

# HYDRAULIC CALCULATIONS FOR STORM SEWER AND LATERALS

## STORM DRAIN CALCULATIONS

RUNOFF COLLECTION POINT		DISTANCE BETWEEN	INCREMENTAL DRAINAGE AREA				ACCUM-ULATED STORM WATER RUNOFF	SLOPE OF HYDRAULIC GRADIENT	SELECTED STORM DRAIN SIZE	VELOCITY IN DRAIN	FLOW TIME IN DRAIN	TIME AT DOWNSTREAM STATION	REMARKS				
UPSTREAM STATION	DOWNSTREAM STATION	COLLECTION POINTS	AREA No.	DRAINAGE AREA 'ACRES'	RUNOFF COEFF. 'C'	INCREMENTAL 'CA'	UPSTREAM TIME AT (MIN.)	DESIGN STORM FREQUENCY (YEARS)	TIME OF CONCENTRATION (MIN)	INTENSITY 'I' (IN/HR)	RUNOFF 'Q' (CFS)	(FT/FT)	(IN)	COLLECTION POINTS 'V'	DISTANCE/ V x 60 (MIN)	DOWNSTREAM STATION (MIN)	
EXISTING STORM DRAIN SYSTEM																	
10+50	9+30	120		68.41	0.51	35.22	15.50	100	15	7.60	267.65	0.0106	60	13.63	0.15	15.65	
9+30	8+84	46		0.00	0.51	0.00	15.65	100	15	7.50	264.13	0.0062	66	11.12	0.07	15.72	
8+84	8+53	31		0.00	0.51	0.00	15.72	100	15	7.50	264.13	0.0062	66	11.12	0.05	15.76	
8+53	8+34	19		0.00	0.51	0.00	15.76	100	15	7.50	264.13	0.0062	66	11.12	0.03	15.79	
8+34	7+33	101		3.18	0.90	2.86	15.79	100	15	7.50	285.60	0.0072	66	12.02	0.14	15.93	
7+33	4+88	245		6.34	0.90	5.71	15.93	100	10	7.50	328.39	0.0044	76.5	10.29	0.40	16.33	EQUIVALENT CONDUIT DIAMETER
4+88	2+28	260		0.00	0.90	0.00	16.33	100	10	7.40	324.01	0.0024	85	8.22	0.53	16.85	EQUIVALENT CONDUIT DIAMETER
2+28	0+00	228		0.00	0.90	0.00	16.85	100	10	7.30	319.63	0.0025	84	8.31	0.46	17.31	
STORM DRAIN 1.0																	
7+10	3+60	349.91		1.51	0.90	1.36	10.00	100	10	8.74	11.88	0.0128	18	6.72	0.87	10.87	
3+60	1+61	199.15		1.98	0.90	1.78	10.87	100	10	8.50	26.70	0.0074	27	6.71	0.49	11.36	
1+61	0+00	160.78		2.81	0.90	2.53	11.36	100	10	8.35	47.34	0.0033	39	5.71	0.47	11.83	

## HYDRAULIC ANALYSIS OF EXISTING STORM DRAIN SYSTEM

STATION	SECTION	PIPE DIA.	AREA	R	R 2/3	N	Q CFS	VEL FPS	V2/2g	Sf	PIPE LENGTH	PIPE FRICTION	Kj	PIPE BENDS	Kj	WYES & MANHOLES	Kj	DIA CHANGE	TOTAL LOSSES	WATER SURFACE	ENERGY GRADIENT	COMMENTS	STATION
0+00		84	38.485	1.750	1.452	0.013	319.70	8.31	1.07	0.0025	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.54	0.54	575.69	576.76	BOX TO 84'	0+00
2+28		84	38.485	1.750	1.452	0.013	319.70	8.31	1.07	0.0025	228.00	0.57	0.00	0.00	0.00	0.00	0.50	0.54	1.11	576.79	577.86	84' TO 72'	2+28
4+88		72	28.274	1.500	1.310	0.013	206.90	7.32	0.83	0.0024	260.00	0.62	0.00	0.00	0.00	0.00	0.45	0.37	0.99	577.79	578.62	72' TO BOX	4+88
4+88		60	19.635	1.250	1.160	0.013	117.10	5.96	0.55	0.0020	273.00	0.55	0.35	0.19	0.00	0.00	0.45	0.25	0.99	577.79	578.34	60' TO BOX	4+88
7+33		72/54	47.909																	577.79	577.79		
7+33		2-7X3	42.000	1.050	1.033	0.013	328.40	7.82	0.95	0.0044	245.00	1.07	0.00	0.00	0.00	0.00	0.50	0.47	1.55	579.34	580.28	BOX TO 66'	7+33
8+34		66	23.758	1.375	1.237	0.013	285.60	12.02	2.24	0.0072	191.00	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.73	580.07	582.31		8+34
8+53		66	23.758	1.375	1.237	0.013	285.60	12.02	2.24	0.0072	19.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.14	580.20	582.45		8+53
8+84		66	23.758	1.375	1.237	0.013	264.20	11.12	1.92	0.0062	50.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.31	580.51	582.43	24x66 CONN	8+84
9+30		66	23.758	1.375	1.237	0.013	264.20	11.12	1.92	0.0062	46.00	0.28	0.00	0.00	0.00	0.00	0.35	0.67	0.96	581.47	583.39	66' TO 60'	9+30
10+50		60	19.635	1.250	1.160	0.013	267.70	13.63	2.89	0.0106	120.00	1.27	0.00	0.00	0.00	0.00	0.00	0.00	1.27	582.74	585.62		10+50
0+00		24	3.142	0.500	0.630	0.013	11.48	3.65	0.21	0.0026	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	580.51	580.80	24x66 CONN	0+00
2+86		24	3.142	0.500	0.630	0.013	11.48	3.65	0.21	0.0026	286.07	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.74	581.33	581.54	10' INLET	2+86

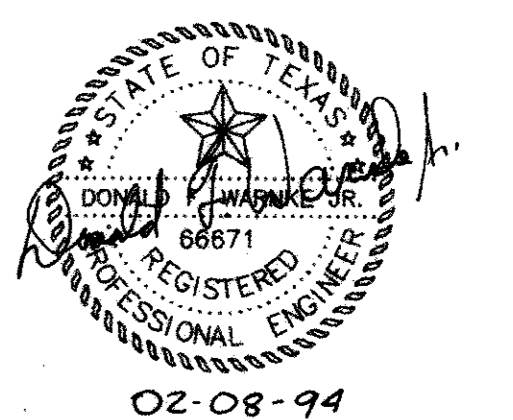
07-Feb-94

COMP USA ADDISON / JOB NO. 93059 / FILE NAME STM1012B

## HYDRAULIC CALCULATIONS FOR STORM SEWER AND LATERALS

STATION	SECTION	PIPE DIA.	AREA	R	R 2/3	N	Q CFS	VEL FPS	V2/2g	Sf	PIPE LENGTH	PIPE FRICTION	Kj	PIPE BENDS	Kj	WYES & MANHOLES	Kj	DIA CHANGE	TOTAL LOSSES	WATER SURFACE	ENERGY GRADIENT	COMMENTS	STATION
STORM DRAIN 1.0																							
0+00		39	8.296	0.813	0.871	0.013	47.34	5.71	0.51	0.0033	0.00	0.00	0.35	0.18	0.00	0.00	1.00	0.51	0.68	579.34	580.02	39' CONN	0+00
1+61		39	8.296	0.813	0.871	0.013	47.34	5.71	0.51	0.0033	160.78	0.53	0.00	0.00	0.50	0.25	0.00	0.00	0.78	580.80	581.31	27x39 CONN	1+61
1+65		39	8.296	0.813	0.871	0.013	26.70	3.22	0.16	0.0010	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.17	580.97	581.13	39' TO 27'	1+65
3+60		27	3.976	0.563	0.681	0.013	26.70	6.72	0.70	0.0074	195.15	1.45	0.00	0.00	0.50	0.35	1.00	0.70	2.50	583.47	584.17	TYPE A MH	3+60
7+10		18	1.767	0.375	0.520	0.013	11.88	6.72	0.70	0.0128	349.91	4.48	0.00	0.00	0.00	0.00	0.00	0.00	4.48	587.95	588.65	10' C.I.	7+10
0+00		1.1	27	3.976	0.563	0.681	0.013	22.12	5.56	0.48	0.0051	0.00	0.00	0.00	0.50	0.24	1.00	0.48	0.72	580.80	582.00	27x39 CONN	0+00
0+78		1.1	27	3.976	0.563	0.681	0.013	22.12	5.56	0.48	0.0051	78.00	0.40	0.00	0.00	0.00	0.00	0.00	0.40	581.92	582.40	2-10' C.I.	0+78
0+00		1.2	18	1.767	0.375	0.520	0.013	15.55	8.80	1.20	0.0219	0.00	0.00	0.00	0.50	0.60	1.00	1.20	1.80	585.27	586.48	18x27 CONN	0+00
2+08		1.2	18	1.767	0.375	0.520	0.013	15.55	8.80	1.20	0.0219	208.00	4.56	0.00	0.00	0.05	0.00	0.00	4.61	589.88	591.08	3'x3' D.I.	2+08
3+24		1.2	18	1.767	0.375	0.520	0.013	6.29	3.56	0.20	0.0036	115.87	0.42	0.00	0.00	0.00	0.00	0.00	0.42	590.30	590.49	8' INLET	3+24
0+00		2.0	60	19.635	1.250	1.160	0.013	117.10	5.96	0.55	0.0020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	576.79	577.34	60x84 CONN	0+00
2+73		2.0	60	19.635	1.250	1.160	0.013	117.10	5.96	0.55	0.0020	273.00	0.55	0.35	0.19	0.00	0.00	0.00	0.99	577.79	578.34	60' TO BOX	2+73

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY DONALD F. WARNEKE JR., P.E. 66671 ON 01/21/94



02-08-94

HYDRAULIC CALCULATIONS						
COMP USA						
ADDISON TOWN CENTER						
TOWN OF ADDISON, TEXAS						
LAWRENCE A. CATES & ASSOC.						CONSULTING ENGINEERS
						DALLAS, TEXAS
DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
LAC	LAC	01/21/94	N/A	D.P.	93059 HYD.CALC.DWG	C-9A