

Figure 5-11 Typical junction chamber at manhole. Note: mm \times 0.03937 = in.-

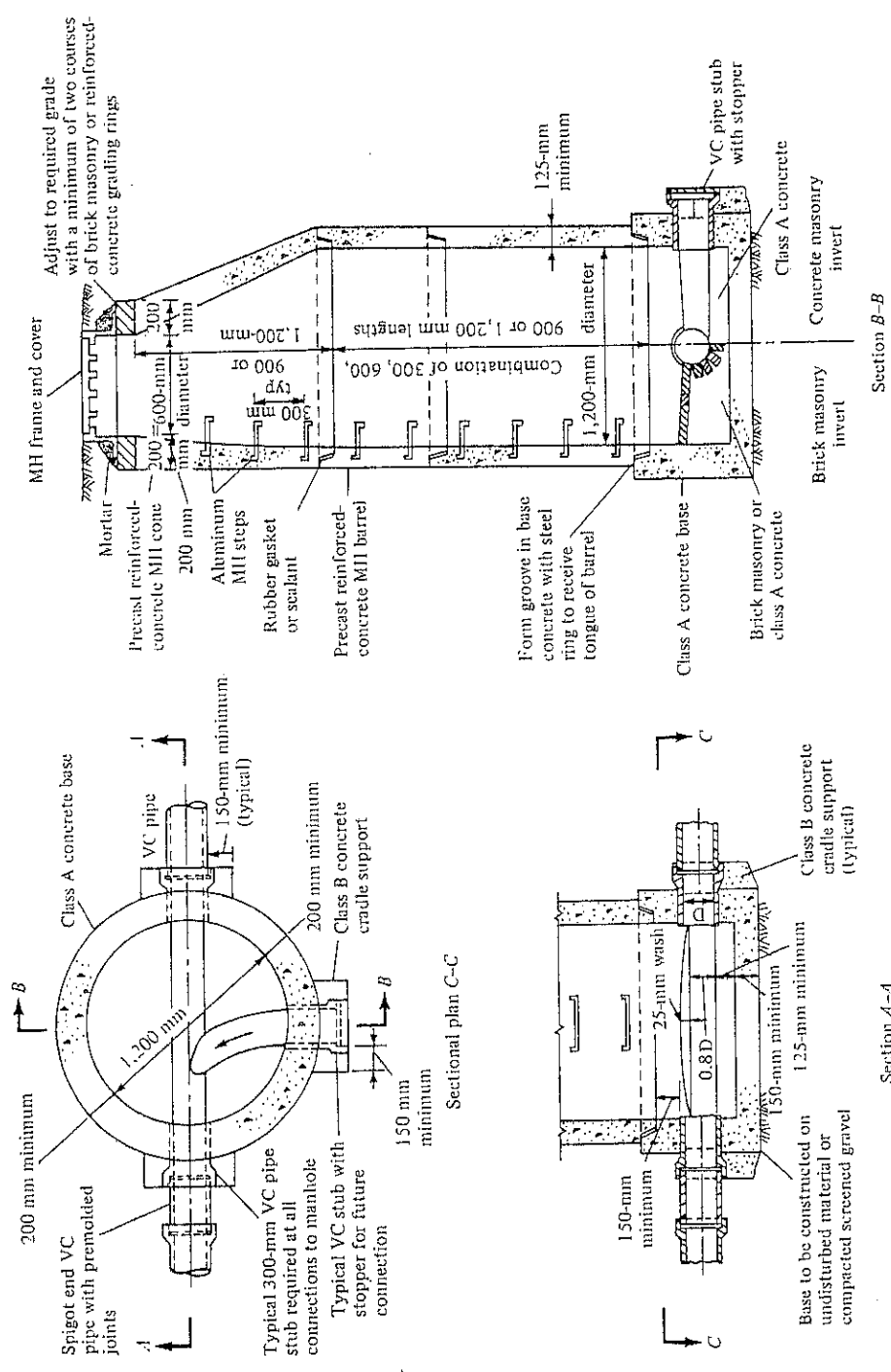
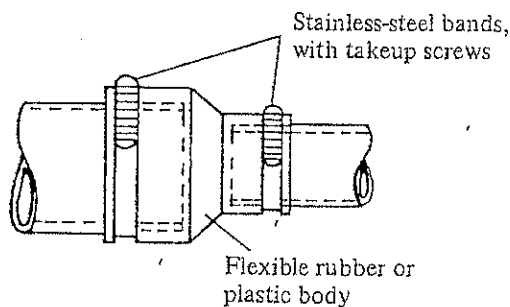
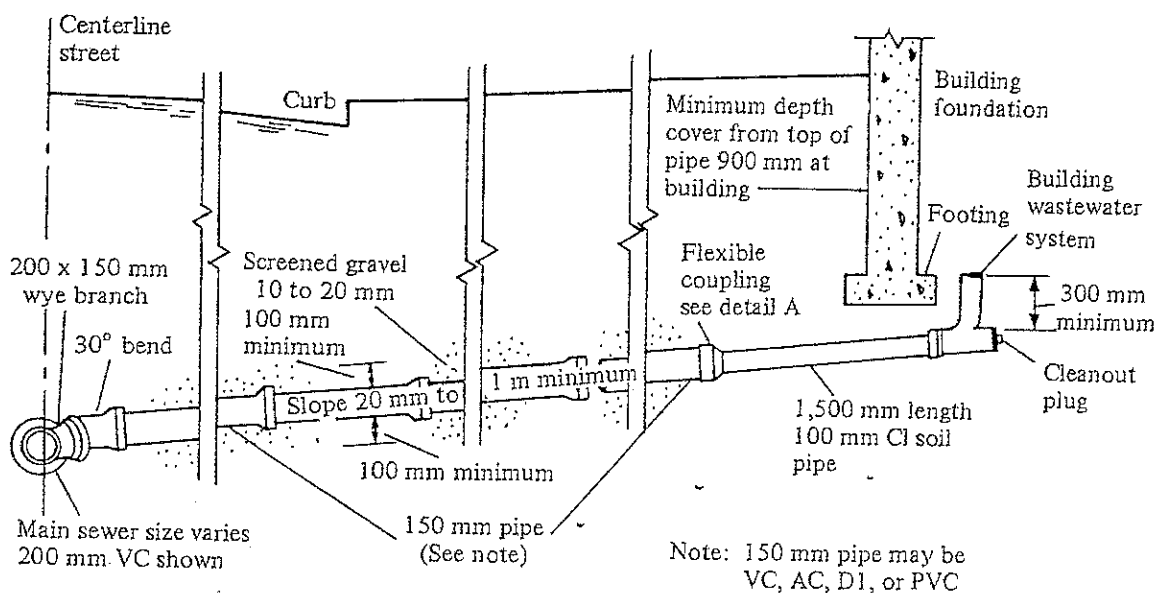


Figure 5-1 Manhole with cast-in-place base for vitrified-clay sewers 600 mm in diameter and smaller. Note: mm \times 0.03937 = in.

Building Connections

Building connections, also called *house* or *building sewers* or *house connections*, are small-pipe sewers leading from buildings to the public sewer in the street (see Fig. 5-5). In some places, the builder or owner is responsible for the construction of these sewers and the connection to the public sewers. In others, the municipality installs the portion of the work in the public street or even the entire connection from the street sewer to the building.

Most cities require the use of cast-iron pipe for the house sewer for a distance of 1 or 2 m outside the wall of the building. Regardless of the type of pipe used, care must be taken to support the pipe properly so that it will not be damaged by subsequent settling. If the pipe passes through the foundation wall, a joint should be provided at the outside face of the wall.



Detail A - Flexible coupling;
no scale

Figure 5-5 Typical house connection. Note: mm \times 0.03937 = in.

Figure 5-4 Typical drop inlets for vitrified-clay pipe. (a) Outside drop. (b) Inside drop for sewers 600 mm in diameter and smaller. Note: mm \times 0.03937 = in.

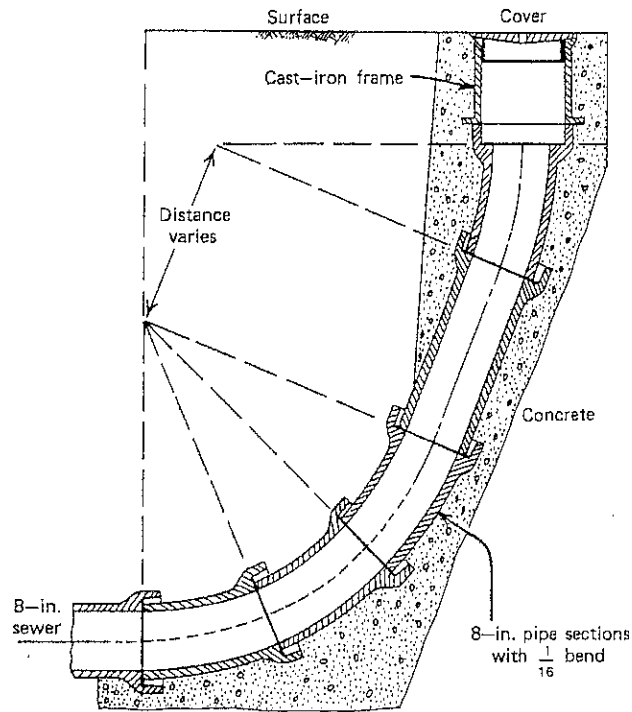


Figure 10-5 Terminal cleanout for ends of short branch or lateral sewers.

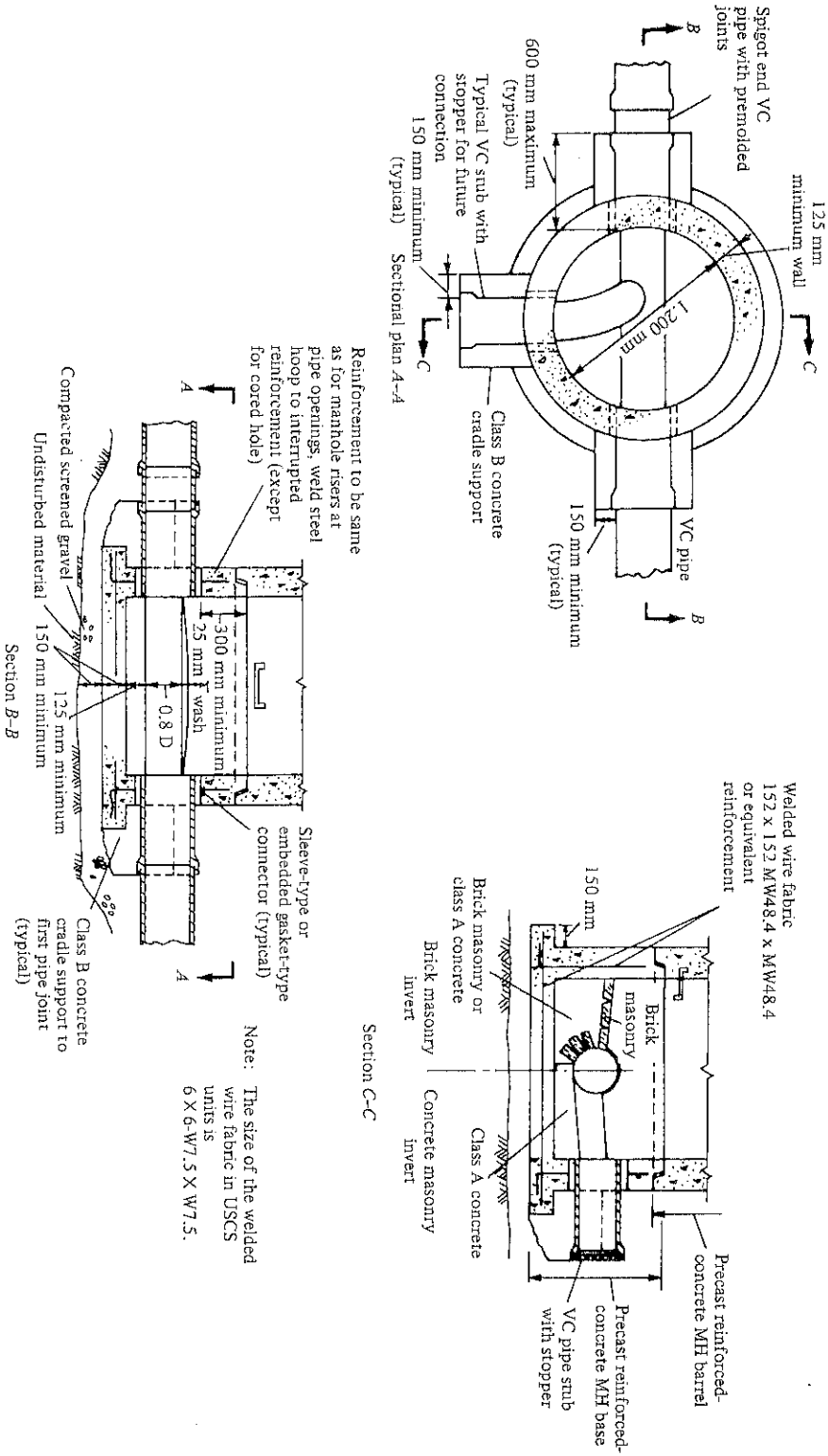


Figure 5-2 Typical precast reinforced-concrete manhole base for vitrified-clay sewers 600 mm in diameter and smaller. Note: mm x 0.03937 = in.

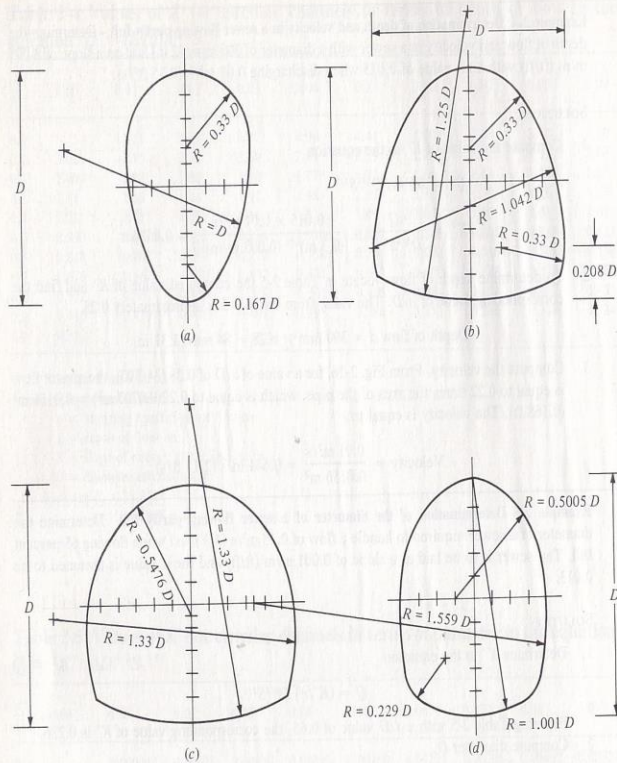


Figure 2-17 Noncircular sewer sections [12]. (a) Egg-shaped section; (b) semielliptical section; (c) horseshoe section; (d) basket handle section.

Table 2-6. Detailed data on these and other sections may be found in Refs. 1 and 11.

2-5 MINOR LOSSES

Head losses in sewerage systems other than the normal frictional losses that typically occur where the magnitude or direction of the fluid velocity changes are called *minor losses*. These minor losses can usually be expressed as functions of the squares of representative fluid velocities. Minor losses in closed conduits are somewhat different from those in open channels.

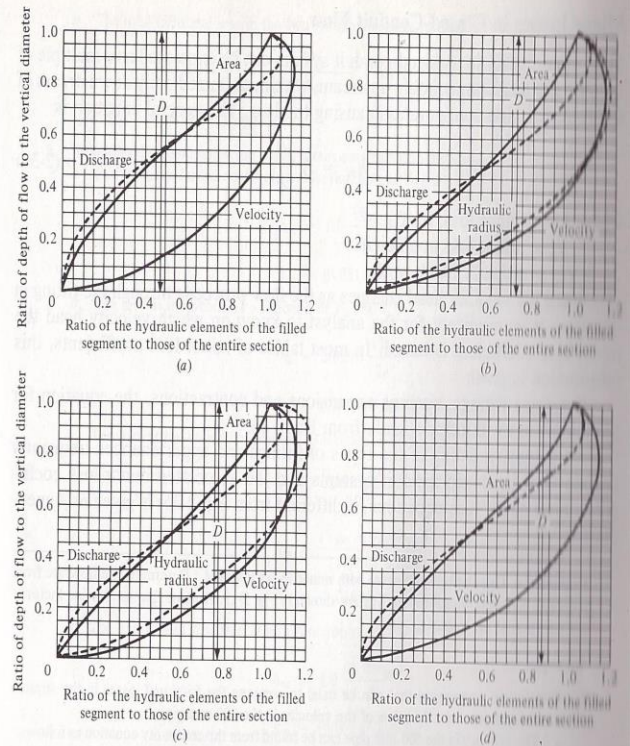


Figure 2-18 Hydraulic elements of noncircular sewers [12]. (a) Egg-shaped section; (b) semielliptical section; (c) horseshoe section; (d) basket handle section.

Table 2-6 Hydraulic elements of various sewer sections [1, 11] (see Figs. 2-17 and 2-18)

Type of sewer	Hydraulic elements of full sections ^a		
	Area	Wetted perimeter	Hydraulic radius
Egg-shaped	$0.510D^2$	$2.643D$	$0.193D$
Semielliptical	$0.783D^2$	$3.258D$	$0.240D$
Horseshoe	$0.913D^2$	$3.466D$	$0.263D$
Basket handle	$0.786D^2$	$3.193D$	$0.246D$

^a D = diameter of conduit, m.
Note: $m \times 3.2808 = ft$