high density polyethylene pipe

Sclairpipe®

Flow of Water

KWH PIPE

SCLAIRPIPE®

high-density polyethylene pipe

FLOW TABLES

INTRODUCTION

The head loss values computed in the FLOW TABLES are based on a Hazen-Williams "C" value of 150. Correction factors to accomodate other "C" values are shown at the bottom of each page.

Tests conducted with SCLAIRPIPE® high-density polyethylene pipe by independent testing organizations have shown that the inside surface of SCLAIRPIPE exhibits a resistance to cold water flow equivalent to a "C" value of 155. Joining standard pipe lengths by the thermal fusion process lowers the "C" value to 150. A "system" design value of "C" = 150 is recommended for water service at 73.4 ° F.

In sewage and slurries service "C" values ranging up to 140 are typical. A "system" design value of "C" = 130 is normally recommended for slurries and sewage at 73.4 ° F for long term design purposes.

For further information on flow fluids in SCLAIRPIPE®, please contact your KWH Pipe SCLAIRPIPE® representative.

3/4 AND 1 INCH SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	3/4 INCH IPS DR 17 I.D.= 0.906			3/4 INCH IPS DR 11 I.D.= 0.839				1 INCH IPS DR 17 I.D.= 1.141			1 INCH IPS DR 11 I.D.= 1.051		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
.5	0.2	0.00	0.44	0.3	0.00	0.64	.5	0.2	0.00	0.14	0.2	0.00	0.21
1	0.5	0.00	1.58	0.6	0.01	2.30	1	0.3	0.00	0.51	0.4	0.00	0.77
1.5	0.7	0.01	3.35	0.9	0.01	4.87	1.5	0.5	0.00	1.09	0.6	0.00	1.62
2	1.0	0.02	5.70	1.2	0.02	8.29	2	0.6	0.01	1.85	0.7	0.01	2.77
2.5	1.2	0.02	8.62	1.5	0.03	12.53	2.5	0.8	0.01	2.80	0.9	0.01	4.18
3	1.5	0.03	12.08	1.7	0.05	17.57	3	0.9	0.01	3.93	1.1	0.02	5.86
3.5	1.7	0.05	16.08	2.0	0.06	23.37	3.5	1.1	0.02	5.23	1.3	0.03	7.80
4	2.0	0.06	20.59	2.3	0.08	29.93	4	1.3	0.02	6.69	1.5	0.03	9.99
4.5	2.2	0.08	25.60	2.6	0.11	37.22	4.5	1.4	0.03	8.33	1.7	0.04	12.42
5	2.5	0.10	31.12	2.9	0.13	45.24	5	1.6	0.04	10.12	1.8	0.05	15.10
6	3.0	0.14	43.62	3.5	0.19	63.41	6	1.9	0.06	14.19	2.2	0.08	21.17
7	3.5	0.19	58.03	4.1	0.26	84.36	7	2.2	0.08	18.87	2.6	0.10	28.16
8	4.0	0.25	74.31	4.6	0.34	108.03	8	2.5	0.10	24.17	3.0	0.14	36.06
9	4.5	0.31	92.42	5.2	0.43	134.36	9	2.8	0.12	30.06	3.3	0.17	44.85
10	5.0	0.39	112.33	5.8	0.53	163.31	10	3.1	0.15	36.53	3.7	0.21	54.51
12	6.0	0.56	157.45	7.0	0.76	228.90	12	3.8	0.22	51.21	4.4	0.31	76.40
14	7.0	0.76	209.47	8.1	1.03	304.52	14	4.4	0.30	68.72	5.2	0.42	101.65
16	8.0	0.99	268.23	9.3	1.35	389.96	16	5.0	0.39	87.23	5.9	0.55	130.16
18	9.0	1.25	333.61	10.4	1.70	485.00	18	5.6	0.50	108.50	6.7	0.69	161.89
20	9.9	1.55	405.48	11.6	2.10	589.50	20	6.3	0.61	131.87	7.4	0.85	196.77
23	11.4	2.05	525.27	13.3	2.78	763.64	23	7.2	0.81	170.83	8.5	1.13	254.89
26	12.9	2.61	659.15	15.1	3.55	958.29	26	8.2	1.04	214.37	9.6	1.44	319.86
29	14.4	3.25	806.89	16.8	4.42	1173.06	29	9.1	1.29	262.42	10.7	1.80	391.55
32	15.9	3.96	968.24	18.6	5.38	1407.65	32	10.0	1.57	314.90	11.8	2.19	469.85
35	17.4	4.74	1143.03	20.3	6.44	1661.75	35	11.0	1.88	371.74	12.9	2.62	554.67

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

1-1/2 AND 2 INCH IPS SCLAIRPIPE
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VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	1-1/2 INCH IPS DR 17 I.D.= 1.656			1-1/2 INCH IPS DR 11 I.D.= 1.528				2 INCH IPS DR 17 I.D.= 2.075			2 INCH IPS DR 11 I.D.= 1.917		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
1	0.1	0.00	0.08	0.2	0.00	0.12	2.5	0.2	0.00	0.15	0.3	0.00	0.22
2	0.3	0.00	0.30	0.3	0.00	0.45	5	0.5	0.00	0.55	0.6	0.00	0.81
3	0.4	0.00	0.64	0.5	0.00	0.95	7.5	0.7	0.01	1.16	0.8	0.01	1.71
4	0.6	0.01	1.09	0.7	0.01	1.61	10	0.9	0.01	1.98	1.1	0.02	2.92
5	0.7	0.01	1.65	0.9	0.01	2.44	12.5	1.2	0.02	3.00	1.4	0.03	4.41
6	0.9	0.01	2.31	1.0	0.02	3.42	15	1.4	0.03	4.20	1.7	0.04	6.18
7	1.0	0.02	3.08	1.2	0.02	4.55	17.5	1.7	0.04	5.59	1.9	0.06	8.23
8	1.2	0.02	3.94	1.4	0.03	5.83	20	1.9	0.06	7.16	2.2	0.08	10.54
9	1.3	0.03	4.90	1.6	0.04	7.25	22.5	2.1	0.07	8.91	2.5	0.10	13.10
10	1.5	0.03	5.95	1.7	0.05	8.81	25	2.4	0.09	10.83	2.8	0.12	15.93
12	1.8	0.05	8.34	2.1	0.07	12.35	30	2.8	0.13	15.18	3.3	0.17	22.32
14	2.1	0.07	11.10	2.4	0.09	16.43	35	3.3	0.17	20.19	3.9	0.24	29.70
16	2.4	0.09	14.22	2.8	0.12	21.03	40	3.8	0.22	25.86	4.4	0.31	38.03
18	2.7	0.11	17.68	3.1	0.15	26.16	45	4.3	0.28	32.16	5.0	0.39	47.30
20	3.0	0.14	21.49	3.5	0.19	31.80	50	4.7	0.35	39.09	5.6	0.48	57.49
24	3.6	0.20	30.12	4.2	0.28	44.57	60	5.7	0.51	54.79	6.7	0.69	80.58
28	4.2	0.27	40.07	4.9	0.37	59.29	70	6.6	0.69	72.89	7.8	0.95	107.21
32	4.8	0.35	51.32	5.6	0.49	75.93	80	7.6	0.90	93.34	8.9	1.23	137.28
36	5.4	0.45	63.82	6.3	0.62	94.44	90	8.5	1.14	116.10	10.0	1.56	170.74
40	6.0	0.55	77.57	7.0	0.76	114.78	100	9.5	1.41	141.11	11.1	1.93	207.53
46	6.8	0.73	100.49	8.0	1.01	148.69	115	10.9	1.86	182.79	12.8	2.55	268.84
52	7.7	0.94	126.10	9.1	1.29	186.59	130	12.3	2.38	229.39	14.4	3.26	337.36
58	8.6	1.17	154.37	10.1	1.61	228.41	145	13.8	2.95	280.80	16.1	4.06	412.97
64	9.5	1.42	185.23	11.2	1.96	274.08	160	15.2	3.60	336.95	17.8	4.94	495.55
70	10.4	1.70	218.67	12.2	2.34	323.56	175	16.6	4.30	397.77	19.4	5.91	585.01

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

3 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 26 I.D.= 3.214			DR 21 I.D.= 3.146			DR 17 I.D.= 3.063			DR 15.5 I.D.= 3.021			DR 13.5 I.D.= 2.951		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
10	0.4	0.00	0.24	0.4	0.00	0.26	0.4	0.00	0.30	0.4	0.00	0.32	0.5	0.00	0.36
20	0.8	0.01	0.86	0.8	0.01	0.95	0.9	0.01	1.08	0.9	0.01	1.16	0.9	0.01	1.30
30	1.2	0.02	1.81	1.2	0.02	2.01	1.3	0.03	2.29	1.3	0.03	2.45	1.4	0.03	2.75
40	1.6	0.04	3.09	1.7	0.04	3.43	1.7	0.05	3.90	1.8	0.05	4.17	1.9	0.06	4.68
50	2.0	0.06	4.67	2.1	0.07	5.18	2.2	0.07	5.90	2.2	0.08	6.31	2.4	0.09	7.07
70	2.8	0.12	8.71	2.9	0.13	9.66	3.1	0.15	11.00	3.1	0.15	11.76	3.3	0.17	13.19
90	3.6	0.20	13.88	3.7	0.22	15.39	3.9	0.24	17.51	4.0	0.25	18.73	4.2	0.28	21.01
110	4.4	0.30	20.13	4.5	0.32	22.32	4.8	0.36	25.40	4.9	0.38	27.16	5.2	0.42	30.46
130	5.2	0.42	27.42	5.4	0.45	30.41	5.7	0.50	34.61	5.8	0.53	37.01	6.1	0.58	41.50
150	5.9	0.55	35.75	6.2	0.60	39.63	6.5	0.67	45.11	6.7	0.71	48.23	7.1	0.78	54.10
170	6.7	0.71	45.07	7.0	0.77	49.97	7.4	0.86	56.87	7.6	0.91	60.82	8.0	1.00	68.21
190	7.5	0.89	55.38	7.9	0.97	61.40	8.3	1.07	69.88	8.5	1.13	74.73	8.9	1.25	83.81
210	8.3	1.08	66.66	8.7	1.18	73.90	9.2	1.31	84.11	9.4	1.39	89.94	9.9	1.52	100.88
230	9.1	1.30	78.89	9.5	1.41	87.46	10.0	1.57	99.54	10.3	1.66	106.45	10.8	1.83	119.39
250	9.9	1.53	92.06	10.3	1.67	102.07	10.9	1.86	116.16	11.2	1.96	124.22	11.8	2.16	139.32
290	11.5	2.07	121.18	12.0	2.25	134.36	12.6	2.50	152.91	13.0	2.64	163.52	13.6	2.90	183.40
330	13.1	2.67	153.94	13.6	2.91	170.68	14.4	3.24	194.25	14.8	3.42	207.73	15.5	3.76	232.98
370	14.7	3.36	190.27	15.3	3.66	210.96	16.1	4.07	240.09	16.6	4.30	256.75	17.4	4.73	287.96
410	16.3	4.13	230.11	17.0	4.49	255.13	17.9	5.00	290.36	18.4	5.28	310.51	19.3	5.80	348.25
450	17.8	4.97	273.40	18.6	5.41	303.13	19.6	6.02	345.00	20.2	6.36	368.93	21.2	6.99	413.77
500	19.8	6.14	332.31	20.7	6.68	368.44	21.8	7.43	419.33	22.4	7.85	448.41	23.5	8.63	502.92

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

3 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 11 I.D.= 2.826			DR 9 I.D.= 2.675			DR 7.3 I.D.= 2.485		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
10	0.5	0.00	0.44	0.6	0.01	0.58	0.7	0.01	0.82
20	1.0	0.02	1.60	1.1	0.02	2.08	1.3	0.03	2.98
30	1.5	0.04	3.38	1.7	0.05	4.40	2.0	0.06	6.31
40	2.0	0.07	5.77	2.3	0.08	7.50	2.6	0.11	10.74
50	2.6	0.10	8.72	2.9	0.13	11.34	3.3	0.17	16.24
70	3.6	0.20	16.25	4.0	0.25	21.14	4.6	0.33	30.28
90	4.6	0.33	25.89	5.1	0.41	33.68	6.0	0.55	48.23
110	5.6	0.50	37.54	6.3	0.62	48.83	7.3	0.83	69.93
130	6.7	0.69	51.15	7.4	0.86	66.54	8.6	1.15	95.29
150	7.7	0.92	66.66	8.6	1.14	86.73	9.9	1.54	124.20
170	8.7	1.18	84.05	9.7	1.47	109.35	11.2	1.97	156.60
190	9.7	1.48	103.28	10.8	1.84	134.36	12.6	2.47	192.42
210	10.8	1.81	124.31	12.0	2.24	161.72	13.9	3.01	231.60
230	11.8	2.17	147.12	13.1	2.69	191.40	15.2	3.61	274.10
250	12.8	2.56	171.69	14.3	3.18	223.35	16.5	4.27	319.87
290	14.9	3.45	226.00	16.5	4.28	294.01	19.2	5.74	421.06
330	16.9	4.46	287.10	18.8	5.54	373.49	21.8	7.44	534.89
370	18.9	5.61	354.85	21.1	6.96	461.64	24.5	9.35	661.12

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

4 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 26 I.D.= 4.133			DR 21 I.D.= 4.046			DR 17 I.D.= 3.938			DR 15.5 I.D.= 3.885			DR 13.5 I.D.= 3.794		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
10	0.2	0.00	0.07	0.2	0.00	0.08	0.3	0.00	0.09	0.3	0.00	0.09	0.3	0.00	0.11
20	0.5	0.00	0.25	0.5	0.00	0.28	0.5	0.00	0.32	0.5	0.00	0.34	0.6	0.01	0.38
30	0.7	0.01	0.53	0.7	0.01	0.59	0.8	0.01	0.67	0.8	0.01	0.72	0.9	0.01	0.81
40	1.0	0.01	0.91	1.0	0.02	1.01	1.1	0.02	1.14	1.1	0.02	1.22	1.1	0.02	1.37
50	1.2	0.02	1.37	1.2	0.02	1.52	1.3	0.03	1.73	1.4	0.03	1.85	1.4	0.03	2.07
70	1.7	0.04	2.56	1.7	0.05	2.83	1.8	0.05	3.22	1.9	0.06	3.45	2.0	0.06	3.87
90	2.2	0.07	4.07	2.2	0.08	4.51	2.4	0.09	5.14	2.4	0.09	5.49	2.6	0.10	6.16
110	2.6	0.11	5.90	2.7	0.12	6.54	2.9	0.13	7.45	3.0	0.14	7.96	3.1	0.15	8.93
130	3.1	0.15	8.04	3.2	0.16	8.92	3.4	0.18	10.15	3.5	0.19	10.85	3.7	0.21	12.17
150	3.6	0.20	10.48	3.7	0.22	11.62	4.0	0.24	13.23	4.1	0.26	14.14	4.3	0.28	15.86
170	4.1	0.26	13.22	4.2	0.28	14.65	4.5	0.31	16.68	4.6	0.33	17.83	4.8	0.36	20.00
190	4.6	0.32	16.24	4.7	0.35	18.00	5.0	0.39	20.49	5.1	0.41	21.91	5.4	0.45	24.57
210	5.0	0.40	19.55	5.2	0.43	21.67	5.5	0.48	24.66	5.7	0.51	26.37	6.0	0.56	29.58
230	5.5	0.47	23.13	5.7	0.52	25.65	6.1	0.57	29.19	6.2	0.61	31.21	6.5	0.67	35.00
250	6.0	0.56	27.00	6.2	0.61	29.93	6.6	0.68	34.06	6.8	0.72	36.42	7.1	0.79	40.85
290	6.9	0.75	35.54	7.2	0.82	39.40	7.6	0.91	44.84	7.9	0.96	47.94	8.2	1.06	53.77
330	7.9	0.98	45.14	8.2	1.06	50.05	8.7	1.18	56.96	8.9	1.25	60.91	9.4	1.37	68.30
370	8.9	1.23	55.80	9.2	1.34	61.86	9.8	1.49	70.40	10.0	1.57	75.28	10.5	1.73	84.42
410	9.8	1.51	67.48	10.2	1.64	74.81	10.8	1.82	85.14	11.1	1.93	91.04	11.6	2.12	102.10
450	10.8	1.82	80.18	11.2	1.98	88.89	11.9	2.20	101.16	12.2	2.32	108.17	12.8	2.55	121.31
500	12.0	2.24	97.45	12.5	2.44	108.04	13.2	2.71	122.95	13.5	2.87	131.48	14.2	3.15	147.45
600	14.4	3.23	136.59	15.0	3.51	151.43	15.8	3.91	172.33	16.3	4.13	184.28	17.0	4.54	206.67
700	16.8	4.39	181.72	17.5	4.78	201.47	18.4	5.32	229.27	19.0	5.62	245.16	19.9	6.17	274.95
800	19.2	5.74	232.70	20.0	6.25	257.99	21.1	6.95	293.59	21.7	7.34	313.94	22.7	8.06	352.08

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

4 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 11 I.D.= 3.633			DR 9 I.D.= 3.440			DR 7.3 I.D.= 3.194			DR 6.3 I.D.= 2.986		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
10	0.3	0.00	0.13	0.3	0.00	0.17	0.4	0.00	0.24	0.5	0.00	0.33
20	0.6	0.01	0.47	0.7	0.01	0.61	0.8	0.01	0.87	0.9	0.01	1.21
30	0.9	0.01	0.99	1.0	0.02	1.29	1.2	0.02	1.85	1.4	0.03	2.55
40	1.2	0.02	1.69	1.4	0.03	2.20	1.6	0.04	3.15	1.8	0.05	4.35
50	1.5	0.04	2.56	1.7	0.05	3.32	2.0	0.06	4.76	2.3	0.08	6.58
70	2.2	0.07	4.76	2.4	0.09	6.20	2.8	0.12	8.87	3.2	0.16	12.26
90	2.8	0.12	7.59	3.1	0.15	9.87	3.6	0.20	14.13	4.1	0.26	19.53
110	3.4	0.18	11.00	3.8	0.22	14.31	4.4	0.30	20.49	5.0	0.39	28.32
130	4.0	0.25	14.99	4.5	0.31	19.50	5.2	0.42	27.92	5.9	0.55	38.59
150	4.6	0.34	19.54	5.2	0.42	25.42	6.0	0.56	36.39	6.8	0.73	50.29
170	5.3	0.43	24.64	5.9	0.54	32.05	6.8	0.72	45.89	7.8	0.94	63.41
190	5.9	0.54	30.28	6.5	0.67	39.38	7.6	0.90	56.38	8.7	1.17	77.92
210	6.5	0.66	36.44	7.2	0.82	47.40	8.4	1.10	67.86	9.6	1.43	93.79
230	7.1	0.79	43.13	7.9	0.98	56.10	9.2	1.32	80.32	10.5	1.72	111.00
250	7.7	0.93	50.33	8.6	1.16	65.46	10.0	1.56	93.73	11.4	2.03	129.53
290	9.0	1.26	66.25	10.0	1.56	86.17	11.6	2.10	123.38	13.2	2.73	170.50
330	10.2	1.63	84.16	11.4	2.02	109.47	13.2	2.71	156.73	15.1	3.54	216.60
370	11.4	2.05	104.02	12.8	2.54	135.30	14.8	3.41	193.72	16.9	4.45	267.72
410	12.7	2.51	125.80	14.1	3.12	163.63	16.4	4.19	234.28	18.7	5.47	323.77
450	13.9	3.03	149.47	15.5	3.76	194.42	18.0	5.05	278.36	20.5	6.58	384.68
500	15.5	3.74	181.67	17.2	4.64	236.31	20.0	6.23	338.34	22.8	8.13	467.57
600	18.6	5.38	254.64	20.7	6.68	331.22	24.0	8.97	474.22	27.4	11.70	655.36

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

5 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 26 I.D.= 5.109			DR 21 I.D.= 5.001			DR 17 I.D.= 4.870			DR 15.5 I.D.= 4.802			DR 13.5 I.D.= 4.690		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
10	0.2	0.00	0.02	0.2	0.00	0.03	0.2	0.00	0.03	0.2	0.00	0.03	0.2	0.00	0.04
20	0.3	0.00	0.09	0.3	0.00	0.10	0.3	0.00	0.11	0.4	0.00	0.12	0.4	0.00	0.14
30	0.5	0.00	0.19	0.5	0.00	0.21	0.5	0.00	0.24	0.5	0.00	0.26	0.6	0.00	0.29
40	0.6	0.01	0.32	0.7	0.01	0.36	0.7	0.01	0.41	0.7	0.01	0.44	0.7	0.01	0.49
50	0.8	0.01	0.49	0.8	0.01	0.54	0.9	0.01	0.62	0.9	0.01	0.66	0.9	0.01	0.74
70	1.1	0.02	0.91	1.1	0.02	1.01	1.2	0.02	1.15	1.2	0.02	1.23	1.3	0.03	1.38
90	1.4	0.03	1.45	1.5	0.03	1.61	1.6	0.04	1.83	1.6	0.04	1.96	1.7	0.04	2.19
110	1.7	0.05	2.10	1.8	0.05	2.33	1.9	0.06	2.65	2.0	0.06	2.84	2.0	0.07	3.18
130	2.0	0.06	2.87	2.1	0.07	3.18	2.2	0.08	3.61	2.3	0.08	3.87	2.4	0.09	4.33
150	2.4	0.09	3.73	2.5	0.09	4.14	2.6	0.10	4.71	2.7	0.11	5.04	2.8	0.12	5.65
170	2.7	0.11	4.71	2.8	0.12	5.22	2.9	0.13	5.94	3.0	0.14	6.35	3.2	0.16	7.12
190	3.0	0.14	5.79	3.1	0.15	6.41	3.3	0.17	7.30	3.4	0.18	7.81	3.5	0.19	8.75
210	3.3	0.17	6.96	3.4	0.18	7.72	3.6	0.21	8.79	3.7	0.22	9.39	3.9	0.24	10.54
230	3.6	0.20	8.24	3.8	0.22	9.14	4.0	0.25	10.40	4.1	0.26	11.12	4.3	0.29	12.47
250	3.9	0.24	9.62	4.1	0.26	10.66	4.3	0.29	12.13	4.4	0.31	12.98	4.6	0.34	14.55
290	4.5	0.32	12.66	4.7	0.35	14.04	5.0	0.39	15.97	5.1	0.41	17.08	5.4	0.45	19.15
330	5.2	0.42	16.08	5.4	0.46	17.83	5.7	0.51	20.29	5.9	0.54	21.70	6.1	0.59	24.33
370	5.8	0.53	19.88	6.1	0.57	22.04	6.4	0.64	25.08	6.6	0.67	26.82	6.9	0.74	30.07
410	6.4	0.65	24.04	6.7	0.70	26.65	7.1	0.78	30.33	7.3	0.83	32.43	7.6	0.91	36.37
450	7.1	0.78	28.57	7.4	0.85	31.67	7.8	0.94	36.04	8.0	0.99	38.54	8.4	1.09	43.21
500	7.8	0.96	34.72	8.2	1.05	38.49	8.6	1.16	43.80	8.9	1.23	46.84	9.3	1.35	52.53
600	9.4	1.38	48.67	9.8	1.51	53.95	10.4	1.67	61.40	10.6	1.77	65.65	11.2	1.94	73.62
700	11.0	1.88	64.74	11.5	2.05	71.78	12.1	2.28	81.68	12.4	2.41	87.34	13.0	2.65	97.95
800	12.5	2.46	82.91	13.1	2.68	91.91	13.8	2.98	104.59	14.2	3.14	111.84	14.9	3.45	125.42
900	14.1	3.11	103.12	14.7	3.39	114.32	15.5	3.77	130.09	16.0	3.98	139.10	16.7	4.37	155.99
1000	15.7	3.84	125.33	16.4	4.18	138.95	17.3	4.65	158.12	17.7	4.91	169.07	18.6	5.40	189.60
1100	17.2	4.65	149.53	18.0	5.06	165.77	19.0	5.63	188.64	19.5	5.95	201.71	20.4	6.53	226.21
1200	18.8	5.53	175.67	19.6	6.02	194.75	20.7	6.70	221.62	21.3	7.08	236.98	22.3	7.77	265.76
1300	20.4	6.49	203.74	21.3	7.07	225.87	22.4	7.86	257.03	23.1	8.30	274.84	24.2	9.12	308.22

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

5 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 11 I.D.= 4.490			DR 9 I.D.= 4.253			DR 7.3 I.D.= 3.948			DR 6.3 I.D.= 3.691		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
10	0.2	0.00	0.05	0.2	0.00	0.06	0.3	0.00	0.09	0.3	0.00	0.12
20	0.4	0.00	0.17	0.5	0.00	0.22	0.5	0.00	0.31	0.6	0.01	0.43
30	0.6	0.01	0.35	0.7	0.01	0.46	0.8	0.01	0.66	0.9	0.01	0.91
40	0.8	0.01	0.60	0.9	0.01	0.78	1.0	0.02	1.12	1.2	0.02	1.55
50	1.0	0.02	0.91	1.1	0.02	1.18	1.3	0.03	1.69	1.5	0.03	2.34
70	1.4	0.03	1.70	1.6	0.04	2.21	1.8	0.05	3.16	2.1	0.07	4.37
90	1.8	0.05	2.70	2.0	0.06	3.52	2.4	0.09	5.03	2.7	0.11	6.95
110	2.2	0.08	3.92	2.5	0.10	5.10	2.9	0.13	7.30	3.3	0.17	10.08
130	2.6	0.11	5.34	2.9	0.13	6.95	3.4	0.18	9.94	3.9	0.24	13.74
150	3.0	0.14	6.96	3.4	0.18	9.05	3.9	0.24	12.96	4.5	0.31	17.91
170	3.4	0.19	8.78	3.8	0.23	11.41	4.4	0.31	16.34	5.1	0.40	22.58
190	3.8	0.23	10.78	4.3	0.29	14.03	5.0	0.39	20.08	5.7	0.50	27.74
210	4.3	0.28	12.98	4.7	0.35	16.88	5.5	0.47	24.17	6.3	0.61	33.39
230	4.7	0.34	15.36	5.2	0.42	19.98	6.0	0.56	28.60	6.9	0.74	39.52
250	5.1	0.40	17.93	5.6	0.50	23.32	6.5	0.67	33.38	7.5	0.87	46.12
290	5.9	0.54	23.60	6.5	0.67	30.69	7.6	0.90	43.94	8.7	1.17	60.71
330	6.7	0.70	29.98	7.4	0.87	38.99	8.6	1.16	55.81	9.9	1.52	77.12
370	7.5	0.88	37.05	8.3	1.09	48.19	9.7	1.46	68.98	11.0	1.91	95.32
410	8.3	1.08	44.81	9.2	1.34	58.28	10.7	1.79	83.43	12.2	2.34	115.28
450	9.1	1.30	53.24	10.2	1.61	69.24	11.8	2.16	99.13	13.4	2.82	136.97
500	10.1	1.60	64.71	11.3	1.99	84.16	13.1	2.67	120.48	14.9	3.48	166.48
600	12.2	2.31	90.70	13.5	2.86	117.97	15.7	3.84	168.87	17.9	5.01	233.34
700	14.2	3.14	120.67	15.8	3.90	156.94	18.3	5.23	224.67	20.9	6.82	310.43
800	16.2	4.10	154.53	18.0	5.09	200.97	20.9	6.83	287.70	23.9	8.91	397.52
900	18.2	5.19	192.19	20.3	6.44	249.96	23.5	8.65	357.82	26.9	11.28	494.41
1000	20.3	6.41	233.60	22.6	7.95	303.81	26.1	10.67	434.91	29.8	13.92	600.94

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

6 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 32.5 I.D.= 6.193			DR 26 I.D.= 6.084			DR 21 I.D.= 5.957			DR 17 I.D.= 5.798			DR 15.5 I.D.= 5.720		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
20	0.2	0.00	0.03	0.2	0.00	0.04	0.2	0.00	0.04	0.2	0.00	0.05	0.2	0.00	0.05
40	0.4	0.00	0.13	0.4	0.00	0.14	0.5	0.00	0.15	0.5	0.00	0.17	0.5	0.00	0.19
60	0.6	0.01	0.27	0.7	0.01	0.29	0.7	0.01	0.32	0.7	0.01	0.37	0.7	0.01	0.39
80	0.9	0.01	0.46	0.9	0.01	0.50	0.9	0.01	0.55	1.0	0.01	0.63	1.0	0.02	0.67
100	1.1	0.02	0.69	1.1	0.02	0.75	1.2	0.02	0.83	1.2	0.02	0.95	1.2	0.02	1.01
140	1.5	0.03	1.28	1.5	0.04	1.40	1.6	0.04	1.55	1.7	0.05	1.76	1.7	0.05	1.89
180	1.9	0.06	2.05	2.0	0.06	2.23	2.1	0.07	2.47	2.2	0.07	2.81	2.2	0.08	3.00
220	2.3	0.09	2.97	2.4	0.09	3.23	2.5	0.10	3.58	2.7	0.11	4.07	2.7	0.12	4.36
260	2.8	0.12	4.04	2.9	0.13	4.40	3.0	0.14	4.88	3.2	0.16	5.55	3.2	0.16	5.93
300	3.2	0.16	5.27	3.3	0.17	5.73	3.5	0.19	6.36	3.6	0.21	7.23	3.7	0.22	7.74
340	3.6	0.21	6.64	3.8	0.22	7.23	3.9	0.24	8.02	4.1	0.27	9.12	4.2	0.28	9.75
380	4.1	0.26	8.16	4.2	0.27	8.88	4.4	0.30	9.85	4.6	0.33	11.21	4.7	0.35	11.98
420	4.5	0.31	9.82	4.6	0.34	10.69	4.8	0.37	11.86	5.1	0.41	13.49	5.2	0.43	14.42
460	4.9	0.38	11.62	5.1	0.40	12.66	5.3	0.44	14.03	5.6	0.49	15.97	5.7	0.52	17.07
500	5.3	0.44	13.57	5.5	0.48	14.77	5.8	0.52	16.37	6.1	0.58	18.63	6.2	0.61	19.92
600	6.4	0.64	19.01	6.6	0.69	20.70	6.9	0.75	22.95	7.3	0.83	26.11	7.5	0.88	27.92
700	7.5	0.87	25.30	7.7	0.93	27.54	8.1	1.02	30.53	8.5	1.13	34.74	8.7	1.19	37.15
800	8.5	1.14	32.39	8.8	1.22	35.27	9.2	1.33	39.10	9.7	1.47	44.49	10.0	1.56	47.57
900	9.6	1.44	40.29	9.9	1.54	43.86	10.4	1.68	48.63	10.9	1.87	55.33	11.2	1.97	59.17
1000	10.7	1.78	48.97	11.0	1.90	53.31	11.5	2.07	59.10	12.1	2.30	67.25	12.5	2.43	71.91
1100	11.7	2.15	58.42	12.1	2.30	63.60	12.7	2.51	70.51	13.4	2.79	80.24	13.7	2.95	85.80
1200	12.8	2.56	68.64	13.2	2.74	74.72	13.8	2.98	82.84	14.6	3.32	94.27	15.0	3.51	100.80
1300	13.9	3.00	79.61	14.4	3.22	86.66	15.0	3.50	96.08	15.8	3.89	109.33	16.2	4.11	116.90
1400	14.9	3.48	91.32	15.5	3.73	99.41	16.1	4.06	110.21	17.0	4.52	125.41	17.5	4.77	134.10
1500	16.0	4.00	103.76	16.6	4.28	112.96	17.3	4.66	125.23	18.2	5.19	142.50	18.7	5.48	152.37
1600	17.1	4.55	116.93	17.7	4.87	127.30	18.4	5.31	141.13	19.4	5.90	160.59	20.0	6.23	171.72
1700	18.1	5.13	130.83	18.8	5.50	142.43	19.6	5.99	157.90	20.6	6.66	179.68	21.2	7.04	192.12
1800	19.2	5.75	145.44	19.9	6.17	158.33	20.7	6.71	175.53	21.9	7.47	199.74	22.5	7.89	213.57
1900	20.3	6.41	160.75	21.0	6.87	175.01	21.9	7.48	194.01	23.1	8.32	220.77	23.7	8.79	236.07

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

6 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 13.5 I.D.= 5.584			DR 11 I.D.= 5.349			DR 9 I.D.= 5.065			DR 7.3 I.D.= 4.700			DR 6.3 I.D.= 4.395		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
20	0.3	0.00	0.06	0.3	0.00	0.07	0.3	0.00	0.09	0.4	0.00	0.13	0.4	0.00	0.18
40	0.5	0.00	0.21	0.6	0.01	0.26	0.6	0.01	0.33	0.7	0.01	0.48	0.8	0.01	0.66
60	0.8	0.01	0.44	0.9	0.01	0.54	1.0	0.01	0.71	1.1	0.02	1.01	1.3	0.02	1.40
80	1.0	0.02	0.75	1.1	0.02	0.92	1.3	0.03	1.20	1.5	0.03	1.72	1.7	0.04	2.38
100	1.3	0.03	1.13	1.4	0.03	1.40	1.6	0.04	1.82	1.8	0.05	2.60	2.1	0.07	3.59
140	1.8	0.05	2.11	2.0	0.06	2.61	2.2	0.08	3.39	2.6	0.10	4.85	2.9	0.14	6.70
180	2.4	0.09	3.37	2.6	0.10	4.15	2.9	0.13	5.40	3.3	0.17	7.72	3.8	0.22	10.67
220	2.9	0.13	4.88	3.1	0.15	6.02	3.5	0.19	7.83	4.0	0.26	11.20	4.6	0.33	15.47
260	3.4	0.18	6.66	3.7	0.21	8.20	4.1	0.27	10.66	4.8	0.36	15.26	5.5	0.47	21.09
300	3.9	0.24	8.67	4.3	0.29	10.69	4.8	0.35	13.90	5.5	0.48	19.89	6.3	0.62	27.48
340	4.4	0.31	10.94	4.8	0.37	13.47	5.4	0.46	17.52	6.3	0.61	25.08	7.1	0.80	34.65
380	5.0	0.39	13.44	5.4	0.46	16.56	6.0	0.57	21.53	7.0	0.76	30.82	8.0	1.00	42.58
420	5.5	0.47	16.18	6.0	0.56	19.93	6.7	0.69	25.92	7.7	0.93	37.09	8.8	1.22	51.25
460	6.0	0.57	19.14	6.6	0.67	23.58	7.3	0.83	30.67	8.5	1.12	43.90	9.7	1.46	60.65
500	6.5	0.67	22.34	7.1	0.79	27.52	7.9	0.98	35.79	9.2	1.32	51.23	10.5	1.72	70.78
600	7.9	0.96	31.31	8.6	1.14	38.58	9.5	1.42	50.17	11.0	1.90	71.81	12.6	2.48	99.21
700	9.2	1.31	41.66	10.0	1.56	51.32	11.1	1.93	66.74	12.9	2.59	95.53	14.7	3.38	131.99
800	10.5	1.71	53.35	11.4	2.03	65.72	12.7	2.52	85.47	14.7	3.38	122.33	16.8	4.41	169.02
900	11.8	2.17	66.35	12.8	2.57	81.74	14.3	3.19	106.30	16.6	4.28	152.15	18.9	5.59	210.21
1000	13.1	2.68	80.64	14.3	3.17	99.35	15.9	3.94	129.20	18.4	5.29	184.93	21.0	6.90	255.50
1100	14.4	3.24	96.21	15.7	3.84	118.53	17.5	4.77	154.14	20.2	6.40	220.63	23.1	8.35	304.82
1200	15.7	3.85	113.03	17.1	4.57	139.25	19.1	5.67	181.09	22.1	7.62	259.21	25.2	9.93	358.12
1300	17.0	4.52	131.09	18.5	5.37	161.50	20.6	6.66	210.03	23.9	8.94	300.63	27.3	11.66	415.34
1400	18.3	5.24	150.38	20.0	6.22	185.26	22.2	7.72	240.92	25.8	10.37	344.85	29.4	13.52	476.44
1500	19.6	6.02	170.87	21.4	7.14	210.51	23.8	8.86	273.76	27.6	11.90	391.85	31.5	15.52	541.37

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

7 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 32.5 I.D.= 6.661			DR 26 I.D.= 6.544			DR 21 I.D.= 6.406			DR 17 I.D.= 6.237			DR 15.5 I.D.= 6.150		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
20	0.2	0.00	0.02	0.2	0.00	0.03	0.2	0.00	0.03	0.2	0.00	0.03	0.2	0.00	0.04
40	0.4	0.00	0.09	0.4	0.00	0.10	0.4	0.00	0.11	0.4	0.00	0.12	0.4	0.00	0.13
60	0.6	0.00	0.19	0.6	0.01	0.20	0.6	0.01	0.23	0.6	0.01	0.26	0.6	0.01	0.27
80	0.7	0.01	0.32	0.8	0.01	0.35	0.8	0.01	0.38	0.8	0.01	0.44	0.9	0.01	0.47
100	0.9	0.01	0.48	1.0	0.01	0.52	1.0	0.02	0.58	1.0	0.02	0.66	1.1	0.02	0.71
140	1.3	0.03	0.90	1.3	0.03	0.98	1.4	0.03	1.08	1.5	0.03	1.23	1.5	0.04	1.32
180	1.7	0.04	1.43	1.7	0.05	1.56	1.8	0.05	1.73	1.9	0.06	1.96	1.9	0.06	2.10
220	2.0	0.06	2.07	2.1	0.07	2.26	2.2	0.07	2.50	2.3	0.08	2.85	2.4	0.09	3.04
260	2.4	0.09	2.82	2.5	0.10	3.07	2.6	0.10	3.41	2.7	0.12	3.88	2.8	0.12	4.15
300	2.8	0.12	3.68	2.9	0.13	4.01	3.0	0.14	4.44	3.1	0.15	5.06	3.2	0.16	5.41
340	3.1	0.15	4.64	3.2	0.16	5.05	3.4	0.18	5.60	3.6	0.20	6.37	3.7	0.21	6.82
380	3.5	0.19	5.70	3.6	0.20	6.21	3.8	0.22	6.88	4.0	0.25	7.83	4.1	0.26	8.38
420	3.9	0.23	6.87	4.0	0.25	7.47	4.2	0.27	8.29	4.4	0.30	9.43	4.5	0.32	10.08
460	4.2	0.28	8.12	4.4	0.30	8.85	4.6	0.33	9.81	4.8	0.36	11.16	5.0	0.38	11.93
500	4.6	0.33	9.48	4.8	0.35	10.32	5.0	0.39	11.44	5.2	0.43	13.02	5.4	0.45	13.92
600	5.5	0.48	13.29	5.7	0.51	14.47	6.0	0.56	16.04	6.3	0.62	18.25	6.5	0.65	19.52
700	6.4	0.65	17.68	6.7	0.70	19.25	7.0	0.76	21.34	7.3	0.84	24.28	7.5	0.89	25.96
800	7.4	0.85	22.64	7.6	0.91	24.65	8.0	0.99	27.32	8.4	1.10	31.09	8.6	1.16	33.25
900	8.3	1.07	28.16	8.6	1.15	30.66	8.9	1.25	33.98	9.4	1.39	38.67	9.7	1.47	41.35
1000	9.2	1.32	34.23	9.5	1.42	37.26	9.9	1.54	41.31	10.5	1.72	47.00	10.8	1.81	50.26
1100	10.1	1.60	40.83	10.5	1.72	44.45	10.9	1.87	49.28	11.5	2.08	56.08	11.9	2.20	59.96
1200	11.0	1.91	47.97	11.4	2.04	52.23	11.9	2.22	57.90	12.6	2.47	65.88	12.9	2.61	70.44
1300	12.0	2.24	55.64	12.4	2.40	60.57	12.9	2.61	67.15	13.6	2.90	76.41	14.0	3.07	81.70
1400	12.9	2.59	63.82	13.3	2.78	69.48	13.9	3.03	77.03	14.7	3.37	87.65	15.1	3.56	93.72
1500	13.8	2.98	72.52	14.3	3.19	78.95	14.9	3.47	87.52	15.7	3.86	99.59	16.2	4.08	106.49
1600	14.7	3.39	81.73	15.2	3.63	88.97	15.9	3.95	98.63	16.8	4.40	112.24	17.2	4.64	120.01
1700	15.6	3.82	91.44	16.2	4.10	99.54	16.9	4.46	110.35	17.8	4.96	125.57	18.3	5.24	134.27
1800	16.6	4.29	101.65	17.2	4.60	110.66	17.9	5.00	122.68	18.9	5.56	139.59	19.4	5.88	149.26
1900	17.5	4.78	112.35	18.1	5.12	122.31	18.9	5.57	135.60	19.9	6.20	154.29	20.5	6.55	164.98
2000	18.4	5.29	123.55	19.1	5.68	134.50	19.9	6.18	149.11	21.0	6.87	169.67	21.6	7.26	181.42

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

7 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 13.5 I.D.= 6.006			DR 11 I.D.= 5.751			DR 9 I.D.= 5.446			DR 7.3 I.D.= 5.056			DR 6.3 I.D.= 4.727		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
20	0.2	0.00	0.04	0.2	0.00	0.05	0.3	0.00	0.06	0.3	0.00	0.09	0.4	0.00	0.13
40	0.5	0.00	0.15	0.5	0.00	0.18	0.5	0.00	0.23	0.6	0.01	0.33	0.7	0.01	0.46
60	0.7	0.01	0.31	0.7	0.01	0.38	0.8	0.01	0.49	1.0	0.01	0.71	1.1	0.02	0.97
80	0.9	0.01	0.52	1.0	0.02	0.65	1.1	0.02	0.84	1.3	0.03	1.20	1.5	0.03	1.66
100	1.1	0.02	0.79	1.2	0.02	0.98	1.4	0.03	1.27	1.6	0.04	1.82	1.8	0.05	2.51
140	1.6	0.04	1.48	1.7	0.05	1.82	1.9	0.06	2.37	2.2	0.08	3.39	2.5	0.10	4.68
180	2.0	0.06	2.35	2.2	0.08	2.90	2.5	0.10	3.77	2.9	0.13	5.40	3.3	0.17	7.46
220	2.5	0.10	3.41	2.7	0.11	4.21	3.0	0.14	5.47	3.5	0.19	7.83	4.0	0.25	10.81
260	2.9	0.13	4.65	3.2	0.16	5.73	3.6	0.20	7.45	4.1	0.27	10.67	4.7	0.35	14.73
300	3.4	0.18	6.06	3.7	0.21	7.47	4.1	0.26	9.71	4.8	0.35	13.90	5.4	0.46	19.21
340	3.8	0.23	7.64	4.2	0.27	9.42	4.7	0.34	12.25	5.4	0.46	17.53	6.2	0.59	24.21
380	4.3	0.29	9.39	4.7	0.34	11.57	5.2	0.42	15.05	6.0	0.57	21.54	6.9	0.74	29.75
420	4.7	0.35	11.30	5.2	0.42	13.93	5.8	0.52	18.11	6.7	0.70	25.92	7.6	0.91	35.81
460	5.2	0.42	13.38	5.7	0.50	16.48	6.3	0.62	21.43	7.3	0.83	30.68	8.3	1.09	42.38
500	5.6	0.50	15.61	6.2	0.59	19.23	6.9	0.73	25.01	7.9	0.99	35.80	9.1	1.28	49.46
600	6.8	0.72	21.88	7.4	0.85	26.96	8.2	1.06	35.06	9.5	1.42	50.18	10.9	1.85	69.33
700	7.9	0.98	29.11	8.6	1.16	35.87	9.6	1.44	46.64	11.1	1.93	66.76	12.7	2.52	92.23
800	9.0	1.28	37.28	9.8	1.51	45.93	11.0	1.88	59.73	12.7	2.52	85.49	14.5	3.29	118.10
900	10.2	1.61	46.37	11.1	1.92	57.12	12.3	2.38	74.29	14.3	3.19	106.33	16.3	4.16	146.89
1000	11.3	1.99	56.36	12.3	2.37	69.43	13.7	2.94	90.29	15.9	3.94	129.23	18.1	5.14	178.54
1100	12.4	2.41	67.24	13.5	2.86	82.83	15.1	3.55	107.72	17.5	4.77	154.18	19.9	6.22	213.01
1200	13.6	2.87	79.00	14.8	3.41	97.32	16.4	4.23	126.55	19.1	5.67	181.14	21.8	7.40	250.25
1300	14.7	3.37	91.62	16.0	4.00	112.87	17.8	4.96	146.78	20.6	6.66	210.08	23.6	8.68	290.23
1400	15.8	3.91	105.10	17.2	4.64	129.47	19.2	5.75	168.37	22.2	7.72	240.98	25.4	10.07	332.93
1500	16.9	4.48	119.42	18.5	5.32	147.12	20.6	6.60	191.31	23.8	8.87	273.83	27.2	11.56	378.30
1600	18.1	5.10	134.58	19.7	6.06	165.79	21.9	7.51	215.60	25.4	10.09	308.59	29.0	13.15	426.33
1700	19.2	5.76	150.57	20.9	6.84	185.49	23.3	8.48	241.22	27.0	11.39	345.26	30.8	14.85	476.98

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

8 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 32.5 I.D.= 8.063			DR 26 I.D.= 7.921			DR 21 I.D.= 7.754			DR 17 I.D.= 7.550			DR 15.5 I.D.= 7.446		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
30	0.2	0.00	0.02	0.2	0.00	0.02	0.2	0.00	0.02	0.2	0.00	0.03	0.2	0.00	0.03
60	0.4	0.00	0.07	0.4	0.00	0.08	0.4	0.00	0.09	0.4	0.00	0.10	0.4	0.00	0.11
90	0.6	0.01	0.16	0.6	0.01	0.17	0.6	0.01	0.19	0.6	0.01	0.21	0.7	0.01	0.23
120	0.8	0.01	0.27	0.8	0.01	0.29	0.8	0.01	0.32	0.9	0.01	0.37	0.9	0.01	0.39
150	0.9	0.01	0.40	1.0	0.01	0.44	1.0	0.02	0.49	1.1	0.02	0.55	1.1	0.02	0.59
210	1.3	0.03	0.75	1.4	0.03	0.82	1.4	0.03	0.91	1.5	0.04	1.03	1.5	0.04	1.10
270	1.7	0.05	1.20	1.8	0.05	1.30	1.8	0.05	1.44	1.9	0.06	1.64	2.0	0.06	1.76
330	2.1	0.07	1.74	2.1	0.07	1.89	2.2	0.08	2.10	2.4	0.09	2.38	2.4	0.09	2.55
390	2.5	0.09	2.37	2.5	0.10	2.58	2.6	0.11	2.86	2.8	0.12	3.25	2.9	0.13	3.47
450	2.8	0.13	3.08	2.9	0.13	3.36	3.1	0.15	3.72	3.2	0.16	4.23	3.3	0.17	4.53
500	3.1	0.15	3.75	3.3	0.17	4.08	3.4	0.18	4.52	3.6	0.20	5.15	3.7	0.21	5.50
600	3.8	0.22	5.25	3.9	0.24	5.72	4.1	0.26	6.34	4.3	0.29	7.21	4.4	0.30	7.71
700	4.4	0.30	6.99	4.6	0.32	7.61	4.8	0.35	8.43	5.0	0.39	9.60	5.2	0.41	10.26
800	5.0	0.40	8.95	5.2	0.42	9.74	5.4	0.46	10.80	5.7	0.51	12.29	5.9	0.54	13.14
900	5.7	0.50	11.13	5.9	0.54	12.12	6.1	0.58	13.43	6.4	0.65	15.29	6.6	0.69	16.34
1000	6.3	0.62	13.53	6.5	0.66	14.73	6.8	0.72	16.33	7.2	0.80	18.58	7.4	0.85	19.87
1100	6.9	0.75	16.14	7.2	0.80	17.57	7.5	0.87	19.48	7.9	0.97	22.17	8.1	1.02	23.70
1200	7.5	0.89	18.96	7.8	0.95	20.64	8.1	1.04	22.89	8.6	1.15	26.04	8.8	1.22	27.84
1300	8.2	1.04	21.99	8.5	1.12	23.94	8.8	1.22	26.54	9.3	1.35	30.20	9.6	1.43	32.29
1400	8.8	1.21	25.23	9.1	1.30	27.46	9.5	1.41	30.45	10.0	1.57	34.64	10.3	1.66	37.04
1600	10.1	1.58	32.31	10.4	1.69	35.17	10.9	1.84	38.99	11.5	2.05	44.36	11.8	2.17	47.44
1800	11.3	2.00	40.18	11.7	2.15	43.74	12.2	2.33	48.49	12.9	2.60	55.18	13.2	2.74	59.00
2000	12.6	2.47	48.84	13.0	2.65	53.17	13.6	2.88	58.94	14.3	3.20	67.06	14.7	3.39	71.71
2200	13.8	2.99	58.26	14.3	3.20	63.43	14.9	3.49	70.32	15.8	3.88	80.01	16.2	4.10	85.55
2400	15.1	3.56	68.45	15.6	3.81	74.52	16.3	4.15	82.61	17.2	4.61	94.00	17.7	4.88	100.51
2600	16.3	4.17	79.39	16.9	4.48	86.43	17.7	4.87	95.81	18.6	5.42	109.02	19.1	5.72	116.57
2800	17.6	4.84	91.07	18.2	5.19	99.14	19.0	5.65	109.90	20.0	6.28	125.06	20.6	6.64	133.72
3000	18.9	5.56	103.48	19.5	5.96	112.65	20.4	6.48	124.88	21.5	7.21	142.10	22.1	7.62	151.94
3200	20.1	6.32	116.62	20.8	6.78	126.95	21.7	7.38	140.74	22.9	8.20	160.14	23.6	8.67	171.23

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

8 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 13.5 I.D.= 7.270			DR 11 I.D.= 6.963			DR 9 I.D.= 6.594			DR 7.3 I.D.= 6.119			DR 6.3 I.D.= 5.723		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
30	0.2	0.00	0.03	0.3	0.00	0.04	0.3	0.00	0.05	0.3	0.00	0.08	0.4	0.00	0.11
60	0.5	0.00	0.12	0.5	0.00	0.15	0.6	0.00	0.19	0.7	0.01	0.28	0.7	0.01	0.39
90	0.7	0.01	0.26	0.8	0.01	0.32	0.8	0.01	0.41	1.0	0.01	0.59	1.1	0.02	0.82
120	0.9	0.01	0.44	1.0	0.02	0.54	1.1	0.02	0.70	1.3	0.03	1.01	1.5	0.03	1.39
150	1.2	0.02	0.66	1.3	0.02	0.82	1.4	0.03	1.06	1.6	0.04	1.52	1.9	0.05	2.10
210	1.6	0.04	1.24	1.8	0.05	1.52	2.0	0.06	1.98	2.3	0.08	2.84	2.6	0.11	3.92
270	2.1	0.07	1.97	2.3	0.08	2.43	2.5	0.10	3.16	2.9	0.13	4.52	3.3	0.17	6.24
330	2.5	0.10	2.86	2.8	0.12	3.52	3.1	0.15	4.58	3.6	0.20	6.55	4.1	0.26	9.05
390	3.0	0.14	3.90	3.3	0.17	4.80	3.7	0.21	6.24	4.2	0.28	8.93	4.8	0.36	12.34
450	3.5	0.19	5.08	3.8	0.22	6.25	4.2	0.28	8.13	4.9	0.37	11.64	5.6	0.49	16.08
500	3.9	0.23	6.17	4.2	0.28	7.60	4.7	0.34	9.89	5.4	0.46	14.15	6.2	0.60	19.54
600	4.6	0.33	8.65	5.0	0.40	10.66	5.6	0.49	13.86	6.5	0.66	19.83	7.4	0.86	27.39
700	5.4	0.46	11.51	5.9	0.54	14.18	6.6	0.67	18.43	7.6	0.90	26.38	8.7	1.17	36.44
800	6.2	0.60	14.74	6.7	0.71	18.15	7.5	0.88	23.60	8.7	1.18	33.78	9.9	1.53	46.67
900	6.9	0.75	18.33	7.6	0.89	22.58	8.4	1.11	29.36	9.8	1.49	42.02	11.1	1.94	58.04
1000	7.7	0.93	22.28	8.4	1.10	27.44	9.4	1.37	35.68	10.8	1.84	51.07	12.4	2.40	70.55
1100	8.5	1.13	26.58	9.2	1.34	32.74	10.3	1.66	42.57	11.9	2.22	60.93	13.6	2.90	84.16
1200	9.3	1.34	31.22	10.1	1.59	38.46	11.2	1.97	50.01	13.0	2.65	71.58	14.9	3.45	98.88
1300	10.0	1.57	36.21	10.9	1.87	44.61	12.2	2.31	58.01	14.1	3.11	83.02	16.1	4.05	114.68
1400	10.8	1.82	41.54	11.8	2.16	51.17	13.1	2.68	66.54	15.2	3.60	95.23	17.3	4.70	131.55
1600	12.3	2.38	53.19	13.4	2.83	65.53	15.0	3.51	85.21	17.4	4.71	121.94	19.8	6.14	168.46
1800	13.9	3.01	66.16	15.1	3.58	81.50	16.9	4.44	105.97	19.5	5.96	151.67	22.3	7.77	209.51
2000	15.4	3.72	80.41	16.8	4.41	99.06	18.7	5.48	128.81	21.7	7.35	184.34	24.8	9.59	254.65
2200	17.0	4.50	95.93	18.5	5.34	118.18	20.6	6.63	153.67	23.9	8.90	219.93	27.2	11.60	303.81
2400	18.5	5.36	112.71	20.2	6.36	138.84	22.5	7.89	180.54	26.0	10.59	258.38	29.7	13.81	356.93
2600	20.1	6.29	130.72	21.9	7.46	161.02	24.3	9.26	209.39	28.2	12.43	299.67	32.2	16.20	413.97

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

10 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 32.5 I.D.=10.048			DR 26 I.D.= 9.874			DR 21 I.D.= 9.665			DR 17 I.D.= 9.410			DR 15.5 I.D.= 9.279		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
50	0.2	0.00	0.02	0.2	0.00	0.02	0.2	0.00	0.02	0.2	0.00	0.02	0.2	0.00	0.03
100	0.4	0.00	0.07	0.4	0.00	0.07	0.4	0.00	0.08	0.5	0.00	0.09	0.5	0.00	0.10
150	0.6	0.01	0.14	0.6	0.01	0.15	0.7	0.01	0.17	0.7	0.01	0.19	0.7	0.01	0.20
200	0.8	0.01	0.23	0.8	0.01	0.26	0.9	0.01	0.28	0.9	0.01	0.32	0.9	0.01	0.34
250	1.0	0.02	0.35	1.0	0.02	0.39	1.1	0.02	0.43	1.2	0.02	0.49	1.2	0.02	0.52
350	1.4	0.03	0.66	1.5	0.03	0.72	1.5	0.04	0.80	1.6	0.04	0.91	1.7	0.04	0.97
450	1.8	0.05	1.05	1.9	0.06	1.15	2.0	0.06	1.27	2.1	0.07	1.45	2.1	0.07	1.55
600	2.4	0.09	1.80	2.5	0.10	1.95	2.6	0.11	2.17	2.8	0.12	2.47	2.8	0.13	2.64
700	2.8	0.13	2.39	2.9	0.13	2.60	3.1	0.15	2.88	3.2	0.16	3.28	3.3	0.17	3.51
800	3.2	0.16	3.06	3.4	0.18	3.33	3.5	0.19	3.69	3.7	0.21	4.20	3.8	0.22	4.49
900	3.6	0.21	3.80	3.8	0.22	4.14	3.9	0.24	4.59	4.1	0.27	5.22	4.3	0.28	5.59
1000	4.0	0.26	4.62	4.2	0.27	5.03	4.4	0.30	5.58	4.6	0.33	6.35	4.7	0.35	6.79
1100	4.4	0.31	5.52	4.6	0.33	6.01	4.8	0.36	6.66	5.1	0.40	7.57	5.2	0.42	8.10
1200	4.9	0.37	6.48	5.0	0.39	7.06	5.2	0.43	7.82	5.5	0.48	8.90	5.7	0.50	9.52
1300	5.3	0.43	7.52	5.4	0.46	8.18	5.7	0.50	9.07	6.0	0.56	10.32	6.2	0.59	11.04
1500	6.1	0.58	9.80	6.3	0.62	10.67	6.6	0.67	11.82	6.9	0.75	13.45	7.1	0.79	14.38
1700	6.9	0.74	12.35	7.1	0.79	13.45	7.4	0.86	14.91	7.8	0.96	16.96	8.1	1.01	18.14
1900	7.7	0.92	15.18	8.0	0.99	16.52	8.3	1.08	18.32	8.8	1.20	20.84	9.0	1.27	22.28
2100	8.5	1.13	18.27	8.8	1.21	19.89	9.2	1.32	22.05	9.7	1.46	25.09	9.9	1.55	26.82
2300	9.3	1.35	21.62	9.6	1.45	23.54	10.1	1.58	26.09	10.6	1.75	29.69	10.9	1.85	31.74
2600	10.5	1.73	27.13	10.9	1.85	29.54	11.4	2.02	32.74	12.0	2.24	37.26	12.3	2.37	39.84
2900	11.7	2.15	33.21	12.1	2.31	36.16	12.7	2.51	40.08	13.4	2.79	45.61	13.7	2.95	48.76
3200	12.9	2.62	39.85	13.4	2.81	43.39	14.0	3.05	48.10	14.7	3.40	54.73	15.2	3.59	58.52
3500	14.2	3.13	47.05	14.7	3.36	51.22	15.3	3.65	56.78	16.1	4.06	64.61	16.6	4.29	69.08
3800	15.4	3.69	54.79	15.9	3.96	59.64	16.6	4.31	66.12	17.5	4.79	75.23	18.0	5.06	80.44
4100	16.6	4.30	63.07	17.2	4.61	68.66	17.9	5.02	76.11	18.9	5.58	86.60	19.4	5.89	92.60
4400	17.8	4.95	71.88	18.4	5.31	78.25	19.2	5.78	86.74	20.3	6.42	98.70	20.8	6.78	105.53
4700	19.0	5.65	81.22	19.7	6.06	88.42	20.5	6.59	98.01	21.7	7.33	111.52	22.3	7.74	119.25
5000	20.2	6.39	91.08	20.9	6.85	99.15	21.8	7.46	109.91	23.0	8.29	125.06	23.7	8.76	133.72

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

10 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 13.5 I.D.= 9.062			DR 11 I.D.= 8.679			DR 9 I.D.= 8.219			DR 7.3 I.D.= 7.627			DR 6.3 I.D.= 7.133		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
50	0.2	0.00	0.03	0.3	0.00	0.04	0.3	0.00	0.05	0.3	0.00	0.07	0.4	0.00	0.09
100	0.5	0.00	0.11	0.5	0.00	0.13	0.6	0.01	0.17	0.7	0.01	0.25	0.8	0.01	0.34
150	0.7	0.01	0.23	0.8	0.01	0.28	0.9	0.01	0.36	1.0	0.02	0.52	1.2	0.02	0.72
200	1.0	0.02	0.39	1.1	0.02	0.48	1.2	0.02	0.62	1.4	0.03	0.89	1.6	0.04	1.22
250	1.2	0.02	0.58	1.4	0.03	0.72	1.5	0.04	0.94	1.7	0.05	1.34	2.0	0.06	1.85
350	1.7	0.05	1.09	1.9	0.06	1.34	2.1	0.07	1.74	2.4	0.09	2.50	2.8	0.12	3.45
450	2.2	0.08	1.74	2.4	0.09	2.14	2.7	0.11	2.78	3.1	0.15	3.98	3.6	0.20	5.49
600	3.0	0.14	2.96	3.2	0.16	3.64	3.6	0.20	4.73	4.2	0.27	6.77	4.8	0.36	9.36
700	3.5	0.19	3.93	3.8	0.22	4.84	4.2	0.28	6.30	4.9	0.37	9.01	5.6	0.49	12.45
800	4.0	0.25	5.04	4.3	0.29	6.20	4.8	0.36	8.07	5.6	0.49	11.54	6.4	0.63	15.94
900	4.5	0.31	6.26	4.9	0.37	7.71	5.4	0.46	10.03	6.3	0.62	14.36	7.2	0.80	19.83
1000	5.0	0.39	7.61	5.4	0.46	9.38	6.0	0.57	12.19	7.0	0.76	17.45	8.0	0.99	24.10
1100	5.5	0.47	9.08	5.9	0.55	11.19	6.6	0.69	14.55	7.7	0.92	20.82	8.8	1.20	28.75
1200	6.0	0.55	10.67	6.5	0.66	13.14	7.2	0.82	17.09	8.4	1.10	24.46	9.6	1.43	33.78
1300	6.5	0.65	12.37	7.0	0.77	15.24	7.8	0.96	19.82	9.1	1.29	28.36	10.4	1.68	39.18
1500	7.4	0.87	16.13	8.1	1.03	19.87	9.0	1.28	25.83	10.5	1.71	36.97	12.0	2.23	51.07
1700	8.4	1.11	20.34	9.2	1.32	25.05	10.2	1.64	32.57	11.9	2.20	46.61	13.5	2.87	64.39
1900	9.4	1.39	24.99	10.3	1.65	30.78	11.4	2.05	40.02	13.3	2.75	57.28	15.1	3.58	79.11
2100	10.4	1.70	30.08	11.4	2.02	37.05	12.6	2.50	48.17	14.7	3.36	68.94	16.7	4.38	95.22
2300	11.4	2.04	35.60	12.4	2.42	43.85	13.9	3.00	57.01	16.1	4.03	81.59	18.3	5.25	112.70
2600	12.9	2.60	44.67	14.1	3.09	55.02	15.7	3.83	71.55	18.1	5.14	102.39	20.7	6.71	141.42
2900	14.4	3.24	54.68	15.7	3.84	67.36	17.5	4.77	87.58	20.2	6.40	125.33	23.1	8.34	173.12
3200	15.9	3.94	65.62	17.3	4.68	80.83	19.3	5.80	105.10	22.3	7.79	150.40	25.5	10.16	207.74
3500	17.4	4.72	77.46	18.9	5.60	95.42	21.1	6.94	124.07	24.4	9.32	177.54	27.9	12.15	245.24
3800	18.9	5.56	90.20	20.5	6.60	111.11	22.9	8.19	144.48	26.5	10.99	206.75	30.3	14.33	285.58
4100	20.4	6.47	103.83	22.2	7.68	127.90	24.7	9.53	166.31	28.6	12.79	237.99	32.7	16.68	328.74

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

12 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 32.5 I.D.=11.919			DR 26 I.D.=11.711			DR 21 I.D.=11.463			DR 17 I.D.=11.160			DR 15.5 I.D.=11.005		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
70	0.2	0.00	0.01	0.2	0.00	0.02	0.2	0.00	0.02	0.2	0.00	0.02	0.2	0.00	0.02
140	0.4	0.00	0.05	0.4	0.00	0.06	0.4	0.00	0.06	0.5	0.00	0.07	0.5	0.00	0.08
210	0.6	0.01	0.11	0.6	0.01	0.12	0.7	0.01	0.13	0.7	0.01	0.15	0.7	0.01	0.16
280	0.8	0.01	0.19	0.8	0.01	0.21	0.9	0.01	0.23	0.9	0.01	0.26	0.9	0.01	0.28
350	1.0	0.02	0.29	1.0	0.02	0.31	1.1	0.02	0.35	1.1	0.02	0.40	1.2	0.02	0.42
490	1.4	0.03	0.54	1.5	0.03	0.58	1.5	0.04	0.65	1.6	0.04	0.74	1.6	0.04	0.79
600	1.7	0.05	0.78	1.8	0.05	0.85	1.9	0.05	0.94	2.0	0.06	1.07	2.0	0.06	1.15
700	2.0	0.06	1.04	2.1	0.07	1.13	2.2	0.07	1.25	2.3	0.08	1.43	2.4	0.09	1.53
800	2.3	0.08	1.33	2.4	0.09	1.45	2.5	0.10	1.61	2.6	0.11	1.83	2.7	0.11	1.95
900	2.6	0.10	1.66	2.7	0.11	1.80	2.8	0.12	2.00	2.9	0.14	2.27	3.0	0.14	2.43
1000	2.9	0.13	2.01	3.0	0.14	2.19	3.1	0.15	2.43	3.3	0.17	2.76	3.4	0.18	2.96
1100	3.2	0.16	2.40	3.3	0.17	2.61	3.4	0.18	2.90	3.6	0.20	3.30	3.7	0.21	3.53
1200	3.4	0.19	2.82	3.6	0.20	3.07	3.7	0.22	3.40	3.9	0.24	3.87	4.0	0.25	4.14
1300	3.7	0.22	3.27	3.9	0.23	3.56	4.0	0.25	3.95	4.3	0.28	4.49	4.4	0.30	4.80
1400	4.0	0.25	3.75	4.2	0.27	4.09	4.3	0.30	4.53	4.6	0.33	5.15	4.7	0.35	5.51
1700	4.9	0.37	5.38	5.1	0.40	5.85	5.3	0.44	6.49	5.6	0.48	7.38	5.7	0.51	7.90
2000	5.7	0.52	7.27	6.0	0.55	7.91	6.2	0.60	8.77	6.5	0.67	9.98	6.7	0.71	10.67
2300	6.6	0.68	9.41	6.8	0.73	10.25	7.1	0.80	11.36	7.5	0.89	12.92	7.7	0.94	13.82
2600	7.5	0.87	11.81	7.7	0.94	12.86	8.1	1.02	14.25	8.5	1.13	16.22	8.8	1.20	17.34
2900	8.3	1.09	14.46	8.6	1.16	15.74	9.0	1.27	17.45	9.5	1.41	19.85	9.8	1.49	21.23
3300	9.5	1.41	18.37	9.8	1.51	20.00	10.2	1.64	22.17	10.8	1.82	25.22	11.1	1.93	26.97
3700	10.6	1.77	22.70	11.0	1.90	24.71	11.5	2.06	27.40	12.1	2.29	31.17	12.5	2.42	33.33
4100	11.8	2.17	27.46	12.2	2.33	29.89	12.7	2.53	33.13	13.4	2.82	37.70	13.8	2.98	40.31
4500	12.9	2.61	32.62	13.4	2.80	35.51	14.0	3.05	39.37	14.7	3.39	44.79	15.1	3.58	47.89
4900	14.1	3.10	38.19	14.6	3.32	41.58	15.2	3.62	46.09	16.0	4.02	52.44	16.5	4.25	56.07
5300	15.2	3.63	44.17	15.8	3.89	48.08	16.5	4.23	53.30	17.4	4.71	60.65	17.8	4.97	64.84
5700	16.4	4.20	50.54	17.0	4.50	55.02	17.7	4.90	60.99	18.7	5.44	69.39	19.2	5.75	74.20
6100	17.5	4.81	57.30	18.2	5.15	62.38	18.9	5.61	69.15	20.0	6.23	78.68	20.5	6.59	84.13
6500	18.7	5.46	64.45	19.3	5.85	70.17	20.2	6.37	77.78	21.3	7.08	88.50	21.9	7.48	94.63
6900	19.8	6.15	71.99	20.5	6.59	78.37	21.4	7.17	86.88	22.6	7.98	98.85	23.2	8.43	105.69

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

12 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 13.5 I.D.=10.749			DR 11 I.D.=10.293			DR 9 I.D.= 9.746			DR 7.3 I.D.= 9.046			DR 6.3 I.D.= 8.459		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
70	0.2	0.00	0.02	0.3	0.00	0.03	0.3	0.00	0.04	0.3	0.00	0.06	0.4	0.00	0.08
140	0.5	0.00	0.09	0.5	0.00	0.11	0.6	0.01	0.14	0.7	0.01	0.20	0.8	0.01	0.28
210	0.7	0.01	0.18	0.8	0.01	0.23	0.9	0.01	0.29	1.0	0.02	0.42	1.2	0.02	0.58
280	1.0	0.02	0.31	1.1	0.02	0.39	1.2	0.02	0.50	1.4	0.03	0.72	1.6	0.04	0.99
350	1.2	0.02	0.47	1.3	0.03	0.58	1.5	0.04	0.76	1.7	0.05	1.09	2.0	0.06	1.50
490	1.7	0.05	0.88	1.9	0.06	1.09	2.1	0.07	1.42	2.4	0.09	2.03	2.8	0.12	2.80
600	2.1	0.07	1.29	2.3	0.08	1.58	2.6	0.10	2.06	3.0	0.14	2.95	3.4	0.18	4.07
700	2.5	0.10	1.71	2.7	0.11	2.11	3.0	0.14	2.74	3.5	0.19	3.92	4.0	0.25	5.42
800	2.8	0.12	2.19	3.1	0.15	2.70	3.4	0.18	3.51	4.0	0.25	5.02	4.5	0.32	6.94
900	3.2	0.16	2.73	3.5	0.19	3.36	3.9	0.23	4.37	4.5	0.31	6.25	5.1	0.41	8.63
1000	3.5	0.19	3.31	3.8	0.23	4.08	4.3	0.29	5.31	5.0	0.38	7.59	5.7	0.50	10.49
1100	3.9	0.24	3.95	4.2	0.28	4.87	4.7	0.35	6.33	5.5	0.46	9.06	6.2	0.61	12.51
1200	4.2	0.28	4.64	4.6	0.33	5.72	5.1	0.41	7.44	6.0	0.55	10.64	6.8	0.72	14.70
1300	4.6	0.33	5.39	5.0	0.39	6.64	5.6	0.48	8.63	6.4	0.65	12.35	7.4	0.85	17.05
1400	4.9	0.38	6.18	5.4	0.45	7.61	6.0	0.56	9.90	6.9	0.75	14.16	7.9	0.98	19.56
1700	6.0	0.56	8.85	6.5	0.67	10.90	7.3	0.83	14.18	8.4	1.11	20.29	9.6	1.45	28.02
2000	7.1	0.78	11.96	7.7	0.92	14.73	8.6	1.15	19.16	9.9	1.54	27.41	11.3	2.00	37.86
2300	8.1	1.03	15.50	8.8	1.22	19.09	9.8	1.51	24.82	11.4	2.03	35.51	13.0	2.65	49.05
2600	9.2	1.31	19.44	10.0	1.56	23.95	11.1	1.94	31.14	12.9	2.60	44.56	14.7	3.39	61.55
2900	10.2	1.64	23.80	11.1	1.94	29.32	12.4	2.41	38.12	14.4	3.23	54.55	16.4	4.21	75.35
3300	11.6	2.12	30.24	12.7	2.51	37.25	14.1	3.12	48.43	16.4	4.18	69.30	18.7	5.46	95.72
3700	13.1	2.66	37.37	14.2	3.16	46.04	15.8	3.92	59.86	18.3	5.26	85.65	21.0	6.86	118.30
4100	14.5	3.27	45.20	15.8	3.88	55.67	17.6	4.81	72.39	20.3	6.46	103.59	23.2	8.42	143.08
4500	15.9	3.94	53.70	17.3	4.67	66.15	19.3	5.80	86.01	22.3	7.78	123.08	25.5	10.15	169.99
4900	17.3	4.67	62.88	18.8	5.54	77.45	21.0	6.87	100.70	24.3	9.23	144.10	27.7	12.03	199.03
5300	18.7	5.46	72.71	20.4	6.48	89.56	22.7	8.04	116.45	26.3	10.79	166.64	30.0	14.07	230.16
5700	20.1	6.32	83.20	21.9	7.50	102.48	24.4	9.30	133.25	28.3	12.48	190.68	32.3	16.28	263.36

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

13 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 32.5 I.D.=12.502			DR 26 I.D.=12.285			DR 21 I.D.=12.025			DR 17 I.D.=11.707			DR 15.5 I.D.=11.545		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
80	0.2	0.00	0.01	0.2	0.00	0.02	0.2	0.00	0.02	0.2	0.00	0.02	0.2	0.00	0.02
160	0.4	0.00	0.05	0.4	0.00	0.06	0.5	0.00	0.06	0.5	0.00	0.07	0.5	0.00	0.08
240	0.6	0.01	0.11	0.6	0.01	0.12	0.7	0.01	0.14	0.7	0.01	0.16	0.7	0.01	0.17
320	0.8	0.01	0.19	0.9	0.01	0.21	0.9	0.01	0.23	1.0	0.01	0.26	1.0	0.01	0.28
400	1.0	0.02	0.29	1.1	0.02	0.32	1.1	0.02	0.35	1.2	0.02	0.40	1.2	0.02	0.43
600	1.6	0.04	0.62	1.6	0.04	0.67	1.7	0.04	0.75	1.8	0.05	0.85	1.8	0.05	0.91
800	2.1	0.07	1.05	2.2	0.07	1.15	2.3	0.08	1.27	2.4	0.09	1.45	2.4	0.09	1.55
1000	2.6	0.11	1.59	2.7	0.11	1.73	2.8	0.12	1.92	3.0	0.14	2.18	3.1	0.15	2.34
1200	3.1	0.15	2.23	3.2	0.16	2.43	3.4	0.18	2.69	3.6	0.20	3.06	3.7	0.21	3.27
1400	3.7	0.21	2.97	3.8	0.22	3.23	3.9	0.24	3.58	4.2	0.27	4.07	4.3	0.29	4.36
1600	4.2	0.27	3.80	4.3	0.29	4.14	4.5	0.32	4.59	4.8	0.35	5.22	4.9	0.37	5.58
1800	4.7	0.34	4.73	4.9	0.37	5.14	5.1	0.40	5.70	5.4	0.45	6.49	5.5	0.47	6.94
2000	5.2	0.43	5.74	5.4	0.46	6.25	5.6	0.50	6.93	5.9	0.55	7.89	6.1	0.58	8.43
2200	5.7	0.52	6.85	5.9	0.55	7.46	6.2	0.60	8.27	6.5	0.67	9.41	6.7	0.71	10.06
2400	6.3	0.61	8.05	6.5	0.66	8.76	6.8	0.72	9.72	7.1	0.80	11.05	7.3	0.84	11.82
2700	7.0	0.78	10.01	7.3	0.83	10.90	7.6	0.91	12.08	8.0	1.01	13.75	8.3	1.06	14.70
3000	7.8	0.96	12.17	8.1	1.03	13.25	8.5	1.12	14.69	8.9	1.24	16.71	9.2	1.31	17.87
3300	8.6	1.16	14.52	8.9	1.24	15.81	9.3	1.35	17.52	9.8	1.50	19.94	10.1	1.59	21.32
3600	9.4	1.38	17.06	9.7	1.48	18.57	10.2	1.61	20.59	10.7	1.79	23.42	11.0	1.89	25.04
3900	10.2	1.62	19.78	10.5	1.74	21.54	11.0	1.89	23.88	11.6	2.10	27.17	11.9	2.22	29.05
4300	11.2	1.97	23.71	11.6	2.11	25.81	12.1	2.30	28.61	12.8	2.55	32.55	13.1	2.70	34.80
4700	12.3	2.35	27.95	12.7	2.52	30.43	13.3	2.74	33.73	14.0	3.05	38.38	14.4	3.22	41.04
5100	13.3	2.77	32.51	13.8	2.97	35.40	14.4	3.23	39.24	15.2	3.59	44.65	15.6	3.80	47.74
5500	14.4	3.22	37.39	14.9	3.45	40.71	15.5	3.76	45.13	16.4	4.18	51.35	16.8	4.41	54.90
5900	15.4	3.71	42.59	15.9	3.97	46.36	16.6	4.32	51.39	17.5	4.81	58.48	18.0	5.08	62.52
6400	16.7	4.36	49.51	17.3	4.68	53.90	18.0	5.09	59.75	19.0	5.66	67.98	19.6	5.98	72.69
6900	18.0	5.07	56.91	18.6	5.43	61.95	19.5	5.91	68.68	20.5	6.58	78.14	21.1	6.95	83.55
7400	19.3	5.83	64.78	20.0	6.25	70.52	20.9	6.80	78.18	22.0	7.56	88.95	22.6	7.99	95.11
7900	20.6	6.64	73.12	21.4	7.12	79.60	22.3	7.75	88.24	23.5	8.62	100.40	24.1	9.11	107.35

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

13 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 13.5 I.D.=11.274			DR 11 I.D.=10.797			DR 9 I.D.=10.225			DR 7.3 I.D.= 9.491		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
80	0.3	0.00	0.02	0.3	0.00	0.03	0.3	0.00	0.04	0.4	0.00	0.06
160	0.5	0.00	0.09	0.6	0.00	0.11	0.6	0.01	0.14	0.7	0.01	0.20
240	0.8	0.01	0.19	0.8	0.01	0.23	0.9	0.01	0.30	1.1	0.02	0.43
320	1.0	0.02	0.32	1.1	0.02	0.39	1.2	0.02	0.51	1.4	0.03	0.73
400	1.3	0.03	0.48	1.4	0.03	0.59	1.6	0.04	0.77	1.8	0.05	1.10
600	1.9	0.06	1.02	2.1	0.07	1.25	2.3	0.08	1.63	2.7	0.11	2.33
800	2.6	0.10	1.73	2.8	0.12	2.13	3.1	0.15	2.78	3.6	0.20	3.97
1000	3.2	0.16	2.62	3.5	0.19	3.23	3.9	0.24	4.20	4.5	0.32	6.00
1200	3.8	0.23	3.67	4.2	0.27	4.52	4.7	0.34	5.88	5.4	0.46	8.41
1400	4.5	0.31	4.88	4.9	0.37	6.02	5.4	0.46	7.82	6.3	0.62	11.19
1600	5.1	0.41	6.26	5.6	0.49	7.70	6.2	0.60	10.02	7.2	0.81	14.33
1800	5.8	0.52	7.78	6.3	0.62	9.58	7.0	0.76	12.46	8.1	1.03	17.83
2000	6.4	0.64	9.46	7.0	0.76	11.65	7.8	0.94	15.14	9.0	1.27	21.67
2200	7.0	0.78	11.28	7.7	0.92	13.90	8.6	1.14	18.07	9.9	1.53	25.85
2400	7.7	0.92	13.25	8.4	1.10	16.33	9.3	1.36	21.23	10.8	1.82	30.37
2700	8.6	1.17	16.48	9.4	1.39	20.30	10.5	1.72	26.40	12.2	2.31	37.78
3000	9.6	1.44	20.04	10.5	1.71	24.68	11.7	2.12	32.09	13.5	2.85	45.92
3300	10.6	1.75	23.90	11.5	2.07	29.44	12.8	2.57	38.28	14.9	3.45	54.78
3600	11.5	2.08	28.08	12.6	2.47	34.59	14.0	3.06	44.98	16.2	4.11	64.36
3900	12.5	2.44	32.57	13.6	2.89	40.12	15.2	3.59	52.16	17.6	4.82	74.64
4300	13.8	2.96	39.02	15.0	3.52	48.07	16.7	4.36	62.50	19.4	5.86	89.43
4700	15.1	3.54	46.01	16.4	4.20	56.68	18.3	5.21	73.69	21.2	7.00	105.45
5100	16.3	4.17	53.53	17.8	4.95	65.93	19.8	6.14	85.73	23.0	8.24	122.67
5500	17.6	4.85	61.56	19.2	5.76	75.83	21.4	7.14	98.59	24.8	9.58	141.08
5900	18.9	5.58	70.11	20.6	6.62	86.36	22.9	8.22	112.28	26.6	11.03	160.67
6400	20.5	6.57	81.51	22.3	7.79	100.40	24.9	9.67	130.54	28.8	12.98	186.79

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

14 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 32.5 I.D.=13.086			DR 26 I.D.=12.859			DR 21 I.D.=12.586			DR 17 I.D.=12.253			DR 15.5 I.D.=12.086		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
80	0.2	0.00	0.01	0.2	0.00	0.01	0.2	0.00	0.01	0.2	0.00	0.02	0.2	0.00	0.02
160	0.4	0.00	0.04	0.4	0.00	0.05	0.4	0.00	0.05	0.4	0.00	0.06	0.4	0.00	0.06
240	0.6	0.01	0.09	0.6	0.01	0.10	0.6	0.01	0.11	0.7	0.01	0.12	0.7	0.01	0.13
320	0.8	0.01	0.15	0.8	0.01	0.17	0.8	0.01	0.19	0.9	0.01	0.21	0.9	0.01	0.23
400	1.0	0.01	0.23	1.0	0.02	0.25	1.0	0.02	0.28	1.1	0.02	0.32	1.1	0.02	0.34
600	1.4	0.03	0.50	1.5	0.03	0.54	1.5	0.04	0.60	1.6	0.04	0.68	1.7	0.04	0.73
800	1.9	0.06	0.84	2.0	0.06	0.92	2.1	0.07	1.02	2.2	0.07	1.16	2.2	0.08	1.24
1000	2.4	0.09	1.28	2.5	0.10	1.39	2.6	0.10	1.54	2.7	0.12	1.75	2.8	0.12	1.87
1200	2.9	0.13	1.79	3.0	0.14	1.95	3.1	0.15	2.16	3.3	0.17	2.46	3.3	0.18	2.63
1400	3.3	0.17	2.38	3.5	0.19	2.59	3.6	0.20	2.87	3.8	0.23	3.27	3.9	0.24	3.49
1600	3.8	0.23	3.05	3.9	0.24	3.32	4.1	0.27	3.68	4.3	0.29	4.18	4.5	0.31	4.47
1800	4.3	0.29	3.79	4.4	0.31	4.13	4.6	0.34	4.57	4.9	0.37	5.20	5.0	0.39	5.56
2000	4.8	0.36	4.61	4.9	0.38	5.01	5.2	0.41	5.56	5.4	0.46	6.32	5.6	0.49	6.76
2200	5.2	0.43	5.50	5.4	0.46	5.98	5.7	0.50	6.63	6.0	0.56	7.55	6.1	0.59	8.07
2400	5.7	0.51	6.46	5.9	0.55	7.03	6.2	0.60	7.79	6.5	0.66	8.86	6.7	0.70	9.48
2700	6.4	0.65	8.03	6.7	0.69	8.74	7.0	0.76	9.69	7.3	0.84	11.03	7.5	0.89	11.79
3000	7.2	0.80	9.76	7.4	0.86	10.62	7.7	0.93	11.78	8.1	1.04	13.40	8.4	1.10	14.33
3300	7.9	0.97	11.64	8.1	1.04	12.68	8.5	1.13	14.05	9.0	1.25	15.99	9.2	1.33	17.09
3600	8.6	1.15	13.68	8.9	1.23	14.89	9.3	1.34	16.51	9.8	1.49	18.78	10.0	1.58	20.08
3900	9.3	1.35	15.87	9.6	1.45	17.27	10.0	1.58	19.15	10.6	1.75	21.78	10.9	1.85	23.29
4300	10.3	1.64	19.01	10.6	1.76	20.69	11.1	1.92	22.94	11.7	2.13	26.10	12.0	2.25	27.91
4700	11.2	1.96	22.41	11.6	2.10	24.40	12.1	2.29	27.05	12.8	2.55	30.78	13.1	2.69	32.91
5100	12.2	2.31	26.07	12.6	2.48	28.38	13.1	2.70	31.47	13.8	3.00	35.80	14.2	3.17	38.28
5500	13.1	2.69	29.99	13.6	2.88	32.64	14.2	3.13	36.19	14.9	3.49	41.17	15.4	3.68	44.03
5900	14.1	3.09	34.15	14.6	3.31	37.18	15.2	3.61	41.21	16.0	4.01	46.89	16.5	4.24	50.14
6400	15.3	3.64	39.70	15.8	3.90	43.22	16.5	4.24	47.91	17.4	4.72	54.52	17.9	4.99	58.29
6900	16.5	4.23	45.64	17.0	4.53	49.68	17.8	4.93	55.07	18.7	5.49	62.66	19.3	5.80	67.00
7400	17.6	4.86	51.95	18.3	5.21	56.55	19.1	5.67	62.69	20.1	6.31	71.33	20.7	6.67	76.27
7900	18.8	5.54	58.64	19.5	5.94	63.83	20.3	6.47	70.76	21.5	7.19	80.51	22.1	7.60	86.09
8400	20.0	6.27	65.70	20.7	6.72	71.52	21.6	7.31	79.28	22.8	8.13	90.20	23.4	8.59	96.45

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

14 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 13.5 I.D.=11.802			DR 11 I.D.=11.301			DR 9 I.D.=10.701			DR 7.3 I.D.= 9.934		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
80	0.2	0.00	0.02	0.3	0.00	0.02	0.3	0.00	0.03	0.3	0.00	0.04
160	0.5	0.00	0.07	0.5	0.00	0.09	0.6	0.01	0.11	0.7	0.01	0.16
240	0.7	0.01	0.15	0.8	0.01	0.18	0.9	0.01	0.24	1.0	0.02	0.34
320	0.9	0.01	0.25	1.0	0.02	0.31	1.1	0.02	0.41	1.3	0.03	0.58
400	1.2	0.02	0.38	1.3	0.03	0.47	1.4	0.03	0.62	1.6	0.04	0.88
600	1.8	0.05	0.82	1.9	0.06	1.00	2.1	0.07	1.31	2.5	0.10	1.87
800	2.3	0.09	1.39	2.5	0.10	1.71	2.8	0.13	2.23	3.3	0.17	3.18
1000	2.9	0.13	2.10	3.2	0.16	2.59	3.5	0.20	3.36	4.1	0.26	4.81
1200	3.5	0.19	2.94	3.8	0.23	3.63	4.3	0.28	4.72	4.9	0.38	6.75
1400	4.1	0.26	3.92	4.5	0.31	4.82	5.0	0.39	6.27	5.8	0.52	8.98
1600	4.7	0.34	5.02	5.1	0.41	6.18	5.7	0.50	8.03	6.6	0.68	11.49
1800	5.3	0.43	6.24	5.7	0.51	7.68	6.4	0.64	9.99	7.4	0.86	14.30
2000	5.9	0.53	7.58	6.4	0.63	9.34	7.1	0.79	12.14	8.2	1.06	17.38
2200	6.4	0.65	9.05	7.0	0.77	11.14	7.8	0.95	14.49	9.0	1.28	20.73
2400	7.0	0.77	10.63	7.6	0.91	13.09	8.5	1.13	17.02	9.9	1.52	24.36
2700	7.9	0.97	13.22	8.6	1.16	16.28	9.6	1.44	21.17	11.1	1.93	30.29
3000	8.8	1.20	16.07	9.6	1.43	19.79	10.6	1.77	25.73	12.3	2.38	36.82
3300	9.7	1.46	19.17	10.5	1.73	23.61	11.7	2.14	30.70	13.6	2.88	43.93
3600	10.5	1.73	22.52	11.5	2.06	27.74	12.8	2.55	36.07	14.8	3.42	51.61
3900	11.4	2.03	26.12	12.4	2.41	32.17	13.8	2.99	41.83	16.0	4.02	59.85
4300	12.6	2.47	31.29	13.7	2.93	38.55	15.3	3.64	50.12	17.7	4.89	71.72
4700	13.8	2.95	36.90	15.0	3.51	45.45	16.7	4.35	59.09	19.3	5.84	84.56
5100	14.9	3.48	42.92	16.3	4.13	52.87	18.1	5.12	68.74	21.0	6.87	98.37
5500	16.1	4.05	49.37	17.5	4.80	60.81	19.5	5.96	79.06	22.6	7.99	113.13
5900	17.3	4.66	56.22	18.8	5.52	69.25	20.9	6.85	90.04	24.3	9.20	128.84
6400	18.7	5.48	65.36	20.4	6.50	80.51	22.7	8.06	104.67	26.3	10.82	149.78
6900	20.2	6.37	75.13	22.0	7.56	92.54	24.5	9.37	120.32	28.4	12.58	172.17

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

16 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 32.5 I.D.=14.957			DR 26 I.D.=14.696			DR 21 I.D.=14.385			DR 17 I.D.=14.005			DR 15.5 I.D.=13.812		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
100	0.2	0.00	0.01	0.2	0.00	0.01	0.2	0.00	0.01	0.2	0.00	0.01	0.2	0.00	0.01
200	0.4	0.00	0.03	0.4	0.00	0.04	0.4	0.00	0.04	0.4	0.00	0.05	0.4	0.00	0.05
300	0.5	0.00	0.07	0.6	0.01	0.08	0.6	0.01	0.09	0.6	0.01	0.10	0.6	0.01	0.11
400	0.7	0.01	0.12	0.8	0.01	0.13	0.8	0.01	0.15	0.8	0.01	0.17	0.9	0.01	0.18
500	0.9	0.01	0.18	0.9	0.01	0.20	1.0	0.02	0.22	1.0	0.02	0.25	1.1	0.02	0.27
700	1.3	0.03	0.34	1.3	0.03	0.37	1.4	0.03	0.41	1.5	0.03	0.47	1.5	0.03	0.50
900	1.6	0.04	0.55	1.7	0.05	0.60	1.8	0.05	0.66	1.9	0.05	0.75	1.9	0.06	0.80
1100	2.0	0.06	0.79	2.1	0.07	0.86	2.2	0.07	0.96	2.3	0.08	1.09	2.4	0.09	1.17
1300	2.4	0.09	1.08	2.5	0.09	1.18	2.6	0.10	1.31	2.7	0.11	1.49	2.8	0.12	1.59
1500	2.7	0.12	1.41	2.8	0.13	1.54	3.0	0.14	1.70	3.1	0.15	1.94	3.2	0.16	2.07
1700	3.1	0.15	1.78	3.2	0.16	1.94	3.4	0.18	2.15	3.5	0.20	2.44	3.6	0.21	2.61
1900	3.5	0.19	2.19	3.6	0.20	2.38	3.7	0.22	2.64	3.9	0.24	3.00	4.1	0.26	3.21
2100	3.8	0.23	2.63	4.0	0.25	2.86	4.1	0.27	3.17	4.4	0.30	3.61	4.5	0.31	3.86
2300	4.2	0.28	3.11	4.3	0.30	3.39	4.5	0.32	3.76	4.8	0.36	4.27	4.9	0.38	4.57
2500	4.6	0.33	3.63	4.7	0.35	3.95	4.9	0.38	4.38	5.2	0.42	4.99	5.3	0.45	5.33
2900	5.3	0.44	4.78	5.5	0.47	5.21	5.7	0.51	5.77	6.0	0.57	6.57	6.2	0.60	7.02
3300	6.0	0.57	6.07	6.2	0.61	6.61	6.5	0.66	7.33	6.9	0.74	8.34	7.1	0.78	8.92
3700	6.8	0.71	7.51	7.0	0.76	8.17	7.3	0.83	9.06	7.7	0.92	10.31	7.9	0.98	11.02
4100	7.5	0.87	9.08	7.7	0.94	9.88	8.1	1.02	10.96	8.5	1.14	12.47	8.8	1.20	13.33
4500	8.2	1.05	10.79	8.5	1.13	11.74	8.9	1.23	13.02	9.4	1.37	14.81	9.6	1.44	15.84
5000	9.1	1.30	13.11	9.4	1.40	14.27	9.9	1.52	15.82	10.4	1.69	18.00	10.7	1.78	19.25
5500	10.0	1.57	15.64	10.4	1.69	17.03	10.8	1.84	18.88	11.4	2.04	21.48	11.8	2.16	22.97
6000	11.0	1.87	18.38	11.3	2.01	20.01	11.8	2.19	22.18	12.5	2.43	25.23	12.8	2.57	26.98
6500	11.9	2.20	21.31	12.3	2.36	23.20	12.8	2.57	25.72	13.5	2.85	29.27	13.9	3.01	31.29
7000	12.8	2.55	24.45	13.2	2.73	26.62	13.8	2.98	29.51	14.6	3.31	33.57	15.0	3.50	35.90
7600	13.9	3.01	28.47	14.4	3.22	31.00	15.0	3.51	34.36	15.8	3.90	39.09	16.2	4.12	41.80
8200	15.0	3.50	32.77	15.5	3.75	35.68	16.2	4.08	39.55	17.0	4.54	45.00	17.5	4.80	48.12
8800	16.1	4.03	37.35	16.6	4.32	40.66	17.3	4.70	45.08	18.3	5.23	51.29	18.8	5.52	54.84
9400	17.2	4.60	42.21	17.8	4.93	45.95	18.5	5.37	50.93	19.5	5.97	57.95	20.1	6.30	61.96
10000	18.3	5.20	47.33	18.9	5.58	51.53	19.7	6.07	57.12	20.8	6.75	64.99	21.4	7.13	69.49

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

16 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 13.5 I.D.=13.488			DR 11 I.D.=12.915			DR 9 I.D.=12.231			DR 7.3 I.D.=11.353		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
100	0.2	0.00	0.02	0.2	0.00	0.02	0.3	0.00	0.02	0.3	0.00	0.04
200	0.4	0.00	0.06	0.5	0.00	0.07	0.5	0.00	0.09	0.6	0.01	0.13
300	0.7	0.01	0.12	0.7	0.01	0.15	0.8	0.01	0.19	0.9	0.01	0.27
400	0.9	0.01	0.20	1.0	0.01	0.25	1.1	0.02	0.32	1.3	0.02	0.46
500	1.1	0.02	0.30	1.2	0.02	0.37	1.4	0.03	0.49	1.6	0.04	0.70
700	1.6	0.04	0.57	1.7	0.05	0.70	1.9	0.06	0.91	2.2	0.08	1.30
900	2.0	0.06	0.90	2.2	0.08	1.11	2.4	0.09	1.44	2.8	0.13	2.07
1100	2.5	0.09	1.31	2.7	0.11	1.61	3.0	0.14	2.09	3.5	0.19	3.00
1300	2.9	0.13	1.78	3.2	0.16	2.19	3.5	0.19	2.85	4.1	0.26	4.08
1500	3.4	0.18	2.32	3.7	0.21	2.86	4.1	0.26	3.72	4.7	0.35	5.32
1700	3.8	0.23	2.93	4.1	0.27	3.61	4.6	0.33	4.69	5.4	0.45	6.71
1900	4.3	0.28	3.60	4.6	0.34	4.43	5.2	0.42	5.76	6.0	0.56	8.24
2100	4.7	0.35	4.33	5.1	0.41	5.33	5.7	0.51	6.93	6.6	0.68	9.92
2300	5.2	0.41	5.12	5.6	0.49	6.31	6.2	0.61	8.21	7.2	0.82	11.74
2500	5.6	0.49	5.98	6.1	0.58	7.37	6.8	0.72	9.58	7.9	0.97	13.70
2900	6.5	0.66	7.87	7.1	0.78	9.70	7.9	0.97	12.61	9.1	1.30	18.04
3300	7.4	0.85	10.00	8.1	1.01	12.32	9.0	1.26	16.01	10.4	1.69	22.91
3700	8.3	1.07	12.36	9.0	1.27	15.22	10.1	1.58	19.79	11.6	2.12	28.32
4100	9.2	1.32	14.95	10.0	1.56	18.41	11.1	1.94	23.94	12.9	2.60	34.25
4500	10.1	1.59	17.76	11.0	1.88	21.87	12.2	2.34	28.44	14.2	3.14	40.69
5000	11.2	1.96	21.58	12.2	2.32	26.59	13.6	2.88	34.57	15.7	3.87	49.46
5500	12.3	2.37	25.75	13.4	2.81	31.72	14.9	3.49	41.24	17.3	4.68	59.01
6000	13.4	2.82	30.25	14.6	3.35	37.26	16.3	4.15	48.45	18.9	5.57	69.33
6500	14.6	3.31	35.09	15.9	3.93	43.22	17.7	4.87	56.19	20.5	6.54	80.40
7000	15.7	3.84	40.25	17.1	4.56	49.58	19.0	5.65	64.46	22.0	7.59	92.23
7600	17.0	4.53	46.87	18.5	5.37	57.73	20.7	6.66	75.06	23.9	8.94	107.40
8200	18.4	5.27	53.95	20.0	6.25	66.45	22.3	7.76	86.40	25.8	10.41	123.63
8800	19.7	6.07	61.49	21.5	7.20	75.74	23.9	8.93	98.47	27.7	11.99	140.90

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

18 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 32.5 I.D.=16.826			DR 26 I.D.=16.533			DR 21 I.D.=16.183			DR 17 I.D.=15.755			DR 15.5 I.D.=15.539		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
100	0.1	0.00	0.01	0.1	0.00	0.01	0.2	0.00	0.01	0.2	0.00	0.01	0.2	0.00	0.01
200	0.3	0.00	0.02	0.3	0.00	0.02	0.3	0.00	0.02	0.3	0.00	0.03	0.3	0.00	0.03
300	0.4	0.00	0.04	0.4	0.00	0.04	0.5	0.00	0.05	0.5	0.00	0.06	0.5	0.00	0.06
400	0.6	0.01	0.07	0.6	0.01	0.08	0.6	0.01	0.08	0.7	0.01	0.10	0.7	0.01	0.10
500	0.7	0.01	0.10	0.7	0.01	0.11	0.8	0.01	0.13	0.8	0.01	0.14	0.9	0.01	0.16
700	1.0	0.02	0.20	1.0	0.02	0.21	1.1	0.02	0.24	1.2	0.02	0.27	1.2	0.02	0.29
900	1.3	0.03	0.31	1.3	0.03	0.34	1.4	0.03	0.38	1.5	0.03	0.43	1.5	0.04	0.46
1100	1.6	0.04	0.45	1.6	0.04	0.49	1.7	0.05	0.55	1.8	0.05	0.62	1.9	0.05	0.67
1300	1.9	0.06	0.61	1.9	0.06	0.67	2.0	0.06	0.75	2.1	0.07	0.85	2.2	0.08	0.91
1500	2.2	0.07	0.80	2.2	0.08	0.87	2.3	0.09	0.97	2.5	0.10	1.11	2.6	0.10	1.19
1700	2.5	0.09	1.01	2.5	0.10	1.10	2.7	0.11	1.22	2.8	0.12	1.40	2.9	0.13	1.50
1900	2.7	0.12	1.24	2.8	0.13	1.35	3.0	0.14	1.50	3.1	0.15	1.72	3.2	0.16	1.84
2100	3.0	0.14	1.49	3.1	0.15	1.63	3.3	0.17	1.81	3.5	0.19	2.07	3.6	0.20	2.21
2300	3.3	0.17	1.77	3.4	0.19	1.93	3.6	0.20	2.14	3.8	0.23	2.45	3.9	0.24	2.62
2500	3.6	0.20	2.06	3.7	0.22	2.25	3.9	0.24	2.50	4.1	0.27	2.86	4.3	0.28	3.06
2900	4.2	0.27	2.72	4.3	0.30	2.96	4.5	0.32	3.29	4.8	0.36	3.76	4.9	0.38	4.03
3300	4.8	0.36	3.45	4.9	0.38	3.76	5.2	0.42	4.18	5.5	0.47	4.78	5.6	0.49	5.12
3700	5.4	0.45	4.26	5.5	0.48	4.65	5.8	0.52	5.17	6.1	0.58	5.90	6.3	0.62	6.32
4100	5.9	0.55	5.16	6.1	0.59	5.62	6.4	0.64	6.25	6.8	0.72	7.14	7.0	0.76	7.65
4500	6.5	0.66	6.13	6.7	0.71	6.68	7.0	0.78	7.43	7.4	0.86	8.48	7.7	0.92	9.08
5000	7.2	0.82	7.45	7.5	0.88	8.12	7.8	0.96	9.03	8.3	1.07	10.31	8.5	1.13	11.04
5500	8.0	0.99	8.88	8.2	1.06	9.69	8.6	1.16	10.77	9.1	1.29	12.30	9.4	1.37	13.17
6000	8.7	1.18	10.44	9.0	1.26	11.39	9.4	1.38	12.65	9.9	1.54	14.45	10.2	1.63	15.48
6500	9.4	1.38	12.10	9.7	1.48	13.20	10.2	1.62	14.68	10.7	1.80	16.76	11.1	1.91	17.95
7000	10.1	1.60	13.88	10.5	1.72	15.15	11.0	1.88	16.84	11.6	2.09	19.22	11.9	2.21	20.59
7600	11.0	1.89	16.17	11.4	2.03	17.64	11.9	2.21	19.61	12.6	2.47	22.38	12.9	2.61	23.98
8200	11.9	2.20	18.61	12.3	2.36	20.30	12.8	2.58	22.57	13.6	2.87	25.77	13.9	3.04	27.60
8800	12.7	2.53	21.21	13.2	2.72	23.14	13.8	2.97	25.72	14.5	3.31	29.37	15.0	3.50	31.46
9400	13.6	2.89	23.97	14.1	3.10	26.15	14.7	3.38	29.06	15.5	3.77	33.18	16.0	3.99	35.54
10000	14.5	3.27	26.88	15.0	3.51	29.32	15.7	3.83	32.59	16.5	4.27	37.21	17.0	4.52	39.86

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

18 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 13.5 I.D.=15.174			DR 11 I.D.=14.532			DR 9 I.D.=13.760		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
100	0.2	0.00	0.01	0.2	0.00	0.01	0.2	0.00	0.01
200	0.4	0.00	0.03	0.4	0.00	0.04	0.4	0.00	0.05
300	0.5	0.00	0.07	0.6	0.01	0.08	0.7	0.01	0.11
400	0.7	0.01	0.12	0.8	0.01	0.14	0.9	0.01	0.19
500	0.9	0.01	0.17	1.0	0.01	0.22	1.1	0.02	0.28
700	1.2	0.02	0.33	1.4	0.03	0.40	1.5	0.04	0.53
900	1.6	0.04	0.52	1.8	0.05	0.64	2.0	0.06	0.84
1100	2.0	0.06	0.75	2.1	0.07	0.93	2.4	0.09	1.22
1300	2.3	0.08	1.03	2.5	0.10	1.27	2.8	0.13	1.66
1500	2.7	0.11	1.34	2.9	0.13	1.66	3.3	0.17	2.17
1700	3.0	0.14	1.68	3.3	0.17	2.09	3.7	0.21	2.74
1900	3.4	0.18	2.07	3.7	0.21	2.57	4.1	0.27	3.36
2100	3.7	0.22	2.49	4.1	0.26	3.09	4.6	0.33	4.05
2300	4.1	0.26	2.95	4.5	0.31	3.65	5.0	0.39	4.79
2500	4.5	0.31	3.44	4.9	0.37	4.26	5.4	0.46	5.59
2900	5.2	0.42	4.53	5.7	0.50	5.61	6.3	0.62	7.36
3300	5.9	0.54	5.75	6.4	0.65	7.13	7.2	0.81	9.34
3700	6.6	0.68	7.11	7.2	0.81	8.81	8.1	1.01	11.55
4100	7.3	0.84	8.60	8.0	1.00	10.66	8.9	1.25	13.97
4500	8.0	1.01	10.22	8.8	1.20	12.66	9.8	1.50	16.60
5000	8.9	1.24	12.42	9.7	1.48	15.39	10.9	1.85	20.17
5500	9.8	1.51	14.82	10.7	1.80	18.36	12.0	2.24	24.07
6000	10.7	1.79	17.41	11.7	2.14	21.57	13.1	2.67	28.27
6500	11.6	2.10	20.19	12.7	2.51	25.02	14.2	3.13	32.79
7000	12.5	2.44	23.16	13.6	2.91	28.70	15.2	3.63	37.62
7600	13.6	2.88	26.97	14.8	3.43	33.42	16.6	4.28	43.80
8200	14.6	3.35	31.05	16.0	3.99	38.47	17.9	4.98	50.42
8800	15.7	3.85	35.39	17.2	4.60	43.85	19.2	5.74	57.47
9400	16.8	4.40	39.98	18.3	5.25	49.55	20.5	6.55	64.93
10000	17.8	4.98	44.84	19.5	5.94	55.56	21.8	7.41	72.82

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

20 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 32.5 I.D.=18.696			DR 26 I.D.=18.370			DR 21 I.D.=17.982			DR 17 I.D.=17.507			DR 15.5 I.D.=17.265		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
200	0.2	0.00	0.01	0.2	0.00	0.01	0.3	0.00	0.01	0.3	0.00	0.02	0.3	0.00	0.02
400	0.5	0.00	0.04	0.5	0.00	0.05	0.5	0.00	0.05	0.5	0.00	0.06	0.6	0.00	0.06
600	0.7	0.01	0.09	0.7	0.01	0.10	0.8	0.01	0.11	0.8	0.01	0.12	0.8	0.01	0.13
800	0.9	0.01	0.15	1.0	0.01	0.16	1.0	0.02	0.18	1.1	0.02	0.21	1.1	0.02	0.22
1000	1.2	0.02	0.23	1.2	0.02	0.25	1.3	0.03	0.27	1.3	0.03	0.31	1.4	0.03	0.34
1400	1.6	0.04	0.42	1.7	0.05	0.46	1.8	0.05	0.51	1.9	0.05	0.58	1.9	0.06	0.63
1800	2.1	0.07	0.67	2.2	0.07	0.73	2.3	0.08	0.81	2.4	0.09	0.93	2.5	0.10	1.00
2200	2.6	0.10	0.97	2.7	0.11	1.06	2.8	0.12	1.18	2.9	0.14	1.35	3.0	0.14	1.44
2600	3.0	0.14	1.33	3.2	0.16	1.45	3.3	0.17	1.61	3.5	0.19	1.84	3.6	0.20	1.97
3000	3.5	0.19	1.73	3.6	0.21	1.89	3.8	0.23	2.10	4.0	0.25	2.40	4.1	0.27	2.57
3400	4.0	0.25	2.18	4.1	0.27	2.38	4.3	0.29	2.65	4.6	0.32	3.02	4.7	0.34	3.24
3800	4.5	0.31	2.68	4.6	0.33	2.92	4.8	0.36	3.25	5.1	0.40	3.71	5.2	0.43	3.98
4200	4.9	0.38	3.23	5.1	0.41	3.52	5.3	0.44	3.91	5.6	0.49	4.47	5.8	0.52	4.78
4600	5.4	0.45	3.82	5.6	0.49	4.17	5.8	0.53	4.63	6.2	0.59	5.29	6.3	0.63	5.66
5000	5.9	0.54	4.46	6.1	0.58	4.86	6.3	0.63	5.40	6.7	0.70	6.17	6.9	0.74	6.61
5800	6.8	0.72	5.87	7.0	0.78	6.40	7.4	0.85	7.11	7.8	0.94	8.12	8.0	1.00	8.70
6600	7.7	0.93	7.45	8.0	1.00	8.13	8.4	1.09	9.04	8.8	1.22	10.32	9.1	1.29	11.05
7400	8.7	1.17	9.21	9.0	1.26	10.05	9.4	1.38	11.17	9.9	1.53	12.75	10.2	1.62	13.66
8200	9.6	1.44	11.14	10.0	1.55	12.15	10.4	1.69	13.51	11.0	1.88	15.42	11.3	1.99	16.52
9000	10.5	1.74	13.23	10.9	1.87	14.44	11.4	2.04	16.05	12.1	2.27	18.32	12.4	2.40	19.63
10000	11.7	2.14	16.08	12.1	2.30	17.55	12.7	2.51	19.50	13.4	2.80	22.27	13.8	2.96	23.85
11000	12.9	2.60	19.19	13.4	2.79	20.94	13.9	3.04	23.27	14.7	3.39	26.57	15.2	3.59	28.46
12000	14.1	3.09	22.54	14.6	3.32	24.60	15.2	3.62	27.34	16.1	4.03	31.21	16.5	4.27	33.43
13000	15.2	3.62	26.15	15.8	3.89	28.53	16.5	4.25	31.71	17.4	4.74	36.20	17.9	5.01	38.78
14000	16.4	4.20	29.99	17.0	4.52	32.72	17.8	4.93	36.37	18.7	5.49	41.53	19.3	5.81	44.48
15000	17.6	4.83	34.08	18.2	5.18	37.18	19.0	5.65	41.33	20.1	6.30	47.19	20.7	6.67	50.54
16000	18.7	5.49	38.41	19.4	5.90	41.90	20.3	6.43	46.57	21.4	7.17	53.18	22.0	7.59	56.96
17000	19.9	6.20	42.97	20.6	6.66	46.88	21.6	7.26	52.11	22.8	8.10	59.49	23.4	8.57	63.73

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

20 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 13.5 I.D.=16.860			DR 11 I.D.=16.146			DR 9 I.D.=15.289		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
200	0.3	0.00	0.02	0.3	0.00	0.02	0.4	0.00	0.03
400	0.6	0.01	0.07	0.6	0.01	0.09	0.7	0.01	0.11
600	0.9	0.01	0.15	0.9	0.01	0.18	1.1	0.02	0.24
800	1.2	0.02	0.25	1.3	0.02	0.31	1.4	0.03	0.41
1000	1.4	0.03	0.38	1.6	0.04	0.47	1.8	0.05	0.61
1400	2.0	0.06	0.70	2.2	0.08	0.87	2.5	0.10	1.14
1800	2.6	0.11	1.12	2.8	0.13	1.39	3.2	0.16	1.82
2200	3.2	0.16	1.63	3.5	0.19	2.01	3.9	0.24	2.64
2600	3.8	0.22	2.21	4.1	0.26	2.74	4.6	0.33	3.60
3000	4.3	0.29	2.89	4.7	0.35	3.58	5.3	0.44	4.69
3400	4.9	0.38	3.64	5.4	0.45	4.51	6.0	0.56	5.91
3800	5.5	0.47	4.47	6.0	0.56	5.54	6.7	0.70	7.26
4200	6.1	0.58	5.38	6.6	0.69	6.67	7.4	0.86	8.74
4600	6.6	0.69	6.37	7.3	0.82	7.89	8.1	1.03	10.34
5000	7.2	0.82	7.43	7.9	0.97	9.21	8.8	1.22	12.07
5800	8.4	1.10	9.78	9.2	1.31	12.13	10.2	1.64	15.89
6600	9.5	1.42	12.43	10.4	1.70	15.40	11.6	2.12	20.19
7400	10.7	1.79	15.36	11.7	2.13	19.04	13.1	2.66	24.95
8200	11.9	2.20	18.58	12.9	2.62	23.02	14.5	3.27	30.17
9000	13.0	2.64	22.08	14.2	3.15	27.36	15.9	3.94	35.85
10000	14.5	3.27	26.83	15.8	3.89	33.25	17.6	4.86	43.58
11000	15.9	3.95	32.01	17.4	4.71	39.67	19.4	5.88	51.99
12000	17.3	4.70	37.61	18.9	5.61	46.60	21.2	7.00	61.08
13000	18.8	5.52	43.62	20.5	6.58	54.05	22.9	8.22	70.84
14000	20.2	6.40	50.04	22.1	7.63	62.00	24.7	9.53	81.26

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

22 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 32.5 I.D.=20.565			DR 26 I.D.=20.206			DR 21 I.D.=19.778			DR 17 I.D.=19.257			DR 15.5 I.D.=18.992		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
200	0.2	0.00	0.01	0.2	0.00	0.01	0.2	0.00	0.01	0.2	0.00	0.01	0.2	0.00	0.01
400	0.4	0.00	0.03	0.4	0.00	0.03	0.4	0.00	0.03	0.4	0.00	0.04	0.5	0.00	0.04
600	0.6	0.01	0.06	0.6	0.01	0.06	0.6	0.01	0.07	0.7	0.01	0.08	0.7	0.01	0.08
800	0.8	0.01	0.09	0.8	0.01	0.10	0.8	0.01	0.11	0.9	0.01	0.13	0.9	0.01	0.14
1000	1.0	0.01	0.14	1.0	0.02	0.16	1.0	0.02	0.17	1.1	0.02	0.20	1.1	0.02	0.21
1400	1.4	0.03	0.27	1.4	0.03	0.29	1.5	0.03	0.32	1.5	0.04	0.37	1.6	0.04	0.39
1800	1.7	0.05	0.42	1.8	0.05	0.46	1.9	0.06	0.51	2.0	0.06	0.58	2.0	0.07	0.63
2200	2.1	0.07	0.61	2.2	0.08	0.67	2.3	0.08	0.74	2.4	0.09	0.85	2.5	0.10	0.91
2600	2.5	0.10	0.83	2.6	0.11	0.91	2.7	0.12	1.01	2.9	0.13	1.16	3.0	0.14	1.24
3000	2.9	0.13	1.09	3.0	0.14	1.19	3.1	0.15	1.32	3.3	0.17	1.51	3.4	0.18	1.61
3400	3.3	0.17	1.37	3.4	0.18	1.50	3.6	0.20	1.66	3.8	0.22	1.90	3.9	0.23	2.03
3800	3.7	0.21	1.68	3.8	0.23	1.84	4.0	0.25	2.04	4.2	0.28	2.33	4.3	0.29	2.50
4200	4.1	0.26	2.03	4.2	0.28	2.21	4.4	0.30	2.46	4.6	0.34	2.81	4.8	0.36	3.01
4600	4.5	0.31	2.40	4.6	0.33	2.62	4.8	0.36	2.91	5.1	0.40	3.32	5.2	0.43	3.56
5000	4.8	0.37	2.80	5.0	0.39	3.06	5.2	0.43	3.40	5.5	0.48	3.88	5.7	0.51	4.15
5800	5.6	0.49	3.69	5.8	0.53	4.02	6.1	0.58	4.47	6.4	0.64	5.10	6.6	0.68	5.47
6600	6.4	0.64	4.68	6.6	0.69	5.11	6.9	0.75	5.68	7.3	0.83	6.48	7.5	0.88	6.95
7400	7.2	0.80	5.79	7.4	0.86	6.31	7.8	0.94	7.02	8.2	1.05	8.01	8.4	1.11	8.58
8200	7.9	0.98	7.00	8.2	1.06	7.64	8.6	1.15	8.49	9.1	1.29	9.69	9.3	1.36	10.38
9000	8.7	1.19	8.32	9.0	1.27	9.07	9.4	1.39	10.09	10.0	1.55	11.52	10.2	1.64	12.33
10000	9.7	1.46	10.11	10.0	1.57	11.03	10.5	1.72	12.26	11.1	1.91	14.00	11.4	2.02	14.99
11000	10.7	1.77	12.06	11.0	1.90	13.16	11.5	2.08	14.63	12.2	2.32	16.70	12.5	2.45	17.89
12000	11.6	2.11	14.17	12.0	2.27	15.46	12.6	2.47	17.18	13.3	2.76	19.62	13.7	2.92	21.01
13000	12.6	2.48	16.43	13.0	2.66	17.93	13.6	2.90	19.93	14.4	3.23	22.75	14.8	3.42	24.37
14000	13.6	2.87	18.85	14.0	3.08	20.57	14.7	3.36	22.86	15.5	3.75	26.10	15.9	3.97	27.96
15000	14.5	3.30	21.42	15.1	3.54	23.37	15.7	3.86	25.97	16.6	4.31	29.66	17.1	4.56	31.77
16000	15.5	3.75	24.14	16.1	4.03	26.34	16.8	4.39	29.27	17.7	4.90	33.42	18.2	5.18	35.80
17000	16.5	4.23	27.01	17.1	4.55	29.46	17.8	4.96	32.75	18.8	5.53	37.39	19.4	5.85	40.05
18000	17.4	4.75	30.02	18.1	5.10	32.75	18.9	5.56	36.41	19.9	6.20	41.57	20.5	6.56	44.53
19000	18.4	5.29	33.19	19.1	5.68	36.20	19.9	6.19	40.24	21.0	6.91	45.94	21.6	7.31	49.21

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

22 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 13.5 I.D.=18.544			DR 11 I.D.=17.760		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
200	0.2	0.00	0.01	0.3	0.00	0.01
400	0.5	0.00	0.04	0.5	0.00	0.05
600	0.7	0.01	0.09	0.8	0.01	0.11
800	1.0	0.01	0.16	1.0	0.02	0.19
1000	1.2	0.02	0.24	1.3	0.03	0.29
1400	1.7	0.04	0.44	1.8	0.05	0.55
1800	2.2	0.07	0.70	2.3	0.09	0.87
2200	2.6	0.11	1.02	2.9	0.13	1.27
2600	3.1	0.15	1.39	3.4	0.18	1.72
3000	3.6	0.20	1.81	3.9	0.24	2.25
3400	4.1	0.26	2.29	4.4	0.31	2.83
3800	4.5	0.32	2.81	5.0	0.38	3.48
4200	5.0	0.39	3.38	5.5	0.47	4.19
4600	5.5	0.47	4.00	6.0	0.56	4.96
5000	6.0	0.56	4.67	6.5	0.66	5.79
5800	6.9	0.75	6.15	7.6	0.89	7.62
6600	7.9	0.97	7.81	8.6	1.16	9.68
7400	8.8	1.22	9.66	9.7	1.46	11.97
8200	9.8	1.50	11.68	10.7	1.79	14.47
9000	10.8	1.81	13.88	11.7	2.15	17.19
10000	11.9	2.23	16.86	13.0	2.66	20.90
11000	13.1	2.70	20.12	14.4	3.22	24.93
12000	14.3	3.21	23.64	15.7	3.83	29.29
13000	15.5	3.77	27.41	17.0	4.49	33.97
14000	16.7	4.37	31.45	18.3	5.21	38.97
15000	17.9	5.02	35.73	19.6	5.98	44.28
16000	19.1	5.71	40.27	20.9	6.81	49.90
17000	20.3	6.44	45.05	22.2	7.69	55.83

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

24 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 32.5 I.D.=22.435			DR 26 I.D.=22.043			DR 21 I.D.=21.577			DR 17 I.D.=21.007			DR 15.5 I.D.=20.718		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
200	0.2	0.00	0.00	0.2	0.00	0.01	0.2	0.00	0.01	0.2	0.00	0.01	0.2	0.00	0.01
400	0.3	0.00	0.02	0.3	0.00	0.02	0.4	0.00	0.02	0.4	0.00	0.02	0.4	0.00	0.03
600	0.5	0.00	0.04	0.5	0.00	0.04	0.5	0.00	0.04	0.6	0.00	0.05	0.6	0.01	0.05
800	0.7	0.01	0.06	0.7	0.01	0.07	0.7	0.01	0.07	0.7	0.01	0.09	0.8	0.01	0.09
1000	0.8	0.01	0.09	0.8	0.01	0.10	0.9	0.01	0.11	0.9	0.01	0.13	1.0	0.01	0.14
1400	1.1	0.02	0.17	1.2	0.02	0.19	1.2	0.02	0.21	1.3	0.03	0.24	1.3	0.03	0.26
1800	1.5	0.03	0.28	1.5	0.04	0.30	1.6	0.04	0.34	1.7	0.04	0.38	1.7	0.05	0.41
2200	1.8	0.05	0.40	1.9	0.05	0.44	1.9	0.06	0.49	2.0	0.07	0.55	2.1	0.07	0.59
2600	2.1	0.07	0.55	2.2	0.08	0.60	2.3	0.08	0.66	2.4	0.09	0.76	2.5	0.10	0.81
3000	2.4	0.09	0.71	2.5	0.10	0.78	2.6	0.11	0.86	2.8	0.12	0.99	2.9	0.13	1.06
3400	2.8	0.12	0.90	2.9	0.13	0.98	3.0	0.14	1.09	3.2	0.16	1.24	3.3	0.17	1.33
3800	3.1	0.15	1.10	3.2	0.16	1.20	3.3	0.17	1.34	3.5	0.20	1.53	3.6	0.21	1.64
4200	3.4	0.18	1.33	3.5	0.20	1.45	3.7	0.21	1.61	3.9	0.24	1.84	4.0	0.25	1.97
4600	3.7	0.22	1.57	3.9	0.24	1.71	4.1	0.26	1.90	4.3	0.29	2.17	4.4	0.30	2.33
5000	4.1	0.26	1.83	4.2	0.28	2.00	4.4	0.30	2.22	4.6	0.34	2.54	4.8	0.36	2.72
5800	4.7	0.35	2.41	4.9	0.37	2.63	5.1	0.41	2.93	5.4	0.45	3.34	5.5	0.48	3.58
6600	5.4	0.45	3.06	5.6	0.48	3.34	5.8	0.53	3.72	6.1	0.59	4.24	6.3	0.62	4.55
7400	6.0	0.57	3.79	6.2	0.61	4.13	6.5	0.66	4.59	6.9	0.74	5.24	7.1	0.78	5.62
8200	6.7	0.70	4.58	6.9	0.75	5.00	7.2	0.81	5.56	7.6	0.91	6.34	7.8	0.96	6.79
9000	7.3	0.84	5.44	7.6	0.90	5.94	7.9	0.98	6.60	8.4	1.09	7.54	8.6	1.16	8.07
10000	8.1	1.03	6.62	8.4	1.11	7.22	8.8	1.21	8.02	9.3	1.35	9.16	9.6	1.43	9.81
11000	8.9	1.25	7.89	9.3	1.34	8.61	9.7	1.47	9.57	10.2	1.63	10.93	10.5	1.73	11.71
12000	9.8	1.49	9.27	10.1	1.60	10.12	10.6	1.74	11.25	11.2	1.95	12.84	11.5	2.06	13.75
13000	10.6	1.75	10.76	11.0	1.88	11.73	11.4	2.05	13.04	12.1	2.28	14.89	12.4	2.42	15.95
14000	11.4	2.03	12.34	11.8	2.18	13.46	12.3	2.37	14.96	13.0	2.65	17.08	13.4	2.80	18.30
15000	12.2	2.33	14.02	12.6	2.50	15.29	13.2	2.73	17.00	13.9	3.04	19.41	14.3	3.22	20.79
16000	13.0	2.65	15.80	13.5	2.84	17.24	14.1	3.10	19.16	14.9	3.46	21.87	15.3	3.66	23.43
17000	13.8	2.99	17.68	14.3	3.21	19.28	15.0	3.50	21.43	15.8	3.90	24.47	16.3	4.13	26.21
18000	14.6	3.35	19.65	15.2	3.60	21.44	15.8	3.93	23.83	16.7	4.38	27.20	17.2	4.63	29.14
19000	15.5	3.73	21.72	16.0	4.01	23.69	16.7	4.37	26.34	17.7	4.88	30.07	18.2	5.16	32.21

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

24 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 13.5 I.D.=20.231			DR 11 I.D.=19.374		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
200	0.2	0.00	0.01	0.2	0.00	0.01
400	0.4	0.00	0.03	0.4	0.00	0.04
600	0.6	0.01	0.06	0.7	0.01	0.07
800	0.8	0.01	0.10	0.9	0.01	0.13
1000	1.0	0.02	0.16	1.1	0.02	0.19
1400	1.4	0.03	0.29	1.5	0.04	0.36
1800	1.8	0.05	0.46	2.0	0.06	0.57
2200	2.2	0.08	0.67	2.4	0.09	0.83
2600	2.6	0.11	0.91	2.8	0.13	1.13
3000	3.0	0.14	1.19	3.3	0.17	1.47
3400	3.4	0.18	1.50	3.7	0.22	1.85
3800	3.8	0.23	1.84	4.2	0.27	2.28
4200	4.2	0.28	2.21	4.6	0.33	2.74
4600	4.6	0.33	2.62	5.0	0.40	3.25
5000	5.0	0.39	3.06	5.5	0.47	3.79
5800	5.8	0.53	4.02	6.4	0.63	4.99
6600	6.6	0.69	5.11	7.2	0.82	6.34
7400	7.4	0.86	6.32	8.1	1.03	7.83
8200	8.2	1.06	7.64	9.0	1.26	9.47
9000	9.0	1.28	9.08	9.9	1.52	11.25
10000	10.0	1.57	11.04	11.0	1.88	13.68
11000	11.0	1.90	13.17	12.1	2.27	16.32
12000	12.0	2.27	15.47	13.2	2.70	19.17
13000	13.0	2.66	17.94	14.2	3.17	22.23
14000	14.1	3.09	20.58	15.3	3.68	25.50
15000	15.1	3.54	23.39	16.4	4.22	28.98
16000	16.1	4.03	26.35	17.5	4.81	32.66
17000	17.1	4.55	29.49	18.6	5.43	36.54
18000	18.1	5.10	32.78	19.7	6.08	40.62
19000	19.1	5.68	36.23	20.8	6.78	44.89

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

28 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 32.5 I.D.=26.173			DR 26 I.D.=25.717			DR 21 I.D.=25.174			DR 17 I.D.=24.508			DR 15.5 I.D.=24.171		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
300	0.2	0.00	0.00	0.2	0.00	0.01	0.2	0.00	0.01	0.2	0.00	0.01	0.2	0.00	0.01
600	0.4	0.00	0.02	0.4	0.00	0.02	0.4	0.00	0.02	0.4	0.00	0.02	0.4	0.00	0.03
900	0.5	0.00	0.04	0.6	0.00	0.04	0.6	0.01	0.04	0.6	0.01	0.05	0.6	0.01	0.05
1200	0.7	0.01	0.06	0.7	0.01	0.07	0.8	0.01	0.07	0.8	0.01	0.09	0.8	0.01	0.09
1500	0.9	0.01	0.09	0.9	0.01	0.10	1.0	0.01	0.11	1.0	0.02	0.13	1.1	0.02	0.14
2100	1.3	0.02	0.17	1.3	0.03	0.19	1.4	0.03	0.21	1.4	0.03	0.24	1.5	0.03	0.26
2700	1.6	0.04	0.28	1.7	0.04	0.30	1.7	0.05	0.34	1.8	0.05	0.38	1.9	0.06	0.41
3300	2.0	0.06	0.40	2.0	0.07	0.44	2.1	0.07	0.49	2.3	0.08	0.55	2.3	0.08	0.59
3900	2.3	0.08	0.55	2.4	0.09	0.60	2.5	0.10	0.66	2.7	0.11	0.76	2.7	0.12	0.81
4500	2.7	0.11	0.71	2.8	0.12	0.78	2.9	0.13	0.86	3.1	0.15	0.99	3.2	0.16	1.06
5100	3.0	0.15	0.90	3.2	0.16	0.98	3.3	0.17	1.09	3.5	0.19	1.24	3.6	0.20	1.33
5700	3.4	0.18	1.10	3.5	0.19	1.20	3.7	0.21	1.34	3.9	0.24	1.53	4.0	0.25	1.63
6300	3.8	0.22	1.33	3.9	0.24	1.45	4.1	0.26	1.61	4.3	0.29	1.84	4.4	0.31	1.97
6900	4.1	0.27	1.57	4.3	0.29	1.71	4.5	0.31	1.90	4.7	0.35	2.17	4.8	0.37	2.33
7500	4.5	0.31	1.83	4.6	0.34	2.00	4.9	0.37	2.22	5.1	0.41	2.54	5.3	0.43	2.72
8700	5.2	0.42	2.41	5.4	0.45	2.63	5.6	0.49	2.93	5.9	0.55	3.34	6.1	0.58	3.58
9900	5.9	0.55	3.06	6.1	0.59	3.34	6.4	0.64	3.72	6.8	0.71	4.24	7.0	0.76	4.54
11000	6.6	0.68	3.72	6.8	0.73	4.06	7.1	0.79	4.52	7.5	0.88	5.16	7.7	0.93	5.52
12000	7.2	0.80	4.38	7.4	0.86	4.77	7.8	0.94	5.31	8.2	1.05	6.06	8.4	1.11	6.49
13000	7.8	0.94	5.08	8.1	1.01	5.54	8.4	1.10	6.15	8.9	1.23	7.03	9.1	1.30	7.53
15000	9.0	1.26	6.62	9.3	1.35	7.22	9.7	1.47	8.02	10.2	1.64	9.16	10.5	1.74	9.81
17000	10.2	1.61	8.34	10.5	1.73	9.10	11.0	1.89	10.11	11.6	2.11	11.55	11.9	2.23	12.37
19000	11.4	2.01	10.25	11.8	2.16	11.18	12.3	2.36	12.43	13.0	2.63	14.19	13.3	2.78	15.20
21000	12.5	2.46	12.34	13.0	2.64	13.46	13.6	2.88	14.96	14.3	3.21	17.08	14.8	3.40	18.29
23000	13.7	2.95	14.60	14.2	3.17	15.93	14.9	3.46	17.70	15.7	3.86	20.21	16.2	4.08	21.65
25000	14.9	3.49	17.04	15.5	3.75	18.59	16.2	4.09	20.66	17.1	4.56	23.59	17.6	4.82	25.26
27000	16.1	4.07	19.65	16.7	4.37	21.43	17.5	4.77	23.82	18.4	5.31	27.20	19.0	5.62	29.13
29000	17.3	4.69	22.43	18.0	5.04	24.47	18.8	5.50	27.19	19.8	6.13	31.05	20.4	6.49	33.26
31000	18.5	5.36	25.37	19.2	5.76	27.68	20.1	6.28	30.77	21.2	7.01	35.13	21.8	7.41	37.63
33000	19.7	6.08	28.49	20.4	6.53	31.08	21.3	7.12	34.55	22.5	7.94	39.44	23.2	8.40	42.25

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

28 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

DR 13.5
I.D.=23.603

FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000
300	0.2	0.00	0.01
600	0.4	0.00	0.03
900	0.7	0.01	0.06
1200	0.9	0.01	0.10
1500	1.1	0.02	0.16
2100	1.5	0.04	0.29
2700	2.0	0.06	0.46
3300	2.4	0.09	0.67
3900	2.9	0.13	0.91
4500	3.3	0.17	1.19
5100	3.8	0.22	1.50
5700	4.2	0.28	1.84
6300	4.6	0.34	2.21
6900	5.1	0.40	2.62
7500	5.5	0.48	3.06
8700	6.4	0.64	4.02
9900	7.3	0.83	5.11
11000	8.1	1.03	6.21
12000	8.8	1.22	7.30
13000	9.6	1.44	8.47
15000	11.1	1.91	11.03
17000	12.5	2.46	13.91
19000	14.0	3.07	17.10
21000	15.5	3.75	20.58
23000	17.0	4.49	24.35
25000	18.4	5.31	28.42
27000	19.9	6.19	32.77

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

32 INCH METRIC SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 32.5 I.D.=29.541			DR 26 I.D.=29.024			DR 21 I.D.=28.415			DR 17 I.D.=27.663			DR 15.5 I.D.=27.288		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
400	0.2	0.00	0.00	0.2	0.00	0.00	0.2	0.00	0.01	0.2	0.00	0.01	0.2	0.00	0.01
800	0.4	0.00	0.02	0.4	0.00	0.02	0.4	0.00	0.02	0.4	0.00	0.02	0.4	0.00	0.02
1200	0.6	0.00	0.03	0.6	0.01	0.04	0.6	0.01	0.04	0.6	0.01	0.05	0.7	0.01	0.05
1600	0.8	0.01	0.06	0.8	0.01	0.06	0.8	0.01	0.07	0.9	0.01	0.08	0.9	0.01	0.09
2000	0.9	0.01	0.09	1.0	0.01	0.10	1.0	0.02	0.11	1.1	0.02	0.12	1.1	0.02	0.13
2800	1.3	0.03	0.16	1.4	0.03	0.18	1.4	0.03	0.20	1.5	0.04	0.23	1.5	0.04	0.24
3600	1.7	0.04	0.26	1.8	0.05	0.29	1.8	0.05	0.32	1.9	0.06	0.36	2.0	0.06	0.39
4400	2.1	0.07	0.38	2.1	0.07	0.41	2.2	0.08	0.46	2.4	0.09	0.53	2.4	0.09	0.56
5200	2.4	0.09	0.52	2.5	0.10	0.56	2.6	0.11	0.63	2.8	0.12	0.72	2.9	0.13	0.77
6000	2.8	0.12	0.67	2.9	0.13	0.73	3.0	0.15	0.82	3.2	0.16	0.93	3.3	0.17	1.00
6800	3.2	0.16	0.85	3.3	0.17	0.93	3.5	0.19	1.03	3.6	0.21	1.18	3.8	0.22	1.26
7600	3.6	0.20	1.04	3.7	0.21	1.14	3.9	0.23	1.27	4.1	0.26	1.44	4.2	0.27	1.55
8400	3.9	0.24	1.26	4.1	0.26	1.37	4.3	0.28	1.52	4.5	0.32	1.74	4.6	0.34	1.86
9200	4.3	0.29	1.49	4.5	0.31	1.62	4.7	0.34	1.80	4.9	0.38	2.06	5.1	0.40	2.20
10000	4.7	0.34	1.73	4.9	0.37	1.89	5.1	0.40	2.10	5.4	0.45	2.40	5.5	0.48	2.57
12000	5.6	0.50	2.43	5.8	0.53	2.65	6.1	0.58	2.95	6.4	0.65	3.37	6.6	0.69	3.61
14000	6.6	0.67	3.23	6.8	0.73	3.53	7.1	0.79	3.92	7.5	0.88	4.48	7.7	0.93	4.80
16000	7.5	0.88	4.14	7.8	0.95	4.52	8.1	1.03	5.02	8.6	1.15	5.73	8.8	1.22	6.14
18000	8.5	1.12	5.15	8.8	1.20	5.62	9.1	1.31	6.25	9.7	1.46	7.13	9.9	1.54	7.64
20000	9.4	1.38	6.26	9.7	1.48	6.83	10.2	1.61	7.59	10.7	1.80	8.67	11.0	1.90	9.29
22000	10.3	1.67	7.47	10.7	1.79	8.15	11.2	1.95	9.06	11.8	2.18	10.34	12.1	2.30	11.08
24000	11.3	1.98	8.78	11.7	2.13	9.57	12.2	2.32	10.64	12.9	2.59	12.15	13.2	2.74	13.01
26000	12.2	2.33	10.18	12.7	2.50	11.10	13.2	2.73	12.34	14.0	3.04	14.09	14.4	3.22	15.09
28000	13.1	2.70	11.68	13.6	2.90	12.74	14.2	3.16	14.16	15.0	3.53	16.16	15.5	3.73	17.31
30000	14.1	3.10	13.27	14.6	3.33	14.47	15.2	3.63	16.09	16.1	4.05	18.37	16.6	4.28	19.67
32000	15.0	3.53	14.95	15.6	3.79	16.31	16.3	4.13	18.13	17.2	4.61	20.70	17.7	4.87	22.17
34000	16.0	3.98	16.73	16.5	4.28	18.25	17.3	4.66	20.28	18.2	5.20	23.16	18.8	5.50	24.81
36000	16.9	4.46	18.60	17.5	4.79	20.29	18.3	5.23	22.55	19.3	5.83	25.74	19.9	6.17	27.58
38000	17.8	4.97	20.55	18.5	5.34	22.42	19.3	5.83	24.92	20.4	6.50	28.46	21.0	6.87	30.48
40000	18.8	5.51	22.60	19.5	5.92	24.66	20.3	6.46	27.41	21.5	7.20	31.29	22.1	7.62	33.52

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

32 INCH METRIC SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

DR 13.5
I.D.=26.648

FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000
400	0.2	0.00	0.01
800	0.5	0.00	0.03
1200	0.7	0.01	0.06
1600	0.9	0.01	0.10
2000	1.2	0.02	0.15
2800	1.6	0.04	0.27
3600	2.1	0.07	0.44
4400	2.5	0.10	0.63
5200	3.0	0.14	0.86
6000	3.5	0.19	1.12
6800	3.9	0.24	1.42
7600	4.4	0.30	1.74
8400	4.9	0.37	2.09
9200	5.3	0.44	2.48
10000	5.8	0.52	2.89
12000	7.0	0.75	4.06
14000	8.1	1.03	5.40
16000	9.3	1.34	6.91
18000	10.4	1.70	8.59
20000	11.6	2.10	10.44
22000	12.7	2.54	12.46
24000	13.9	3.02	14.64
26000	15.1	3.54	16.98
28000	16.2	4.11	19.48
30000	17.4	4.72	22.13
32000	18.5	5.37	24.94
34000	19.7	6.06	27.90

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

36 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 32.5 I.D.=33.651			DR 26 I.D.=33.064			DR 21 I.D.=32.366			DR 17 I.D.=31.510		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
600	0.2	0.00	0.01	0.2	0.00	0.01	0.2	0.00	0.01	0.2	0.00	0.01
1200	0.4	0.00	0.02	0.4	0.00	0.02	0.5	0.00	0.02	0.5	0.00	0.03
1800	0.7	0.01	0.04	0.7	0.01	0.04	0.7	0.01	0.05	0.7	0.01	0.05
2400	0.9	0.01	0.07	0.9	0.01	0.07	0.9	0.01	0.08	1.0	0.02	0.09
3000	1.1	0.02	0.10	1.1	0.02	0.11	1.2	0.02	0.12	1.2	0.02	0.14
4200	1.5	0.04	0.18	1.6	0.04	0.20	1.6	0.04	0.22	1.7	0.05	0.25
5400	2.0	0.06	0.29	2.0	0.06	0.32	2.1	0.07	0.36	2.2	0.08	0.41
6600	2.4	0.09	0.43	2.5	0.10	0.46	2.6	0.10	0.52	2.7	0.12	0.59
7800	2.8	0.12	0.58	2.9	0.13	0.63	3.1	0.15	0.70	3.2	0.16	0.80
9000	3.3	0.17	0.76	3.4	0.18	0.82	3.5	0.19	0.92	3.7	0.22	1.05
10000	3.6	0.20	0.92	3.7	0.22	1.00	3.9	0.24	1.11	4.1	0.27	1.27
11000	4.0	0.25	1.09	4.1	0.27	1.19	4.3	0.29	1.33	4.5	0.32	1.52
12000	4.3	0.29	1.29	4.5	0.32	1.40	4.7	0.34	1.56	5.0	0.38	1.78
13000	4.7	0.35	1.49	4.9	0.37	1.63	5.1	0.40	1.81	5.4	0.45	2.07
14000	5.1	0.40	1.71	5.2	0.43	1.87	5.5	0.47	2.08	5.8	0.52	2.37
16000	5.8	0.52	2.19	6.0	0.56	2.39	6.3	0.61	2.66	6.6	0.68	3.03
18000	6.5	0.66	2.73	6.7	0.71	2.97	7.0	0.77	3.30	7.4	0.86	3.77
20000	7.2	0.82	3.31	7.5	0.88	3.61	7.8	0.96	4.02	8.3	1.07	4.59
22000	8.0	0.99	3.95	8.2	1.06	4.31	8.6	1.16	4.79	9.1	1.29	5.47
24000	8.7	1.18	4.64	9.0	1.26	5.07	9.4	1.38	5.63	9.9	1.54	6.43
27000	9.8	1.49	5.77	10.1	1.60	6.30	10.6	1.74	7.00	11.2	1.94	7.99
30000	10.8	1.84	7.02	11.2	1.97	7.66	11.7	2.15	8.51	12.4	2.40	9.72
33000	11.9	2.22	8.37	12.4	2.39	9.14	12.9	2.60	10.15	13.6	2.90	11.59
36000	13.0	2.65	9.84	13.5	2.84	10.73	14.1	3.10	11.93	14.9	3.46	13.62
39000	14.1	3.11	11.41	14.6	3.34	12.45	15.3	3.64	13.84	16.1	4.06	15.80
43000	15.5	3.77	13.67	16.1	4.05	14.92	16.8	4.42	16.58	17.8	4.93	18.93
47000	17.0	4.51	16.12	17.6	4.84	17.59	18.4	5.28	19.55	19.4	5.89	22.32
51000	18.4	5.31	18.75	19.1	5.70	20.46	20.0	6.22	22.74	21.1	6.94	25.96
55000	19.9	6.18	21.57	20.6	6.63	23.53	21.5	7.24	26.15	22.7	8.07	29.86

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

40 INCH METRIC SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 32.5 I.D.=36.898			DR 26 I.D.=36.255			DR 21 I.D.=35.496		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
700	0.2	0.00	0.00	0.2	0.00	0.00	0.2	0.00	0.01
1400	0.4	0.00	0.02	0.4	0.00	0.02	0.5	0.00	0.02
2100	0.6	0.01	0.03	0.7	0.01	0.04	0.7	0.01	0.04
2800	0.8	0.01	0.06	0.9	0.01	0.06	0.9	0.01	0.07
3500	1.1	0.02	0.08	1.1	0.02	0.09	1.1	0.02	0.10
4900	1.5	0.03	0.16	1.5	0.04	0.17	1.6	0.04	0.19
6300	1.9	0.06	0.25	2.0	0.06	0.27	2.1	0.07	0.30
7700	2.3	0.08	0.36	2.4	0.09	0.39	2.5	0.10	0.44
9100	2.7	0.12	0.49	2.8	0.13	0.54	3.0	0.14	0.60
11000	3.3	0.17	0.70	3.4	0.18	0.76	3.6	0.20	0.85
12000	3.6	0.20	0.82	3.7	0.22	0.90	3.9	0.24	1.00
13000	3.9	0.24	0.95	4.1	0.26	1.04	4.2	0.28	1.16
14000	4.2	0.28	1.09	4.4	0.30	1.19	4.6	0.32	1.33
15000	4.5	0.32	1.24	4.7	0.34	1.35	4.9	0.37	1.51
16000	4.8	0.36	1.40	5.0	0.39	1.53	5.2	0.42	1.70
19000	5.7	0.51	1.92	5.9	0.55	2.10	6.2	0.60	2.33
22000	6.6	0.68	2.52	6.9	0.73	2.75	7.2	0.80	3.06
25000	7.5	0.88	3.20	7.8	0.95	3.49	8.1	1.03	3.88
28000	8.4	1.11	3.95	8.7	1.19	4.30	9.1	1.30	4.78
31000	9.3	1.36	4.76	9.7	1.46	5.20	10.1	1.59	5.78
35000	10.5	1.73	5.96	10.9	1.86	6.51	11.4	2.03	7.23
39000	11.7	2.15	7.29	12.2	2.31	7.95	12.7	2.52	8.84
43000	12.9	2.61	8.73	13.4	2.81	9.53	14.0	3.06	10.59
47000	14.1	3.12	10.30	14.6	3.35	11.23	15.3	3.66	12.48
51000	15.3	3.67	11.98	15.9	3.95	13.07	16.6	4.30	14.52
55000	16.5	4.27	13.77	17.1	4.59	15.03	17.9	5.01	16.70
59000	17.7	4.92	15.69	18.4	5.28	17.11	19.2	5.76	19.02
63000	18.9	5.61	17.71	19.6	6.02	19.32	20.5	6.57	21.48
67000	20.1	6.34	19.85	20.9	6.81	21.66	21.8	7.43	24.07

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

42 INCH IPS SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 32.5 I.D.=39.261			DR 26 I.D.=38.576			DR 21 I.D.=37.760		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
800	0.2	0.00	0.00	0.2	0.00	0.00	0.2	0.00	0.00
1600	0.4	0.00	0.01	0.4	0.00	0.02	0.5	0.00	0.02
2400	0.6	0.01	0.03	0.7	0.01	0.03	0.7	0.01	0.04
3200	0.8	0.01	0.05	0.9	0.01	0.06	0.9	0.01	0.06
4000	1.1	0.02	0.08	1.1	0.02	0.09	1.1	0.02	0.10
5600	1.5	0.03	0.15	1.5	0.04	0.16	1.6	0.04	0.18
7200	1.9	0.06	0.24	2.0	0.06	0.26	2.1	0.07	0.29
8800	2.3	0.09	0.34	2.4	0.09	0.37	2.5	0.10	0.41
10000	2.7	0.11	0.43	2.8	0.12	0.47	2.9	0.13	0.53
12000	3.2	0.16	0.61	3.3	0.17	0.66	3.4	0.19	0.74
14000	3.7	0.22	0.81	3.9	0.23	0.88	4.0	0.25	0.98
16000	4.2	0.28	1.03	4.4	0.30	1.13	4.6	0.33	1.25
18000	4.8	0.36	1.29	5.0	0.38	1.40	5.2	0.42	1.56
20000	5.3	0.44	1.56	5.5	0.47	1.71	5.7	0.52	1.90
22000	5.8	0.53	1.87	6.1	0.57	2.03	6.3	0.62	2.26
25000	6.6	0.69	2.36	6.9	0.74	2.58	7.2	0.81	2.87
28000	7.4	0.86	2.92	7.7	0.93	3.18	8.0	1.01	3.53
31000	8.2	1.06	3.52	8.5	1.14	3.84	8.9	1.24	4.27
34000	9.0	1.27	4.18	9.4	1.37	4.56	9.8	1.49	5.06
37000	9.8	1.51	4.88	10.2	1.62	5.33	10.6	1.77	5.92
41000	10.9	1.85	5.91	11.3	1.99	6.44	11.8	2.17	7.16
45000	11.9	2.23	7.02	12.4	2.40	7.66	12.9	2.61	8.51
49000	13.0	2.65	8.22	13.5	2.84	8.96	14.1	3.10	9.96
53000	14.1	3.10	9.50	14.6	3.32	10.37	15.2	3.63	11.52
57000	15.1	3.58	10.87	15.7	3.85	11.86	16.4	4.19	13.18
62000	16.5	4.24	12.71	17.1	4.55	13.86	17.8	4.96	15.41
67000	17.8	4.95	14.67	18.4	5.31	16.00	19.3	5.79	17.79
72000	19.1	5.71	16.76	19.8	6.14	18.28	20.7	6.69	20.32
77000	20.4	6.53	18.98	21.2	7.02	20.70	22.1	7.65	23.01

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

48 INCH METRIC SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 32.5 I.D.=44.302			DR 26 I.D.=43.526			DR 21 I.D.=42.616		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
1000	0.2	0.00	0.00	0.2	0.00	0.00	0.2	0.00	0.00
2000	0.4	0.00	0.01	0.4	0.00	0.01	0.5	0.00	0.01
3000	0.6	0.01	0.03	0.6	0.01	0.03	0.7	0.01	0.03
4000	0.8	0.01	0.04	0.9	0.01	0.05	0.9	0.01	0.05
5000	1.0	0.02	0.07	1.1	0.02	0.07	1.1	0.02	0.08
7000	1.5	0.03	0.12	1.5	0.04	0.14	1.6	0.04	0.15
9000	1.9	0.06	0.20	1.9	0.06	0.22	2.0	0.06	0.24
11000	2.3	0.08	0.29	2.4	0.09	0.31	2.5	0.10	0.35
13000	2.7	0.11	0.39	2.8	0.12	0.43	2.9	0.13	0.47
15000	3.1	0.15	0.51	3.2	0.16	0.56	3.4	0.18	0.62
17000	3.5	0.20	0.64	3.7	0.21	0.70	3.8	0.23	0.78
19000	4.0	0.25	0.79	4.1	0.26	0.86	4.3	0.29	0.96
21000	4.4	0.30	0.95	4.5	0.32	1.04	4.7	0.35	1.15
23000	4.8	0.36	1.13	5.0	0.39	1.23	5.2	0.42	1.37
25000	5.2	0.43	1.31	5.4	0.46	1.43	5.6	0.50	1.59
29000	6.1	0.57	1.73	6.3	0.61	1.89	6.5	0.67	2.10
33000	6.9	0.74	2.20	7.1	0.80	2.40	7.5	0.87	2.66
37000	7.7	0.93	2.72	8.0	1.00	2.96	8.4	1.09	3.29
41000	8.6	1.14	3.28	8.9	1.23	3.58	9.3	1.34	3.98
45000	9.4	1.38	3.90	9.7	1.48	4.26	10.2	1.61	4.73
50000	10.4	1.70	4.74	10.8	1.83	5.17	11.3	1.99	5.75
55000	11.5	2.06	5.66	11.9	2.21	6.17	12.4	2.41	6.86
60000	12.5	2.45	6.65	13.0	2.63	7.25	13.6	2.87	8.06
65000	13.6	2.87	7.71	14.1	3.09	8.41	14.7	3.37	9.35
70000	14.6	3.33	8.84	15.1	3.58	9.65	15.8	3.91	10.72
76000	15.9	3.93	10.30	16.4	4.22	11.23	17.2	4.60	12.49
82000	17.1	4.57	11.85	17.7	4.91	12.93	18.5	5.36	14.37
88000	18.4	5.27	13.51	19.0	5.66	14.74	19.9	6.17	16.38
94000	19.6	6.01	15.27	20.3	6.46	16.65	21.2	7.04	18.51

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

55 INCH METRIC SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 32.5 I.D.=51.698			DR 26 I.D.=50.805		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
1000	0.2	0.00	0.00	0.2	0.00	0.00
2000	0.3	0.00	0.01	0.3	0.00	0.01
3000	0.5	0.00	0.01	0.5	0.00	0.01
4000	0.6	0.01	0.02	0.6	0.01	0.02
5000	0.8	0.01	0.03	0.8	0.01	0.03
7000	1.1	0.02	0.06	1.1	0.02	0.06
9000	1.4	0.03	0.09	1.4	0.03	0.10
11000	1.7	0.04	0.14	1.7	0.05	0.15
13000	2.0	0.06	0.18	2.1	0.07	0.20
15000	2.3	0.08	0.24	2.4	0.09	0.26
17000	2.6	0.11	0.30	2.7	0.11	0.33
19000	2.9	0.13	0.37	3.0	0.14	0.41
21000	3.2	0.16	0.45	3.3	0.17	0.49
23000	3.5	0.19	0.53	3.7	0.21	0.58
25000	3.8	0.23	0.62	4.0	0.25	0.67
29000	4.4	0.31	0.81	4.6	0.33	0.89
33000	5.1	0.40	1.03	5.2	0.43	1.13
37000	5.7	0.50	1.28	5.9	0.54	1.40
41000	6.3	0.62	1.55	6.5	0.66	1.69
45000	6.9	0.74	1.84	7.1	0.80	2.00
50000	7.7	0.92	2.23	7.9	0.98	2.44
55000	8.4	1.11	2.66	8.7	1.19	2.91
60000	9.2	1.32	3.13	9.5	1.42	3.42
65000	10.0	1.55	3.63	10.3	1.66	3.96
70000	10.7	1.80	4.16	11.1	1.93	4.54
76000	11.6	2.12	4.85	12.1	2.27	5.29
82000	12.6	2.46	5.58	13.0	2.65	6.09
88000	13.5	2.84	6.36	14.0	3.05	6.94
94000	14.4	3.24	7.19	14.9	3.48	7.84
100000	15.3	3.67	8.06	15.9	3.94	8.80

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

63 INCH METRIC SCLAIRPIPE

VELOCITY, VELOCITY HEAD AND HEAD LOSS / 1000 FEET; (HAZEN WILLIAMS FORMULA)

DESIGN STRESS = 800 PSI
COEFFICIENT C = 150 CONSTANT

	DR 32.5 I.D.=59.102			DR 26 I.D.=58.076		
FLOWS USGPM	VEL FPS	VEL HD FEET	HD LOSS FT/1000	VEL FPS	VEL HD FEET	HD LOSS FT/1000
2000	0.2	0.00	0.00	0.2	0.00	0.00
4000	0.5	0.00	0.01	0.5	0.00	0.01
6000	0.7	0.01	0.02	0.7	0.01	0.03
8000	0.9	0.01	0.04	1.0	0.01	0.04
10000	1.2	0.02	0.06	1.2	0.02	0.06
14000	1.6	0.04	0.11	1.7	0.05	0.12
18000	2.1	0.07	0.18	2.2	0.07	0.19
22000	2.6	0.10	0.25	2.7	0.11	0.28
26000	3.0	0.15	0.35	3.2	0.16	0.38
30000	3.5	0.19	0.45	3.6	0.21	0.49
34000	4.0	0.25	0.57	4.1	0.27	0.62
38000	4.5	0.31	0.70	4.6	0.33	0.76
42000	4.9	0.38	0.84	5.1	0.41	0.92
46000	5.4	0.45	1.00	5.6	0.49	1.09
50000	5.9	0.54	1.16	6.1	0.58	1.27
58000	6.8	0.72	1.53	7.0	0.78	1.67
66000	7.7	0.94	1.95	8.0	1.00	2.12
74000	8.7	1.18	2.41	9.0	1.26	2.63
82000	9.6	1.44	2.91	10.0	1.55	3.18
90000	10.6	1.74	3.46	10.9	1.87	3.77
100000	11.7	2.15	4.20	12.1	2.31	4.59
110000	12.9	2.60	5.02	13.4	2.79	5.47
120000	14.1	3.09	5.89	14.6	3.32	6.43
130000	15.2	3.63	6.83	15.8	3.90	7.45
140000	16.4	4.21	7.84	17.0	4.52	8.55
150000	17.6	4.83	8.91	18.2	5.19	9.72
160000	18.8	5.50	10.04	19.4	5.90	10.95
170000	19.9	6.21	11.23	20.7	6.67	12.25

THE HEAD LOSSES CAN BE CORRECTED FOR OTHER C VALUES BY MULTIPLYING THE HEAD LOSS BY THE FOLLOWING CORRECTION FACTORS:

C	CORRECTION FACTOR	C	CORRECTION FACTOR
150	1.00	120	1.51
140	1.14	110	1.77
130	1.30	100	2.12

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