

Manhole | types purposes | design | why

A manhole is a type of structure built generally constructed or placed under the ground for inspection or to provide the connectivity of pipes, etc.

It is a very useful structure in construction and there are many advantages of it.

A general definition of a manhole can be described as follows.

A manhole is an inspection chamber that provides the access to utilities such as sewer, drainage systems, water supply systems, etc.

Purposes of Manhole

- Inspection - It is used as an inspection chamber. When there are long pipelines, it is required the inspection for various purposes.
- Cleaning - When pipes need to clean, manholes placed in regular spacing will be used.
- Maintenance - It is required to do the maintenance on the pipelines that lay underground. They may be placed to transfer liquids or even they may be used for electrical works.
- To Joint two lines - When pipelines are played, they need to connect to maintain continuity. For example, a sewer line or water line can be considered.
- To seal foul gases escape - When sewer lines are running from starting point to end, there will be leaks in foul gases. If we construct seal manholes, they can be avoided.
- To maintain Conventional Length - Pipes can not lie over the full length. We have to have a connection. At the connection, we need to have a manhole for many purposes, as discussed above.

Types of Manholes

Mainly, they can be categorized under two main categories.

- **Circular Types**

Generally, the circular type is more popular due to its advantages over the square type.

It is more stable in terms of structural stability. The circular shape lead not induce bending and shear forces. Instead, hoop and meridian stress will be induced. Since the concrete is strong in compression, less reinforcement and less section thickness are required for these manholes.

- **Square Types**

Square type is also more commonly used. Due to the nature of the structure, this type may be more costly when compared to the circular type.

Other Types of Categorizations

Depending on the depth or the height of the Manhole, they can be divided into three types.

- Shallow
- Normal Deep
- Deep

In addition, they are categorized based on the type of construction material used.

Manhole Types based on Material used

- **Concrete Cast In-situ**

The most commonly used construction material is concrete. As it is readily available, it can easily be used used for construction.

- **Precast Concrete**
- **Steel**

Steel is not a commonly used type of manhole. However, in old structures and new construction, steel is used as a replacement for the concrete.

However, attention shall be used to durability as corrosion is a concern for the steel structures.



- **Plastic**

It is a modern type of manhole used in construction. It is very useful due to its advantages.

Low cost of construction, higher durability, no reaction with reactive materials such as sewer, easy to place, etc. are some of the advantages of these types.

Due to the low self-weight, it could not be able to place in the areas where the water table is high (close to the ground).

- **Fiber Glass**