SPR™EX
CASE STUDY

ROADSIDE RENEWAL

in the San Bernardino Mountains

SEKISUI SPR
Leading-Edge Trenchless Solutions

PROJECT DETAILS

Rehabilitating storm drains and culverts for transportation departments can be a challenge, particularly when working in difficult site conditions. Nu-Line Technologies, Inc., of Encinitas, CA was recently awarded a project by Caltrans District 8. The project was located near Running Springs, CA in the San Bernardino Mountains. The scope of work included the rehabilitation of 24" and 30" inch CMP storm culverts along the State Highway 330.

Nu-Line Technologies bid this project using Sekisui's SPR™EX Spiral Wound liners. Sekisui's PVC Spiral Wound liners are approved by Caltrans per Design Information Bulletin #83-4 Alternative Pipe Liners per Section 15-536: MACHINE SPIRAL WOUND POLYVINYL CHLORIDE (PVC) PIPELINER (EXPANDABLE OR CLOSE-FIT DIAMETER).

Sekisui Spiral Wound liners were the best trenchless rehabilitation solution for this project. First, Spiral Wound liners could be designed a structural repair solution for fully deteriorated pipe conditions as well as increase overall hydraulic capacity due to the improved Manning's coefficient.

The SPR™EX construction footprint is small and the set up fast and efficient. The installation equipment is highly portable, allowing the contractor to do difficult and remote access set up. Due to the environmental and biological concerns from construction materials and methods, it was imperative that the contractor use the most environmentally friendly construction materials. The project required the Contractor to submit a Water Pollution Control plan as part of their pre-construction submittal package. As Spiral Wound liners are mechanically installed, there was no concern about potential styrene contamination as would be the case if the contractor used a resin impregnated liner.

1,800 FT
Project Length

24" - 30"
Liner Diameters

4 DAYS
Project Duration

SPR™EX
- 6" - 42"
- Tight fit
- Circular shapes

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Version 1.2020

SITE ACCESS ISSUES

Site access on this project was particularly difficult. Route 330 is a two lane highway located in the San Bernardino Mountains. Traffic control would need to be carefully managed with this passageway being popular with tourists. The project site required a minimal presence as to keep the flow of cars moving and not to create safety/travel interference. Access to the

culverts was even more challenging. The inlets were typically located off the shoulder in wooded areas with the outlets located down steep inclines in dense brush. The SPR™EX installation equipment was typically set up at the upstream inlet. Crews were also located at the downstream outlet where they were able to hand carry equipment necessary to terminate the liner and to install end seals. Due to slope and host pipe deformation, the contractor had to make intermittent adjustments to the installation equipment to control the lining process.

ENVIRONMENTAL STEWARDSHIP

As mandated by the California Department of Wildlife (CSOFAW) and Caltrans Special Provisions, the Contractor was required to have a Biologist on site during key phases of the project. The CMP culverts to be rehabilitated were located within or near the habitats of regulated species including the Southern Rubber Boa and several nesting and migratory birds. The Biologist was responsible for preparing a biological information program to inform personnel and to guarantee compliance with the laws and regulations protecting said species.

The Contractor's Biologist had to be on site during the pre-construction, clearing and grubbing phase to properly identify the habitat locations. Based on the species, the Contractor was required to maintain specific distances from their habitat.

In the case of the nesting and migratory birds, no work could be done during the nesting season and could only be executed once the birds had fledged.

Rubber Boa

If any species was harmed by the Contractor's work or if any other environmental or biological compliances were violated, the Biologist was required to inform Caltrans who would inform the California Department of Wildlife. Based on their assessment, the Biologist would be responsible for recommending alternative staging or construction sites. Additional measures would then be implemented to further protect the habitats. Since SPR™EX is a mechanical, environmentally friendly solution, the rehabilitation process posed no chemical contamination threat to the sensitive area.

THE SPIRAL WOUND SOLUTION

SPR™EX is a tight fit lining solution for 6" – 42" diameter gravity pipelines. The liners are initially installed at a fixed diameter, smaller than the host pipe. Typically, winding occurs from upstream to downstream, however reverse set ups can be done. The liner is formed via a static winding machine that joins subsequent strips of profile and creates a structural liner within the host pipe. Once the liner reaches the termination structure, the liner is torsionally restrained, then expanded by severing the secondary or "sacrificial" lock. This action allows the profile to expand creating a tight fit liner which requires no annular space grouting. Furthermore, the entire installation process can be done in live flow conditions typically without the need for by-passing.

Although the site location proved to be difficult, Nu-Line Technologies successfully rehabilitated the CMP culverts using SPR™EX. With site access and environmental challenges at play, Nu-Line was still able to complete the project with SPR™EX on time and on budget.

> "Due to the sensitive environmental areas, we found utilizing the SPR™EX product was the obvious choice in executing the project in a timely manner and limiting exposure in these work areas. We are extremely pleased with the end result as was Caltrans District 8."
>
> - Connor Moore, Project Manager Nu-Line Technologies, LLC.