

Fibreglass Liner

For manholes & pump stations

Sept 11



ARMATEC

FRP (FIBREGLASS) LINER

Reinstate deteriorated concrete manholes and pump stations in wastewater networks by inserting an ARMATEC FRP liner. The FRP liner is pre-made in ARMATEC's factory to the required dimensions before excavation begins. Once inserted and sealed at the bottom, and after inlet pipes are made off, the annulus between the FRP liner and the concrete is filled with a flowable cement grout to seal and fill the cavity.

Manhole Detail: The bottom and underside of the top are coated with Armaline™ 1730 moisture tolerant epoxy coatings from ARMATEC.

Pump Station Detail: Insert a Flygt TOPS base into the pump station, grout in place, then land the FRP Liner on this and seal the joint.

The majority of the internal surface area in a manhole or pump station is the walls (often 90%). This is the part of the concrete manhole or pump station that deteriorates the fastest, and is most prone to leaks and infiltration. It is also the part that is quickly and easily lined with the FRP liner.

BENEFITS OF FRP LINER

- **Restores strength** to deteriorated concrete manholes and pump stations. The FRP liner can be made to any wall thickness to either add back some strength, or be strong enough totally on it's own.
- **Corrosion resistant** to H₂S and many other corrosive gases. Indefinite life in wastewater networks.
- **Easy clean surface** of the exceptionally smooth mould finish fibreglass for minimal ongoing costs.
- **No infiltration or leaks** possible in the future as the liner plus grouting seals all current leaks.
- **Indefinite life;** design life for the FRP liner is 50 years plus.

PROBLEMS FOR COATING ALTERNATIVE

Problems coating a manhole or pump station wall are:

- **Surface preparation** is difficult with deteriorated concrete in confined space. It is difficult to get back to 'sound' concrete. Plus there is the debris to remove.
- **Uneven surface** that results is difficult to coat and achieve a smooth and pinhole free finish.
- **Wet surface and humid conditions** make coating application and curing difficult.
- **No restoration of strength** to the deteriorated concrete manhole or pump station.
- **Cracks and joints** in the concrete are partially, but not totally, sealed.
- **Limited life;** design life for a coating is 10 years, after which time it will need replacing or at least some maintenance.

These problems are overcome using a FRP liner from ARMATEC.

USES

- Municipal sewer manholes
- Chemical sewer manholes
- Pump stations
- Flume access ways



FRP liner in a manhole results in an exceptionally smooth corrosion resistant surface, plus it restores strength to a deteriorated concrete manhole. The whole process can take just a few days with minimum excavation and disruption at the surface.



The extent of surface excavation at the surface required for the fibreglass liner method can be seen in this photograph; a two metre square only for just a few days. A huge excavation would have been required to completely replace the concrete manhole due the unstable sandy nature of the ground; the road would probably have needed to be closed, as well as the adjacent cafe and bar, for a week or more.

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TYPICAL INSTALLATION PROCEDURE

For the suggested procedures and methodology for reinstating a concrete manhole or pump station using an ARMATEC FRP liner, see the separate bulletin. Go to the website: 'www.armatec.co.nz', then click on 'Coatings & Linings', then 'FRP Liner'.

Local civil contractors can do most or all of the work, including the small areas of coating at the top and bottom. Alternatively ARMATEC can supply tradesmen to do the specialist work in partnership with the contractor.

There are many different ways of sealing off the bottom of the FRP Liner. All that is required is for the seal to stay in place during the first lift of grouting the annulus.

The manhole or pump station can be lined LIVE, or flows can be stopped for short periods to make the tasks easier. Employ safe work practices at all times when entering a confined space in a wastewater network; H₂S accumulation is dangerous and can kill.

FAST INSTALLATION

Minimal excavation is required compared to totally the manhole or pump station. Installation can be done in a few days, minimising disruption and costs.

DETAILED DESIGN

Contact ARMATEC engineers for the design if the FRP Liner. It is essential that the wall thickness and stiffness is sufficient to handle the loads during grouting of the annulus. If this is done incorrectly, the FRP Liner could buckle inwards during grouting.

FLYGT TOPS BASES - PUMP STATIONS

Flygt TOPS Bases are manufactured in corrosion resistant fibreglass, with precontoured slopes and pump discharge elbows mounted. This base is available from Xylem (previously ITT Water & Wastewater) at phone 09-415-8687).



FRP Liner ready to install - easy clean smooth internal surfaces



Lowering the FRP Liner into place ready to make off inlets and grout the annulus. Use safe practices at all times - H₂S monitoring equipment, fresh air forced fed, and personal protective equipment.

