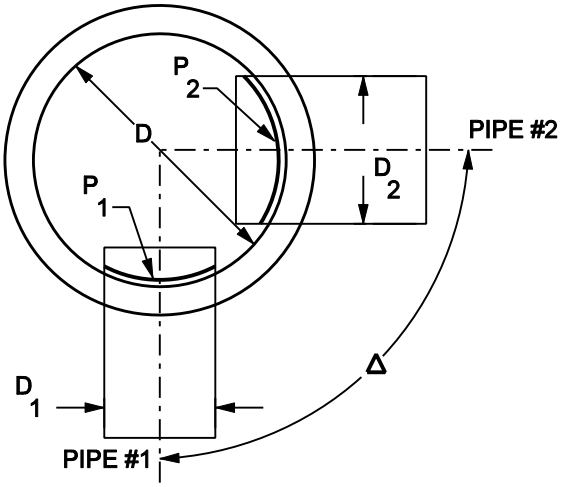

$$\frac{180\,(P_1 + P_2 + 12)}{\pi D \Delta} \leq 1$$

P_2 = MANHOLE PERIMETER REMOVED FOR PIPE 1 HOLE (IN.)

P_1 = MANHOLE PERIMETER REMOVED FOR PIPE 2 HOLE (IN.)

Δ = ANGLE BETWEEN THE PIPE CENTERLINES (DEGREES)

D = INSIDE DIAMETER OF THE MANHOLE (IN.)

SEE TABLE BELOW FOR P1 & P2

THE MANHOLE OR INLET STRUCTURE MUST BE LARGE ENOUGH TO ACCEPT THE MAXIMUM PIPE AS SHOWN BELOW

APPLY ABOVE EQUATION TO DETERMINE MINIMUM MANHOLE SIZE. IF THERE ARE MORE THAN 2 PIPES, CHECK EVERY COMBINATION OF PIPES TO DETERMINE THE MOST CRITICAL PAIR.

A MINIMUM LEG WIDTH BETWEEN PIPE HOLES OF 6" MEASURED ON THE INSIDE OF THE MANHOLE MUST BE MAINTAINED.

NOTE: ALL PIPES SHALL BE TRIMMED FLUSH TO INTERIOR WALL OF STRUCTURE

PIPE I.D. (in.)	HOLE SIZE (in.)	MIN. M.H. DIA. (in.)	' = MNDOT DESIGN N SIZE BASED ON ONE PIPE CONNECTION * = MNDOT DESIGN SD EXCEPTION , MAX. PIPE SIZE IS 24" I.D. MANHOLE PERIMETER, P (in.) REMOVED TO INSTALL PIPE												
			30" I.D. M.H.	48" I.D. M.H.	54" I.D. M.H.	60" I.D. M.H.	66" I.D. M.H.	72" I.D. M.H.	78" I.D. M.H.	84" I.D. M.H.	90" I.D. M.H.	96" I.D. M.H.	102" I.D. M.H.	108" I.D. M.H.	120" I.D. M.H.
12	20	30	21.89	20.63	20.49	20.39	20.32	20.27	20.23	20.19	20.17	20.15	20.13	20.12	20.09
15	24	30	27.82	25.13	24.87	24.69	24.56	24.47	24.40	24.34	24.29	24.26	24.23	24.20	24.16
18	26	30'	31.45	27.48	27.13	26.89	26.72	26.60	26.51	26.43	26.38	26.33	26.29	26.26	26.21
21	30	48		32.41	31.81	31.42	31.14	30.94	30.79	30.68	30.59	30.51	30.45	30.40	30.32
24	34	48		37.78	36.78	36.15	35.72	35.41	35.18	35.00	34.87	34.75	34.66	34.59	34.47
27	38	48*		43.85	42.15	41.15	40.49	40.03	39.69	39.43	39.23	39.07	38.94	38.83	38.67
30	42	54			48.12	46.52	45.53	44.84	44.35	43.98	43.70	43.47	43.29	43.14	42.91
33	46	54			55.05	52.42	50.90	49.90	49.20	48.68	48.28	47.97	47.72	47.52	47.21
36	48	60				55.64	53.75	52.54	51.70	51.09	50.63	50.27	49.98	49.74	49.38
42	55	66					65.02	62.59	61.04	59.96	59.17	58.57	58.09	57.71	57.13
48	64	72						78.83	75.06	72.76	71.20	70.05	69.18	68.50	67.50
54	70	84								82.75	80.20	78.44	77.15	76.16	74.74
60	78	90									94.36	91.05	88.80	87.16	84.91
66	84	102											100.48	97.85	94.46
72	90	108												110.11	104.84
78	98	120													116.42

MH FOR PIPES GREATER THAN 60" REQUIRE SPECIAL PRECAST DESIGN METHOD. MNDOT DRAINAGE MANUAL 8.8.

MINNEAPOLIS DESIGN CHART
NOT TO SCALE

MINNEAPOLIS
DEPARTMENT OF PUBLIC WORKS

DRAWN: DCD	DATE: 5/03
APPROVED: HRS	DATE: 1/07

MANHOLE SIZING CHART

STANDARD PLATE NO. SEWR-6001