

CUMULATIVE STORM SEWER CALCULATIONS

Storm Sewer Design Analysis
 SEDONA LAKES
 CR 94 & CR 101
 Manvel, Texas

Design Frequency: 5 years
 100-Year Multiplier: 1.00
 Downstream 25-year WS ELEV 60.38 feet

Manhole No. From	Manhole No. to	Drainage Area (acres)	Total Area (acres)	Runoff Coefficient C	DA C * A	Total C * A	Time of Conc. (min)	Intensity I (in/hr)	Drainage Area Flow (cfs)	Total Flow (cfs)	Reach Length (ft)	Diameter (in)	Slope %	Manning's Roughness Coefficient "n"	Design Capacity (cfs)	Design Velocity (ft/sec)	Full Pipe Flow			Drop from Downstream Manhole (ft)	Flowline Elevation Upstream (ft)	Flowline Elevation Downstream (ft)	Minimum Depth Ratio (y/d or y/h)	Minimum W.S. Elev. Downstream (ft)	Actual Depth Ratio (y/d or y/h)	Actual Flow per Barrel			Change in Head (ft)	Elevation of Hyd. Grad. Upstream (ft)	Elevation of Hyd. Grad. Downstream (ft)	Top of Pipe Elevation Upstream (ft)	Top of Pipe Elevation Downstream (ft)	Pvmt / Grate Elevation Upstream (ft)	
																	Area (sq ft)	Wetted Perimeter (ft)	Fall (ft)							Actual Velocity (ft/sec)	Area (sq ft)	Wetted Perimeter (ft)							Hydraulic Gradient %
A4	A3	1.66	1.66	0.80	1.33	1.33	25.93	4.96	6.59	6.59	65	30	0.130	0.013	14.8	3.0	4.9	7.9	0.08	0.00	58.00	57.92	0.46	59.07	1.00	1.34	4.91	7.85	0.026	0.02	60.52	60.51	60.50	60.42	63.25
A3	A2	0.00	1.66	0.80	0.00	1.33	25.93	4.96	0.00	6.59	63	30	0.130	0.013	14.8	3.0	4.9	7.9	0.08	0.00	57.92	57.84	0.46	58.99	1.00	1.34	4.91	7.85	0.026	0.02	60.51	60.49	60.42	60.34	62.45
A2	A1	0.00	2.66	0.80	0.00	2.13	26.88	4.86	0.00	10.34	113	30	0.130	0.013	14.8	3.0	4.9	7.9	0.15	0.24	57.84	57.69	0.61	59.22	1.00	2.11	4.91	7.85	0.064	0.07	60.49	60.42	60.34	60.19	62.35
A1	EX1	0.00	4.30	0.80	0.00	3.44	27.93	4.75	0.00	16.35	65	36	0.100	0.013	21.1	3.0	7.1	9.4	0.07	0.00	57.45	57.38	0.66	59.36	1.00	2.31	7.07	9.42	0.060	0.04	60.42	60.38	60.45	60.38	62.80
A2A	A2	1.00	1.00	0.80	0.80	0.80	25.00	5.07	4.05	4.05	9	18	0.500	0.013	7.4	4.2	1.8	4.7	0.05	0.00	57.89	57.84	0.52	58.62	1.00	2.29	1.77	4.71	0.149	0.01	60.50	60.49	59.39	59.34	62.00
A1A	A1	1.64	1.64	0.80	1.31	1.31	25.91	4.96	6.51	6.51	143	18	0.500	0.013	7.4	4.2	1.8	4.7	0.72	0.00	58.17	57.45	0.72	58.53	1.00	3.69	1.77	4.71	0.384	0.55	60.97	60.42	59.67	58.95	62.00

*THE DRAINAGE CALCULATIONS LISTED ABOVE ARE BASED ON THE 5-YEAR STORM EVENT PER CITY OF MANVEL DESIGN GUIDELINES.

REFERENCE ONLY

CUMULATIVE STORM SEWER CALCULATIONS

Storm Sewer Design Analysis
 SEDONA LAKES
 CR 94 & CR 101
 Manvel, Texas

Design Frequency: 100 years
 100-Year Multiplier: 1.25
 Downstream 25-year WS ELEV 60.38 feet

Manhole No. From	Manhole No. to	Drainage Area (acres)	Total Area (acres)	Runoff Coefficient C	DA C * A	Total C * A	Time of Conc. (min)	Intensity I (in/hr)	Drainage Area Flow (cfs)	Total Flow (cfs)	Reach Length (ft)	Diameter (in)	Slope %	Manning's Roughness Coefficient "n"	Design Capacity (cfs)	Design Velocity (ft/sec)	Full Pipe Flow			Drop from Downstream Manhole (ft)	Flowline Elevation Upstream (ft)	Flowline Elevation Downstream (ft)	Minimum Depth Ratio (y/d or y/h)	Minimum W.S. Elev. Downstream (ft)	Actual Depth Ratio (y/d or y/h)	Actual Flow per Barrel			Change in Head (ft)	Elevation of Hyd. Grad. Upstream (ft)	Elevation of Hyd. Grad. Downstream (ft)	Top of Pipe Elevation Upstream (ft)	Top of Pipe Elevation Downstream (ft)	Pvmt / Grate Elevation Upstream (ft)	
																	Area (sq ft)	Wetted Perimeter (ft)	Fall (ft)							Actual Velocity (ft/sec)	Area (sq ft)	Wetted Perimeter (ft)							Hydraulic Gradient %
A4	A3	1.66	1.66	0.80	1.66	1.66	25.93	7.69	12.76	12.76	65	30	0.130	0.013	14.8	3.0	4.9	7.9	0.08	0.00	58.00	57.92	0.71	59.70	1.00	2.60	4.91	7.85	0.097	0.06	60.92	60.86	60.50	60.42	63.25
A3	A2	0.00	1.66	0.80	0.00	1.66	25.93	7.69	0.00	12.76	63	30	0.130	0.013	14.8	3.0	4.9	7.9	0.08	0.00	57.92	57.84	0.71	59.62	1.00	2.60	4.91	7.85	0.097	0.06	60.86	60.80	60.42	60.34	62.45
A2	A1	0.00	2.66	0.80	0.00	2.66	26.88	7.54	0.00	20.06	113	30	0.130	0.013	14.8	3.0	4.9	7.9	0.15	0.24	57.84	57.69	1.00	60.19	1.00	4.09	4.91	7.85	0.239	0.27	60.80	60.53	60.34	60.19	62.35
A1	EX1	0.00	4.30	0.80	0.00	4.30	27.93	7.39	0.00	31.77	65	36	0.100	0.013	21.1	3.0	7.1	9.4	0.07	0.00	57.45	57.38	1.00	60.38	1.00	4.49	7.07	9.42	0.227	0.15	60.53	60.38	60.45	60.38	62.80
A2A	A2	1.00	1.00	0.80	1.00	1.00	25.00	7.84	7.84	7.84	9	18	0.500	0.013	7.4	4.2	1.8	4.7	0.05	0.00	57.89	57.84	0.88	59.16	1.00	4.44	1.77	4.71	0.557	0.05	60.85	60.80	59.39	59.34	62.00
A1A	A1	1.64	1.64	0.80	1.64	1.64	25.91	7.69	12.62	12.62	143	18	0.500	0.013	7.4	4.2	1.8	4.7	0.72	0.00	58.17	57.45	1.00	58.95	1.00	7.14	1.77	4.71	1.442	2.06	62.59	60.53	59.67	58.95	62.00

*THE DRAINAGE CALCULATIONS LISTED ABOVE ARE BASED ON THE 100-YEAR STORM EVENT PER CITY OF MANVEL DESIGN GUIDELINES.

No.	REVISIONS	DATE
1	MUD COMMENTS	2/4/2019

ALJ Lindsey
 CIVIL ENGINEER
 10215 S
 Houston, TX 77059
 281.301.9595
 PROJ-P-1328



11 MARCH 2019
 ALJ PROJECT NO. 005.1B.CV.062
 DATE: MARCH 2019
 SCALE: N/A
 DRAWN BY: KD
 CHECKED BY: ALJ

DRAINAGE AREA CALCULATIONS

WATER, SANITARY, & STORM
 EXTENSIONS SERVING
 4.3013 ACRE TRACT
 CITY OF MANVEL,
 BRAZORIA COUNTY, TEXAS