

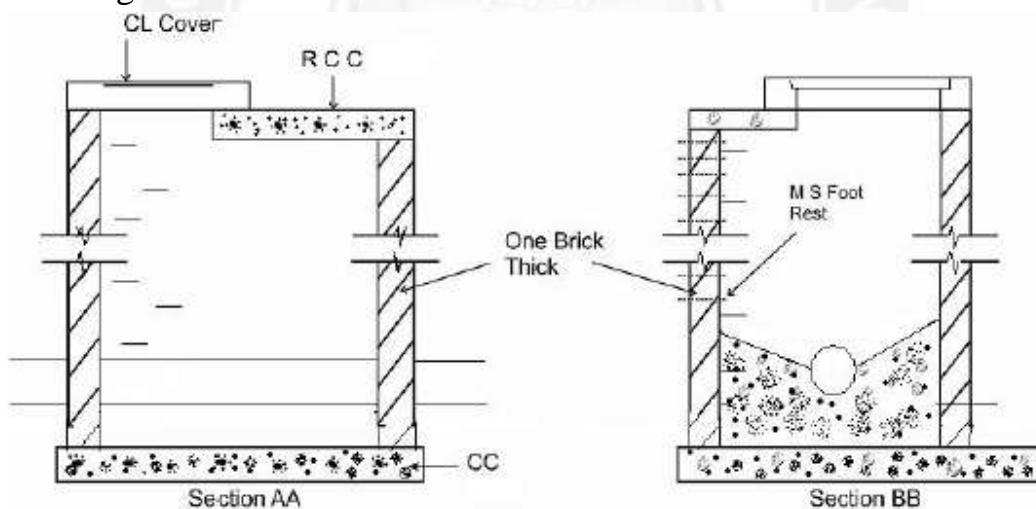
SEWER APPURTENANCES:

The structures, which are constructed at suitable intervals along the sewerage system to help its efficient operation and maintenance, are called as sewer appurtenances. These include:

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|----------------------|--------------------|-------------------|
| (1) Manholes, | (2) Drop manholes, | (3) Lamp holes, |
| (4) Clean-outs, | (5) Street inlets | (6) Catch basins, |
| (7) Inverted siphon, | | |

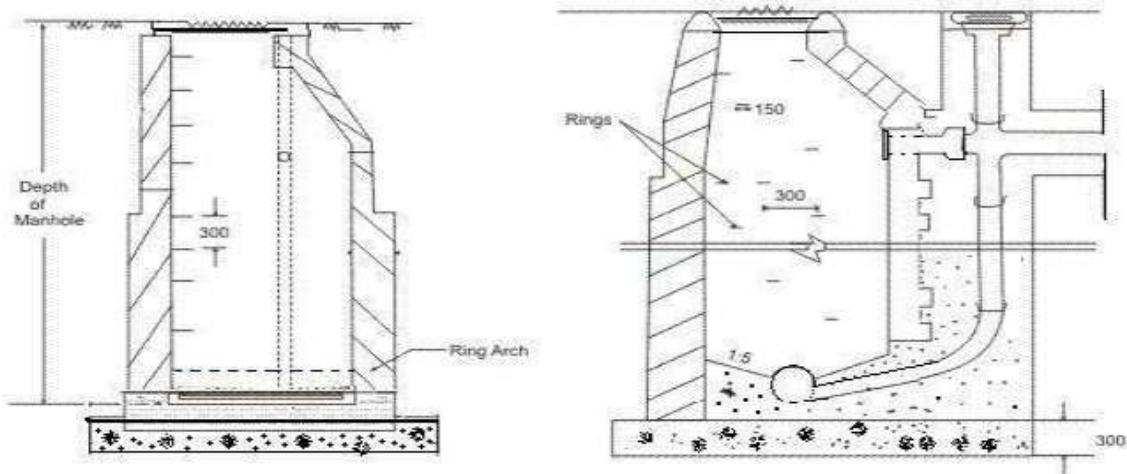
Manholes

The manhole is masonry or R.C.C. chamber constructed at suitable intervals along the sewer lines, for providing access into them. Thus, the manhole helps in inspection, cleaning and maintenance of sewer. These are provided at every bend, junction, change of gradient or change of diameter of the sewer. The sewer line between the two manholes is laid straight with even gradient. For straight sewer line manholes are provided at regular interval depending upon the diameter of the sewer. The minimum width of the manhole should not be less than internal diameter of the sewer pipes plus 150 mm benching on both the sides.



Drop Manholes

When a sewer connects with another sewer, where the difference in level between invert level of branch sewer and water line in the main sewer at maximum discharge is greater than 0.6 m, a manhole may be built either with vertical or nearly vertical drop pipe from higher sewer to the lower one. The drop manhole is also required in the same sewer line in sloping ground, when drop more than 0.6 m is required to control the gradient and to satisfy the maximum velocity i.e., non-scouring velocity.

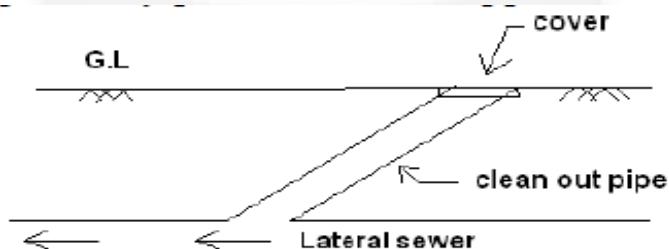


Lamp hole

It is an opening or hole constructed in a sewer for purpose of lowering a lamp inside it. It consists of stoneware or concrete pipe, which is connected to sewer line through a T-junction as shown in the figure. The pipe is covered with concrete to make it stable. Manhole cover of sufficient strength is provided at ground level to take the load of traffic. An electric lamp is inserted in the lamp hole and the light of lamp is observed from manholes. If the sewer length is unobstructed, the light of lamp will be seen. It is constructed when construction of manhole is difficult. In present practice as far as possible the use of lamp hole is avoided. This lamp hole can also be used for flushing the sewers. If the top cover is perforated it will also help in ventilating the sewer, such lamp hole is known as fresh air inlet.

Clean out

It is a pipe which is connected to the underground sewer. The other end of the clean-out pipe is brought up to ground level and a cover is placed at ground level (Figure 8.8). A clean-out is generally provided at the upper end of lateral sewers in place of manholes.



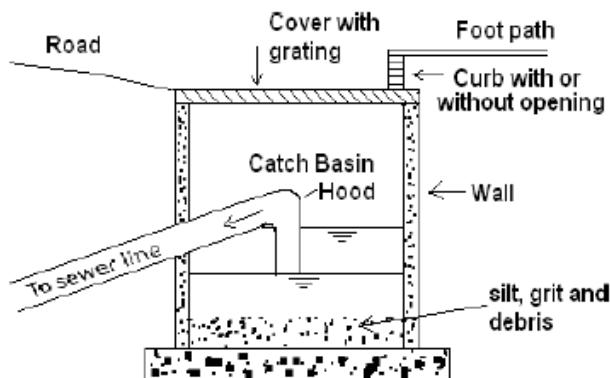
During blockage of pipe, the cover is taken out and water is forced through the clean-out pipe to lateral sewers to remove obstacles in the sewer line. For large obstacles, flexible rod may be inserted through the clean-out pipe and moved forward and backward to remove such obstacle.

Storm water inlets

Storm water inlets are provided to admit the surface runoff to the sewers. These are Classified in three major groups viz. curb inlets, gutter inlets, and combined inlets. They are provided either depressed or flush with respect to the elevation of the pavement surface. The structure of the inlet is constructed with brickwork with cast iron grating at the opening confirming to IS 5961. Where the traffic load is not expected, fabricated steel grating can be used. The clear opening shall not be more than 25 mm. The connecting pipe from the street inlet to the sewer should be minimum of 200 mm diameter and laid with sufficient slope. A maximum spacing of 30 m is recommended between the inlets, which depends upon the road surface, size and type of inlet and rainfall.

Catch basins

Catch basins are provided to stop the entry of heavy debris present in the storm water into the sewers. However, their use is discouraged because of the nuisance due to mosquito breeding apart from posing substantial maintenance problems. At the bottom of the basin space is provided for the accumulation of impurities. Perforated cover is provided at the top of the basin to admit rain water into the basin. A hood is provided to prevent escape of sewer gas.



Inverted Siphon

An inverted siphon or depressed sewer is a sewer that runs full under gravity flow at a pressure above atmosphere in the sewer. Inverted siphons are used to pass under obstacles such as buried pipes, subways, etc. This terminology 'siphon' is misnomer as there is no siphon action in the depressed sewer. As the inverted siphon requires considerable attention for maintenance, it should be used only where other means of passing an obstacle inline of the sewer are impracticable.

