



**SPECIAL PROVISIONS
FOR
CULVERT LINING**

**Mills County
STP-S-C065(117)--5E-65**

**Effective Date
March 21, 2023**

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

154067.01 DESCRIPTION.

- A. Culvert Lining.** Resin impregnated, cured-in-place pipe (CIPP).
- B.** Rehabilitate existing 70 inch (span) by 45 inch (rise) CMP (arch) to prevent continued corrosion of the inner walls of the culvert and to reestablish the structural integrity of the culvert. Includes construction of structural and protective liner while maintaining the hydraulic opening area of the structure.

154067.02 MATERIALS.

- A.** Apply Article 4147.01 of the Standard Specifications.
- B. Submittals.**
 - 1. CIPP Rehabilitation.**
 - a. Thickness Design:** Submit design calculations for CIPP wall thickness based upon ASTM F 1216, prepared and signed by a licensed Professional Engineer in the State of Iowa.
 - b. Resin:** Certificate of compliance with ASTM F 1216 or D 5813.
 - c. Tube:** Certificate of compliance with ASTM F 1216 or F 2019. If glass fiber reinforcement is used, CIPP strain corrosion testing according to ASTM D 3681.
 - d. Wet Out and Curing:** Complete description of the manufacturer's recommended wet out procedure and curing method for the type of lining proposed.
 - e. Safety Procedures:** Submit documentation of National Institute of Occupational Safety and Health (NIOSH) testing, health hazard evaluation, and recommended safety procedures for CIPP workers and public. The safety plan is to include a method to establish a safe perimeter around culvert openings a minimum of 15 feet in diameter. Based on active air monitoring, workers must wear suitable Personal Protection Equipment (PPE) when initially opening and entering the transport truck or storage unit holding the liner.
 - 2. Installer Information.** When requested by the Contracting Authority, submit the following prior to the preconstruction meeting.
 - a.** Installer name.

- b. Completed project list for last 5 years including for each project and year completed, client name/address/contact person/phone number, and footages installed by pipe diameter.
 - c. Detailed installation procedures, including estimated times for each task and other items unique to each product.
 - d. Video of installation process, if available.
 - e. Evidence of properly trained personnel.
 - f. Related ASTM standards or any nationally recognized standards for product installation.
 - g. Available equipment list.
 - h. Detailed procedures for repairing the product in the event of future damage or failure, including any required specialized equipment or training.
 - i. Videos of two rehabilitated culverts showing before and after conditions.
3. Additional information may be required. The submittal of prequalification information in no way implies that the product, manufacturer, or installer will be deemed to be qualified. The Contracting Authority, in its sole discretion, will determine whether a product, manufacturer, or installer does or does not qualify as an approved equal.

C. The Engineer may allow substitutions. Provide as a minimum the following information for evaluation:

1. Product Information.

- a. Product name.
- b. Year product first available in the United States.
- c. Total footage or number of line segments installed in the United States.
- d. Results of all available product testing, including but not limited to leakage, physical properties, pipe stiffness, chemical resistance, strain-corrosion, external loading, flow characteristics, infiltration/inflow reductions, structural capacity, and external hydrostatic loading capacity.
- e. Samples of before and after product.
- f. Design method.
- g. Typical lining thickness for culvert sizes included in the project.

2. Manufacturer Information.

- a. Manufacturer name.
- b. Years of experience manufacturing the product.
- c. Country of manufacture of all product components.
- d. Quality control procedures for product manufacture, including inspection requirements, testing procedures, and allowable tolerance levels.
- e. Related ASTM standards, or other nationally recognized standards for product manufacturing.

154067.03 CONSTRUCTION.

A. Cleaning.

1. Complete CCTV inspection of culvert prior to initiating cleaning. Provide copy of video inspection to Engineer.
2. Clean and remove soil, grit, debris, and obstructions prior to insertion of culvert lining. Continue until the condition of the host pipe meets the requirements of the liner manufacturer.
3. Do not flush debris onto downstream property.
4. Deposit removed material at an approved site.
5. Complete CCTV inspection of culvert upon completion of all cleaning and obstruction removal activities. Provide copy of video inspection to Engineer.

B. Resin Impregnated Cured-In-Place Lining.

1. Install liner according to the manufacturer's published recommendations and ASTM F 1216.
2. Vacuum impregnate tube with resin (wet-out) at manufacturer's plant under quality controlled conditions or on-site in mobile wet-out unit.
3. Fill all voids in the tube material, adding 5% to 10% excess resin to allow for migration of resin into the voids and cracks.

C. Inspection.

1. Perform CCTV video inspection of completed CIPP lining. Provide copy of video inspection to Engineer.

2. Ensure the tube is free of dry spots, lifts (spots cured away from the culvert), and delaminations. Remove and replace deficient sections.
3. If the CIPP does not fit tight against the original pipe at its termination point, seal the space between the pipes by filling with a resin mixture or hydrophilic seal compatible with the CIPP.

154067.04 METHOD OF MEASUREMENT.

Measurement for Culvert Lining will be in linear feet along the centerline of the culvert.

154067.05 BASIS OF PAYMENT.

- A. Payment for Culvert Lining will be made at the contract unit price per linear foot for the type of repair.
- B. Payment is full compensation for the preparation of the surface during lining operations and all other costs associated with repair of the culvert to properly complete the installation and inspection.