

MANHOLE REHABILITATION THAT MATTERS:

The Utilization of FRP Composite Structural Manhole Inserts for Lasting Impact



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX



Introduction



Chris Welch

Director North America Sales
Water, Environmental and Flow Solutions

Fiber Glass Systems | NOV

Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX



Water, Environmental & Flow Solutions



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX



Rehabilitation of Concrete Manholes Using Structural Fiberglass Manhole Liners



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX



Installation of fiberglass manhole liners

- *Structural Repair* of degrading manhole assets
- Minimal disruption of service and traffic flow
 - Prevents I&I
- Impervious to H₂S Corrosion
 - Maintenance Free

With several easy steps for a completely rehabilitated non-corrosive sanitary sewer manhole.



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX





Case Study: Manhole Site Location WWTP - Tulsa, OK

Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX



Basic Equipment and Personnel -

Backhoe, generator, saws-all or jigsaw & safety equipment.

Backhoe operator, and several laborers.



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX



Basic Materials-

- Fiberglass manhole liner (measure from the invert to the finished grade and deduct one foot).
 - Approximately 10 gallons of epoxy grout
- Scrap pieces of PVC (same size as incoming and lateral sewer lines coming into the existing manhole).
 - Six inches of concrete or brick grade rings.
 - Approximately 2 yards of wet concrete grout.



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX



CAUTION

Observe all safety rules and regulations.
H2S gases may be present and necessary
Precautions should be taken.



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX





Excavate and expose the existing manhole cone section.

Make sure to leave ring and cover on manhole until excavation is complete to prevent debris from falling into manhole.



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX



Remove the Existing Ring and Cover.



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX





If lateral sewer connections are coming into the side of the manhole, mark the location of the sewer lines on the new liner.



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX



Insert the new fiberglass liner into the existing manhole.



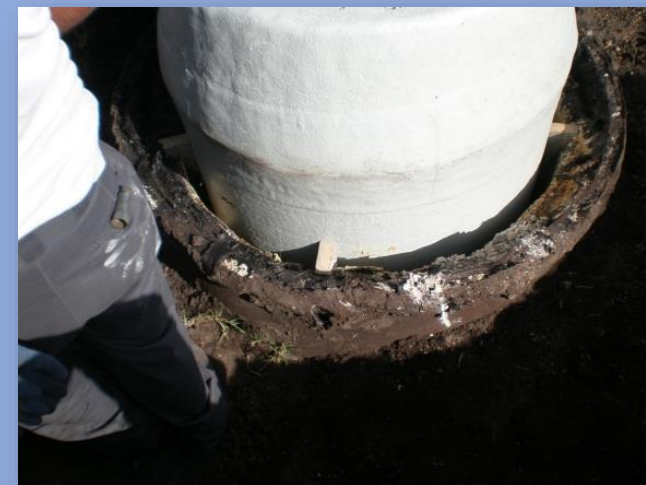
Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX



n and center the manhole liner in the existing manhole.
Use wedges to keep the liner in place.



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX





Mark contour of the existing bench
on the bottom
of the new manhole liner.



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX



Cut along the contour marks.

The goal is to match the existing contour of the bench area within 1 inch.



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX





Use a saws-all with a carbide grit blade to make the contour cuts.



Place the fiberglass liner
into the existing manhole.



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX





Align the manhole liner using wedges.
Make sure to level
The manhole liner.



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX





Using proper safety equipment,
enter the manhole liner.

Seal around the bottom of
the manhole liner.

If a drop sewer line is present,
make a cutout for the drop
sewer line.

Insert a short piece
of PVC into the drop sewer line
to be used as a form.



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX



Pour a concrete slurry or epoxy grout
Into the annular space between the fiberglass manhole
Liner and the existing concrete manhole.



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX



Bring grout or back fill material
to the same elevation as the
flat surface of the
manhole liner cone section.



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX



Install grade rings and (re-)install ring & cover.



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX



In flood plains, the fiberglass manhole liner may extend above grade.

A concrete cap may be poured around the fiberglass manhole liner with this type of installation.



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX



The result is a rehabilitated, water-tight
Non-corrosive manhole.



06/25/2009



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX



Who's using FRP manholes??

- SAWS
- TRA
- Ft. Worth
- Dallas
- Beaumont
- Corpus Christi
- Laredo
- Amarillo
- Lubbock
- Midland
- Odessa
- Tulsa
- Tucson
- Minneapolis
- Kansas City
- Nashville
- Sioux Falls
- Miami
- Tampa
- Orlando
- Jacksonville
- Omaha
- Lincoln
- Denver
- Riverside, CA
- Carlsbad, CA and NM
- Many more....



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX



FRP Composite Rehabilitation Inserts

- 1-piece Watertight FRP Structures
- Highly Corrosion Resistant
- AASHTO H20 Traffic Rated
- Design meets ASTM D3299
- Minimizes I & I
- Lowest life-cycle cost
- Maintenance-Free for the Life of the Manhole
- Over 50 Years of Experience



Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX



QUESTIONS?

Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX



Thank you!

Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX

