



Advantages of Round Manholes over Square and Rectangular Shapes

The use of square and rectangular manholes is becoming common, as more sizes of flat-walled structures are created, promoted, and installed beneath street rights of way. When looking toward the new shapes, we tend to forget about the benefits of the classic circular manhole that serves the infrastructure industry very well.

There are situations where an intersecting series of pipes would be better accommodated by round manholes than flat-walled structures. Consideration of the sizes and angles of incoming and outgoing pipes must be taken when selecting a manhole. Round manholes work in any situation where the pipes do not enter and exit in multiples of 90 degrees. This configuration eliminates the need for large oval holes in flat walled structures to accommodate pipe angles. Oval holes create the need for grout work that may be challenging for contractors. Notoriously difficult are oblique cuts to the pipe ends so they become flush with the interior wall of the manhole. It is difficult to maintain a watertight connection with oval holes, since there are (generally) few available boots or gaskets designed for this shape of penetration. Round manholes require smaller excavations to install, with an absence of corners, and no “lining-up” of edges to achieve a fit between the risers.



Round manholes have several manufacturing and design advantages. It is assumed that the lateral earth pressure and hydrostatic pressure act uniformly around the periphery of the manhole in its installed state. Round sections experience no bending moment in the horizontal plane and accordingly they require less reinforcement. This allows round precast manhole sections to be installed at great depths without increasing the wall thickness of the structure - as long as slabs and bases are designed for the loads. Most precast manufacturers have equipment to produce circular cages for pipe, so creating manhole cages using the same processes is standard practice. Unless the manufacturer has box cage making equipment, it is more labour intensive to create cages or bend mesh for square and rectangular pieces. Round structures have fewer corners and edges that can be damaged during manufacturing or handling. This reduces the amount of patch work needed on a manhole before it reaches a contractor's site.

There are challenges associated with round structures, but these can be overcome with appropriate sizing and planning in advance. Round manholes do not tolerate the intersection of large pipes at 90 degrees without a significant upsize required to maintain the structural arm between pipe openings. They can be more difficult to modify when cutting or coring on-site. Pipes are usually cut to be flush with the walls at the springline instead of flush with the wall at all points, thereby reducing the amount of working space within the manhole. This may be seen as an advantage, since protruding pipes will reduce the length of benching required between them, given that a partial flow channel is already provided. In general, round manholes work well in most applications, but there are situations where round manholes are more difficult to install than a square or rectangular structure.

Flat walled structures satisfy the requirements of situations where a round structure will not work. It is a good service to clients for pipe producers to have the ability to supply square and rectangular manholes and keep all options available.

[Links](#)

[American Concrete Pipe Association Design Manual](http://www.concrete-pipe.org/pages/design-manual.html)

<http://www.concrete-pipe.org/pages/design-manual.html>

[Ontario Concrete Pipe Association Design Manual](http://ocpa.com/_resources/OCPA_DesignManual.pdf)

http://ocpa.com/_resources/OCPA_DesignManual.pdf

[Circular Precast Concrete Manholes \(Design Data 20\)](http://www.concrete-pipe.org/pdfdd/DD_20.pdf)

http://www.concrete-pipe.org/pdfdd/DD_20.pdf

[Manhole Flotation \(Design Data 41\)](http://www.concrete-pipe.org/pdfdd/DD_41.pdf)

http://www.concrete-pipe.org/pdfdd/DD_41.pdf

[Concrete Pipe Joints— Your Best Choice](http://www.concrete-pipe.org/epipe/ConcretePipeJointsBrochureFormat-highrez-epipe07-124.pdf)

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Note: Information for this TechInfo sheet was supplied by Laura Thomas, Inland Pipe, Calgary (<http://www.lehighhansoncanada.com/products/pipe.aspx>)

