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Legacy report on the 2000 International Building Code®, the 2000 International Mechanical Code®, the 2002 Accumulative Supplement to the International Codes™, the BOCA® National Building Code/1999, the 1999 Standard Building Code®, the 1997 Standard Mechanical Code® and the 1997 Uniform Building Code™

DIVISION: 07—THERMAL AND MOISTURE PROTECTION
Section: 07815—Flexible Blanket Fireproofing

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1.0 SUBJECT

FyreWrap® Duct Insulation Flexible Enclosure System:

1.1 FyreWrap® 1.5 Duct Insulation

2.0 PROPERTIES FOR WHICH EVALUATION IS SOUGHT

- 2.1 Alternative to one- and two-hour fire-resistance-rated shaft enclosure for air ducts
2.2 Method for reducing required clearances to combustible materials
2.3 Interior finish material
2.4 Duct covering material
2.5 Noncombustibility

3.0 DESCRIPTION

3.1 General:

The FyreWrap Duct Insulation blanket material is a calcia, magnesia, silica blanket. It is provided either unfaced, faced on one side or totally encapsulated in a fiberglass-reinforced aluminum foil scrim. The FyreWrap® 1.5 Duct Insulation nominally 1 1/2 inches (38 mm) thick. The 1 1/2 inch thick blanket is delivered to the job sites in rolls 25 feet long (7.62m) long and either 2 feet (610 mm) or 4 feet (1219 mm) wide. The FyreWrap 1.5 blankets have a nominal density of 8 pcf (128.1 kg/m³). All have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less when tested in accordance with UBC Standard 8-1 and ASTM E 84.

3.2 FyreWrap 1.5 Duct Insulation One-Hour and Two-Hour Rated HVAC System:

3.2.1 FyreWrap 1.5 Duct Insulation one-hour and two-hour rated HVAC system consists of a single-layer system, nominal thickness 1 1/2 inches, applied directly on to the duct

surface. The material is designed to be installed with 3 inch perimeter and 3 inch longitudinal overlaps. Installation guidelines for banding procedures, pin spacing, etc. are described in section 3.6.

3.3 Installation Guidelines for Banding and Pin Spacing:

3.3.1 Optional Filament Tape: To assist with installation of the insulation the use of filament tape is permitted. The recommended spacing for the optional tape is 1 1/2 inches from the blanket edge and approximately 10 1/2 inches on center. When pins are not used during the installation of FyreWrap Duct Insulations the filament tape must be placed on 8 inch centers.

3.3.2 Stainless Steel Banding: Use minimum 1/2 inch wide nom. 0.015-in thick stainless steel bands. Place bands nominally 1 1/2 inches from the blanket edge and a Maximum of 10 1/2 inches on center. Tension the banding material to hold the insulation in place without causing any cutting or damage to the insulation or duct. When pins are not used during the installation of FyreWrap Duct Insulations, the banding must be placed on 8 inch centers.

3.3.3 Required Pin Placement: For all HVAC ducts, steel insulation pins must be welded on the bottom of the horizontal duct surfaces, and on the outside vertical duct rises. When using FyreWrap 1.5 Duct Insulation space insulation pins in columns 12 inches on center, 6 to 12 inches from the duct edge and 10 1/2 inches apart. When using FyreWrap MAX 2.0 Duct Insulation space pins in columns 10 1/2 inches apart, 1 1/2 inches from each duct edge and spaced 9 1/2 inches apart down the length of the duct. FyreWrap Duct Insulations are impaled over the pins and held in place with speed clips (washers) to keep the system from sagging. Exposed ends of pins shall be bent over to eliminate safety hazards.

3.4 Field Fabricated Access Doors:

3.4.1 Access doors for use with the single layer FyreWrap 1.5 Duct Insulation for 1-Hour and 2-Hour rated HVAC Ducts can be field fabricated as follows. A gasket of 1/2 inch (12.7mm) thick unfaced FyreWrap or ceramic fiber blanket shall be installed between the duct and the door cover. Each access door assembly has four threaded rods, one welded to each corner of the access door opening. Each

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threaded rod measures 0.25 inch (6.4mm) in diameter and approximately 3¹/₂ to 5 inches in length. Optional use of hollow steel tubes can be fit over the threaded rods and act as protective sleeves for the blanket material when the door is fastened. Five steel insulation pins shall be welded to the cover, one in each corner (approximately 1 inch in from the corner) and one at the center of the steel door panel for blanket insulation. Two layers of blanket material shall be installed over the threaded rods and pins with successive layers cut to size resulting in a perimeter joint extending 1 inch beyond the layer below. Secure blanket in place with 1¹/₂ inch diameter steel speed washers installed over the insulation pins. Place washers on the threaded rods and secure with nuts. Seal all cut edges with aluminum foil tape. Do not install banding over this area.

3.5 Duct Support:

3.5.1 Horizontal duct support assemblies do not require FyreWrap insulation when constructed using a minimum ¹/₂ inch diameter all-thread steel rod and a 2 inch by 2 inch by ¹/₄ inch steel angle spaced a maximum 60 inches on center along the length of the duct. A minimum clearance of 2 inches is required between the insulated duct and the steel rod. For all other duct support configurations, a single layer of FyreWrap 1.5 Duct Insulation is required on all components. Utilize a minimum 3 inch overlap (approximately a ¹/₄ turn) on all joints.

3.6 Through Penetration Firestop System:

Penetrations of a fire-resistance-rated floor/ceiling assembly by HVAC ducts shall be protected by the appropriate firestop system as described in the following assemblies:

3.6.2 FyreWrap 1.5 Duct Insulation, Single Layer, 1-Hour and 2-Hour Fire Rated HVAC Duct:

Duct Construction: Steel, minimum nominal thickness of 0.06 inch (1.52mm)(16 gage).

Duct Size: Maximum dimension of 24 by 54 inches (610 by 1371.6 mm) and a maximum perimeter dimension of 29 by 61 inches (736.6 by 1549.4 mm).

Penetration Opening: The annular space on each side of the duct shall range from ³/₄ inch on one side to a maximum of 3 inches on the other side.

Duct Wrap: The HVAC duct shall be insulated as described in Section 3.2 and 3.6.

Packing Material: The annular space around the insulated duct shall be tightly packed with unfaced FyreWrap Insulation, folded and compressed to fill the opening. Cut the blanket into 9 inch strips, then fold the blanket into a "U" shape and compress it approximately 37%, insert it into the opening to fill the entire annular space. Recess the surface of the packing material a min ¹/₄ inch from the top surface of the floor, as required to accommodate the necessary depth of caulk fill material.

Sealant Material: Johns Manville Firetemp CI, SI or SE intumescent caulk is applied over the FyreWrap blanket, fully covering the FyreWrap blanket to a minimum thickness of 0.25 inch (6.4 mm). The caulk is overlapped onto the surface of the concrete and onto the insulated duct approximately ¹/₂ inch.

Floor Construction: Reinforced light weight (nominal density of 118 lb/ft³ (1890kg/m³) concrete slabs with a minimum thickness of 4¹/₂ inches (114 mm).

4.0 INSTALLATION

Installation shall be in accordance with the manufacturer's published instructions, subject to the conditions of this report. The manufacturer's published installation instructions and this report shall be strictly adhered to and a copy of these instructions shall be available at all times on the job site during installation.

5.0 IDENTIFICATION

Each package and/or blanket of FyreWrap Duct insulation covered by this report shall be labeled with the manufacturer's name and/or trademark, address, surface-burning characteristics, the name of the quality control agency (Intertek Testing Services NA, Ltd.) and this ICC-ES legacy evaluation report number NER-609 for field identification.

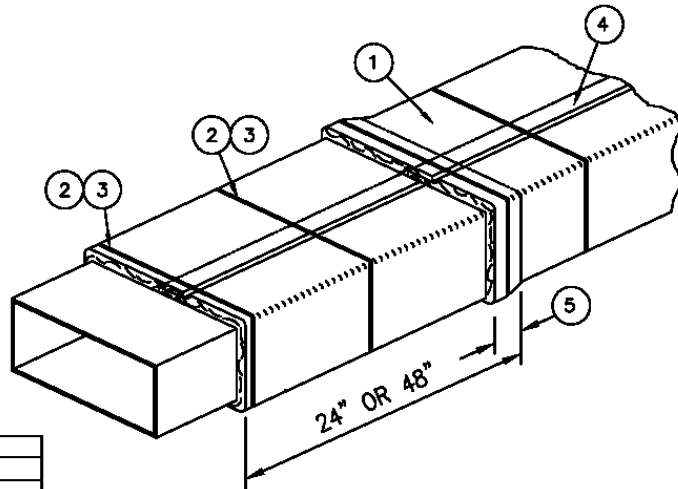
6.0 EVIDENCE SUBMITTED

- 6.1 Omega Point Laboratories, Inc., Test Report No. 16201-106210, dated April 12, 2000, containing a report of the fire performance of the FyreWrap insulation materials evaluated during a two-hour ASTM E 119 engulfment exposure. The through-penetration firestop system was tested in accordance with ASTM E 814.
- 6.2 Omega Point Laboratories, Inc., Test Report No. 16201-106568, dated April 10, 2000, containing a report of the fire performance of the FyreWrap insulation materials evaluated during two-hour ASTM E 119 non-load bearing wall exposure test.
- 6.3 Omega Point Laboratories, Inc., Test Report No. 160201-106208, dated April 10, 2000, containing a report of the fire performance of the FyreWrap insulation materials tested in accordance with Sections 12 and 13 of the UL 1978 Standard for Grease Ducts.
- 6.4 An engineering analysis prepared and signed by Arthur J. Parker and Jesse J. Beitel of Hughes Associates, Inc., dated October 9, 2000, containing an analytical engineering assessment in support of installation on ducts which exceed the sizes evaluated during testing.
- 6.5 Underwriters Laboratories Inc., Assignment OONK-24556, dated September 20, 2000, on hot surface performance testing of FyreWrap in accordance with ASTM C 411.
- 6.6 Underwriters Laboratories Inc., Assignment OONK24-556, dated September 20, 2000, on an unfaced calcium-magnesium-silica fiber blanket in accordance with ASTM E 136.
- 6.7 Underwriters Laboratories Inc., Project No. 94NK27-386, dated December 19, 1994, for surface-burning characteristics of building materials in accordance with ASTM E 84.
- 6.8 Omega Point Laboratories, Document No. 16201-1, 2, and 3, Revision C, May 2002, Quality Control Manual for Unifrax Corporation's FyreWrap Duct Insulation Material.
- 6.9 Engineering calculations, prepared, signed and sealed by Arthur J. Parker and Jesse J. Beitel of Hughes Associates, Inc., dated April 20, 2001, containing an analysis of the structural capacity of vertical and horizontal steel ducts and support systems.

- 6.10** The manufacturer's installation instructions, titled Unifrax FyreWrap Installation Manual Form C-3082, effective August 2002.
- 6.11** Omega Point Laboratories, Inc., Test Report No. 15956-107895A, Dated January 15, 2001, containing a report of the fire performance of the FyreWrap Max 2.0 insulation materials tested in accordance with Sections 12 and 13 of the UL 1978 Standard for Grease Ducts.
- 6.12** Omega Point Laboratories, Inc., Test Report No. 15956-107897A, dated January 25, 2001, containing a report of the fire performance of the FyreWrap MAX 2.0 Duct Insulation material evaluated during a two-hour ASTM E 119 engulfment exposure.
- 6.13** Omega Point Laboratories, Inc., Test Report No. 15956-107893A, dated January 26, 2001, containing a report of the fire performance of the FyreWrap 1.5 Duct Insulation material evaluated during a two-hour engulfment exposure as outlined in ISO 6944-1985 (E).
- 6.14** Omega Point Laboratories, Inc., Test Report No. 15956-107894A, dated January 25, 2001, containing a report of the through penetration fire stop performance, evaluated during a two-hour exposure in accordance with ASTM E 814-97 Standard Test Method for Fire Tests Through-Penetration Firestops and ULC S-115-95 Standard Test Method of Fire Tests of Firestop Systems.
- 6.15** Omega Point Laboratories, Inc., Test Report No. 15956-108746A dated June 8, 2001, containing a report of the fire performance of the FyreWrap 1.5 Duct Insulation material evaluated during a one-hour engulfment exposure as outlined in ISO 6944-1985 (E).
- 6.16** Omega Point Laboratories, Inc., Test Report No. 15956-108745A, dated June 11, 2001, containing a report of the through penetration fire stop performance, evaluated during a one-hour exposure in accordance with ASTM E 814-97 Standard Test Method for Fire Tests Through-Penetration Firestops and ULC S-115-95 Standard Test Method of Fire Tests of Firestop Systems.
- 6.17** Omega Point Laboratories, Inc. 2002 Directory of Firestop Design Listings; Design numbers, FS 580W, FS 554W & FS 555F.
- 6.18** Omega Point Laboratories, Inc., Test Report No. 16201-114719, dated July 14, 2003, containing a report on the fire performance of the FyreWrap EZ 1.5 insulation material tested in accordance with Sections 12 and 13 of UL 1978 Standard for Grease Ducts.
- 6.19** Omega Point Laboratories, Inc., Test Report No. 16201-113986, dated November 5, 2003, containing a report of the fire performance of the FyreWrap EZ 1.5 insulation material tested in accordance with ASTM E 814 for a two-hour fire rated through penetration concrete floor firestop assembly.
- 6.20** Omega Point Laboratories, Inc., Test Report No. 16201-113985, dated October 16, 2003, containing a report of the fire performance of the FyreWrap EZ 1.5 insulation material tested in accordance with ASTM E 814 for a two-hour fire rated through penetration gypsum wall firestop assembly.
- 6.21** Omega Point Laboratories, Inc. 2003 Directory of Design Listings Design No. 560F and VAD-537F.
- 6.22** Omega Point Laboratories, Inc., Engineering Evaluation: Comparison of ISO-6944 to ASTM E 119 Engulfment Fire Tests, letter dated April 30, 2003.
- 6.23** Omega Point Laboratories, Inc., Engineering Evaluation ISO-6944 Ducts Tested under Projects 15956-108746A and 16201-113986, letter dated December 1, 2003.
- 7.0 CONDITIONS OF USE**
- The ICC-ES Subcommittee for the National Evaluation Service finds that the FyreWrap Duct Insulation described in this report complies with or is a suitable alternate to that specified in the 2000 *International Building Code*[®], the 2000 *International Mechanical Code*[®], the 2002 *Accumulative Supplement to the International Codes*[™], the BOCA[®] *National Building Code/1999*, the 1999 *Standard Building Code*[®], the 1997 *Standard Mechanical Code*[®] and the 1997 *Uniform Building Code*[™], subject to the following conditions:
- 7.1** The FyreWrap Duct Insulation blankets shall be installed in accordance with the manufacturer's instructions and the requirements of the applicable code, subject to the conditions of this report.
- 7.2** Use of FyreWrap Duct Insulations as an alternative to a fire-resistance-rated shaft enclosure shall be limited to steel. HVAC Ducts must be constructed out of minimum nominal thickness of 0.06 inch (1.52 mm) (16 Gage) steel.
- 7.3** Use of FyreWrap Duct Insulations as a means of reducing clearance to combustibles to zero is limited to ducts constructed of a minimum nominal thickness of 0.06 inch (1.52 mm) (16 Gage) steel. Use of FyreWrap 1.5 Duct insulation as a means of reducing clearance to combustibles is limited to HVAC ducts constructed of a minimum nominal thickness of 0.06 inch (1.52 mm) (16 Gage) steel.
- 7.4** FyreWrap Ducts Insulations shall extend for a minimum distance of 36 inch (914 mm) beyond the edge of the combustible material when the duct wrap is used for zero-clearance to combustible installations, when the entire length of the duct is not completely wrapped.
- 7.5** Through penetration firestop systems are constructed as listed in Section 3.9 of this evaluation report.
- 7.6** Where FyreWrap Duct Insulation is used as an alternative to a fire-resistance-rated shaft enclosure, and the support framing does not meet the criteria stated in this report, all horizontal and vertical support members for the duct shall be completely wrapped with one layer of wrap material.
- 7.7** For installations where ducts enclosed with FyreWrap Duct Insulations penetrate a floor construction other than that described in Section 3.9 and 7.6 of this report, the ducts shall be enclosed in a fire-resistance-rated shaft enclosure in accordance with the requirements of the applicable Code.
- 7.8** This report is subject to periodic re-examination. For information on the current status of this report, contact the ICC-ES.

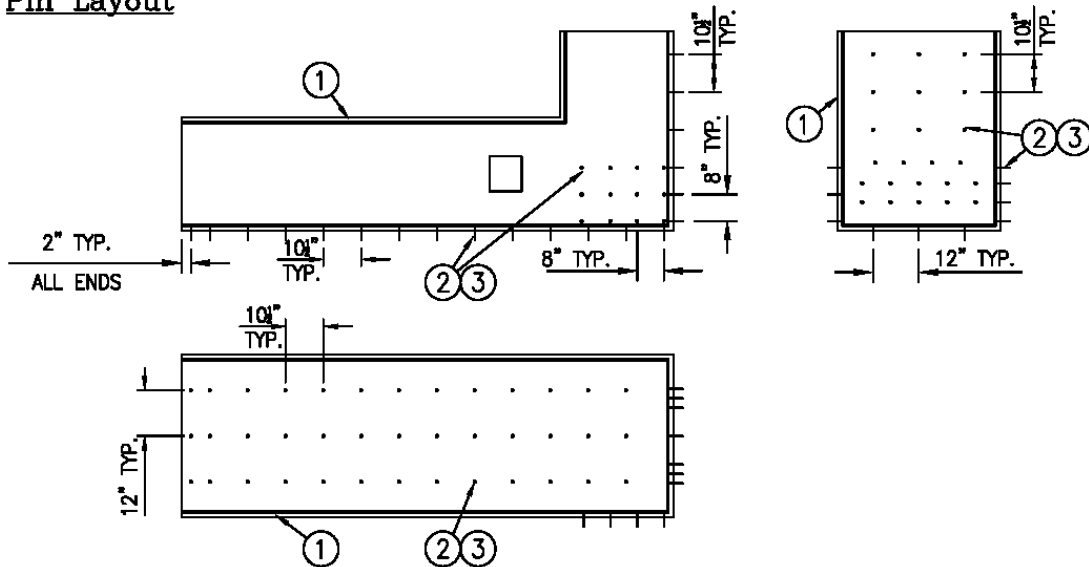
FIGURE 1
FyreWrap®1.5 Duct Insulation
1 Hour and 2 Hour Fire Rated HVAC Duct System
(Single Layer Installation)

Duct Wrap Layout



ITEM	DESCRIPTION
1	FyreWrap® 1.5 Duct Insulation, One Layer
2	Filament Tape (Temporary Hold)
3	SS Banding Straps (Permanent Hold)
4	3" Minimum Perimeter Overlap
5	3" Minimum Longitudinal Overlap

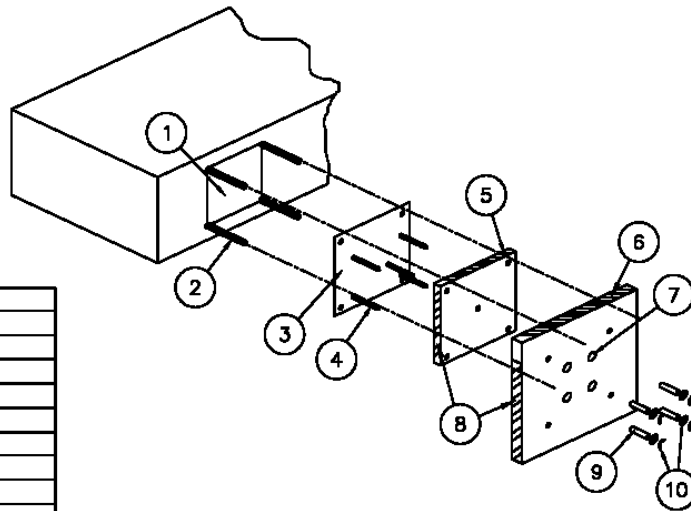
Pin Layout



ITEM	DESCRIPTION
1	FyreWrap® 1.5 Duct Insulation, One Layer
2	Steel Insulation Pins
3	1 1/2" Sq. or 1 1/2" dia. Steel Speed Clips

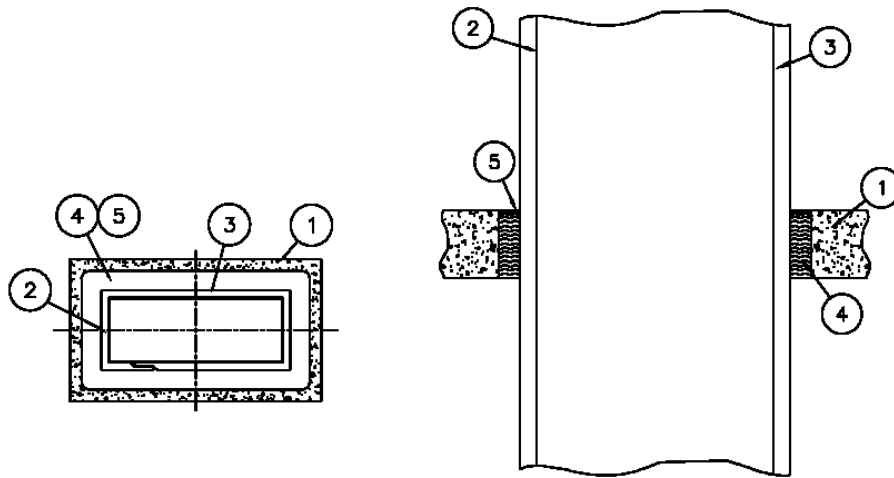
FIGURE 2
FyreWrap®1.5 Duct Insulation
1 Hour and 2 Hour Fire Rated HVAC Duct System
(Single Layer Installation)

Access Door



Legend:	
1	Access Door Opening
2	1/2" Dia. Threaded Rods
3	Access Door Cover Panel (16 gauge)
4	Insulation Pins - Welded to Cover
5	First Layer FyreWrap® 1.5
6	Second Layer FyreWrap® 1.5 - w/ 1" perimeter overlap on all sides
7	Speed Clips/Washers
8	Cut Edges Sealed With Aluminum Foil Tape
9	Hollow Steel Tubing, 1/2" ID (optional)
10	1/2" Dia. Wing Nuts and Washers

Firestop

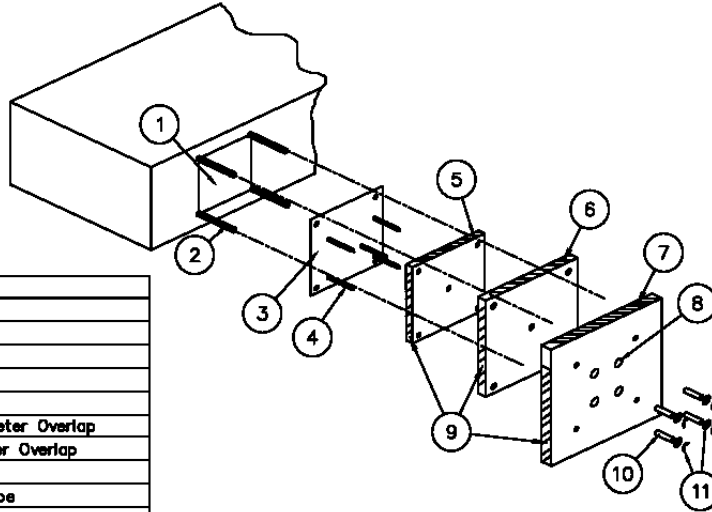


Legend:	
1	Concrete or Block Wall or Floor
2	HVAC Duct
3	FyreWrap® 1.5 Duct Insulation, One Layer
4	Unfaced FyreWrap® 1.5 Blanket, 4 1/2" depth
5	Firestop SI, SE or CI, 1/2" depth Plus 1/2" Overlap On Concrete

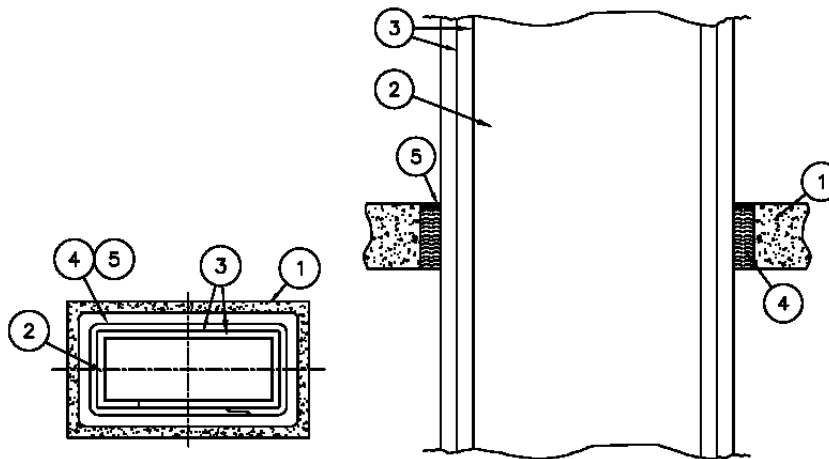
FIGURE 3
FyreWrap® 1.5 Duct Insulation
2 hour Rated HVAC Duct System
(Two Layer Installation)

Access Door

Legend:	
1	Access Door Opening
2	# Dia. Threaded Rods
3	Access Door Cover Panel (16 Gauge)
4	Insulation Pins – Welded to Cover
5	First Layer FyreWrap® 1.5
6	Second Layer FyreWrap® 1.5, w/ 1" Perimeter Overlap
7	Third Layer FyreWrap® 1.5, w/ 1" Perimeter Overlap
8	Speed Clips/Washers
9	Cut Edges Sealed With Aluminum Foil Tape
10	Hollow Steel Tubing, # ID (optional)
11	# Dia. Wing Nuts and Washers



Firestop



Legend:	
1	Concrete Floor or Blocks, 4½" depth
2	Grease Duct
3	FyreWrap® 1.5 Duct Insulation, Two Layers
4	4½" Mineral Wool Packing (Nom. 4 PCF)
5	STI/GE Silicone Pensil 300, ½" depth,