

431-PIPE LINER
(REV 1-30-20)

The following new Section is added after Section 431:

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 Plans 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 linear 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 ~~is clean, dry and stable~~ 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 linear 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, pulling/pushing ~~spin cast, spiral winding, paneling, or point repair coating, or bursting~~. Seal or grout the annular space between the interior of the host pipe and the exterior of the liner if required by ~~according to~~ 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. 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 manufactures installation method meets the minimum requirements of ASTM F-585.

~~431-4.2.1 Polyethylene: Install polyethylene pipe liner in accordance with ASTM F-585. The manufacturer's written instructions may be substituted for ASTM F-585 with written permission from the Engineer.~~

~~431-4.2.2 High density polyethylene: Install high density polyethylene pipe liner in accordance with ASTM F-585. The manufacturer's written instructions may be substituted for ASTM F-585 with written permission from the Engineer.~~

~~431-4.2.3 Polyvinyl chloride: Install polyvinyl chloride pipe liner in accordance with ASTM F-1698.~~

~~431-4.2.4 Fiberglass, steel or aluminum: Install fiberglass, steel or aluminum pipe liner in accordance with the manufacturer's written instructions.~~

~~431-4.2.5 Steel Reinforced Polyethylene Ribbed Pipe: Install reinforced pipe liner in accordance with ASTM F-585. The manufacturer's written instructions may be substituted for ASTM F-585 with written permission from the Engineer.~~

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 Pulling/Pushing: Install the liner in accordance with the manufacturer's written instructions. Protect the pipe liner end using a device that uniformly distributes the applied load around the perimeter of the liner. Continuously monitor the applied load, and do not stretch the liner by more than 1% of its original length. For liner lengths of 100 feet or less, the end protection device may be omitted, with written permission from the Engineer. Do not seal the liner ends or begin grouting prior to 24 hours after liner installation.~~

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 Spiral Winding: Install the pipe liner in accordance with ASTM F-1698 or ASTM F-1741.~~

~~431-4.6 Paneling: Install the pipe liner in accordance with the manufacturer's written instructions. Limit paneling to host pipes having 90-inch or greater internal diameters. Do not place panels where a liner joint will lie along or near the crown of the host pipe.~~

~~431-4.7 Coating: Use materials and install the pipe liner in accordance with the manufacturer's written instructions.~~

~~431-4.8 Bursting: Install the pipe liner in accordance with the manufacturer's written instructions. Limit bursting to vitrified clay or concrete crossdrain or sidedrain pipe having no lateral connections or risers. Further limit bursting to locations where no part of the host pipe passes within 5 feet of any buried utility or pavement base material.~~

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. For consideration of other materials for point repair, submit request in writing to Engineer for consideration at no additional cost to the Department.

431-5 Acceptance.

Inspect the complete rehabilitation by means of closed-circuit television. Obtain written approval from the Engineer prior to allowing persons to enter a host pipe. Provide the Engineer videos of all preliminary and final inspections.

431-6 Method of Measurement.

The quantity of pipe liner to be paid for will be the length, per foot, of pipe liner installed and accepted, 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. 431- 1- 2AA Pipe Liner - Maintenanceper foot.