

# I & I BARRIER

**STRIKE PRODUCTS**

U.S. Patent No. 6,986,226



**STOP Infiltration**

Nick Egger asked me to provide you with some feedback and photos (see attached) of the I/I barrier you provided for a trial run. The contractor installed the barrier approximately 3 weeks ago. The comments they had were all positive which was doubly impressive because they have used this type of barrier before in Brooklyn Center. They like the ease of installation and the speed at which it is installed. I am impressed with the appearance of the finished product and simplicity of the design. I have given thought to other inside liner devices, but have always been reluctant to use them because of the possibility of parts falling into the invert of the manhole and causing backups. Your product eliminates this concern.

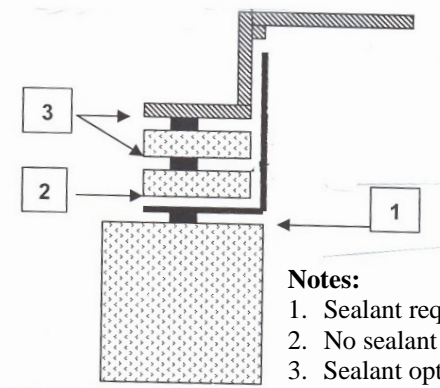
Thank you for the opportunity to examine and use your product.

Dave Chalmers  
Engineering Supervisor  
City of Hastings  
Ph 651-480-2334  
Fax: 651-437-7082

## Cities Benefit From I&I Barrier



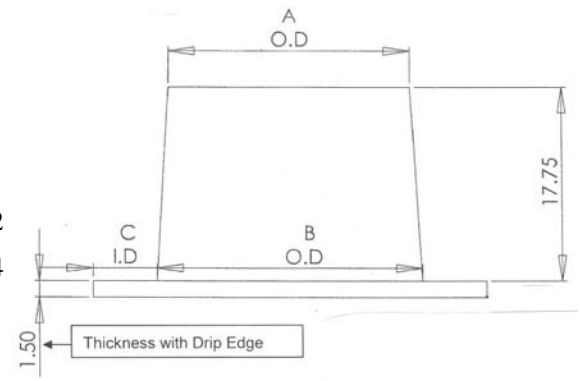
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**Notes:**

1. Sealant required here
2. No sealant needed for drainage
3. Sealant optional

SIZE	A	B	C
24/5	21 3/4	23 7/8	5 3/4
24/6.5	21 3/4	23 7/8	7 1/4
24/8	21 3/8	23 7/8	9 1/4
26/6	24 1/2	25 3/4	6 1/2
27/5	24 3/4	26 3/4	6 1/4



**MATERIALS**

PROPERTY	TEST METHOD	VALUE
Material	ASTM D-1248	MDPE
Melt Index	ASTM D-1238	4.5
Density	ASTM D	.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 87% retention of tensile strength after 10,000 hours of 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.

**TESTING 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.

**TESTING 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. AMERICAN ENGINEERING TESTING, INC., ST. PAUL, MN