

SP- 121029
(New)



Iowa Department of Transportation

**SPECIAL PROVISIONS
FOR
LARGE DIAMETER SANITARY SEWER**

**Polk County
Project No. NHS-U-1945(409)--8G-77**

**Effective Date
May 21, 2013**

THE STANDARD SPECIFICATIONS, SERIES 2012, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

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1. Sanitary Sewer Pipe Liner

- 1.1 Ameron T-Lock by Ameron Protective Lining Products, or equal.
- 1.2 Liner material: polyvinylchloride resin pigments and plasticizers; compounded to remain flexible; polyvinylchloride resin not less than 99% by weight of total resin used; copolymer resins not permitted.
- 1.3 Physical properties of liner: tensile strength: 2,200 psi minimum; elongation at break: 200% minimum.
- 1.4 Liner configuration:
 - 1.4.1 Liner sheet minimum thickness: 1.65 mm.
 - 1.4.2 Tee-shaped locking extensions of same material as liner; integrally extruded with liner sheet.
 - 1.4.3 Locking extensions: 2.5 inch apart; minimum 0.375 inch high.
 - 1.4.4 Liner sheets nominal width: 48 inch; maximum length: 24 inches.
 - 1.4.5 Joint strips: 3/4 inch width minimum; nominal thickness of 3/32 inch.
- 1.5 Other characteristics of liner:
 - 1.5.1 Continuous locking extensions embedded in concrete to withstand test pull of at least 100 lbs. per linear inch applied perpendicular to surface without rupture of locking extensions or withdrawal from embedment.
 - 1.5.2 Plastic liner sheet plates, locking extensions, joint corner and welding strips free of cracks, cleavages and other defects.
 - 1.5.3 Sufficient flexibility to bridge up to 1/4 inch settling cracks without damage to liner.
 - 1.5.4 Lining repairable at any time during life of pipe.

- 1.6 Installation of liner in reinforced concrete pipe:
 - 1.6.1 Liner installation in pipe shall be in accordance with manufacturer's recommendation.
 - 1.6.2 Liner shall cover entire interior surface of pipe.
 - 1.6.3 Liner installed with locking extensions parallel with longitudinal access of pipe.
 - 1.6.4 Liner shall be held snugly in place against inner forms.
 - 1.6.5 Locking extensions shall terminate not more than 1.5 inch from the end of the inside surface of pipe sections.
 - 1.6.6 Joint flaps shall extend 4 inch beyond end of inside surface.
 - 1.6.7 Concrete poured against liner shall be vibrated, spaded or compacted to protect lining and produce dense, homogenous concrete securely anchoring the locking extensions into concrete.
 - 1.6.8 Lined concrete pipe may be cured by standard curing method.
 - 1.6.9 Provide no pipe with damaged lining; damaged lining may be repaired to satisfaction of Engineer.
- 1.7 Field jointing of pipe liner:
 - 1.7.1 Inside of pipe joint filled and carefully pointed with cement mortar; mortar shall not extend into the pipe beyond the straight line connecting the surfaces of adjoining pipe section; pipe joints must be dried before liner joints are made.
 - 1.7.2 Mortar and other foreign material shall be removed from liner surface adjacent to pipe joint; clean and dry surface.
 - 1.7.3 Field joints in lining at pipe joints:
 - 1.7.3.1 Joint flap with locking extensions removed; joint flap shall overlap the lining of adjacent pipe section, minimum 0.5 inch; heat sealed in place prior to welding.
 - 1.7.3.2 Field joint completed by welding flap to the lining of adjacent pipe using 1 inch weld strip.
 - 1.7.3.3 Protect flap from damage; excessive tension and distortion in bending back the flap to be avoided; heating of liner required at temperatures below 50°F. as required to avoid damage to flap.
 - 1.7.3.4 Welding of joints in accordance with manufacturer's requirements; hot air welding tools shall provide effluent air at a temperature between 500°F. and 600°F.; welding tools held approximately 0.5 inch to materials to be joined; welding tools moved back and forth over junction of the two

materials; welding tool moved slowly enough as weld progresses to cause small bead of molten material to be visible along both edges and in front of weld strip.

- 1.7.3.5 Weld both sides of joint flap except leave 8 inch of joint flap at pipe invert on downstream side of joint unwelded to provide relief of groundwater pressure, except as otherwise noted.

1.8 Testing and repair of liner:

- 1.8.1 Following installation of all surface covered lining, including welds, shall be tested with an approved electrical holiday detector with instruments set between 18,000 volts and 22,000 volts.
- 1.8.2 All welds shall be physically tested by a non-destructive probing method.
- 1.8.3 All repairs accomplished with welding strip fused over liner in area of patch; larger patches may utilize smooth liner sheet applied over the damaged area with adhesive; edges burned with welding strip fused to the patch and the liner adjoining the repair patch.

2. Polyvinylchloride Liner for Manholes

- 2.1 Ameron T-Lock by Ameron Protective Lining Products, or equal.
- 2.2 Liner material: polyvinylchloride resin pigments and plasticizers; compounded to remain flexible; polyvinylchloride resin not less than 99% by weight of total resin used; copolymer resins not permitted.
- 2.3 Physical properties of liner: tensile strength: 2,200 psi minimum; elongation at break: 200% minimum.
- 2.4 Liner configuration:
 - 2.4.1 Liner sheet minimum thickness: 1.65 mm.
 - 2.4.2 Tee-shaped locking extensions of same material as liner; integrally extruded with liner sheet.
 - 2.4.3 Locking extensions: 2.5" apart; minimum: 0.375 inches high.
 - 2.4.4 Liner sheets nominal width: 48"; maximum length: 24 inches.
 - 2.4.5 Joint strips: 3/4 inch width minimum; nominal thickness of 3/32 inch.
- 2.5 Other characteristics of liner:
 - 2.5.1 Continuous locking extensions embedded in concrete to withstand test pull of at least 100 lbs. per linear inch applied perpendicular to surface without rupture of locking extensions or withdrawal from embedment.
 - 2.5.2 Plastic liner sheet plates, locking extensions, joint corner and welding strips free of cracks, cleavages and other defects.

2.5.3 Sufficient flexibility to bridge up to 1/4 inch settling cracks without damage to liner.

2.5.4 Lining repairable at any time during life of pipe.

2.6 Installation of liner in reinforced concrete manhole:

2.6.1 Liner installation shall be in accordance with manufacturer's recommendation.

2.6.2 Liner shall cover entire interior surface.

2.6.3 Liner shall be held snugly in place against inner forms.

2.6.4 Locking extensions shall terminate not more than 1.5 inch from the end of the inside surface of sections.

2.6.5 Joint flaps shall extend 4 inches beyond end of inside surface.

2.6.6 Concrete poured against liner shall be vibrated, spaded or compacted to protect lining and produce dense, homogenous concrete securely anchoring the locking extensions into concrete.

2.6.7 Lined concrete pipe may be cured by standard curing method.

2.6.8 Provide no manholes with damaged lining; damaged lining may be repaired to satisfaction of Engineer.

2.7 Field jointing of liner:

2.7.1 Inside of manhole joint filled and carefully pointed with cement mortar; mortar shall not extend into the manhole beyond the straight line connecting the surfaces of adjoining manhole section; joints must be dried before liner joints are made.

2.7.2 Mortar and other foreign material shall be removed from liner surface adjacent to joint; clean and dry surface.

2.7.3 Field joints in lining at manhole joints:

2.7.3.1 Joint flap with locking extensions removed; joint flap shall overlap the lining of adjacent manhole section, minimum 0.5 inch; heat sealed in place prior to welding.

2.7.3.2 Field joint completed by welding flap to the lining of adjacent manhole using 1 inch weld strip.

2.7.3.3 Protect flap from damage; excessive tension and distortion in bending back the flap to be avoided; heating of liner required at temperatures below 50°F. as required to avoid damage to flap.

- 2.7.3.4 Welding of joints in accordance with manufacturer's requirements; hot air welding tools shall provide effluent air at a temperature between 500°F. and 600°F.; welding tools held approximately 0.5 inch to materials to be joined; welding tools moved back and forth over junction of the two materials; welding tool moved slowly enough as weld progresses to cause small bead of molten material to be visible along both edges and in front of weld strip.
- 2.7.3.5 Weld both sides of joint flap except leave 8 inch of joint flap at manhole invert on downstream side of joint unwelded to provide relief of groundwater pressure, except as otherwise noted.

2.8 Testing and repair of liner:

- 2.8.1 Following installation all surfaces covered with lining, including welds, shall be tested with an approved electrical holiday detector with instruments set between 18,000 volts and 22,000 volts.
- 2.8.2 All welds shall be physically tested by a non-destructive probing method.
- 2.8.3 All repairs accomplished with welding strip fused over liner in area of patch; larger patches may utilize smooth liner sheet applied over the damaged area with adhesive; edges burned with welding strip fused to the patch and the liner adjoining the repair patch.

END OF SECTION