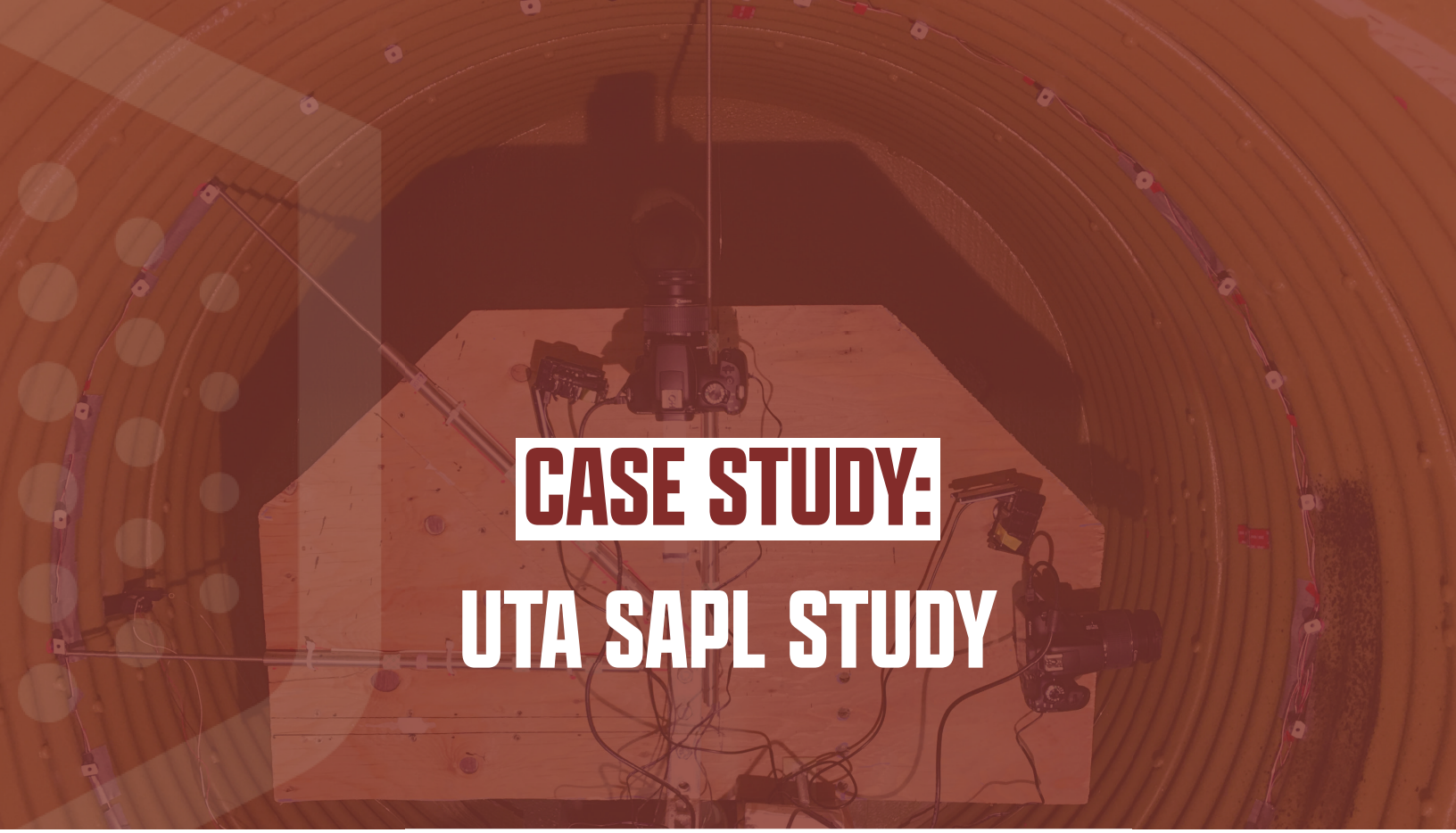

CASE STUDY:
UTA SAPL STUDY

STUDY

Structural Design Methodology for Spray Applied Pipe Liners in Gravity Storm Water Conveyance Conduits, UTA

PROBLEM

There was no standard design/testing methodology for spray applied pipe liners. SprayWall® was chosen to help create them.

RESULTS

SprayWall® was an effective method of structural rehabilitation, increasing pipe strength and reducing operating times.

SprayWall® was chosen by the University of Texas at Arlington in a 2020 study to create testing and application standards for spray applied pipe rehabilitation liners in Department of Transportation markets.

Previously, there was no standard structural design methodology for spray applied pipe liners.

This study aimed to create:

- A design methodology for spray applied pipe liners used for structural rehabilitation of gravity storm water conveyance conduits
- A structural design lab testing method for pipes that were treated using spray applied pipe liners
- An accelerated lab methodology to test liner durability

SprayWall® was the only polymeric material to participate in this innovative test. The other test material was a cementitious spray applied liner.

Both were applied to invert-less corrugated metal pipe culverts that were put through stringent ring compression testing in the UTA's Civil Engineering Lab's Soil Prism Test Bed.

The invert-less corrugated metal pipe culverts were designed to simulate deteriorated pipes that failed at the invert, where ring compression forces are the strongest. The compression forces would show how well each liner would perform in realistic underground conditions.

THE RESULTS SPEAK FOR THEMSELVES

SprayWall® makes infrastructure stronger.

The control pipe, with no spray applied treatment, was not able to resist the applied pressure from the test on its own. When treated with SprayWall®, the pipe's load-carrying capacity was increased by 471.7% at 250 mils of application, 484.8% at 500 mils of application, and 802.7% at 1000 mils of application.

So, when a deteriorated pipe is at risk of failing, SprayWall® can make its load-bearing capacity up to 8 times stronger.

SprayWall® was approximately four times stronger than the cementitious mixture when it came to ring compression forces, and cured much faster.

Additionally, the cementitious liner required filling in the corrugations of the test pipes in order for it to work properly. SprayWall® could be applied directly onto the conduits without filling the gaps, potentially saving construction crews a lot of time in the field.

SprayWall® was so effective that it was deemed structurally capable to function as its own pipe inside of the unit being tested.

SprayWall® met AND exceeded AASHTO's LRFD (bridge) strict design requirements, widely accepted in the United States Department of Transportation market, especially as a prerequisite for acceptance into state DOT's culvert rehabilitation programs.

With a service life of over 50 years, these results will hold up for decades to come.