**3M Company**
**Design No. 3MU/JS 180-09**
**Perimeter Fire Barrier System**
**FireDam™ Spray 200**
**Fire Barrier Watertight Spray**
**Fire and Water Barrier Tape FWBT**
**Fire Barrier 1000 NS Silicone Sealant**
**Fire Barrier 1003 SL Silicone Sealant**
**ASTM E2307, ASTM E1399, UL 2079 (Air Leakage)**
**Rating: See Table 1**

| | **Fire Barrier Watertight Spray (Item 3B)** | | **FireDam™ Spray 200, FWBT, Fire Barrier 1000 NS Silicone Sealant, Fire Barrier 1003 SL Silicone Sealant (Item 3B)** | |
|---|---|---|---|---|
| | Mineral Wool Compression (See Item 3A) | | Mineral Wool Compression (See Item 3A) | |
| | 33% | 50% | 33% | 50% |
| F-Rating per ASTM E2307 | 3 Hour | 3 Hour | 3 Hour | 3 Hour |
| T-Rating per ASTM E2307 | 1-1/2 Hour | 2-1/2 Hour | 1-1/2 Hour | 2-1/2 Hour |
| ASTM E1399 Class IV: 500 cycles@ 30 cpm Cycling (%) | Horizontal 10% Vertical n/a | Horizontal 10% Vertical 6.25% | Horizontal 11% Vertical n/a | Horizontal 16.7% Vertical 6.25% |
| L-Rating per UL 2079 | < 1.0 SCFM/LF | < 1.0 SCFM/LF | < 1.0 SCFM/LF | < 1.0 SCFM/LF |

**Table 1 - Ratings**

1. **CONCRETE FLOOR ASSEMBLY:** Use a 3 hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100 to 150 pcf, having a min. thickness of 4-1/2 in. at the joint face. Increase floor assembly thickness as required for concrete type to meet the specified rating period. When a longitudinal recess (blockout) is required to contain an architectural joint system, increase concrete floor assembly thickness to maintain a min. thickness of 4-1/2 in. and accommodate depth of blockout formed in the concrete: blockout width unrestricted.

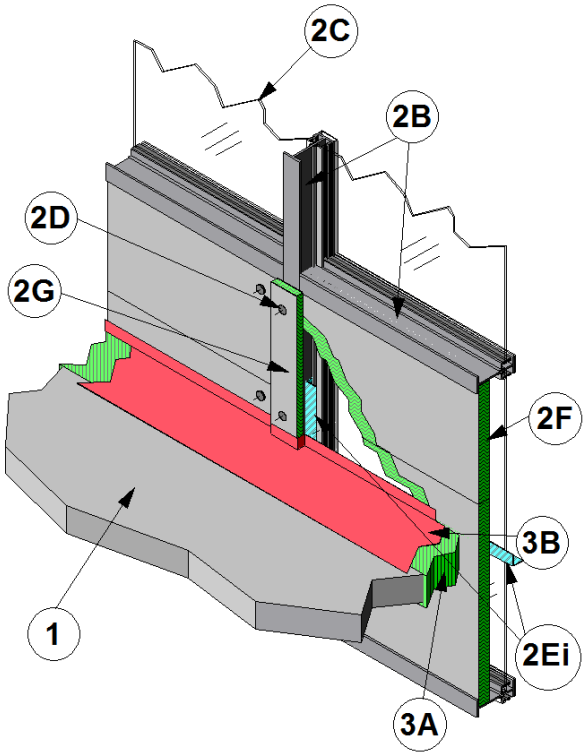


**FIGURE 1 – Perimeter Fire Barrier System with Angle Reinforcement**

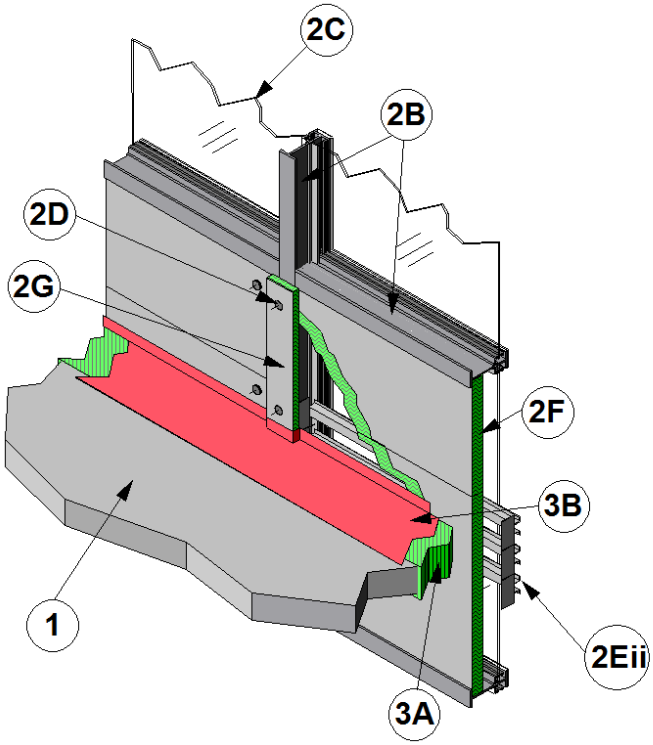


**FIGURE 2 – Perimeter Fire Barrier System with Hat Channel Reinforcement**

**2. CURTAIN WALL ASSEMBLY:** The curtain wall assembly shall incorporate the following construction features:

A. MOUNTING ATTACHMENT (Not Shown) – Attach aluminum framing (Item 2B) to the structural framing according to the curtain wall manufacturer's instructions. When required, connect the mounting attachments to the joint face of the concrete floor assembly (Item 1) according to the curtain wall manufacturer's instructions. Limit distance between mounting attachments to max. 120 in.

B. ALUMINUM FRAMING – Install I-shaped mullions and transoms, sized according to the curtain wall system manufacturer's guidelines. Min. overall dimensions of mullion framing extrusions: 0.125 in. thick with a min. 5-1/2 in. height and a min. of 2-1/2 in. width. Min. overall dimensions of transom framing is 0.125 in. thick with a min. 2 in. height and a min. of 2 in. width of the extrusion. Mullions are to be spaced a min. 60 in. on center (oc) and transoms are to be spaced a min. 10 in. oc. Upper transom is to be located flush with the top surface of the concrete floor assembly (Item 1) (as measured from the bottom of the transom).

C. GLASS PANELS – Size and install glass panels to aluminum framing (Item 2B) according to the curtain wall system manufacturer's guidelines. Use a min. 1/4 in. thick clear, heat-strengthened (HS) glass or tempered glass with a max. width and height less than the aluminum framing (Item 2B) oc spacing, which allows the glass to be secured between the notched shoulder of the aluminum framing and pressure bar. Secure panels with a thermal break (rubber extrusion), pressure bar (aluminum extrusion), min. 1/4-20 × 5/8 in. long screws, and a snap face (aluminum extrusion).

D. IMPALING PINS – Use min. 12 GA steel pins, a min. 1/2 in. longer than the thickness of the curtain wall insulation. Attach pins to a nominal 2 × 2 in. clip angle constructed with 20 GA, galvanized sheet steel and secure the clips to the aluminum framing (Item 2B) with No. 10, self-tapping, sheet metal screws. Space pins a max. of 12 in. oc on the vertical framing members and a max. of 20 in. oc on the horizontal framing members that make up the perimeter of the spandrel area. Install the interior face of the curtain wall insulation (Item 2F) so that it is flush with the interior face of the aluminum framing (Item 2B).

E. REINFORCING MEMBERS – Reinforce and support the back side of the curtain wall insulation (Item 2F) using one of the following two options:

i. Reinforcing Angle: (See Figure 1) Mount a min. 1-1/2 × 1-1/2 in., 20 GA galvanized, steel angle to the vertical framing members so that the vertical leg serves as a backer to the exterior face of the curtain wall insulation (Item 2F) and the horizontal leg extends away from the curtain wall insulation (Item 2F) and locate at the centerline of the perimeter joint protection (Item 3). Size the angle 8 in. longer than the span between the interior edges of the vertical framing members and form the angle so that it has a 4 in. vertical leg on each end. Secure the 4 in. vertical leg to the vertical framing member on each side with three, No. 10, steel, self-tapping, sheet metal screws placed in a triangular fashion with a max. spacing of 2 in. oc.

ii. Reinforcing Hat Channel: (See Figure 2) Install galvanized steel, 24 GA, hat channel, nominally 2-1/2 in. wide ×7/8 in. deep, to span the mullion-to-mullion space for the attachment of the curtain wall insulation located at the centerline of the perimeter joint protection. Orient each hat channel section with the wide section facing the curtain wall glazing. Cut each section to a min. 4 in. longer than the mullion spacing, with the ends cut, flattened and folded across the narrow width (toward the joint system) into mounting flanges perpendicular to the hat channel length. These flanges will each be nominally 2 in. long and will be attached to the inside faces of the mullions with No. 10 x 1 in. long self-drilling, self-tapping screws. The curtain wall insulation is to be supported by, and fastened into, this stiffening hat channel section.

F. CURTAIN WALL INSULATION – Use only Intertek certified products meeting the following min. requirements. Use nominal 24 in. wide, 4 in. thick, 4 pcf density; nominal 3 in. thick, 6 pcf density; or nominal 2 in. thick, 8 pcf density, mineral wool batt insulation faced on one side with aluminum foil scrim (vapor retarder), which is exposed to the room interior. Install curtain wall insulation between aluminum framing (Item 2B). Install curtain wall insulation flush with the interior face of the aluminum framing (Item 2B). Secure curtain wall insulation with clips and impaling pins for 2 in. thick 8 pcf insulation or 3 in. thick 6 pcf insulation. Friction fit 4 in. thick 4 pcf insulation using curtain wall insulation length at least 1/4 in. longer than the distance between aluminum framing (Item 2B). Install 24 in. wide curtain wall insulation without vertical seams, spanning the full length between aluminum framing (Item 2B). Locate horizontal seams in the curtain wall insulation at least 6 in. from the top surface of the perimeter joint protection (Item 3). Maintain 1-1/4 in. air cavity between curtain wall insulation and glass panel surface (Item 2C). Seal all meeting edges of curtain wall insulation with nominal 4 in. wide pressure sensitive aluminum foil faced tape (not shown) centered over the junction so that approximately 2 in. of tape covers each edge of the adjacent curtain wall insulation. Option – in lieu of filling the full depth of the space between aluminum framing (Item 2B) with 4 in. thick, 4 pcf density curtain wall insulation, use either min. 3 in. thick 6 pcf density, or 2 in. thick 8 pcf density curtain wall insulation mechanically secured (do not secure by friction fit). Install perimeter fire barrier reinforcement (Item 3C).

G. FRAMING COVERS – Use only Intertek certified products meeting the following min. requirements. Make framing covers, of nominal 4 in. wide strips of 8 pcf density, mineral wool batt insulation faced on one side with aluminum foil scrim (vapor retarder). Install with aluminum foil scrim exposed to the room interior. Install framing covers centered over each vertical framing member and secured to the member with impaling pins and clips spaced a max. 12 in. oc and attached in accordance with Item 2D. Make framing covers below the perimeter joint protection (Item 3) nominal 2 in. thick and those above the perimeter joint treatment, nominal 1 in. thick. Do not pass framing covers through the perimeter joint protection (Item 3). Abut framing covers to the top and bottom surfaces of the perimeter joint protection

(Item 3). Apply pressure sensitive aluminum foil faced tape (not shown) over all meeting edges of curtain wall insulation and framing covers (Item 2G) so that approximately 2 in. covers each edge of the adjacent material.

3. **PERIMETER JOINT PROTECTION:** The perimeter joint (linear opening) is not to exceed an 8 in. nominal joint width (joint width at installation). The perimeter joint treatment shall incorporate the following construction features:

   A. PACKING MATERIAL – Use only Intertek certified products meeting the following min. requirements. Use a min. 4 in. thick, 4 pcf density, mineral wool batt insulation. Cut insulation into 4 in wide strips and install with the fibers running parallel to the edge of concrete floor assembly (Item 1) and curtain wall assembly (Item 2). Stack 4 in wide packing material strips to achieve required compression (refer below) when installed in the nominal joint width at the required 4 in. depth. Compress the packing material into the perimeter joint. Tightly compress together splices (butt joints) in the lengths of packing material by using min. 1/4 in. compression per piece of packing material. When a spray coating or tape is used as the fill, void, or cavity material (Item 3B), locate the top surface of the packing material flush with the top surface of the concrete floor assembly (Item 1). When the non-sag or self-leveling silicone sealant is used as the fill, void, or cavity material (Item 3B), recess the top surface of the packing material 1/4 in. from the top surface of the concrete floor assembly (Item 1).

      i. When 50% compression is required stack the width of the packing material 2 times wider than the nominal joint width.

      ii. When 33% compression is required stack the width of the packing material 1.5 times wider than the nominal joint width.

   B. FILL, VOID, OR CAVITY MATERIAL – Apply either spray coating or sealant over the packing material (Item 3A) as follows:

      i. **CERTIFIED MANUFACTURER:** 3M Company

      **CERTIFIED PRODUCT:** Joint Sealant Spray

      **CERTIFIED MODEL:** FD Spray 200 (Elastomeric, Sprayable)

      Spray apply the liquid to cover the exposed top surface of the packing material (Item 3A) compressed and installed in the perimeter joint. Apply a min. wet film thickness of 1/8 in. and overlap the spray coating a min. 1/2 in. onto the adjacent curtain wall assembly (Item 2) and concrete floor assembly (Item 1). When the spraying process is stopped and the applied spray coating cures to an elastomeric film before installation process is restarted, then overlap the edge of the cured spray coating at least 1/8 in. with the liquid spray coating.

      ii. **CERTIFIED MANUFACTURER:** 3M Company

      **CERTIFIED PRODUCT:** Joint Sealant Spray

**CERTIFIED MODEL:** Fire Barrier Watertight Spray (Elastomeric, Sprayable)

Spray apply the liquid to cover the exposed top surface of the packing material (Item 3A) compressed and installed in the perimeter joint. Apply a min. wet film thickness of 1/10 in. and overlap the spray coating a min. 1/2 in. onto the adjacent curtain wall assembly (Item 2) and concrete floor assembly (Item 1). When the spraying process is stopped and the applied spray coating cures to an elastomeric film before installation process is restarted, then overlap the edge of the cured spray coating at least 1/8 in. with the liquid spray coating.

iii. **CERTIFIED MANUFACTURER:** 3M Company

**CERTIFIED PRODUCT:** Joint Sealant Tape

**CERTIFIED MODEL:** Fire and Water Barrier Tape FWBT (Tape)

Apply the tape such that there is a min. 1 in. overlap onto the adjacent curtain wall assembly (Item 2) and the concrete floor assembly (Item 1). Overlap joints in the tape system by 1/2 in.

iv. **CERTIFIED MANUFACTURER:** 3M Company

**CERTIFIED PRODUCT:** Joint Sealant

**CERTIFIED MODEL:** FB 1000 N/S Silicone Sealant (Non-sag)

Apply non-sag or self-leveling sealant to cover the exposed surface of the packing material (Item 3A) compressed and installed in the perimeter joint. Apply min. 1/4 in. thickness non-sag or self-leveling sealant over the packing material (Item 3A) and finish flush with the top surface of the concrete floor assembly (Item 1).

v. **CERTIFIED MANUFACTURER:** 3M Company

**CERTIFIED PRODUCT:** Joint Sealant

**CERTIFIED MODEL:** FB 1003 S/L (Self-leveling) Sealant

Apply non-sag or self-leveling sealant to cover the exposed surface of the packing material (Item 3A) compressed and installed in the perimeter joint. Apply min. 1/4 in. thickness non-sag or self-leveling sealant over the packing material (Item 3A) and finish flush with the top surface of the concrete floor assembly (Item 1).

C. PERIMETER FIRE BARRIER REINFORCEMENT (Not Shown) – Use when either 3 in. thick 6 pcf density, or 2 in. thick 8 pcf density curtain wall insulation (Item 2F) is installed. Use min. 20 GA, steel angle having a 1-1/2 in. high vertical leg and a 1-1/2 in. wide horizontal leg. Fully embed horizontal leg into the packing material (Item 3A) at the vertical centerline of the packing material. Secure the vertical leg at each mullion interior face (aluminum framing – Item 2B) using at least two min. 1/2 in. long, No. 10, sheet metal screws spaced nominally 1 in. oc. Install perimeter fire barrier reinforcement continuous along the length of the perimeter joint protection

(Item 3). Overlap joints in the perimeter fire barrier reinforcement a min. 12 in. and secure the overlap using at least three min. 1/4 in. long, No. 10, sheet metal screws spaced nominally 4 in. oc, placed in both the vertical and horizontal legs of the angles.