Detention Pond A

MODIFIED RATIONAL METHOD DETENTION VOLUME CALCULATIONS– Detention Pond "A"
(10ac. School Site & 9.3 ac. Sheet flow from subdivision)

	Existing					Proposed				
Return Period	Existing Area	T_c	i	c	Q_{exist}	Detained Area	T_c	i	c	Q_p
100	19.30	20	8.30	0.35	56.07	19.30	10	9.80	0.60	113.5

Modified Rational Calculations
Return Period 100
Q_{allow} [3] 56.07
T_c prop (min) 10

T_d(min)	I (in/hr)	CA	Q_p (cfs)	Vol $_{in}$ (ft^3)	Vol $_{out}$ (ft^3)	Total Storage
10	9.8	11.580	113.48	68090	33640	34451
20	8.3	11.580	96.11	115337	50460	64877
30	6.82	11.580	78.98	142156	67280	74876
40	5.8	11.580	67.16	161194	84100	77094
50	5	11.580	57.90	173700	100920	72780
60	4.44	11.580	51.42	185095	117740	67355
70	3.98	11.580	46.09	193571	134560	59012
80	3.62	11.580	41.92	201214	151380	49835
90	3.32	11.580	38.45	207606	168200	39407

Example (40 min)

Inflow Volume = Td^*Qp^*60
= 40min*67.16cfs*60sec/min
= 161,194 ft^3

Outflow Volume = $0.5^*(Td+Tc)^*Qallow^*60$
= 0.5*(40+10)min*56.07cfs*60sec/min
= 84,100 ft^3

Storage Volume = Inflow Volume – Outflow Volume
= 161,194 ft^3 – 84,100 ft^3
= 77,094 ft^3

[3] numerical difference is due to rounding

Detention Pond A

Pond Storage Volume Required = 77,094 cubic feet

Pond Storage Volume Provided = 108,252 cubic feet

Detention Pond A Storage Calculations

Elevation	Area (ft2)	Average Area (ft2)	Incremental Storage (ft3)	Cumulative Storage (ft3)
587	0	0	0	0
587.5	486	243	121.5	121.5
588	5507	2996.5	1498.25	1619.75
589	10858	8182.5	8182.5	9802.25
590	23294	17076	17076	26878.25
591	39530	31412	31412	58290.25
592	60393	49961.5	49961.5	108251.75

Detention Pond A Summary

Return Period (yrs)	Required Q_{Allow} (cfs)	Required Storage (ft^3)	Required Min. Pond Elevation (ft)	Required $Q_{released}$ at Min. Pond Elev. (cfs)
10	39.11	52501	590.82	34.8
25	44.85	61397	591.06	41.6
50	49.99	69538	591.22	47.8
100	56.07	77094	591.38	55.05

Detention Pond B

MODIFIED RATIONAL METHOD DETENTION VOLUME CALCULATIONS

	Existing					Proposed				
Return Period	Existing Area	T_c	i	c	Q_{exist}	Detained Area	T_c	i	c	Q_p
100	27.00	20	8.30	0.35	78.44	27.00	10	9.80	0.50	132.3

Modified Rational Calculations
Return Period 100
Q_{allow} [3] 78.44
T_c prop (min) 10

T_d(min)	I (in/hr)	CA	Q_p (cfs)	Vol $_{in}$ (ft^3)	Vol $_{out}$ (ft^3)	Total Storage
10	9.8	13.500	132.30	79380	47081	32319
20	8.3	13.500	112.05	134460	70592	63869
30	6.82	13.500	92.07	165726	94122	71604
40	5.8	13.500	78.30	187920	117653	70268
50	5	13.500	67.50	202500	141183	61317
60	4.44	13.500	59.94	215784	164714	51071
70	3.98	13.500	53.73	225866	188244	37422
80	3.62	13.500	48.87	234576	211775	22802
90	3.32	13.500	44.82	242028	235305	6723

Example (80 min)

Inflow Volume = Td^*Qp^*60
= 80min*2.98cfs*60sec/min
= 14,304 ft^3

Outflow Volume = $0.5^*(Td+Tc)^*Qallow^*60$
= 0.5*(80+10)min*1.69cfs*60sec/min
= 4563 ft^3

Storage Volume = Inflow Volume – Outflow Volume
= 14,304 ft^3 – 4563 ft^3
= 9,741 ft^3

[3] numerical difference is due to rounding

Detention Pond B

Pond Storage Volume Required = 71,694 cubic feet

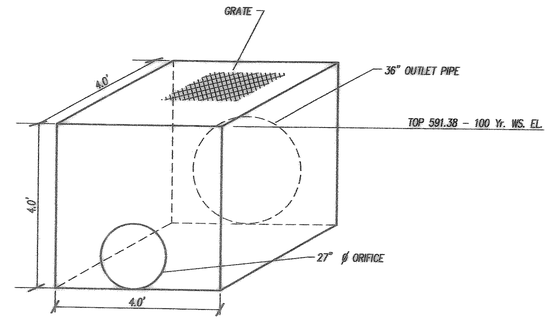
Pond Storage Volume Provided = 75,919 cubic feet

Detention Pond B Storage Calculations

Elevation	Area (ft2)	Average Area (ft2)	Incremental Storage (ft3)	Cumulative Storage (ft3)
564	36000	0	0	0
565	41250	38625	38625	38625
565.85	46500	43875	37294	75919

Detention Pond B Summary

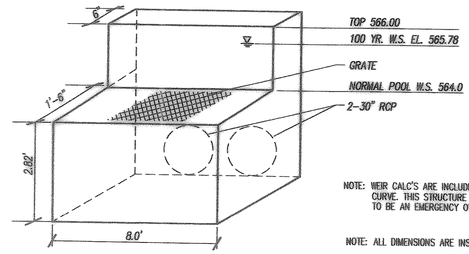
Return Period (yrs)	Required Q_{Allow} (cfs)	Required Storage (ft^3)	Required Min. Pond Elevation (ft)	Required $Q_{released}$ at Min. Pond Elev. (cfs)
10	54.72	50009	565.29	48.3
25	62.75	57866	565.47	58.8
50	69.93	65772	565.65	69.9
100	78.44	71604	565.78	78.4



NOTE: ALL DIMENSIONS ARE INSIDE DIMENSIONS

DETENTION POND "A"
PRECAST CATCH BASIN

NTS.

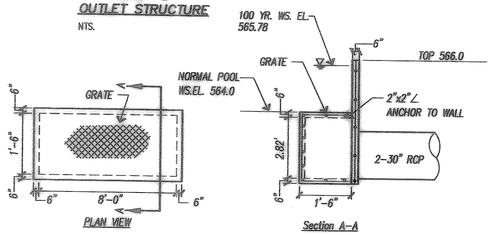


NOTE: WEIR CALC'S ARE INCLUDED IN OUTFLOW RATING CURVE. THIS STRUCTURE IS NOT INTENDED TO BE AN EMERGENCY OVERFLOW STRUCTURE.

NOTE: ALL DIMENSIONS ARE INSIDE DIMESIONS

POND "B"
OUTLET STRUCTURE

NTS.



NOTE:
ALL REINF. SHALL BE #3 BARS ON 12" O.C.E.W.

RETENTION/DETENTION POND "B"
OUTLET STRUCTURE

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY CHRISTOPHER R. CUNY, P.E. 65642

STATE OF TEXAS
CHRISTOPHER R. CUNY
65642
LICENSED
PROFESSIONAL ENGINEER

8-22-2007

Construction Record Drawing
8-22-2007

Detention and Retention Pond calculations					
Fontanna Ranch					
City of Rockwall, Rockwall County, Texas					
Spring Haven Investments, Inc.					
6750 Hillcrest Plaza Dr. • Suite 305 • Dallas, Texas 75230 • 972.386.3333					
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Drawn By:	Checked By:	Date:	Scale:	Project No.:	Sheet No.:
MSC	DJW	10/18/06	No Scale	05-013	23 of 45

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