

CUMULATIVE STORM SEWER CALCULATIONS

Storm Sewer Design Analysis  
 SEDONA LAKES  
 CR 4 & 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		Fall (ft)	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)								Actual Velocity (ft/sec)	Area (sq ft)	Wetted Perimeter (ft)	Hydraulic Gradient %						
A3A	A3	3.29	3.29	0.80	2.63	2.63	27.33	4.81	12.67	12.67	110.24	30	0.130	0.013	14.8	3.0	4.9	7.9	0.14	0.00	58.64	58.50	0.71	60.28	0.85	2.85	4.45	5.87	0.090	0.10	60.73	60.63	61.14	61.00	61.80
A3	A2	0.00	3.29	0.80	0.00	2.63	27.33	4.81	0.00	12.67	110.24	30	0.130	0.013	14.8	3.0	4.9	7.9	0.14	0.50	58.50	58.36	0.71	60.14	0.87	2.79	4.53	6.01	0.087	0.10	60.63	60.54	61.00	60.86	62.10
A2	A1	0.00	3.29	0.80	0.00	2.63	27.33	4.81	0.00	12.67	115.25	30	0.130	0.013	14.8	3.0	4.9	7.9	0.15	0.25	57.86	57.71	0.71	59.49	1.00	2.58	4.91	7.85	0.095	0.11	60.54	60.43	60.36	60.21	62.20
A1	EX1	1.01	4.30	0.80	0.81	3.44	27.93	4.75	3.84	16.35	77.8	36	0.100	0.013	21.1	3.0	7.1	9.4	0.08	0.00	57.46	57.38	0.66	59.36	1.00	2.31	7.07	9.42	0.060	0.05	60.43	60.38	60.46	60.38	61.36

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

CUMULATIVE STORM SEWER CALCULATIONS

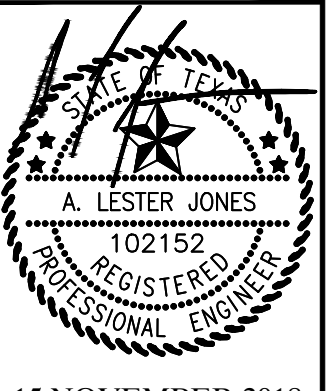
Storm Sewer Design Analysis  
 SEDONA LAKES  
 CR 4 & CR 101  
 Manvel, Texas

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		Fall (ft)	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)								Actual Velocity (ft/sec)	Area (sq ft)	Wetted Perimeter (ft)	Hydraulic Gradient %						
A3A	A3	3.29	3.29	0.80	3.29	3.29	27.33	7.47	24.59	24.59	110.24	30	0.130	0.013	14.8	3.0	4.9	7.9	0.14	0.00	58.64	58.50	1.00	61.00	1.00	5.01	4.91	7.85	0.359	0.40	61.76	61.37	61.14	61.00	61.80
A3	A2	0.00	3.29	0.80	0.00	3.29	27.33	7.47	0.00	24.59	110.24	30	0.130	0.013	14.8	3.0	4.9	7.9	0.14	0.50	58.50	58.36	1.00	60.86	1.00	5.01	4.91	7.85	0.359	0.40	61.37	60.97	61.00	60.86	62.10
A2	A1	0.00	3.29	0.80	0.00	3.29	27.33	7.47	0.00	24.59	115.25	30	0.130	0.013	14.8	3.0	4.9	7.9	0.15	0.25	57.86	57.71	1.00	60.21	1.00	5.01	4.91	7.85	0.359	0.41	60.97	60.56	60.36	60.21	62.20
A1	EX1	1.01	4.30	0.80	1.01	4.30	27.93	7.39	7.46	31.77	77.8	36	0.100	0.013	21.1	3.0	7.1	9.4	0.08	0.00	57.46	57.38	1.00	60.38	1.00	4.49	7.07	9.42	0.227	0.18	60.56	60.38	60.46	60.38	61.36

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

No.	REVISIONS	DATE



15 NOVEMBER 2018

ALJ PROJECT NO. 008.18.CV.062  
 DATE: NOV. 2018  
 SCALE: N/A  
 DRAWN BY: KD  
 CHECKED BY: ALJ

STORM SEWER CALCULATIONS

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