STORM SEWER DESIGN CALCULATION TABLE (100–yr Return Frequency)

LINE NO.	LINE STA.	STRUC. NUMBERS (from)	STRUC. NUMBERS (to)	TARGET SLOPE (%) [2]	STRUCT TOP	PIPE COVER (ft)	PIPE INVERTS US estimate	PIPE INVERTS US set [4]	PIPE INVERTS DS set [1]	PIPE INVERTS DS estimate	UPSTREAM STRUCTURES 1	UPSTREAM STRUCTURES 2	UPSTREAM STRUCTURES 3	LOCAL C	LOCAL A (ac)	LOCAL C X A (ac)	TOTAL C X A (ac)	INLET TIME (min)	TOTAL Tc (min)	100-YR "K"	100-YR "C" (ave.)	100-YR I (in/hr)	100-YR A (Ac)	100-YR Q (cfs)	PIPE DIA. (in) [3]	MANN N	PIPE SLOPE (%)	MANNYS FULL CAP (cfs)	MANNYS FULL VEL (fps)	DES VEL (fps)	VEL HEAD (ft)	FLOW DEPTH (in)	PIPE LEN (ft)	FLOW TIME (min)
15	10+00.00	15-1	-	1.00%	1012.50	0.00	1009.00	1009.00			15-2	-	-	0.00	0.00	0.00	11.68	0.00	8.21	1.25	0.80	9.14	14.60	133.44	42	0.013								
15	12+38.48	15-2	15-1	2.80%	1035.00	15.82	1015.68			1009.00	15-3	-	-	0.80	14.10	11.28	11.68	8.00	8.00	1.25	0.80	9.21	14.60	134.47	42	0.013	2.80%	168.35	17.50	19.43	5.87	28.38	238.48	0.20
15	12+88.28	15-3	15-2	2.00%	1027.00	6.83	1018.92			1017.93	-	-	-	0.80	0.50	0.40	0.40	7.05	7.05	1.25	0.80	9.54	0.50	4.77	15	0.013	2.00%	9.14	7.44	7.52	0.88	7.69	49.80	0.11
16	10+00.00	16-1	-	1.00%	1015.23	0.00	1013.23	1013.23			16-2	-	-	0.00	0.00	0.00	2.33	0.00	7.44	1.25	0.53	9.40	4.40	27.40	24	0.013								
16	11+40.70	16-2	16-1	1.00%	1026.00	9.36	1014.64			1013.23	16-3	-	-	0.53	4.00	2.12	2.33	7.05	7.17	1.25	0.53	9.49	4.40	27.66	24	0.013	1.00%	22.62	7.20	8.81	1.20	24.00	140.70	0.27
16	11+77.36	16-3	16-2	1.00%	1017.83	1.38	1015.20			1014.84	-	-	-	0.53	0.40	0.21	0.21	7.05	7.05	1.25	0.53	9.54	0.40	2.53	15	0.013	1.00%	6.46	5.26	4.94	0.38	6.52	36.66	0.12
17	10+00.00	17-1	-	1.00%	1040.00	7.50	1030.00	1030.00			17-2	-	-	0.00	0.00	0.00	6.30	0.00	14.56	1.25	0.30	7.45	21.00	58.67	30	0.024								
17	11+17.04	17-2	17-1	5.00%	1040.00	1.65	1035.85			1030.00	-	-	-	0.30	21.00	6.30	6.30	14.40	14.40	1.25	0.30	7.49	21.00	58.98	30	0.024	5.00%	49.68	10.12	12.02	2.24	30.00	117.04	0.16
18	10+00.00	18-1	-	1.00%	1035.00	9.50	1022.00	1022.00			18-2	-	-	0.00	0.00	0.00	17.06	0.00	15.27	1.25	0.30	7.31	56.86	155.87	42	0.013								
18	12+64.00	18-2	18-1	1.00%	1038.00	9.86	1024.64			1022.00	-	-	-	0.30	56.86	17.06	17.06	15.00	15.00	1.25	0.30	7.36	56.86	156.93	42	0.013	1.00%	100.61	10.46	16.31	4.13	42.00	264.00	0.27
19	10+00.00	19-1	-	1.00%	990.00	13.34	973.66	973.66		0.00	19-2	-	-	0.00	0.00	0.00	5.99	0.00	15.09	1.25	0.35	7.34	17.25	54.94	36	0.013								
19	10+78.13	19-2	19-1	1.00%	995.00	16.73	975.27	975.27		973.66	19-3	-	-	0.35	16.25	5.69	5.99	15.00	15.00	1.25	0.35	7.36	17.25	55.09	36	0.013	2.06%	95.75	13.55	14.02	3.05	19.60	78.13	0.09
19	11+33.80	19-3	19-2	1.00%	990.00	11.17	977.33			976.77	-	-	-	0.30	1.00	0.30	0.30	0.00	0.00	1.25	0.30	12.93	1.00	4.85	18	0.012	1.00%	11.38	6.44	6.18	0.59	8.20	55.67	0.15

INLET DESIGN TABLE (100–yr Return Frequency)

LINE NO.	LINE STA.	STRUC. NO.	OVERLAND FLOW LEN (ft)	OVERLAND FLOW S (%)	OVERLAND FLOW "C"	OVERLAND FLOW TIME (min)	GUTTER FLOW LEN (ft)	GUTTER FLOW S (%)	GUTTER FLOW VEL (fps)	GUTTER FLOW TIME (min)	INLET TIME (min)	100-YR "K"	100-YR "C"	100-YR I (in/hr)	100-YR A (Ac)	100-YR Q (cfs)	US BYPASS (cfs)	TOTAL FLOW (cfs)	STREET SLOPE (%)	STREET XSLOPE (%)	12 CG-1 CAP (cfs)	INLET LEN (ft)	0.83 INLET CAP. (cfs) 0.83	80% CAP. (cfs)	BYPASS DS (cfs)
15	10+00.00	15-1																							
15	12+38.48	15-2	49	2.0%	0.30	8.00					8.00	1.25	0.80	9.21	14.10	129.86		129.86		2.08%	SUMP	5	15.46	12.37	117.49
15	12+88.28	15-3	38	2.0%	0.30	7.05					7.05	1.25	0.80	9.54	0.50	4.77		4.77		2.08%	SUMP	5	15.46	12.37	
16	10+00.00	16-1																							
16	11+40.70	16-2	38	2.0%	0.30	7.05					7.05	1.25	0.53	9.54	4.00	25.28		25.28	3.00%	2.08%	7.39	5	7.16	5.73	19.55
16	11+77.36	16-3	38	2.0%	0.30	7.05					7.05	1.25	0.53	9.54	0.40	2.53		2.53	3.00%	2.08%	7.39	5	7.16	5.73	
17	10+00.00	17-1																							
17	11+17.04	17-2	100	1.0%	0.30	14.40					14.40	1.25	0.30	7.49	21.00	58.98		58.98			SUMP				58.98
18	10+00.00	18-1																							
18	12+64.00	18-2	100	1.0%	0.30	14.40	500	1.0%	2.81	2.97	15.00	1.25	0.30	7.36	56.86	156.93		156.93			SUMP				156.93
19	10+00.00	19-1																		2.08%	SUMP				
19	10+78.13	19-2	150	1.0%	0.30	17.64	500	1.0%	2.81	2.97	15.00	1.25	0.35	7.36	16.25	52.33		52.33		2.08%	SUMP	24	74.23	59.38	
19	11+33.80	19-3										1.25	0.30	12.93	1.00	4.85		4.85		2.08%	SUMP	5	15.46	12.37	

BASED ON TRAVEL TIME CALCULATION APWA SECTION 5602.5 B.
GUTTER CAPACITIES BASED ON MAXIMUM ALLOWABLE SPREAD.

DATE	P.E. SIGNATURE	DESCRIPTION
10-01-07	R.J.S.	Prepared for Review.
11-16-07	R.J.S.	Issued for bid
12-07-07	R.J.S.	⚠1 Revised tables
02-13-08	R.J.S.	⚠2 Revised Line 16

DRAINAGE TABLES

CENTERPOINT–KCS INTERMODAL CENTER

STATE OF MISSOURI ROBERT J. SUNTA E–25751 REGISTERED PROFESSIONAL ENGINEER

Reviewed By:	B.A.C.
Designed By:	R.J.S.
Drafted By:	J.W.W.

Lutjen Project No.: 07166

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