

MAIN STORM SEWER PIPE CALCULATIONS

PIPE STATION		DISTANCE (FEET)	CA	FLOW TIME		TOTAL FLOW (CFS)	PIPE SLOPE (FT/FT)	SIZE	CAPACITY (CFS)	HYDRAULIC GRADE LINE	
UPSTREAM	DOWNSTREAM			IN PIPE (MIN)	INTENSITY (IN/HR)					IN	OUT
LINE A											
-1+65.6	O-1	19.2	92.89	25.28	6.18	578.2	0.0053	10 x 6 ft	757.8	592.73	592.36
-0+80.07	-1+65.6	85.5	90.82	25.17	6.18	566.2	0.0052	10 x 6 ft	751.5	593.11	592.73
0+92.29	-0+80.07	172.4	90.18	24.97	6.20	563.9	0.0050	10 x 6 ft	738.5	593.96	593.11
3+75.55	0+92.29	283.3	85.62	24.60	6.25	539.2	0.0042	10 x 6 ft	675.9	595.02	593.96
7+03.91	3+75.55	328.4	83.59	24.17	6.30	530.8	0.0042	10 x 6 ft	676.0	596.35	595.02
8+67.55	7+03.91	163.6	83.32	24.00	6.32	530.8	0.0070	10 x 5 ft	673.5	598.47	596.51
8+81.30	8+67.55	13.8	69.13	23.98	6.32	440.6	0.0065	10 x 5 ft	650.0	598.35	598.47
9+73.62	8+81.30	92.3	69.13	23.89	6.33	441.3	0.0101	9 x 5 ft	708.3	599.26	598.35
10+27.74	9+73.62	54.1	68.86	23.83	6.34	440.1	0.0100	9 x 5 ft	704.9	599.79	599.26
14+91.36	10+27.74	463.6	68.56	23.37	6.40	442.0	0.0100	9 x 5 ft	705.3	604.44	598.55
15+00.00	14+91.36	8.6	68.12	23.36	6.40	439.2	0.0104	9 x 5 ft	720.3	604.51	604.44
23+19.90	15+00.00	819.9	68.12	22.43	6.51	446.9	0.0068	9 x 5 ft	580.6	610.11	603.71
24+07.68	23+19.90	87.8	67.62	22.36	6.52	444.2	0.0202	9 x 5 ft	1002.1	611.86	610.11
30+66.36	24+07.68	658.7	63.67	21.50	6.62	424.9	0.0048	9 x 5 ft	488.8	614.90	611.86
30+94.34	30+66.36	28.0	58.73	21.46	6.62	392.2	0.0046	9 x 5 ft	481.0	614.81	614.90
32+87.49	30+94.34	193.2	58.12	21.20	6.66	389.9	0.0048	9 x 5 ft	489.7	615.73	614.81
35+26.68	32+87.49	239.2	57.07	20.88	6.69	385.1	0.0048	9 x 5 ft	489.3	616.85	615.73
35+67.54	35+26.68	40.9	56.40	20.82	6.70	381.0	0.0047	9 x 5 ft	481.2	617.01	616.85
36+44.81	35+67.54	77.3	56.40	20.72	6.71	381.7	0.0049	9 x 5 ft	494.9	617.39	616.85
37+77.04	36+44.81	132.2	54.98	20.54	6.74	373.3	0.0048	8 x 5 ft	420.6	618.27	617.39
39+58.25	37+77.04	181.2	49.50	20.29	6.77	337.6	0.0048	8 x 5 ft	422.2	618.88	618.27
40+94.38	39+58.25	136.1	49.29	20.10	6.79	337.3	0.0048	8 x 5 ft	424.3	619.54	618.88
LINE A/C	40+94.38	138.5	49.21	19.91	6.81	338.0	0.0048	8 x 5 ft	423.8	620.21	619.25
43+82.93	LINE A/C	150.1	46.80	19.70	6.84	322.8	0.0048	7 x 5 ft	356.4	621.16	620.28
44+71.86	43+82.93	88.9	42.22	19.57	6.86	292.0	0.0047	7 x 5 ft	353.6	621.32	621.16
LINE A/D	44+71.86	20.2	22.52	19.54	6.87	155.8	0.0050	7 x 5 ft	362.0	621.32	621.32
45+05.00	LINE A/D	10.0	3.27	12.00	8.25	27.2	0.1520	24 inch	88.2	622.51	621.32
LINE B											
-1+23.37	O-1	56.0	154.56	42.13	4.87	759.0	0.0054	10 x 6 ft	763.6	593.87	593.14
-1+15.72	-1+23.37	7.7	147.97	42.13	4.87	726.8	0.0052	10 x 6 ft	754.1	593.75	593.87
1+00.74	-1+15.72	202.1	147.51	41.91	4.89	726.4	0.0057	10 x 6 ft	786.7	594.89	593.75
3+02.81	1+00.74	202.1	147.43	41.69	4.90	728.0	0.0058	10 x 6 ft	793.5	596.07	594.89
3+66.25	3+02.81	63.4	100.03	41.62	4.90	494.4	0.0054	10 x 5 ft	588.1	596.16	596.07
6+52.87	3+66.25	286.6	99.78	41.26	4.92	495.3	0.0050	10 x 5 ft	567.5	597.59	596.16
8+53.27	6+52.87	200.4	99.64	41.04	4.94	495.9	0.0069	9 x 5 ft	587.8	599.29	597.59
8+93.63	8+53.27	40.4	99.57	40.99	4.94	495.8	0.0069	9 x 5 ft	587.8	599.57	599.29
9+78.22	8+93.63	84.6	99.57	40.90	4.95	496.4	0.0071	9 x 5 ft	594.4	600.18	599.57
10+26.04	9+78.22	47.8	99.25	40.85	4.95	495.1	0.0077	9 x 5 ft	620.8	600.54	600.18
14+95.55	10+26.04	469.5	98.51	40.36	4.98	494.3	0.0080	9 x 5 ft	630.7	604.28	600.54
18+62.40	14+95.55	366.9	98.07	39.98	5.00	494.4	0.0080	9 x 5 ft	632.9	607.23	604.28
24+10.26	18+62.40	546.3	96.57	39.50	5.03	489.8	0.0131	9 x 5 ft	809.1	614.39	607.23
LINE C											
1+90.89	LINE A/C	192.7	2.41	17.08	7.22	17.6	0.0049	30 inch	28.8	620.40	620.21
2+13.99	1+90.89	23.1	1.91	17.02	7.23	13.9	0.0061	30 inch	31.9	620.39	620.40
2+95.95	2+13.99	82.0	1.71	16.84	7.25	12.5	0.0106	24 inch	23.3	621.02	620.39
3+55.98	2+95.95	60.0	1.71	16.67	7.28	12.5	0.0053	24 inch	16.5	621.37	621.02
3+79.07	3+55.98	23.1	1.48	16.60	7.29	10.9	0.0052	24 inch	16.3	621.41	621.37
4+68.89	3+79.07	89.8	1.38	16.32	7.33	10.2	0.0049	24 inch	15.8	621.80	621.41
4+91.99	4+68.89	23.1	1.25	16.25	7.34	9.3	0.0052	24 inch	16.3	621.84	621.80
6+08.14	4+91.99	116.2	1.16	15.99	7.38	8.6	0.0138	24 inch	26.6	623.40	621.84
7+66.41	6+08.14	158.3	1.06	15.47	7.45	8.0	0.0049	24 inch	15.8	624.12	623.40
8+33.65	7+66.41	67.2	0.33	10.00	8.74	2.9	0.0290	24 inch	38.5	625.67	624.12
LINE D											
0+08.65	0+00.00	8.7	19.25	19.44	6.88	133.5	0.0030	6 x 3 ft	112.7	626.39	626.26
2+43.50	0+08.65	234.9	18.72	18.90	6.96	131.3	0.0030	6 x 3 ft	113.5	627.25	626.39

Notes:

- All information taken from StormCAD model of system. Slope shown is as input into StormCAD and may vary from plans depending on location of nodes.
- All information based on the 100-year storm event.

INLET CALCULATIONS

Inlet (Paving Station, Offset)	Drainage Area	Drainage Area Flow (cfs)	Bypass Flow (cfs)	Total Flow (cfs)	Gutter Slope (ft/ft)	Cross Slope (ft/ft)	Gutter Depth (ft)	Grade/Sag?	On-Grade Inlets			Sag Inlets		
									Capacity / Foot (cfs/ft)	Length Provided	Flow Intercepted	Flow Bypassed	Length Provided	
LINE A														
35+37.27, 31.99 LT	6	3.1	0.0	3.1	0.0117	0.0208	0.22	Grade	0.45	10	3.1	0.0		
35+37.40, 32.03 RT	9A	2.5	0.0	2.5	0.0117	0.0208	0.20	Grade	0.43	10	2.5	0.0		
36+32.00, 32.03 RT	11E	2.1	0.0	2.1	0.0117	0.0208	0.19	Grade	0.42	10	2.1	0.0		
37+00.00, 2.16 LT	11D	1.0	0.0	1.0	0.0068	0.0208	0.16	Grade	0.40	10	1.0	0.0		
37+25.25, 30.06 RT	11B-1	2.5	0.0	2.5	0.0068	0.0208	0.23	Grade	0.45	8	2.5	0.0		
39+70.00, 22.30 RT	11A-1	1.8	0.0	1.8	0.0068	0.0208	0.20	Grade	0.43	8	1.8	0.0		
43+00.00, 22.00 RT	14B	2.4	0.0	2.4	0.0053	0.0200	0.23	Grade	0.46	10	2.4	0.0		
45+70.00, 22.00 RT	15A	2.4	0.0	2.4	0.0300	0.0208	0.17	Grade	0.40	10	2.4	0.0		
50+83.50, 20.00 RT	BRIDGE	3.9	0.0	3.9	0.0300	0.0208	0.20	Grade	N/A	GRATE				
66+81.50, 20.05 LT	BRIDGE	2.7	0.0	2.7	0.0220	0.0208	0.19	Grade	N/A	GRATE				
66+93.02, 20.00 RT	BRIDGE	2.7	0.0	2.7	0.0220	0.0208	0.19	Grade	N/A	GRATE				
71+26.88, 6.00 RT	22	2.3	0.0	2.3	0.0220	0.0208	0.18	Grade	0.41	10	2.3	0.0		
71+46.75, 32.00 LT	22B	3.5	0.0	3.5	0.0220	0.0208	0.21	Grade	0.44	10	3.5	0.0		
72+56.00, 32.00 LT	25	7.8	0.0	7.8	0.0220	0.0208	0.28	Sag	N/A				2 - 8'	
72+50.20, 6.25 RT	26B	2.4	0.0	2.4	0.0220	0.0208	0.18	Sag	N/A				12	
75+38.92, 6.00 RT	26A	1.9	0.0	1.9	0.0052	0.0208	0.22	Grade	0.44	8	1.9	0.0		
LINE B														
39+52.86, 5.00 LT	10B	2.2	0.0	2.2	0.0068	0.0208	0.22	Grade	0.44	8	2.2	0.0		
42+38.47, 16.00 LT	14	1.3	0.0	1.3	0.0053	0.0200	0.18	Grade	0.42	8	1.3	0.0		
45+50.00, 31.67 LT	14A	0.6	0.0	0.6	0.0300	0.0208	0.10	Grade	0.35	8	0.6	0.0		
45+71.12, 25.04 LT	13C	2.8	0.0	2.8	0.0300	0.0208	0.18	Grade	0.41	8	2.8	0.0		
50+83.50, 20.00 LT	BRIDGE	3.9	0.0	3.9	0.0300	0.0208	0.20	Grade	N/A	GRATE				
LINE C														
80+23.15, 32.00 LT	B4	4.4	0.0	4.4	0.0066	0.0208	0.28	Sag	N/A				10	
80+23.15, 32.00 RT	B11	1.5	0.0	1.5	0.0066	0.0208	0.19	Sag	N/A				10	
81+88.24, 32.00 LT	B2	2.0	0.0	2.0	0.0066	0.0208	0.21	Grade	0.44	8	2.0	0.0		
81+88.24, 32.00 RT	28A	0.7	0.0	0.7	0.0066	0.0208	0.14	Grade	0.38	8	0.7	0.0		
83+01.15, 32.00 LT	28D	1.2	0.0	1.2	0.0066	0.0208	0.17	Grade	0.41	10	1.2	0.0		
83+01.15, 32.00 RT	28B	0.7	0.0	0.7	0.0066	0.0208	0.14	Grade	0.38	10	0.7	0.0		
86+50.00, 32.00 LT	27C	1.8	0.0	1.8	0.0174	0.0208	0.17	Sag	N/A				10	
86+50.00, 43.00 RT	28C	2.9	0.0	2.9	0.0073	0.0208	0.24	Sag	N/A				10	
SURVEYOR														
0+06.29 LAT '1'	8B	3.5	0.0	3.5	0.0100	0.0208	0.24	Grade	0.46	8	3.5	0.0		
0+12.70 LAT '2'	8C	4.1	0.0	4.1	0.0100	0.0208	0.25	Grade	0.48	8	3.8	0.3		

Note: All flows based on the 100-year storm event.



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY:
A. KATURA CURRY
ON 7-21-04.
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DATE: FEBRUARY 2004	SCALE:	N.T.S.	JOB NO.:	02-320
DRAWN: G&A	DESIGN: AKC	REVIEWED: BRG	DWG: 320DRNCALCS	
ARAPAHO ROAD PHASE III				
DRAINAGE CALCULATIONS				
TOWN OF ADDISON				
g&a Grantham & Associates, Inc.			SHT. D-3	
1919 S. SHILOH ROAD, SUITE 310, L.B.				