

PLASTIC CHIMNEY LINER I&I BARRIER[®] BY AP/M PERMAFORM[®]

1 Intent: It is the intent of this specification to provide minimum standards for materials and methods for installing a molded plastic sleeve that is incorporated into the chimney section of a manhole assembly. It is a fact that grade rings alone, whether they are concrete, plastic or rubber will not provide a leak proof system. Ground movement from freeze/thaw cycling and traffic flow will loosen joints and allow the system to leak. Properly installed, the I&I Barrier provides an impermeable shield against the infiltration of ground water and eroded soil.

2 Applicability: These repair means and methods may be used in new and rehab construction.

3 Referenced Standards

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| 3.1 | ASTM D-695 | Standard Test Method for Compressive Properties of Rigid Plastics |
| 3.2 | ASTM D-790 | Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials |
| 3.3 | ASTM D-638 | Standard Test Method for Tensile Properties of Plastics |

4 Inflow Control

4.1 Manufactured Chimney Plastic Sleeve

4.1.1 The I & I Barrier is a molded polymer sleeve that is incorporated into the chimney section of a manhole assembly while setting the frame. Properly installed, the I & I Barrier provides an impermeable shield against the infiltration of ground water and eroded soil. When the I & I Barrier is installed, it provides an inner wall that diverts the inflow away from the collection system. The I & I Barrier is cut to height and installed on top of the cone. The cut height is determined by adding the adjustment ring stack up dimension to the inside height of the cover frame. Caution should be used to not interfere with the complete seating of the cover into the frame. The joints between the cone and the I & I Barrier are sealed using a special mastic caulk as described in the general installation instructions. The adjustment rings, cover frame and cover are installed as usual or they may be dry stacked.

4.1.1.1 The bottom surface of the I & I BARRIER flange shall be sealed to the manhole cone top surface using Sealant as specified.

4.1.1.2 The sealant shall be applied to the top surface of the manhole cone section only. Sufficient sealant must be used to accommodate flaws in the cone surface and "out-of-flat" conditions. The amount of sealant and its placement will be determined by the condition of the cone. This determination will be the responsibility of the contractor installing the I & I BARRIER. The I & I BARRIER is centrally seated on the cone against the Sealant and the bottom adjustment ring is centrally placed on the top surface of the I & I BARRIER flange using no sealant.

4.1.1.3 If plastic adjustment rings with a vertical tongue are used, the tongue must be cut off to allow the bottom ring to set flush on the I & I BARRIER flange. This removal should be done per instructions from

the adjustment ring manufacturer. The chimney section is completed based on the type of adjustment rings being utilized.

- 4.1.1.4 The I & I Barrier is manufactured from medium density polyethylene as defined by ASTM designation D 1248 with the following properties:

Melt Index, ASTM D-1238	4.5
Density, ASTM D-792	.938
Tensile strength at yield, psi, ASTM D-638	2800
Elongation at break, %, ASTM D-638	400
Flexural Modulus, tangent, psi, ASTM D-790	115,000
ESCR, ASTM D-1693	1000
UL-94 @ .060 & @ .120 thickness, UL-94	HB
Deflection Temp, 88 psi, °C, D-648	83
Deflection Temp, 264 psi, °C, D-648	42
Low Temp Impact, -40°C, ft-lb, ARM	68

- 4.1.1.5 This resin produces a product that has excellent low temperature impact resistance, excellent environmental stress crack resistance and it is highly resistant to degradation from sunlight. UV resistance when tested in accordance with SAE Test Procedure J-1960 shows an increase in elongation at break values and 87% retention of tensile strength after 10,000 hours exposure.

- 4.1.1.6 A 25,000 pound load distributed over the 533 square inch area of the I & I Barrier flange represents a pressure of 47 pounds per square. Passing the proof-load testing of AASHTO Designation M-306 represents a load bearing capacity in excess of 494 pounds per square inch. When multiplied by the 494 pounds per square inch value over the 533 square inches of bearing surface, a product load capacity of over 264,000 pounds or 132 tons is achieved.

5 Testing

- 5.1 A simple field test can be used to assure the integrity of the seal between the I & I BARRIER and the manhole cone prior to back-filling the installation. Fill the excavated area around the chimney section with water to a level above the joint between the I & I BARRIER and the top of the manhole cone. NOTE: Sufficient weight must be applied to the I & I BARRIER flange to form a seal. Inspect the area inside the manhole below the cone upper edge for any signs of leakage. If moisture is present, sufficient sealant has not been applied to form a seal. Reseal as necessary and retest.

6 Submittals

- 6.1 All submittals shall conform to the requirements of the Contract document.
- 6.2 In addition, the following items may be required of the installer to be submitted to the engineer at the sole discretion of the engineer. This Contract shall not be considered complete until receipt and acceptance of the following:

- 6.2.1 Reference submittals
- 5.2.1.1 Contractor certification
 - 5.2.1.2 Material certification

6.2.2 Product data

5.2.2.2 I & I Barrier, Manufactured Barrier

7 Product Handling

7.1 Special handling is not required for the I & I Barrier.

8 Quality Assurance and Acceptance

8.1 Visual inspection should verify a leak-free, uniform appearance.

9 Measurement for Payment:

9.1 Payment shall be made at the unit price per installation