

INSIDE PIPE DIA.	1/4 FULL			1/2 FULL			3/4 FULL			FULL		
	DISCH. CFS	SLOPE		DISCH. CFS	SLOPE		DISCH. CFS	SLOPE		DISCH. CFS	SLOPE	
		n=.013	n=.024		n=.013	n=.024		n=.013	n=.024		n=.013	n=.024
6	.077	.0100	.0340	.20	.0049	.0170	.32	.0039	.0130	.40	.0049	.0170
8	.17	.0058	.0200	.44	.0029	.0096	.71	.0023	.0076	.88	.0029	.0096
10	.21	.0051	.0180	.54	.0025	.0085	.88	.0020	.0066	1.08	.0025	.0085
12	.31	.0040	.0140	.79	.0020	.0067	1.26	.0016	.0052	1.58	.0020	.0067
15	.48	.0030	.0100	1.22	.0015	.0050	1.98	.0012	.0039	2.44	.0015	.0050
18	.69	.0024	.0089	1.77	.0012	.0039	2.85	.0009	.0030	3.54	.0012	.0039
21	.94	.0019	.0064	2.40	.0010	.0032	3.88	.0008	.0025	4.80	.0010	.0032
24	1.23	.0016	.0054	3.15	.0008	.0027	5.04	.0006	.0021	6.30	.0008	.0027
30	1.92	.0012	.0040	4.91	.0006	.0020	7.90	.0005	.0016	9.82	.0006	.0020
36	2.76	.0010	.0032	7.08	.0005	.0016	11.40	.0004	.0012	14.20	.0005	.0016
42	3.76	.0008	.0026	9.60	.0004	.0013	15.50	.0003	.0010	19.20	.0004	.0013
48	4.91	.0007	.0022	12.60	.0004	.0011	20.30	.0003	.0008	25.20	.0004	.0011
54	6.20	.0006	.0018	15.90	.0003	.0009	25.60	.0002	.0007	31.80	.0003	.0009
60	7.68	.0005	.0016	19.60	.0003	.0008	31.60	.0002	.0006	39.20	.0003	.0008
72	11.20	.0004	.0013	28.30	.0003	.0007	45.50	.0002	.0005	56.60	.0003	.0007
84	15.20	.0003	.0010	38.50	.0002	.0006	62.00	.0002	.0004	77.00	.0002	.0006
96	19.80	.0003	.0009	50.20	.0002	.0005	81.00	.0001	.0004	100.00	.0002	.0005
108	25.10	.0003	.0008	63.50	.0002	.0004	102.00	.0001	.0003	127.00	.0002	.0004
120	30.70	.0002	.0007	78.60	.0001	.0004	126.00	.0001	.0003	157.00	.0001	.0004

n VALUES FOR MANNING'S FORMULA

MINIMUM SLOPES REQUIRED FOR SEWERS TO  
 MAINTAIN SELF-CLEANSING VELOCITY OF 2.0  
 FT. PER SECOND  
 (SLOPE IN FT. PER FT.)

REFERENCES:  
 "CONCRETE PIPE NEWS" 1955

MINNEAPOLIS DESIGN REFERENCE  
 NOT TO SCALE



DRW: DCD

DATE: 12/02

APP: HRS

DATE: 1/07

MINIMUM SLOPES FOR 2.0 FT. PER SEC.

STANDARD  
 PLATE  
 NO.  
 SEWR-6014