

When determining minimum manhole (MH) diameter requirements for various pipe sizes and angles, two general criteria must be met:

1. MH or CB must be large enough to accept the maximum pipe size as given in the attached Mn/DOT Table 8.7.
2. A minimum "Leg" width of 8", measured at the inside of the manhole, should be maintained between holes. Knowing the relative location of any two pipes, and the angle between them, the width of the "Leg" for a given manhole size can be determined by using the following equation:

$$\text{Leg} = \frac{\pi D \Delta}{360} - \left(\frac{P1 + P2}{2} \right)$$

Where: P1 = perimeter of manhole removed for pipe 1 (inches)

P2 = perimeter of manhole removed for pipe 2 (inches)

D = inside diameter of manhole (inches)

Δ = angle between the two pipes (degrees)
(look up P1, P2 and minimum D in Mn/DOT Table 8.7)

EXAMPLE:

Given: Pipe #1 = 54" I.D.

Pipe #2 = 48" I.D.

"Δ" = 140 deg.

Check criteria #1:

From Mn/DOT Table 8.7, a min. MH dia. of 84" is required for the largest (54") pipe.

Check criteria #2:

From Mn/DOT Table 8.7 with D = 84":

P1 = 82.75"

P2 = 72.76"

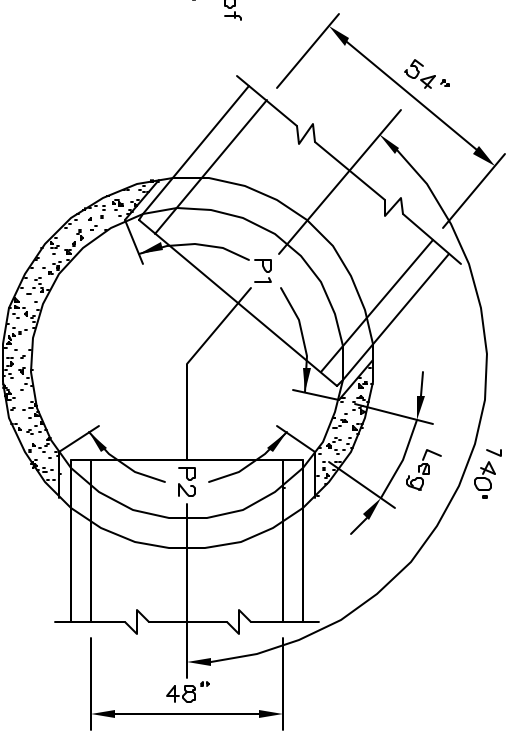
Calculate inside "Leg" dimension

$$\text{Leg} = \frac{\pi D \Delta}{360} - \left(\frac{P1 + P2}{2} \right)$$

$$\text{Leg} = \left(\frac{\pi \times 84 \times 140}{360} \right) - \left(\frac{82.75 + 72.76}{2} \right)$$

Leg = 24.87" > 8" OK

If the "Leg" dimension had been less than 8" the diameter of the manhole would be increased to the next larger size and the "Leg" dimension would be checked again.



MANHOLE DIAGRAM

NOTES:

1. Should 3 or more pipes be required, each set of pipes should be studied separately with respect to "Δ".
2. The flowlines are assumed to be approximately the same.

MINIMUM MANHOLE SIZE DETERMINATION