Unifrax I LLC
Design No. UNI/BI 120-08
FIRE RESISTANT VENTILAITON AIR DUCT
FyreWrap® Elite® 1.5 Insulation

	ASTM E2816	ASTM E814	
Duct	**Rating**	**F-Rating**	**T-Rating**
Condition A (Horizontal)	2 Hour	2 Hour	2 Hour
Condition B (Vertical)	2 Hour	2 Hour	2 Hour

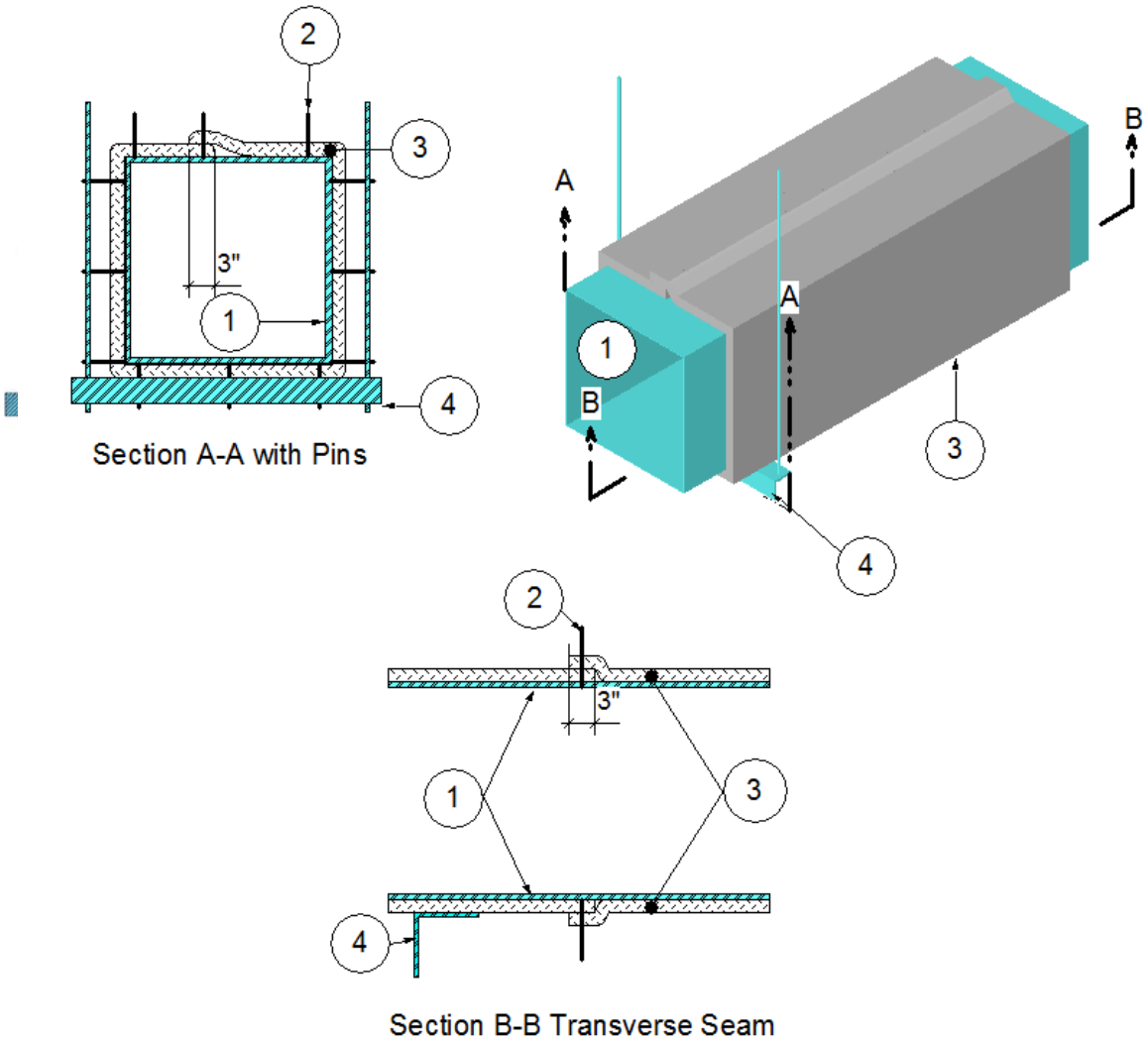

Figure 1. Horizontal Duct Condition A and Vertical Duct Condition B. (Illustrated in Horizontal Orientation)

1. **VENTILATION AIR DUCT:** Use a duct constructed to SMACNA HVAC Duct Construction Standard, min. 2 in. H_2O-pressure class, rectangular duct, with a max. cross-sectional area of 2040 in.^{2} with no single dimension exceeding 85 in.

2. PINS: Refer to Figure 1. Use steel impaling pins to secure the insulation. The pins are min. 12 GA, 6 in. long, with a 2 × 2 in., 30 GA galvanized steel base with a self-adhesive tape on the base. Secure pins to the ventilation air duct (Item 1) with the self-adhesive tape, supplemented with a single 1/8 in. stainless steel rivet through the pin base and the duct. Secure insulation on pins with 2-1/2 × 2-1/2 in. × 12 GA, galvanized steel clip washers.

PIN SPACING:

A. VERTICAL DUCT – Install pins with max. spacing of 12 in on center (oc) around the perimeter of the duct. Where insulation (Item 3) seams overlap by the required 3 in., a row of pins shall be located at the mid-line of the overlap, and spaced 12 in. Support the insulation collars (Item 7C) at the penetration with two rows of pins spaced max. 3 in. between the rows. Pin placement in one row shall correspond with pin placement in the other row. Space each row of pins vertically at max. 20 in oc.

B. HORIZONTAL DUCT – Install pins in the same manner described for VERTICAL DUCT, adjusted for the horizontal orientation, and with the exception that pins are not required on sides or top of duct, except at locations of seam overlaps along the length of the duct, and on insulation collars (Item 7C).

3. CERTIFIED MANUFACTURER: Unifrax I LLC

CERTIFIED PRODUCT: Duct Insulation

MODEL: FyreWrap® Elite® 1.5 Insulation

DUCT INSULATION: Apply one layer of nominal 1-1/2 in. thick, 6 pcf density duct insulation over the entire surface of the ventilation air duct (Item 1). Apply with transverse and longitudinal joints overlapping a min. of 3 in. The overlapping joint running the length of the duct shall be located on one of the short sides of the duct. Duct insulation is installed with 1 in. compression at wall and floor penetrations. Finish exposed ends of insulation with aluminum tape.

4. SUPPORTS: Support the horizontal portion of the insulated ventilation air duct (Item 1) using an un-insulated "trapeze" system composed of min. 3 × 3 × 1/4 in. steel angle as the cross-member, and two min. 3/8 in. all-thread steel rods connected using nuts and washers. The horizontal supports shall be spaced a max. of 15 in. from the face of the supporting wall construction (Item 5), and a max. of 55 in. oc between supports. Adjust the spacing as needed to carry a max. combined load of the ventilation air duct (Item 1) and duct insulation (Item 3) of 200 lb per horizontal support.. Connect the all-thread steel rods to the underside of the floor assembly using an attachment method designed to carry the system weight under a fire exposure condition equivalent to the exposure corresponding to the listed 2 hour fire rating. Place one all-thread steel rod at each end of the trapeze cross-member. Center ventilation air duct (Item 1) with duct insulation (Item 3) on trapeze cross-member. Space all-thread steel rods a min. of 1 in. and max. 6 in. from surface of the insulated ventilation air duct. Extend trapeze cross-member at least 2 in. past each all-thread rod. Where ventilation air duct (Item 1) penetrates a fire rated floor ceiling assembly (Item 5D), install a riser support prior to installing duct insulation (Item 3), using un-insulated 1-1/2 × 1-1/2 × 1/4 in. steel angles welded to the ventilation air duct (Item 1) and a supporting steel frame designed and constructed to meet the requirements of the International Mechanical Code.

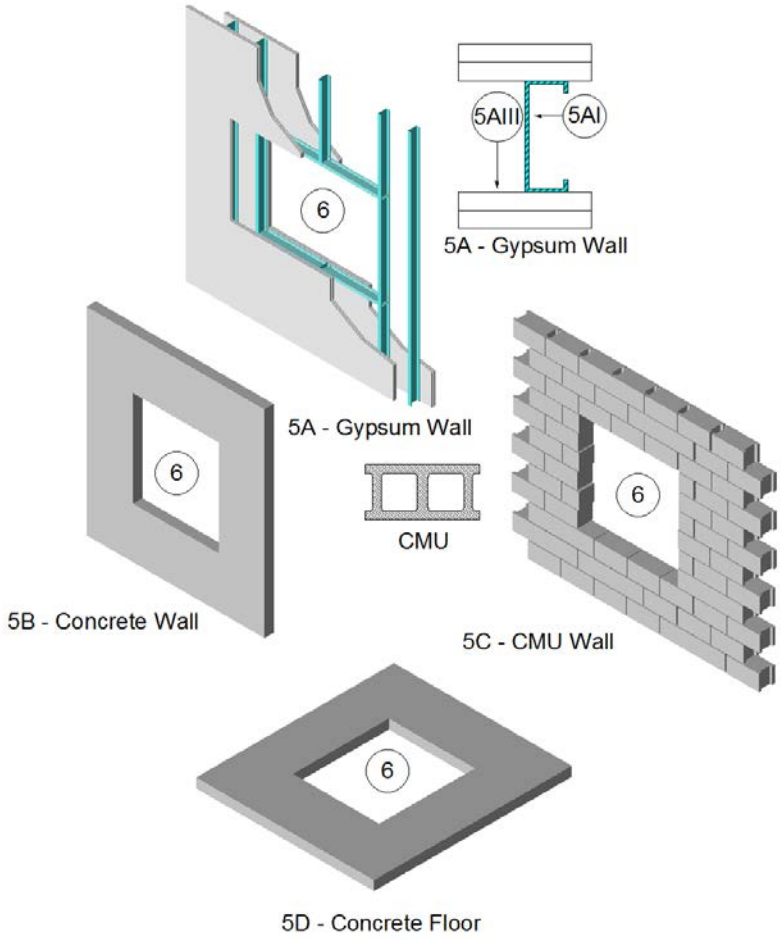

Figure 2. Supporting Construction.

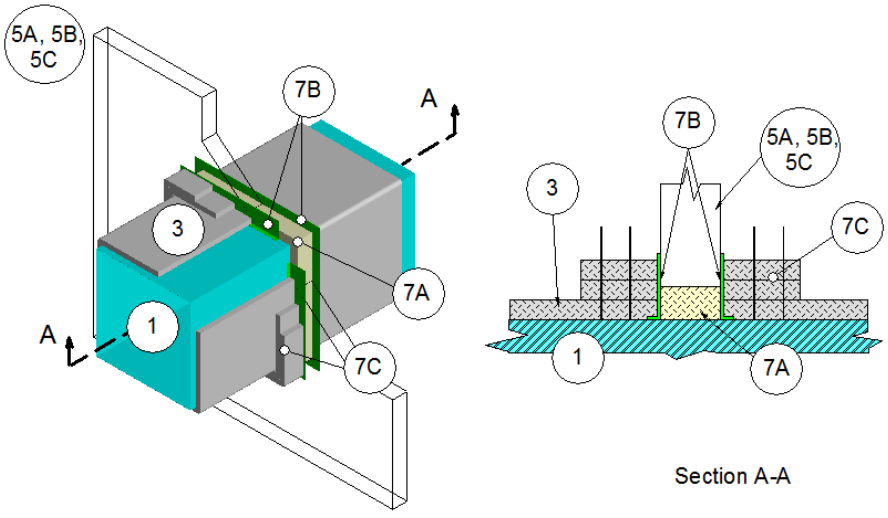

Figure 3. Penetration Assembly, Duct Through Wall.

5. SUPPORTING CONSTRUCTION: Refer to Figure 2. Use one of the following wall or floor assemblies:

A. GYPSUM WALL ASSEMBLY – Use a symmetrical 2 hour rated gypsum wall assembly constructed in accordance with the corresponding fire resistance rated design listing and consisting of the following min. requirements:

i. Steel Studs – Min. 25 GA galvanized steel studs measuring 3-5/8 in. wide with 1-1/4 in. legs spaced max. 24 in. oc.

ii. Tracks – Channel U-shaped floor and ceiling runners measuring 1/2 in. deep × 3-5/8 in. wide.

iii. Gypsum Board – Cover studs and runners with two layers of 5/8 in. thick Type X gypsum board on each face. Apply vinyl or casein joint compound to face layers of gypsum board in two coats to all exposed screw heads and gypsum board joints. Embed min. 2 in. wide paper, plastic, or fiberglass tape in first layer of joint compound over joints in gypsum board. Min. wall assembly thickness is 6 in. measured from face layer of gypsum board to opposite face layer of gypsum board.

B. CONCRETE WALL ASSEMBLY – Use a symmetrical, min. 2 hour rated, solid concrete wall assembly made from reinforced lightweight or normal weight (100-150 pcf) concrete constructed of solid concrete with a min. concrete thickness measured from exposed face to exposed face using one of the following:

i. Lightweight concrete at 4.6 in.

ii. Sand-lightweight concrete at 4.6 in.

iii. Carbonate, aggregate concrete at 4.6 in.

iv. Siliceous aggregate concrete at 5 in.

C. MASONRY WALL ASSEMBLY – Use a symmetrical, min. 2 hour rated, nominal 8 × 8 × 16 in. concrete masonry unit (CMU) wall, or wall assembly made from lightweight or normal weight concrete (100-150-pcf).

D. CONCRETE FLOOR ASSEMBLY – Use a symmetrical, min. 2 hour rated solid concrete floor assembly made from reinforced lightweight or normal weight concrete (100-150-pcf) with a min. thickness measured from exposed face to exposed face using one of the following:

i. Lightweight concrete at 4.6 in.

ii. Sand-lightweight concrete at 4.6 in.

iii. Carbonate aggregate concrete at 4.6 in.

iv. Siliceous aggregate concrete at 5 in.

6. OPENING: Create an opening in the supporting construction (Item 5). The opening shall be framed out using min. 25 GA steel studs when using gypsum wall construction and shall have a solid perimeter face for masonry wall construction. The opening shall be sized to house the ventilation air duct (Item 1) without duct insulation (Item 3). Position the ventilation air duct (Item 1) concentrically in the opening such that there is a 2-1/2 ± 1/2 in. annular space on all sides.

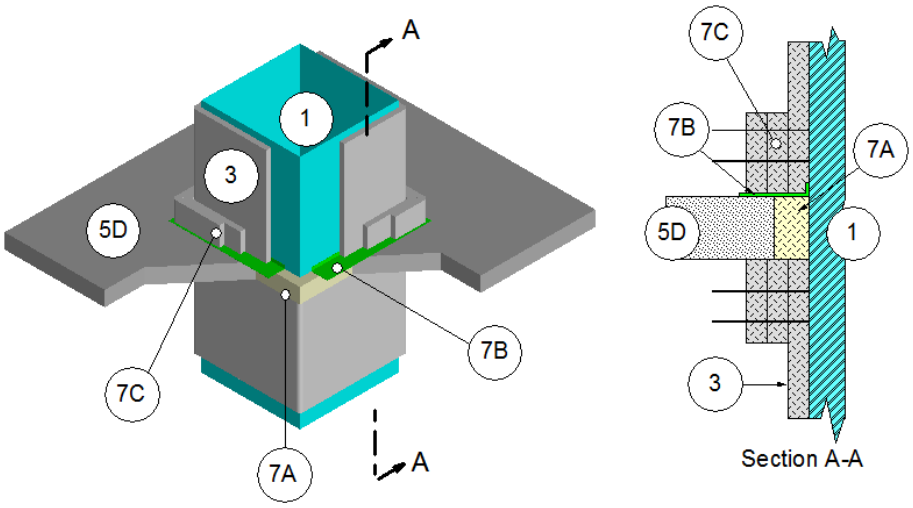

Figure 4. Penetration Assembly, Duct Through Floor.

7. PENETRATION FIRESTOP: Install firestop between the supporting construction (Item 5) and the insulated ventilation air duct (Item 1). Use a firestop system with the following min. requirements:

A. CERTIFIED COMPANY – Unifrax I LLC

CERTIFIED PRODUCT – Duct Insulation

MODEL – FyreWrap® Elite® 1.5 Insulation

PACKING MATERIAL – Fill the entire annular space with certified duct insulation without the encapsulation (foil scrim) and compress to 30% by volume.

B. STEEL FLASHING – Use min. 18 GA steel flashing bent at a 90 degree angle with a 1 in. and a 5 in. leg. Secure the 1 in. leg of the flashing to the duct (Item 1) with #10, 1 in., self-tapping screws. Locate screws 1 in. from either end of the flashing and space remaining fasteners 8 in. oc. Attach the 5 in. leg to supporting construction using 3/16 in. diameter × 1-3/4 in. long concrete anchors for concrete floors, or #8 × 1-1/2 in. self-tapping screws for steel stud framed walls, spaced 1 in. from the ends and 6 in. oc in between. Attach to duct using #8 × 1 in. self-tapping screws spaced 1 in. from the edge of the duct and 6 in. oc in between. Use steel flashing on both sides for wall assemblies (Figure 3), and use steel flashing on the top side for floor-ceiling assemblies (Figure 4).

C. CERTIFIED CPOMPANY – Unifrax I LLC

CERTIFIED PRODUCT – Duct Insulation

MODEL – FyreWrap® Elite® 1.5 Insulation

DUCT INSULATION – Install two 6 in. wide duct insulation strips to form collars at the penetration on both sides of the supporting construction (Item 5). Support the collars with two rows of pins spaced max. 3 in. between rows. The location of pins in one row shall correspond with the location of pins in the other row. Space pins in the rows max. 12 in. around the perimeter of the ventilation air duct (Item 1).