RANKIN
5 YR STORM CALCULATIONS
Present Conditions
Q=CIA

A =	0.26
C =	0.5
Tc =	10
I5 =	6.1
Q5 =	0.793

Future Conditions (Developed)		Offsite Conditions (Undeveloped)		Bypass	
A =	0.26	A =	0.06	A=	0.02
Aadj=	0.24				
C =	0.9	C =	0.5	C=	0.9
Tc =	10	Tc =	10	Tc=	10
I5 =	6.1	I5 =	6.1	I5 =	6.1
Q5 =	1.4274	Q5 =	0.183	Q5 =	0.1098

Flow for Storm Durations (Developed)				Flow for Storm Durations (Offsite)			
Time	I	C	Q	Time	I	C	Q
10 min	6.1	0.9	1.3176	10 min	6.1	0.5	0.183
15 min	5.5	0.9	1.188	15 min	5.5	0.5	0.165
20 min	5	0.9	1.08	20 min	5	0.5	0.15
30 min	4	0.9	0.864	30 min	4	0.5	0.12
40 min	3.4	0.9	0.7344	40 min	3.4	0.5	0.102
50 min	2.9	0.9	0.6264	50 min	2.9	0.5	0.087
60 min	2.6	0.9	0.5616	60 min	2.6	0.5	0.078
70 min	2.4	0.9	0.5184	70 min	2.4	0.5	0.072
80 min	2.2	0.9	0.4752	80 min	2.2	0.5	0.066
90 min	2	0.9	0.432	90 min	2	0.5	0.06
100 min	1.8	0.9	0.3888	100 min	1.8	0.5	0.054
110 min	1.7	0.9	0.3672	110 min	1.7	0.5	0.051

Storage Calculations

10 min			
Inflow	900.36	Storage	380.64
Outflow	519.72		
15 min			
Inflow	1217.7	Storage	568.05
Outflow	649.65		
20 min			
Inflow	1476	Storage	696.42
Outflow	779.58		
30 min			
Inflow	1771.2	Storage	731.76
Outflow	1039.44		
40 min			
Inflow	2007.36	Storage	708.06
Outflow	1299.3		
50 min			
Inflow	2140.2	Storage	581.04
Outflow	1559.16		
60 min			
Inflow	2302.56	Storage	483.54
Outflow	1819.02		
70 min			
Inflow	2479.68	Storage	400.8
Outflow	2078.88		
80 min			
Inflow	2597.76	Storage	259.02
Outflow	2338.74		
90 min			
Inflow	2656.8	Storage	58.2
Outflow	2598.6		
100 min			
Inflow	2656.8	Storage	-201.66
Outflow	2858.46		
110 min			
Inflow	2509.2	Storage	-609.12
Outflow	3118.32		

RANKIN
10 YR STORM CALCULATIONS
Present Conditions
Q=CIA

A =	0.26
C =	0.5
Tc =	10
I_{10} =	7.2
Q_{10} =	0.936

Future Conditions (Developed)		Offsite Conditions (Undeveloped)		Bypass	
A =	0.26	A =	0.06	A=	0.02
Aadj=	0.24				
C =	0.9	C =	0.5	C=	0.9
Tc =	10	Tc =	10	Tc=	10
I_{10} =	7.2	I_{10} =	7.2	I_{10} =	7.2
Q_{10} =	1.6848	Q_{10} =	0.216	Q_{10} =	0.1296

Flow for Storm Durations (Developed)				Flow for Storm Durations (Offsite)			
Time	I	C	Q	Time	I	C	Q
10 min	7.2	0.9	1.5552	10 min	7.2	0.5	0.216
15 min	6.5	0.9	1.404	15 min	6.5	0.5	0.195
20 min	5.8	0.9	1.2528	20 min	5.8	0.5	0.174
30 min	4.7	0.9	1.0152	30 min	4.7	0.5	0.141
40 min	4	0.9	0.864	40 min	4	0.5	0.12
50 min	3.5	0.9	0.756	50 min	3.5	0.5	0.105
60 min	3	0.9	0.648	60 min	3	0.5	0.09
70 min	2.7	0.9	0.5832	70 min	2.7	0.5	0.081
80 min	2.5	0.9	0.54	80 min	2.5	0.5	0.075
90 min	2.3	0.9	0.4968	90 min	2.3	0.5	0.069
100 min	2.2	0.9	0.4752	100 min	2.2	0.5	0.066
110 min	1.9	0.9	0.4104	110 min	1.9	0.5	0.057

Storage Calculations

10 min			
Inflow	1062.72	Storage	449.28
Outflow	613.44		
15 min			
Inflow	1439.1	Storage	672.3
Outflow	766.8		
20 min			
Inflow	1712.16	Storage	792
Outflow	920.16		
30 min			
Inflow	2081.16	Storage	854.28
Outflow	1226.88		
40 min			
Inflow	2361.6	Storage	828
Outflow	1533.6		
50 min			
Inflow	2583	Storage	742.68
Outflow	1840.32		
60 min			
Inflow	2656.8	Storage	509.76
Outflow	2147.04		
70 min			
Inflow	2789.64	Storage	335.88
Outflow	2453.76		
80 min			
Inflow	2952	Storage	191.52
Outflow	2760.48		
90 min			
Inflow	3055.32	Storage	-11.88
Outflow	3067.2		
100 min			
Inflow	3247.2	Storage	-126.72
Outflow	3373.92		
110 min			
Inflow	2804.4	Storage	-876.24
Outflow	3680.64		

RANKIN
25 YR STORM CALCULATIONS
Present Conditions
Q=CIA

A =	0.26
C =	0.5
Tc =	10
I25 =	8.2
Q25 =	1.066

Future Conditions (Developed)		Offsite Conditions (Undeveloped)		Bypass	
A =	0.26	A =	0.06	A=	0.02
Aadj=	0.24				
C =	0.9	C =	0.5	C=	0.9
Tc =	10	Tc =	10	Tc=	10
I25 =	8.2	I25 =	8.2	I25 =	8.2
Q25 =	1.9188	Q25 =	0.246	Q25 =	0.1476

Flow for Storm Durations (Developed)				Flow for Storm Durations (Offsite)			
Time	I	C	Q	Time	I	C	Q
10 min	8.2	0.9	1.7712	10 min	8.2	0.5	0.246
15 min	7.5	0.9	1.62	15 min	7.5	0.5	0.225
20 min	6.7	0.9	1.4472	20 min	6.7	0.5	0.201
30 min	5.5	0.9	1.188	30 min	5.5	0.5	0.165
40 min	4.7	0.9	1.0152	40 min	4.7	0.5	0.141
50 min	4	0.9	0.864	50 min	4	0.5	0.12
60 min	3.5	0.9	0.756	60 min	3.5	0.5	0.105
70 min	3.2	0.9	0.6912	70 min	3.2	0.5	0.096
80 min	2.7	0.9	0.5832	80 min	2.7	0.5	0.081
90 min	2.5	0.9	0.54	90 min	2.5	0.5	0.075
100 min	2.4	0.9	0.5184	100 min	2.4	0.5	0.072
110 min	2.3	0.9	0.4968	110 min	2.3	0.5	0.069

Storage Calculations

10 min			
Inflow	1210.32	Storage	511.68
Outflow	698.64		
15 min			
Inflow	1660.5	Storage	787.2
Outflow	873.3		
20 min			
Inflow	1977.84	Storage	929.88
Outflow	1047.96		
30 min			
Inflow	2435.4	Storage	1038.12
Outflow	1397.28		
40 min			
Inflow	2774.88	Storage	1028.28
Outflow	1746.6		
50 min			
Inflow	2952	Storage	856.08
Outflow	2095.92		
60 min			
Inflow	3099.6	Storage	654.36
Outflow	2445.24		
70 min			
Inflow	3306.24	Storage	511.68
Outflow	2794.56		
80 min			
Inflow	3188.16	Storage	44.28
Outflow	3143.88		
90 min			
Inflow	3321	Storage	-172.2
Outflow	3493.2		
100 min			
Inflow	3542.4	Storage	-300.12
Outflow	3842.52		
110 min			
Inflow	3394.8	Storage	-797.04
Outflow	4191.84		

RANKIN
100 YR STORM CALCULATIONS
Present Conditions
Q=CIA

A =	0.26
C =	0.5
Tc =	10
I_{100} =	9.8
Q_{100} =	1.274

Future Conditions (Developed)		Offsite Conditions (Undeveloped)		Bypass	
A =	0.26	A =	0.06	A=	0.02
Aadj=	0.24				
C =	0.9	C =	0.5	C=	0.9
Tc =	10	Tc =	10	Tc=	10
I_{100} =	9.8	I_{100} =	9.8	I_{100} =	9.8
Q_{100} =	2.2932	Q_{100} =	0.294	Q_{100} =	0.1764

Flow for Storm Durations (Developed)				Flow for Storm Durations (Offsite)			
Time	I	C	Q	Time	I	C	Q
10 min	9.8	0.9	2.1168	10 min	9.8	0.5	0.294
15 min	9	0.9	1.944	15 min	9	0.5	0.27
20 min	8.3	0.9	1.7928	20 min	8.3	0.5	0.249
30 min	6.9	0.9	1.4904	30 min	6.9	0.5	0.207
40 min	5.8	0.9	1.2528	40 min	5.8	0.5	0.174
50 min	5	0.9	1.08	50 min	5	0.5	0.15
60 min	4.5	0.9	0.972	60 min	4.5	0.5	0.135
70 min	4	0.9	0.864	70 min	4	0.5	0.12
80 min	3.7	0.9	0.7992	80 min	3.7	0.5	0.111
90 min	3.5	0.9	0.756	90 min	3.5	0.5	0.105
100 min	3.4	0.9	0.7344	100 min	3.3	0.5	0.099
110 min	3.2	0.9	0.6912	110 min	2.9	0.5	0.087

Storage Calculations

10 min			
Inflow	1446.48	Storage	611.52
Outflow	834.96		
15 min			
Inflow	1992.6	Storage	948.9
Outflow	1043.7		
20 min			
Inflow	2450.16	Storage	1197.72
Outflow	1252.44		
30 min			
Inflow	3055.32	Storage	1385.4
Outflow	1669.92		
40 min			
Inflow	3424.32	Storage	1336.92
Outflow	2087.4		
50 min			
Inflow	3690	Storage	1185.12
Outflow	2504.88		
60 min			
Inflow	3985.2	Storage	1062.84
Outflow	2922.36		
70 min			
Inflow	4132.8	Storage	792.96
Outflow	3339.84		
80 min			
Inflow	4368.96	Storage	611.64
Outflow	3757.32		
90 min			
Inflow	4649.4	Storage	474.6
Outflow	4174.8		
100 min			
Inflow	5000.4	Storage	408.12
Outflow	4592.28		
110 min			
Inflow	4669.2	Storage	-340.56
Outflow	5009.76		

REVISED TO CONFORM TO CONSTRUCTION RECORDS.
DATE: 7-8-20

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY W.L. DOUPHRATE II, TEXAS P.E. NO. 60102, F-856, ON DATE: JULY 15, 2019

DOUPHRATE & ASSOCIATES, INC.
ENGINEERING • PROJECT MANAGEMENT • SURVEYING
2235 RIDGE RD., # 200 ROCKWALL, TEXAS 75087
PHONE: (972)771-9004 FAX: (972)771-9005

DRAINAGE CALCULATIONS
RANKIN LAW OFFICES
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS

REVISION
W.L.D.
CHECKED
G.C.W.
DRAWN
SCALE
1"=20' H
1"=' V
JULY, 2019
DATE
19013
PROJECT
5.0