

MODIFIED RATIONAL METHOD DETENTION CALCULATIONS

Runoff Coefficient C = 0.9
 Drainage Area - A = 14.26 acres
 Time of Concentration - t_c = 10 minutes
 Allowable Outflow Rate - Q^a = 64.97 cfs

Duration (minutes)	Intensity (inches/hr)	Depth (inches)	Inflow Discharge Q=CVA	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	75,484	20	36,962	38,522	60.8
15	9.10	2.28	116.8	105,110	25	43,728	61,382	82.6
20	8.30	2.77	106.5	127,827	30	58,473	69,354	97.8
25	7.50	3.13	96.3	144,383	35	68,219	76,164	108.8
30	6.90	3.45	88.6	158,398	40	77,964	80,434	116.2
35	6.50	3.79	83.4	175,184	45	87,710	87,474	121.7
40	6.20	4.11	79.3	194,810	50	97,455	97,355	126.1
50	5.00	4.77	64.2	207,911	60	116,946	90,965	133.9
60	4.50	5.00	57.8	221,012	70	136,437	84,575	141.1
70	4.10	5.19	52.6	231,012	80	155,928	75,084	146.8
80	3.75	5.35	48.1	241,177	90	175,419	65,758	151.5
90	3.48	5.49	44.7	244,873	100	194,910	50,263	155.3
120	2.65	5.30	34.0	267,060	130	253,383	13,677	164.2
180	1.93	5.78	24.7	322,483	180	370,329	(8,510)	180.0
360	1.16	6.88	14.9	406,581	370	721,167	(398,674)	199.7
720	0.73	8.80	9.4	441,233	730	1,422,843	(1,016,262)	223.5
1440	0.40	9.55	5.1	441,233	1,450	2,826,195	(2,384,962)	271.9
		Required Storage Volume		87,475	cubic 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 (cu. ft)	Outflow (cfs)
520	1	5,693	22.97
521	2	15,527	32.48
522	3	25,361	38.79
523	4	35,195	43.94
524	5	44,227	48.07
525	6	52,561	51.27
526	7	60,194	53.54
527	8	67,028	54.87

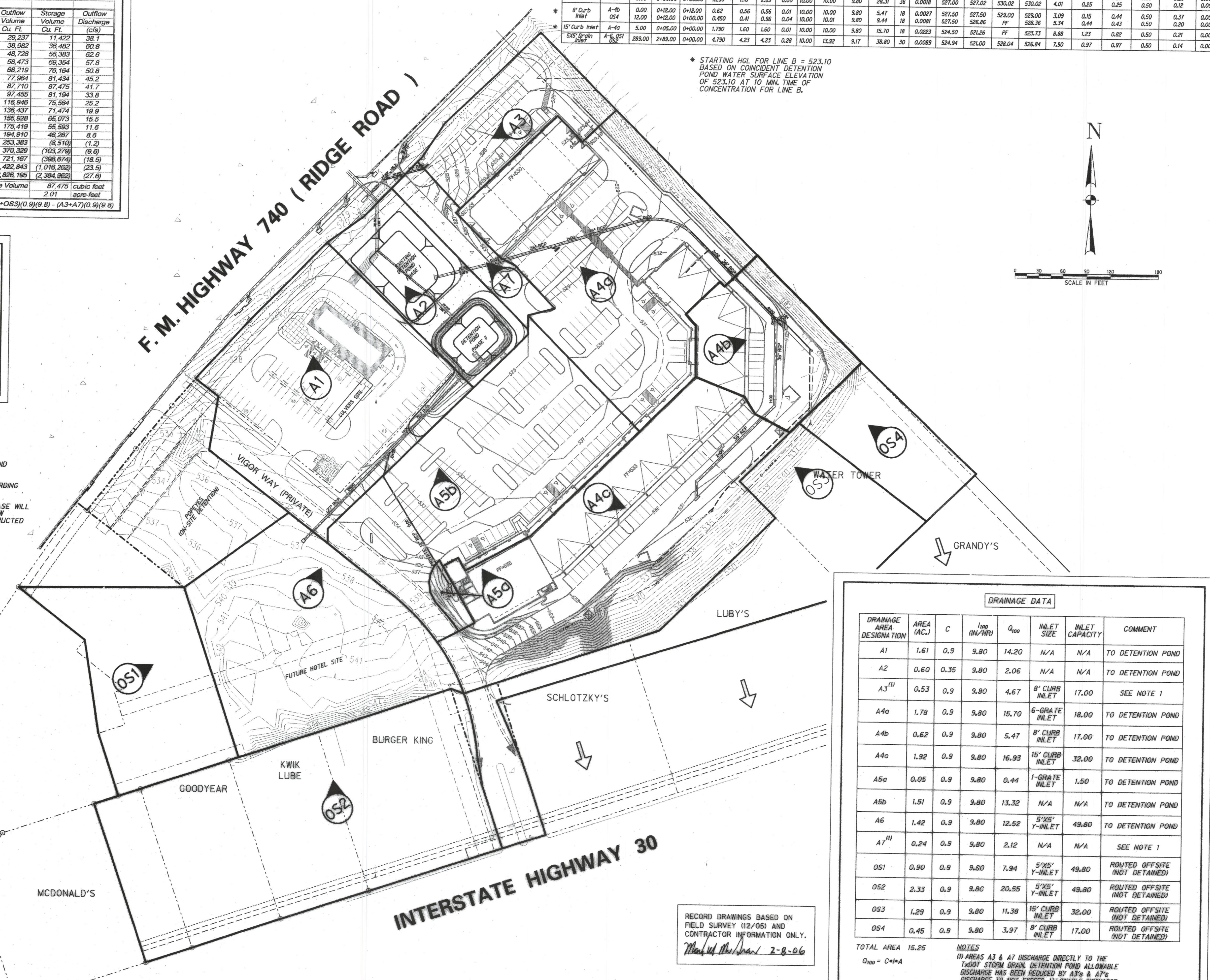
BY STRAIGHT LINE INTERPOLATION, BASED ON MAX. STORAGE VOLUME REQUIRED OF 87,475 CUBIC FEET, MAX. WATER SURFACE ELEV. = 526.84

- 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 Upstream Station	To Downstream Station	Total Drainage Area (Ac)	Invert C/A	Cumulative C/A	Flow Time In Pipe (min)	Inlet 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 H.G. Elevation (ft)	D/S H.G. Elevation (ft)	Full Flow Velocity (ft/s)	Flow Velocity (ft/s)	MINOR LOSSES	V2/2g D/S End of Pipe (ft)	V2/2g D/S End of Pipe (ft)	Junction Loss K	Headloss of D/S end of Pipe (ft)	Pipe Loss K	Pipe Loss K	Minor Loss K
Lot 'B-2'	A-4,053	290.00	2+30.00	0+00.00	1.290	2.89	2.89	1.21	10.00	10.00	9.80	28.31	36	0.0018	527.02	525.36	FF	528.36	4.01	0.25	0.43	0.50	0.30	0.00	0.00	0.00	0.00	0.00
Line 'B'	A-4,054	342.00	4+13.00	0+71.00	0.450	0.96	3.85	1.09	10.00	11.21	9.61	37.01	36	0.0031	525.35	520.51	FF	524.13	5.24	0.43	0.82	0.50	0.67	0.00	0.00	0.00	0.00	
6-Grate Inlet	A-4	0.00	0+00.00	0+00.00	1.920	1.73	1.73	0.00	10.00	10.00	9.80	16.93	36	0.0006	527.00	527.00	530.22	530.22	2.40	0.09	0.25	0.50	0.20	0.00	0.00	0.00	0.00	
8' Curb Inlet	A-4b	0.00	0+12.00	0+12.00	0.62	0.56	0.56	0.01	10.00	10.00	9.80	5.47	18	0.0027	527.50	527.50	528.00	528.00	3.09	0.15	0.44	0.50	0.37	0.00	0.00	0.00	0.00	
15' Curb Inlet	A-4c	5.00	0+05.00	0+05.00	1.790	1.60	1.60	0.01	10.00	10.00	9.80	9.44	18	0.0081	527.50	526.86	FF	528.36	5.34	0.44	0.50	0.50	0.20	0.00	0.00	0.00	0.00	
6x8 Drain Inlet	A-4,051	289.00	2+89.00	0+00.00	4.790	4.23	4.23	0.28	10.00	13.92	9.17	38.80	30	0.0089	524.94	521.00	528.04	528.04	7.90	0.97	0.97	0.50	0.14	0.00	0.00	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)

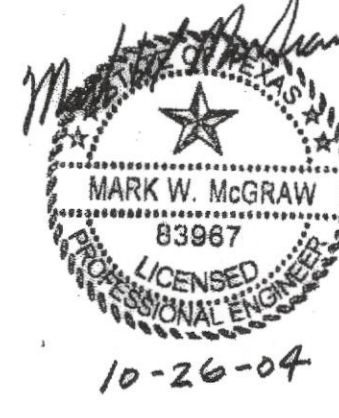
TOTAL AREA 15.25
 Q₁₀₀ = C*I*A

NOTE:
 (1) AREAS A3 & A7 DISCHARGE 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 W. McGraw 2-B-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
 5606 NORTHWEST BLAZA DRIVE
 DALLAS, TEXAS 75225
 TEL (214) 346-6280
 FAX (214) 739-0895

Project No:	AWD # 20817	
Issue:		
Revisions:		
No.	Date	Description
1	10/04/02	FIRST SUBMITTAL
2	04/06/03	SECOND SUBMITTAL
3	05/06/03	THIRD SUBMITTAL
4	05/06/03	FOURTH SUBMITTAL
5	7/20/04	FIFTH SUBMITTAL
7	10/26/04	SEVENTH SUBMITTAL
Drawn by:		
Checked by:		
Sheet Title:	DRAINAGE AREA MAP	
Sheet Number:	C3.1	