Unifrax I LLC
Design No. UNI/BI 120-09
FIRE RESISTANT VENTILAITON AIR DUCT
FyreWrap® Elite® 1.5 Insulation

	ASTM E2816	ASTM E814	
Duct	**Rating**	**F-Rating**	**T-Rating**
Condition C (Horizontal)	NOT RATED	NOT RATED	NOT RATED
Condition D (Vertical)	1 Hour	2 Hour	1 Hour

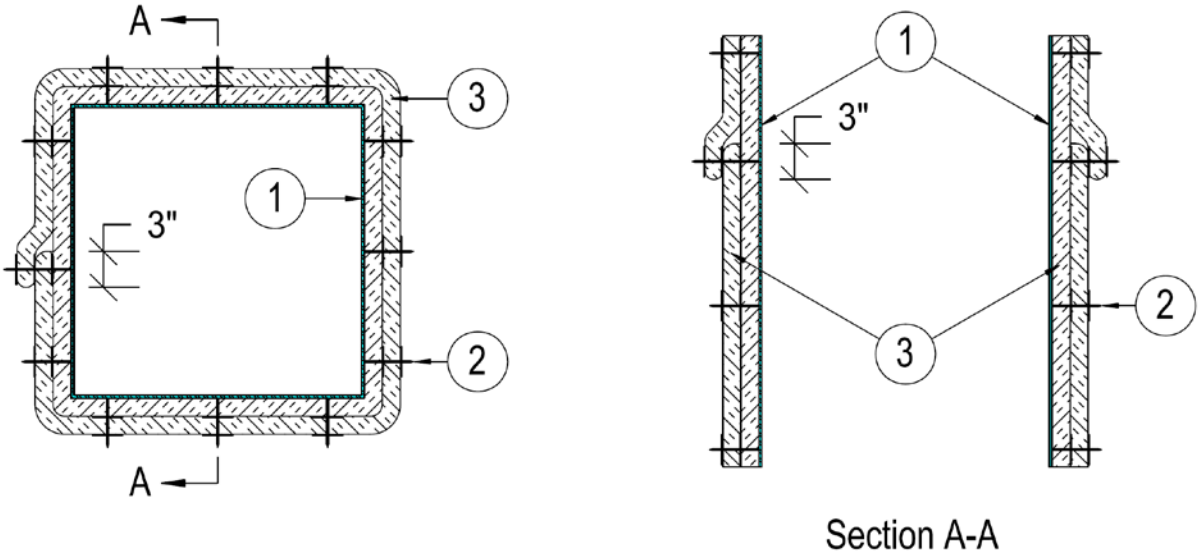

Figure 1. Plan and Section, Vertical Duct Condition D.

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 516 in.^{2} with no single dimension exceeding 43 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. Use greater pin length when required to penetrate through multiple overlapping duct insulation (Item 3) joints. 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: VERTICLE DUCT: Install pins with max. spacing of 12 in. 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. on center (oc) around the perimeter. Support the insulation collars (Item 7C) at the penetration with two rows of pins spaced max. 3 in. between the rows. Pins in one row shall correspond with pins in the other row. Space each row of pins vertically at max. 20 in. oc.

3. **CERTIFIED MANUFACTURER:** Unifrax I LLC

   CERTIFIED PRODUCT: Duct Insulation

   MODEL: FyreWrap® Elite® 1.5 Insulation

   DUCT INSULATION: Apply two layers of nominal 1-1/2 in. thick, 6 pcf density duct insulation over the entire surface of the ventilation air duct (Item 1). Apply first layer with compressed (min. 1 in.), butted transverse and longitudinal joints. Locate the longitudinal butt joints at adjacent or opposite corners of the duct for alternating sections of duct insulation. Use filament tape to hold longitudinal butt joints together at the corners of the duct. Apply second layer of insulation with transverse and longitudinal joints overlapping a min. of 3 in. Offset joints between layers. Duct insulation is installed with 1 in. compression at wall and floor penetrations. Finish exposed ends of insulation and insulation overlap joints with aluminum tape.

4. **SUPPORTS:** 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.

5. **SUPPORTING CONSTRUCTION:** 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 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.

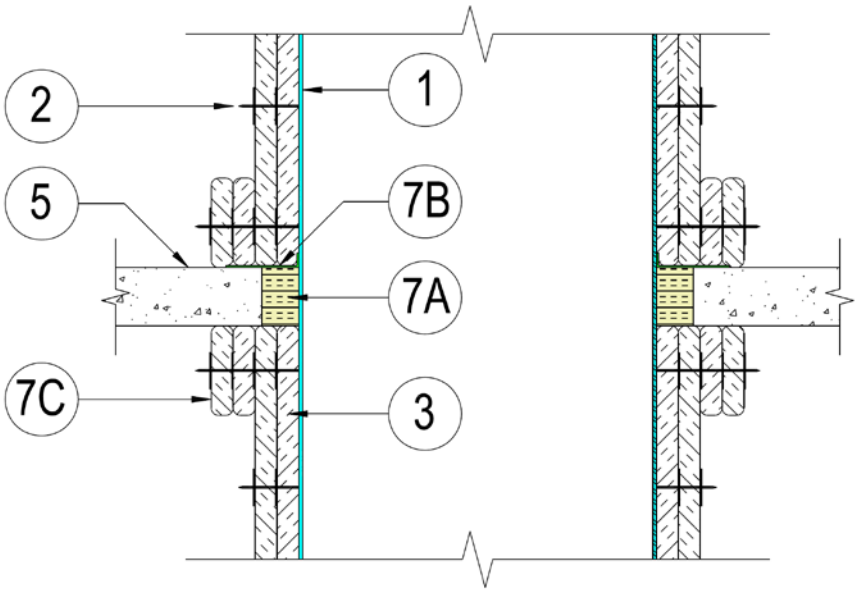

Figure 2. Penetration Assembly, Duct Through Floor.

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

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

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 nominal 3/16 in. diameter × 1-3/4 in. long concrete anchors spaced 1 in. from each end of the flashing and max. 8 in. oc in between anchors. Use the steel flashing on the top side for floor-ceiling assemblies (Figure 2).

C. CERTIFIED CPOMPANY – Unifrax I LLC

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DUCT INSULATION – Install two 6 in. wide duct insulation strips to form collars at the penetration, on both sides. Support the collars with two rows of pins spaced max. 3 in. between rows. Pins in one row shall correspond with pins in the other row. Space pins in the rows max. 12 in.