Wisconsin Wastewater Operators Association

CURED-IN-PLACE MANHOLE LINING & INSTALLATION

PRESENTED BY: Mike Blazejovsky Visu-Sewer, Inc.
CIPM Lining Introduction

- Manufactured by McNeil Technologies since the 1990’s

- Fully Structural monolithic liner
- Manufactured custom fit
- Prevents corrosion
- Prevents infiltration
- 100 year anticipated design life
- 20 year material Warranty
- 5-U.S. patents
Triplex literally means “3 layers”

Outer layers (1) and (3) are structural fiberglass material. One bonds to the MH wall and the other forms the inside of the new manhole.

Middle liner (2) is a non-porous, water and gas impermeable PVC material with felt on both sides.

100% Solids Epoxy
Project consideration

- Shape and Depth
  - Measurements
  - Thickness
  - Installation time
- Lining bench only or invert?
- By-pass pumping
  - Inside drops
- Access
  - Traffic
  - Overhead wires
  - Easements
- Cure-In-Place Pipe
  - Line pipe first

Collapsed manhole
Custom Fabrication

Please Indicate Canister Diameter

STRUCTURAL & WORK CONDITIONS
- Structure: [ ] Brick, [ ] Concrete, [ ] Other
- Explain:
  - Night Installation Required
  - Surcharge above Benches
  - Force Main above Benches
  - Laterals above Benches
  - Sewage Flow Control Problems
  - Truck Access Problems
  - Heavy Traffic Control Problems

PREP CONDITIONS
- Remove Steps
- Remove old Rehab materials
- Severe H₂S Deterioration

Infiltration
- [ ] Minor, [ ] Severe

Pipes
- [ ] Walls
- [ ] Invert Channel
- [ ] Bench
- Rebuild Wall Sections
- Build new Benches
- Re-shape existing Benches
- Re-grout: [ ] Pipes, [ ] Rings
- Remove Drop Pipe?
- By Whom?
- Other(s)

Special Conditions:
- Invert Channels to be lined?
- [ ] Yes, [ ] No
- Diameter change: If lining channel, make sure bench section is drawn below.

Special Manufacturing Instructions:

Structure Location / Map
- Location/Address:
  - [ ] 24”
  - [ ] 30”
  - [ ] 36”
  - [ ] Other
- Bottom Disc: [ ] Round, [ ] Oval
- Special Manufacturing Instructions:

Visu-Sewer
Preparation for Installation

- Surface Preparation
  - Pressure washing
  - Remove debris & lose material
  - Degreaser

- Remove Obstructions
  - Roots
  - Deposits
  - Steps
  - Inside drops

- Infiltration
  - Hydraulic cement
  - Chemical grout
- The CIPM liner is wet-out at the project site.
- During the resin “wet-out” process, a layer of plywood covered with plastic is used to protect the surrounding area.
Bench and Flow-line preparation
Crew travels to the job site with the liner(s) to be installed and the resin. The truck(s) have a crane, a boiler for heat and pressure, tools, and other items needed to perform the CIPM process.
Each custom liner is individually fabricated and packaged.

Liner has a “rim” and “handles” to facilitate wet-out.

Liner is rolled out on the plastic to begin wet-out.

Liner is rolled out. It will have resin applied on one side, then “inverted” and applied to the other. That’s what the handle is for. This will be cut off after the manhole is finished.
1. Top of liner with handle
2. Half piece for manhole bench
3. Main body of liner
4. Inflatable bladder that will be removed after curing.
Left View is the inflatable bladder from the top. Right view is the bladder after the liner has been “inverted” to wet out the inner layer. Note that this bladder is inflated during curing to force the liner against the manhole wall and is then removed after the manhole is fully cured.
Resin is brought to the site in pre-packaged kits from the manufacturer consisting of resin and hardener. The resin and hardener are mixed at the project site, and applied by rollers, brushes, and by hand.
The resin is a thermal set resin and must be applied rapidly!
Resin is applied to both sides with a roller and by hand to saturate all folds in the liner.
Note the pull ropes that are attached to the lift straps sewed to the liner at the factory (1). The liner is finally inverted using gravity and a crane (2, 3). Wet-out then continues on the other side of the liner. This side will adhere to the MH wall.
This is the device that frames the manhole casting and allows for inflation of the internal bladder and steam injection for curing.
Half moon bench liners are installed prior to insertion of the overall manhole liner.
If necessary, after the bladder is inflated but before steam curing begins:

- Someone may be lowered into the liner bladder to make sure of a proper fit against the interior of the MH walls.
Note the benches that were cured. CIPM liner can also be applied to the invert if specified by the engineer.
Manhole Lining Options

Ideal for brick and block manholes that are missing mortar
Manhole Lining
Raven Epoxy
Questions?