

CURED-IN-PLACE PIPE LINER

Effective: April 15, 2022

Description. This work shall consist of installing cured-in-place pipe (CIPP) liners to rehabilitate pipe culverts or storm sewers.

Materials. Resin-impregnated flexible tubes or pipes shall be according to ASTM D 5813. Upon delivery of materials to the jobsite, the Contractor shall furnish independent test reports from the supplier showing the physical properties of the CIPP liner meets the material requirements of the applicable ASTM documents for the proposed liner.

Construction Requirements. Installation of the CIPP liner shall consist of a resin impregnated flexible tube or pipe being inverted or pulled into the host pipe and expanded to conform to the interior of the host pipe. The resin impregnated tube shall then be cured in place, creating a continuous structural liner within the host pipe.

The Contractor shall submit the following to the Engineer for approval, at least 15 days prior to the start of work:

- (a) References. A list containing at least three projects completed within the last three years prior to this project's bid date in which the Contractor performing this work has installed CIPP liners. The list of projects shall contain names and phone numbers of representatives who can verify the Contractor's participation on those projects.
- (b) Experience. Name and experience record of the CIPP liner supervisor
- (c) Materials. Manufacturer's published literature for the proposed CIPP liner.
- (d) Installation Procedure. Proposed methods of water diversion, cleaning and preparation of the existing culvert, ASTM standard for the proposed CIPP liner, setup locations for pulling or inverting the CIPP liner, testing and inspection methods, and final clean-up operations. Quality control procedures for conformance with applicable water testing and stormwater management requirements.

The Contractor shall submit a design report for each CIPP liner in the Contract, sealed by an Illinois licensed Structural Engineer, prior to the installation of the respective CIPP liner. Prior to completion of the design report, the Contractor shall clean and inspect the host pipe as described in the installation procedure. The Contractor shall provide a recording of the inspection to the Engineer. Authorization from the Engineer shall be requested to clear any obstructions not able to be removed by conventional sewer cleaning equipment.

The design report shall be submitted to the Engineer for approval prior to installation and include the following.

- (a) The anticipated length and diameter of CIPP liner.
- (b) The location and characteristics of cavities in and around the existing structure, and the location and quantity of any additional materials required, such as grout, pea gravel, or flowable backfill, to repair the existing structure and fill these cavities.

- (c) The location of any deformities such as jagged edges that may impact the liner installation or its function, and a plan to correct the deformities.
- (d) Design calculations and required in-place liner thickness of the CIPP liner. The wall thickness shall be calculated using the methodology provided in the applicable ASTM standard practice for the approved CIPP liner. The design loads shall be as per the AASHTO LRFD Bridge Design Specifications. The host pipe shall be considered fully deteriorated. The proposed CIPP liner shall have a 50-year design life, with a factor of safety of two (2).
- (e) The final in-place hydraulic opening shape and dimensions of the CIPP liner.

Liner shall not be installed until the design report has been approved by the Engineer. Liner shall not be installed if rain is in the forecast on the day of installation.

After completion of the design report, but prior to installation of the CIPP liner, the Contractor shall confirm the host pipe is in suitable condition for the installation of the proposed CIPP system.

Pipes shall be drained and flow shall be diverted.

The CIPP shall be installed according to ASTM F 1216, ASTM F 1743, or ASTM F 2019.

A resin impregnated sample (wick) shall be provided by the Contractor to provide verification of the curing process taking place in the host pipe.

The CIPP wall thickness installed by the Contractor shall be the Required In-Place Liner Thickness calculated in the design report, with allowable tolerances as per the applicable ASTM documents. Measured sample thickness will not include any portion not considered by the Engineer to be considered a structural component of the system.

The Contractor shall inspect the CIPP liner and provide the Engineer with a recording showing and describing the entire length of the completed liner. Any excessive wrinkling or damaged CIPP liner areas shall be repaired or modified to the satisfaction of the Engineer.

Method of Measurement. This work will be measured for payment in place in feet. When the CIPP enters a manhole, inlet, or catch basin, the measurement will end at the inside wall of the manhole, inlet, or catch basin.

Basis of Payment. This work will be paid for at the contract unit price per foot for CURED-IN-PLACE PIPE LINER, of the diameter specified.

Debris removal requiring equipment beyond conventional sewer cleaning equipment, repair of existing pipes, and filling of voids prior to the installation of the CIPP liner will be paid for according to Article 109.04.