RUNOFF CALCULATIONS

100-YEAR EXISTING CONDITIONS

Area	Acreage	c	I	Q
1	0.12	0.35	8.3	0.35
2	0.26	0.35	8.3	0.76
3	0.29	0.35	8.3	0.84
4	0.65	0.35	8.3	1.89
5	0.42	0.35	8.3	1.22
6	0.13	0.35	8.3	0.38
Total =	1.87			5.43

100-YEAR PROPOSED CONDITIONS

Area	Acreage	c	I	Q
1	0.12	0.35	8.3	0.35
2	0.26	0.90	9.8	2.29
3	0.29	0.90	9.8	2.56
4	0.65	0.90	9.8	5.73
5	0.42	0.35	8.3	1.22
6	0.13	0.35	8.3	0.38
Total =	1.87			12.53

Allowable Pond Outflow	Actual Pond Outflow
2.79	2.54 *

50-YEAR EXISTING CONDITIONS

Area	Acreage	c	I	Q
1	0.12	0.35	7.4	0.31
2	0.26	0.35	7.4	0.67
3	0.29	0.35	7.4	0.75
4	0.65	0.35	7.4	1.68
5	0.42	0.35	7.4	1.09
6	0.13	0.35	7.4	0.34
Total =	1.87			4.84

50-YEAR PROPOSED CONDITIONS

Area	Acreage	c	I	Q
1	0.12	0.35	7.4	0.31
2	0.26	0.90	9.0	2.11
3	0.29	0.90	9.0	2.35
4	0.65	0.90	9.0	5.27
5	0.42	0.35	7.4	1.09
6	0.13	0.35	7.4	0.34
Total =	1.87			11.46

Allowable Pond Outflow	Actual Pond Outflow
2.43	2.29 *

25-YEAR EXISTING CONDITIONS

Area	Acreage	c	I	Q
1	0.12	0.35	6.6	0.28
2	0.26	0.35	6.6	0.60
3	0.29	0.35	6.6	0.67
4	0.65	0.35	6.6	1.50
5	0.42	0.35	6.6	0.97
6	0.13	0.35	6.6	0.30
Total =	1.87			4.32

25-YEAR PROPOSED CONDITIONS

Area	Acreage	c	I	Q
1	0.12	0.35	6.6	0.28
2	0.26	0.90	8.3	1.94
3	0.29	0.90	8.3	2.17
4	0.65	0.90	8.3	4.86
5	0.42	0.35	6.6	0.97
6	0.13	0.35	6.6	0.30
Total =	1.87			10.51

Allowable Pond Outflow	Actual Pond Outflow
2.10	2.03 *

10-YEAR EXISTING CONDITIONS

Area	Acreage	c	I	Q
1	0.12	0.35	5.8	0.24
2	0.26	0.35	5.8	0.53
3	0.29	0.35	5.8	0.59
4	0.65	0.35	5.8	1.32
5	0.42	0.35	5.8	0.85
6	0.13	0.35	5.8	0.26
Total =	1.87			3.80

10-YEAR PROPOSED CONDITIONS

Area	Acreage	c	I	Q
1	0.12	0.35	5.8	0.24
2	0.26	0.90	7.2	1.68
3	0.29	0.90	7.2	1.88
4	0.65	0.90	7.2	4.21
5	0.42	0.35	5.8	0.85
6	0.13	0.35	5.8	0.26
Total =	1.87			9.14

Allowable Pond Outflow	Actual Pond Outflow
1.87	1.75 *

Allowalbe pond outflow is computed by taking the Total Existing Conditions Runoff and subtracting the Proposed Conditions Runoff from Areas 1 and 2 (which are undetained) to determine the maximum allowable discharge from the Detention Pond to insure that there is no increase in Runoff from the 10-year, 25-year, 50-year and 100-year design storms. The Actual Pond Outflow is taken from the routing computations below.

100-YEAR STORM ROUTING

Rockwall-DET-Final *Type II 24-hr Rainfall=9.80"*
Prepared by Gonzalez & Schneeberg, Engineers & Surveyors, Inc. Page 1
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Pond 1P: ROCKWALL

Inflow = 12.91 cfs @ 12.02 hrs, Volume= 0.700 af
Outflow = 2.54 cfs @ 12.27 hrs, Volume= 0.694 af, Atten= 80%, Lag= 15.5 min
Primary = 2.54 cfs @ 12.27 hrs, Volume= 0.694 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 490.60' Storage= 10,799 cf
Plug-Flow detention time= 43.8 min calculated for 0.694 af (99% of inflow)
Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
486.20	0	0	0
487.00	2,600	1,040	1,040
488.00	2,660	2,630	3,670
489.00	2,720	2,690	6,360
490.00	2,780	2,750	9,110
491.00	2,840	2,810	11,920
491.80	2,890	2,292	14,212

Primary OutFlow (Free Discharge)
1=Broad-Crested Rectangular Weir
2=Orifice/Grate

#	Routing	Invert	Outlet Devices
1	Primary	490.60'	**8.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
2	Primary	486.20'	**6.9" Vert. Orifice/Grate** C= 0.600

25-YEAR STORM ROUTING

Rockwall-DET-Final *Type II 24-hr Rainfall=7.60"*
Prepared by Gonzalez & Schneeberg, Engineers & Surveyors, Inc. Page 1
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Pond 1P: ROCKWALL

Inflow = 8.71 cfs @ 12.02 hrs, Volume= 0.470 af
Outflow = 2.03 cfs @ 12.24 hrs, Volume= 0.464 af, Atten= 77%, Lag= 13.4 min
Primary = 2.03 cfs @ 12.24 hrs, Volume= 0.464 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 489.12' Storage= 6,697 cf
Plug-Flow detention time= 36.7 min calculated for 0.464 af (99% of inflow)
Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
486.20	0	0	0
487.00	2,600	1,040	1,040
488.00	2,660	2,630	3,670
489.00	2,720	2,690	6,360
490.00	2,780	2,750	9,110
491.00	2,840	2,810	11,920
491.80	2,890	2,292	14,212

Primary OutFlow (Free Discharge)
1=Broad-Crested Rectangular Weir
2=Orifice/Grate

#	Routing	Invert	Outlet Devices
1	Primary	490.60'	**8.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
2	Primary	486.20'	**6.9" Vert. Orifice/Grate** C= 0.600

50-YEAR STORM ROUTING

Rockwall-DET-Final *Type II 24-hr Rainfall=8.70"*
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Pond 1P: ROCKWALL

Inflow = 10.79 cfs @ 12.02 hrs, Volume= 0.583 af
Outflow = 2.29 cfs @ 12.26 hrs, Volume= 0.577 af, Atten= 79%, Lag= 14.5 min
Primary = 2.29 cfs @ 12.26 hrs, Volume= 0.577 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 489.85' Storage= 8,692 cf
Plug-Flow detention time= 40.2 min calculated for 0.577 af (99% of inflow)
Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
486.20	0	0	0
487.00	2,600	1,040	1,040
488.00	2,660	2,630	3,670
489.00	2,720	2,690	6,360
490.00	2,780	2,750	9,110
491.00	2,840	2,810	11,920
491.80	2,890	2,292	14,212

Primary OutFlow (Free Discharge)
1=Broad-Crested Rectangular Weir
2=Orifice/Grate

#	Routing	Invert	Outlet Devices
1	Primary	490.60'	**8.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
2	Primary	486.20'	**6.9" Vert. Orifice/Grate** C= 0.600

10-YEAR STORM ROUTING

Rockwall-DET-Final *Type II 24-hr Rainfall=6.50"*
Prepared by Gonzalez & Schneeberg, Engineers & Surveyors, Inc. Page 1
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Pond 1P: ROCKWALL

Inflow = 6.69 cfs @ 12.02 hrs, Volume= 0.361 af
Outflow = 1.75 cfs @ 12.22 hrs, Volume= 0.356 af, Atten= 74%, Lag= 12.3 min
Primary = 1.75 cfs @ 12.22 hrs, Volume= 0.356 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Peak Elev= 488.44' Storage= 4,844 cf
Plug-Flow detention time= 33.4 min calculated for 0.356 af (99% of inflow)
Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
486.20	0	0	0
487.00	2,600	1,040	1,040
488.00	2,660	2,630	3,670
489.00	2,720	2,690	6,360
490.00	2,780	2,750	9,110
491.00	2,840	2,810	11,920
491.80	2,890	2,292	14,212

Primary OutFlow (Free Discharge)
1=Broad-Crested Rectangular Weir
2=Orifice/Grate

#	Routing	Invert	Outlet Devices
1	Primary	490.60'	**8.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
2	Primary	486.20'	**6.9" Vert. Orifice/Grate** C= 0.600

CALCULATION OF REQUIRED DETENTIO VOLUME

Allowable 100-year Release Rate = 2.79
ca for Areas 3-6 = 1.04

Storm Duration	Rainfall Intensity	Volume	Required Storage	
15	9.0	Inflow = 8424 Outflow = 2511	5913	
20	8.3	Inflow = 10358 Outflow = 2930	7429	
30	6.9	Inflow = 12917 Outflow = 3767	9150	
40	5.8	Inflow = 14477 Outflow = 4604	9873	
50	5.0	Inflow = 15600 Outflow = 5441	10160	**REQUIRED**
60	4.3	Inflow = 16099 Outflow = 6278	9822	
70	3.9	Inflow = 17035 Outflow = 7115	9921	
80	3.6	Inflow = 17971 Outflow = 7952	10020	
90	3.3	Inflow = 18533 Outflow = 8789	9744	
100	3.0	Inflow = 18720 Outflow = 9626	9095	
110	2.8	Inflow = 19219 Outflow = 10463	8757	
120	2.6	Inflow = 19469 Outflow = 11300	8169	

STAGE/STORAGE CURVE FOR POND

Rockwall-DET-Final *Type II 24-hr Rainfall=9.80"*
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Pond 1P: ROCKWALL

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
486.20	0	0	491.40	2,865	13,066
486.30	325	130	491.50	2,871	13,352
486.40	650	260	491.60	2,877	13,639
486.50	975	390	491.70	2,884	13,925
486.60	1,300	520	491.80	2,890	14,212
486.70	1,625	650			
486.80	1,950	780			
486.90	2,275	910			
487.00	2,600	1,040			
487.10	2,606	1,303			
487.20	2,612	1,566			
487.30	2,618	1,829			
487.40	2,624	2,092			
487.50	2,630	2,355			
487.60	2,636	2,618			
487.70	2,642	2,881			
487.80	2,648	3,144			
487.90	2,654	3,407			
488.00	2,660	3,670			
488.10	2,666	3,939			
488.20	2,672	4,208			
488.30	2,678	4,477			
488.40	2,684	4,746			
488.50	2,690	5,015			
488.60	2,696	5,284			
488.70	2,702	5,553			
488.80	2,708	5,822			
488.90	2,714	6,091			
489.00	2,720	6,360			
489.10	2,726	6,635			
489.20	2,732	6,910			
489.30	2,738	7,185			
489.40	2,744	7,460			
489.50	2,750	7,735			
489.60	2,756	8,010			
489.70	2,762	8,285			
489.80	2,768	8,560			
489.90	2,774	8,835			
490.00	2,780	9,110			
490.10	2,786	9,391			
490.20	2,792	9,672			
490.30	2,798	9,953			
490.40	2,804	10,234			
490.50	2,810	10,515			
490.60	2,816	10,796			
490.70	2,822	11,077			
490.80	2,828	11,358			
490.90	2,834	11,639			
491.00	2,840	11,920			
491.10	2,846	12,206			
491.20	2,852	12,493			
491.30	2,859	12,779			

STAGE/DISCHARGE CURVE VERTICAL ORIFICE WITH OVERFLOW TO LIP OF WYE INLET

Rockwall-DET-Final *Type II 24-hr Rainfall=9.80"*
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Pond 1P: ROCKWALL

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
486.20	0.00	488.28	1.67	490.36	2.46
486.24	0.01	488.32	1.69	490.40	2.47
486.28	0.02	488.36	1.71	490.44	2.49
486.32	0.05	488.40	1.73	490.48	2.50
486.36	0.08	488.44	1.75	490.52	2.51
486.40	0.12	488.48	1.76	490.56	2.52
486.44	0.17	488.52	1.78	490.60	2.54
486.48	0.23	488.56	1.80	490.64	2.73
486.52	0.29	488.60	1.82	490.68	3.07
486.56	0.35	488.64	1.83	490.72	3.50
486.60	0.42	488.68	1.85	490.76	4.02
486.64	0.48	488.72	1.87	490.80	4.60
486.68	0.55	488.76	1.88	490.84	5.26
486.72	0.61	488.80	1.90	490.88	6.00
486.76	0.66	488.84	1.92	490.92	6.79
486.80	0.70	488.88	1.93	490.96	7.65
486.84	0.74	488.92	1.95	491.00	8.57
486.88	0.78	488.96	1.97	491.04	9.56
486.92	0.82	489.00	1.98	491.08	10.62
486.96	0.86	489.04	2.00	491.12	11.74
487.00	0.90	489.08	2.01	491.16	12.92
487.04	0.93	489.12	2.03	491.20	14.17
487.08	0.96	489.16	2.04	491.24	15.52
487.12	0.99	489.20	2.06	491.28	16.95
487.16	1.03	489.24	2.07	491.32	18.45
487.20	1.06	489.28	2.09	491.36	20.02
487.24	1.08	489.32	2.10	491.40	21.66
487.28	1.11	489.36	2.12	491.44	23.13
487.32	1.14	489.40	2.13	491.48	24.64
487.36	1.17	489.44	2.15	491.52	26.19
487.40	1.19	489.48	2.16	491.56	27.77
487.44	1.22	489.52	2.18	491.60	29.39
487.48	1.25	489.56	2.19	491.64	31.01
487.52	1.27	489.60	2.21	491.68	32.66
487.56	1.29	489.64	2.22	491.72	34.34
487.60	1.32	489.68	2.23	491.76	36.05
487.64	1.34	489.72	2.25	491.80	37.80
487.68	1.37	489.76	2.26		
487.72	1.39	489.80	2.28		
487.76	1.41	489.84	2.29		
487.80	1.43	489.88	2.30		
487.84	1.45	489.92	2.32		
487.88	1.48	489.96	2.33		
487.92	1.50	490.00	2.34		
487.96	1.52	490.04	2.36		
488.00	1.54	490.08	2.37		
488.04	1.56	490.12	2.38		
488.08	1.58	490.16	2.40		
488.12	1.60	490.20	2.41		
488.16	1.62	490.24	2.42		
488.20	1.64	490.28	2.43		
488.24	1.66	490.32	2.45		

8/30/04

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12/16/03

⚠ RECORD DRAWING

THIS DRAWING HAS BEEN REVISED TO REFLECT CONSTRUCTION RECORDS MAINTAINED BY THE GENERAL CONTRACTOR: RIDGEMONT COMMERCIAL CONSTRUCTION

DATE OF REVISION: AUGUST 30, 2004

BENCHMARKS:

TOP OPERATING NUT OF FIRE HYDRANT AT INTERSECTION OF YELLOW JACKET LN. AND KYLE DR.

ELEV.= 529.26

NO.	DATE	REVISION
1	8-30-04	Changes for record drawing

5

PROJ. NO.:4956-03-07-15 DWG. NO.:4956grd.dwg

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DETENTION CALCULATIONS

LOT 3R, BLOCK B, THE WOODS AT ROCKWALL ADDITION NO. 1

SURGERY CENTER OF ROCKWALL

CITY OF ROCKWALL, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
GSES	GSES	NOVEMBER 2003	1"=20'			