

MODIFIED RATIONAL METHOD DETENTION CALCULATIONS

Runoff Coefficient C =	0.9						
Drainage Area A =	14.28	acres					
Time of Concentration - tc =	10	minutes					
Allowable Outflow Rate - Q* =	64.97	cfs					

Duration (minutes)	Intensity (inches/hr)	Depth (inches)	Inflow Discharge Q-CIA	Inflow Volume Cu. Ft.	Outflow Duration (minutes)	Outflow Volume Cu. Ft.	Storage Volume Cu. Ft.	Outflow Discharge (cfs)
5	10.56	0.88	135.5	40,658	15	29,237	11,422	38.1
10	9.80	1.63	125.8	75,464	20	38,962	36,482	60.8
15	9.10	2.28	116.8	105,110	25	48,728	56,383	62.6
20	8.30	2.77	106.5	127,827	30	58,473	69,354	57.8
25	7.50	3.13	96.3	144,383	35	68,219	76,164	50.8
30	6.90	3.45	88.6	159,398	40	77,964	81,434	45.2
35	6.50	3.79	83.4	175,184	45	87,710	87,475	41.7
40	6.20	4.07	79.4	191,849	50	97,455	94,394	38.8
45	5.90	4.30	76.2	208,494	55	107,190	101,304	36.2
50	5.60	4.47	73.5	226,119	60	116,940	109,179	34.0
60	5.00	4.50	67.8	267,911	70	136,437	131,474	29.9
70	4.10	4.78	62.6	310,001	80	155,928	154,073	25.5
80	3.75	5.00	58.1	353,442	90	174,419	171,023	21.6
90	3.48	5.22	54.7	397,227	100	191,910	185,317	18.6
120	2.65	6.30	34.0	244,873	130	253,383	(8,510)	(1.2)
180	1.93	7.78	24.7	267,080	190	370,329	(103,249)	(9.6)
360	0.98	14.9	14.9	322,493	370	721,167	(398,674)	(18.5)
720	0.73	8.80	9.4	408,581	730	1,422,843	(1,016,262)	(23.5)
1440	0.40	8.55	5.1	441,233	1,450	2,826,195	(2,384,962)	(27.8)

Required Storage Volume: 87,475 cubic feet
2.01 acre-feet

*Allowable Q = (A1+A2+A3+A4+A5+A6+A7)(0.35)(8.3) + (OS1+OS2+OS3)(0.9)(9.8) - (A3+A7)(0.9)(9.8)

Calculations based on City of Rockwall 100-yr IDF Curve

POND STAGE VS. STORAGE & DISCHARGE

Orifice Coefficient C =	0.60		
Orifice Area A =	4.77	Sq. Ft.	

Water Surface Elevation	Height of Water in Detention Pond (ft)	Storage (ft ³)	Outflow (cfs)
520	1.16	5,693	22.97
521	2	15,527	32.49
522	3	28,361	38.79
523	4	35,639	45.94
524	5	47,227	51.36
525	6	60,188	56.27
526	7	74,184	60.77
527	8	89,939	64.87

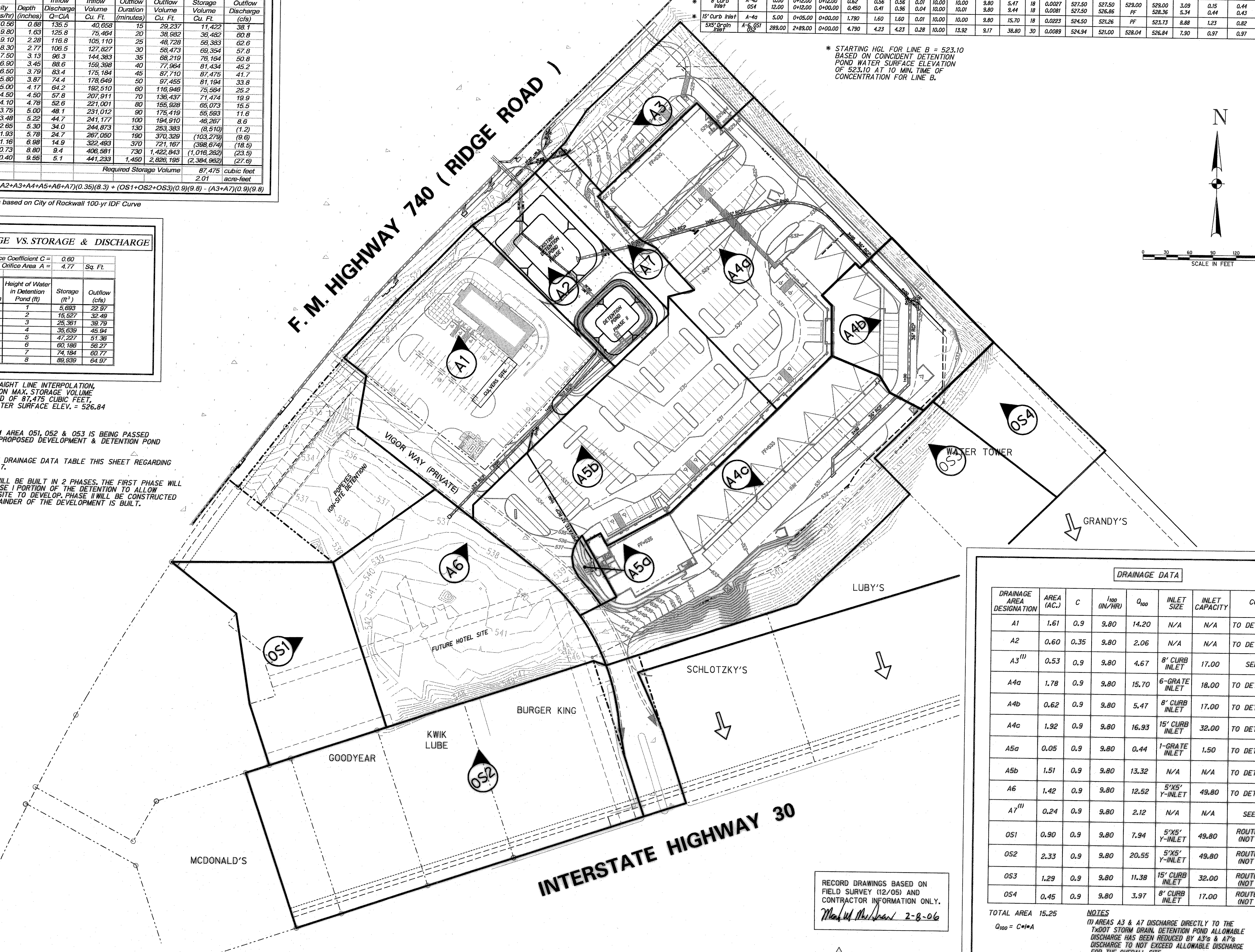
BY STRAIGHT LINE INTERPOLATION, BASED ON MAX. STORAGE VOLUME REQUIRED OF 87,475 CUBIC FEET, MAX. WATER SURFACE ELEV. = 526.84

- 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 AREAS A3 & 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.

Pipe/Inlet Description	Drainage Area (Ac)	Pipe Length (ft)	From Station	To Station	Total Drainage Area (Ac)	Invert Elev.	Flow Time (min)	Time of Concentration (min)	100-Year Storm (In/hr)	100-Year Storm (Cfs)	Pipe Size (In)	Hydraulic Slope	U/S Flowline Elevation (ft)	D/S Flowline Elevation (ft)	U/S I.L.C. Elevation (ft)	D/S I.L.C. Elevation (ft)	Full Flow Velocity (fps)	V2/2g (ft/s)	V2/2g (ft/s)	D/S End Junction Loss K	Junction Headloss at D/S end of Pipe (ft)	Pipe Minor Loss K	Pipe Minor Loss (ft)						
Lat 'B-2'	A-4c,OS3	290.00	2+50.00	0+00.00	1.290	2.89	2.89	10.00	9.80	28.31	36	0.0018	527.02	525.35	520.51	519.50	3.6	0.0031	520.51	523.52	530.22	530.02	4.01	0.25	0.43	0.50	0.30	0.00	0.00
Line 'B'	A-4b,OS4	342.00	4+13.00	0+00.00	0.450	0.96	3.85	10.00	11.21	37.01	36	0.0031	520.51	519.50	520.51	519.50	3.6	0.0031	520.51	523.52	530.22	530.02	4.01	0.25	0.43	0.50	0.30	0.00	0.00
6-Grate Inlet	A-4c	0.00	0+00.00	0+00.00	1.290	1.73	1.73	10.00	9.80	16.93	36	0.0018	527.00	527.00	530.22	530.22	4.01	0.0018	527.00	527.00	530.22	530.22	4.01	0.09	0.25	0.50	0.20	0.00	0.00
8' Curb Inlet	A-4b	0.00	0+12.00	0+12.00	0.62	0.56	0.56	10.00	10.00	3.80	18	0.0027	527.50	527.50	529.00	529.00	3.09	0.0027	527.50	527.50	529.00	529.00	3.09	0.15	0.44	0.50	0.37	0.00	0.00
15' Curb Inlet	A-4a	12.00	0+12.00	0+12.00	0.450	0.41	0.96	10.00	10.01	3.80	18	0.0081	527.50	526.86	526.86	526.86	3.44	0.0081	527.50	526.86	526.86	526.86	3.44	0.44	0.43	0.50	0.20	0.00	0.00
5x5' Drain Inlet	A-6, OS1	5.00	0+05.00	0+00.00	1.790	1.60	1.60	10.00	9.80	15.70	18	0.0223	524.50	521.26	528.04	528.04	8.88	0.0223	524.50	521.26	528.04	528.04	8.88	1.23	0.82	0.50	0.21	0.00	0.00

* STARTING HGL FOR LINE B = 523.10 BASED ON COINCIDENT DETENTION POND WATER SURFACE ELEVATION OF 523.10 AT 10 MIN TIME OF CONCENTRATION FOR LINE B.

F. M. HIGHWAY 740 (RIDGE ROAD)



DRAINAGE DATA							
DRAINAGE AREA DESIGNATION	AREA (AC.)	C	I ₁₀₀ (IN/HR)	Q ₁₀₀	INLET SIZE	INLET CAPACITY	COMMENT
A1	1.61	0.9	9.80	14.20	N/A	N/A	TO DETENTION POND
A2	0.60	0.35	9.80	2.06	N/A	N/A	TO DETENTION POND
A3 ⁽¹⁾	0.53	0.9	9.80	4.67	8' CURB INLET	17.00	SEE NOTE 1
A4a	1.78	0.9	9.80	15.70	6-GRATE INLET	18.00	TO DETENTION POND
A4b	0.62	0.9	9.80	5.47	8' CURB INLET	17.00	TO DETENTION POND
A4c	1.92	0.9	9.80	16.93	15' CURB INLET	32.00	TO DETENTION POND
A5a	0.05	0.9	9.80	0.44	1-GRATE INLET	1.50	TO DETENTION POND
A5b	1.51	0.9	9.80	13.32	N/A	N/A	TO DETENTION POND
A6	1.42	0.9	9.80	12.52	5'x5' Y-INLET	49.80	TO DETENTION POND
A7 ⁽¹⁾	0.24	0.9	9.80	2.12	N/A	N/A	SEE NOTE 1
OS1	0.90	0.9	9.80	7.94	5'x5' Y-INLET	49.80	ROUTED OFFSITE (NOT DETAINED)
OS2	2.33	0.9	9.80	20.55	5'x5' Y-INLET	49.80	ROUTED OFFSITE (NOT DETAINED)
OS3	1.29	0.9	9.80	11.38	15' CURB INLET	32.00	ROUTED OFFSITE (NOT DETAINED)
OS4	0.45	0.9	9.80	3.97	8' CURB INLET	17.00	ROUTED OFFSITE (NOT DETAINED)

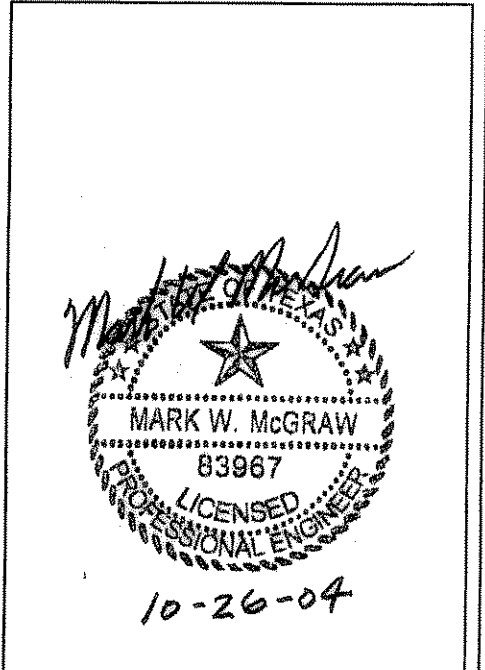
TOTAL AREA 15.25
Q₁₀₀ = C*I*A

NOTES
(1) AREAS A3 & A7 DRAIN DIRECTLY TO THE TxDOT STORM DRAIN. DETENTION POND ALLOWABLE DISCHARGE HAS BEEN REDUCED BY A3'S & A7'S DISCHARGE TO NOT EXCEED ALLOWABLE DISCHARGE FOR THE OVERALL SITE.

RECORD DRAWINGS BASED ON FIELD SURVEY (12/05) AND CONTRACTOR INFORMATION ONLY.
Mark of the Owner 2-8-06

RIDGE ROAD TOWN CENTRE
ROCKWALL, TEXAS

Vigor PROPERTIES INC.
Ridge Road Town Centre Partners, L.P.
by its General Partners:
RIDGE ROAD PARTNERS L.L.C.



Half Associates, Inc.
ENGINEERS • ARCHITECTS • SCIENTISTS • PLANNERS • SURVEYORS
8616 NORTHWEST PLAZA DRIVE
DALLAS, TEXAS 75225
(214) 390-0000
FAX (214) 739-0800

Project No:	AVO # 20817	
Revision:		
No.	Date	Description
1	11/04/02	FIRST SUBMITTAL
2	4/08/03	SECOND SUBMITTAL
3	5/09/03	THIRD SUBMITTAL
4	6/09/03	FOURTH SUBMITTAL
5	7/08/04	FIFTH SUBMITTAL
7	10/29/04	SEVENTH SUBMITTAL

Drawn by:
Checked by:
Sheet Title:
DRAINAGE AREA MAP
Sheet No.:
C3.1