Design Number 3MU/BPF 120-03
PERIMETER FIRE BARRIERS
3M Company
FireDam™ Spray 200, Fire Barrier Watertight Spray**,** Fire and Water Barrier Tape FWBT,
Fire Barrier 1000 NS Silicone Sealant, and Fire Barrier 1003 SL Silicone Sealant
ASTM E 2307
T-Rating 0 Hour
F-Rating 2 Hour
ASTM E 2307/ASTM E 1399 Cycling
Class I: 500 cycles @ 1 cpm
Rated for ± 16.7% Horizontal Movement @ 50% Compression (Reference Item 3A)
Rated for ± 6.25% Vertical Shear Movement @ 50% Compression (Reference Item 3A)
Rated for ± 5% Horizontal Movement @ 20% Compression (Reference Item 3A)
UL 2079
L-Rating <1.0 SCFM/LF

‡: Fire Barrier Watertight Spray cycling rating limited to ±10% horizontal movement

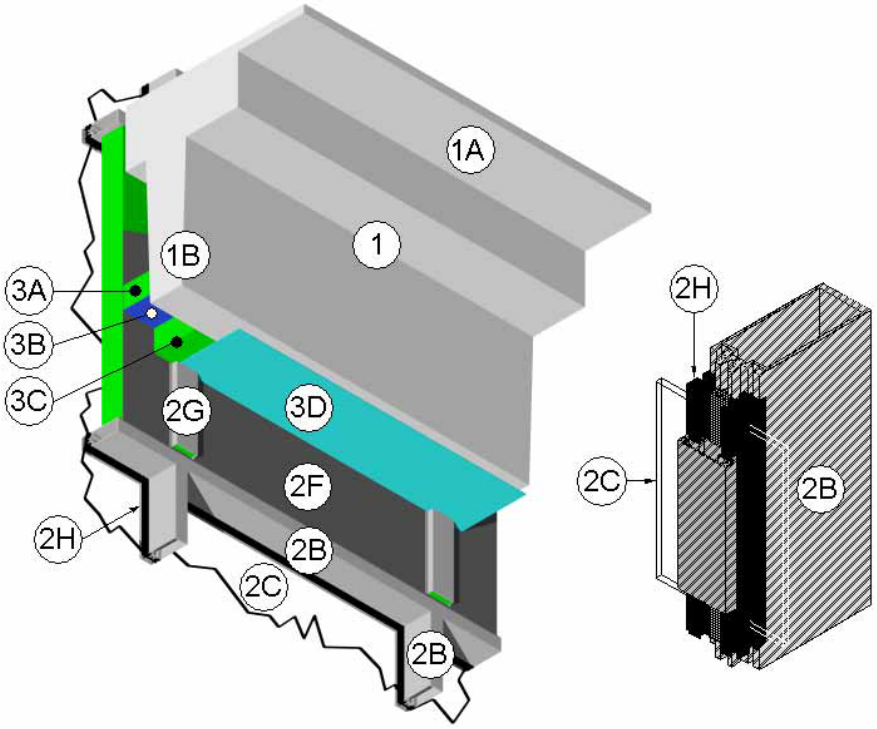

Figure 1 – Lower left wall assembly isometric and
aluminum framing extrusion assembly (transoms & mullions) isometric

1. **CONCRETE FLOOR ASSEMBLY:** Refer to Figure 1. Min. 2 hour rated monolithic concrete floor assembly made from either lightweight or normal weight concrete with a density of 100 to 150 pcf density. 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.

   A. CONCRETE FLOOR – Min. 2 hour rated, nominal 4-1/2 in. thick reinforced, slab increasing to nominal 16 in. thick at joint face (slab edge) created by cast-in-place technique integral with concrete beam (Item 1B).

B. CONCRETE BEAM – Nominal 31 in. deep, 12 in. wide, 2 hour rated, pre-cast or cast-in-place reinforced concrete spandrel beam integral with concrete floor (Item 1A).

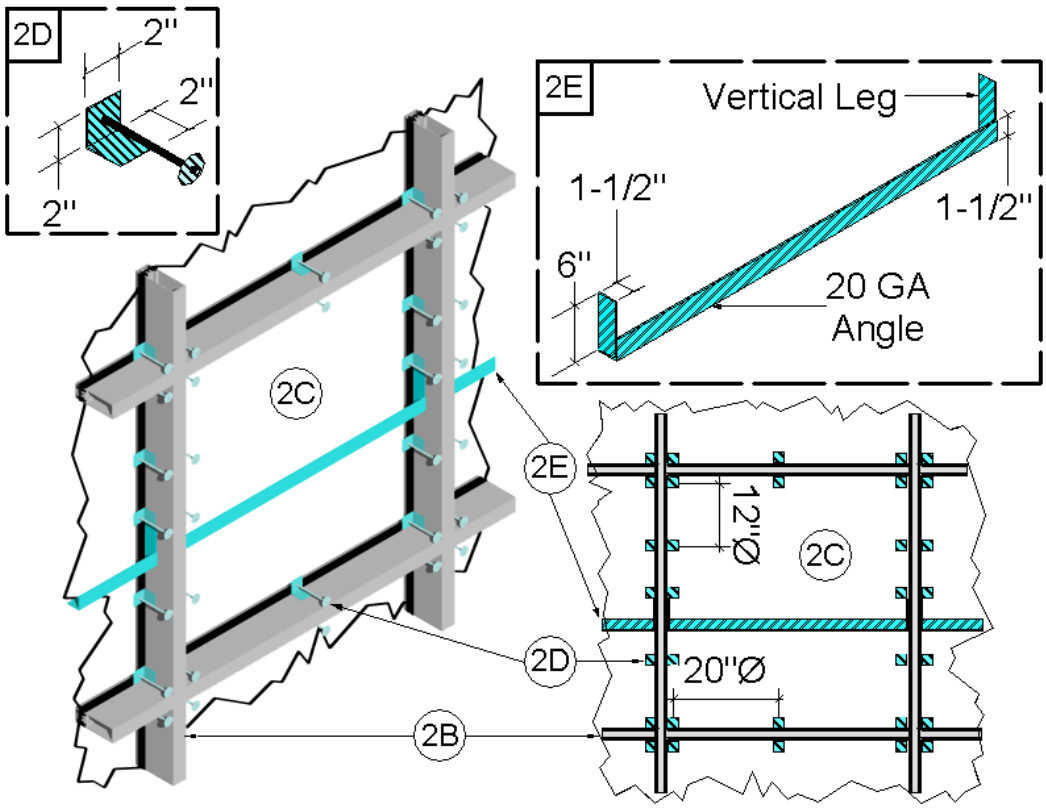

Figure 2 – Aluminum framing isometric, aluminum framing elevation, impaling pin isometric, and reinforcement angle isometric

2. CURTAIN WALL ASSEMBLY: Refer to Figures 1 and 2. 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 a max. 120 in.

B. ALUMINUM FRAMING – Use hollow rectangular aluminum extruded tubing with min. overall dimensions of 0.100 in. thick, 5-1/2 in. high. and 2-1/2 in. wide. Locate mullions (vertical aluminum framing) nominally 85-1/2 in. on center (oc) and locate transoms (horizontal aluminum framing) a max. 30-1/2 in. oc. For the spandrel region, locate the upper transom (horizontal aluminum framing) a min. 20 in. above the perimeter joint protection (Item 3) as measured from the top surface of the packing material (Item 3A) to the underside of the transom (horizontal aluminum framing).

C. GLASS PANELS – Sized and installed into aluminum framing (Item 2B) according to the curtain wall system manufacturer's guidelines. Use 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) and pressure bar. Secure glass panels with

a thermal break (rubber extrusion), pressure (aluminum extrusion), min. 1/4-20 × 5/8 in. long screws, and a snap face (aluminum extrusion).

D. IMPALING PINS – Use with curtain wall insulation (Item 2E) and framing covers (Item 2F), locate, size, and install impaling pins according to the curtain wall system manufacturer's guidelines, or be a min. 4-1/2 in. long, 12 GA pin attached to one of the following: a nominal 2 in. × 2 in. plate; a nominal 2 in. × 2 in. × 2 in. long angle; or can be directly attached to the aluminum framing (Item 2B) using a stud gun. Cap all pins using a nominal 1 in. diameter speed washer. Spacing impaling pins a max. of 12 in. oc vertically and 20 in. oc horizontally. Install impaling pins around the periphery of the curtain wall insulation (Item 2F) so that its interior face is flush with the interior face of the aluminum framing (Item 2B).

E. REINFORCING ANGLE – Locate reinforcing angle at all horizontal butt joints of the curtain wall insulation (Item 2F) in the field of the glass spandrel panels (Item 2C) and at the mid-height of the packing material (Item 3A). Mount a min. 1-1/2 × 7/8 in., 20 GA, galvanized steel angle to the vertical aluminum framing mullions (Item 2B), 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 and is located at the centerline of the packing material (Item 3A). Size the angle 12 in. longer than the span between the interior edges of the vertical aluminum framing, mullions, (Item 2B) and form the angle so that it has a 6 in. vertical leg on each end. Secure the 6 in. vertical leg on each end to the vertical aluminum framing mullions, (Item 2B) on each side with two No. 10 steel self-tapping sheet metal screws placed in a stable fashion with a max. spacing of 2 in. oc, or fastening method of equal strength and stability.

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, 3 in. thick 6 pcf density, or 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 and installed in the stud cavity. Install curtain wall insulation between aluminum framing (Item 2B). Secure curtain wall insulation with impaling pins (Item 2D) attached to aluminum framing (Item 2B). Seal all meeting edges of curtain wall insulation with nominal 3 in. wide, pressure sensitive, aluminum foil-faced tape centered over the junction so that approximately 1-1/2 in. of tape covers each edge of the adjacent curtain wall insulation. Apply pressure sensitive aluminum foil-faced tape over all meeting edges of curtain wall insulation and framing covers (Item 2F) so that approximately 2 in. covers each edge of the adjacent material. Install curtain wall insulation flush with the interior face of the aluminum framing (Item 2B). Install 24 in. wide curtain wall insulation spanning the full length and height between aluminum framing (Item 2B). Refer to Figure 3. For vertical insulation butt joints, first install back-to-back angles created from min. 20 GA steel having min. 2 in. legs. Position back-to-back angles in front of reinforcing angle (Item 2E). Mechanically fasten ends of steel back-to-back angles to horizontal 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 panels (Item 2C). Option: In lieu of filling the full depth of the stud cavity with 4 in. thick, 4 pcf density curtain wall insulation, use min. 2 in. thick 8 pcf density, or 3 in. thick 6 pcf density, curtain wall insulation mechanically secured (do not secure by friction fit) and use additional horizontal support angle (not shown). Locate a horizontal support angle consisting of a

min. 20 GA steel angle, having 1-1/2 in. × 1-1/2 in. legs horizontally at the mid-height of the packing material (Item 3A) and attached to each mullion of aluminum framing (Item 2B) using min. No. 6, 1/2 in. long self-tapping sheet metal screws.

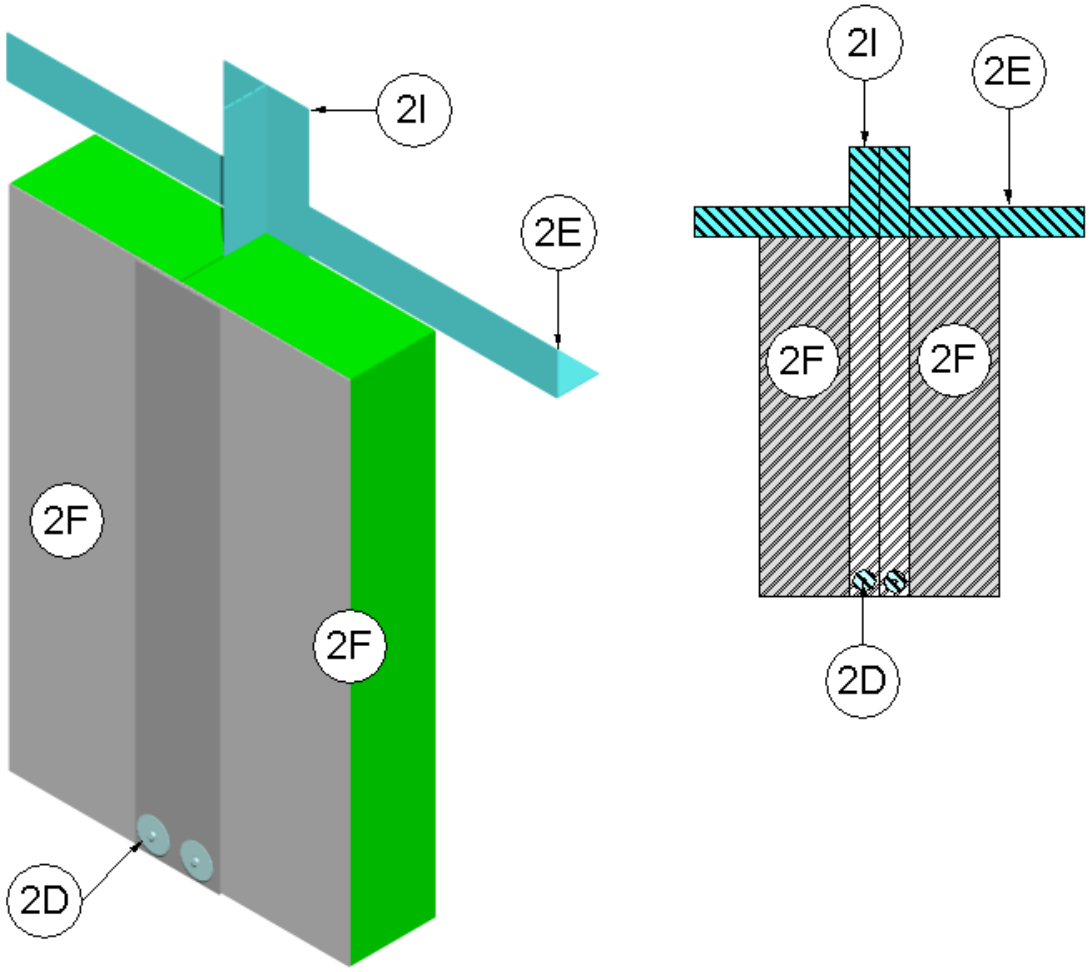

Figure 3 – Curtain wall insulation vertical butt joint isometric and elevation

G. FRAMING COVERS – Make from strips of min. 1 in. thick × min. 4 in. wide, 8 pcf density min., wool batt insulation faced on one side with aluminum foil scrim (vapor retarder), which is exposed to the room interior. Center framing covers over all aluminum framing (Item 2B) and secure using impaling pins or cup-head weld pins (Item 2D). Do not pass framing covers through the perimeter joint protection (Item 3). Allow framing covers to abut top and bottom surfaces of the perimeter joint protection (Item 3) provided that no deformation occurs. Use only Intertek certified products meeting the above min requirements.

H. THERMAL BREAK ASSEMBLY – Secure panels with a thermal break (thermal-set rubber extrusion) pressure bar (aluminum extrusion). Protect spandrel panels according to Item 2F.

3. PERIMETER JOINT PROTECTION: Refer to Figures 1 and 4. Install impaling pins (Item 2D), reinforcement angle (Item 2E), and protect spandrel panels using curtain wall insulation (Item 2F) before installing perimeter joint protection. Do not install

framing covers (Item 2G) until after perimeter joint protection. Do not exceed a 12 in. nominal joint width (joint width at installation). Install perimeter joint protection from bottom of concrete floor assembly (Item 1). Sandwich the fill, void, or cavity material (Item 3B) between two pieces of packing material (Items 3A and 3C). Incorporate the following construction features for the perimeter joint protection (also known as perimeter fire barrier system):

A. PACKING MATERIAL – Use of min. 4 in. thick, 4 pcf density, mineral wool batt insulation installed with the fibers running parallel to the edge of concrete floor assembly (Item 1) and curtain wall assembly (Item 2). Cut packing material width to achieve required compression, refer below, when installed in the nominal joint width. Compress the packing material into the perimeter joint created between the curtain wall insulation (Item 2F) and the concrete spandrel beam (Item 1B). Create a recess at least 4 in. deep between the bottom of the packing material and the bottom surface of the concrete spandrel beam (Item 1B) to allow installation of the fill, void, or cavity material (Item 3B) and the second piece of packing material (Item 3C). 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, 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, recess the top surface of the packing material 1/4 in. from the top surface of the concrete floor assembly (Item 1). Use only Intertek certified products meeting the above min requirements.

i. When horizontal movement of ±16.7% and vertical shear of ±6.25% is required, install packing material at 50% compression. Cut the width of the packing material 2 times wider than the nominal joint width.

ii. When horizontal movement of ±5% is required, install packing material at 20% compression. Cut the width of the packing material 1-1/4 times wider than the nominal joint width.

B. **CERTIFIED MANUFACTURER** – 3M Company

CERTIFIED PRODUCT – FireDam™ or Fire Barrier™

MODEL – FD Spray 200 (Elastomeric, Sprayable), Fire Barrier Watertight Spray (Elastomeric, Sprayable), or Fire and Water Barrier Tape FWBT (Tape) or FB 1000 N/S Silicone Sealant (Non-sag) or FB 1003 S/L (Self-leveling)

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

Spray Coating – 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.

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.

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. SECONDARY PACKING MATERIAL – Install after the fill, void, or cavity material (Item 3B) is cured. Use a min. 4 in. thick, 4 pcf density, mineral wool batt insulation installed with the fibers running parallel to the edge of concrete floor assembly (Item 1) and curtain wall assembly (Item 2). Cut packing material width to achieve same compression as packing material (Item 3A). Compress the packing material into the perimeter joint created between the curtain wall insulation (Item 2F) and the concrete spandrel beam (Item 1B). Stagger butt joint of secondary packing material and packing material (Item 3A). Tightly compress together splices (butt joints) in the lengths of packing material by using min. 1/4 in. compression per piece of packing material. Verify finished installation flush with bottom of concrete spandrel beam (Item 1B). Use only Intertek certified products meeting the above min. requirements.

D. COVER PLATE – Install a min. 18 GA, L-shaped, steel plate having a nominal 3 in. vertical leg and a horizontal leg sized to span the nominal joint width between the curtain wall insulation (Item 2F) and the concrete spandrel beam (Item 1B). Position the steel plate flush against bottom of concrete spandrel beam (Item 1B) and against the interior exposed vertical aluminum framing mullions (Item 2B). Attach the vertical leg of the L-shaped steel plate to each vertical aluminum framing mullion (Item 2B), using min. No.10, self-tapping sheet metal screws nominally 2 in. below the horizontal leg. Space fasteners a max. of 48 in. oc and attach the horizontal leg of the L-shaped steel plate to the bottom of concrete spandrel beam (Item 1B) using Hilti XC-20 THP fasteners or equivalent pre-mounted, plastic top-head, concrete nails made of zinc-coated (5 to 13 μm thick), hardened steel, having a nominal 3/4 in. shank length, 0.138 in. diameter, cut-point and dome-head configuration.