

**RANCH TRAIL
5 YR STORM CALCULATIONS**

Present Conditions
Q=CIA

A =	0.15	Areas 2 & 9 Detained
C =	0.796	Composite C Factor = .796
Tc =	10	
I5 =	6.1	
Q5 =	0.72834	

Future Conditions (Developed)			Offsite Conditions (Undeveloped)			Bypass		
A =	0.15		A =	0		A =	0	
Aadj =	0.15							
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 =	0.8235		Q5 =	0		Q5 =	0	

Flow for Storm Durations (Developed)				Flow for Storm Durations (Offsite)			
Time	I	C	Q	Time	I	C	Q
10 min	6.1	0.9	0.8235	10 min	6.1	0.5	0
15 min	5.5	0.9	0.7425	15 min	5.5	0.5	0
20 min	5	0.9	0.675	20 min	5	0.5	0
30 min	4	0.9	0.54	30 min	4	0.5	0
40 min	3.4	0.9	0.459	40 min	3.4	0.5	0
50 min	2.9	0.9	0.3915	50 min	2.9	0.5	0
60 min	2.6	0.9	0.351	60 min	2.6	0.5	0
70 min	2.4	0.9	0.324	70 min	2.4	0.5	0
80 min	2.2	0.9	0.297	80 min	2.2	0.5	0
90 min	2	0.9	0.27	90 min	2	0.5	0
100 min	1.8	0.9	0.243	100 min	1.8	0.5	0
110 min	1.7	0.9	0.2295	110 min	1.7	0.5	0

Storage Calculations

Time	Inflow	Outflow	Storage
10 min	494.1	437.004	57.096
15 min	668.25	546.255	121.995
20 min	810	655.506	154.494
30 min	972	874.008	97.992
40 min	1101.6	1092.51	9.09
50 min	1174.5	1311.012	-136.512
60 min	1263.6	1529.514	-265.914
70 min	1360.8	1748.016	-387.216
80 min	1425.6	1966.518	-540.918
90 min	1458	2185.02	-727.02
100 min	1458	2403.522	-945.522
110 min	1377	2622.024	-1245.02

**RANCH TRAIL
10 YR STORM CALCULATIONS**

Present Conditions
Q=CIA

A =	0.15	Areas 2 & 9 Detained
C =	0.796	Composite C Factor = .796
Tc =	10	
I10 =	7.2	
Q10 =	0.85968	

Future Conditions (Developed)			Offsite Conditions (Undeveloped)			Bypass		
A =	0.15		A =	0		A =	0	
Aadj =	0.15							
C =	0.9		C =	0.5		C =	0.9	
Tc =	10		Tc =	10		Tc =	10	
I10 =	7.2		I10 =	7.2		I10 =	7.2	
Q10 =	0.972		Q10 =	0		Q10 =	0	

Flow for Storm Durations (Developed)				Flow for Storm Durations (Offsite)			
Time	I	C	Q	Time	I	C	Q
10 min	7.2	0.9	0.972	10 min	7.2	0.5	0
15 min	6.5	0.9	0.8775	15 min	6.5	0.5	0
20 min	5.8	0.9	0.783	20 min	5.8	0.5	0
30 min	4.7	0.9	0.6345	30 min	4.7	0.5	0
40 min	4	0.9	0.54	40 min	4	0.5	0
50 min	3.5	0.9	0.4725	50 min	3.5	0.5	0
60 min	3	0.9	0.405	60 min	3	0.5	0
70 min	2.7	0.9	0.3645	70 min	2.7	0.5	0
80 min	2.5	0.9	0.3375	80 min	2.5	0.5	0
90 min	2.3	0.9	0.3105	90 min	2.3	0.5	0
100 min	2.2	0.9	0.297	100 min	2.2	0.5	0
110 min	1.9	0.9	0.2565	110 min	1.9	0.5	0

Storage Calculations

Time	Inflow	Outflow	Storage
10 min	583.2	515.808	67.392
15 min	789.75	644.76	144.99
20 min	939.6	773.712	165.888
30 min	1142.1	1031.616	110.484
40 min	1296	1289.52	6.48
50 min	1417.5	1547.424	-129.924
60 min	1458	1805.328	-347.328
70 min	1530.9	2063.232	-532.332
80 min	1620	2321.136	-701.136
90 min	1676.7	2579.04	-902.34
100 min	1782	2836.944	-1054.94
110 min	1539	3094.848	-1555.85

**RANCH TRAIL
25 YR STORM CALCULATIONS**

Present Conditions
Q=CIA

A =	0.15	Areas 2 & 9 Detained
C =	0.796	Composite C Factor = .796
Tc =	10	
I25 =	8.2	
Q25 =	0.97908	

Future Conditions (Developed)			Offsite Conditions (Undeveloped)			Bypass		
A =	0.15		A =	0		A =	0	
Aadj =	0.15							
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 =	1.107		Q25 =	0		Q25 =	0	

Flow for Storm Durations (Developed)				Flow for Storm Durations (Offsite)			
Time	I	C	Q	Time	I	C	Q
10 min	8.2	0.9	1.107	10 min	8.2	0.5	0
15 min	7.5	0.9	1.0125	15 min	7.5	0.5	0
20 min	6.7	0.9	0.9045	20 min	6.7	0.5	0
30 min	5.5	0.9	0.7425	30 min	5.5	0.5	0
40 min	4.7	0.9	0.6345	40 min	4.7	0.5	0
50 min	4	0.9	0.54	50 min	4	0.5	0
60 min	3.5	0.9	0.4725	60 min	3.5	0.5	0
70 min	3.2	0.9	0.432	70 min	3.2	0.5	0
80 min	2.7	0.9	0.3645	80 min	2.7	0.5	0
90 min	2.5	0.9	0.3375	90 min	2.5	0.5	0
100 min	2.4	0.9	0.324	100 min	2.4	0.5	0
110 min	2.3	0.9	0.3105	110 min	2.3	0.5	0

Storage Calculations

Time	Inflow	Outflow	Storage
10 min	664.2	587.448	76.752
15 min	911.25	734.31	176.94
20 min	1085.4	881.172	204.228
30 min	1336.5	1174.896	161.604
40 min	1522.8	1468.62	54.18
50 min	1620	1762.344	-142.344
60 min	1701	2056.068	-355.068
70 min	1814.4	2349.792	-535.392
80 min	1749.6	2643.516	-893.916
90 min	1822.5	2937.24	-1114.74
100 min	1944	3230.964	-1286.96
110 min	1863	3524.688	-1661.69

**RANCH TRAIL
100 YR STORM CALCULATIONS**

Present Conditions
Q=CIA

A =	0.15	Areas 2 & 9 Detained
C =	0.796	Composite C Factor = .796
Tc =	10	
I100 =	9.8	
Q100 =	1.17012	

Future Conditions (Developed)			Offsite Conditions (Undeveloped)			Bypass		
A =	0.15		A =	0		A =	0	
Aadj =	0.15							
C =	0.9		C =	0.5		C =	0.9	
Tc =	10		Tc =	10		Tc =	10	
I100 =	9.8		I100 =	9.8		I100 =	9.8	
Q100 =	1.323		Q100 =	0		Q100 =	0	

Flow for Storm Durations (Developed)				Flow for Storm Durations (Offsite)			
Time	I	C	Q	Time	I	C	Q
10 min	9.8	0.9	1.323	10 min	9.8	0.5	0
15 min	9	0.9	1.215	15 min	9	0.5	0
20 min	8.3	0.9	1.1205	20 min	8.3	0.5	0
30 min	6.9	0.9	0.9315	30 min	6.9	0.5	0
40 min	5.8	0.9	0.783	40 min	5.8	0.5	0
50 min	5	0.9	0.675	50 min	5	0.5	0
60 min	4.5	0.9	0.6075	60 min	4.5	0.5	0
70 min	4	0.9	0.54	70 min	4	0.5	0
80 min	3.7	0.9	0.4995	80 min	3.7	0.5	0
90 min	3.5	0.9	0.4725	90 min	3.5	0.5	0
100 min	3.4	0.9	0.459	100 min	3.4	0.5	0
110 min	3.2	0.9	0.432	110 min	2.9	0.5	0

Storage Calculations

Time	Inflow	Outflow	Storage
10 min	793.8	702.072	91.728
15 min	1093.5	877.59	215.91
20 min	1344.6	1053.108	291.492
30 min	1676.7	1404.144	272.556
40 min	1879.2	1755.18	124.02
50 min	2025	2106.216	-81.216
60 min	2187	2457.252	-270.252
70 min	2268	2808.288	-540.288
80 min	2397.6	3159.324	-761.724
90 min	2551.5	3510.36	-958.86
100 min	2754	3861.396	-1107.4
110 min	2592	4212.432	-1620.43

REVISED TO CONFORM TO CONSTRUCTION RECORDS.
 DATE: 2-17-26



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY W.L. DOUPHRATE II, TEXAS P.E. NO. 60102, F-986, ON DATE: MAY 3, 2024

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

DRAINAGE DETENTION CALCULATIONS WEIR NO 2
 RANCH TRAIL OFFICES
 CITY OF ROCKWALL
 ROCKWALL COUNTY, TEXAS

REVISION
 W.L.D.
 CHECKED
 G.C.W.
 DRAWN
 SCALE 1"=50' H
 DATE MAY, 2024
 PROJECT 23028
 51