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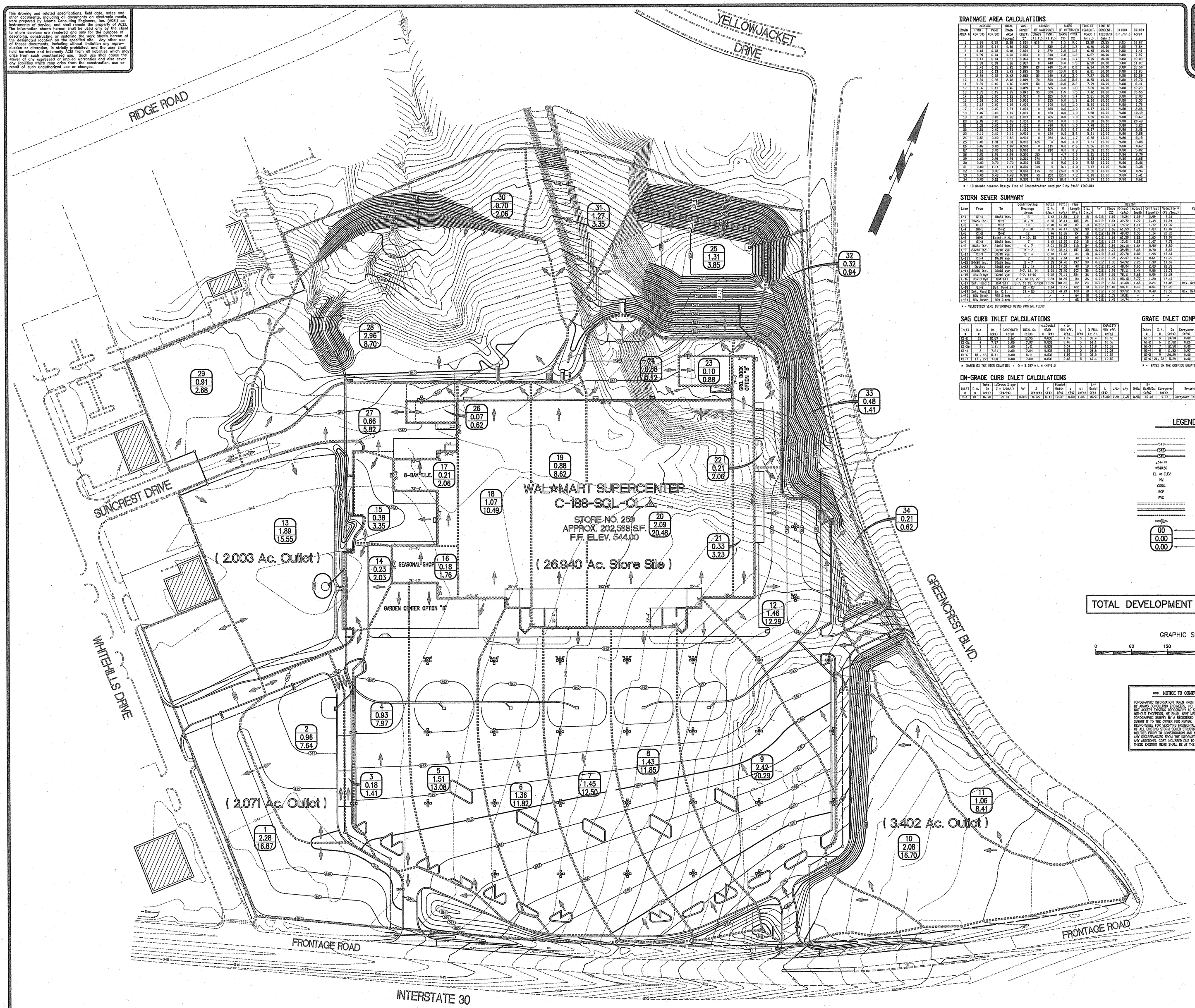

DRAINAGE AREA CALCULATIONS

DRAIN AREA #	POINT (C-30)	ACRES/ PARK (C-30)	TOTAL DRAIN AREA (acres)	AVG. RUNOFF COEFF. "C"	GRADE POINT (L.F.)	LENGTH OF WATERSHED (L.F.)	SLOPE OF WATERSHED GRADE (%)	POINT (%)	TIME OF CONCENT. (VOAC.) (min.)	TIME OF CONCENT. (EQUATION) (min.)	I(100) (in./hr.)	Q(100) (cfs)
1	1.90	0.38	2.28	0.800	613	0	1.5	0.0	12.28	13.25	5.25	16.87
2	0.80	0.16	0.96	0.813	0	250	0.5	1.3	6.46	10.00	9.80	7.64
3	0.15	0.03	0.18	0.800	0	272	0.5	1.3	6.45	10.00	9.80	1.41
4	0.85	0.04	0.93	0.854	0	349	0.5	1.3	6.87	10.00	9.80	7.97
5	1.47	0.04	1.51	0.864	0	450	0.5	1.3	7.05	10.00	9.80	13.08
6	1.30	0.03	1.36	0.867	0	440	0.5	1.3	6.95	10.00	9.80	11.82
7	1.45	0.03	1.45	0.879	21	440	10.5	2.6	5.94	10.00	9.80	12.50
8	1.33	0.13	1.43	0.865	50	492	10.5	2.8	6.81	10.00	9.80	11.85
9	2.24	0.18	2.42	0.855	0	549	8.0	2.8	7.27	10.00	9.80	20.29
10	1.88	0.20	2.08	0.819	71	800	10.5	2.5	8.25	10.00	9.80	16.70
11	0.95	0.11	1.06	0.809	50	420	10.5	2.6	7.79	10.00	9.80	8.41
12	1.36	0.10	1.46	0.859	0	305	0.5	1.3	7.25	10.00	9.80	12.29
13	1.79	0.10	1.89	0.841	35	615	0.5	1.3	7.42	10.00	9.80	15.55
14	0.23	0.00	0.23	0.900	0	133	0.5	1.4	5.81	10.00	9.80	2.03
15	0.36	0.02	0.38	0.900	0	150	0.5	1.3	5.91	10.00	9.80	3.35
16	0.18	0.00	0.18	0.900	0	100	0.5	1.3	5.60	10.00	9.80	1.76
17	0.21	0.00	0.21	1.000	0	140	0.5	1.3	6.17	10.00	9.80	2.06
18	1.00	0.07	1.07	1.000	0	420	0.5	1.3	7.98	10.00	9.80	10.49
19	0.88	0.00	0.88	1.000	0	425	0.5	1.3	7.55	10.00	9.80	8.62
20	2.09	0.00	2.09	1.000	0	395	0.5	1.3	7.28	10.00	9.80	20.48
21	0.33	0.00	0.33	1.000	0	410	0.5	1.3	7.48	10.00	9.80	3.23
22	0.21	0.00	0.21	1.000	0	200	0.5	0.7	5.67	10.00	9.80	2.06
23	0.10	0.00	0.10	0.900	0	130	0.5	2.6	5.61	10.00	9.80	0.88
24	0.58	0.00	0.58	0.900	0	250	0.5	1.7	6.28	10.00	9.80	5.12
25	0.00	1.31	1.31	0.300	485	0	8.5	0.0	7.41	10.00	9.80	3.85
26	0.07	0.00	0.07	0.900	0	115	0.5	2.6	5.56	10.00	9.80	0.62
27	0.66	0.00	0.66	0.900	0	215	0.5	0.9	6.53	10.00	9.80	5.82
28	0.00	2.96	2.96	0.300	525	0	4.7	0.0	8.15	10.00	9.80	8.70
29	0.00	0.91	0.91	0.300	370	0	1.5	0.0	9.93	10.00	9.80	2.68
30	0.00	0.70	0.70	0.300	135	0	9.6	0.0	5.98	10.00	9.80	2.06
31	0.00	1.14	1.14	0.300	315	0	8.1	0.0	7.47	10.00	9.80	3.35
32	0.00	0.32	0.32	0.300	175	30	25.0	5.0	5.70	10.00	9.80	0.94
33	0.00	0.48	0.48	0.300	75	255	30.0	7.2	5.10	10.00	9.80	1.41
34	0.00	0.21	0.21	0.300	95	135	18.5	7.2	5.87	10.00	9.80	0.62

* - 10 minute minimum Design Time of Concentration used per City Staff (I=9.80)

STORM SEWER SUMMARY

Line	From	To	Contributing Drainage Areas	Total D.A. (ac.)	Total Q (cfs)	Pipe Length (ft.)	Dia. (in.)	"n"	Slope (%)	DESIGN Q(max) (cfs)	Actual Depth	Critical Elev.	Velocity * (ft./sec.)	Remarks
L-1	Q1-4	18x24 Inc.	8	1.43	11.85	115	18	0.012	1.15	12.24	1.29	5.99	7.31	
L-2	18x24 Inc.	MH-1	8 - 9	3.85	32.14	185	24	0.012	1.54	22.70	1.77	1.49	10.34	
L-3	C1-1	MH-1	10	2.08	16.03	82	18	0.012	0.44	19.12	1.11	1.72	11.29	
L-4	MH-1	MH-2	8 - 10	5.92	48.17	232	30	0.012	1.62	41.39	1.76	1.83	13.27	
L-5	C1-2	MH-2	10	1.46	12.76	24	18	0.012	16.54	49.03	0.35	1.14	20.22	
L-6	MH-2	Exist. R.R.	8 - 10, 12	7.29	61.13	68	30	0.012	1.68	41.99	1.86	1.85	13.29	
L-7	C1-3	18x24 Inc.	7	1.45	12.32	115	18	0.012	1.13	12.01	1.28	1.97	7.78	
L-8	18x24 Inc.	24x30 Inc.	6 - 7	2.81	24.30	115	24	0.012	0.58	20.11	1.64	2.52	8.89	
L-9	24x30 Inc.	30x18 Ave	5 - 7	8.21	37.43	157	30	0.012	0.25	29.39	2.05	0.78	8.63	
L-10	C1-5	30x18 Ave	2 - 4	2.07	17.50	34	18	0.012	5.03	27.79	1.89	1.05	15.81	
L-11	C1-4	18x18 Ave	2	0.96	7.64	43	18	0.012	3.05	19.07	1.63	0.61	10.76	
L-12	24x30 Inc.	30x36 Inc.	2 - 7	8.28	54.45	197	30	0.012	1.52	54.92	2.25	1.20	11.69	
L-13	Outlet	36x18 Ave	12 - 14	0.18	17.98	45	18	0.012	15.41	48.04	0.65	2.09	22.76	
L-14	36x36 Inc.	36x36 Ave	2-7, 12, 14	8.50	70.93	102	36	0.012	1.16	78.11	2.44	2.88	11.73	
L-15	36x18 Ave	36x18 Ave	2-7, 12-14	9.07	77.11	224	36	0.012	1.01	78.11	2.68	0.99	11.38	
L-16	36x18 Ave	Outfall	2-7, 12-17, 27	9.94	84.93	32	36	0.012	1.05	80.15	2.77	1.05	12.47	
L-17	Ext. Pond 1	Outfall	2-7, 12-18, 27-28	10.97	104.12	32	24	0.012	2.56	41.68	1.65	2.84	14.86	Max. Release 39 cfs
L-18	Q1-6	Ext. Pond 2	21 - 22	0.44	4.17	102	18	0.012	16.52	28.73	0.46	3.54	15.82	
L-19	Ext. Pond 2	Ex. C-1	19 - 25	2.50	44.24	105	18	0.012	7.36	22.52	0.39	0.48	12.35	Max. Release 4.3 cfs
L-20	RDW Ditch	RDW Ditch	✓	✓	✓	64	18	0.012	5.78	16.81	✓	✓	✓	
L-21	RDW Ditch	RDW Ditch	✓	✓	✓	62	18	0.012	1.45	14.74	✓	✓	✓	

* - VELOCITIES WERE DETERMINED USING PARTIAL FLOWS

SAG CURB INLET CALCULATIONS

INLET #	D.A. (a)	Qa (cfs)	CARRYOVER (cfs)	TOTAL Qa (b)	ALLOWABLE HEAD H (ft)	* L= 90% eff. (ft)	L (ft)	% FULL L/Lr	CAPACITY 90% eff. (cfs)
C1-2	12	12.29	0.67	12.96	0.800	4.97	5	99.4	10.56
C1-3a	4	7.97	0.00	7.97	0.800	3.56	5	81.1	10.56
C1-3b	3	1.41	0.00	1.41	0.800	2.34	5	13.3	10.56
C1-4	2	7.64	0.00	7.64	0.800	2.93	5	58.6	10.56
C1-5	15 - 16	5.11	0.00	5.11	0.800	1.76	5	29.2	10.56
C1-7	17 - 27	7.88	0.00	7.88	0.800	2.08	5	63.4	10.56

* BASED ON THE WEIR EQUATION : Q = 3.00 * L * (H)^1.5

ON-GRADE CURB INLET CALCULATIONS

INLET #	D.A. (a)	Qa (cfs)	Total Q Z = 1/(Sx/n) (ft/ft)	"n"	S (ft/ft)	Y (ft)	Average Width (ft)	a (ft)	qi (cfs)	L= Qa/qi (ft)	L (ft)	L/Lr	a/y	Q/Qa	Q= Qa*Q/Qa (cfs)	Carryover (cfs)	Remarks
C-1	12	16.70	25.96	0.013	0.067	0.41	10.30	0.50	1.95	15.91	15.00	0.94	1.21	0.765	16.03	0.67	Carryover to C1-2

GRATE INLET COMPUTATIONS

Inlet #	D.A. (a)	Qa (cfs)	Carryover (cfs)	Total Qa (cfs)	Allowable Head H (ft)	* Ar (sf)	* P (sf)	% Full Ar/Ap	Capacity (cfs)	Carryover (cfs)	Remarks
G1-1	5	13.08	0.00	13.08	0.30	4.264	5.156	91.5	14.28	0.00	Type "C" G-1, (3 Grates)
G1-2	6	11.82	0.26	11.82	0.30	4.069	5.156	80.8	14.28	0.00	Type "C" G-1, (3 Grates)
G1-3	7	12.50	0.00	12.50	0.30	4.514	5.156	87.6	14.28	0.00	Type "C" G-1, (3 Grates)
G1-4	8	11.85	0.97	11.85	0.30	4.281	5.156	83.0	14.28	0.00	Type "C" G-1, (3 Grates)
G1-5	9	20.29	0.00	20.29	0.38	6.889	6.889	99.3	20.43	0.00	Type "D" G-1, (4 Grates)
G1-6	21, 22	2.27	0.00	2.27	0.42	1.039	2.773	59.5	3.37	0.00	Type "A" G-1, (1 Grate)

* - BASED ON THE GRIFICE EQUATION : Q = 4.82 * A * (H)^1/2

LEGEND

	EXISTING CONTOURS (1' INTERVAL)
542	EXISTING CONTOURS (5' INTERVAL)
543	PROPOSED CONTOURS (1' INTERVAL)
545	PROPOSED CONTOURS (5' INTERVAL)
+544.13	EXISTING SPOT ELEVATION
*540.50	PROPOSED SPOT ELEVATION
EL. or ELEV.	ELEVATION
INV.	INVERT
CONC.	CONCRETE
RCP	REINFORCED CONCRETE PIPE
PVC	POLYVINYL CHLORIDE PIPE
	EXISTING STORM SEWER
	PROPOSED STORM SEWER
	PROPOSED 6" PVC FRENCH DRAIN
	DRAINAGE DIRECTION ARROW
00	DRAINAGE AREA NUMBER
0.00	DRAINAGE AREA IN ACRES
0.00	100-YEAR STORM FLOW IN CFS

DETENTION POND VOLUME ANALYSIS

POND NO. 1 - Required Volume = 2.5 Acre-feet (108,900 C.F.)

Contour Elevation	Area (S.F.)	Double End Area	Volume (C.F.)	Accumulated Volume
518.0	141			
		2345	1270.5	1270.5
519.0	8454			
		7482	3741.0	5013.5
520.0	5079			
		12202	6501.0	11514.5
521.0	8844			
		26892	19346.0	30860.5
522.0	11848			
		27261	33680.5	64541.0
523.0	15513			
		34853	17425.5	81966.5
524.0	19338			
		43283	21491.0	103457.5
525.0	23942			
		53966	26332.0	129789.5
526.0	29124			
		62917	30958.5	160748.0
527.0	34793			
		74712	37255.0	198014.0
528.0	39919			

POND NO. 2 - Required Volume = 1.9 Ac.-Ft. OR, 84 C.F.)

Contour Elevation	Area (S.F.)	Double End Area	Volume (C.F.)	Accumulated Volume
507.0	114			
		4606	3088.0	3088.0
508.0	6542			
		17597	8798.5	11886.5
509.0	11815			
		25983	12791.5	24678.0
510.0	14568			
		30905	15302.5	40980.5
511.0	16597			
		32554	16252.0	56952.5
512.0	17457			
		36462	18231.0	75183.5
513.0	18995			
		39279	19389.5	94573.0
514.0	20584			
		42992	21481.0	116054.0
515.0	22213			
		46652	23326.0	139380.0
516.0	23934			

REVISIONS	BY	REVISIONS	BY
NOV. 6, 1995	R.D.M.		
NOV. 16, 1995	R.D.M.		
NOV. 30, 1995 (OTB)	R.D.M.		

DESIGNED R.D.M.
DRAWN R.D.M.
CHECKED D.J.A.

ADAMS CONSULTING ENGINEERS, INC.
CIVIL / ENVIRONMENTAL ENGINEERS ▪ SURVEYORS
6320 Dogwood Road ▪ Tyler, Texas 75703 ▪ (903) 561-8919

DRAINAGE AREA MAP

WAL-MART SUPERCENTER #259
INTERSTATE 30
ROCKWALL, TEXAS

DATE 8/25/95
JOB NO. 93-11W
SHEET NO. 7

STATE OF TEXAS — DANIEL J. ADAMS — 34506 — REGISTERED PROFESSIONAL ENGINEER
12.1.95