

**PIPE LINER**  
**(REV 2-27-20) (7-21)**

Section 431 is deleted and the following substituted:

**SECTION 431**  
**PIPE LINER**

**431-1 Description.**

Rehabilitate drainage pipe by installing a pipe liner in accordance with the requirements of this Section. The Contract Documents will indicate the location of the pipe to be rehabilitated, the material composition and the alternate liner types that may be used to rehabilitate the pipe, and the alternative methods of liner installation.

**431-2 Materials.**

Meet the requirements of Section 948.

**431-3 Pre-installation Requirements.**

Prior to installation, submit to the Engineer the proposed liner product, including the Manufacturer's installation instructions. Obtain written approval for the proposed liner product from the Engineer prior to beginning work. Installation of the rehabilitative pipe liner shall meet the requirements of this Section, Section 948, and the Manufacturer's written instructions for pipe preparation and liner installation. Prior to installing the pipe liner, inspect the host pipe and ensure that it meets the manufacturer's requirements for host pipe. Inspect the host pipe by means of closed-circuit television. The closed-circuit television inspection may be augmented by a visual inspection in which persons enter a host pipe to inspect it, at no additional cost to the Department. Obtain written approval from the Engineer prior to allowing persons to enter a host pipe. Furnish all equipment necessary to inspect, remove silt and other debris, and dewater the host pipe to the satisfaction of the Engineer. Seal cracks and joints when required for the liner product and method using an approved chemical grout of either acrylamide base gel, acrylic base gel, urethane base gel, or urethane base foam. Place flowable fill as directed by the Engineer to maintain the stability of the host pipe.

**431-4 Installation Methods.**

**431-4.1 General:** Install the liner using one of, or a combination of, the following methods: slip lining, inverting, spin cast, or point repair. Seal or grout the annular space between the interior of the host pipe and the exterior of the liner if required by the liner product manufacturer's written instructions.

**431-4.2 Slip lining:** Use either polyethylene, high density polyethylene, polyvinyl chloride, fiberglass, steel or aluminum pipe liner that is the same shape as the host pipe. Install the liner by joining discrete lengths, panels or segments of the pipe liner in a manhole or other access point and inserting the liner into the host pipe. Ensure manufacturer's installation method meets the minimum requirements of ASTM F-585.

**431-4.3 Inverting:** Install a resin impregnated felt tube pipe liner into the host pipe, and cure in place in accordance with the manufacturer's written requirements meeting the minimum

requirements of ASTM F-1216. Ensure wall thickness of liner provided conforms to the requirements of ASTM F-1216 for that of a fully deteriorated pipe.

**431-4.4 Spin cast liner:** Coat interior of pipe with fiber reinforced cement/mortar mix applied with a centrifugal device in accordance with manufacturer's written requirements meeting minimum standards of ASTM F-2551-09.

**431-4.5 Point Repair:** Install stainless steel repair sleeves meeting the material requirements for steel liners in Section 948, in accordance with manufacturer's written requirements and conforming to the requirements of ASTM F3110-14. Submit to the Engineer a written request for consideration of other point repair materials. Approved use of other materials will be at no additional cost to the Department.

#### **431-5 Acceptance.**

Inspect the complete rehabilitation by means of closed-circuit television. The closed-circuit television final inspection may be augmented by a visual inspection in which persons enter a host pipe to inspect it, at no additional cost to the Department. Obtain written approval from the Engineer prior to allowing persons to enter a host pipe for final inspection purposes. Provide the Engineer with videos, along with supporting documentation of visual inspections conducted if applicable, of all preliminary and final inspections.

#### **431-6 Method of Measurement.**

The quantity of pipe liner will be the actual length of the pipe lined, per foot, of pipe liner installed and accepted, Overlap when required by manufacture's specifications will be incidental to the actual length of pipe lined, measured along the centerline of the pipe, from end to end as documented and verified by the post repair video inspection.

#### **431-7 Basis of Payment.**

Price and payment for pipe liner will be full compensation for furnishing and installing the pipe liner in accordance with the requirements of this Section, including all materials, labor and incidentals required to dewater and clean host pipe, dispose of all silt and debris, seal cracks and joints in the host pipe, and seal and grout the annular space between the liner and interior of the host pipe.

Price and payment for pipe liner will also be full compensation for all equipment, materials and labor required for inspections, and for furnishing videos of the inspections to the Engineer.

Payment will be made under:

Item No. E431- 1- AA                      Pipe Liner - Maintenance.