HYDRAULIC CALCULATIONS FOR STORM SEWER AND LATERALS

STORM DRAIN CALCULATIONS

RUNOFF COLLECTION POINT UPSTREAM STATION	RUNOFF COLLECTION POINT DOWNSTREAM STATION	DISTANCE BETWEEN COLLECTION POINTS	INCREMENTAL DRAINAGE AREA No.	INCREMENTAL DRAINAGE AREA 'ACRES'	RUNOFF COEFF. 'C'	INCREMENTAL 'CA'	'CA'	TIME AT UPSTREAM TIME AT (MIN.)	DESIGN STORM FREQUENCY (YEARS)	TIME OF CONCENTRATION (MIN)	INTENSITY 'I' (IN/HR)	ACCUMULATED STORM WATER RUNOFF 'Q' (CFS)	SLOPE OF HYDRAULIC GRADIENT 'S' (FT/FT)	SELECT STORM DRAIN SIZE (IN.	VELOCITY IN DRAIN BETWEEN COLLECTION POINTS 'V' (FPS)	FLOW TIME IN DRAIN DISTANCE/V / 60 (MIN)	TIME AT DOWNSTREAM STATION (MIN)	REMARKS
EXISTING STORM DRAIN SYSTEM																		
10+50	9+30	120		68.41	0.51	35.22	35.22	15.50	100	15	7.60	267.65	0.0106		13.63	0.15	15.65	
9+30	8+84	46		0.00	0.51	0.00	35.22	15.65	100	15	7.50	264.13	0.0062		11.12	0.07	15.72	
8+84	8+53	31		0.00	0.51	0.00	35.22	15.72	100	15	7.50	264.13	0.0062		11.12	0.05	15.76	
8+53	8+34	19		0.00	0.51	0.00	35.22	15.76	100	15	7.50	264.13	0.0062		11.12	0.03	15.79	
8+34	7+33	101		3.18	0.90	2.86	38.08	15.79	100	15	7.50	285.60	0.0072		12.02	0.14	15.93	
7+33	4+88	245		6.34	0.90	5.71	43.79	15.93	100	10	7.50	328.39	0.0044	7x	10.89	0.40	16.33	EQUIVALENT CONDUIT DIAMETER
4+88	2+28	260		0.00	0.90	0.00	43.79	16.33	100	10	7.40	324.01	0.0024		8.22	0.52	16.85	EQUIVALENT CONDUIT DIAMETER
2+28	0+00	228		0.00	0.90	0.00	43.79	16.85	100	10	7.30	319.63	0.0025		8.31	0.46	17.31	
STORM DRAIN 1.0																		
7+10	3+60	349.91		1.51	0.90	1.36	1.36	10.00	100	10	8.74	11.88	0.0128		6.78	0.87	10.87	
3+60	1+61	199.15		1.98	0.90	1.78	3.14	10.87	100	10	8.50	26.70	0.0074		6.71	0.49	11.36	
1+61	0+00	160.78		2.81	0.90	2.53	5.67	11.36	100	10	8.35	47.34	0.0033		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 MANHOL	Kj	DIA CHANGE	TOTAL LOSSES	WATER SURFACE	ENERGY GRADIENT	COMMENTS	STATION
																				575.15			
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	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	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	0.45	0.37	0.98	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	0.45	0.25	0.99	577.79	578.34	60" TO BOX	4+88
		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	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	101.00	0.73	0.00	0.00	0.00	0	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	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	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	0.95	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	0.00	0.00	1.27	582.74	585.62		10+50
																				580.51			
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	0.40	0	0.00	0.00	0.08	580.60	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	0.00	0.00	0.74	581.33	581.54	18" 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 MANHOL	Kj	DIA CHANGE	TOTAL LOSSES	WATER SURFACE	ENERGY GRADIENT	COMMENTS	STATION
STORM DRAIN 1.0																							
																				579.34			
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	1.00	0.51	0.68	580.02	580.53	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	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	1.00	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	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	0.00	0.00	4.48	587.95	588.65	18" C I	7+10
																				580.80			
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	0.00	0.50	0	1.00	0.48	0.72	581.52	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	0.00	0.00	0.40	581.92	582.40	2-18 C I	0+78
																				583.47			
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	0.00	0.50	0	1.00	1.20	1.60	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	0.00	0	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	0.00	0.00	0.42	590.30	590.49	8" INLET	3+24
																				574.79			
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	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	0.45	0.25	0.99	577.79	578.34	60" TO BOX	2+73

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

STATE OF TEXAS · DONALD F. WARNKE JR. · 66671 · REGISTERED PROFESSIONAL ENGINEER

02-08-94

AS-BUILTS

I CERTIFY THIS PROJECT WAS CONSTRUCTED IN GENERAL CONFORMANCE WITH THESE CONSTRUCTION PLANS AND WILL FUNCTION AS DESIGNED.

STATE OF TEXAS

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 HYDCALC.DWG	C-9A

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