100 YEAR STORM EVENT

EXISTING DRAINAGE CRITERIA
ON-SITE GOING WEST ONLY
EXISTING EX 3, SEE SHEET C3.1
Q = CIA
A = 12.53 Acres
C = 0.35
Tc = 20 minutes
I_{100}= 8.30 in/hr
Q_{100}= 36.40 cfs (ALLOWABLE SITE DISCHARGE TO WEST)

PROPOSED DRAINAGE CRITERIA
Q = CIA
A = 14.47 Acres
C = 0.90
Tc = 10 minutes
I_{100}= 9.80 in/hr
Q_{100}= 127.63 cfs (DEVELOPED)

AREA THAT BY-PASSES DETENTION = 0.21 acres (DA 31)
Q_{100} THAT BY-PASSES DETENTION = 1.85 cfs
ALLOWABLE Q FROM DETENTION = 34.55 cfs

5 YEAR STORM EVENT

EXISTING DRAINAGE CRITERIA
ON-SITE GOING WEST ONLY
EXISTING EX 3, SEE SHEET C3.1
Q = CIA
A = 12.53 Acres
C = 0.35
Tc = 20 minutes
I_5= 4.90 in/hr
Q_5= 21.49 cfs (ALLOWABLE SITE DISCHARGE TO WEST)

PROPOSED DRAINAGE CRITERIA
Q = CIA
A = 14.47 Acres
C = 0.90
Tc = 10 minutes
I_5= 6.20 in/hr
Q_5= 80.74 cfs (DEVELOPED)

AREA THAT BY-PASSES DETENTION = 0.21 acres (DA 31)
Q_5 THAT BY-PASSES DETENTION = 1.17 cfs
ALLOWABLE Q FROM DETENTION = 20.32 cfs

10 YEAR STORM EVENT

EXISTING DRAINAGE CRITERIA
ON-SITE GOING WEST ONLY
EXISTING EX 3, SEE SHEET C3.1
Q = CIA
A = 12.53 Acres
C = 0.35
Tc = 20 minutes
I_{10} = 5.90 in/hr
Q_{10} = 25.87 cfs (ALLOWABLE SITE DISCHARGE TO WEST)

PROPOSED DRAINAGE CRITERIA
Q = CIA
A = 14.47 Acres
C = 0.90
Tc = 10 minutes
I_{10} = 7.10 in/hr
Q_{10} = 92.46 cfs (DEVELOPED)

AREA THAT BY-PASSES DETENTION = 0.21 acres (DA 31)
Q_{10} THAT BY-PASSES DETENTION = 1.34 cfs
ALLOWABLE Q FROM DETENTION = 24.53 cfs

25 YEAR STORM EVENT

EXISTING DRAINAGE CRITERIA
ON-SITE GOING WEST ONLY
EXISTING EX 3, SEE SHEET C3.1
Q = CIA
A = 12.53 Acres
C = 0.35
Tc = 20 minutes
I_{25} = 6.70 in/hr
Q_{25} = 29.38 cfs (ALLOWABLE SITE DISCHARGE TO WEST)

PROPOSED DRAINAGE CRITERIA
Q = CIA
A = 14.47 Acres
C = 0.90
Tc = 10 minutes
I_{25} = 8.30 in/hr
Q_{25} = 108.09 cfs (DEVELOPED)

AREA THAT BY-PASSES DETENTION = 0.21 acres (DA 31)
Q_{25} THAT BY-PASSES DETENTION = 1.57 cfs
ALLOWABLE Q FROM DETENTION = 27.81 cfs

CITY OF **ROCKWALL** DETENTION BASIN DESIGN - EAST SIDE
TP 40 - 100 YEAR

GIVEN:

Area =	14.26	
Prop C =	0.90	
Prop Tc =	10.00	min
Max Q =	34.55	cfs
Prop Q out	34.55	cfs

RESULT:
Maximum
Required Storage = **147,799** cf
Provided Storage = 150,090 cf

100 Year

5 min.	I=	10.15	Q=	0.9	x	10.150	x	14.26	=	130.27	cfs
10 min.	I=	9.80	Q=	0.9	x	9.800	x	14.26	=	125.77	cfs
15 min.	I=	9.00	Q=	0.9	x	9.000	x	14.26	=	115.51	cfs
20 min.	I=	8.30	Q=	0.9	x	8.300	x	14.26	=	106.52	cfs
30 min.	I=	6.90	Q=	0.9	x	6.900	x	14.26	=	88.55	cfs
40 min.	I=	5.70	Q=	0.9	x	5.700	x	14.26	=	73.15	cfs
50 min.	I=	5.00	Q=	0.9	x	5.000	x	14.26	=	64.17	cfs
60 min.	I=	4.50	Q=	0.9	x	4.500	x	14.26	=	57.75	cfs
70 min.	I=	4.00	Q=	0.9	x	4.000	x	14.26	=	51.34	cfs
80 min.	I=	3.70	Q=	0.9	x	3.700	x	14.26	=	47.49	cfs
90 min.	I=	3.50	Q=	0.9	x	3.500	x	14.26	=	44.92	cfs
100 min.	I=	3.40	Q=	0.9	x	3.400	x	14.26	=	43.64	cfs
110 min.	I=	3.20	Q=	0.9	x	3.200	x	14.26	=	41.07	cfs
120 min.	I=	2.70	Q=	0.9	x	2.700	x	14.26	=	34.65	cfs

5	min Storm	In	5	x	130.27	x	60	=		39,080	cf
		Out	0.5	x	15	x	34.55	x	60	=	15,548	cf
									Storage	=	23,532	cf
10	min Storm	In	10	x	125.77	x	60	=		75,464	cf
		Out	0.5	x	20	x	34.55	x	60	=	20,730	cf
									Storage	=	54,734	cf
15	min Storm	In	15	x	115.51	x	60	=		103,955	cf
		Out	0.5	x	25	x	34.55	x	60	=	25,913	cf
									Storage	=	78,043	cf
20	min Storm	In	20	x	106.52	x	60	=		127,827	cf
		Out	0.5	x	30	x	34.55	x	60	=	31,095	cf
									Storage	=	96,732	cf
30	min Storm	In	30	x	88.55	x	60	=		159,398	cf
		Out	0.5	x	40	x	34.55	x	60	=	41,460	cf
									Storage	=	117,938	cf
40	min Storm	In	40	x	73.15	x	60	=		175,569	cf
		Out	0.5	x	50	x	34.55	x	60	=	51,825	cf
									Storage	=	123,744	cf
50	min Storm	In	50	x	64.17	x	60	=		192,510	cf
		Out	0.5	x	60	x	34.55	x	60	=	62,190	cf
									Storage	=	130,320	cf
60	min Storm	In	60	x	57.75	x	60	=		207,911	cf
		Out	0.5	x	70	x	34.55	x	60	=	72,555	cf
									Storage	=	135,356	cf
70	min Storm	In	70	x	51.34	x	60	=		215,611	cf
		Out	0.5	x	80	x	34.55	x	60	=	82,920	cf
									Storage	=	132,691	cf
80	min Storm	In	80	x	47.49	x	60	=		227,932	cf
		Out	0.5	x	90	x	34.55	x	60	=	93,285	cf
									Storage	=	134,647	cf
90	min Storm	In	90	x	44.92	x	60	=		242,563	cf
		Out	0.5	x	100	x	34.55	x	60	=	103,650	cf
									Storage	=	138,913	cf
100	min Storm	In	100	x	43.64	x	60	=		261,814	cf
		Out	0.5	x	110	x	34.55	x	60	=	114,015	cf
									Storage	=	147,799	cf
110	min Storm	In	110	x	41.07	x	60	=		271,054	cf
		Out	0.5	x	120	x	34.55	x	60	=	124,380	cf
									Storage	=	146,674	cf
120	min Storm	In	120	x	34.65	x	60	=		249,493	cf
		Out	0.5	x	130	x	34.55	x	60	=	134,745	cf
									Storage	=	114,748	

CITY OF **ROCKWALL** DETENTION BASIN DESIGN - EAST SIDE
TP 40 - 5 YEAR

GIVEN:

Area =	14.26	
Prop C =	0.90	
Prop Tc =	10.00	min
Max Q =	20.32	cfs
Prop Q out	20.19	cfs

RESULT:
Maximum
Required Storage = **86,823** cf
Provided Storage = 87,050 cf

5 Year

5 min.	I=	7.20	Q=	0.9	x	7.20	x	14.26	=	92.40	cfs
10 min.	I=	6.20	Q=	0.9	x	6.20	x	14.26	=	79.57	cfs
15 min.	I=	5.50	Q=	0.9	x	5.50	x	14.26	=	70.59	cfs
20 min.	I=	4.90	Q=	0.9	x	4.90	x	14.26	=	62.89	cfs
30 min.	I=	4.10	Q=	0.9	x	4.10	x	14.26	=	52.62	cfs
40 min.	I=	3.40	Q=	0.9	x	3.40	x	14.26	=	43.64	cfs
50 min.	I=	2.90	Q=	0.9	x	2.90	x	14.26	=	37.22	cfs
60 min.	I=	2.60	Q=	0.9	x	2.60	x	14.26	=	33.37	cfs
70 min.	I=	2.40	Q=	0.9	x	2.400	x	14.26	=	30.80	cfs
80 min.	I=	2.30	Q=	0.9	x	2.300	x	14.26	=	29.52	cfs
90 min.	I=	2.10	Q=	0.9	x	2.100	x	14.26	=	26.95	cfs
100 min.	I=	1.90	Q=	0.9	x	1.900	x	14.26	=	24.38	cfs
110 min.	I=	1.80	Q=	0.9	x	1.800	x	14.26	=	23.10	cfs
120 min.	I=	1.60	Q=	0.9	x	1.600	x	14.26	=	20.53	cfs

5	min Storm	In	5	x	92.40	x	60	=		27,721	cf
		Out	0.5	x	15	x	20.32	x	60	=	9,144	cf
									Storage	=	18,577	cf
10	min Storm	In	10	x	79.57	x	60	=		47,742	cf
		Out	0.5	x	20	x	20.32	x	60	=	12,192	cf
									Storage	=	35,550	cf
15	min Storm	In	15	x	70.59	x	60	=		63,528	cf
		Out	0.5	x	25	x	20.32	x	60	=	15,240	cf
									Storage	=	48,288	cf
20	min Storm	In	20	x	62.89	x	60	=		75,464	cf
		Out	0.5	x	30	x	20.32	x	60	=	18,288	cf
									Storage	=	57,176	cf
30	min Storm	In	30	x	52.62	x	60	=		94,715	cf
		Out	0.5	x	40	x	20.32	x	60	=	24,384	cf
									Storage	=	70,331	cf
40	min Storm	In	40	x	43.64	x	60	=		104,725	cf
		Out	0.5	x	50	x	20.32	x	60	=	30,480	cf
									Storage	=	74,245	cf
50	min Storm	In	50	x	37.22	x	60	=		111,656	cf
		Out	0.5	x	60	x	20.32	x	60	=	36,576	cf
									Storage	=	75,080	cf
60	min Storm	In	60	x	33.37	x	60	=		120,126	cf
		Out	0.5	x	70	x	20.32	x	60	=	42,672	cf
									Storage	=	77,454	cf
70	min Storm	In	70	x	30.80	x	60	=		129,367	cf
		Out	0.5	x	80	x	20.32	x	60	=	48,768	cf
									Storage	=	80,599	cf
80	min Storm	In	80	x	29.52	x	60	=		141,687	cf
		Out	0.5	x	90	x	20.32	x	60	=	54,864	cf
									Storage	=	86,823	cf
90	min Storm	In	90	x	26.95	x	60	=		145,538	cf
		Out	0.5	x	100	x	20.32	x	60	=	60,960	cf
									Storage	=	84,578	cf
100	min Storm	In	100	x	24.38	x	60	=		146,308	cf
		Out	0.5	x	110	x	20.32	x	60	=	67,056	cf
									Storage	=	79,252	cf
110	min Storm	In	110	x	23.10	x	60	=		152,468	cf
		Out	0.5	x	120	x	20.32	x	60	=	73,152	cf
									Storage	=	79,316	cf
120	min Storm	In	120	x	20.53	x	60	=		147,848	cf
		Out	0.5	x	130	x	20.32	x	60	=	79,248	cf
									Storage	=	68,600	cf

CITY OF **ROCKWALL** DETENTION BASIN DESIGN - EAST SIDE
TP 40 - 10 YEAR

GIVEN:

Area =	14.26	
Prop C =	0.90	
Prop Tc =	10.00	min
Max Q =	24.53	cfs
Prop Q out	23.55	cfs

RESULT:
Maximum
Required Storage = **93,937** cf
Provided Storage = 94,180 cf

10 Year

5 min.	I=	8.20	Q=	0.9	x	8.20	x	14.26	=	105.24	cfs
10 min.	I=	7.10	Q=	0.9	x	7.10	x	14.26	=	91.12	cfs
15 min.	I=	6.50	Q=	0.9	x	6.50	x	14.26	=	83.42	cfs
20 min.	I=	5.90	Q=	0.9	x	5.90	x	14.26	=	75.72	cfs
30 min.	I=	4.70	Q=	0.9	x	4.70	x	14.26	=	60.32	cfs
40 min.	I=	4.00	Q=	0.9	x	4.00	x	14.26	=	51.34	cfs
50 min.	I=	3.40	Q=	0.9	x	3.40	x	14.26	=	43.64	cfs
60 min.	I=	3.00	Q=	0.9	x	3.00	x	14.26	=	38.50	cfs
70 min.	I=	2.80	Q=	0.9	x	2.800	x	14.26	=	35.94	cfs
80 min.	I=	2.60	Q=	0.9	x	2.600	x	14.26	=	33.37	cfs
90 min.	I=	2.40	Q=	0.9	x	2.400	x	14.26	=	30.80	cfs
100 min.	I=	2.20	Q=	0.9	x	2.200	x	14.26	=	28.23	cfs
110 min.	I=	2.00	Q=	0.9	x	2.000	x	14.26	=	25.67	cfs
120 min.	I=	1.80	Q=	0.9	x	1.800	x	14.26	=	23.10	cfs

5	min Storm	In	5	x	105.24	x	60	=		31,572	cf
		Out	0.5	x	15	x	24.53	x	60	=	11,039	cf
									Storage	=	20,533	cf
10	min Storm	In	10	x	91.12	x	60	=		54,673	cf
		Out	0.5	x	20	x	24.53	x	60	=	14,718	cf
									Storage	=	39,955	cf
15	min Storm	In	15	x	83.42	x	60	=		75,079	cf
		Out	0.5	x	25	x	24.53	x	60	=	18,398	cf
									Storage	=	56,681	cf
20	min Storm	In	20	x	75.72	x	60	=		90,865	cf
		Out	0.5	x	30	x	24.53	x	60	=	22,077	cf
									Storage	=	68,788	cf
30	min Storm	In	30	x	60.32	x	60	=		108,576	cf
		Out	0.5	x	40	x	24.53	x	60	=	29,436	cf
									Storage	=	79,140	cf
40	min Storm	In	40	x	51.34	x	60	=		123,206	cf
		Out	0.5	x	50	x	24.53	x	60	=	36,795	cf
									Storage	=	86,411	cf
50	min Storm	In	50	x	43.64	x	60	=		130,907	cf
		Out	0.5	x	60	x	24.53	x	60	=	44,154	cf
									Storage	=	86,753	cf
60	min Storm	In	60	x	38.50	x	60	=		138,607	cf
		Out	0.5	x	70	x	24.53	x	60	=	51,513	cf
									Storage	=	87,094	cf
70	min Storm	In	70	x	35.94	x	60	=		150,928	cf
		Out	0.5	x	80	x	24.53	x	60	=	58,872	cf
									Storage	=	92,056	cf
80	min Storm	In	80	x	33.37	x	60	=		160,168	cf
		Out	0.5	x	90	x	24.53	x	60	=	66,231	cf
									Storage	=	93,937	cf
90	min Storm	In	90	x	30.80	x	60	=		166,329	cf
		Out	0.5	x	100	x	24.53	x	60	=	73,590	cf
									Storage	=	92,739	cf
100	min Storm	In	100	x	28.23	x	60	=		169,409	cf
		Out	0.5	x	110	x	24.53	x	60	=	80,949	cf
									Storage	=	88,460	cf
110	min Storm	In	110	x	25.67	x	60	=		169,409	cf
		Out	0.5	x	120	x	24.53	x	60	=	88,308	cf
									Storage	=	81,101	cf
120	min Storm	In	120	x	23.10	x	60	=		166,329	cf
		Out	0.5	x	130	x	24.53	x	60	=	95,667	cf
									Storage	=	70,662	cf

CITY OF **ROCKWALL** DETENTION BASIN DESIGN - EAST SIDE
TP 40 - 25 YEAR

GIVEN:

Area =	14.26	
Prop C =	0.90	
Prop Tc =	10.00	min
Max Q =	27.81	cfs
Prop Q out	25.06	cfs

RESULT:
Maximum
Required Storage = **111,135** cf
Provided Storage = 111,430 cf

25 Year

5 min.	I=	9.30	Q=	0.9	x	9.30	x	14.26	=	119.36	cfs
10 min.	I=	8.30	Q=	0.9	x	8.30	x	14.26	=	106.52	cfs
15 min.	I=	7.40	Q=	0.9	x	7.40	x	14.26	=	94.97	cfs
20 min.	I=	6.70	Q=	0.9	x	6.70	x	14.26	=	85.99	cfs
30 min.	I=	5.50	Q=	0.9	x	5.50	x	14.26	=	70.59	cfs
40 min.	I=	4.60	Q=	0.9	x	4.60	x	14.26	=	59.04	cfs
50 min.	I=	4.00	Q=	0.9	x	4.00	x	14.26	=	51.34	cfs
60 min.	I=	3.50	Q=	0.9	x	3.50	x	14.26	=	44.92	cfs
70 min.	I=	3.30	Q=	0.9	x	3.300	x	14.26	=	42.35	cfs
80 min.	I=	3.00	Q=	0.9	x	3.000	x	14.26	=	38.50	cfs
90 min.	I=	2.80	Q=	0.9	x	2.800	x	14.26	=	35.94	cfs
100 min.	I=	2.60	Q=	0.9	x	2.600	x	14.26	=	33.37	cfs
110 min.	I=	2.40	Q=	0.9	x	2.400	x	14.26	=	30.80	cfs
120 min.	I=	2.20	Q=	0.9	x	2.200	x	14.26	=	28.23	cfs

5	min Storm	In	5	x	119.36	x	60	=		35,807	cf
		Out	0.5	x	15	x	27.81	x	60	=	12,515	cf
									Storage	=	23,292	cf
10	min Storm	In	10	x	106.52	x	60	=		63,913	cf
		Out	0.5	x	20	x	27.81	x	60	=	16,686	cf
									Storage	=	47,227	cf
15	min Storm	In	15	x	94.97	x	60	=		85,474	cf
		Out	0.5	x	25	x	27.81	x	60	=	20,858	cf
									Storage	=	64,617	cf
20	min Storm	In	20	x	85.99	x	60	=		103,185	cf
		Out	0.5	x	30	x	27.81	x	60	=	25,029	cf
									Storage	=	78,156	cf
30	min Storm	In	30	x	70.59	x	60	=		127,057	cf
		Out	0.5	x	40	x	27.81	x	60	=	33,372	cf
									Storage	=	93,685	cf
40	min Storm	In	40	x	59.04	x	60	=		141,687	cf
		Out	0.5	x	50	x	27.81	x	60	=	41,715	cf
									Storage	=	99,972	cf
50	min Storm	In	50	x	51.34	x	60	=		154,008	cf
		Out	0.5	x	60	x	27.81	x	60	=	50,058	cf
									Storage	=	103,950	cf
60	min Storm	In	60	x	44.92	x	60	=		161,708	cf
		Out	0.5	x	70	x	27.81	x	60	=	58,401	cf
									Storage	=	103,307	cf
70	min Storm	In	70	x	42.35	x	60	=		177,879	cf
		Out	0.5	x	80	x	27.81	x	60	=	66,744	cf
									Storage	=	111,135	cf
80	min Storm	In	80	x	38.50	x	60	=		184,810	cf
		Out	0.5	x	90	x	27.81	x	60	=	75,087	cf
									Storage	=	109,723	cf
90	min Storm	In	90	x	35.94	x	60	=		194,050	cf
		Out	0.5	x	100	x	27.81	x	60	=	83,430	cf
									Storage	=	110,620	cf
100	min Storm	In	100	x	33.37	x	60	=		200,210	cf
		Out	0.5	x	110	x	27.81	x	60	=	91,773	cf
									Storage	=	108,437	cf
110	min Storm	In	110	x	30.80	x	60	=		203,291	cf
		Out	0.5	x	120	x	27.81	x	60	=	100,116	cf
									Storage	=	103,175	cf
120	min Storm	In	120	x	28.23	x	60	=		203,291	cf
		Out	0.5	x	130	x	27.81	x	60	=	108,459	cf
									Storage	=	94,832	cf

RECORD DRAWING

THE SIGNED AND SEALED CONSTRUCTION DOCUMENT HAS BEEN REVISED TO REFLECT CONSTRUCTION RECORDS MAINTAINED AND PROVIDED BY THE CONTRACTOR FOR THIS PROJECT. THE INFORMATION SHOWN ON THIS RECORD DRAWING, WHICH WAS PROVIDED BY THE CONTRACTOR, OR OTHERS NOT ASSOCIATED WITH THE DESIGN ENGINEER, CANNOT BE VERIFIED FOR ACCURACY OR COMPLETENESS. PACHECO KOCH SHALL ASSUME NO LIABILITY FOR ANY CHANGES MADE DURING CONSTRUCTION THAT WERE NOT SPECIFICALLY APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION. THE SEALED CONSTRUCTION DRAWINGS ARE ON FILE AT THE OFFICES OF PACHECO KOCH.

ATTESTED BY:
SIGNATURE: _____
ENGINEER OF RECORD: CHET LEUGERS, P.E.
CONTRACTOR: MILLER-VALENTINE CONSTRUCTION
DATE REVISED: 06/08/2017

NO.	DATE	REVISION
1	06/09/2017	RECORD DRAWINGS

Pacheco Koch
7557 RAMBLER ROAD, SUITE 1400
DALLAS, TX 75231 972.235.3031
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10193805

DETENTION CALCULATIONS SHEET
ROCKWALL MANUFACTURING FACILITY
LOT 1, BLOCK A, ROCKWALL
TECHNOLOGY PARK, PHASE IV
CITY OF ROCKWALL, ROCKWALL COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
CTL	RHB	JULY 2016	N.T.S.			C3.3

Rockwall Manufacturing Facility

Case Number: SP2016-12