

I / I BARRIER

Patent Pending

STOP INFILTRATION

The I / I Barrier is designed to stop water from leaking into your Manholes through the grade rings. Many tests have proven that an excess amount of ground water is being infiltrated in through septic systems, which causes more water to be processed in the treatment plants. This in turn costs municipalities more and more money when it rains or when the snow melts. The I / I Barrier is made of polyethylene which is weather and puncture resistant. The I / I Barrier forms an interior wall that stops water from infiltrating into the manhole.

Cut the I / I Barrier to the desired height



Set on and Seal to the Cone



Add Grade Rings to Desired Height



Place Manhole Frame



I / I BARRIER SPECIFICATIONS

PRODUCT DESCRIPTION:

As this is a newly designed product, there are no specific standards regarding its use or installation other than those published by the manufacture and the practice of good engineering principles.

The design and intended application of this product is simple and apparent. It is a molded polymer shield that is incorporated into the chimney section of a manhole assembly. Properly installed, the I/I Barrier provides an impermeable shield against the infiltration of ground water and eroded soil. It is an established 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. When the I/I Barrier is installed, it provides an inner wall that diverts the inflow back out instead of into 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 is sealed using butyl mastic caulk as described in the general installation instructions. The adjustment rings, cover frame and cover are then installed as usual.

INSTALLATION SPECIFICATION:

The bottom surface of the I/I BARRIER flange shall be sealed to the manhole cone top surface using a butyl sealant as specified by the manufacture of the I/I BARRIER.

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 then centrally seated on the cone against the sealant. The bottom adjustment ring is then centrally placed on the top surface of the I/I BARRIER flange using no sealant.

If plastic adjustment rings with a vertical tongue are being 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 then completed based on the type of adjustment rings being utilized.

SEALANT SPECIFICATION:

I / I Sealant as distributed by Strike Products or an approved equal.

Strike Bond Butyl Rubber Sealant as distributed by Strike Products or approved equal.

Material must meet or exceed the requirements of ASTM C-990 and AASHTO M-198 specifications.

FIELD TESTING INSTALLATION FOR LEAKS:

A simple field test can be utilized 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 manhole cone top. NOTE: Sufficient weight must be applied to the I/I BARRIER flange to affect 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 affect a seal. Reseal as necessary and retest.

MANUFACTURING:

The I/I Barrier is molded using proven manufacturing standards established by the Association of Rotational Molders. A job sheet is maintained for each production run documenting materials, machine settings and quality checks. The manufacturing process is controlled to assure a quality part that meets the molding specifications and performance requirements of the application.

MATERIALS:

The I/I Barrier is manufactured from medium density polyethylene as defined by ASTM designation D 1248 and having the following properties:

PROPERTY	TEST METHOD	VALUE
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

This plastic 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 was

tested in accordance with SAE Test Procedure J-1960. The material shows an increase in elongation at break values and an 87% retention of tensile strength after 10,000 hours exposure.

PERFORMANCE SPECIFICATION:

As there are no performance criteria specific to the I/I Barrier, we are defaulting to

Federal Specification A-A-60005 dated March 2, 1998. which applies to Manhole Frames, Covers, Gratings, Steps, Sump and Catch Basins. Section 3.3.1 Traffic Loads, calls for a transverse proof-load strength of 25,000 pounds. Proof-load testing is being done in accordance with AASHTO Designation M-306 Standard Specification for Drainage Structure Castings. This specification outlines the test and required results as follows:

- 1) A 40,000 pound test load is concentrated on a 9 x 9 inch area of the product.
- 2) The load is maintained for one minute
- 3) Upon removal, the test sample is inspected. Any visible cracks or permanent deformation shall be cause for failure.

On May 29, 2002 the following testing was conducted by American Engineering Testing with the noted results. A complete test report is available upon request.

Procedure

Seven test samples, 9" x 9" x 0.2" ± were prepared for testing. Six of the samples were loaded to 40,000 lbs. for one minute per AASHTO specification M-306. The seventh sample was loaded to 100,000 lbs. for three minutes. The samples were measured for thickness at four locations to the nearest 0.001" before and after loading for visible signs of cracking or permanent deformation. Test loading was performed using a Forney Model No. LT-810 load tester with a F96 load indicator, calibrated on January 16, 2002. Measuring was performed with a Mitutoyo 6" digital caliper Model CD 6BS, calibrated on April 4, 2002.

Results

All seven samples showed no change in thickness and no visible cracking or obvious permanent deformation.

Based on the above testing done in an independent test facility, we offer the following statement:

A 25,000 pound load distributed over the 533 square inch area of the I/I Barrier flange represents a 47 pounds per square inch load. Passing the proof-load testing of AASHTO Designation M-306 represents a load bearing capacity in excess of 494 pounds per square inch. When we multiply the 494 pounds per square inch value over the 533 square inches of bearing surface, we have a product load capacity of over 250,000 pounds or 125 tons.

It is easy to see that 25,000 pounds will not be a problem. The testing done to the 100,000 pound loading more than verifies this correlation. In addition, backfilling around the manhole chimney structure and encapsulation of the cover frame in the roadbed prevent any lateral forces being transferred to the I/I Barrier.