

MODIFIED RATIONAL METHOD DETENTION CALCULATIONS

Runoff Coefficient - C =	0.9						
Drainage Area - A =	15.25	acres					
Time of Concentration - tc =	10	minutes					
Allowable Outflow Rate - Q* =	72.4	cfs					

Duration (minutes)	Intensity (inches/hr)	Depth (inches)	Inflow Discharge Q=CA	Inflow Volume Cu. Ft.	Outflow Duration (minutes)	Outflow Volume Cu. Ft.	Storage Volume Cu. Ft.	Outflow Discharge (cfs)
5	10.56	0.88	144.9	43,481	15	32,580	10,901	36.3
10	9.80	1.63	134.5	80,703	20	43,440	37,263	62.7
15	9.10	2.28	124.9	112,408	25	54,300	58,108	64.6
20	8.30	2.77	113.9	136,701	30	65,160	71,541	59.6
30	6.90	3.45	94.7	170,465	40	86,880	83,585	46.4
40	5.80	3.87	79.6	191,062	50	108,600	82,462	34.4
50	5.00	4.17	68.6	205,875	60	130,320	75,555	25.2
60	4.50	4.50	61.8	222,345	70	152,040	70,305	19.5
70	4.10	4.78	56.3	236,345	80	173,760	62,585	14.9
80	3.75	5.00	51.5	247,050	90	195,480	51,570	10.7
90	3.48	5.22	47.8	257,350	100	217,200	40,150	7.5
120	2.65	5.30	36.4	261,873	130	286,360	23,487	(2.8)
180	1.93	5.76	26.4	285,590	190	412,680	(127,080)	(11.9)
360	1.16	6.98	16.0	344,882	370	803,640	(458,758)	(21.2)
720	0.73	8.80	10.1	434,808	730	1,585,560	(1,150,752)	(26.6)
1440	0.40	9.55	5.5	471,866	1,450	3,149,400	(2,677,535)	(31.0)
			Required Storage Volume	83,585	cubic feet			
				1.92	acre-feet			

* Allowable Q = (A1+A2+A3+A4+A5+A6+A7)(0.95)(0.9) + (OS1+OS2+OS3)(0.9)(0.9) - (A7)(0.9)(0.9)

Calculations based on City of Rockwall 100-yr IDF Curve

POND STAGE VS. STORAGE & DISCHARGE

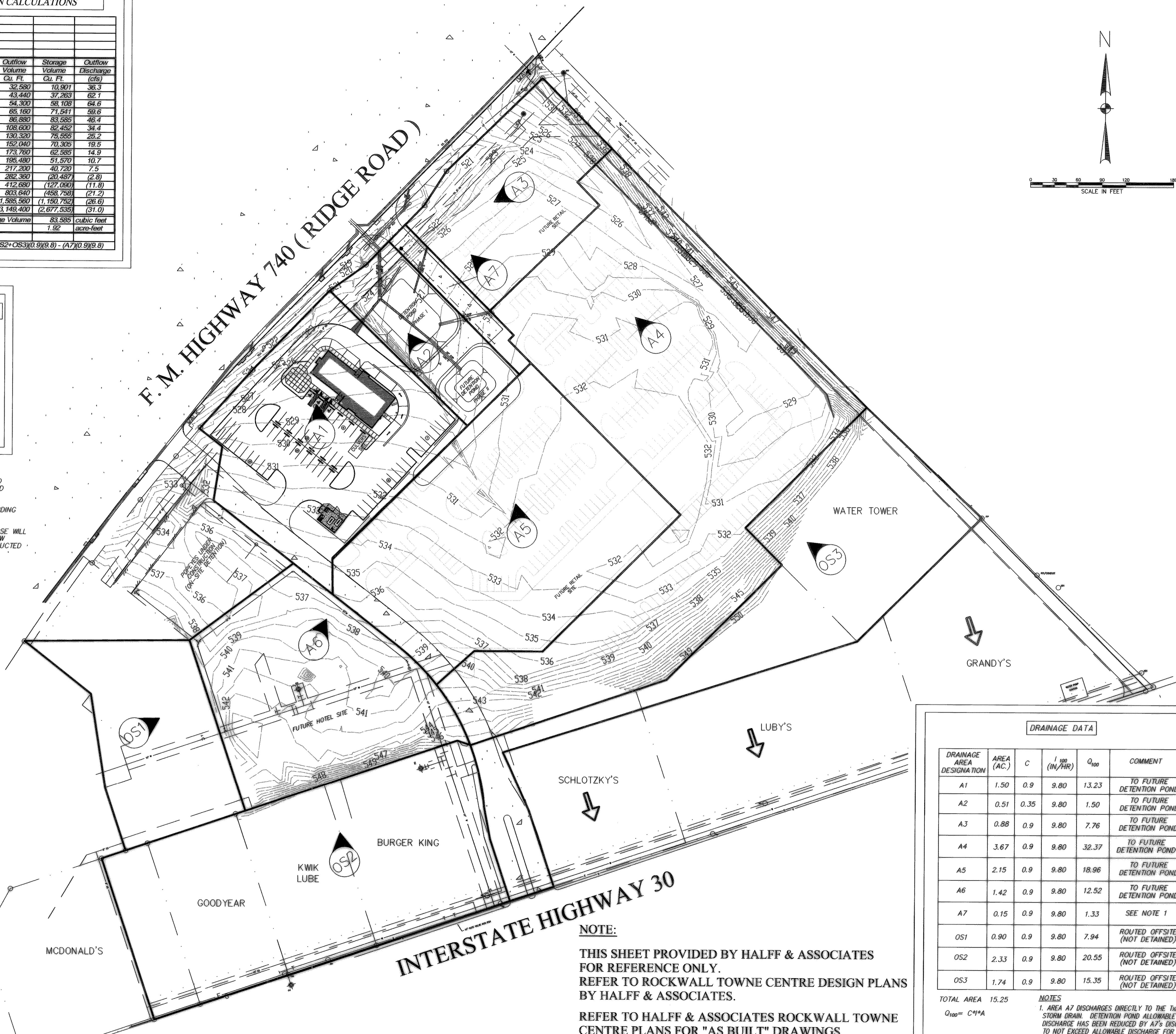
Orifice Coefficient - C =	0.60		
Orifice Area - A =	5.32	Sq. Ft.	

Water Surface Elevation	Height of Water in Detention Pond (ft)	Storage (ft ³)	Outflow (cfs)
520	1	5,685	26.60
521	2	11,380	36.20
522	3	17,085	44.34
523	4	26,241	51.19
524	5	37,491	57.24
525	6	50,849	62.70
526	7	66,969	67.72
527	8	85,863	72.40

- NOTE: 1. RUNOFF FROM AREA OS1, OS2 & OS3 IS BEING PASSED THROUGH THE PROPOSED DEVELOPMENT & DETENTION POND UNDETAINED.
2. SEE NOTE IN DRAINAGE DATA TABLE THIS SHEET REGARDING AREA A7.
3. DETENTION WILL BE BUILT IN 2 PHASES. THE FIRST PHASE WILL BUILD THE PHASE I PORTION OF THE DETENTION TO ALLOW THE CULVERS SITE TO DEVELOP. PHASE II WILL BE CONSTRUCTED WHEN THE REMAINDER OF THE DEVELOPMENT IS BUILT.

F. M. HIGHWAY 740 (RIDGE ROAD)

INTERSTATE HIGHWAY 30



DRAINAGE DATA

DRAINAGE AREA DESIGNATION	AREA (AC.)	C	I ₁₀₀ (IN/HR)	Q ₁₀₀	COMMENT
A1	1.50	0.9	9.80	13.23	TO FUTURE DETENTION POND
A2	0.51	0.35	9.80	1.50	TO FUTURE DETENTION POND
A3	0.88	0.9	9.80	7.76	TO FUTURE DETENTION POND
A4	3.67	0.9	9.80	32.37	TO FUTURE DETENTION POND
A5	2.15	0.9	9.80	18.96	TO FUTURE DETENTION POND
A6	1.42	0.9	9.80	12.52	TO FUTURE DETENTION POND
A7	0.15	0.9	9.80	1.33	SEE NOTE 1
OS1	0.90	0.9	9.80	7.94	ROUTED OFFSITE (NOT DETAINED)
OS2	2.33	0.9	9.80	20.55	ROUTED OFFSITE (NOT DETAINED)
OS3	1.74	0.9	9.80	15.35	ROUTED OFFSITE (NOT DETAINED)

TOTAL AREA 15.25
Q₁₀₀ = C^{1.49}A

NOTES
1. AREA A7 DISCHARGES DIRECTLY TO THE TxDOT STORM DRAIN. DETENTION POND ALLOWABLE DISCHARGE HAS BEEN REDUCED BY A7'S DISCHARGE TO NOT EXCEED ALLOWABLE DISCHARGE FOR THE OVERALL SITE.

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DRAINAGE AREA MAP
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