

SPRAYWALL PIPE LINER

Office of Project Development (OPD)
Conference

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PROBLEM – DETERIORATED PIPE WEST RIVER ROAD INTERCHANGE



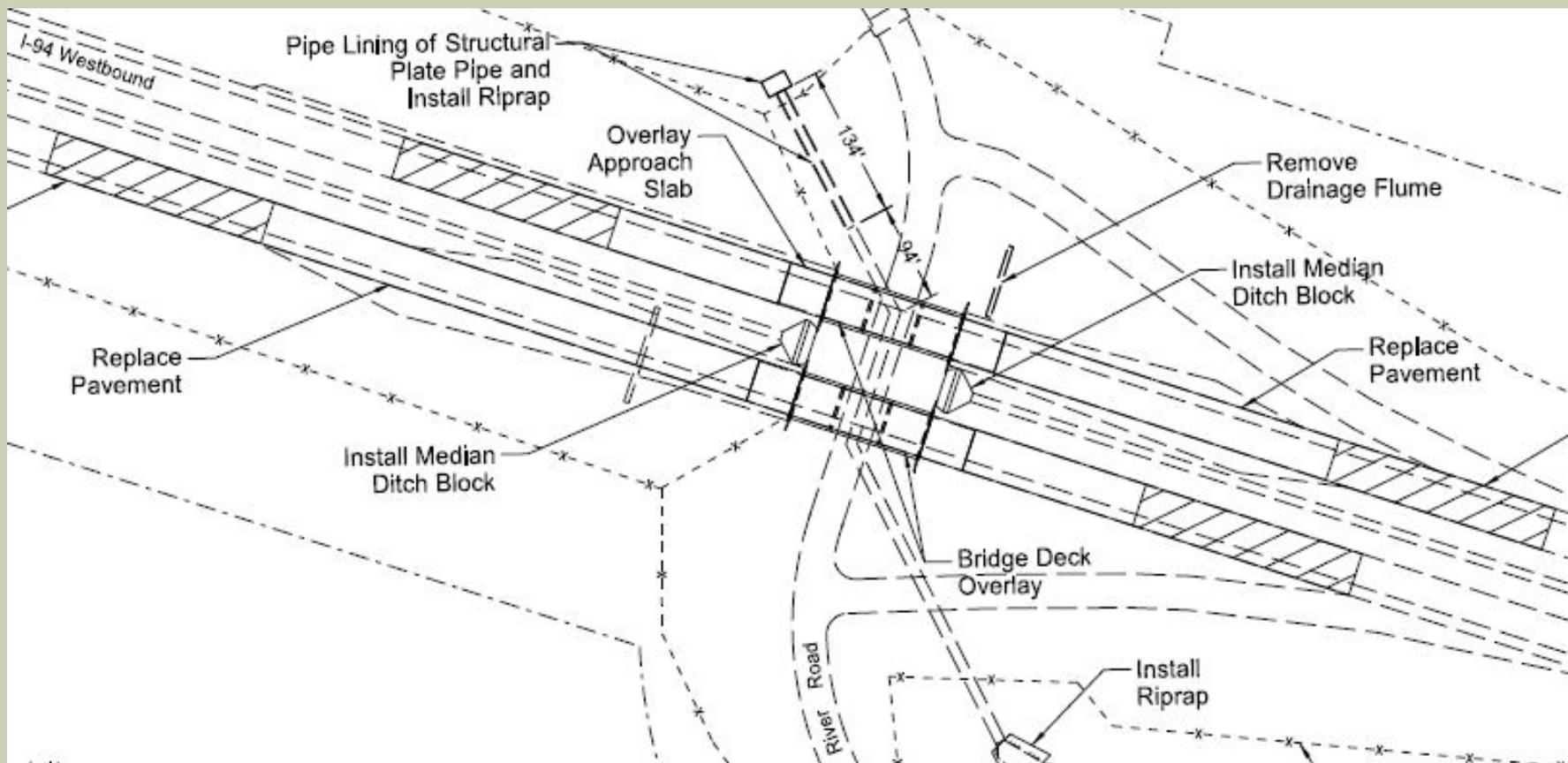
PIPE CONDITION



PIPE CONDITION



PLAN VIEW OF PIPE



OPTIONS

■ Pipe Replacement

- Drive piling for approximately 30' of excavation.
- Possible closing of separation road.
- Time!

■ Lining the Pipe

- No disruption to traveling public
- Much quicker fix.
- NDDOT did not have much experience with pipe liners.

SPRAYWALL PIPE LINER

Spraywall is a self-priming polyurethane lining that can re-establish structural integrity.

- Product of “Spayroq Protective Lining Systems”
- 2-part polyurethane
- Applied utilizing a proprietary heated spray system
- Cure Time
 - Tack-free after 2 minutes
 - Initial cure complete after 60 minutes

SPRAYWALL PIPE LINER - DESIGN

- Structural Design Thickness = 500 mils
 - Structurally competent without host pipe

- Mannings Coefficient = 0.09
 - RCP = 0.12
 - CMP = 0.18

- Liner thickness calculated using ASTM F1216
“Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube”

- Average Bid Price = \$138,950

PIPE PREPARATION

- Dewatered the pipe
- Removed the corrosion
- Sealed deteriorated holes caused by corrosion
- Heated the pipe to optimal temperature for SprayWall installation

REMOVING THE CORROSION



SEALING DETERIORATED HOLES

- Speed Crete Blue Line
 - a rapid setting cement based mortar
 - Applied and finished with hands
 - Filling holes provides profile for Spraywall



BEFORE AND AFTER PIPE PREPARATION



SPRAYWALL INSTALLATION

- Technician wore a Tyvek suit and mask
 - Fresh Air
 - Cooler temperature
- Test Panel
 - Used to find correct application rate.
 - Performed Daily
 - If weather conditions change multiple test panels may be performed



SPRAYWALL INSTALLATION

- Pipe must be completely dry
- Can be applied during winter months
 - Hose transferring 2-part polyurethane is heated
 - Inside of pipe is also heated
 - Water near entrance is frozen



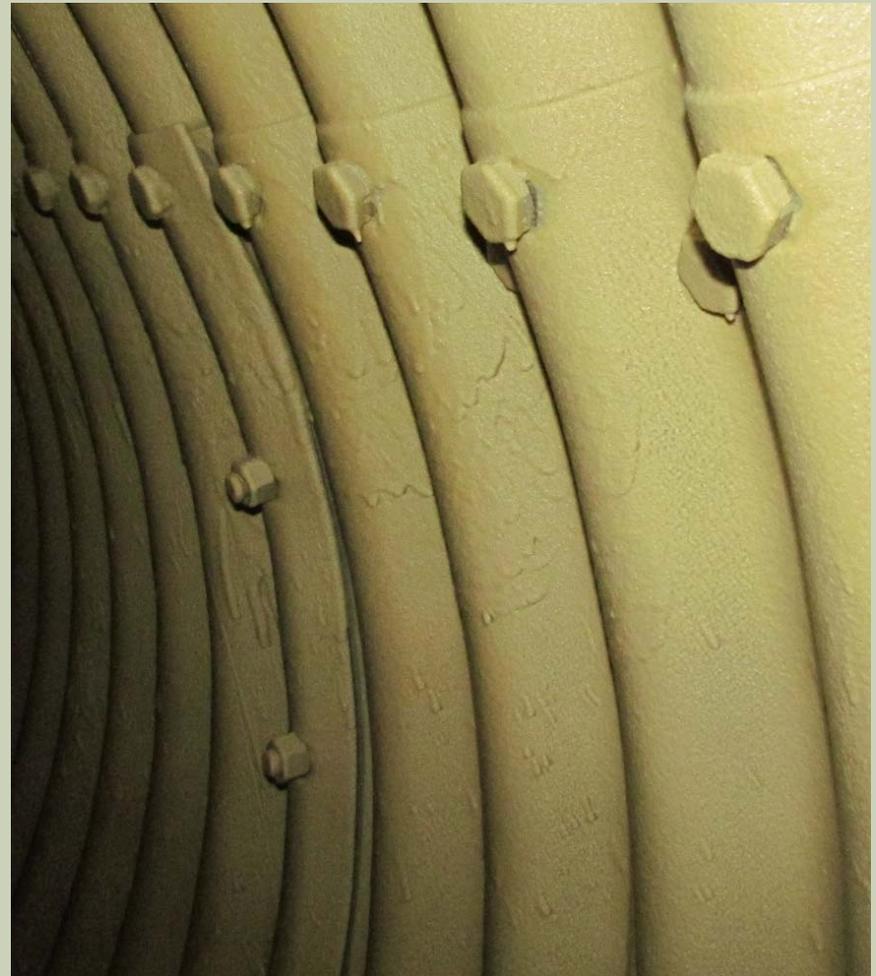
SPRAYWALL OVERLAP

- If unable to complete in one day, an overlap transition is used.
- Existing Spraywall Liner scuffed with wire brush to ensure adhesion.



SPRAYWALL INSTALLATION ISSUES

- Getting proper coverage around sharp angles
 - Contractor had adjust spraying technique
- The Spraywall components were setting up within the hose and spray nozzle.



COMPONENTS SETTING UP IN HOSE

- Components sensitive to pressure.
- Longer length of hose requires more pressure.
 - Pipe entrance location was difficult to get Spraywall pumping equipment next too.
 - Hose length = 400'
 - Optimal length = 300'
- Required additional time to finish project.

THICKNESS OF LINER

- Contractor and Materials & Research performed depth checks.
- Drilled hole into liner and measured depth with caliper.
- Holes Repaired with SR 6100, an epoxy from Sprayroq

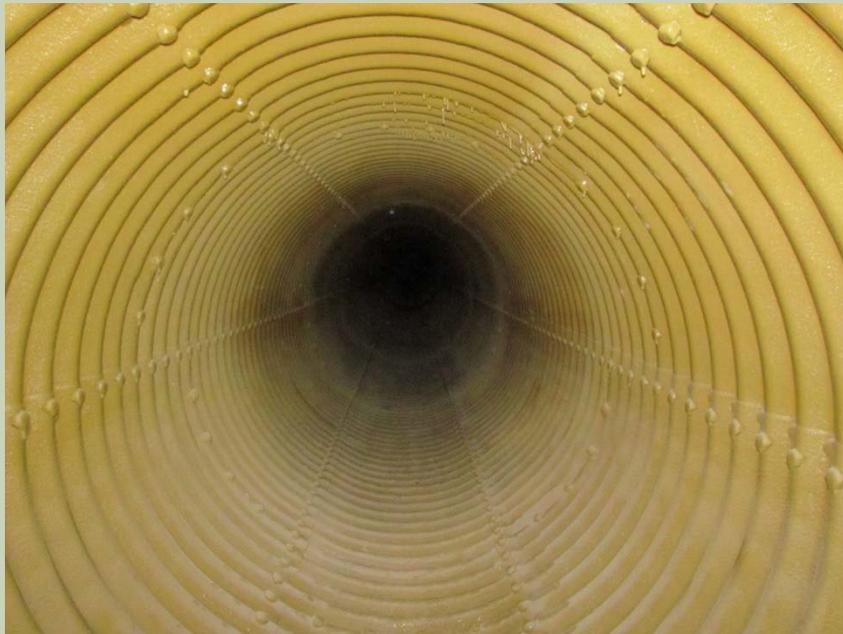


DEPTH CHECKS

- Contractor performed depth checks multiple times a day.
- M&R performed 13 depth checks after liner was installed.

Depth Checks	Mils
Average	652
Standard Deviation	226
Max	1,133
Min	316

FINAL PRODUCT



FINAL PRODUCT

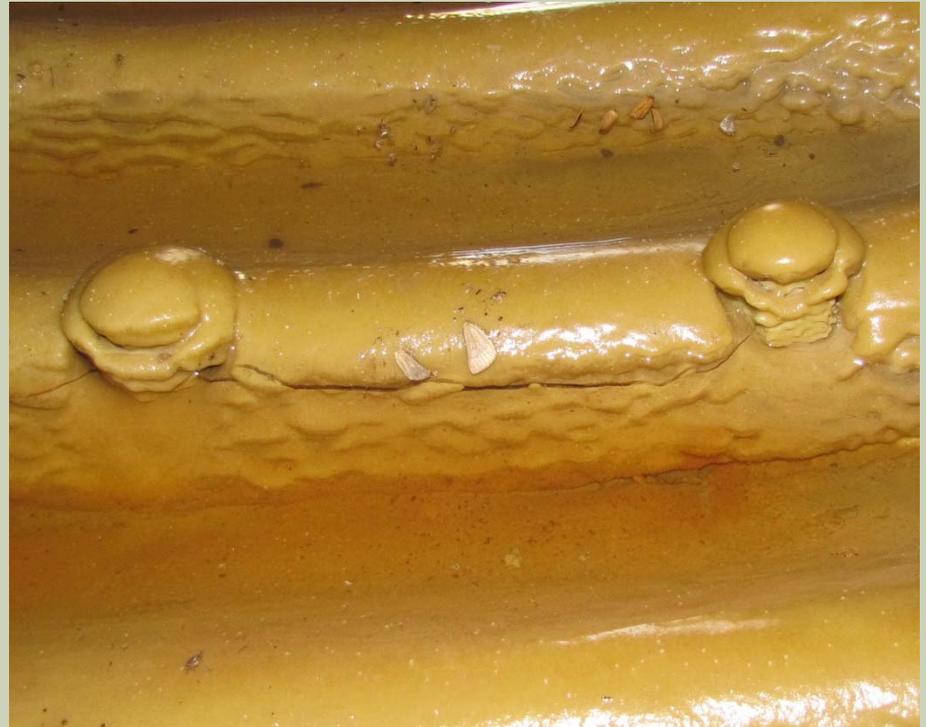


FINAL PRODUCT



FIRST ANNUAL EVALUATION

- 1 small crack within pipe
- 2 cracks on pipe entrance
- Liner scraped away from bolts at entrance



ENTRANCE DAMAGE

- The damage on the bottom of entrance appears to be caused by the rip rap installation.



ENTRANCE DAMAGE



SUMMARY

■ Pros

- No excavation or creation of a dip
- No disruption to the traveling public
- Quick curing time
- Infiltration control and chemical resistance
- Structural Rehab

■ Cons

- Polyurethane components sensitive to pressure and temperature
- Requires learning curve for proper application technique

QUESTIONS?

