89.7
30	40	69.27	0.41	1.00	28.18	3.30	93.0	167393	107686	**59707**	**1.37**	89.7
40	50	69.27	0.41	1.00	28.18	2.60	73.3	175847	134608	**41239**	**0.95**	89.7
50	60	69.27	0.41	1.00	28.18	2.30	64.8	194448	161530	**32917**	**0.76**	89.7
60	70	69.27	0.41	1.00	28.18	1.90	53.5	192756	188451	**4304**	**0.10**	89.7
70	80	69.27	0.41	1.00	28.18	1.80	50.7	213046	215373	**-2327**	**-0.05**	89.7
80	90	69.27	0.41	1.00	28.18	1.70	47.9	229954	242294	**-12340**	**-0.28**	89.7
90	100	69.27	0.41	1.00	28.18	1.60	45.1	243481	269216	**-25735**	**-0.59**	89.7

DETENTION CALCULATIONS - 10 Year

Storm	Inflow	Area	Future	Future	Future	Rainfall	Inflow	Volume	Volume	Volume	Volume	Outflow
Duration	Duration	(AC.)	"C"	"Kf"	"CA"	intensity	(cfs)	(cubic ft.)	(cubic ft.)	(cubic ft.)	(acre-ft.)	(cfs)
10	20	69.27	0.41	1.00	28.18	7.10	200.1	120050	58989	**61061**	**1.40**	98.3
20	30	69.27	0.41	1.00	28.18	5.90	166.3	199519	88483	**111036**	**2.55**	98.3
30	40	69.27	0.41	1.00	28.18	4.80	135.3	243481	117978	**125503**	**2.88**	98.3
40	50	69.27	0.41	1.00	28.18	4.00	112.7	270534	147472	**123062**	**2.83**	98.3
50	60	69.27	0.41	1.00	28.18	3.50	98.6	295897	176966	**118930**	**2.73**	98.3
60	70	69.27	0.41	1.00	28.18	3.00	84.5	304351	206461	**97890**	**2.25**	98.3
70	80	69.27	0.41	1.00	28.18	2.80	78.9	331404	235955	**95449**	**2.19**	98.3
80	90	69.27	0.41	1.00	28.18	2.60	73.3	351694	265450	**86245**	**1.98**	98.3
90	100	69.27	0.41	1.00	28.18	2.50	70.5	380439	294944	**85495**	**1.96**	98.3
100	110	69.27	0.41	1.00	28.18	2.30	64.8	388893	324439	**64454**	**1.48**	98.3

DETENTION CALCULATIONS - 25 Year

Storm	Inflow	Area	Future	Future	Future	Rainfall	Inflow	Volume	Volume	Volume	Volume	Outflow
Duration	Duration	(AC.)	"C"	"Kf"	"CA"	intensity	(cfs)	(cubic ft.)	(cubic ft.)	(cubic ft.)	(acre-ft.)	(cfs)
10	20	69.27	0.41	1.00	28.18	8.30	233.9	140340	93698	**46642**	**1.07**	156.2
20	30	69.27	0.41	1.00	28.18	6.60	186.0	223191	140547	**82644**	**1.90**	156.2
30	40	69.27	0.41	1.00	28.18	5.50	155.0	278988	187395	**91593**	**2.10**	156.2
40	50	69.27	0.41	1.00	28.18	4.60	129.6	311114	234244	**76870**	**1.76**	156.2
50	60	69.27	0.41	1.00	28.18	4.00	112.7	338168	281093	**57075**	**1.31**	156.2
60	70	69.27	0.41	1.00	28.18	3.50	98.6	355076	327942	**27134**	**0.62**	156.2
70	80	69.27	0.41	1.00	28.18	3.30	93.0	390584	374791	**15793**	**0.36**	156.2
80	90	69.27	0.41	1.00	28.18	3.10	87.4	419328	421640	**-2312**	**-0.05**	156.2
90	100	69.27	0.41	1.00	28.18	2.90	81.7	441309	468489	**-27180**	**-0.62**	156.2
100	110	69.27	0.41	1.00	28.18	2.70	76.1	456526	515337	**-58811**	**-1.35**	156.2

DETENTION CALCULATIONS - 50 Year

Storm	Inflow	Area	Future	Future	Future	Rainfall	Inflow	Volume	Volume	Volume	Volume	Outflow
Duration	Duration	(AC.)	"C"	"Kf"	"CA"	intensity	(cfs)	(cubic ft.)	(cubic ft.)	(cubic ft.)	(acre-ft.)	(cfs)
10	20	69.27	0.41	1.00	28.18	9.00	253.6	152175	103425	**48750**	**1.12**	172.4
20	30	69.27	0.41	1.00	28.18	7.50	211.4	253626	155138	**98488**	**2.26**	172.4
30	40	69.27	0.41	1.00	28.18	6.10	171.9	309423	206851	**102572**	**2.35**	172.4
40	50	69.27	0.41	1.00	28.18	5.20	146.5	351694	258564	**93131**	**2.14**	172.4
50	60	69.27	0.41	1.00	28.18	4.50	126.8	380439	310276	**70162**	**1.61**	172.4
60	70	69.27	0.41	1.00	28.18	3.90	109.9	395656	361989	**33667**	**0.77**	172.4
70	80	69.27	0.41	1.00	28.18	3.70	104.3	437927	413702	**24225**	**0.56**	172.4
80	90	69.27	0.41	1.00	28.18	3.50	98.6	473435	465415	**8020**	**0.18**	172.4
90	100	69.27	0.41	1.00	28.18	3.30	93.0	502179	517127	**-14948**	**-0.34**	172.4
100	110	69.27	0.41	1.00	28.18	3.00	84.5	507252	568840	**-61589**	**-1.41**	172.4

DETENTION CALCULATIONS - 100 Year

Storm	Inflow	Area	Future	Future	Future	Rainfall	Inflow	Volume	Volume	Volume	Volume	Outflow	
Duration	Duration	(AC.)	"C"	"Kf"	"CA"	intensity	(cfs)	(cubic ft.)	(cubic ft.)	(cubic ft.)	(acre-ft.)	(cfs)	
10	20	69.27	0.41	1.00	28.18	9.80	276.2	165702	117867	**47836**	**1.10**	196.4	
20	30	69.27	0.41	1.00	28.18	8.30	233.9	280679	176800	**103879**	**2.38**	196.4	
30	40	69.27	0.41	1.00	28.18	6.90	194.4	350004	235733	**114270**	**2.62**	196.4	←MAXIMUM STORAGE REQUIRED
40	50	69.27	0.41	1.00	28.18	5.80	163.4	392275	294666	**97608**	**2.24**	196.4	
50	60	69.27	0.41	1.00	28.18	5.00	140.9	422710	353600	**69110**	**1.59**	196.4	
60	70	69.27	0.41	1.00	28.18	4.50	126.8	456526	412533	**43994**	**1.01**	196.4	
70	80	69.27	0.41	1.00	28.18	4.00	112.7	473435	471466	**1969**	**0.05**	196.4	
80	90	69.27	0.41	1.00	28.18	3.70	104.3	500488	530399	**-29911**	**-0.69**	196.4	
90	100	69.27	0.41	1.00	28.18	3.50	98.6	532614	589333	**-56719**	**-1.30**	196.4	

DETENTION POND RELEASE RATE CALCULATIONS

Elevation Calculations Based on Actual Release Rate

Event	Maximum Actual Release Rate	Storage Requirement	Occurs at Elevation
2-year	89.7	59707	515.63
10-year	98.3	125503	517.80
25-year	156.2	91593	516.81
50-year	172.4	102572	517.06
100-year	196.4	114270	517.43

Release Rate Calculations Based on Above Table - 9' Weir

Stage	H	Weir Length	Discharge	Allowable Discharge	Above (Below)	
513.00	0.00	8.00	0.0			
514.00	1.00	8.00	21.0			
515.00	2.00	8.00	59.5			
515.63	2.63	8.00	89.7	92.5	(2.75)	2-year
515.80	2.79	8.00	98.3	139.9	(41.61)	10-year
516.00	3.00	8.00	109.3			
516.81	3.80	8.00	156.2	156.5	(0.36)	25-year
517.06	4.06	8.00	172.4	177.9	(5.50)	50-year
517.43	4.43	8.00	196.4	196.8	(0.40)	100-year
518.00	5.00	8.00	235.2			
519.00	6.00	8.00	309.2			

AS-BUILT AUGUST 2012
BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY CONTRACTORS

STATE OF TEXAS
BRANDON DAVIDSON
87682
REGISTERED PROFESSIONAL ENGINEER
8/16/12

The seal appearing on this document was authorized by Brandon Davidson P.E. 87682, on August 16, 2012

NO.	REVISIONS	BY	DATE

CORWIN ENGINEERING, INC.
200 W. BELMONT, SUITE E
ALLEN, TEXAS 75013 (972) 396-1200

CONSTRUCTION PLANS FOR
STONE CREEK
PHASE IIA
ROCKWALL, TEXAS

DETENTION CALCULATIONS

DRAWN BY	DESIGNED BY	CHECKED BY	SHEET NO.
BDD	BDD	BDD	4 OF 11
JOB NUMBER	DATE	SCALE:	
11009	APRIL 2011	NTS	