DRAINAGE AREA COMPUTATIONS - SYSTEM A

FROM MH	TO MH	AREA (AC)	TOTAL AREA (AC)	C	Tc (MIN)	I₁₀ (IN/HR)	Q₁₀ (CFS)	I₁₀₀ (IN/HR)	Q₁₀₀ (CFS)
100	102	0.13	0.13	0.88	10.00	6.54	0.73	9.27	1.03
102	104	0.46	0.59	0.88	10.63	6.40	3.32	9.08	4.71
104	106	0.00	0.59	0.88	11.58	6.20	3.32	8.82	4.58
106	107	0.00	0.95	0.88	11.98	6.12	5.15	8.71	7.32
107	108	0.00	2.06	0.88	12.53	6.02	10.90	8.57	15.51
108	node 2	0.00	2.49	0.88	12.97	5.94	13.00	8.46	18.51
node 2	110	0.00	2.61	0.88	13.42	5.86	13.45	8.35	19.18
110	111	0.00	7.24	0.88	14.11	5.74	36.54	8.18	52.14
111	112	0.00	7.41	0.88	14.78	5.63	36.71	8.04	52.42
112	114	0.00	7.99	0.88	15.09	5.58	39.23	7.97	56.04
114	116	2.11	10.10	0.88	15.62	5.49	48.84	7.86	69.83
116	118	0.56	11.11	0.88	16.01	5.44	53.16	7.78	76.05
118	120	0.00	11.11	0.88	16.31	5.39	53.16	7.72	75.46
inlet 304	111	0.07	0.07	0.88	10.00	6.54	0.40	9.27	0.56
inlet 306	111	0.11	0.11	0.88	10.00	6.54	0.61	9.27	0.86
122	124	0.08	0.08	0.88	10.00	6.54	0.44	9.27	0.63
124	126	0.29	0.37	0.88	10.34	6.47	2.08	9.17	2.95
126	106	0.00	0.37	0.88	10.68	6.39	2.08	9.07	2.91
128	inlet 310	0.57	0.57	0.88	10.00	6.54	3.28	9.27	4.65
inlet 310	107	0.31	0.88	0.88	10.16	6.51	5.04	9.22	7.14
inlet 312	107	0.22	0.22	0.88	10.00	6.54	1.29	9.27	1.82
130	node	0.04	0.04	0.88	10.00	6.54	0.22	9.27	0.31
node	134	0.00	0.15	0.88	10.40	6.45	0.85	9.15	1.21
134	136	0.28	0.43	0.88	10.46	6.44	2.43	9.13	3.45
136	108	0.00	0.43	0.88	10.81	6.36	2.43	9.03	3.42
138	140	0.03	0.03	0.88	10.00	6.54	0.17	9.27	0.24
140	node	0.08	0.11	0.88	10.31	6.47	0.64	9.18	0.90
inlet 308	node 2	0.12	0.12	0.88	10.00	6.54	0.71	9.27	1.00
inlet 314	142	0.37	0.37	0.88	10.00	6.54	2.14	9.27	3.04
142	110	0.00	0.52	0.88	10.02	6.54	2.99	9.27	4.24
inlet 316	142	0.15	0.15	0.88	10.00	6.54	0.85	9.27	1.20
144	146	1.93	1.93	0.88	10.00	6.54	11.11	9.27	15.75
146	148	0.13	2.06	0.88	10.21	6.50	11.79	9.21	16.72
148	150	1.03	3.30	0.88	10.89	6.35	18.44	9.01	26.17
150	152	0.00	3.30	0.88	11.25	6.27	18.44	8.91	25.88
152	153	3.81	3.81	0.88	11.43	6.24	20.91	8.86	29.71
153	110	0.00	4.11	0.88	11.86	6.15	22.23	8.74	31.61
inlet 318	153	0.16	0.16	0.88	10.00	6.54	0.94	9.27	1.33
inlet 320	153	0.13	0.13	0.88	10.00	6.54	0.77	9.27	1.10
inlet 322	154	0.09	0.09	0.88	10.00	6.54	0.53	9.27	0.75
154	152	0.00	0.18	0.88	10.15	6.51	1.05	9.23	1.49
inlet 324	154	0.09	0.09	0.88	10.00	6.54	0.53	9.27	0.75
156	158	0.03	0.03	0.88	10.00	6.54	0.16	9.27	0.22
158	148	0.12	0.20	0.88	10.28	6.48	1.16	9.19	1.65
160	158	0.06	0.06	0.88	10.00	6.54	0.34	9.27	0.49
162	inlet 164	0.33	0.33	0.88	10.00	6.54	1.88	9.27	2.67
inlet 164	152	0.00	0.33	0.88	10.14	6.51	1.88	9.23	2.66
166	168	0.33	0.33	0.88	10.00	6.54	1.92	9.27	2.72
168	170	0.25	0.58	0.88	10.49	6.43	3.28	9.13	4.65
170	112	0.00	0.58	0.88	10.86	6.35	3.28	9.02	4.60
172	174	0.35	0.35	0.88	10.00	6.54	2.03	9.27	2.88
174	116	0.10	0.45	0.88	10.33	6.47	2.56	9.17	3.63

STORM PROFILES - SYSTEM A

FROM MH	TO MH	SLOPE (%)	DESIGN Q cap (CFS)	Q₁₀₀ (CFS)	ACTUAL V₁₀₀ (FPS)	VELOCITY HEAD Hv (FT)
100	102	0.177	4.4	1.03	0.58	0.01
102	104	0.177	4.4	4.71	2.67	0.11
104	106	0.177	4.4	4.58	2.59	0.10
106	107	0.177	4.4	7.32	4.14	0.27
107	108	0.103	10.0	15.51	3.90	0.24
108	node 2	0.090	12.3	18.51	3.77	0.22
node 2	110	0.090	12.3	19.18	3.91	0.24
110	111	0.048	31.6	52.14	4.15	0.27
111	112	0.048	31.6	52.42	4.17	0.27
112	114	0.048	31.6	56.04	4.46	0.31
114	116	0.041	39.9	69.83	4.39	0.30
116	118	0.036	49.5	76.05	3.87	0.23
118	120	0.180	17.4	75.46	15.37	3.67
inlet 304	111	0.177	4.4	0.56	0.32	0.00
inlet 306	111	0.177	4.4	0.86	0.49	0.00
122	124	0.177	4.4	0.63	0.36	0.00
124	126	0.177	4.4	2.95	1.67	0.04
126	106	0.177	4.4	2.91	1.65	0.04
128	inlet 310	0.177	4.4	4.65	2.63	0.11
inlet 310	107	0.177	4.4	7.14	4.04	0.25
inlet 312	107	0.177	4.4	1.82	1.03	0.02
130	node	0.177	4.4	0.31	0.18	0.00
node	134	0.177	4.4	1.21	0.68	0.01
134	136	0.177	4.4	3.45	1.95	0.06
136	108	0.177	4.4	3.42	1.93	0.06
138	140	0.177	4.4	0.24	0.14	0.00
140	node	0.177	4.4	0.90	0.51	0.00
inlet 308	node 2	0.177	4.4	1.00	0.57	0.01
inlet 314	142	0.177	4.4	3.04	1.72	0.05
142	110	0.177	4.4	4.24	2.40	0.09
inlet 316	142	0.177	4.4	1.20	0.68	0.01
144	146	0.177	4.4	15.75	8.91	1.23
146	148	0.177	4.4	16.72	9.46	1.39
148	150	0.177	4.4	26.17	14.81	3.41
150	152	0.177	4.4	25.88	14.65	3.33
152	153	0.177	4.4	29.71	16.81	4.39
153	110	0.177	4.4	31.61	17.89	4.97
inlet 318	153	0.177	4.4	1.33	0.75	0.01
inlet 320	153	0.177	4.4	1.10	0.62	0.01
inlet 322	154	0.177	4.4	0.75	0.42	0.00
154	152	0.177	4.4	1.49	0.84	0.01
inlet 324	154	0.177	4.4	0.75	0.42	0.00
156	158	0.177	4.4	0.22	0.13	0.00
158	148	0.177	4.4	1.65	0.93	0.01
160	158	0.177	4.4	0.49	0.27	0.00
162	inlet 164	0.177	4.4	2.67	1.51	0.04
inlet 164	152	0.177	4.4	2.66	1.50	0.04
166	168	0.177	4.4	2.72	1.54	0.04
168	170	0.177	4.4	4.65	2.63	0.11
170	112	0.177	4.4	4.60	2.60	0.11
172	174	0.177	4.4	2.88	1.63	0.04
174	116	0.177	4.4	3.63	2.06	0.07

Header row above table: S f | Q cap | Q 100 | V 100 | H v

COMPUTATIONS FOR STORM DRAINS SYSTEM A ADDISON GROVES

FROM MH	TO MH	Q₁₀ (CFS)	REACH (FT)	LINE SIZE (IN)	DESIGN Q (CFS)	Q₁₀₀ (CFS)	Q Avail Qdesign - Q100 (CFS)	Delta Q Q100 - Q10 (CFS)	Q req Delta Q avail (CFS)	Street / Alley / Detention Capacity (CFS)	Frictional Slope (FT / FT)	UPST. H.G.L. (FT)	DNST. H.G.L. (FT)	V1 (Flow In) (fps)	V2 (Flow Out) (fps)	V2^2 2g (fps)	V1^2 2g (fps)	Kj (Coeff. of Loss) 1 (const)	Hj1 (HL 1) (FT)	Kj (Coeff. of Loss) 2 (const)	Hj2 (HL 2) (FT)	Hj Total (FT)	Elev of Hyd Grade line (FT)	Elev Difference TC - HGL TC (FT)	TC-HGL (FT)	Comments
100	102	0.73	95	18	4.4	1.03	3.70	0.30	-3.40	158.87	0.0001	611.47	611.46	-	0.58							0.01	611.47	616.16	4.69	Inlet at Beginning of Line
102	104	3.32	107	18	4.4	4.71	1.11	1.39	0.28	87.08	0.0020	611.46	611.25	0.58	2.67	0.11	0.01		0.11			0.11	611.36	616.05	4.69	Inlet
104	106	3.32	45	18	4.4	4.58	1.11	1.25	0.15	42.18	0.0019	611.25	611.16	2.67	2.59	0.10	0.11		-0.01			-0.01	611.15	616.48	5.33	Inlet
106	107	5.15	97	18	4.4	7.32	-0.72	2.17	2.89	17.03	0.0049	611.16	610.69	2.59	4.14	0.27	0.10		0.31			0.31	611.00	616.04	5.04	Incoming Opposing Flows
107	108	10.90	72	27	10.0	15.51	-0.93	4.61	5.55	39.72	0.0025	610.69	610.51	4.14	3.90	0.24	0.27	0.30	0.16	0.20	0.08	0.23	610.46	616.16	5.29	Manhole with Lateral + Pipe Enlargement
108	node 2	13.00	71	30	12.3	18.51	-0.66	5.51	6.17	55.94	0.0021	610.51	610.37	3.90	3.77	0.22	0.24	0.75	0.04	0.10	0.02	0.07	610.42	616.15	5.71	45° WYE + Pipe Enlargement
node 2	110	13.45	114	30	12.3	19.18	-1.12	5.72	6.84	63.34	0.0022	610.37	610.12	3.77	3.91	0.24	0.22					0.00	610.12	616.15	6.03	NONE
110	111	36.54	116	48	31.6	52.14	-4.99	15.59	20.59	65.63	0.0013	610.12	609.97	3.91	4.15	0.27	0.24		0.59	0.35	0.08	0.67	610.64	617.36	6.72	Incoming Opposing Flows + Pipe Enlargement
111	112	36.71	55	48	31.6	52.42	-5.16	15.71	20.87	39.14	0.0013	609.97	609.90	4.15	4.17	0.27	0.27	0.36	0.17			0.17	610.07	615.86	5.79	Manhole with Lateral
112	114	39.23	78	54	39.9	56.04	0.69	16.82	16.12	245.17	0.0008	609.90	609.84	4.17	3.52	0.19	0.27	0.30	0.11			0.11	610.00	615.86	5.86	Manhole with Lateral
114	116	48.84	58	60	49.5	69.83	0.70	20.99	20.29	225.64	0.0007	609.84	609.79	3.52	3.56	0.20	0.19	0.36	0.13	0.10	0.02	0.15	609.94	614.43	4.49	Manhole with Lateral + Pipe Enlargement
116	118	53.16	49	60	49.5	76.05	-3.62	22.89	26.51	124.77	0.0009	609.79	609.75	3.56	3.87	0.23	0.20	0.30	0.17	0.10	0.02	0.19	609.95	613.37	3.42	Manhole with Lateral + Pipe Enlargement
118	120	53.16	27	30	54.7	83.02	1.51	29.86	28.35	31.00	0.0413	609.75	609.64	3.87	16.91	4.44	0.23	0.30	4.37			4.37	609.64	612.27	2.63	Manhole with Lateral
118	120	53.16	27	18	50.8	22.48	-2.33	-30.68	-28.35	31.00	0.0463	609.65	609.64	16.91	12.72	2.51	4.44	0.30	1.18			1.18	609.64	612.27	2.63	Manhole with Lateral
inlet 304	111	0.40	28	18	4.4	0.56	4.03	0.17	-3.87	75.78	0.0000	609.97	609.97	-	0.32	0.00			1.25			0.00	609.97	616.63	6.66	Inlet at Beginning of Line
inlet 306	111	0.61	14	18	4.7	0.86	4.10	0.25	-3.85	51.90	0.0001	609.97	609.97	-	0.49	0.00			1.25			0.00	609.98	616.63	6.65	Inlet at Beginning of Line
122	124	0.44	51	18	4.4	0.63	3.99	0.19	-3.80	96.57	0.0000	611.23	611.23	-	0.36	0.00			1.25			0.00	611.23	616.24	5.01	Inlet at Beginning of Line
124	126	2.08	51	18	4.4	2.95	2.35	0.87	-1.49	73.82	0.0006	611.23	611.19	0.36	1.67	0.04	0.00		0.04			0.04	611.19	616.00	4.81	Inlet
126	106	2.08	31	18	4.4	2.91	2.35	0.84	-1.52	63.32	0.0008	611.19	611.16	1.67	1.65	0.04	0.04		0.00			0.00	611.16	616.50	5.34	Inlet
128	inlet 310	3.28	24	18	4.4	4.65	1.15	1.37	0.22	PARK	0.0020	610.82	610.82	-	2.63	0.11			1.25			0.13	610.96	615.00	4.04	Inlet at Beginning of Line
inlet 310	107	5.04	28	18	4.4	7.14	-0.60	2.10	2.71	32.49	0.0047	610.82	610.69	2.63	4.04	0.25	0.11		0.18			0.18	610.88	615.93	5.05	Inlet
inlet 312	107	1.29	15	18	4.4	1.82	3.14	0.54	-2.61	50.07	0.0003	610.70	610.69	-	1.03	0.02			1.25			0.02	610.72	615.93	5.21	Inlet at Beginning of Line
130	node	0.22	60	18	4.4	0.31	4.21	0.09	-4.12	114.62	0.0000	610.61	610.60	-	0.18	0.00			1.25			0.00	610.61	616.32	5.71	Inlet at Beginning of Line
node	134	0.85	9	18	4.4	1.21	3.58	0.36	-3.22	26.35	0.0001	610.60	610.60	0.18	0.68	0.01	0.00		0.00			0.00	610.60	616.07	5.47	NONE
134	136	2.43	53	18	4.4	3.45	2.00	1.02	-0.98	69.64	0.0011	610.60	610.55	0.68	1.95	0.06	0.01		0.06			0.06	610.60	616.00	5.40	Inlet
136	108	2.43	30	18	4.4	3.42	2.00	0.98	-1.02	58.66	0.0011	610.55	610.51	1.95	1.93	0.06	0.06		0.00			0.00	610.51	616.50	5.99	Inlet
inlet 308	node 2	0.71	21	18	4.4	1.00	3.72	0.30	-3.43	62.16	0.0001	610.37	610.37	-	0.57				1.25			0.01	610.38	616.71	6.33	Inlet at Beginning of Line
inlet 314	142	2.14	19	18	25.8	3.04	23.65	0.90	-22.75	49.99	0.0008	610.27	610.25	-	1.72	0.05			1.25			0.06	610.31	617.54	7.23	Inlet at Beginning of Line
142	110	2.99	18	18	25.8	4.24	22.81	1.25	-21.56	35.87	0.0015	610.15	610.12	1.72	2.40	0.09	0.05		0.06			0.06	610.18	617.70	7.52	Inlet
inlet 316	142	0.85	17	18	4.4	1.20	3.58	0.35	-3.23	55.24	0.0001	611.16	611.16	-	0.68				1.25			0.01	611.17	617.54	6.37	Inlet at Beginning of Line
144	146	11.11	31	30	12.3	15.75	1.23	4.64	3.41	PARK	0.0015	610.96	610.91	-	3.21	0.16			1.25			0.20	611.11	617.54	7.43	Inlet at Beginning of Line
146	148	11.79	210	30	25.0	16.72	13.22	4.93	-8.29	219.40	0.0017	610.91	610.57	3.21	3.41	0.18	0.16		0.03			0.03	610.60	615.82	5.22	Inlet
148	150	18.44	53	36	17.7	26.17	-0.74	7.74	8.48	59.94	0.0015	610.57	610.48	3.41	3.70	0.21	0.18		0.10			0.10	610.58	614.83	4.25	Inlet with Multiple Entering Flows
150	152	18.44	27	36	17.7	25.88	-0.74	7.45	8.19	34.93	0.0015	610.48	610.44	3.70	3.66	0.21	0.21		-0.01			-0.01	610.44	614.98	4.54	Inlet
152	153	20.91	65	36	17.7	29.71	-3.22	8.80	12.02	30.33	0.0020	610.44	610.32	3.66	4.20	0.27	0.21	0.30	0.21	0.70	0.15	0.36	610.68	614.43	3.75	Manhole with Lateral + Change in Direction at Manhole
153	110	22.23	196	42	24.1	31.61	1.85	9.38	7.53	454.87	0.0010	610.32	610.12	4.20	3.29	0.17	0.27	0.10	0.03			0.03	610.15	614.43	4.28	Pipe Enlargement
inlet 318	153	0.94	32	18	4.4	1.33	3.49	0.39	-3.10	76.55	0.0002	610.32	610.32	-	0.75	0.01			1.25			0.01	610.33	614.43	4.10	Inlet at Beginning of Line
inlet 320	153	0.77	11	18	4.4	1.10	3.66	0.32	-3.33	46.60	0.0001	610.32	610.32	-	0.62	0.01			1.25			0.01	610.32	614.43	4.11	Inlet at Beginning of Line
inlet 322	154	0.53	22	18	4.4	0.75	3.90	0.22	-3.68	65.01	0.0001	610.45	610.45	-	0.42	0.01			1.25			0.00	610.46	614.00	3.54	Inlet at Beginning of Line
154	152	1.05	44	18	4.4	1.49	3.38	0.44	-2.94	86.38	0.0002	610.45	610.44	0.42	0.84	0.01	0.01	0.15	0.00			0.00	610.44	614.00	3.55	Manhole
inlet 324	154	0.53	12	18	4.4	0.75	3.90	0.22	-3.68	49.10	0.0001	610.45	610.45	-	0.42	0.01			1.25			0.00	610.46	614.00	3.54	Inlet at Beginning of Line
156	158	0.16	42	18	4.4	0.22	4.27	0.07	-4.21	100.03	0.0000	610.60	610.60	-	0.13	0.00			1.25			0.00	610.60	616.49	5.89	Inlet at Beginning of Line
158	148	1.16	160	18	4.4	1.65	3.27	0.49	-2.78	234.83	0.0002	610.60	610.57	0.13	0.93	0.01	0.00	0.15	0.00			0.00	610.57	616.06	5.49	Manhole
160	158	0.34	31	18	4.4	0.49	4.09	0.14	-3.94	68.74	0.0000	610.61	610.60	-	0.27	0.00			1.25			0.00	610.60	615.92	5.31	Inlet at Beginning of Line
162	inlet 164	1.88	44	18	9.4	2.67	7.54	0.79	-6.75	65.63	0.0007	610.51	610.48	-	1.51				1.25			0.04	610.52	614.70	4.18	Inlet at Beginning of Line
inlet 164	152	1.88	56	18	4.4	2.66	2.55	0.77	-1.77	0.00	0.0006	610.48	610.44	1.51	1.50	0.04	0.04		-			0.00	610.44	615.00	4.56	Inlet
166	168	1.92	73	18	4.4	2.72	2.51	0.80	-1.71	99.36	0.0007	610.14	610.09	-	1.54	0.04			1.25			0.05	610.14	616.40	6.26	Inlet at Beginning of Line
168	170	3.28	57	18	4.4	4.65	1.15	1.37	0.22	54.39	0.0020	610.09	609.98	1.54	2.63	0.11	0.04		0.09			0.09	610.07	616.40	6.33	Inlet
170	112	3.28	75	18	15.5	4.60	12.27	1.30	-10.95	44.64	0.0019	609.98	609.89	2.63	2.60	0.11	0.11		0.00			0.00	609.89	616.77	6.88	Inlet
172	174	2.03	49	18	4.4	2.88	2.40	0.85	-1.55	70.45	0.0008	609.88	609.85	-	1.63	0.04			1.25			0.05	609.88	613.80	3.90	Inlet at Beginning of Line
174	116	2.56	44	18	4.4	3.63	1.87	1.07	-0.80	55.17	0.0012	609.85	609.79	1.63	2.06	0.07	0.04		0.03			0.03	609.83	614.17	4.34	Inlet

ADDISON
TOWN OF ADDISON
DALLAS COUNTY, TEXAS

IMPROVEMENT PLANS
ADDISON GROVE

DRAINAGE AREA CALCULATIONS -
DRAINAGE SYSTEM A

SAWYER ENGINEERING, LLC
TBPE: F-9171
1520 OLIVER STREET
HOUSTON, TEXAS 77007
(832) 553-5948

PROJECT	DESIGN	DRAWN	DATE	FILE	SHEET
	CDP	JDS	MAY 2017		19