Manhole in InfoWorks ICM

# Introduction

Manholes in InfoWorks ICM have two stacked cylinders:

* A chamber sits at the bottom that connects the pipes
* A shaft on the top that provides access

A blue object with a red square

Description automatically generated with medium confidence

In most cases, InfoWorks ICM automatically calculates the shapes based on the connected pipe sizes, if the “#D flag” are set for the input parameters.

A diagram of a cylinder

Description automatically generated

However, for large diameter pipes, you may overwrite the default shaft area.

A computer graphics showing a blue and orange object

Description automatically generated with medium confidence

# Example

Consider 3 similar manholes that differ in the size of the pipe,

* mh24: 24” pipe
* mh48: 48” pipe
* mh46\_shaft16: 48” pipe with a shaft area of 16sf

Screens screenshot of a computer

Description automatically generated

A screenshot of a computer generated image

Description automatically generated

For fields with the #D flags, the default values are calculated by InfoWorks ICM:

* chamber floor is 95, the invert of the connecting pipe
* chamber roof is the crown of the pipe, for 24” pipe 95+2=97, and 48” pipe 95+4=99
* chamber and shaft area is the same: for 24” pipe pi\*(1 +0.762/2/3.281)^2=15.9SF, for 48” pi\*(2 +0.762/2/3.281)^2=33.18SF

A close-up of a chart

Description automatically generated

# 2D Meshing for manhole

When a manhole is connected to the 2D surface, InfoWorks ICM will aggregate the triangles around the manhole if needed to make sure the element has an area larger than the shaft area. For example, for the shaft with a 10ft diameter pipe, 9 triangles are merged for the element to contain the large shaft. If the shape of the element is critical, considering using break lines and mesh zone to refine the element.

A screenshot of a computer

Description automatically generated

# Conclusion

InfoWorks ICM automatically determines the manhole shape based on the pipe diameters. For large diameter manholes, the shaft size should be reviewed and reduced if needed. When modeling manholes in a 2D model, review the mesh element at the manhole to ensure it is correctly sized to match the manhole shaft.