MODIFIED RATIONAL METHOD DETENTION BASIN DESIGN
POND #1

PRESENT CONDITIONS								
	DEV				UNDEV			
Q = CIA								
AREA =	1.67	acres			3.56	acres		
C =	0.35				0.35			
T =	20	minutes			20	minutes		
i 100 =	8.3	in/hr			8.3	in/hr		
Q100 =	1.86	max imum release rate			10.34	max imum release rate		
FUTURE CONDITIONS								
C =	0.8					C =	0.8	
T =	10					T =	20	
i 100 =	9.8	10 min				i 100 =	8.3	20 min
Q100 =	13.09					Q100 =	11.09	
C =	0.8					C =	0.8	
T =	30					T =	40	
i 100 =	7.1	30 min				i 100 =	5.9	40 min
Q100 =	9.49					Q100 =	7.88	
C =	0.8					C =	0.8	
T =	50					T =	60	
i 100 =	5	50 min				i 100 =	4.5	60 min
Q100 =	6.68					Q100 =	6.01	
C =	0.8					C =	0.8	
T =	70					T =	80	
i 100 =	4	70 min				i 100 =	3.7	80 min
Q100 =	5.34					Q100 =	4.94	
C =	0.8							
T =	90							
i 100 =	3.4	90 min						
Q100 =	4.54							
EXISTING CONDITIONS								
C =	0.35					C =	0.35	
T =	10					T =	20	
i 100 =	9.8	10 min				i 100 =	8.3	20 min
Q100 =	12.21					Q100 =	10.34	
C =	0.35					C =	0.35	
T =	30					T =	40	
i 100 =	7.1	30 min				i 100 =	5.9	40 min
Q100 =	8.85					Q100 =	7.35	
C =	0.35					C =	0.35	
T =	50					T =	60	
i 100 =	5	50 min				i 100 =	4.5	60 min
Q100 =	6.23					Q100 =	5.61	
C =	0.35					C =	0.35	
T =	70					T =	80	
i 100 =	4	70 min				i 100 =	3.7	80 min
Q100 =	4.98					Q100 =	4.61	
C =	0.35							
T =	90							
i 100 =	3.4	90 min						
Q100 =	4.24							

	inflow =	T*Q*60				
	outflow=	0.5*(T+Td)*Q*60		Td=DESIGN TIME=10		
		CFS			REQUIRED STORAGE CF	
10 min storm	inflow =	15182			7861	
	outflow=	7321				
20 min storm	inflow =	25717			14735	
	outflow=	10982				
30 min storm	inflow =	32998			18356	
	outflow=	14642				
40 min storm	inflow =	38561			18258	
	outflow=	18303				
50 min storm	inflow =	38730			16767	
	outflow=	21963				
60 min storm	inflow =	41828			16205	
	outflow=	25624				
70 min storm	inflow =	43378			14093	
	outflow=	29284				
80 min storm	inflow =	45856			12911	
	outflow=	32945				
90 min storm	inflow =	47406			10800	
	outflow=	36605				

Depth/Flow Calculations
Pond #1
h=1 Q=5.97 cfs
h=2 Q=8.47 cfs
h=3.97 Q=11.81 cfs

MODIFIED RATIONAL METHOD DETENTION BASIN DESIGN
POND #2

PRESENT CONDITIONS								
	DEV				UNDEV			
Q = CIA								
AREA =	0.39	acres			4.2	acres		
C =	0.35				0.35			
T =	20	minutes			20	minutes		
i 100 =	8.3	in/hr			8.3	in/hr		
Q100 =	0.00	max imum release rate			12.09	max imum release rate		
FUTURE CONDITIONS								
C =	0.8					C =	0.8	
T =	10					T =	20	
i 100 =	9.8	10 min				i 100 =	8.3	20 min
Q100 =	3.06					Q100 =	2.59	
C =	0.8					C =	0.8	
T =	30					T =	40	
i 100 =	7.1	30 min				i 100 =	5.9	40 min
Q100 =	2.22					Q100 =	1.84	
C =	0.8					C =	0.8	
T =	50					T =	60	
i 100 =	5	50 min				i 100 =	4.5	60 min
Q100 =	1.56					Q100 =	1.40	
C =	0.8					C =	0.8	
T =	70					T =	80	
i 100 =	4	70 min				i 100 =	3.7	80 min
Q100 =	1.25					Q100 =	1.15	
C =	0.8							
T =	90							
i 100 =	3.4	90 min						
Q100 =	1.06							
EXISTING CONDITIONS								
C =	0.35					C =	0.35	
T =	10					T =	20	
i 100 =	9.8	10 min				i 100 =	8.3	20 min
Q100 =	14.41					Q100 =	12.20	
C =	0.35					C =	0.35	
T =	30					T =	40	
i 100 =	7.1	30 min				i 100 =	5.9	40 min
Q100 =	10.44					Q100 =	8.67	
C =	0.35					C =	0.35	
T =	50					T =	60	
i 100 =	5	50 min				i 100 =	4.5	60 min
Q100 =	7.35					Q100 =	6.62	
C =	0.35					C =	0.35	
T =	70					T =	80	
i 100 =	4	70 min				i 100 =	3.7	80 min
Q100 =	5.88					Q100 =	5.44	
C =	0.35							
T =	90							
i 100 =	3.4	90 min						
Q100 =	5.00							

	inflow =	T*Q*60				
	outflow=	0.5*(T+Td)*Q*60		Td=DESIGN TIME=10		
		CFS			REQUIRED STORAGE CF	
10 min storm	inflow =	10478			3224	
	outflow=	7254				
20 min storm	inflow =	17749			6868	
	outflow=	10881				
30 min storm	inflow =	22774			8266	
	outflow=	14508				
40 min storm	inflow =	25233			7098	
	outflow=	18135				
50 min storm	inflow =	26730			4968	
	outflow=	21762				
60 min storm	inflow =	28868			3479	
	outflow=	25389				
70 min storm	inflow =	29938			922	
	outflow=	29016				
80 min storm	inflow =	31648			-995	
	outflow=	32643				
90 min storm	inflow =	32718			-3552	
	outflow=	36270				

Depth/Flow Calculations
Pond #2
h=1 Q=5.97 cfs
h=2 Q=8.47 cfs
h=3.97 Q=11.81 cfs

MODIFIED RATIONAL METHOD DETENTION BASIN DESIGN
POND #3

PRESENT CONDITIONS								
Q = CIA								
AREA =	1.86	acres						
C =	0.35							
T =	20	minutes						
i 100 =	8.3	in/hr						
Q100 =	3.09	max imum release rate						
FUTURE CONDITIONS								
C =	0.8					C =	0.8	
T =	10					T =	20	
i 100 =	9.8	10 min				i 100 =	8.3	20 min
Q100 =	14.58					Q100 =	12.35	
C =	0.8					C =	0.8	
T =	30					T =	40	
i 100 =	7.1	30 min				i 100 =	5.9	40 min
Q100 =	10.56					Q100 =	8.78	
C =	0.8					C =	0.8	
T =	50					T =	60	
i 100 =	5	50 min				i 100 =	4.5	60 min
Q100 =	7.44					Q100 =	6.70	
C =	0.8					C =	0.8	
T =	70					T =	80	
i 100 =	4	70 min				i 100 =	3.7	80 min
Q100 =	5.95					Q100 =	5.51	
C =	0.8							
T =	90							
i 100 =	3.4	90 min						
Q100 =	5.06							

	inflow =	T*Q*60				
	outflow=	0.5*(T+Td)*Q*60		Td=DESIGN TIME=10		
		CFS			REQUIRED STORAGE CF	
10 min storm	inflow =	8749			6895	
	outflow=	1854				
20 min storm	inflow =	14820			12039	
	outflow=	2781				
30 min storm	inflow =	19017			15309	
	outflow=	3708				
40 min storm	inflow =	21070			16435	
	outflow=	4635				
50 min storm	inflow =	22320			16758	
	outflow=	5562				
60 min storm	inflow =	24106			17617	
	outflow=	6489				
70 min storm	inflow =	24998			17582	
	outflow=	7416				
80 min storm	inflow =	26427			18084	
	outflow=	8343				
90 min storm	inflow =	27320			18050	
	outflow=	9270				

Depth/Flow Calculations
Pond #3
h=.2 Q=.512 cfs
h=.4 Q=1.02 cfs
h=.6 Q=1.53 cfs
h=.8 Q=2.04 cfs
h=1.2 Q=3.07 cfs

DOUPHRATE & ASSOCIATES, INC.
ENGINEERING • PROJECT MANAGEMENT • SURVEYING
2231 RIDGE RD., # 200 ROCKWALL, TEXAS 75087
PHONE: (972)771-9004 FAX: (972)771-9005

STORM CALCULATIONS
JUSTIN ROAD PROFESSIONAL PARK
CITY OF ROCKWALL, TEXAS
COUNTY OF ROCKWALL

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