

Storm Sewer Design

10 yr. Storm

Project: Keefe Tracts 2 & 3
Job No.: 15M053.000

Formulas Used:
Q_r = ACI
V_p = 1.486 R^{A(2/3)} S^{A(1/2)/n}
Q_p = A_p V_p

Bayer Becker Engineers

Designed By: MJL Date: 09/13/16
Reviewed By: Date:
Revisions: Date:

Revisions: Date:
Revisions: Date:
Revisions: Date:

LOCATION			TOPOGRAPHY				TIME			DESIGN										Constant n value:			0.015		
Street	From Structure	To Structure	Area (acres)	"C"	Contributing Area	Composite C	T-inlet (min.)	T-upstr (min.)	T_c-conc. (min.)	Intensity (in./hr.)	Q_r (c.f.s.)	Pipe Size (inches)	"n"	Distance (ft.)	Slope (%)	Velocity (ft./sec)	Q_p (c.f.s.)	Flow Time (min.)	T/Grate	Inlet Invert	Outlet Invert	Inlet Clearance			
	1	4	0.44	0.90	0.44	0.90	10.00	10.00	10.00	5.15	2.04	15	0.015	109	0.50	3.23	3.96	0.56	864.35	861.3	860.76	1.80			
	2	3	0.03	0.90	0.03	0.90	10.00	10.00	10.00	5.15	0.14	12	0.015	32	2.00	5.56	4.37	0.10	868.19	865.19	864.54	2.00			
	3	4	0.03	0.90	0.06	0.90	10.00	10.10	10.10	5.14	0.28	12	0.015	55	2.02	5.59	4.39	0.16	868.19	864.54	863.42	2.65			
	4	5	0.13	0.90	0.63	0.90	10.00	10.56	10.56	5.07	2.87	15	0.015	55	0.50	3.23	3.96	0.28	867.33	860.76	860.49	5.32			
	5	6	0.63	0.90	1.26	0.90	10.00	10.85	10.85	5.02	5.70	18	0.015	79	0.50	3.64	6.44	0.36	867.08	860.13	859.74	5.45			
	6	7	0.12	0.90	1.38	0.90	10.00	11.21	11.21	4.97	6.17	18	0.015	70	1.00	5.15	9.10	0.23	868.06	859.74	859.04	6.82			
	7	8	0.15	0.90	1.53	0.90	10.00	11.44	11.44	4.94	6.80	18	0.015	17	2.00	7.29	12.87	0.04	865.35	853.34	853.00	10.51			
	10	11	0.17	0.60	0.17	0.60	10.00	10.00	10.00	5.15	0.53	12	0.015	17	2.00	5.56	4.37	0.05	866.31	853.33	853.00	11.98			
	12	13	0.00	0.40	0.00	0.40	10.00	10.00	10.00	5.15	0.00	42	0.015	12	4.00	18.13	174.39	0.01	857.61	853.15	852.67	0.96			
	14	15	0.00	0.40	0.00	0.40	10.00	10.00	10.00	5.15	0.00	18	0.015	17	4.00	10.30	18.21	0.03	855.60	853.35	852.67	0.75			
	16	17	0.07	0.35	0.07	0.35	10.00	10.00	10.00	5.15	0.13	12	0.015	130	0.50	2.78	2.18	0.78	864.7	862.7	862.05	1.00			
	17	18	0.07	0.35	0.14	0.35	10.00	10.78	10.78	5.03	0.25	12	0.015	210	0.50	2.78	2.18	1.26	864.7	862.05	861	1.65			
	18	19	0.00	0.00	0.14	0.35	10.00	12.04	12.04	4.85	0.24	36	0.015	21	2.00	11.57	81.75	0.03	862.67	853.41	853	6.26			
	30	34	0.27	0.90	0.27	0.90	10.00	10.00	10.00	5.15	1.25	12	0.015	151	0.50	2.78	2.18	0.91	864.1	861.01	860.26	2.09			
	31	32	0.20	0.90	0.20	0.90	10.00	10.00	10.00	5.15	0.93	12	0.015	92	0.50	2.78	2.18	0.55	861.83	858.80	858.34	2.03			
	32	33	0.50	0.90	0.70	0.90	10.00	10.55	10.55	5.07	3.19	15	0.015	30	0.50	3.23	3.96	0.15	861.52	858.1	857.94	2.17			
	33	34	0.63	0.90	1.33	0.90	10.00	10.71	10.71	5.04	6.04	18	0.015	101	0.50	3.64	6.44	0.46	861.52	855.9	855.39	4.12			
	34	37	0.00	0.00	1.60	0.90	10.00	11.17	11.17	4.98	7.16	18	0.015	71	1.00	5.15	9.10	0.23	864.82	855.39	854.68	7.93			
	35	37	0.57	0.90	0.57	0.90	10.00	10.00	10.00	5.15	2.64	12	0.015	62	4.80	8.62	6.77	0.12	864.38	861.25	858.25	2.13			
	36	37	0.27	0.90	0.27	0.90	10.00	10.00	10.00	5.15	1.25	12	0.015	67	0.50	2.78	2.18	0.40	861.68	858.59	858.25	2.09			
	37	38	0.31	0.90	2.75	0.90	10.00	11.40	11.40	4.94	12.23	18	0.015	38	2.50	8.15	14.39	0.08	861.7	854.68	853.73	5.52			
	38	39	0.20	0.90	2.95	0.90	10.00	11.48	11.48	4.93	13.09	18	0.015	29	2.50	8.15	14.39	0.06	861.7	853.73	853	6.47			
	40	41	0.09	0.90	0.09	0.90	10.00	10.00	10.00	5.15	0.42	12	0.015	73	0.50	2.78	2.18	0.44	863.07	859.88	859.51	2.19			
	41	42	0.60	0.90	0.69	0.90	10.00	10.44	10.44	5.08	3.16	15	0.015	119	0.50	3.23	3.96	0.61	862.93	859.26	858.67	2.42			
	42	43	0.42	0.90	1.11	0.90	10.00	11.05	11.05	4.99	4.99	18	0.015	60	0.50	3.64	6.44	0.27	862.93	858.41	858.11	3.02			
	43	44	0.11	0.90	1.22	0.90	10.00	11.33	11.33	4.95	5.44	18	0.015	78	0.50	3.64	6.44	0.36	862.93	858.11	857.72	3.32			
	44	45	0.03	0.90	1.25	0.90	10.00	11.68	11.68	4.90	5.51	18	0.015	38	0.50	3.64	6.44	0.17	863.51	857.72	857.53	4.29			
	45	63	0.03	0.90	1.28	0.90	10.00	11.86	11.86	4.88	5.62	18	0.015	14	1.00	5.15	9.10	0.05	863.51	857.53	857.39	4.48			
	46	47	0.05	0.90	0.05	0.90	10.00	10.00	10.00	5.15	0.23	12	0.015	38	0.50	2.78	2.18	0.23	863.02	859.98	859.79	2.04			
	47	64	0.09	0.90	0.14	0.90	10.00	10.23	10.23	5.12	0.64	12	0.015	15	1.00	3.93	3.09	0.06	863.02	859.79	859.64	2.23			
	55	56	0.31	0.90	0.31	0.90	10.00	10.00	10.00	5.15	1.44	12	0.015	82	0.50	2.78	2.18	0.49	860.45	857.22	856.81	2.23			
	56	57	0.13	0.90	0.44	0.90	10.00	10.49	10.49	5.08	2.01	12	0.015	55	0.49	2.76	2.17	0.33	860.61	856.81	856.54	2.80			
	57	58	0.22	0.90	0.66	0.90	10.00	10.82	10.82	5.03	2.99	15	0.015	106	0.50	3.23	3.96	0.55	863.31	856.3	855.76	5.76			
	58	62	0.35	0.90	1.01	0.90	10.00	11.37	11.37	4.95	4.50	18	0.015	99	0.50	3.64	6.44	0.45	863.23	855.51	855.01	6.22			
	59	60	0.35	0.90	0.35	0.90	10.00	10.00	10.00	5.15	1.62	12	0.015	11	0.50	2.78	2.18	0.07	862.4	859.32	859.26	2.08			
	60	61	0.20	0.90	0.55	0.90	10.00	10.07	10.07	5.14	2.54	15	0.015	38	0.50	3.23	3.96	0.20	861.88	859.02	858.83	1.61			
	61	62	0.22	0.90	0.77	0.90	10.00	10.26	10.26	5.11	3.54	15	0.015	22	1.08	4.75	5.83	0.08	861.88	858.82	858.58	1.81			
	62	63	0.36	0.90	2.14	0.90	10.00	11.82	11.82	4.88	9.40	24	0.015	107	0.50	4.43	13.93	0.40	862.73	854.69	854.15	6.04			
	63	64	0.29	0.90	3.71	0.90	10.00	12.23	12.23	4.83	16.11	30	0.015	99	0.50	5.12	25.14	0.32	863.38	853.65	853.15	7.23			
	64	65	0.33	0.90	4.18	0.90	10.00	12.55	12.55	4.78	17.99	30	0.015	130	0.50	5.12	25.14	0.42	863.62	853.15	852.50	7.97			

LOCATION			TOPOGRAPHY				TIME				DESIGN											Constant n value: 0.015		
Street	From Structure	To Structure	Area (acres)	"C"	Contributing Area	Composite C	T-inlet (min.)	T-upstr (min.)	T_c-conc. (min.)	Intensity (in./hr.)	Q_r (c.f.s.)	Pipe Size (inches)	"n"	Distance (ft.)	Slope (%)	Velocity (ft./sec)	Q_p (c.f.s.)	Flow Time (min.)	T/Grate	Inlet Invert	Outlet Invert	Inlet Clearance		
	75	76	0.00	0.40	0.00	0.40	10.00	10.00	10.00	5.15	0.00	96	0.015	277	0.30	8.61	432.96	0.54	857.31	850.19	849.36	-0.88		
	76	77	0.00	0.40	0.00	0.40	10.00	10.54	10.54	5.07	0.00	96	0.015	133	0.30	8.61	432.96	0.26	857.17	849.36	848.96	-0.19		
	77	78	0.00	0.40	0.00	0.40	10.00	10.79	10.79	5.03	0.00	96	0.015	51	0.30	8.61	432.96	0.10	856.60	848.96	848.81	-0.36		
	100	101	0.33	0.81	0.33	0.81	10.00	10.00	10.00	5.15	1.38	12	0.015	45	0.50	2.78	2.18	0.27	860.30	857.46	857.23	1.84		
	101	102	0.18	0.35	0.51	0.65	10.00	10.27	10.27	5.11	1.69	12	0.015	69	0.50	2.78	2.18	0.41	860.60	857.23	856.89	2.37		
	102	105	0.35	0.72	0.86	0.68	10.00	10.68	10.68	5.05	2.94	15	0.015	96	0.50	3.23	3.96	0.50	860.6	856.9	856.42	2.45		
	105	106	0.09	0.35	0.95	0.65	10.00	11.18	11.18	4.97	3.05	15	0.015	48	0.50	3.23	3.96	0.25	861.2	856.42	856.18	3.53		
	106	107	0.00	0.00	0.95	0.65	10.00	11.43	11.43	4.94	3.03	15	0.015	35	0.50	3.23	3.96	0.18	862.5	856.18	856	5.07		
	107	108	0.00	0.35	0.95	0.65	10.00	11.61	11.61	4.91	3.02	15	0.015	24	0.50	3.23	3.96	0.12	861.47	850.26	850.14	9.96		
	108	109	0.23	0.80	1.18	0.68	10.00	11.73	11.73	4.89	3.90	18	0.015	72	0.50	3.64	6.44	0.33	860.63	849.88	849.52	9.25		
	110	109	0.06	0.40	0.06	0.40	10.00	10.00	10.00	5.15	0.12	12	0.015	57	1.50	4.82	3.78	0.20	861.02	856.8	855.94	3.22		
	109	115	0.00	0.00	1.24	0.66	10.00	12.06	12.06	4.85	3.98	18	0.015	57	0.72	4.38	7.73	0.22	860	849.52	849.11	8.98		
	111	112	0.32	0.90	0.32	0.90	10.00	10.00	10.00	5.15	1.48	12	0.015	33	2.00	5.56	4.37	0.10	851.70	848.40	847.74	2.30		
	112	113	0.25	0.90	0.57	0.90	10.00	10.10	10.10	5.14	2.63	12	0.015	35	3.22	7.05	5.54	0.08	851.70	847.74	846.63	2.96		
	140	141	0.00	0.00	0.00	0.00	10.00	10.00	10.00	5.15	0.00	12	0.015	30	2.00	5.56	4.37	0.09	853.57	850.27	849.68	2.30		
	141	142	0.00	0.00	0.00	0.00	10.00	10.09	10.09	5.14	0.00	12	0.015	8	3.88	7.74	6.08	0.02	849.98	848.15	847.84	0.83		
	142	113	0.73	0.78	0.73	0.78	10.00	10.11	10.11	5.13	2.92	12	0.015	11	2.00	5.56	4.37	0.03	856.41	846.84	846.63	8.57		
	113	114	0.00	0.00	1.30	0.83	10.00	10.18	10.18	5.12	5.55	24	0.015	30	0.50	4.41	13.86	0.11	854.9	845.63	845.48	7.27		
	114	121	0.00	0.40	1.30	0.83	10.00	10.29	10.29	5.11	5.53	24	0.015	139	0.50	4.41	13.86	0.52	855.30	845.48	844.79	7.82		
	115	116	0.13	0.40	1.37	0.64	10.00	12.28	12.28	4.82	4.21	18	0.015	102	0.71	4.33	7.64	0.39	858	849.11	848.39	7.39		
	116	117	0.00	0.40	1.37	0.64	10.00	12.67	12.67	4.77	4.16	18	0.015	117	0.90	4.89	8.64	0.40	858.37	847.8	846.75	9.07		
	117	118	0.22	0.40	1.59	0.60	10.00	13.07	13.07	4.71	4.53	18	0.015	64	1.00	5.15	9.10	0.21	855.83	846.75	846.11	7.58		
	118	121	0.16	0.40	1.75	0.59	10.00	13.28	13.28	4.69	4.81	18	0.015	68	1.20	5.64	9.97	0.20	852.63	846.11	845.29	5.02		
	120	121	0.08	0.35	0.08	0.35	10.00	10.00	10.00	5.15	0.14	12	0.015	64	0.50	2.78	2.18	0.38	847	845.11	844.79	0.89		
	121	510	0.44	0.40	3.57	0.65	10.00	13.48	13.48	4.66	10.78	24	0.015	26	0.50	4.41	13.86	0.10	849.8	844.79	844.66	3.01		
	125	126	0.25	0.85	0.25	0.85	10.00	10.00	10.00	5.15	1.09	12	0.015	76	0.50	2.78	2.18	0.46	851.10	848.90	848.52	1.20		
	126	127	0.32	0.40	0.57	0.60	10.00	10.46	10.46	5.08	1.73	12	0.015	120	0.50	2.78	2.18	0.72	853.60	848.52	847.92	4.08		
	127	128	0.24	0.35	0.81	0.52	10.00	11.18	11.18	4.97	2.11	12	0.015	122	0.50	2.78	2.18	0.73	853.60	847.92	847.31	4.68		
	128	129	0.22	0.35	1.03	0.49	10.00	11.91	11.91	4.87	2.44	12	0.015	103	5.15	8.92	7.01	0.19	853.60	847.31	842.02	5.29		
	130	129	0.57	0.90	0.57	0.90	10.00	10.00	10.00	5.15	2.64	15	0.015	21	1.00	4.56	5.60	0.08	847.83	840.19	839.98	6.39		
	129	131	0.10	0.35	1.70	0.62	10.00	12.10	12.10	4.84	5.08	15	0.015	30	1.00	4.56	5.60	0.11	845.2	839.99	839.68	3.96		
	131	132	0.00	0.40	1.70	0.62	10.00	12.21	12.21	4.83	5.07	15	0.015	26	1.00	4.56	5.60	0.09	842.81	839.68	839.42	1.88		
	132	512	0.00	0.00	1.70	0.62	10.00	12.30	12.30	4.82	5.05	15	0.015	7	1.00	4.56	5.60	0.03	842	839.42	839.36	1.33		

