Flow Determination for Rockwall

2-Year Event

Trib. Area = *2.49* acres

Existing C = *0.4587* OS1, OS2, E1 and E2 Weighted C Value
Existing Tc = *20* min
Tc Intensity = 3.90 in/hr
Q existing = *4.69* cfs
Bypass = *0.82* cfs
Q allowable = *3.87* cfs

Proposed C = *0.619212* OS1, OS2, and P1 Weighted C Value
Proposed Tc = *10* min
in/hr
Req Volume = ***0.1036*** acre-ft
4,515 cubic feet

2-YEAR EVENT

Duration	Intensity	Qp(in) (cfs)	Qp(out) (cfs)	VOLin (cf)	VOLout (cf)	Req. Storage (cf)	Req. Storage (acre-ft)	Tp Out (min)
10	5.30	8.17	3.87	4,903	2,322	2,581	**0.06**	14.7
15	4.50	6.94	3.87	6,244	2,903	3,342	**0.08**	20.6
20	3.90	6.01	3.87	7,216	3,483	3,733	**0.09**	26.4
30	3.30	5.09	3.87	9,159	4,644	4,515	**0.10**	37.6
40	2.60	4.01	3.87	9,621	5,805	3,816	**0.09**	49.7
50	2.30	3.55	3.87	10,639	6,966	3,673	**0.00**	60.9
60	1.90	2.93	3.87	10,546	8,127	2,419	**0.00**	73.2
70	1.80	2.78	3.87	11,656	9,288	2,368	**0.00**	83.9
80	1.70	2.62	3.87	12,581	10,449	2,132	**0.00**	94.8
90	1.60	2.47	3.87	13,321	11,610	1,711	**0.00**	105.7
100	1.50	2.31	3.87	13,877	12,771	1,106	**0.00**	116.7
110	1.40	2.16	3.87	14,247	13,932	315	**0.00**	127.9

5-Year Event

Trib. Area = *2.49* acres

Existing C = *0.4587* OS1, OS2, E1 and E2 Weighted C Value
Existing Tc = *20* min
Tc Intensity = 4.90 in/hr
Q existing = *5.70* cfs
Bypass = *0.95* cfs
Q allowable = *4.75* cfs

Proposed C = *0.619212* OS1, OS2, and P1 Weighted C Value
Proposed Tc = *10* min
Req Volume = ***0.1304*** acre-ft
5,679 cubic feet

5-YEAR EVENT

Duration	Intensity	Qp(in) (cfs)	Qp(out) (cfs)	VOLin (cf)	VOLout (cf)	Req. Storage (cf)	Req. Storage (acre-ft)	Tp Out (min)
10	6.10	9.41	4.75	5,643	2,850	2,793	**0.06**	15.1
15	5.50	8.48	4.75	7,632	3,563	4,070	**0.09**	20.6
20	4.90	7.56	4.75	9,066	4,275	4,791	**0.11**	26.3
30	4.10	6.32	4.75	11,379	5,700	5,679	**0.13**	37.5
40	3.40	5.24	4.75	12,581	7,125	5,456	**0.13**	49.1
50	2.80	4.32	4.75	12,951	8,550	4,401	**0.00**	61.0
60	2.60	4.01	4.75	14,432	9,975	4,457	**0.00**	71.8
70	2.40	3.70	4.75	15,542	11,400	4,142	**0.00**	82.8
80	2.30	3.55	4.75	17,022	12,825	4,197	**0.00**	93.4
90	2.10	3.24	4.75	17,484	14,250	3,234	**0.00**	104.7
100	1.90	2.93	4.75	17,577	15,675	1,902	**0.00**	116.2
110	1.80	2.78	4.75	18,317	17,100	1,217	**0.00**	127.1

10-Year Event

Trib. Area = *2.49* acres

Existing C = *0.4587* OS1, OS2, E1 and E2 Weighted C Value
Existing Tc = *20* min
Tc Intensity = 5.90 in/hr
Q existing = *6.79* cfs
Bypass = *1.1* cfs
Q allowable = *5.69* cfs

Proposed C = *0.619212* OS1, OS2, and P1 Weighted C Value
Proposed Tc = *10* min
Req Volume = ***0.1491*** acre-ft
6,493 cubic feet

10-YEAR EVENT

Duration	Intensity	Qp(in) (cfs)	Qp(out) (cfs)	VOLin (cf)	VOLout (cf)	Req. Storage (cf)	Req. Storage (acre-ft)	Tp Out (min)
10	7.10	10.95	5.69	6,568	3,414	3,154	**0.07**	15.2
15	6.50	10.02	5.69	9,020	4,268	4,752	**0.11**	20.7
20	5.90	9.10	5.69	10,916	5,121	5,795	**0.13**	26.3
30	4.80	7.40	5.69	13,321	6,828	6,493	**0.15**	37.7
40	4.00	6.17	5.69	14,802	8,535	6,267	**0.14**	49.2
50	3.50	5.40	5.69	16,189	10,242	5,947	**0.00**	60.5
60	3.00	4.63	5.69	16,652	11,949	4,703	**0.00**	72.3
70	2.80	4.32	5.69	18,132	13,656	4,476	**0.00**	83.2
80	2.60	4.01	5.69	19,242	15,363	3,879	**0.00**	94.2
90	2.50	3.85	5.69	20,815	17,070	3,745	**0.00**	104.8
100	2.40	3.70	5.69	22,202	18,777	3,425	**0.00**	115.4
110	2.30	3.55	5.69	23,405	20,484	2,921	**0.00**	126.0

25-Year Event

Trib. Area = *2.49* acres

Existing C = *0.4587* OS1, OS2, E1 and E2 Weighted C Value
Existing Tc = *20* min
Tc Intensity = 6.60 in/hr
Q existing = *7.71* cfs
Bypass = *1.29* cfs
Q allowable = *6.42* cfs

Proposed C = *0.619212* OS1, OS2, and P1 Weighted C Value
Proposed Tc = *10* min
Req Volume = ***0.1736*** acre-ft
7,560 cubic feet

25-YEAR EVENT

Duration	Intensity	Qp(in) (cfs)	Qp(out) (cfs)	VOLin (cf)	VOLout (cf)	Req. Storage (cf)	Req. Storage (acre-ft)	Tp Out (min)
10	8.30	12.80	6.42	7,678	3,852	3,826	**0.09**	15.0
15	7.50	11.56	6.42	10,407	4,815	5,592	**0.13**	20.6
20	6.60	10.18	6.42	12,211	5,778	6,433	**0.15**	26.3
30	5.50	8.48	6.42	15,264	7,704	7,560	**0.17**	37.6
40	4.60	7.09	6.42	17,022	9,630	7,392	**0.17**	49.1
50	4.00	6.17	6.42	18,502	11,556	6,946	**0.00**	60.4
60	3.50	5.40	6.42	19,427	13,482	5,945	**0.00**	71.9
70	3.30	5.09	6.42	21,370	15,408	5,962	**0.00**	82.6
80	3.10	4.78	6.42	22,943	17,334	5,609	**0.00**	93.4
90	2.90	4.47	6.42	24,145	19,260	4,885	**0.00**	104.4
100	2.70	4.16	6.42	24,978	21,186	3,792	**0.00**	115.4
110	2.50	3.85	6.42	25,440	23,112	2,328	**0.00**	126.7

50-Year Event

Trib. Area = *2.49* acres

Existing C = *0.4587* OS1, OS2, E1 and E2 Weighted C Value
Existing Tc = *20* min
Tc Intensity = 7.50 in/hr
Q existing = *8.62* cfs
Bypass = *1.39* cfs
Q allowable = *7.23* cfs

Proposed C = *0.619212* OS1, OS2, and P1 Weighted C Value
Proposed Tc = *10* min
Req Volume = ***0.1928*** acre-ft
8,397 cubic feet

50-YEAR EVENT

Duration	Intensity	Qp(in) (cfs)	Qp(out) (cfs)	VOLin (cf)	VOLout (cf)	Req. Storage (cf)	Req. Storage (acre-ft)	Tp Out (min)
10	9.00	13.88	7.23	8,326	4,338	3,988	**0.09**	15.2
15	8.10	12.49	7.23	11,240	5,423	5,817	**0.13**	20.8
20	7.50	11.56	7.23	13,877	6,507	7,370	**0.17**	26.3
30	6.10	9.41	7.23	16,929	8,676	8,253	**0.19**	37.7
40	5.20	8.02	7.23	19,242	10,845	8,397	**0.19**	49.0
50	4.50	6.94	7.23	20,815	13,014	7,801	**0.00**	60.4
60	3.90	6.01	7.23	21,647	15,183	6,464	**0.00**	72.0
70	3.70	5.70	7.23	23,960	17,352	6,608	**0.00**	82.7
80	3.50	5.40	7.23	25,903	19,521	6,382	**0.00**	93.4
90	3.30	5.09	7.23	27,476	21,690	5,786	**0.00**	104.2
100	3.00	4.63	7.23	27,753	23,859	3,894	**0.00**	115.6
110	2.90	4.47	7.23	29,511	26,028	3,483	**0.00**	126.2

100-Year Event

Trib. Area = 2.49 acres

Existing C = 0.4587 OS1, OS2, E1 and E2 Weighted C Value
Existing Tc = 20 min
Tc Intensity = 8.30 in/hr
Q existing = *9.48* cfs
Bypass = 1.526 cfs
Q allowable = 7.95 cfs

Proposed C = 0.619212 OS1, OS2, and P1 Weighted C Value
Proposed Tc = 10 min
Proposed I = 9.80 in/hr
Req Volume = ***0.2205*** acre-ft
9,605 cubic feet

Q proposed = 16.64 cfs
Bypass = 1.526 cfs
Q in = *15.11* cfs

100-YEAR EVENT

Duration	Intensity	Qp(in) (cfs)	Qp(out) (cfs)	VOLin (cf)	VOLout (cf)	Req. Storage (cf)	Req. Storage (acre-ft)	Tp Out (min)
10	9.80	15.11	7.95	9,066	4,772	4,294	**0.10**	15.3
15	9.00	13.88	7.95	12,489	5,965	6,523	**0.15**	20.7
20	8.30	12.80	7.95	15,357	7,159	8,198	**0.19**	26.2
30	6.90	10.64	7.95	19,150	9,545	9,605	**0.22**	37.5
40	5.80	8.94	7.95	21,462	11,931	9,531	**0.22**	48.9
50	5.00	7.71	7.95	23,128	14,310	8,818	**0.00**	60.3
60	4.50	6.94	7.95	24,978	16,695	8,283	**0.00**	71.5
70	4.00	6.17	7.95	25,903	19,080	6,823	**0.00**	82.9
80	3.70	5.70	7.95	27,383	21,465	5,918	**0.00**	93.9
90	3.50	5.40	7.95	29,141	23,850	5,291	**0.00**	104.7
100	3.40	5.24	7.95	31,453	26,235	5,218	**0.00**	115.2
110	3.20	4.93	7.95	32,564	28,620	3,944	**0.00**	126.1

OUTLET STRUCTURE CALCULATIONS

Pond Elev. (ft)	8.75" Weir 1 Q	10" Weir 2 Q	Total Q
554.25	7.09	1.81	8.90
554.13	6.52	1.42	7.94
554.01	5.96	1.07	7.02
553.92	5.55	0.83	6.37
553.79	4.98	0.51	5.49
553.70	4.59	0.33	4.92
553.56	4.02	0.10	4.12
553.00	1.99	0.00	1.99
552.06	0.00	0.00	0.00

Outflow structure

Weir 1	W (ft) 0.73	C = 3.0 Invert= 552.06
Weir 2	W (ft) 0.83	C = 3.0 Invert= 553.44

RESULTS

Event (Yr)	existing Q (in)	Required V (cf)	Pond Elevation	Proposed Q out
2	3.87	4,515	553.56	4.12
5	4.75	5,679	553.70	4.92
10	5.69	6,493	553.79	5.49
25	6.42	7,560	553.92	6.37
50	7.23	8,397	554.01	7.02
100	7.95	9,605	554.13	7.94

DETENTION VOLUMES

18" Pipe length= 1464

Pond provided elev. (ft)	Pond A (sf)	Pond V (cf)	Pipe A (sf)	Pipe V (cf)	Total V (cf)
555	10,618	15,761	1.77	2587.03	18,348
554.5	9,395	10,758	1.72	2518.08	13,276
554	7,132	6,626	1.11	1625.04	8,251
553.5	5,520	3,463	0.38	556.32	4,019
553	2,795	1,384	0	0	1,384
552.5	1,458	321	0	0	321
552.06	0	0	0	0	0

RECORD DRAWING

The record drawing herein reflects to the best of the design engineer's knowledge, the approximate location of the constructed improvements using information based on surveying at the site and information provided by the contractor.

Steven R. Homeyer, P.E. #86942
Date 7-20-20

STATE OF TEXAS
STEVEN R. HOMEYER
86942
LICENSED
PROFESSIONAL ENGINEER
7-20-20

CASE NO. SP2019-017

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CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS

DETENTION CALCULATIONS

REVISIONS
07-20-20
1. REVISED OUTLET STRUCTURE, DETENTION VOLUMES, AND RESULTS CALCULATIONS

DRAWN: JAN
DATE: 09/28/2018
HEI #: 18-140

SHEET NO: C8.1