

STORM SEWER CALCULATIONS

Upstream Station	Downstream Station	Distance (ft)	AREA NO.	Total Area (Acres)	Picked Up (Acres)	C	CA	Accumulated CA	Tc (Min)	Design Storm (Years)	I (in/hr)	Q (CFS)	S (ft)	Pipe Size (in)	Velocity (fps)	Head Loss (ft)	Flow Time (Min)	Time at D/S (Min)	Δ Velocity Head (ft)	Hydraulic Grade Upstream	Hydraulic Grade Downstream	Proposed Grade
0+76.04	0+00.00	76.04	Pond	28.03	28.03	0.35	9.81	9.81	20.00	100	8.30	68.1	0.0017	5X3	4.7	0.34	0.27	20.27	0.34	498.97	498.63	
11+25.60	11+05.00	20.60	6	1.75	1.75	0.50	0.88	0.88	10.00	100	9.80	8.6	0.0015	24	2.7	0.11	0.13	10.13	0.11		530.77	533.79
10+73.56	10+50.33	23.23	D3	7.19	7.19	0.50	0.54	1.42	10.13	100	9.78	13.9	0.0039	24	4.4	0.30	0.12	10.25	0.19	530.74	530.55	533.79
10+50.33	6+35.68	14.65	19	0.97	0.97	0.50	0.49	5.50	10.62	100	9.70	53.4	0.0169	30	10.9	1.84	0.33	10.95	0.29	512.63	512.34	
6+35.68	2+99.64	337.04	7.0	2.50	2.20	0.50	1.14	6.64	10.95	100	9.65	84.1	0.0092	36	9.1	1.29	0.52	11.57	-0.28	508.72	509.00	521.55
2+99.64	1+01.96	197.68	D4	2.52	2.73	0.50	1.37	8.01	11.57	100	9.55	76.5	0.0058	42	8.0	0.99	0.41	11.98	-0.15	505.89	506.04	
1+01.96	0+78.99	22.97	D5.17	13.93	13.62	0.50	6.81	14.82	11.98	100	9.48	140.5	0.0051	54	8.8	1.20	0.04	12.02	0.21	504.89	504.68	509.92
0+78.99	0+22.59	56.40	18	0.95	0.95	0.50	0.48	15.30	12.02	100	9.48	145.0	0.0054	54	9.1	1.29	0.10	12.12	0.09	504.57	504.48	509.92
0+22.59																				504.17		
7+33.55	7+33.55	24.73	2	1.69	1.59	0.50	0.80	0.80	10.00	100	9.80	7.8	0.0056	18	4.4	0.30	0.09	10.09	0.30		534.10	537.18
0+48.27	0+00.00	48.27	3	2.41	2.52	0.50	1.26	3.60	12.57	100	9.39	39.8	0.0068	30	6.9	0.74	0.12	12.69	0.43	531.21	531.22	533.57
0+48.27	0+00.00	48.27	3	2.41	2.52	0.50	1.26	3.60	12.57	100	9.39	39.8	0.0068	30	6.9	0.74	0.12	12.69	0.43	531.19	530.76	533.57
0+00.00																				530.43		
1+06.88	0+89.23	17.65	9	1.54	1.54	0.50	0.77	0.77	10.00	100	9.80	7.6	0.0011	24	2.4	0.09	0.12	10.12	0.09		505.92	508.14
0+89.23	0+00.00	89.23	10	0.97	1.19	0.50	0.60	1.37	10.12	100	9.78	13.4	0.0035	24	4.3	0.29	0.35	10.47	0.20	505.90	505.70	508.14
0+00.00															8.0	0.99	0.00	0.00	0.70	505.99		
4+44.54	4+44.54	28.88	15	2.38	2.06	0.50	1.03	1.03	10.00	100	9.80	10.1	0.0082	18	5.7	0.50	0.08	10.08	0.50		510.40	512.79
4+44.54	0+93.75	350.79	16	1.85	1.85	0.50	0.92	1.95	10.08	100	9.79	19.1	0.0071	24	6.1	0.58	0.36	11.04	0.08	510.14	510.06	513.87
0+93.75	0+00.00	93.75	D6	8.08	7.85	0.50	3.93	5.88	11.04	100	9.63	56.6	0.0072	36	8.0	0.99	0.20	11.24	0.41	507.56	505.57	
0+00.00															8.8	1.20	0.00	0.00	0.21	504.89	504.68	509.92
8+77.36	2+74.05	603.31	11.12	3.85	3.81	0.50	1.91	1.91	10.00	100	9.80	18.7	0.0068	24	6.0	0.56	1.68	11.68	0.56		515.47	535.98
2+74.05	0+53.05	221.00	13	2.13	2.00	0.50	1.00	2.91	11.68	100	9.53	27.7	0.0150	24	8.8	1.20	0.42	12.10	0.64	511.34	510.70	518.93
0+53.05	0+00.00	53.05	14	2.10	2.04	0.50	1.02	3.93	12.10	100	9.46	37.2	0.0270	24	11.8	2.16	0.07	12.17	0.96	507.38	506.42	511.62
0+00.00															8.0	0.99	0.00	0.00	-0.59	504.99	505.57	
5+71.39	0+18.64	552.75	EX2.24	14.61	14.61	0.35	5.17	5.17	20.00	100	8.30	42.9	0.0041	36	6.1	0.58	1.51	21.51	0.58		500.87	502.50
0+18.64	0+00.00	18.64	0	0.00	0.00	0.00	0.00	5.17	20.00	100	8.30	42.9	0.0007	5X3	3.0	0.14	0.10	20.10	0.07	498.58	498.51	505.50
0+00.00																				498.50		

EXISTING INLET CAPACITY ANALYSIS

No.	Inlet Location	Freq. (years)	Tc (min)	"I" (in/hr)	Coeff. "C"	"A" (acres)	Q (cfs)	Upstream (cfs)	Flow (cfs)	Capacity (cfs)	Slope (ft/100ft)	Crown Type	Length (ft)	Capacity (cfs)	Downstream Inlet (cfs)	
Pre-Project																
J3	223+50 John King	100	10	9.8	0.9	0.70	6.2	0.0	6.2	20.0	0.80%	6" pbl	15	REC.	10.0	0.0
J4	222+42 John King	100	10	9.8	0.9	0.28	2.5	0.0	2.5	20.0	-	6" pbl	15	REC.	32.0	0.0
J5	219+50 John King	100	10	9.8	0.9	0.76	6.7	0.0	6.7	41.0	4.36%	6" pbl	15	REC.	8.1	0.0
J6	221+50 John King	100	10	9.8	0.9	0.28	2.4	0.0	2.4	32.0	2.00%	6" pbl	15	REC.	9.0	0.0
Post-Project																
J3	223+50 John King	100	10	9.8	0.64	1.97	12.4	0.0	12.4	18.4	0.80%	6" pbl	15	STD.	10.0	2.4
J4	222+42 John King	100	10	9.8	0.61	0.98	5.9	2.4	8.3	18.4	-	6" pbl	15	STD.	32.0	0.0
J5	219+50 John King	100	10	9.8	0.50	0.76	6.7	0.0	6.7	42.9	4.36%	6" pbl	15	STD.	8.1	0.0
J6	221+50 John King	100	10	9.8	0.70	0.51	3.6	0.0	3.6	29.0	2.00%	6" pbl	15	STD.	9.0	0.0

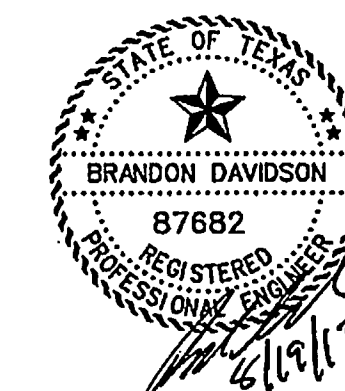
EXISTING CULVERT CAPACITY ANALYSIS

Upstream Station	Downstream Station	Distance (ft)	AREA NO.	Total Area (Acres)	Picked Up (Acres)	C	CA	Accumulated CA	Tc (Min)	Design Storm (Years)	I (in/hr)	Q (CFS)	S (ft)	Pipe Size (in)	Velocity (fps)	Head Loss (ft)	Flow Time (Min)	Time at D/S (Min)	Δ Velocity Head (ft)	Hydraulic Grade Upstream	Hydraulic Grade Downstream	Proposed Grade	
0+00.00																							
Ex. 2'-5"x3' Box Culvert in John King																							
North Box																							
1+66.00	0+00.00	166.00	Pond	28.03	28.03	0.35	9.81	9.81	20.00	100	8.30	68.1	0.0017	5x3	4.7	0.34	0.59	20.59	0.34	498.39	498.05	0.00	
0+00.00																					497.76		
South Box																							
1+66.00	0+70.00	96.00	22-26, EX2	16.81	16.81	0.37	5.27	5.27	20.00	100	8.30	52.0	0.0010	5x3	3.6	0.20	0.44	20.44	0.20		498.39	497.95	0.00
0+70.00	0+00.00	70.00	Line J	4.45	4.45	0.50	4.01	10.28	20.44	100	8.30	85.3	0.0027	5x3	5.9	0.54	0.20	20.64	0.34	498.29	497.95	0.00	

THE CALCULATED HYDRAULIC GRADE LINES FOR BOTH CULVERTS ARE BELOW THE TOP OF THE BOX AT THE UPSTREAM END THEREFORE THE BOXES HAVE ADEQUATE CAPACITY

RELEASED FOR CONSTRUCTION  
 ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN  
 REMAINS WITH THE DESIGN ENGINEER. THE CITY  
 OF ROCKWALL, IN REVIEWING AND RELEASING  
 PLANS FOR CONSTRUCTION, ASSUMES NO  
 RESPONSIBILITY FOR ADEQUACY OR ACCURACY  
 OF DESIGN.

CITY \_\_\_\_\_ DATE \_\_\_\_\_



The seal appearing on  
 this document was  
 authorized by  
 Brandon Davidson  
 P.E. 87682, on  
 August 19, 2013

AS-BUILT JULY 2014  
 INFORMATION PROVIDED BY CONTRACTORS  
 (NOT FIELD VERIFIED)

CORWIN ENGINEERING, INC. 200 W. BELMONT, SUITE E ALLEN, TEXAS 75013 (972)396-1200 TBPE FIRM #5951			
DEVELOPMENT PLANS FOR BREEZY HILL PHASE 2 ROCKWALL, TEXAS			
STORM SEWER CALCULATIONS			
DRAWN BY	DESIGNED BY	CHECKED BY	SHEET NO.
JOB NUMBER	DATE	SCALE:	5 of 25
13022	MAY 2013		