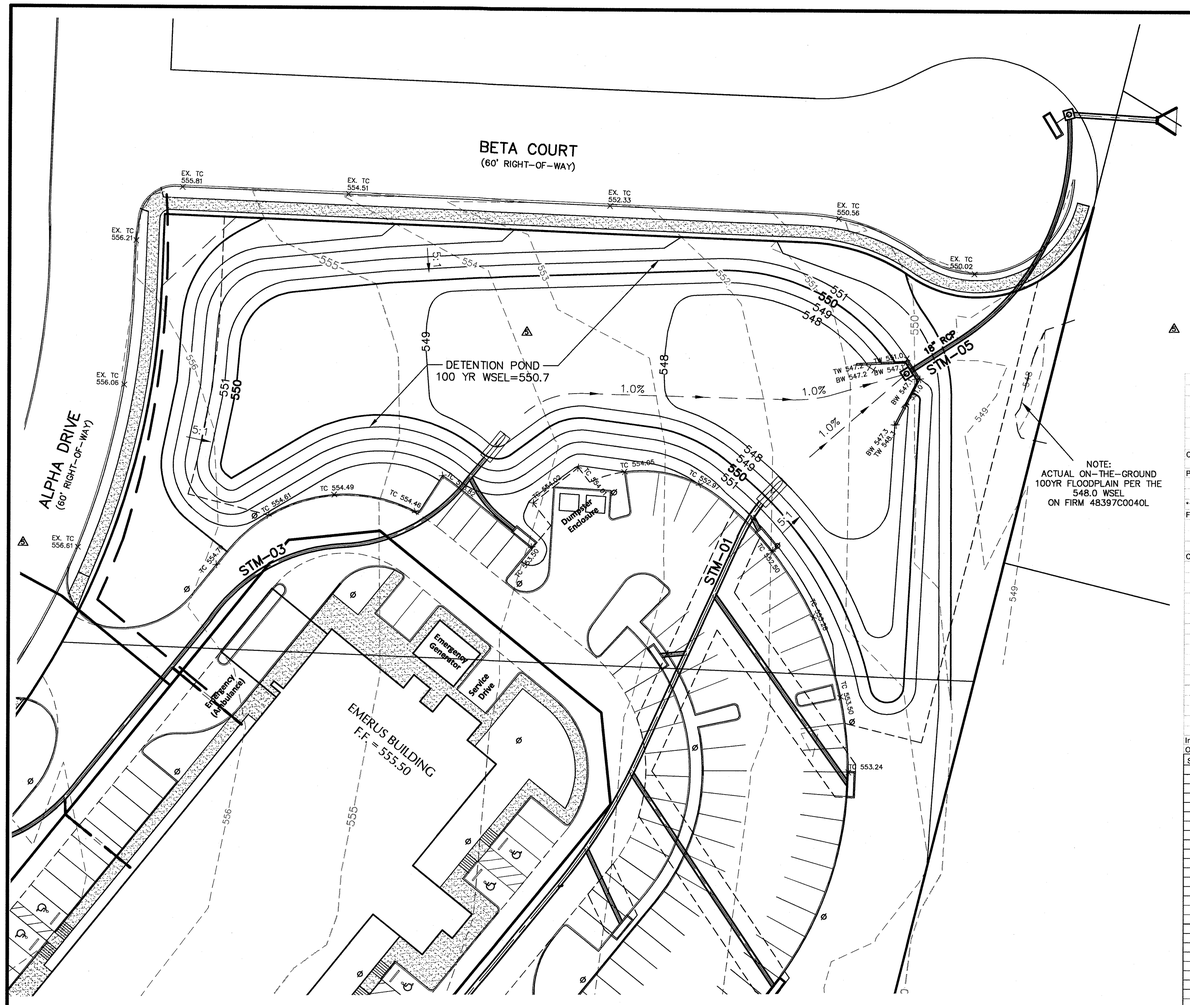
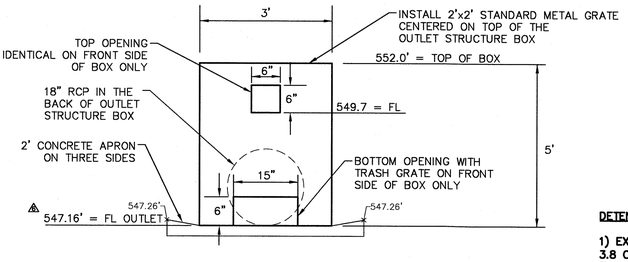


GRAPHIC SCALE

30 15 0 30 90

(IN FEET)
1 inch = 30 ft.



3'x3'x5' POND OUTLET STRUCTURE

NOTE: STRUCTURAL DETAIL SHALL BE PROVIDED PRIOR TO CONSTRUCTION.
N.T.S.

ACTUAL DETENTION VOLUME PROVIDED

DETENTION POND STAGE-STORAGE TABLE

ELEV	CUMULATIVE STORAGE (AC-FT)	ACTUAL RELEASE (CFS)	ALLOWABLE RELEASE (CFS)	COMMENTS
547.0	0.0	0.0	–	OUTLET FLOWLINE
548.0	0.06	0.71	–	
549.0	0.30	3.23	–	
549.7	0.54	4.06	4.10	5-YR WSEL
550.0	0.68	4.70	4.70	10-YR WSEL
550.2	0.80	5.34	5.50	25-YR WSEL
550.7	1.05	6.24	8.4	100-YR WSEL

DETENTION POND CALCULATION NOTES:

1) EXISTING CONDITIONS GENERATE 12.2 CFS OF RUNOFF. PER THE DRAINAGE AREA MAP, 3.8 CFS (0.43AC) OF FULLY DEVELOPED FLOW WILL BYPASS THE POND. THIS YIELDS 12.2 – 3.8 = 8.4 CFS ALLOWABLE RELEASE

2) AS CAN BE SEEN IN THE MODIFIED RATIONAL DETENTION TABLE, THE MINIMUM REQUIRED 100 YR DETENTION VOLUME PER THE CALCULATION TABLE SHOWN IS 0.90 AC-FT WITH AN ALLOWABLE RELEASE RATE OF 8.4 CFS. PER THE STAGE-STORAGE-DISCHARGE TABLE ABOVE, THERE IS 1.05 AC-FT OF STORAGE PROVIDED AT THE 100YR WSEL OF 550.7. THE PEAK OUTFLOW FOR THE 100-YR STORM IS 6.24 CFS. THE 25-YR, 10-YR & 5-YR STORMS WERE ALSO DETAINED BACK TO PRE-DEVELOPED FLOWS

3) COMPARING THE MODIFIED RATIONAL VOLUME CALCULATION TABLE RESULTS WITH THE STAGE-STORAGE-DISCHARGE TABLE ABOVE, CONFIRMS THAT THE MINIMUM AMOUNT OF REQUIRED DETENTION VOLUME HAS BEEN PROVIDED FOR THE 100YR, 25YR, 10YR & 5YR STORMS WHILE NOT EXCEEDING THE PRE-DEVELOPED ALLOWABLE RELEASE RATES.

BENCHMARKS:

CITY OF ROCKWALL MONUMENT R003: BRASS DISK IN CONCRETE SOUTH OF STATE HIGHWAY NO. 66 AND NORTH OF J.W. WILLIAMS MIDDLE SCHOOL, APPROXIMATELY 21' WEST OF A CORNER BACK OF CURB AND APPROXIMATELY 53.5' SOUTHWEST OF AN 8D NAIL WITH SHINER IN POWER POLE.
ELEVATION = 529.23' (FIELD) HOLD* 529.23' (RECORD)

CITY OF ROCKWALL MONUMENT R005: BRASS DISK IN CONCRETE IN GRASS MEDIAN AT INTERSECTION OF FARM TO MARKET ROAD NO. 740 (RIDGE ROAD) AND SUMMIT RIDGE DRIVE, APPROXIMATELY 14' NORTHWEST OF A FIRE HYDRANT AND APPROXIMATELY 10' WEST OF A STREET SIGN.
ELEVATION = 578.71'(RECORD) 578.63' (FIELD)

Emerus Rockwall
Detention Pond
DAA Job No. 12005
Rockwall, Texas

100 Year Modified Rational Detention Calculations

Calculations for Proposed Detention Area — K (100 year)= 1

Present Conditions

T_c (min)	I_{100} (in/hr)	Weighted C	A (ac.)	*Q_{100} (cfs)
20	8.30	0.35	4.19	8.4

*12.2 cfs minus 3.8 cfs (0.43ac) of bypass flow equals 8.4 cfs allowable release

Future Conditions

T_c (min)	I_{100} (in/hr)	Weighted C	A (ac.)	Q_{100} (cfs)
10	9.80	0.9	3.76	33.2

Check Various Storm Durations

Time (min)	I_{100} (in/hr)	C	A (ac.)	Q_{100} (cfs)
10	9.80	0.9	3.76	33.2
15	9.00	0.9	3.76	30.5
20	8.30	0.9	3.76	28.1
30	6.90	0.9	3.76	23.3
40	5.80	0.9	3.76	19.6
50	5.00	0.9	3.76	16.9
60	4.50	0.9	3.76	15.2
70	4.00	0.9	3.76	13.5
80	3.70	0.9	3.76	12.5
90	3.50	0.9	3.76	11.8
100	3.40	0.9	3.76	11.5
120	2.70	0.9	3.76	9.1
150	2.35	0.9	3.76	8.0
180	2.00	0.9	3.76	6.8
210	1.80	0.9	3.76	6.1

Inflow = Storm Duration x Respective Peak Q x 60 sec/min
Outflow = 1/2 inflow duration x Control released discharge x 60 sec/min

Storm (min)			Volume (ft³)
10	Inflow = 10 x 33.2 x 60	=	19898
	Outflow = 0.5 x 20 x 8.4x 60	=	5028
		Storage	14870
15	Inflow = 15 x 30.5 x 60	=	27410
	Outflow = 0.5 x 25 x 8.4x 60	=	6289
		Storage	21126
20	Inflow = 20 x 28.1 x 60	=	33705
	Outflow = 0.5 x 30 x 8.4x 60	=	7541
		Storage	26163
30	Inflow = 30 x 23.3 x 60	=	42029
	Outflow = 0.5 x 40 x 8.4x 60	=	10055
		Storage	31974
40	Inflow = 40 x 19.6 x 60	=	47105
	Outflow = 0.5 x 50 x 8.4x 60	=	12569
		Storage=	34536
50	Inflow = 50 x 16.9 x 60	=	50760
	Outflow = 0.5 x 60 x 8.4x 60	=	15083
		Storage=	35677
60	Inflow = 60 x 15.2 x 60	=	54821
	Outflow = 0.5 x 70 x 8.4x 60	=	17597
		Storage=	37224
70	Inflow = 70 x 13.5 x 60	=	56851
	Outflow = 0.5 x 80 x 8.4x 60	=	20110
		Storage=	36741
80	Inflow = 80 x 12.5 x 60	=	60100
	Outflow = 0.5 x 90 x 8.4x 60	=	22624
		Storage=	37476
90	Inflow = 90 x 11.8 x 60	=	63958
	Outflow = 0.5 x 100 x 8.4x 60	=	25135
		Storage=	38820
100	Inflow = 100 x 11.5 x 60	=	69034
	Outflow = 0.5 x 110 x 8.4x 60	=	27652
		Storage=	41382
120	Inflow = 120 x 9.1 x 60	=	65785
	Outflow = 0.5 x 130 x 8.4x 60	=	32676
		Storage=	33105
Maximum Volume Required		Cubic Feet=	41382
		ACRE-FT REQUIRED=	0.9

Emerus Rockwall
Detention Pond
DAA Job No. 12005
Rockwall, Texas

25 Year Modified Rational Detention Calculations

Calculations for Proposed Detention Area — K (25 year)= 1

Present Conditions

T_c (min)	I_{25} (in/hr)	Weighted C	A (ac.)	*Q_{25} (cfs)
20	5.72	0.35	4.19	5.5

*8.4 cfs minus 2.9 cfs (0.43ac) of bypass flow equals 5.5 cfs allowable release

Future Conditions

T_c (min)	I_{25} (in/hr)	Weighted C	A (ac.)	Q_{25} (cfs)
10	7.59	0.9	3.76	25.7

Check Various Storm Durations

Time (min)	I_{25} (in/hr)	C	A (ac.)	Q_{25} (cfs)
10	7.59	0.9	3.76	25.7
15	6.51	0.9	3.76	22.0
20	5.72	0.9	3.76	19.4
30	4.65	0.9	3.76	15.7
40	3.95	0.9	3.76	13.4
50	3.45	0.9	3.76	11.7
60	3.08	0.9	3.76	10.4
70	2.78	0.9	3.76	9.4
80	2.55	0.9	3.76	8.6
90	2.35	0.9	3.76	8.0
100	2.19	0.9	3.76	7.4
120	1.93	0.9	3.76	6.5
150	1.64	0.9	3.76	5.6
180	1.44	0.9	3.76	4.9
210	1.29	0.9	3.76	4.4

Inflow = Storm Duration x Respective Peak Q x 60 sec/min
Outflow = 1/2 inflow duration x Control released discharge x 60 sec/min

Storm (min)			Volume (ft³)
10	Inflow = 10 x 25.7 x 60	=	15401
	Outflow = 0.5 x 20 x 5.5x 60	=	3274
		Storage	12128
15	Inflow = 15 x 22 x 60	=	19813
	Outflow = 0.5 x 25 x 5.5x 60	=	4092
		Storage	15721
20	Inflow = 20 x 19.4 x 60	=	23236
	Outflow = 0.5 x 30 x 5.5x 60	=	4910
		Storage	18326
30	Inflow = 30 x 15.7 x 60	=	26347
	Outflow = 0.5 x 40 x 5.5x 60	=	6547
		Storage	21800
40	Inflow = 40 x 13.4 x 60	=	32103
	Outflow = 0.5 x 50 x 5.5x 60	=	8184
		Storage=	23919
50	Inflow = 50 x 11.7 x 60	=	35063
	Outflow = 0.5 x 60 x 5.5x 60	=	9821
		Storage=	25242
60	Inflow = 60 x 10.4 x 60	=	37504
	Outflow = 0.5 x 70 x 5.5x 60	=	11458
		Storage=	26046
70	Inflow = 70 x 9.4 x 60	=	39582
	Outflow = 0.5 x 80 x 5.5x 60	=	13094
		Storage=	26487
80	Inflow = 80 x 8.6 x 60	=	41392
	Outflow = 0.5 x 90 x 5.5x 60	=	14731
		Storage=	26660
90	Inflow = 90 x 8 x60	=	42997
	Outflow = 0.5 x 100 x 5.5x 60	=	16368
		Storage=	26629
100	Inflow = 100 x 7.4 x 60	=	44440
	Outflow = 0.5 x 110 x 5.5x 60	=	18005
		Storage=	26435
120	Inflow = 120 x 6.5 x 60	=	46957
	Outflow = 0.5 x 130 x 5.5x 60	=	21278
		Storage=	25678
Maximum Volume Required		Cubic Feet=	26660
		ACRE-FT REQUIRED=	0.6

Emerus Rockwall
Detention Pond
DAA Job No. 12005
Rockwall, Texas

10 Year Modified Rational Detention Calculations

Calculations for Proposed Detention Area — K (10 year)= 1

Present Conditions

T_c (min)	I_{10} (in/hr)	Weighted C	A (ac.)	*Q_{10} (cfs)
20	4.92	0.35	4.19	4.7

*7.2 cfs minus 2.5 cfs (0.43ac) of bypass flow equals 4.7 cfs allowable release

Future Conditions

T_c (min)	I_{10} (in/hr)	Weighted C	A (ac.)	Q_{10} (cfs)
10	6.56	0.9	3.76	22.2

Check Various Storm Durations

Time (min)	I_{10} (in/hr)	C	A (ac.)	Q_{10} (cfs)
10	6.56	0.9	3.76	22.2
15	5.61	0.9	3.76	19.0
20	4.92	0.9	3.76	16.7
30	3.99	0.9	3.76	13.5
40	3.38	0.9	3.76	11.4
50	2.94	0.9	3.76	10.0
60	2.62	0.9	3.76	8.9
70	2.36	0.9	3.76	8.0
80	2.16	0.9	3.76	7.3
90	1.99	0.9	3.76	6.7
100	1.85	0.9	3.76	6.3
120	1.62	0.9	3.76	5.5
150	1.38	0.9	3.76	4.7
180	1.21	0.9	3.76	4.1
210	1.08	0.9	3.76	3.6

Inflow = Storm Duration x Respective Peak Q x 60 sec/min
Outflow = 1/2 inflow duration x Control released discharge x 60 sec/min

Storm (min)			Volume (ft³)
10	Inflow = 10 x 22.2 x 60	=	13324
	Outflow = 0.5 x 20 x 4.7x 60	=	2809
		Storage	10515
15	Inflow = 15 x 19 x 60	=	17090
	Outflow = 0.5 x 25 x 4.7x 60	=	3511
		Storage	13579
20	Inflow = 20 x 16.7 x 60	=	19995
	Outflow = 0.5 x 30 x 4.7x 60	=	4213
		Storage	15782
30	Inflow = 30 x 13.5 x 60	=	24296
	Outflow = 0.5 x 40 x 4.7x 60	=	5617
		Storage	18679
40	Inflow = 40 x 11.4 x 60	=	27430
	Outflow = 0.5 x 50 x 4.7x 60	=	7022
		Storage=	20409
50	Inflow = 50 x 10 x 60	=	29883
	Outflow = 0.5 x 60 x 4.7x 60	=	8426
		Storage=	21456
60	Inflow = 60 x 8.9 x 60	=	31893
	Outflow = 0.5 x 70 x 4.7x 60	=	9831
		Storage=	22062
70	Inflow = 70 x 8 x 60	=	33595
	Outflow = 0.5 x 80 x 4.7x 60	=	11235
		Storage=	22360
80	Inflow = 80 x 7.3 x 60	=	35072
	Outflow = 0.5 x 90 x 4.7x 60	=	12639
		Storage=	22433
90	Inflow = 90 x 6.7 x 60	=	36377
	Outflow = 0.5 x 100 x 4.7x 60	=	14044
		Storage=	22333
100	Inflow = 100 x 6.3 x 60	=	37546
	Outflow = 0.5 x 110 x 4.7x 60	=	15448
		Storage=	22098
120	Inflow = 120 x 5.5 x 60	=	39577
	Outflow = 0.5 x 130 x 4.7x 60	=	18257
		Storage=	21320
Maximum Volume Required		Cubic Feet=	22433
		ACRE-FT REQUIRED=	0.5

Emerus Rockwall
Detention Pond
DAA Job No. 12005
Rockwall, Texas

5 Year Modified Rational Detention Calculations

Calculations for Proposed Detention Area — K (5 year)= 1

Present Conditions

T_c (min)	I_5 (in/hr)	Weighted C	A (ac.)	*Q_5 (cfs)
20	4.34	0.35	4.19	4.1

*5.4 cfs minus 2.3 cfs (0.43ac) of bypass flow equals 4.1 cfs allowable release

Future Conditions

T_c (min)	I_5 (in/hr)	Weighted C	A (ac.)	Q_5 (cfs)
10	5.85	0.9	3.76	19.8

Check Various Storm Durations

Time (min)	I_5 (in/hr)	C	A (ac.)	Q_5 (cfs)
10	5.85	0.9	3.76	19.8
15	4.97	0.9	3.76	16.8
20	4.34	0.9	3.76	14.7
30	3.49	0.9	3.76	11.8
40	2.94	0.9	3.76	10.0
50	2.56	0.9	3.76	8.6
60	2.27	0.9	3.76	7.7
70	2.04	0.9	3.76	6.9
80	1.86	0.9	3.76	6.3
90	1.72	0.9	3.76	5.8
100	1.59	0.9	3.76	5.4
120	1.40	0.9	3.76	4.7
150	1.19	0.9	3.76	4.0
180	1.03	0.9	3.76	3.5
210	0.92	0.9	3.76	3.1

Inflow = Storm Duration x Respective Peak Q x 60 sec/min
Outflow = 1/2 inflow duration x Control released discharge x 60 sec/min

Storm (min)			Volume (ft³)
10	Inflow = 10 x 19.8 x 60	=	11886
	Outflow = 0.5 x 20 x 4.1x 60	=	2458
		Storage	9428
15	Inflow = 15 x 16.8 x 60	=	15135
	Outflow = 0.5 x 25 x 4.1x 60	=	3072
		Storage	12063
20	Inflow = 20 x 14.7 x 60	=	17616
	Outflow = 0.5 x 30 x 4.1x 60	=	3687
		Storage	13929
30	Inflow = 30 x 11.8 x 60	=	21259
	Outflow = 0.5 x 40 x 4.1x 60	=	4916
		Storage	16343
40	Inflow = 40 x 10 x 60	=	23894
	Outflow = 0.5 x 50 x 4.1x 60	=	6144
		Storage=	17749
50	Inflow = 50 x 8.6 x 60	=	25947
	Outflow = 0.5 x 60 x 4.1x 60	=	7373
		Storage=	18574
60	Inflow = 60 x 7.7 x 60	=	27627
	Outflow = 0.5 x 70 x 4.1x 60	=	8602
		Storage=	19025
70	Inflow = 70 x 6.9 x 60	=	29047
	Outflow = 0.5 x 80 x 4.1x 60	=	9831
		Storage=	19216
80	Inflow = 80 x 6.3 x 60	=	30277
	Outflow = 0.5 x 90 x 4.1x 60	=	11060
		Storage=	19217
90	Inflow = 90 x 5.8 x 60	=	31364
	Outflow = 0.5 x 100 x 4.1x 60	=	12289
		Storage=	19075
100	Inflow = 100 x 5.4 x 60	=	32337
	Outflow = 0.5 x 110 x 4.1x 60	=	13518
		Storage=	18819
120	Inflow = 120 x 4.7 x 60	=	34025
	Outflow = 0.5 x 130 x 4.1x 60	=	15975
		Storage=	18050
Maximum Volume Required		Cubic Feet=	19217
		ACRE-FT REQUIRED=	0.4

RECORD DRAWINGS JANUARY 20, 2014
NOTE: THE INTENT OF THE OWNER AND ENGINEER WAS TO CONSTRUCT THE IMPROVEMENTS ACCORDING TO THESE PLANS AS APPROVED BY THE CITY OF ROCKWALL. THE LINES AND GRADES WERE SET ON THE GROUND FOR CONSTRUCTION ACCORDING TO SAID PLANS. WE ARE NOT AWARE OF ANY CHANGES OR REVISIONS TO THESE PLANS DURING CONSTRUCTION EXCEPT AS NOTED ON THE PLANS.

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Issues / Revisions

No.	Date	Description
1	9/28/2012	ISSUED FOR REVIEW
2	10/31/2012	ISSUED FOR REVIEW
3	11/13/2012	ISSUED FOR REVIEW
4	11/16/2012	ISSUED FOR REVIEW
01/30/2013		PR 01
01/20/2014		RECORD DRAWINGS

Project
Emerus Emergency Hospital - Rockwall

EMERUS
ADVANCED EMERGENCY CARE

Interstate Highway 30 and T.L Townsend Drive
Rockwall, TX 75087

Drawing Name
Pond Plan & Calculations

DAA JOB NO. 12005

PEW Constitute Number: 212-020R

Sheet Number: C.7