

Guidance for use of Watertight Rings with Traditional Bases

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Guidance for the use of thick walled 'watertight' manhole rings with traditional in-situ manhole bases.

Typical manhole construction

Traditional manhole construction details are shown in Sewers for Adoption: an in-situ base accommodates the connecting pipe work. Above the level of these pipes the chamber is formed using traditional manhole rings with tongue and groove joint sealed with a proprietary sealing material or sand and cement mortar. These rings are then surrounded in in-situ concrete.

The alternative construction detail shown in Sewer for Adoption uses thicker wall rings of at least 125mm sealed with a proprietary elastomeric seals and load distributor. The rings sit on a precast base complete with benching that connects with incoming pipe work.

The thicker wall and elastomeric seal of the shaft of the alternative construction is watertight and structurally more robust than the traditional construction therefore the need for an in-situ concrete surround is removed.

The precast base connects in a similar way to the rings and the incoming pipes connect with the base using proprietary seals. This provides greater security of watertight performance of the base, which in the traditionally constructed in-situ base is reliant upon the workmanship in constructing the base for its watertight performance.

Additionally, as the benching is precast into the base the need for site operatives to enter a confined space is reduced.

Hybrid manhole construction

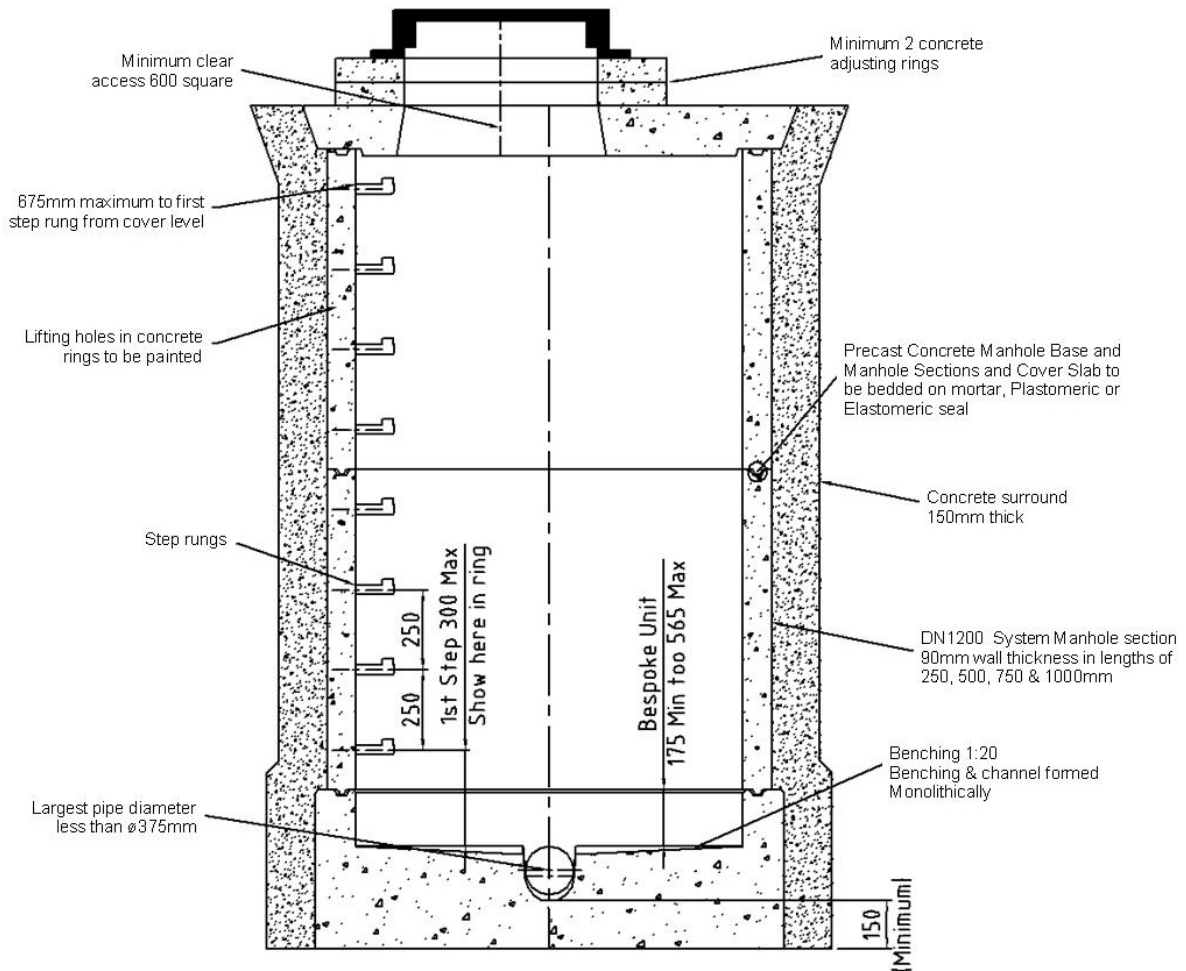
Choosing to realize some but not all of the advantages of the 'watertight' system is an option available to the contractor.

Traditional chamber ring with precast base

Stanton Bonna offer a precast base with a joint detail that is compatible with traditional manhole rings marketed as the 'Perfect' system. This takes advantages of pre-benched bases and proprietary seals for the incoming pipe work but the completed manhole would need to be surrounded in 150mm thickness of in-situ concrete due to the lesser wall thickness of the traditional rings.

Suggested construction details are shown below:

Perfect Manhole Base with standard manhole rings and cover slab (requiring a concrete surround 150mm thick)

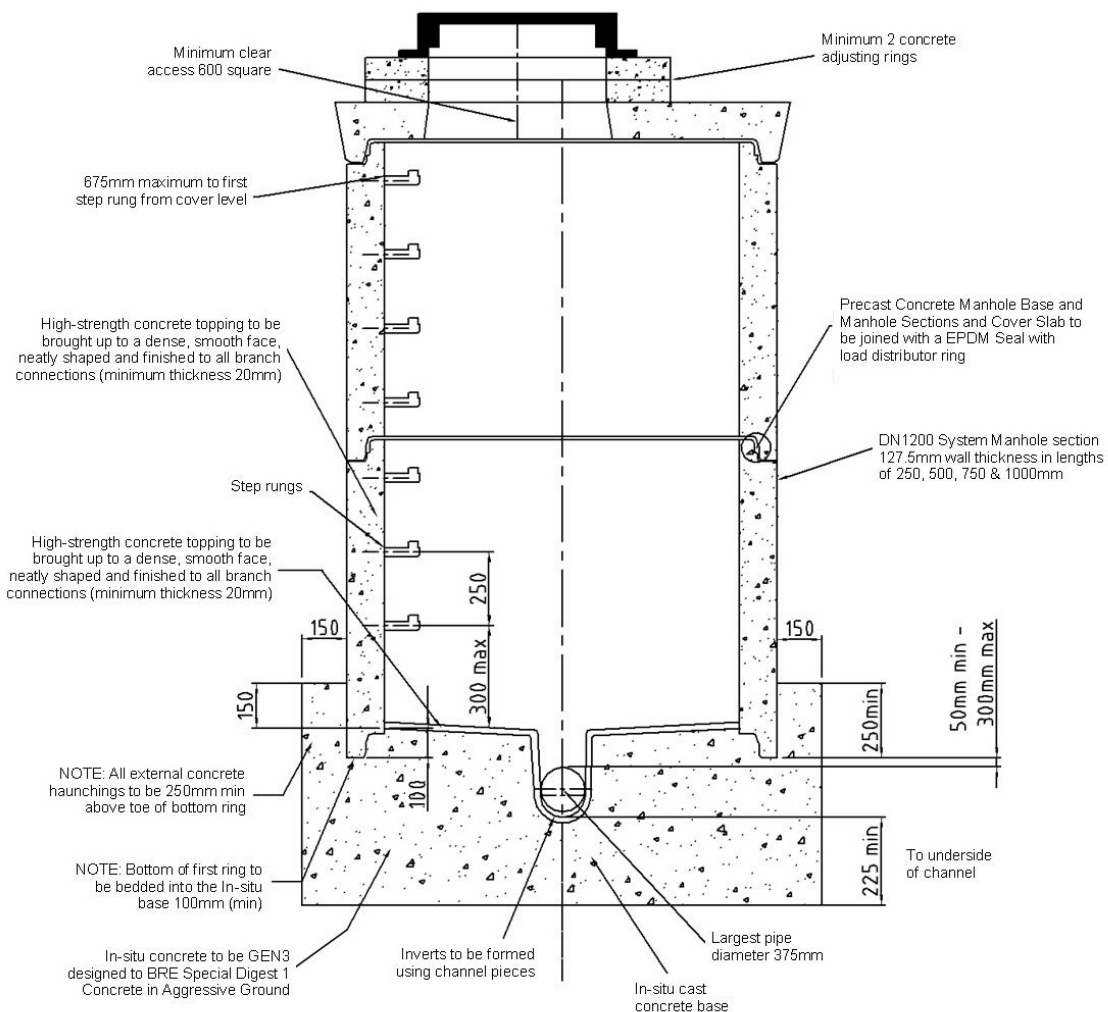


Traditional in-situ base with thick walled chamber rings

The advantage of the thick wall and proprietary seal between the vertical components is taken. However the watertightness of the incoming pipe work connections and the connection of the base to the chamber is reliant on the workmanship on site. The first ring of the chamber must be bedded into the in-situ base to ensure a barrier to leakage and to ensure load transfer for the shaft in to the base, as is the case with traditional manhole construction. The distance between the top of the pipe and underside of the precast thick wall chamber ring should be as shown in Sewers for Adoption for traditional chamber construction.

Suggested construction details are shown below:

Hybrid Chamber with in-situ concrete base, Perfect Watertight System, manhole rings and cover slab



Loads

The loads on the base when using the thicker walled chamber components will be no greater than when using traditional chamber rings as the load due to the in-situ surround is removed.

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