BAYER-BECKER ENGINEERS
6900 TYLERSVILLE ROAD
MASON, OHIO

STORM SEWER CALCULATIONS

10 Year Storm

FORMULAE USED
$Q_r = AC * I$ (required)
$V_p = (1.486 / n) * R^{2/3} * S^{1/2}$
$Q_p = A_p * V_p$
R = (Pipe Dia. / 4)

Designed By: JSD
Reviewed By:
Date: 06/09/16
Sheet:
Job # 15M053.000

LOCATION		TOPOGRAPHY					TIME					DESIGN					TIME		PIPE		REMARKS
From	To	Area Number	Acres	"C" Value	"AC" for Area	"AC" Acumulate	To Inlet "T" (minutes)	In Pipe "Tp" (minutes)	Concentration "T" (minutes)	Intensity "I"	"Q" Required (c.f.s.)	Pipe Size (inches)	"n" Value	Slope in %	Velocity (ft. / sec)	"Q" Provided (c.f.s.)	Length of Pipe (feet)	In Pipe "Tp"	Inlet Invert	Outlet Invert	
		1	0.44	0.95	0.42	0.42	10.0		10.0	5.15	**2.15**	15	0.015	0.50	3.23	**3.96**	109.00	0.6	861.30	860.76	
		2	0.03	0.95	0.03	0.03	10.0		10.0	5.15	**0.15**	12	0.015	2.00	5.56	**4.37**	32.00	0.1	865.19	864.54	
		3	0.03	0.95	0.03	0.06	10.0	0.1	10.1	5.14	**0.29**	12	0.015	2.00	5.56	**4.37**	56.00	0.2	864.54	863.42	
		4	0.11	0.90	0.10	0.57	10.0	0.6	10.6	5.07	**2.91**	15	0.015	0.75	3.95	**4.85**	41.00	0.2	860.76	860.45	
		5	0.46	0.90	0.41	0.99	10.6	0.2	10.7	5.04	**4.98**	18	0.015	0.50	3.64	**6.44**	84.00	0.4	860.20	859.78	
		6	0.26	0.95	0.25	0.25	10.0		10.0	5.15	**1.27**	12	0.015	1.00	3.93	**3.09**	89.00	0.4	863.62	862.73	
		7	0.28	0.90	0.25	1.49	10.7	0.4	11.1	4.98	**7.41**	18	0.015	1.00	5.15	**9.10**	97.00	0.3	859.78	858.81	
		8	0.27	0.90	0.24	1.73	11.1	0.3	11.4	4.94	**8.54**	18	0.015	2.00	7.29	**12.87**	17.00	0.0	854.34	854.00	
		10	0.23	0.50	0.12	0.12	10.0		10.0	5.15	**0.59**	12	0.015	2.00	5.56	**4.37**	17.00	0.1	854.33	853.99	
		20	0.67	0.95	0.64	0.64	10.0		10.0	5.15	**3.28**	18	0.015	0.50	3.64	**6.44**	180.00	0.8	857.49	856.59	
		21	0.70	0.95	0.67	1.30	10.0	0.8	10.8	5.03	**6.54**	24	0.015	2.00	8.83	**27.73**	19.00	0.0	856.09	855.71	
		22	0.20	0.90	0.18	1.48	10.8	0.0	10.9	5.02	**7.44**	24	0.015	0.71	5.26	**16.52**	49.00	0.2	855.72	855.37	
		23	0.21	0.95	0.20	0.20	10.0		10.0	5.15	**1.03**	12	0.015	0.50	2.78	**2.18**	52.00	0.3	857.48	857.22	
		24	0.86	0.95	0.82	1.02	10.0	0.3	10.3	5.10	**5.19**	24	0.015	0.35	3.69	**11.60**	244.00	1.1	856.22	855.37	
		25	0.69	0.95	0.66	3.15	10.3	1.1	11.4	4.94	**15.58**	30	0.015	0.35	4.28	**21.03**	138.00	0.5	854.87	854.39	
		30	0.24	0.95	0.23	0.23	10.0		10.0	5.15	**1.17**	12	0.015	0.50	2.78	**2.18**	98.00	0.6	860.83	860.34	
		31	0.53	0.85	0.45	0.45	10.0	0.6	10.6	5.06	**2.28**	15	0.015	0.50	3.23	**3.96**	149.00	0.8	860.09	859.35	
		32	0.95	0.95	0.90	0.90	10.6	0.8	11.4	4.95	**4.47**	15	0.015	1.00	4.56	**5.60**	92.00	0.3	859.35	858.43	
		33	0.26	0.95	0.25	1.15	11.4	0.3	11.7	4.90	**5.63**	18	0.015	3.00	8.92	**15.77**	11.00	0.0	857.69	857.36	
		34	0.07	0.95	0.07	1.22	11.7	0.0	11.7	4.90	**5.95**	18	0.015	2.00	7.29	**12.87**	38.00	0.1	857.36	856.60	
		35	0.35	0.95	0.33	0.33	10.0		10.0	5.15	**1.71**	12	0.015	1.00	3.93	**3.09**	67.00	0.3	861.83	861.16	
		36	0.07	0.95	0.07	0.40	10.0	0.3	10.3	5.11	**2.04**	12	0.015	1.60	4.97	**3.91**	110.00	0.4	861.16	859.40	
		37	0.06	0.95	0.06	1.67	11.7	0.1	11.8	4.88	**8.17**	18	0.015	2.95	8.85	**15.64**	41.00	0.1	856.60	855.39	
		38	0.59	0.95	0.56	5.39	11.4	0.5	12.0	4.86	**26.20**	36	0.015	0.50	5.78	**40.87**	72.00	0.2	853.89	853.53	
		39	0.25	0.95	0.24	5.62	12.0	0.2	12.2	4.84	**27.19**	36	0.015	0.50	5.78	**40.87**	106.00	0.3	853.53	853.00	

BAYER-BECKER ENGINEERS
6900 TYLERSVILLE ROAD
MASON, OHIO

STORM SEWER CALCULATIONS

10 Year Storm

FORMULAE USED
$Q_r = AC * I$ (required)
$V_p = (1.486 / n) * R^{2/3} * S^{1/2}$
$Q_p = A_p * V_p$
R = (Pipe Dia. / 4)

Designed By: JSD
Reviewed By:
Date: 06/09/16
Sheet:
Job # 15M053.000

LOCATION		TOPOGRAPHY					TIME					DESIGN					TIME		PIPE		REMARKS
From	To	Area Number	Acres	"C" Value	"AC" for Area	"AC" Acumulate	To Inlet "T" (minutes)	In Pipe "Tp" (minutes)	Concentration "T" (minutes)	Intensity "I"	"Q" Required (c.f.s.)	Pipe Size (inches)	"n" Value	Slope in %	Velocity (ft. / sec)	"Q" Provided (c.f.s.)	Length of Pipe (feet)	In Pipe "Tp"	Inlet Invert	Outlet Invert	
		100	0.30	0.81	0.24	0.24	10.0		10.0	5.15	**1.25**	12	0.015	0.50	2.78	**2.18**	53.00	0.3	858.00	857.74	
		101	0.08	0.35	0.03	0.27	10.0	0.3	10.3	5.10	**1.38**	12	0.015	0.50	2.78	**2.18**	49.00	0.3	857.73	857.49	
		102	0.18	0.72	0.13	0.40	10.3	0.3	10.6	5.06	**2.03**	15	0.015	0.50	3.23	**3.96**	34.00	0.2	857.23	857.06	
		103	0.00	0.35	0.00	0.40	10.6	0.2	10.8	5.03	**2.02**	15	0.015	0.50	3.23	**3.96**	34.00	0.2	857.06	856.89	
		104	0.35	0.74	0.26	0.66	10.8	0.2	11.0	5.01	**3.30**	15	0.015	0.50	3.23	**3.96**	96.00	0.5	856.89	856.41	
		105	0.09	0.35	0.03	0.69	11.0	0.5	11.5	4.93	**3.41**	15	0.015	0.50	3.23	**3.96**	48.00	0.2	856.41	856.17	
		106	0.00	0.35	0.00	0.69	11.5	0.2	11.7	4.90	**3.39**	15	0.015	0.50	3.23	**3.96**	35.00	0.2	856.17	856.00	
		107	0.14	0.35	0.05	0.74	11.7	0.2	11.9	4.87	**3.61**	15	0.015	3.69	8.76	**10.75**	27.00	0.1	856.00	855.00	
		107a	0.00	0.35	0.00	0.74	11.9	0.1	11.9	4.87	**3.60**	15	0.015	3.00	7.90	**9.70**	8.00	0.0	851.50	851.26	
		107b	0.00	0.35	0.00	0.74	11.9	0.0	12.0	4.86	**3.60**	15	0.015	0.50	3.23	**3.96**	22.00	0.1	850.25	850.14	
		108	0.25	0.80	0.20	0.94	12.0	0.1	12.0	4.86	**4.57**	18	0.015	0.50	3.64	**6.44**	92.00	0.4	849.89	849.43	
		109	0.02	0.40	0.01	0.95	12.0	0.4	12.4	4.80	**4.55**	18	0.015	0.50	3.64	**6.44**	61.00	0.3	849.43	849.13	
		110	0.07	0.40	0.03	0.98	12.4	0.3	12.7	4.76	**4.65**	18	0.015	0.50	3.64	**6.44**	209.00	1.0	849.12	848.08	
		111	0.66	0.90	0.59	0.59	10.0		10.0	5.15	**3.06**	15	0.015	0.50	3.23	**3.96**	33.00	0.2	848.45	848.29	
		112	0.25	0.90	0.23	0.82	10.0	0.2	10.2	5.13	**4.20**	18	0.015	0.50	3.64	**6.44**	32.00	0.1	848.04	847.88	
		113	0.13	0.40	0.05	0.87	10.2	0.1	10.3	5.10	**4.44**	18	0.015	0.74	4.43	**7.83**	27.00	0.1	847.88	847.68	
		114	0.55	0.95	0.52	1.39	10.3	0.1	10.4	5.09	**7.09**	18	0.015	1.39	6.07	**10.73**	137.00	0.4	847.68	845.78	
		115	0.41	0.40	0.16	0.16	10.0		10.0	5.15	**0.84**	12	0.015	3.35	7.20	**5.65**	112.00	0.3	856.51	852.76	
		116	0.40	0.40	0.16	0.32	10.0	0.3	10.3	5.11	**1.66**	12	0.015	0.50	2.78	**2.18**	71.00	0.4	852.77	852.42	
		116A	0.00	0.40	0.00	0.32	10.3	0.4	10.7	5.05	**1.64**	12	0.015	0.50	2.78	**2.18**	117.00	0.7	852.42	851.84	
		117	0.22	0.40	0.09	0.41	10.7	0.7	11.4	4.94	**2.04**	12	0.015	0.50	2.78	**2.18**	64.00	0.4	851.84	851.52	
		118	0.16	0.40	0.06	0.48	11.4	0.4	11.8	4.89	**2.33**	15	0.015	0.50	3.23	**3.96**	68.00	0.4	846.18	845.84	
		120	0.08	0.35	0.03	0.03	10.0		10.0	5.15	**0.14**	15	0.015	0.50	3.23	**3.96**	64.00	0.3	844.88	844.56	
		121	0.41	0.40	0.16	1.90	10.0	0.3	10.3	5.10	**9.68**	24	0.015	0.50	4.41	**13.86**	26.00	0.1	844.79	844.66	
		125	0.25	0.85	0.21	0.21	10.0		10.0	5.15	**1.09**	12	0.015	0.50	2.78	**2.18**	76.00	0.5	848.90	848.52	
		126	0.27	0.40	0.11	0.32	10.0	0.5	10.5	5.08	**1.63**	12	0.015	0.50	2.78	**2.18**	120.00	0.7	848.52	847.92	
		127	0.24	0.35	0.08	0.40	10.5	0.7	11.2	4.97	**2.01**	12	0.015	0.50	2.78	**2.18**	122.00	0.7	847.92	847.31	
		128	0.22	0.35	0.08	0.48	11.2	0.7	11.9	4.87	**2.34**	12	0.015	5.15	8.92	**7.01**	103.00	0.2	847.31	842.01	
		129	0.10	0.35	0.04	0.52	11.9	0.2	12.1	4.84	**2.50**	12	0.015	6.38	9.93	**7.80**	21.00	0.0	839.30	837.96	
		130	0.57	0.35	0.20	0.72	12.1	0.0	12.1	4.84	**3.46**	15	0.015	0.70	3.82	**4.68**	53.00	0.2	838.40	838.03	
		131	0.00	0.35	0.00	0.72	12.1	0.2	12.4	4.81	**3.44**	15	0.015	0.70	3.82	**4.68**	63.00	0.3	838.10	837.66	
		400	0.00	0.40	0.00	0.40	10.0	10.0	20.0	3.95	**1.58**	15	0.015	0.48	3.16	**3.88**	12.00	0.1	855.61	855.55	

BAYER-BECKER ENGINEERS
6900 TYLERSVILLE ROAD
MASON, OHIO

STORM SEWER CALCULATIONS

10 Year Storm

FORMULAE USED
$Q_r = AC * I$ (required)
$V_p = (1.486 / n) * R^{2/3} * S^{1/2}$
$Q_p = A_p * V_p$
R = (Pipe Dia. / 4)

Designed By:
Reviewed By:
Date:
Sheet:
Job #

LOCATION		TOPOGRAPHY					TIME					DESIGN					TIME		PIPE		REMARKS	TEST	
From	To	Area Number	Acres	"C" Value	"AC" for Area	"AC" Accumulate	To Inlet "T" (minutes)	In Pipe "Tp" (minutes)	Concentration "T" (minutes)	Intensity "I"	"Q" Required (c.f.s.)	Pipe Size (inches)	"n" Value	Slope in %	Velocity (ft. / sec)	"Q" Provided (c.f.s.)	Length of Pipe (feet)	In Pipe "Tp"	Inlet Invert	Outlet Invert		QP > QR	QP - QR > 1
125	126	122a	0.25	0.60	0.15	0.15	10.0		10.0	5.15	**0.77**	12	0.015	0.50	2.78	**2.18**	80.00	0.5					
126	127	122b	0.27	0.30	0.08	0.23	10.0	0.5	10.5	5.08	**1.17**	12	0.015	0.50	2.78	**2.18**	120.00	0.7					INVALID
127	128	123	0.24	0.30	0.07	0.30	10.5	0.7	11.2	4.97	**1.51**	12	0.015	0.50	2.78	**2.18**	122.00	0.7					
128	130	124	0.22	0.30	0.07	0.37	11.2	0.7	11.9	4.87	**1.80**	12	0.015	5.15	8.92	**7.01**	103.00	0.2					
		129	0.11	0.30	0.03	0.40	11.9	0.2	12.1	4.84	**1.95**	12	0.015	6.38	9.93	**7.80**	21.00	0.0					
Bldg 1/2 Roof		130	0.57	0.90	0.51	0.51	10.0		10.0	5.15	**2.64**	12	0.015	4.00	7.86	**6.18**	8.00	0.0					
		MH				0.92	12.1	0.0	12.2	4.84	**4.42**	15	0.015	0.70	3.82	**4.68**	43.00	0.2					INVALID
		MH				0.92	12.2	0.2	12.3	4.81	**4.40**	15	0.015	0.70	3.82	**4.68**	63.00	0.3					INVALID
		131	0.37	0.80	0.30	1.21	12.3		12.3	4.81	**5.82**	15	0.015	1.54	5.66	**6.95**							