

Fibreglass Manholes

Manhole Features



ARMATEC

Stiffness

Stiffness to achieve buried design and vehicle loads is achieved by selecting the correct wall thickness as for pipe. Stiffening ribs can also be placed around the outside of the manhole.



Nozzles

Inlet and outlet nozzles are custom made to match the pipes ... butt fit with flexible joint and socket fit are common choices.



Flotation

An anti-flotation flange is typically fitted around the base of the manhole, and the weight of backfill counteracts flotation forces.



Anchoring Pipes

Inlet pipes can be anchored just outside the manhole to take up loads from thermal expansion. Otherwise these would stress the manhole to pipe joint.



Manhole Lids

Different styles are available to suit customer choices. Some styles allow for site trimming to final grade.



Ladders

Fibreglass or stainless steel ladders can be fitted internally to customer requirements. The fixing detail does not penetrate the fibreglass shell.

ARMATEC Environmental Ltd

ISO 9001

BUREAU VERITAS
Certification



Fibreglass Manholes

Manhole Design



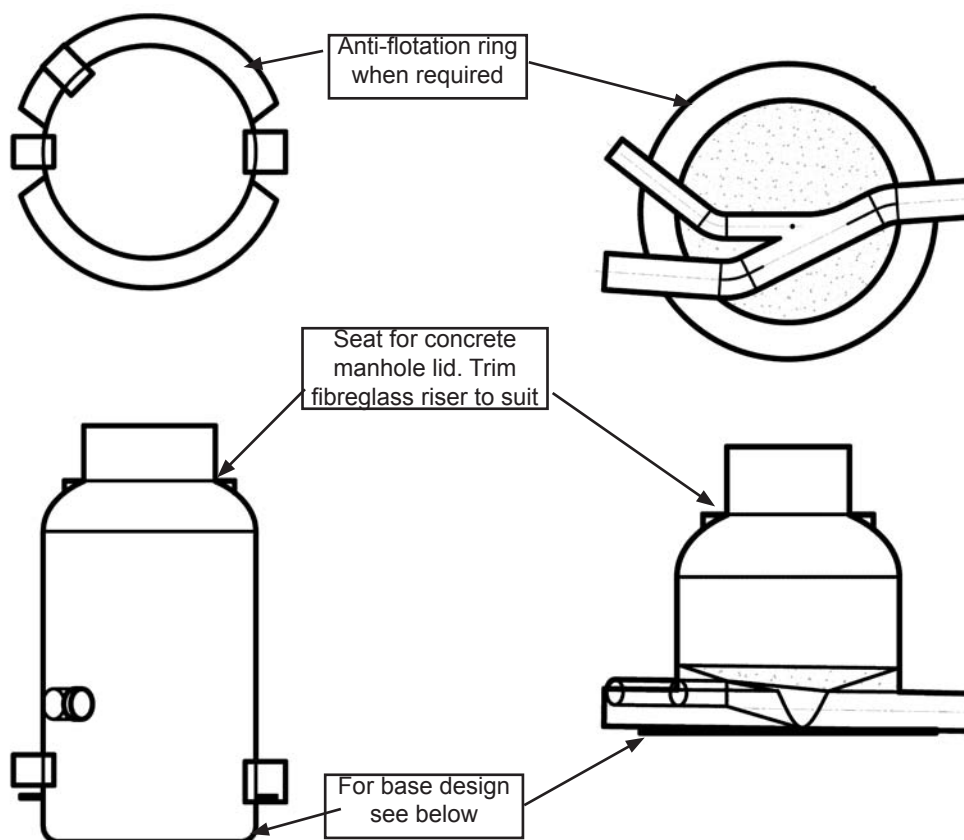
ARMATEC

Fibreglass manholes in drainage systems are purpose built. The majority of work is done in factory, minimising site work and ensuring leak free construction.

Manhole Design

Trade Waste Drains

Municipal Sewers



Trade Waste Base:

The base of a trade waste manhole has a 150 to 300 mm deep integral sump for the following reasons:

- Buffers fibreglass against thermal shock
- Buffers fibreglass against chemical shock
- Gives flow advantages
- Enables superior and more water-tight joints to be made on inlet and outlet pipes
- Extra height leeway for drainage contractor during installation
- Traps stones etc. protecting pipes

Municipal Sewer Base:

The base of a manhole for sewers has a flow through design so that solids cannot be trapped, i.e. self draining. The invert height and orientation of the main inlet and outlet are specified at design stage. This means the inlet, outlet, and haunching, are able to be done in our factory:

- Minimises work at site
- Leak free haunching and pipe joints
- Easy to clean smooth surfaces

ARMATEC Environmental Ltd



Fibreglass Manholes

Sealed Sewers and H_2S

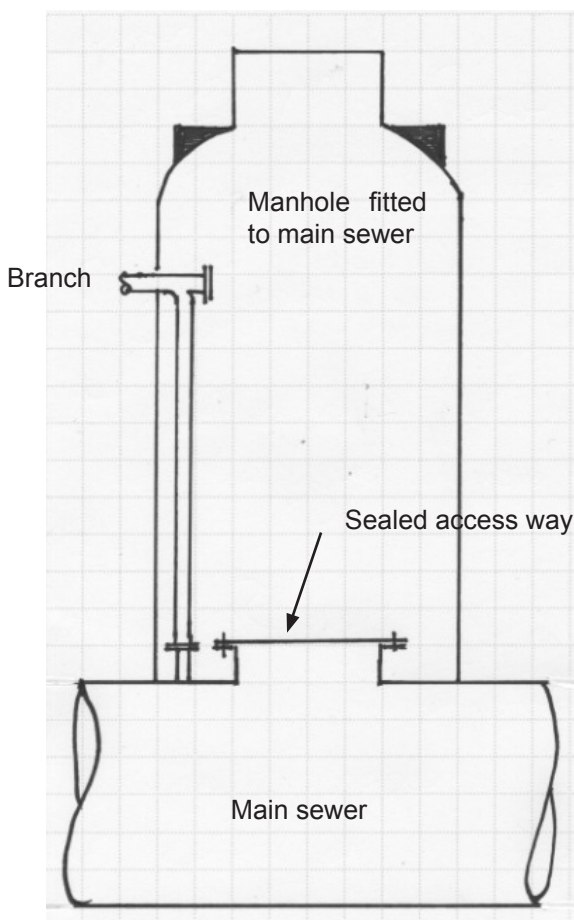


Sealed Sewers

Hydrogen sulphide gas is commonly found in sewers handling municipal wastewater. H_2S is both corrosive and highly toxic.

Sealed sewer systems are used to minimise the accumulation of H_2S , and the possibility of H_2S gases escaping to the environment. They are also used to streamline the flow and minimise the costs of site haunching.

In sealed sewers the main sewer line is totally sealed from the manhole (see sketch). The manhole can be placed over the main pipe at an elbow, or "wye" junction, or other branch.



H_2S Gas in Sewers

Personnel must take safety precautions before entering any sewer manhole. The H_2S concentrations can range from just a few ppm, to hundreds of ppm, and can kill quickly.

A number of people have been overcome by H_2S and died after entering sewer manholes. An unfortunate scenario is: a worker enters a manhole and collapses at the bottom; a second worker observes this and enters the manhole to assist, only to be overcome by the H_2S gases as well. Both will die if not assisted urgently.

H_2S causes throat and eye irritation, headaches, nausea, and fatigue. Symptoms become worse as the H_2S concentration increases. Loss of sense of smell occurs at concentrations over 150 ppm. Time to death is:

H_2S Conc: ppm	Time to Death
100 - 150	8 - 48 hours
150 - 200	4 - 8 hours
200 - 350	1 - 4 hours
350 - 450	38 minutes
450 - 700	2 - 38 minutes
Over 700	0 - 2 minutes

ARMATEC recommends that H_2S gas concentrations are measured and monitored during any manhole entry. In addition, ARMATEC practice is to blow fresh air into the manhole with a flexible duct, to provide a source of fresh air should a worker experience problems.

More on Sealed Sewers?

If you are interested in pursuing sealed sewers, please contact ARMATEC. We can prepare detailed drawings for your project.

Fibreglass Flumes



Fibreglass Flumes

Fibreglass is ideal for the complex shapes of flumes. The end product is one-piece and jointless. All flumes are made from accurately formed moulds, ensuring reproduction is achieved with a high level of accuracy. Flumes can be supplied with integral manholes.

Trapezoidal Flumes

Trapezoidal flumes offer accuracy at a wide flow range and are particularly suited for smaller flows under 100 m³/hr. They have a flat floor with no hydraulic jump, therefore are particularly suited to flows with solids such as mixed sewers.

Parshall Flumes

Parshall flumes offer low head loss, which minimises the effect on the flow being monitored. They have a high degree of self cleaning capability and are able to withstand relatively high degrees of submergence without affecting the rate of flow. They are ideal for measuring a wide range of flow rates, especially larger flows over 100 m³/hr.

Palmer Bowlus Flumes

Palmer Bowlus flumes are compact and portable and often used for retrofitting in an existing pipeline. They are specified according to the pipe size they are being fitted to.

Level Measurement Options

The liquid flowrate is determined by measuring the height of the standing wave formed in the flume. Two ways of measuring the height are:

- **Bubbler in Still Well:** Air is bubbled into the base of a still well connected to the throat of the flume. A pressure sensor on the air bubbler pump gives the measurement of the height of the standing wave. Stillwells can be used on clean water and non-crusting liquids.
- **Ultrasonically Level Transmitter:** Measures liquid level directly above the throat.



Parshall flumes for main city sewer flow monitoring



Parshall Flume installed in nine hour shutdown



Trapezoidal flumes for flow monitoring in small sewers. Easy to set up with flow sampling.