Design No. CEJ 127 P (HI/JS 120-05) PERIMETER FIRE BARRIER SYSTEM Hillt, Inc. ASTM E 2307 Table 1				
	FIRESTOP JOINT SPRAY CFS-SP WB	SILICONE JOINT SPRAY CFS-SP SIL		
F-RATING	2-HR.	2-HR.		
T-RATING	2-HR.	2-HR.		
APPLICATION THICKNESS	1/8" WET FILM (1/16" DRY)	2mm (0.079") WET FILM		
CYCLING (%) HORIZONTAL VERTICAL SEE ITEM 3A	NONE ±6.25 (25% COMPRESSION)	NONE ±6.25 (25% COMPRESSION)		



1. CONCRETE FLOOR ASSEMBLY: Max. two-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a 4 or other the boot much many the other than the other than the point face. Overall slab thickness may vary to accommodate various blockout depths (longitudinal recesses) formed in the concrete, to house the architectural cover plate. The blockout width may also vary without restriction

2. CURTAIN WALL ASSEMBLY: Incorporate the following features: A. Mounting Attachment: (Not shown) Attach the curtain wall framing to the structural framing in accordance to the curtain wall manufacturer's instructions. When required, connect the mounting attachments to the joint face of the floor slab, in accordance to the curtain wall manufacturer's instructions. Max. distance between mounting attachments is 10 ft.

B. Aluminum Framing: Size rectangular aluminum tubing mullions and transoms according to the curtain wall system manufacturer's guideline A real many classical consignation and the set of the s 5-1/4 in. (with cover plate). Mullions are to be spaced a min. 60 in. on center (oc) and spandrel transoms are to be spaced a min. 45 in. oc Spandrel transoms are to be located at a min. height 20 in. above the top surface of the concrete floor assembly (as measured from the

bottom of the transom). C. Glass Panels: Size and install glass panels to curtain wall framing according to the curtain wall system manufacturer's guidelines. Use min. 1/4 in. thick claer, heat-strengthened (HS) glass with a max. width and height less than the aluminum framing o.c. spacing, which allows the Jass to be secured between the notched should of the aluminum framing and pressure bar. Secure panels, which always we glass to be secured between the notched should of the aluminum framing and pressure bar. Secure panels with a thermal break (rubber extrusion), pressure bar (aluminum extrusion), min. 1/4-20 x 5/8 in. long screws, and a snap face (aluminum extrusion). D. Impaling Pins: Size and install min. 12 GA steel pins according to the curtain wall system manufacturer's guidelines, or be a min. 1/2 in. longer than the thickness of the curtain wall insulation. Attach pins to clip angles with typical clip dimensions of: nom. 2 in. by 2 in., constructe with 20 GA galvanized sheet steel. Secure the clips to the aluminum framing with No. 0 self-appling sheet metal screws. Install a min. of 1 screw per clip angle. Space pins max, of 12 in. oc on the vertical framing members and a max, of 20 in. oc on the horizontal framing members above the slab. The interior face of the curtain wall insulation is to be installed so that it is flush with the interior face of the framing. E. Reinforcing Angle. Mount a min. 1-1/2 in. x 1-1/2 in. x 20 GA galvanized steel angle to the inside of the vertical framing members so that the vertical leg serves as a backer to the exterior face of the curtain wall insulation and the horizontal leg extends away from the curtain wall relicating serves as a decket to the extention face of the cutatin wait installation ratio the informating serves as a decket to the extention face of the installation. Locate the reinforcing angle at the elevation of the centerline of the perimeter joint treatment. Size the angle 12 in. longer than the span between the interior edges of the vertical framing members and form the angle so that it has a 6 in. vertical leg on each end. Secure the 6 in. leg to the framing members on each side with three No. 10 steel self-tapping sheet metal screws placed in a triangular fashion with a max.

#### snacing of 2 in oc

spacing of 2 in . oc F. Curtain Wall Insulation: Install nom. 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. Secure with angle clips and impaling pins (Item 2D). Seal all meeting edges of insulation with nom. 4 in. wide pressure sensitive aluminum foil faced tape centered over the junction so that approx. 2 in. of tape covers each edge of the adjacent insulation. The interior face of the batt insulation is, if required compressed, flush with the interior face of the curtain wall framing ating a min. 1 in. air space between the insulation and the glass. Listed Manufacturer:

Only Intertek Certified Mineral Wool Manufacturer's product meeting the above min. requirements

G. Framing Covers: Install nom. I in: thick, 8 in: wide strips of 8 pcf density mineral work but insulation faced on one side with aluminum foil scrim (vapor retarder), which is exposed to the room interior. Center framing covers over each vertical framing member and secured to the member with impaling pins and clips (Item 2D) spaced a min. 1 in: from both edges, and a max 12 in: oc Framing covers below the perimeter joint treatment are nom. 2 in, thick, and those above the perimeter joint treatment are nom. 1 in, thick. Framing covers do not pass through the perimeter joint treatment. They are butted to the top and bottom surfaces of the perimeter joint treatment isted Manufacturer

Only Intertek Certified Mineral Wool Manufacturer's product meeting the above min. requirement

3. PERIMETER JOINT PROTECTION: The perimeter joint (linear opening) is not to exceed nom. 6 in. joint width (joint width at installation) orporate the following construction features:

A. Packing Material: Install min. 4 in. thick, 4 pcf density, mineral wool batt insulation\*\* with the fibers running parallel to the slab edge and curtain wall. Compress the packing material 25% in the normal pion width. Compress the pack insulation into the perimeter joint such that the top surface of the batt insulation is flush with the top surface of the concrete floor slab and its mid depth is compressed against the interior surface of the curtain wall insulation (Item 2F) which is supported by the 20 GA steel reinforcing angle (Item 2E). Splices (butt joints) in the lengths of mineral wool batt insulation are to be tightly compressed together.

Listed Manufacturer: Only Intertek Certified Mineral Wool Manufacturer's product meeting the above min. requirements.

B. CERTIFIED MANUFACTURER: Hilti, Inc.

CERTIFIED PRODUCT: Joint Spray or Sealant MODEL: Firestop Joint Spray CFS-SP WB or Silicone Joint Spray CFS-SP SIL

Fill, Void or Cavity Material: To be applied (spraved, brushed, or troweled) to cover the top exposed surface of the mineral wool installed in the

In your of carry material. To be puppled (payed, in ordered) to overlap the material at poper subset and the interminet work installed in the perimeter (payed). This Apply at the thickness specified in Table 1 and overlap the material at min. 1/2: not the adjacent curries multi-anval assembly and concrete floor slab assembly. If spraying process is stopped and the applied material cures to an elastomeric film before the process is restarted, then overlap the edge of the curred material at least 1/8 in. with the spray.
\*\* Before testing, the test specimen was cycled 500 times at 30 cpm in accordance to ASTM E 1399.



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Hilti Firestop Systems



Intertek	

Design No. CEJ 245 P (HI/BP 135-01) PERIMETER FIRE BARRIER SYSTEM Hiliti, Inc. ASTM E 2307 Table 1						
	FIRESTOP JOINT SPRAY CFS-SP WB	SILICONE JOINT SPRAY CFS-SP SIL				
F-RATING	2 1/4-HR.	2 1/4-HR.				
T-RATING	2 1/4-HR.	2 1/4-HR.				
APPLICATION THICKNESS	1/8" WET FILM (1/16" DRY)	2mm (0.079") WET FILM				
CYCLING (%) HORIZONTAL VERTICAL SEE NOTE 1	± 12.5 ± 5	± 7.5 ± 5				
L-Rating N/A						



CONCRETE FLOOR ASSEMBLY: Two hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150 pcf, with a min, thickness of 4-1/2 in, at the joint face. Overall slab thickness may vary to accommodate various blockout depths ongludinal recesses) formed in the concrete, to house the architectural cover plate. The blockout width may also vary without restriction CURTAIN WALL ASSEMBLY: The concrete curtain wall assembly shall incorporate the following construction features:

A. Mounting Attachment: (Not Shown) Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer's instructions. If required, mounting attachments to the floor slab shall be connected to the joint face of the floor slab. Max manufactors in structures in required, moning auto-ments to the root star strain by connected to the point race of the root start, max, distance between mounting attachments shall be 10th. B. Steel-Stud Framing: Vertical framing members shall be a min. 3-518 in. by 1-518 in., 18 GA steel "C" studs. Attachment shall be according to

the curtain wall system manufacturer's guidelines. Vertical framing not to exceed a spacing of 56 in. on center and shall be completely overed by the concrete panels. If required, horizontal framing members shall be installed according to the curtain wall system manufacturer

. Concrete Panels: Any non-combustible exterior concrete based panel. Panels shall not be less than 1-1/2 in. thick, 12 in. high or 12 in. long. Attachment to the framing shall be according to the curtain wall system manufacturer's guidelines. D. Glass Vision Panels: Glass vision panels shall be at least 35-1/2 in. above the top surface of the floor assembly. Glass vision panels shall be

Taballed to curtain wall framing according to the curtain wall system manufacturer's guidelines. Use a min. 1/4 in. thick, clear tempered glass with a max, width of 59 in. and height of 71 in.

E. Window Gaskets: Secure glass vision panels with a thermal break (thermal-set rubber extrusion)

E. Which Gashes Sector guess which pains with a training tream of the sector of the se

installed according to the curtain wall system manufacturer's guidelines. H. Curtain Wall Insulation: (Not Shown - Optional) When curtain wall insulation is used, the perimeter joint treatment must be installed before the

Contain that insolution may be builted to top and bottom of perimeter joint treatment but not deform the perimeter joint treatment. Either miner wool\*\* or fiberglass batt insulation\*\* may be used. (\*\* Listed with Intertek)

. Concrete Panel Joint: Vertical and horizontal concrete panel joints created between panels can be either flush type (butt joint) or key way type (tongue and groove). Concrete panel edges must be in contact with each other. If required, the surface of the panel joints can be sea

iming Covers: (Not Shown - Optional) Framing covers used over the mullions and transoms are optional. When used, the framing covers shall be located, sized and installed according to the curtain wall system manufacturer's guidelines. Framing covers do not pass through the erimeter joint treatment. They are butted to the top and bottom surfaces of the perimeter joint treatment without deforming it. Either minera

wool" or fiberglass batt insulation" may be used. ("Listed with Intertek) PERIMETER JOINT PROTECTION: The perimeter joint (linear opening) shall not exceed an 8 in. nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features: A. Packing Material: Use a min. 4 in. thick, 4 pcf density, mineral wool batt insulation\*\* installed with the fibers running parallel to the slab edge

reacting metabolic operations in the metabolic processing metabolic metabolic metabolic metabolic metabolic processing parallel of the ado operation of the metabolic (butt joints) in the lengths of mineral wool batt insulation are to be tightly compressed together. Reference the Introduction to Fire Resistive (bit pairs) in the bright of minicipation of the bright of the bright

Hilti Firestop Systems

oncrete floor slab assembly. If the spraving process is stopped and the applied liquid cures to an elastomeric film before process is restarted then overlap the edge of the cured material at least 1/8 in. with the spray. Reference Product Section of this Directory for more details about

C. Support Clips: (Not Shown – Optional) Use standard Z-shaped clips that are min. 20 GA galvanized steel with the following nom. dimensions 1 in. wide by 3 in. high with a 2 in. upper leg and 3 in. lower leg.



#### Design No. CEJ 246 P (HI/BP 120-01) PERIMETER FIRE BARRIER SYSTEM ASTM F 2307 Table 1 FIRESTOP SILICONE JOINT SPRAY JOINT SPRAY CFS-SP SIL CFS-SP WB F-RATING 1 3/4-HR 1 3/4-HR T-RATING 1 1/4-HR 1 1/4-HR 1/8" WET FILM APPLICATION 2mm (0.079") WF THICKNESS (1/16" DRY) FILM CYCLING (% ± 15 ± 7.5 HORIZONTAL

+ 5

± 5



VERTICAL

SEE NOTE



ELOOR ASSEMBLY: Two-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150 pcf, with a minute the revealed at the point face. Overall slab thickness may increase to accommodate various blockou recesses) formed in the concrete, to house an architectural cover plate. The blockout width may also vary without restriction 2. CURTAIN WALL ASSEMBLY: The curtain wall assembly shall incorporate the following construction features:

A Mounting Attachment: (Not shown) Attachment of the curtain wall framing to the structural framing is required at each floor. The mounting attachments to the floor slab shall be either to the top surface of the floor slab or the joint face of the floor slab, according to the curtain wall manufacturer's instructions. The distance between mounting attachments shall be a min. 60 in. on center (oc) The mounting attachments shall

B. Aluminum Framino: Rectangular aluminum tubing mullions and transoms, sized according to the curtain wall system manufacturer's 2. Volument running, and the second secon height of 33 in, above the top surface of the concrete floor assembly (as measured from the bottom of the transom)

C. Glass Spandrel Panelis: Glass spandrel panels shall be installed to curtain wall reasoned norm account of the curtain wall system manufacturer's guidelines. Use a min. 1/4 in. thick, clear tempered glass with a max. width of 59 in. and height of 71 in. D. Glass Vision Panels: Glass vision panels shall be at least 35-1/2 in. above the top surface of the floor assembly and installed to curtain wall

framing according to the curtain wall system manufacturer's guidelines. Same min, requirements as in 2C.

E. Secure panels with a thermal break (thermal-set rubber extrusion), pressure ber (aluminum extrusion), 1/4-20 x 5/8 in. long screws, and a snap face (aluminum extrusion). The spandrel panels shall be insulated according to 2G.

Impaling Pins: When pins are used instead of screws, locate pins in the same manner as the screws in 2F, sized and installed according to the curtain wall system manufacturer's quidelines, or be a min, 4-1/2 in, long, 12 GA steel pin attached to a nom, 2 in, by 2 in, galvanized sheet steel plate, a nom. 2 by 2 by 2 in. long angle, or directly attached to the finaming using a stud gun. Space pins a max, 1 or 2 n. by 2

aluminum foil scrim (vapor retarder) which is exposed to the room interior. (\*\* Listed with Intertek) Tightly fit insulation between vertical framin automation of secure with screece spaced a max. B in, oc attached to perimeter spandrel angles (2), locate horizontal seam at the mid-heigh of the perimeter joint protection (3). All other horizontal seams in the insulation are to be at least 6 in. from the top surface of the perimeter joint treatment. The interior face of the batts is flush with the interior face of the curtain wall framing. A min. 2 in. air space is created between the glass and the insulation. The 36 in. wide batts shall be installed without vertical seams, spanning the full length between the vertical and

the glass and use instances in the out with de tasks and enhances without ventices earlies, spanning use run length between the ventice and horizontal curdain wall framing members, which create the spander panel area. H. Framing Covers: Make strips of min. 1 in. thick by 4 in. wide, 8 pcf, mineral wool batt insulation\*\* faced on one side with aluminum foil scrim (vapor relarder), which is exposed to the room interior. (\*\*Listed with Intertek) Center framing covers over each vertical framing member and secured to the member with impaling pins and clips spaced max, 12 in. oc Do not pass framing covers through the perimeter joint protection 3). But farming covers to the pand bottom surfaces of the perimeter joint protection (3). Seal the sides of the mullion covers with aluminum foil tape flared min. 1 in. onto curtain wall insulation (2G).

. Reinforcing Angle: At the horizontal butt joints of the insulation in the field of the glass spandrel panels (2C), place two 20 GA steel angles back to back to form a "T". Locate the "T" reinforcing angle at the horizontal centerline of the perimeter joint protection and secure the

angle to the perimeter spandrel angles (2J). J. Perimeter Spandrel Angles: Use a min. 16 GA 1-1/2 x 1-1/2 steel angles around the entire perimeter of spandrel window area. Attach the

vertical angles to the mullions with screws. Attach the horizontal angles to the vertical angles with secures. PERIMETER JOINT PROTECTION: The perimeter joint (linear opening) shall not exceed 8 in. nom. Joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features: A. Packing Material: Use a min. 4 in. thick, 4 pcd density, mineral wool batt insulation\* installed with the fibers running parallel to the slab edge addressing Material: Use a min. 4 in. thick, 4 pcd density, mineral wool batt insulation\* installed with the fibers running parallel to the slab edge addressing Material: Use a min. 4 in. thick, 4 pcd density, mineral wool batt insulation\* installed with the fibers running parallel to the slab edge addressing Material: Use a min. 4 in thick a provide material business of the source of the slab edge addressing Material: Use a min. 4 intervices a mineral wool batt insulation\* installed with the fibers running parallel to the slab edge addressing Material: Use a mine a material business of the source of the source of the slab edge addressing Material: Use a mine a material business of the source of the source of the slab edge addressing Material: Use addressing addr

and curtain wall. (\*\* Listed with Intertek) The packing material shall be compressed 33% in the nominal joint width. Compress the batt insulation into the perimeter joint such that the top surface of the batt insulation is flush with the top surface of the concrete floor slab. Splices but joints) in the lengths of mineral wool bat insulation are to be tightly compressed together. Reference the Introduction to Fire Resistive Joint Systems Section of this Directory for more details on how to determine the cut width of the insulation to be installed in the nominal joint

width, and how to determine the compressed percentage of a known insulation width installed in a known nominal joint width B. CERTIFIED MANUFACTURER: Hilti, Inc. CERTIFIED PRODUCT: Joint Spray or Sealant MODEL: Firestop Joint Spray CFS-SP WB or Silicone Joint Spray CFS-SP SIL

Fill, Void or Cavity Material: To be spray applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply at the thickness specified in Table 1 and overlap the material a min. 1/2 in. onto the adjacent curtain wall assembly and concrete floor slab assembly. If the straying process is stopped and the applical fujuit cures to an elastomeric film before process is restarted. Hen overlap the edge of the cured material at least 1/8 in. with the spray. Reference Product Section of this Directory for more details about the Listed produc

C. Support Clips: (Not Shown) Support clips are optional but recommended for installations subject to vertical shear movement. Standard Z shaped clips are 20 GA galvanized steel with the following dimensions: 1 in. wide by 3 in. high with a 2 in. upper leg and 3 in. lower leg. "Cycling: Before testing, the spliced, test specimen was cycled 500 times at 30 cpm in accordance with ICBO ES AC 30 (Jan. 1997) and ASTM E



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Cycling: Before testing, the spliced, test specimen was cycled 500 times at 30 cpm in accordance with ICBO ES AC 30 (Jan. 1997) and ASTM E

CERTIFIED PRODUCT: Joint Spray or Sealant MODEL: Firestop Joint Spray CFSS WB or Silicone Joint Spray CFS-SP SIL Fill, Void or Cavity Material: To be applied, (sprayed, brushed, or painted) to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply at the thickness specified in Table 1 and overlap the material a min. 1/2 in. onto the adjacent curtain wall assembly and

- . Refer to section 07840 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification
- 2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
- \* Minimum and maximum Width of Joints
- \* Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Drawings shall follow the International Eireston Council (IEC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- References
- \* 2013 Underwriter's Laboratories Fire Resistance Directory Volume 2
- \* 2013 Directory of Listed Materials and Assemblies, Omega Point Laboratories
- \* All governing local and regional building codes

Notes to designer (delete this note after reading and replace with title block information)> 1. Any modification to these details could result in an application/system not meeting the UL or Interlek Classification or the intended temperature or fire ratings. 2. Details shown are up to date as of February 2015. 3. For additional information on the detaik websites the Underwriter's Laboratories or Interlek websites 4. Coordinate fabrication and construction details with curfain wall supplier.					
<ul> <li><li></li></li></ul>					
JOB NUMBER:					
DRAWN:					
CHECKED:					
ISSUE DATE:					
REVISIONS: TYPICAL FIRESTOP PERIMETER JOINT DETAILS SHEET NAME:					
CW.1.6					

Design No. CEJ 259 P (HI/BP 120-08) PERIMETER FIRE BARRIER SYSTEM Hilti, Inc. ASTM E 2307 Table 1					
	FIRESTOP JOINT SPRAY CFS-SP WB	SILICONE JOINT SPRAY CFS-SP SIL			
F-RATING	2-HR.	2-HR.			
T-RATING	1-HR.	1-HR.			
APPLICATION THICKNESS	1/8" WET FILM (1/16" DRY)	2mm (0.079") WET FILM			
CYCLING (%) HORIZONTAL VERTICAL SEE NOTE 1	± 7.5 ± 5	± 7.5 ± 5			
L-Rating <1.0 SCFM/LF					



1. CONCRETE FLOOR ASSEMBLY: Two-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150 pcf, with a min. thickness of 4 in. at the joint face. Overall slab thickness may vary to accommodate various blockout depths (longitudinal recesses) formed in the concrete, to house the architectural cover plate. The blockout width may also vary without restriction.

2. CURTAIN WALL ASSEMBLY. The curtain wall assembly shall incorporate the following construction features: A. Mounting Attachment: (Not shown) Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer's instructions. When required, the mounting attachments to the floor slab shall be connected to the joint face of the floor slab, according to the curtain wall manufacturer's instructions. Max, distance between mounting attachments shall be 10 ft.

B. Steel-Stud Framing Vertical framing members shall be a min. 3/5/8/in by 1/5/8 in 1/6 Asteel "to stud secured in an 18 GA steel "to the and bottom using #6 x 1.25 in. Bugle head SD PT screws. Vertical framing shall not exceed a spacing of 24 in. on center (oc). C. Sandwiched Wall Surface: Use a min. 1/2 in. thick, 48 in. wide by 96 in. long, exterior grade gypsum wallboard (ASTM C 79), cement board,

or fiberalass sheathed avosum wallboard placed over and secured to framing with min, 1-1/4 in, long Type S drywall screws 8 in, oc On indeglass sheatine upped in waturable place over and secure to inaming with mill. 1-1-mill big type of upped to the secure of the secure to inamine the secure of th

Install barrier insulation in each stud cavity so that min. 32 in, of barrier insulation is above the surface of the perimeter joint protection and a man ben in its below the perimeter joint protection. Barrier insulation length is min. 24 in, and fitted bitly between vertical faming members filling all studs. Seal all butt joints of barrier insulation with min. 4 in, wide aluminum foil faced tape. The curtain wall insulation shall completely fill the recess of the min. 3-5/8 in. by 1-5/8 in., 18 GA steel "C" studs. (\*\* Listed with Intertek)

F. Interior Curtain Wall Surface: Apply after Perimeter Joint Protection (3) is installed. Use a min. 1/2 in. thick. 48 in. wide by 96 in. long. Type > gypsum wallboard (ASTM C 36), placed over and secured to framing with #6 by 1-1/4 in. long Type S drywall screws 6 in. oc on the periphery and 12 in. oc in the field. Screw heads are covered with joint compound. Joints created between gypsum wallboard are taped and floated with joint compound. Gyosum wallboard only required to be continuously placed a min. 32 in, above surface of perimeter joint protection. Gyosum wallhoard below the slab is optional

Walload below the siab is optional. G. Exterior Curtain Wall Insulation: An Exterior Insulation Finish System (EIFS) is composed of expanded polystyrene foam (EPS) insulation, and a Exterior Curtain Wall Finish (2H). The EIFS system is a monolithic assembly without expansion or control joints. The EPS foam boards measure 24 in. wide by 48 in. long by 4 in. thick with a nom. density of 1 pcf. The EPS foam is attached to the sandwiched wall surface using mechanical fasteners or an adhesive in accordance with manufacturer's recommendations. Install the EPS boards in a running bond Indication address of an address of an address of a second address of a second address of a second address of a (indicating) process, All EPS boards must be butted together with no gaps or voids between them. Allow a min. of 12 hours before continuing the application process when using adhesive. The EPS boards must be rasped to remove all irregular seams and establish a continuous flat

H. Exterior Curtain Wall Finish: The cementitious base coat and reinforcing mesh is applied over the Exterior Curtain Wall Insulation (2G) Precut the mesh as needed. The mesh is a woven fiberglass reinforcement fabric that is compatible with the cementitious base coat and finish coat materials. Apply 1/16 to 1/8 in. thick cementitious base coat to the exposed surface of the EPS foam. Apply the mesh; embed the must call materials. Apply 11/04 in the link communication and a set of the s aggregates. Apply the cementitious finish coat using a trowel in the same manner as the cementitious base coat. I. Glass Vision Panels: Glass vision panels shall be a min. 35-1/2 in, above the top surface of the floor assembly. Glass vision panels shall be initial of the second s

J. Window Gaskets: Secure glass vision panels with a thermal break (thermal-set rubber extrusion)

Window Framing: Steel framing members shall be a min. 3-bit in by 1-36 in: by 1-36 in: 18 GA steel "U" channel or similar construction that is compatible with steel-stud framing (2b). Locate window framing at least 35 in. above the top surface of the floor assembly.
 PERIMETER JOINT PROTECTION: The perimeter joint (linear opening) shall not exceed an 8 in. nom, joint width (joint width at installati the steel stud framing (2b). Locate window framing at least 35 in. above the top surface of the floor assembly.

the perimeter joint treatment shall incorporate the following construction features: A Packing Material Use a min. In thick, 4 pcf density, mineral wol<sup>m</sup> batt installed with the fibers running parallel to the slab edge and curtain wall. The packing material shall be compressed 33% in the nom, joint width. Compress the batt insulation into the perimeter joint such that the top surface of the batt insulation is flush with the top surface of the concrete floor slab. Splices (butt joints) in the lengths of mineral wool batt insulation are to be tightly compressed together, min, compression 0.25 in, per piece. Notch packing material to receive Imment would achieve the design of the second secon

CERTIFIED PRODUCT: Joint Spray or Sealant

MOEL: Firstop Joint Spary CFS-SP WB or Silicone Joint Spray CFS-SP SIL Fill, Void or Cavity Material: To be applied (sprayed, Brushed, or painted) to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply at the thickness specified in Table 1 and overlap the material a min. 1/2 in. onto with Barrier Insulation (2E) and Concrete Floor Assembly (1). If the spraying process is stopped and the applied liquid cures to an elastomeric film before process is restarter then overlap the edge of the cured material at least 1/8 in. with the spray. Reference Product Section of this Directory for more details about the Listed product.

C. Support Andle: Standard 1-1/2 x 1-1/2 in. min. 20 GA galvanized steel angle attached between all studs with self tapping self drilling screws Set angle at mich height of Packing Material (3A). 9. Support Clips: (Not Shown) Support clips are optional but recommended for installations subject to vertical shear movement. Standard

Z-shaped clips are 20 GA galvanized steel with the following dimensions: 1 in. wide by 3 in. high with a 2 in. upper leg and 3 in. lower leg \*\* Before testing, the spliced, test specimen was cycled 500 times at 30 com according to ASTM E 1399 and ICBO ES AC 30 (Jan,



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CONCRETE FLOOR ASSEMBLY: Two-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a dem of 100-150 pcf, with a min. thickness of 4 in. at the joint face. Overall slab thickness may vary to accommodate various blockout depths (longitudinal recesses) formed in the concrete, to house the architectural cover plate. The blockout width may also vary without restriction

(Indiguonal recesses) times in seconcer, to noise us a cliniculate core plate. The uncount wait may any minor restriction. 2. CURTAIN WAIL ASSEMBLY: The outrain wall assembly shall incorporate the following construction features: A. Mounting Attachment: (Not shown) Attachment of the curtain wall framing to the structural framing shall be connected to the joint face of the floor slab, according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be 10 ft.

B. Steel-Stud Framing: Vertical framing members shall be a min. 35/81 by 15/81 min. 16 G Asteel "Co-studes reusen in an advance of a min. 16 G Asteel "Co-studes secured in a 18 G Asteel To-studes secured in a min. 12 min.

D. Curtain Wall Insulation: (Optional - Not Shown) A faced or un-faced mineral wool or fiberglass\*\* batt insulation installed in each stud cavity i accordance with manufacturer's instructions. (\*\* Listed with Intertek)

E. Barrier Insulation: Use a nom. 24 in. wide by 4 in. thick min. 4 pcf faced or un-faced mineral wool\*\* batt insulation cut to size as required Install barrier insulation in each stud cavity so that min. 32 in. of barrier insulation is above the surface of the perimeter joint protection and a Instant oarner in soladout in each sou carry so that min. 2 and o that in subation is above the solade of the perimeter joint protection. Barrier insulation length is min. 24 in . and fitted tightly between vertical framing membe filing all studs. Seal all but joints of barrier insulation with min. 4 in . wide aluminum foil faced taps. The curtain wall insulation shall completely fill the recess of the min. 3-5/8 in. by 1-5/8 in., 18 GA steel "C" studs. (\*\* Listed with Intertek)

Entreport Curtain Wall Surface: Apoly after Perimeter Joint Protection (3) is installed. Use a min. 1/2 in. thick. 48 in. wide by 96 in. long. Type X smellio contain that cancer, pay a list reinities own i rolection (c) is instance. Ose a min. 12 in times, 4 on web of some of generating approximation of the second to a mining with #6 by 1-114 in. Iong Type S dywall screws 8 in. co in the peripher and 12 in. co in the field. Screw heads are covered with joint compound. Joints created between gypsum wallboard are taped and floated with joint compound. Gypsum wallboard only required to be continuously placed a min. 32 in. above surface of perimeter joint protection. Gypsum wallboard below the slab is optional.

6. Exterior Curtain Wall Insulation: (Optional -Not Shown) An expanded polystyrene feam (EPS) insulation. The EPS foam boards measure 24 in. wide by 48 in. long by 4 in. thick with a nominal density of 1 pcf. The EPS foam is attached to the sandwiched wall surface using mechanical fasteners or an adhesive in accordance with manufacturer's recommendations. Install the EPS boards in a running bond (brick-like) pattern and staggered over sandwiched wall surface (2C) joints. Apply pressure to the EPS boards to assist in the bonding process. All EPS boards must be butted together with no gaps or voids between them. Allow a third of 12 hours before continuing the application process when using adhesive. The EPS boards must be rasped to remove all irregular seams and establish a continuous fl

H. Exterior Curtain Wall Finish: Use cementitious, aluminum or steel siding of any type. Install per manufacturer's instructions. Secure siding to

 a calculation of adult your match or exceptible fastimized adultation of accessing of any specification provide the second standy of a second standy of installed to curtain wall framing according to the curtain wall system manufacturer's guidelines. Use a min. 1/4 in. thick, clear tempered glass with a nom, width of 59 in, and height of 71 in.

J. Window Gaskets: Secure glass vision panels with a thermal break (thermal-set rubber extrusion).
 K. Window Framing: Steel framing members shall be a min. 3-5/8 in. by 1-5/8 in. 18 GA steel "U" channel or similar construction that is

compatible with steel-stud framing (2b). Locate window framing at least 35 in, above the top surface of the floor assembly

PERIMETER JOINT PROTECTION: The perimeter joint (linear opening) shall not exceed an 8 in. nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features: A Packing Material: Use a min. 4 in. thick, 4 pcf density, mineral wool" batt insulation installed with the fibers running parallel to the slab edge

and curtain wall. The packing material shall be compressed 33% in the nominal joint width. Compress the batt insulation into the perimeter ight such that the top surface of the batt insulation is flush with the top surface of the concrete floor slab. Splices (butt joints) in the lengths of point and the boot of the state of the background is not in the top of the of the state of the state. A state of the state Systems Section of this Directory for more details on how to determine the cut width of the insulation to be installed in the nominal joint width, and how to determine the compressed percentage of a known insulation width installed in a known nominal joint width. (\*\* Listed with Intertel 3. CERTIFIED MANUFACTURER: Hilti, Inc

CERTIFIED PRODUCT: Joint Spray or Sealant MODEL: Firestop Joint Spray CFS-SP WB or Silicone Joint Spray CFS-SP SIL

Fill, Void or Cavity Material: To be applied (sprayed, Brushed, or painted) to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply at the thickness specified in Table 1 and overlap the material a min. 1/2 in. onto with Barrier Insulation (2E) and Concrete Floor Assembly (1). If the spraying process is stopped and the applied liquid cures to an elastometric film before process is restarte then overlap the edge of the cure dmaterial at least 1/8 in. with the spray. Reference Product Section of this Directory for more details about the Listed product

port Angle: Standard 1-1/2 x 1-1/2 in. min. 20 GA galvanized steel angle attached between all studs with self tapping self drilling sc Set angle at mid height of Packing Material (3A).

 Support Clips: (Not Shown) Support clips are optional but recommended for installations subject to vertical shear movement. Standard Z-shaped clips are 20 GA galvanized steel with the following dimensions: 1 in. wide by 3 in. high with a 2 in. upper leg and 3 in. lower leg. fore testing, the spliced, test specimen was cycled 500 times at 30 cpm according to ASTM E 1399 and ICBO ES AC 30 (Jan 1997)

June 20, 2014





	Design No. CEJ 307 P (HI/BP 180-01) PERIMETER FIRE BARRIER SYSTEM Hilti, Inc. ASTM E 2307 Table 1				
	FIRESTOP JOINT SPRAY CFS-SP WB	SILICONE JOINT SPRA CFS-SP SII			
E DATING	2 110	0.110			

F-RATING T-RATING 1 3/4-HF 1 3/4-HF 1/8" WET FILM APPLICATION 2mm (0.079") WF THICKNESS (1/16" DRY) FILM CYCLING (% ± 11.25 ± 7.5 HORIZONTAL VERTICAL + 5 + 5 SEE NOTE

L-Rating <1.0 SCFM/LF



CONCRETE FLOOR ASSEMBLY: Two-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150 pcf, with a min. thickness of 4-1/2 in. at the joint face. Overall slab thickness may vary to accommodate various blockout depths (Iongludinal recesses) formed in the concrete, to house the architectural cover plate. The blockout todd as a value arbitrary without restriction. 2. CURTAIN WALL ASSEMBLY: The curtain wall assembly shall incorporate the following construction features: A. Mounting Attachment: (Not shown) Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall

manufacturer's instructions to allow vertical shear movement only. When required, the mounting attachments to the floor slab shall be connected to the joint face of the floor slab, according to the curtain wall manufacturer's instructions. Max, distance between mounting connected to the joint ace of the non-static according to the current wan manuacuus a manuacuus max. Usaante the attachments shall be 10 feet. Lone optional method is to use min. 5 in. wide by 3/4 in. thick extruded kuminum Halfen multing brackets with one nom. 2 in. high leg for support and attachment to the multion and with one leg at least 6 in. longer than nominal joint width. Attach the mounting bracket to the top of the floor with two min. 1/2 in. dia. steel masonry anchors in conjunction with washer plates supplied with the mounting brackets.

aming: Rectangular aluminum tubing mullions and transoms, sized according to the curtain wall system manufacturer's guidelines. Min. overall dimensions of the extruded framing sections are 0.100 in. thick aluminum with a min. 5-1/4 in. depth and a min. or 2-1/2 in. width. Mullion and Transom covers are added to the external side of the framing, giving the framing system a total depth of min. 6-3/ The main main main matrix theorem of the bar of the calculated on the main graph is full main graph of the spanded provided of the transom) and the upper transom must be placed a min. 921 in below the concrete floor (as measured from the underside of the floor to the top side of the transom) and the upper transom must be placed a min. 921 in below the concrete floor (as measured from the upper transom must be placed a min. 921 in below the concrete floor (as measured from the upper transom must be placed a min. 921 in 21 in above the floor (as measured from the top surface of the floor to the upper transom). underside of the transom) while maintaining the min. 46-1/2 in, soandrel panel height. One optional fastening method is to space the mullions as noted herein and secure the mullion mounting anchors (Item 2A) at each floor level in conjunction with extruded aluminum clips bolted to the sides of the mullions and designed to engage the vertical leg of the Halfen mullion mounting bracket in conjunction with an extruded aluminum hook/leveling connector

C. Vision Glass Panels: Glass panels shall be sized and attached to curtain wall framing according to the curtain wall system manufacturer's A name to lease a rates. Sease parties share searce and elaboration to curatin wai naming according to the curatin wai system instantacioners of 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 o.c. spacing, which allows the glass to be secured between the notched shoulder of the aluminum framing and pressure bar. Panels are secured with a thermal break (rubber extrusion), pressure bar (aluminum extrusion), min. 1/4-20 x 5/8 in. long screws, and a snap face (aluminum extrusion).

5. Spandrel Panels: Either glass or aluminum spandrel panels may be applied to the spandrel exterior: If Glass Spandrel Panels: Glass panels shall be sized and installed to curtain wall framing 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 o.c. spacing, which allows the glass to be secured between the notched shoulder of the aluminum framing and pressure bar. Panels are secured with a thermal allows in glass to be secure between the hourbed shoulder of the autiminin harming and pressure bai, Paries are secured with a unerhand break (rubber extrusion), pressure bar (aluminum extrusion), min. 1/4-20 x 5/8 in. long screws, and a snap face (aluminum extrusion). Aluminum Spandrel Panels: Aluminum panels used in the spandrel shall be sized and attached to curtain wall framing according to the curtai wall system manufacturer's guidelines. Use a min. 1/8 in. sheet aluminum panel. E. Insulation Retainer Angle: Secure a minimum 2 in, x 2 in, 20 GA galvanized steel angle to the underside of the top spandrel transom

extending the full length of the transom between each vertical framing member. Position so that the curtain wall insulation (21), when placed flush against the back surface of the angle, is flush with the internal surface of the vertical framing members. Secure the angle to the transor with min. 1 in. No. 10 self-tapping sheet metal screws spaced a maximum 12 in. o.c.

F. Insulation Reinforcement Angle: Place min. 1 in. x 2 in. 20 GA galvanized steel angle horizontally in the spandrel area to reinforce the curtain wall insulation (2I). The 2 in. leg is placed flush against the exterior surface of the urtain wall insulation and the 1 in. dimension is positioned at the top of the 2 in. leg, perpendicular to and outward from the insulation as illustrated. Place a minimum of 3 angles in each spandrel cavit between vertical framing members. Two angles are required to be spaced a max. 6 in. o.c. in the perimeter fire barrier region, with the top angle centered 1 in above the floor. Outside of the perimeter fire barrier region, the spacing of these reinforcement angles is a max. 18 in oc On both ends of each angle, cut the 1 in. leg of the angle 2 in. from the end and fold down to form a slot that is slid onto the flange of the Z-Clip (2G).

G. Z Clips: Position min. 2 in. wide Z-Clips having 2 in. long web and flange dimensions, constructed of min. 18 GA. galvanized steel, onto the 3.2 single 1 cause in the required elevation locations of the insulation Reinforcement Angles (P). Two 2-Clips are secured to the interior of the insulation Reinforcement Angles (P). Two 2-Clips are secured to the interior face of the mullion, placed tightly against the mullion. The 2-clips are secured to the interior face of the mullion with a single 1 in No. 10 self-happing sheet metals screw placed at the center of the 2-Clips.

insulation retainer angle (2E) and insulation reinforcement angle (2F) with min. 3 in, long No. 8 bugle head self-tapping screws fitted with min 1-12 in .diameter steel clinch shields or self-locking washer clips. These are spaced a max. 12-34 in .oc and a max. 4 in .on each side of vertical seams. Where the framing covers (2J) overlap onto the curtain wall insulation (2I) secure framing covers (2J) and curtain wall insulation (2I) to the insulation retainer angle (2E) and insulation reinforcement angle (2F) with min. 5 in. long No. 10 bugle head self-tapping

insolation (2) for the maintening interference of the second seco the framing, and is secured to the Insulation Retainer Angle (2E) and Insulation Reinforcement Angle (2F) with Insulation Retaining Screws and min. 1-12 in . diameter steel clinch shields or self-locking washer clips. (2H). A minimum 3 in air space is created betwen the insulation and panel. All meeting edges of insulation are sealed with nom. 4 in. wide pressure sensitive aluminum foil faced tape centered over the junction so that approx. 2 in. of tape covers each edge of the adjacent insulation. The 36 in. wide batts shall be installed with a maximum of 1 vertically oriented seam in each spandrel cavity, between vertical framing members, spaced a min. 18 in. from any vertical framing member, and continuous vertically without horizontal seams

J. Framing Covers: Strips made of 2 in. thick by 8 in. wide, 8 pcf, mineral wool batt insulation, faced one side with aluminum foil scrim (vapor retarder) which faces the room interior, are centered over each vertical framing member and secured to the Insulation Retainer Angle (2E) and Insulation Reinforcement Angle (2F) with Insulation Retaining Screws spaced 1 in, from both edges of the framing cover, Framing covers do not pass through the perimeter joint treatment. They are butted to the top and bottom surfaces of the perimeter joint treatment Panel Attachment: Secure panels with a thermal break (thermal-set rubber extrusion), pressure bar (aluminum extrusion), 1/4-20 x 5/8 in. long screws, and a snap face (aluminum extrusion). The spandrel panels shall be insulated according to 2!. K Panel Attach







Hilti Firestop Systems

- Refer to section 07840 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification
- 2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
- \* Minimum and maximum Width of Joints
- \* Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- References
- \* 2013 Underwriter's Laboratories Fire Resistance Directory Volume 2
- \* 2013 Directory of Listed Materials and Assemblies, Omega Point Laboratories
- \* All governing local and regional building codes

<notes (delete="" after="" and="" block="" designer="" information)="" note="" reading="" replace="" this="" title="" to="" with=""></notes>	1. Any modification to these details could result in an application/system not meeting	ure or or interfets data as of Education or un internet emperature or inte raungs. O Dataite shown area in chada as of Educations 2016.	2. For additional information on the details, refer to the most current systems found on	the Underwriter's Laboratories or Intertek websites	4. Coordinate fabrication and construction details with curtain wall supplier.
DR CH		i: ED:			
TY FIF JO DE SH	REVISIONS: TYPICAL FIRESTOP PERIMETER JOINT DETAILS SHEET NAME: SHEET NUMBER: CW.2.6				



F. Exterior Curtain Wall Finish: Use brick and mortar of any type. Mortar joints not to exceed 7/8 in. . Secure bricks to wall assembly using

 G. Glass Vision Panels: Glass vision panels shall be installed to curtain wall framing according to the curtain wall system manufact guidelines. Use a min. 1/4 in. thick, clear tempered glass that is fitted to the framing, having a min width of 24 in. and a min. height of 24 in. H. Window Gaskets: Secure glass vision panels with a thermal break (thermal-set rubber extrusion).

Window Framing: Steel framing members shall be a min. 3-36 in, by 1-58 in. 18 GA steel "U" channel or similar construction that is compatible with steel-stud framing (2B). Locate window framing at least 6 in. above the top surface of the floor assembly.

3. PERIMETER JOINT PROTECTION: The perimeter joint (linear opening) shall not exceed a 6 in. nom. Joint width (joint width at installation) and

b) Example Excerning the pointer of the pointer joint such that the top surface of the batt insulation is flush with the top surface of the concrete floor slab and the insulation is compressed parts the intervelop and/or intervelop and/or intervelop and/or or intervelop and/or ulation width installed in a known nominal joint width. (\*\* Listed with Intertek)







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CERTIFIED PRODUCT: Joint Spray or Sealant

Listed produc

c. Packing waterial, use a min. 4 min. 4 pice derisity, mineral woor beat installed with the tides to mining parallel to the state use and curtain wall. The packing material shall be compressed 25% in the nominal joint with. Compress the batt insulation into the perimeter joint such that the top surface of the batt insulation is flush with the top surface of the concrete floor slab and the insulation is compressed against the interior surface of the curtain wall insulation (2D). Splices (butt joints) in the lengths of mineral wool batt insulation are to be tightly compressed.

together. Reference the Introduction to Fire Resistive Joint Systems Section of this Directory for more details on how to determine the cut width

ogenies - teierenke vie intuoduction on nie teaswe own. Gaard second on tins precury of more beaus of now to beerknine vie un witu of the insulation to be installed in the nominal joint width, and how to determine the compressed percentage of a known insulation width installer in a known nominal joint width. (\*\* Listed with intertek) D. CCRTITED MANUFACTUREE: Hitti, Inc.

MODEL: firestop Joint Spray CFS-SP WB or Silicone Joint Spray CFS-SP SIL Fill, Void or Cavity Material: To be applied (sprayed, Brushed, or painted) to cover the exposed surface of the mineral wool installed in the

perimeter joint. Apply at the thickness specified in Table 1 and overlap the material a min. 1/2 inch onto with Curtain Wall Insulation (2D) and

Concrete Floor Assembly (1). If the spraving process is stopped and the applied liquid cures to an elastomeric film before process is restarter

pre testing, the spliced test specimen was cycled 500 times at 30 cpm according to ASTM E 1399 and ICBO ES AC 30 (Jan. 1997).

en overlap the edge of the cured material at least 1/8 in. with the spray. Reference Product Section of this Directory for more details about t









framing (Item 2B) in accordance with the manufacturer's installation instructions. When framing for the aluminum panels is required, it is to be Installed with the manufacturer's installation instructions. The system is a monolithic assembly without expansion or control joints. (4) Brick: Use any conventional brick and mortar type. Any brick pattern is acceptable. Mortar joints not to exceed 7/8 in. Secure bricks to wall assembly using conventional acceptable masonry construction techniques. The system is a monolithic assembly without expansion or control joints. (5)

Stucco: Any Listed and Labeled stucco system is acceptable provided that the following is abided by: When EPS is used, the EPS foam boards nominally measure a maximum of 4 in. thick with a nominal density of 1 pcf. The stucce of nanufacturer confirms the stucco is compatible with the sandwiched wall surface. The system is a monolithic assembly without expansion or control joints. (6) Stone: Use any

conventional stone panel and mortar type measuring at least 1 in. thick. Any stone pattern is acceptable. Mortar joints not to exceed 7/8 in. Secure stones to wall assembly using conventional acceptable masonry construction techniques. The system is a monolithic assembly

Secure states to wai assembly daily conventional acceptation in solar of construction reading construction reading construction assembly without expansion or control joints. (7) Siding: Any Listed and Labeled siding system is acceptable provided that the following is abided by: The siding shall be classified as non-combustble. The system is a monolithic assembly without expansion or control joints. (8) GFRC Panels: Glass fiber reinforced concrete panels shall be at least 1 in. thick and attached in accordance with the manufacturer's installation instructions.



Hilti Firestop Systems

The system is a monolithic assembly without expansion or control joints.

- . Refer to section 07840 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification
- 2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
- \* Minimum and maximum Width of Joints
- \* Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Drawings shall follow the International Eireston Council (IEC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- References
- \* 2013 Underwriter's Laboratories Fire Resistance Directory Volume 2
- \* 2013 Directory of Listed Materials and Assemblies, Omega Point Laboratories
- \* All governing local and regional building codes

Notes to designer (delete this note after reading and replace with title block information)> 1. Any modification to these details could result in an application/system not meeting the UL or Interlek Classification or the intended temperature or fire ratings. 2. Details shown are up to date as of February 2015. 3. For additional information on the detaik websites the Underwriter's Laboratories or Interlek websites 4. Coordinate fabrication and construction details with curfain wall supplier.					
<notes des<br="" to="">1. Any the t 2. Point 3. Fort the L 4. Coo</notes>					
JOB NUMBER:					
DRAWN:					
CHECKED:					
ISSUE DATE:					
REVISIONS: TYPICAL FIRESTOP PERIMETER JOINT DETAILS SHEET NAME:					
SHEET NUMBER:					

#### Design No. CEJ 421 P (HI/BP 120-03) (Cont.) PERIMETER FIRE BARRIER SYSTEM

I. Optional Vision Glass Panels: Glass panels shall be sized and installed to curtain wall framing according to the curtain wall system manufacturer's quidelines. 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 oc spacing, which allows the glass to be secured between the nothed shoulder of the aluminum framing an pressure bar. Panels are secured with a thermal break (rubber extrusion), pressure bar (aluminum extrusion), min. 1/4-20 x 5/8 in. long screws, and a snap face (aluminum extrusion).

J. Optional Window Gaskets: When required by the manufacturer, secure class vision papels with a thermal break (thermal-set rubbe K. Optional Window Framing: Framing material shall be non-combustible. Locate window framing at least 6 in. above the top surface of the

3. PERIMETER JOINT PROTECTION: The perimeter joint (linear opening) shall not exceed a 9 in. nom. joint width (joint width at installation

the interior face of the sandwiched wall surface and the vertical face of the con ate the following construction features:

A. Packing Material: Use a min. 4 in. thick, 4 pcf density, mineral wool batt insulation. Install the top surface of the packing material flush with the top surface of the concrete floor assembly (Item 1). Only Intertek Certified Mineral Wool Manufacturer's product meeting the above min. ments. Compress the lengths of packing material together at least 1/2 in. at splices (butt joints). Install packing material (Item 3A) usi one of the following methods:

Method 1 - Two-step installation process, (1) Install pieces of packing material (Item 3A) between the vertical framing members (Item 2B), Cu method 1= indicate installation pocess. (i) install pieces or packing material (term of ) device in the relation naming methods (term of ) and install the packing material (term 3A) with the fibers running horizontally (perpendicular) to the sale deg (pint face). Cut the pieces of packing material (term 3A) at least 1/4 in. longer than the distance between the vertical framing members (Item 2B) and 1/8 in. greater than the width of the steel-stud framing. (Cut packing material (term 3A) 24-1/4 in. long for a max. 24 in. spacing between vertical framing members (Item 2B). Cut packing material (Item 3A) 6-1/8 in. wide for 6 in., 18 GA steel "C" studs.) Allow no voids between vertical framing members (Item 2B) or between sandwiched wall surface and packing material (Item 3A). (2) Install pieces of packing material (Item 3A) in the ments of the max 3 in nominal joint with (joint with at installation) between the interior (ace in 4), (a) many become grant many of the vertical face of the concrete floor assembly (Item 1). Cut and install the packing material (Item 3A) with the fibers running vertically (parallel) to the slab edge (joint face). Cut packing material (Item 3A) 3-3/4 in. wide for a max.3 in. nominal joint width. Compress the packing material (Item 3A) min 20% and install in nominal joint width.

Werked 2 – Two seture to the probability of the seture of material (Item 3A) at least 1/4 in, longer than the distance between the vertical framing members (Item 2B), (Cut packing material (Item 3A) 421-14 in. long or anx.24 in. spacing between vertical framing members (terr 2b). Out packing material (tern 3A) yiu wide for 6 in, 14 GA steel "C" studs. Install the packing material (tern 3A) (min. compression 33%). Allow no voids between vertical framing members (tern 2b) or between sandwiched wall surface and packing material (tern 3A), (2) Install pieces of packing material (tern 3A) in the max.3 in. nominal joint width (joint width at installation) between the interior face of the steel stud framing (Item 2B) and the vertical face of the concrete Thor assembly (Ifem 1). Cut and install the packing material (Ifem 3) with the fibers running vertically parallel) to the slab edge (joint face) Cut packing material (Item 3) 4-1/2 in. wide for a max. 3 in. nominal joint width. Compress the packing material (Item 3A) min. 33% and stall in nominal joint width

B.CERTIFIED MANUFACTURER: Hilti, Inc.

CERTIFIED PRODUCT: Joint Spray or Sealant

MODEL: Firestop Joint Spray CFS-SP WB or Silicone Joint Spray CFS-SP SIL

Fill, Void or Cavity Material: Spray apply over exposed surface of the packing material (Item 3A). Apply at the thickness specified in Table 1 and overlap the material a min. 1/2 in, onto the adjacent curtain wall assembly and concrete floor slab assembly. When the spraving process is stopped and the applied liquid cures to an elastomeric film before application process is restarted, then overlap the edge of the cured

material at least 1/8 in. with the spray. C. Reinforcing Angle: Required for packing material (Item 3A) installed using Method 1 when mineral wool batt insulation in Optional Curta Wall Insulation (Item 2E) or grosum board in Optional Interior Curtain Wall Surface (Item 2F) is not present. Mount a min, 20GA, 1-1/2 in, x Year instantial (tell re2) or gyption tock in Option and provide introduction of the rest of the re longitudinally in the mid height of the packing material (Item 3A)







HEAD OF WALL JOINT SYSTEM ASTM E 2307-04 Section 14.1 Movement L-Rating <1.0 SCFM/LF

Rated for ± 0 % horizontal movemen Rated for - 100% downward vertical shear movement (3/4 in.) Class II 500 Cycles Rated for + 0% upward vertical shear mo





eproduced by HILTI, Inc Courtesy of Intertek Group June 20, 2014

Intertek



CONCRETE FLOOR ASSEMBLY: Min. two-hour rated concrete floor assembly (Item 1) made from either lightweight or normal weight concrete with a density of 100-150 pcf, with a min, thickness of 4 to 4-1/2 in, respectively, at the slab edge (joint face). Optional - Provided the two-hour The sources of the top on, while a minimum easily of the true minimum easily and the side eagle (junit table), boundaria – MOMBER the Without a concrete floor assembly (item 1) rading is not compromised, the overall slab thickness may vary to accommodate various blockout depth (longitudinal recesses) formed in the concrete, to house an optional architectural joint system. The blockout width may also vary without

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

A Monthing Attackment: Not shown) Attack the steel-stud framing to the structure framing constructures A Monthing Attachment: Not shown) Attack the steel-stud framing to the structure framing according to the curtain wall manufacturer's instructions. When required, connect the mounting attachments to the concrete floor assembly (Item 1) at the slab edge (joint face), accordin to the curtain wall manufacturer's instructions. Use a max. 10 ft. distance between mounting attachments.

B. Steel-Stud Framing: Use min. 6 in. by 1-5/8 in., 16 GA steel "C" studs cut to length as vertical framing members spaced a max, of 16 in, or center (cc), secure the ends of the steel studies in compatible sized 20 GA steel tracks, using min. #6 x -1/2 in. pan or hex head screws. Cantilever the floor track nominally 2 in. past the vertical face of the concrete floor assembly (Item 1). Secure the floor track to the top of the concrete floor assembly (Item 1) with 1/4 in, diameter x 2 in, long concrete screws (or either powder actuated fasteners or steel expansion bolts having equivalent strength and performance) spaced a max of 24 in. oc. Insert the ceiling track inside the "slip-track (deflect to ceiling track above, use min. 24 GA galvanized steel channel with slotted flanges sized to accommodate min. 6 in. by 1-5/8 in., 16 GA stee "C" studs. Alternate Framing Box Sill: Alternate to steel-stud framing (Item 2B) created between window assembly and top of the concrete floor assembly (Item 1), use multiple min. 16 GA galvanized structural steel tracks or steel studs placed horizontally and secured together using min. #6 x 1/2 in. pan or hex head screws or welds and capped top and bottom with floor and ceiling tracks or use multiple mir nized punched steel tracks or steel studs with all openings sealed with mineral wool placed horizontally and secured together using m galvanized puncted steel tracks of steel study with an openings seared with timeral woor process rough #6 x 1/2 in. pan or hex head screws or welds and capped top and bottom with floor and ceiling tracks.

C. Slip-Track (Deflection Channel); As part of the exterior wall assembly (Item 2) and head of wall ioint system, attach a min, 16 GA channel. sized to accommodate steel-stud framing (Item 2B), to the bottom of the concrete floor assembly (Item 1) using 1/4 in. diameter x 2 in. long concrete screws spaced nominally 12 in. on center. Cantilever the slip-track (deflection channel) nominally 2 in. past the vertical face of the concrete floor assembly (Item 1). The cantilevered tracks (Items 2B & 2C) create a min. 4 in, deep by 2 in, wide reveal. Attach reinforcing angle (item 3C) to top of slip-track (deflection channel). Create an exterior max. 3/4 in. horizontal joint (exterior head of wall joint system) at the slip-track (deflection channel) after the sandwiched wall surface (item 2D) is installed. Form the joint using two juxtaposed edges of the sandwiched wall surface (Item 2D) as the sides and create the back of the joint using the exposed steel face of slip-track (deflection channel (Item 2C). Locate the 3/4 in. horizontal joint directly below and parallel to the perimeter joint protection (Item 3). Optional Joint System: Instal a nominal 1/2 in, polyethylene backer rod into the 3/4 in, horizontal joint in contact with the steel face of slip-track (deflection channel. Cove nominal 1/2 in. polyethylene backer rod using a silicone, endothermic, or Intumescent sealant. Only Intertek Certified Seala Manufacturer's product meeting the above min. requirements.

 Sandwiched Wall Surface: Install packing material (Item 3A) and reinforcing angle (Item 3C), then apply and secure a min. 5/8 in. thick, 48 in valuation of the advance of the second secon thick cement based boards attached to steel stud framing (Item 2B) with min. 1-1/4 in, long Type S drywall screws 12 in, oc in field and 8 in on center at perimeter created by the cantilevered tracks (Items 2B & 2C). Do not attach 5/8 in thick cement based boards to slin-trac tion channel) (Item 2C). Butt all edges of all 5/8 in. thick cement based boards tightly together and cover joints with glass fiber mesh ape covered with compatible cementitious coating.

E. Optional Vision Glass Panels: Size and install class panels into curtain wall framing according to the curtain wall system manufacturer's Update ration closes rates due and make gass parties into unlant maning ductains for ductain was specific manufactures a guidelines. Use anin. 14 in . Thick, clear, heat-strengthened (HS) glass or tempered glass sized for the window framing, which allows the vision glass panels to be secured between the notched shoulder of the framing and pressure bar. When required by the manufacturer, secure vision glass panels with a thermal break (rubber extrusion), pressure bar (aluminum extrusion), min. 14-20 x 5/8 in. long screws, and a snap face (aluminum extrusion). Optional Window Framing: Framing material shall be non-combustible. Locate window framing at least 4-1/2 in. above the top surface of the floor assembly. 5. Optional Curtain Wall Clips: (Not shown) When desired, affix min. 20 GA 1 x 1 in. steel angle using 5/8 in. long sheet metal screws to the

vertical framing (Item 2B) and to the surface of the concrete floor assembly (Item 1) using min. 1/4 in. diameter by 1 in. long concrete screws G. Optional Curtain Wall Insulation: (Not shown) When desired, install curtain wall insulation above or below the perimeter joint protection (Item 3) When used secure the insulation in accordance with the manufacturer's installation instructions. Mineral wool or class fiber batt insulation The table, secure the installation is accounted with the manufacture is installation installation. Installation is accounted for the accounted with the installation is accounted for the accounted of glass later bala installation are acceptable. Only Interface Certified Mineral Wood Manufacture's product meeting the above mini-requirements.
 H. Optional Interior Curtain Wall Surface: (Not shown) When desired, install an interior curtain wall surface above or below the perimeter joint

protection (Item 3). When used, secure the interior curtain wall surface in accordance with the manufacturer's installation instructions. Gyosun hoard is accentable

Usan's acceptate: Exterior Curtain Wall Finish: (Not shown) The exterior finish shall not create voids or openings in the sandwiched wall surface and shall extent at least 4 in. above and at least 24 in. below the surface of the concrete floor assembly (Item 1). The following finishes are acceptable: (1) Exterior Insulation Finish System: When desired, use any Listed and Labeled EIFS composed of an expanded polystyrene (EPS) foam Insulation and Exterior Curtain Wall Finish consisting of the following: A plaster, base cost and reducing possible for O were the sandwiched wall surface. Precut the mesh as needed. The mesh is a woven fiberglass reinforcement fabric that is compatible with the plaster base coat and finish coat materials. Apply 1/16 to 1/8 in. thick plaster base coat to the exposed surface of the EPS foam. The EPS place body out that such interaction paper if the such is the subject of the subj between them. Allow a min, of 12 hours before continuing the application process when using adhesive. The EPS boards must be raspect to remove all irregular seams and establish a continuous flat surface. Apply the mesh over the EPS; embed the mesh into the plaster bac coat using a trowel. Start at the middle and work outwards towards edges. The final thickness of the plaster base coat with the mesh embedded should be approximately 1/16 in.. Let the base coat dry completely before applying the plaster finish coat. The plaster finish coat is a gypsum based wall coating which may contain silica sand or marble aggregates. Apply the plaster finish coat using a trowel in the same manner as the plaster base coat. Other installation techniques are acceptable when detailed by the manufacturer. The EIFS system is a monolithic assembly without expansion or control joints. Only Intertek Certified EIFS Manufacturer's product meeting the

above min. requirements. (2) Glass Panels: Size and install class panels into curtain wall framing according to the curtain wall system manufacturer's quidelines. Use c) basis inclusive processing of the second seco break (rubber extrusion), pressure bar (extrusion), min. 1/4-20 x 5/8 in. long screws, and a snap face (extrusion) or other manner as detailed by the manufacturer. The system is a monolithic assembly without expansion or control joints

(3) Aluminum Panels: Min. 118 in. thick aluminum panels secured to the steel-stud framing (Item 2B) in accordance with the manufacturer's installation instructions. When framing for the aluminum panels is required, it is to be installed with the manufacturer's installation instructions. The system is a monolithic assembly without expansion or control joints.

(4) Brick: Use any conventional brick and mortar type. Any brick pattern is acceptable. Mortar joints not to exceed 7/8 in., Secure bricks to wall assembly using conventional acceptable masonry construction techniques. The system is a monolithic assembly without e

(5) Stucco: Any Listed and Labeled stucco system is acceptable provided that the following is abided by: When EPS is used, the EPS foar boards nominally measure a max, of 4 in, thick with a nominal density of 1 pcf. The stucco manufacturer confirms the stucco is

compatible with the sandwiched wall surface. The system is a monolinic activity or 1 point in studeous metal activity or control joints. (6) Stone: Use any conventional stone panel and morar type measuring at least 1 in. thick. Any stone pattern is acceptable. Mortar joints not to exceed 7/8 in... Secure stones to wall assembly using conventional acceptable masonry construction techniques. The system is a monolithic assembly without expansion or control joints.

(7) Siding: Any Listed and Labeled siding system is acceptable provided that the following is abided by: The siding shall be classified as non-combustible. The system is a monolithic assembly without expansion or control joints. (8) GFRC Panels: Glass fiber reinforced concrete panels shall be at least 1 in. thick and attached in accordance with the manufacturer's

installation instructions. The system is a monolithic assembly without expansion or control joints.

(9) Roofing Materials: Any Listed and Labeled Class A bifuminous roofing material applied in accordance with manufacturer's installation instructions. Only Interfex Cartified Roofing Manufacturer's rooduct meeting the above min. requirements.
3. PERIMETER JOINT PROTECTION: The perimeter joint (linear opening) shall not exceed a 2 in. nom. joint width (joint width at installation) between the interior face of the sandwiched wall surface and the vertical face of the concrete floor assembly. The perimeter joint treatment shall orate the following construction features

A. Packing Material: Use a min. 4 in. thick, 4 pcf density, mineral wool batt insulation. Install the top surface of the packing material flush with the top and bottom surface of the concrete floor assembly (Item 1). Only Intertek Certified Mineral Wool Manufacturer's product meeting the above min, requirements, Compress the lengths of packing material together at least 1/2 in, at solices (butt ioints), Install packing material (Item 3A) using the following method: Install the packing material in the reveal created by the cantilevered tracks (Items 2B above the floor & (term of y using the informing memory memory memory and the packing memory in the reveal vested by the campereen activity of the 20 below the flows and the packing meterial a min. of 4-1/4 in. high by min. 2-1/4 in. wide for min. 4 in. by 2 in. reveal. Use proportionate packing material for larger reveals. Overlap and compress the ends of the lengths of the packing material a min. of 1/4 in, tr be butted togethe

B. CERTIFIED MANUFACTURER: Hilti. Inc.

CERTIFIED PRODUCT: Joint Spray or Sealar

MODEL: Firestop Joint Spray CFS-SP WB or Silicone Joint Spray CFS-SP SIL

Fill, Void or Cavity Material: Spray or brush apply in two locations: (1) over the interface of the inside vertical leg of the of the floor track (Item 2B) and the concrete floor assembly (Item 1) and (2) over the interface of the outside vertical leg of the floor track (Item 2B) and the inside

of the sandwiched wall surface (Item 2D). Fill. Void or Cavity material is not required behind the vertical studs. Application of the material is to start and stop on each side of each vertical stud. When alternate box sills used, spray or bush apply fluction in two locations? (1) over the interface of the inside vertical face of the of the ox sill (Item 2B) and the concrete floor assembly (Item 1) and (2) over the interface of the top sill (Item 2B) and the inside face of the sandwiched wall surface (Item 2D). Apply at the thickness specified in Table 1 and overlap the material a min, 1/2 in, onto the adjacent curtain wall assembly and concrete floor slab assembly. When the brushing or spraving proces s stopped and the applied liquid cures to an elastomeric film before application process is restarted, then overlap the edge of the cure rial at least 1/8 in. with the fresh material





#### Design No. CEJ 425 P (HI/BP 120-04) (Cont.) PERIMETER FIRE BARRIER SYSTEM

C. Reinforcing Angle: Mount a min. 20 GA, 1-1/2 in. x 3/4 in. galvanized steel angle continuously to the top of the slip-track (deflection channel) (Item 2C) using min. # 6 x 1/2" framing screws with pan or hex head nominally 24 in. oc. Screws heads located on bottom of sip-track Position the reinforcing angle so that the 3/4 in. horizontal leg attaches the exposed top of the cantilevered slip-track (deflection channel) (Item 2C) and the 1-1/2 in vertical leg is plumb with outside cantilevered edge of the floor track (Item 2B) above. Alternate: Mirror location from above mounting. Mount a min. 20 GA. 1-1/2 in, x 3/4 in, galvanized steel angle continuously to the bottom track (Item 2B) using min. #6 x 1.25 in, pan or bey head head SD PT screws nominally 24 in . oc. Position the reinforcing angle so that the 3/4, in horizontal legistraches the expose ttom of the cantilevered bottom track (Item 2B) and the 1-1/2 in. vertical leg is plumb with outside cantilevered s

D. Steel Cover and Base: (Not shown) Use nominal 6 in. by 2 in., 16 GA steel "C" channel, bottom track (Item 2B), to cover the packing materia (Item 3A) and use nominal 6 in, by 2 in, 16 GA steel "C" channel, slip-track (deflection channel) (Item 2C), to support the packing n terial (Ite

E. Optional Impaling Pins: (Not shown) When desired, use 12 GA steel pins swaged to nominal 2 x 2 in. galvanized steel base plate affixed ma 16 in. oc to edge of concrete floor assembly (Item 1)

June 20, 2014





Design No. HI/BP 150-01 PERIMETER FIRE BARRIER SYSTEM Hilti, Inc. ASTM E 2307 Table 1 FIRESTOP SILICONE JOINT SPRAY JOINT SPRAY CFS-SP WE CFS-SP SII F-RATING 1 3/4-HR. 1 3/4-HR. T-RATING 1 1/4-HR. 1 1/4-HR. APPLICATION THICKNESS 1/8" WET EILM 2mm (0.079") WE<sup>-</sup> FILM (1/16" DRY CYCLING (%) HORIZONTAL ± 11.25 ± 7.5 ± 5 VERTICAL ± 5 SEE NOTE 1





I. CONCRETE FLOOR ASSEMBLY: Three-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150 pcf, with a min. thickness of 4 in. at the joint face. Overall slab thickness may vary to accommodate various blockout depths projudinal recesses) formed in the concrete, to house the architectural cover plate. The blockout width may also vary without restriction.

(uniquently consistent of the contracter, or house the activity of the plant in the contracture of the contracter, or house the activity of the contracter of the contracte connected to the joint face of the floor slab, according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be 10 ft.

B. Aluminum Framing: Rectangular aluminum tubing mullions and transoms, sized according to the curtain wall sys guidelines. Min. overall dimensions of the extruded framing sections are 0.100 in. thick aluminum with a min. 5-1/4 in. depth and a min. of 2-1/2 in. width. Mullion and Transom covers are added to the external side of the framing, giving the framing system a total depth of min. 6-3/4 2 "12 in which which which will related to the safe added to the external side of the family given and in group of the safe added to the external side of the family given and in group of the safe added to the s of the transom) while maintaining the min. 28-1/2 in. spandrel panel height.

C. Vision Glass Panels: Glass panels shall be sized and attached to curtain wall framing 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 aluminuu framing oc spacing, which allows the glass to be secured between the notched shoulder of the aluminum framing and pressure bar. Panels are secured with a thermal break (rubber extrusion), pressure bar (aluminum extrusion), min. 1/4-20 x 5/8 in. long screws, and a snap face uminum extrusion

D. Glass Spandrel Panels: Glass panels shall be sized and installed to curtain wall framing according to the curtain wall system manufacture 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 oc spacing, which allows the class to be secured between the notched shoulder of the aluminum framing and pressure ba Panels are secured with a thermal break (rubber extrusion), pressure bar (aluminum extrusion), min. 1/4-20 x 5/8 in. long screws, and a sna

face (aluminum extrusion). E. Insulation Reinforcement Angle: Place min. 1 in. x 2 in. 20 GA galvanized steel angle horizontally in the spandrel area to reinforce the curtain wall insulation (2H). The 2 in, leg is placed flush against the exterior surface of the curtain wall insulation and the 1 in, dimension is positione at the top of the 2 in leg, perpendicular to and outward from the insulation as illustrated. Place a min. of 3 angles in each spandrel cavity between vertical framing members. Two angles are required to be spaced a max. 6 in. oc in the perimeter fire barrier region, with the lop angle

centered 1 in. above the floor. Outside of the perimeter fire barrier region, the spacing of these reinforcement angles is a max. 18 in. o.c. On both ends of each angle, cut the 1 in. leg of the angle 2 in. from the end and fold down to form a slot that is slid onto the flange of the Z-Clip

(c1), ..., C1 provide a constructed of the construction of the construction of the constructed of min. 18 GA, galvanized steel, onto the multion at the required elevation locations of the Insulation Reinforcement Angles (2E). Two Z-Clips are to be positioned at each location so that one clip extends on each side of the mullion, placed tightly against the mullion. The Z-clips are secured to the interior face of the mullion with a single Link. No. 10 set lapping sheet metal screw placed at the center of the ZClips. G. Insulation Retaining Screws: In the field of the curtain wall insulation between framing covers (21) attach curtain wall insulation (2H) to the

insulation reinforcement angle (2E) with min. 3 in. long No. 8 bugle head self-tapping screws fitted with min. 1-1/2 in. diameter steel clinch insulation reinforcement registric (22) with minimum of the long to long of node origin float in tapping sector with minimum of the long of the origin relation of the long washer of 120) overlap on to the curtain wall insulation (2H) secure framing covers (2I) and curtain wall insulation (2H) to the insulation reinforcement angle (2E) with min. 5 in. long No. 10 bugle head self-tapping screws and min. 1-1/2 in. diameter steel clinch shields or self locking washer clips in accordance with details in 2I. H. Curtain Wall Insulation: A nom. 2 in. thick, 8pcf density mineral wool batt insulation\*\*, faced on one side with aluminum foil scrim (vapor retarder) which faces the room interior, is installed to fill all cavities of the spandrel region between the framing. The batt is to be fitted tightly

related with naces the formation, is installed to it in a varies of ite spenter region between the framing, and is secured to the insulation Reinforcement Angle (2E) with Insulation Relating Screws and min. 1-1/2 in diameter steel dinch shields or self-locking washer clips. (2G). A min. 3 in air species is created between the insulation and panel. All meeting edges of insulation are sealed with nom. 4 in. wide pressure sensitive aluminum foil faced tape centered over the junction so that approx. 2 in. of tape covers each edge of the adjacent insulation. The 36 in, wide batts shall be installed with no vertical seams. Horizontal seams must be space a min. of 3 in. above the perimeter fire barrier. (\*\*Listed with Intertek)

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Hilti Firestop Systems









### Votes

- Refer to section 07840 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification
- Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
- \* Minimum and maximum Width of Joints
- \* Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- References
- \* 2013 Underwriter's Laboratories Fire Resistance Directory Volume 2
- \* 2013 Directory of Listed Materials and Assemblies, Omega Point Laboratories
- \* All governing local and regional building codes

<ul> <li><notes (delete="" after="" and="" block="" designer="" information)="" note="" reading="" replace="" this="" title="" to="" with=""> <ol> <li>Any modification to these details could result in an application/system not meeting the UL or Interfect Classification or the intended temperature or fire ratings.</li> <li>Details shown are up to date as of February 2016.</li> <li>For additional information on the details, refer to the most current systems found on the Underwriter's Laboratories or Interfek websites</li> <li>Coordinate fabrication and construction details with curtain wall supplier.</li> </ol> </notes></li></ul>					
JOB NUMBER: DRAWN: CHECKED: ISSUE DATE:					
REVISIONS: TYPICAL FIRESTOP PERIMETER JOINT DETAILS SHEET NAME: SHEET NUMBER: CW.4.6					

### Design No. HI/BP 150-01 (Cont.) PERIMETER FIRE BARRIER SYSTEM

Framing Covers: Strips made of 2 in thick by 8 in wide 8 pcf mineral wool batt insulation faced one side with aluminum foil scrim (vapor relarder) which faces the room interior, are contered over each vertical framing member and secured to the Insulation. Reinforcement Angle (2E) with Insulation Relaining Screws spaced 1 in. from both edges of the framing cover. Framing covers do not pass through the perimeter joint treatment. They are butted to the top and bottom surfaces of the perimeter joint treatment.

Secure panels with a thermal break (thermal-set rubber extrusion), pressure bar (aluminum extrusion), 1/4-20 x 5/8 in. long screws, and a snap face (aluminum extrusion). The spandrel panels shall be insulated according to 2H.
 PERIMETER JOINT PROTECTION: The perimeter joint (linear opening) shall not exceed an 8 in. nom. joint width (joint width a installation) and

A Eximit LECOUNT POLICIES OF THE particle particle is prime opening just not exceed an on non-part work your work existential incorporate the following construction features: A. Packing Material: Use a min. 4 in, thick, 4 pd density, mineral wool" batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The packing material shall be compressed 44% in the nominal joint width. Compress the batt insulation in the perimeter joint such that the top surface of the batt insulation is flush with the top surface of the concrete floor slab. Splices (butt joints) in the lengths of mineral wool batt insulation are to be tightly compressed together with min. compression of 0.25 in per piece. Reference the Introduction to Fire Resistive Joint Systems Section of this Directory for more details on how to determine the cut width of the insulation to be installed in the nominal joint width, and how to determine the compressed percentage of a known insulation width installed in a known nominal joint width. (\*\* Listed with Intertek)

B. CERTIFIED MANUFACTURER: Hilti, Inc.

CERTIFIED RRODUCT: Joint Spray or Sealant MODEL: Firestop Joint Spray CFS-SP WB or Silicone Joint Spray CFS-SP SIL

Fill, Void or Cavity Material: To be applied (sprayed, brushed, or trowled) to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply at the thickness specified in Table 1 and overlap the material a min. 1/2 in. onto the adjacent curtain wall assembly and concrete floors has assembly. If the spraying process is stopped and the applied liquid cures to an elastomeric film before process is restarted then overlap the edge of the cured material at least 1/8 in. with the spray. Reference Product Section of this Directory for more details about the Listed product.

\*\*Before testing, the spliced, test specimen was cycled 500 times at 30 cpm according to ASTM E 1399 and ICBO ES AC 30 (Jan. 1997). This Design Listing was created using the information outlined in the Introduction to the Fire-Res Introduction to complement the Design Listing.



1. Floor Assembly — Min 4-1/2 in. (114 mm) thick steel-reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) structural

1. Hour Assembly — mini + fiz. In (1) = mini thick steer-eminotes inginitegril (1) to final weight (1) to 50 pc of to 50 pc record or any structure and concerned and a particular particular and a particular particular and a particular particar particular particular p the spandrel panel or tilt-up panel are to be spaced max 72 in. (1829 mm) OC. The top of the dead load anchor is to be recessed min 1/2 in. (13 mm) from top surface of floo

(1) Committee and the second of the second secon above top of floor.

3. Safing System — Max separation between edge of floor assembly and concrete spandrel or till-up panel is 6 in. (152 mm). The safing system is designed to accommodate vertical shear movement of up to 5 percent of its installed width. The safing system shall incorporate th construction features:

A. Forming Material\* — Nom 4 in. (102 mm) thick mineral wool batt safing material to be installed between the concrete spandrel or tilt-up pane To this matching matching matching matching and the standard and matching matching to be matching to be matching matching matching matching matching matching matching matching to be cut to a min 4-1/2 in. (114 mm) width and stacked to a thickness which is at least 25 percent greater than the width of the linear gap between the concrete spandred to till-up panel and the edge of the concrete floor slab. The safing material is compressed and inserted cut-edge-first into the linear gap such that its top surface is flush with the top surface of the floor assembly. A max of one tightly-butted seam is permitted between dead load anchors. An additional min 1/2 in. (13 mm) thick piece of mineral wool batt safing material to be installed to cover top surface of each dead load anchor.

THERMAFIBER INC — SAF B. Fill, Void or Cavity Material" — Min 1/8 in. (3.2 mm) wet thickness (1/16 in. or 1.6 mm dry) of fill material spray-applied over top of forming 

CFS-SP WB Firestop Joint Spray

\*Bearing the UL Classification Mark



Hilti Firestop Systems







1. Floor Assembly — Min 4-1/2 in. thick steel-reinforced lightweight or normal weight (100-150 pcf) structural concrete. Floor assembly to be supported at perimeter edges by spandrel beams having a Restrained or Unrestrained Beam Rating of 2 hr. 2. Curtain Wall Assembly — The curtain wall assembly shall incorporate the following construction features: A Spandrel Panels — Min 36 in. high by min 4 in. thick steel-reinforced lightweight or normal weight (100-150 pcf) structural concrete spandrel panels. Wall may also consist of min 4 in. thick steel-reinforced lightweight or normal weight (100-150 pcf) structural concrete spandrel panels. Wall may also consist of min 4 in. thick steel-reinforced lightweight or normal weight concrete littly panels with a min 36 in. vertical separation between window openings. Panels provided with steel dead load anchors welded to steel reinforcing bars embedded in the concrete for attachment to the steel columns and spandrel beams. Panels also provided with steel alter littly and part of the barsenet may 72 in the spandrel panel or this steel-reinforced for othan and the senarced anal curt the spandrel may 72 in the spandrel panel or the steel columns and spandrel beams. Panels also provided with steel alter littly and part of the barsenet the concrete for othan anal curt the same and concrete for stachment to the senarced may 72 in the spandrel panel with an end of the same and concrete for othan and spandres where the concrete for othan anal curt the same and concrete for stachment to the same analytic spandres for othan analytic spandres in the same and concrete for spandres and curt the same and curt the same and concrete for spandres the same and current of the same and current to the same and current spandres for scala analytic spandres in the same and current spandres for scala and analytic spandres in the same and the same for scalar and current for scala and analytic spandres in the same and the same for scalar analytic spandrest to the same analytic spandrest for scala anchors which are located in the linear gap between the concrete floor slab and the spandrel panel or tilt-up panel are to be spaced max 72 in

C. The top of the dead load anchor is to be recessed min 1/2 in, from top surface of floor 8. Joint System — (Not Shown) - Vertical joints between spandrel panels or tilt-up panels to be protected using Joint System No. WW-S-0042 2. Framed Window — Metal framed window with nom 1/4 in. thick heat-strengthened glass. Sill of window to be min 6 in. above top of floor. 3. Safing System — Max separation between edge of floor assembly and concrete spandrel or tilt-up panel is 6 in. The safing system is designed to mmodate vertical shear movement of up to 5 percent of its installed width. The safing system shall incorporate the following construction

A. Forming Material\* - Nom 4 in. thick mineral wool batt safing material to be installed between the concrete spandrel or tilt-up panel and the edge of the concrete floor slab. Safing material to be cut to a min 4-1/4 in, width and stacked to a thickness which is at least 25 percent eaged in the onclear within a lab. Saming interaction to be out to a minimum rule in the minimum and access to a minimum rule are a present greater than the width of the linear gap between the concrete spandred to till-up panel and the edge of the concrete from slab. The safing material is compressed and inserted cut-edge-first into the linear gap such that its top surface is recessed below the top surface of the floor assembly to accommodate the required thickness of fill material. A max of one tightly-butted seam is permitted between dead load anchors. An additional min 1/2 in. thick piece of mineral wool batt safing material to be installed to cover top surface of each dead load anchor. THERMAFIBER INC - SAF

B. Fill, Void or Cavity Material\* - Min 1/4 in. thickness of fill material applied over top of forming material flush with the top surface of the

b. rm, you u cavry waterial — win 1/4 m. tinckress of tim material applied over top of torming material flush with the top surface of the concrete floor and lapping on tothe concretes floor and lapping on the concrete shore the space floor and lapping on the concrete shore space floor and lapping on the concrete shore space floor and lapping on the concrete space space floor and lapping on the the top surface of the concrete floor and lapping on the concrete space space floor and lapping on the top surface of the concrete space floor and lapping on the top surface space floor shore the top surface of the concrete space floor and lapping on the concrete space space floor space space floor space space space floor space spa

Underwriters Laboratories, Inc.

ring the UL Classification Mark

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writers Laboratori to ASTM E2307



# January 13, 2014

System No. CW-D-2025 F Rating — 2 Hr T Rating — 1/4 Hr Linear Opening Width - 8 In. Max



Floor Assembly — Min 4-1/2 in. (114 mm) thick steel-reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) structural concrete. Floor assembly to be supported at perimeter edges by spandrel beams having a Restrained or Unrestrained Beam Rating of 2 hr. Edge

Contracts Tool obscarsing to be applying the applying and applying and applying the applying weight concrete tilt-up panels with a min 36 in. (914 mm) vertical separation between window openings. Panels provided with steel dead load anchors welded to steel reinforcing bars embedded in the concrete for attachment to the steel columns and spandred beams. Panels also provided with steel lateral anchors or braces. The dead load anchors, which are located in the linear gap between the concrete floor slab and the spandrel panel or tilt-up panel, are to be spaced max 72 in. (1829 mm) OC. The top of the dead load anchor is to be recessed min 1/2 in.

(13 mm) from ton surface of floor I. Framed Window — Metal framed window with nom 1 in. thick (double pane) transparent heat-strengthened glass panels. Sill of window to b min 6 in. above top of floor.

C. Impaling Pins — No. 12 gauge steel pins, min 1/2 in. (13 mm) longer than thickness of insulation boards (Item 2D), swaged to nom 2 by 2 in.

(51 by 51 mm) gala steel base plate. Steel base plates secured to correcte spandred planel with steel concrete spandred word (item 2D) and word steel base plate. Steel base plates secured to correcte spandred planel with steel concrete spandred word word of the spandred references the spandred reference the spandred references the spandred reference the spandred references the spandred reference the spandred references the spandred re above top surface of floor.

C1. Clutch Clipson – (Optional, Not Shown) - Nom 2 by 2 in. (51 by 51 mm) wide by 1-114 in. (32 mm) high V-shaped steel clutch clips used in conjunction with impaling pins (Item 2C) to offset curtain wall insulation (Item 2D) from spandrel panel (Item 2A). Clutch clips to be used on all impaling pins. When clutch clips are used, a row of impaling pins shall be located max 3 in. (76 mm) from top and bottom surfaces of floor assembly and spaced max 18 in. (457 mm) OC.

D. Curtain Wall Insulation\* — Min 2 in (51 mm) thick mineral wool board insulation, faced on one side with aluminum foil/scrim vanor retarded A cutain real instantion — min 2 m (2 m m) much interest work of each work adaption (see or m) and a set with a set work adaption (see or m) and (2 m m) and (2 mm) below planes of floor. Insulation boards secured to spandrel panel with impaling pins in conjunction with min 1-1/2 in. (38 mm) diameter galv steel clinch shields. Butted seams to be covered with aluminum foil tape. ROCKWOOL MALAYSIA SDN BHD — CurtainRock 80

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Underwriters Laboratories, Inc. May 30, 2014

ROXUL INC — CurtainRock 80



# System No. CW-D-2025 (Cont.)

3. Safing System — Max separation between edge of floor assembly and curtain wall insulation is 8 in. The safing system is designed to date vertical shear movement of up to 5% of its installed width. The safing system shall incorporate the following cor

A. Forming Material\* — Mineral wool batt safing material to be cut into min 4-1/2 in. (114 mm) wide pieces and stacked to a thickness which is at last 25 percent greater than the width of the linear gap between the curtain well insulation (litem 20) and the edge of the concrete floor slab. The stacked safing material is compressed and inserted cut-edge-first into the linear gap such that its top surface is flush with the top surface of the floor assembly. A max of one tightly butted seem is permitted between spandrel panel attachment plates or tubes. An additional min 1/2 in. (13 mm) thick piece of mineral wool batt safing material is to be installed to cover top surface of each dead load anchor.

Beau load allollo. ROCKWOOL MALAYSIA SDN BHD — SAFE ROXUL INC — SAFE B. Fill, Void or Cavity Material\* — Min 1/8 in. (3.2 mm) wet thickness (1/16 in. or 1.6 mm dry) of fill material spray-applied over top of forming material and lapping min 1 in. (25 mm) onto the top surface of the concrete floor and onto the curtain wall insulation. When CFS-SP SIL is used, min wet (and dry) thickness of spray is 2 mm.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 672 FC Firestop Joint Spray, CFS-SP SIL Firestop Silicone Joint Spray

or CFS-SP WB Firestop Joint Spray

ing the UL Classification Mark

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rwriters Laborato to ASTM E230



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I. Floor Assembly — Min 4-3/4 in. thick reinforced lightweight or normal weight (100-150 pcf) structural concrete. Perimeter of floor assembly to be provided with min 4 by 4 by 114 in. thick cast-in-place structural steel angle for welf-attachment of multion mounting clips (Item 2A). 2. Curtain Wall Assembly — The curtain wall assembly shall incorporate the following construction features: A. Multion Mounting Clips — Min 4 in. long angles with one nom 4 in. leg for attachment to dege of floor assembly and with one leg approx 4

in. longer than distance to nearest face of mullion. Clips welded to steel angle at edge of floor assembly (Item 1) on each side of vertical mullion (Item 2B) at each floor level. Each clip to be provided with elongated holes to accommodate designed amount of movement. Top degle of each mounting angle to be recessed min 3/4 in, below the surface of floor. B. Framing — The rectangular tubing mullions (vertical members) and transoms (horizontal members) shall be min 2-1/2 in, wide by 5 in.

deep and shall be formed from min 0.100 in. thick aluminum. Mullions spaced max 60 in. OC and secured to mullion mounting clips (Iter 22) at each floor level with two 12 in. diam by 4 in. long has head steel bolts in conjunction with steel must and washers. Interior face of mullions to be max 8 in. from edge of floor assembly. Transoms framing top and bottom edges of spandrel panels (Item 2C) to be spaced min 72 in. OC. Transom forming sill of vision panel (Item 2D) to be located such that its bottom surface is at height of 33 in. above the top surface of the floor (Item 1).

C. Spandrel Panels - Nom ¼ in, thick opaque heat-strengthened glass, nom 1/8 in, thick aluminum panels with 1/4 in, thick edges or nom 1-3/16 in. thick polished granite spandrel panels with 1 in. thick gauged edges. Each panel secured in position with aluminum pressure plates in conjunction with gaskets and steel screws.
D. Vision Panels — Nom 1/4 in. thick transparent heat-strengthened glass. Each panel secured in position with aluminum pressure plates in conjunction with gaskets and steel screws.

2. Notify the data with glazing gaskes and spectra field experience glazie. Each pairs decrea in position with glazing gaskes and spectra parts of the data with glazing gaskes and spectra parts of the data with glazing gaskes and spectra parts of the data with glazing gaskes and spectra parts of the data with glazing gaskes and spectra parts of the data with glazing gaskes and spectra parts of the data with glazing gaskes and spectra parts of the data with glazing gaskes and spectra parts of the data with glazing gaskes and spectra parts of the data with glazing gaskes and spectra parts of the data with glazing gaskes and spectra parts of the data with glazing gaskes and the data w E. Spandrel Panel Per along sides notice and top of each spandrel panel with No. 10 by 172 in. long self-drilling, self-apping steel sectors spaced max 12 in. OC. Angle along bottom of each spandrel panel to be screw-attached to leg of angle on mullion at each end without any direct attachment to transom. F. Stiff Back Channel — Nom 2-1/2 in. wide by 7/8 in. deep hat-shaped channel formed of 22 gauge galv steel to be installed to stiffen curatin wall insulation between mullions above, below and at elevation of safing joint. One stiff back channel to be located with its

centerline approx 6 in, below floor and one stiff back channel to be located with its centerline approx 6 in, above floor. A third stiff back channel is to be located near the midheight of the safing joint. A clearance of 1/4 to 1/2 in. shall be maintained between the ends of the stiff back channels and the mullions. Stiff back channel secured to mullion at each end with channel attachment clip (Item 2G) in conjunction with a No. 8 by 1/2 in. long self-drilling, self-tapping wafer head steel screw or a 3/16 in, diam steel bolt with nut and washer.

(Hun a too by Tier hold setting), earlapping wendpring wendprin attachment clips attached to mullion mounting clips to be provided with elongated holes to accommodate designed amount of movement Channel clips installed with 2-1/2 in. leg recessed from interior face of mullion to accommodate thickness of curtain wall insulation (Iter

H. Curtain Wall Insulation\* — Min 2 in. thick mineral wool board insulation, unfaced or faced on one side with aluminum foil/scrim vapor retarder, supplied in min 36 in. wide boards. Insulation boards to be installed with no vertical seams. A full-width board shall be centered at the midneight of floor and tightly fitted between vertical multions, flush with interior surface of framing. The centered bard shall be secured to the stiff back channels (Item 2F) located approx 6 in. above and below the floor with cup head weld pins (Item 2J) spaced max 10 in. OC along each channel. The remainder of the spandrel panel framing above and below the centered full-width board shall be filled in with additional lengths of board cut to fit tightly between mullions and with the horizontal seams between boards sections tightly butted. The additional regions of our out to the diffusion of the second of the second seco ROXUL INC - CurtainRock 80





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- Refer to section 07840 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification
- Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
- \* Minimum and maximum Width of Joints
- \* Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- References
- \* 2013 Underwriter's Laboratories Fire Resistance Directory, Volume 2
- \* 2013 Directory of Listed Materials and Assemblies, Omega Point Laboratories
- \* All governing local and regional building codes

<notes (delete="" after="" and="" block="" designer="" information)="" note="" reading="" replace="" this="" title="" to="" with=""></notes>	1. Any modification to these details could result in an application/system not meeting	the UL or Intertek Classification or the intended temperature or fire ratings.	2. Details shown are up to date as of February 2015.	3. For additional information on the details, refer to the most current systems found on	the Underwriter's Laboratories or Intertek websites	4. Coordinate fabrication and construction details with curtain wall supplier.
			D: IS: ER			
<u>s</u> +			UME	5.5		-



# System No. CW-D-2026 (Cont.)

rwriters Laboratorie to ASTM E2307

I. Framing Covers - Curtain Wall Insulation\* — Min 8 in. wide strips cut from the same min 2 in. thick mineral wool batt insulation used for the curtain wall insulation (Item 2H). Framing covers to be centered over mullions, and secured to the spandrel panel perimeter angles (left 2E) with source of the s same manner as on the vertical mullions. Framing covers on mullions to abut the mineral wool batt safing material (Item 3A) above and below floor

ROCKWOOL MALAYSIA SDN BHD - CurtainRock 80

ROXUL INC — CurtainRock 80 J. Weld Pin — No. 12 gauge galv steel weld pin with nom 1-3/16 in. diam galv steel cup head. Cup head weld pins provided in two lengths. One length to be equal to thickness of curtain wall insulation (the 2H) and second length to be equal to thickness of curtain wall insulation plus thickness of framing cover (them 2I). Cup head weld pins inserted through curtain wall insulation and multion covers and welded to spandrel panel perimeter angles at max OC spacings referenced in Items 2H and 2I.

Safing System — Max separation between edge of floor assembly and face of framing member at time of installation is 8 in. The safing system is designed to accommodate vertical shear up to 5% of its installed width. - The safing system shall incorporate the following

A. Forming Material\* - Nom 4 in. thick, mineral wool batt safing material to be installed in continuous pieces between mullion clips. Safing material to be cut to a min 4-1/2 in. width and stacked to a thickness which is at least 25 percent greater than the width of the linear gap between the curtain wall and the deg of the concrete floor slab. The safing material is compressed and inserted out-edge-first into the linear gap such that its top surface is recessed from the top-surfaces of the floor assembly to accommodate the required thickness of fill material and such that it is friction-fit between multion mounting angles. Additional pieces of safing material to be friction-fit into space between mullion mounting clips at each mullion location with top edges of mullion clips covered with a min 1/4 in. thickness of ressed safing materia

ROCKWOOL MALAYSIA SDN BHD - SAFE

XUL INC - SAFE B. Fill, Void or Cavity Material\* — Min 1/4 in. thickness of fill material applied over top of forming material, flush with the top surface of the

floor assembly

ILUI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 604 Self-Leveling Firestop Sealant HLTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 604 Self-Leveling Firestop Sealant B1. Fill, Void or Cavity Material" — As an alternate to Item 3B, min 1/8 in. thickness of fill material applied over top of forming material flush

with the top surface of the concrete floor and lapping onto the concrete spandrel panel or tilt-up panel. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CFS-S SIL SL Sealant

Bearing the UL Classification Marl



Hilti Firestop Systems



F Rating — 2 Hr T Rating - 1/4 Hr Integrity Rating - 2 Hr Insulation Rating — 1/4 Hr Linear Opening Width — 8 In. Max Class II Movement Capabilities - 5% Vertical Shear (See Item 3)

System No. CW-D-2027





 Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) structural concrete. Perimeter of floor assembly to be provided with min 4 by 4 by 1/4 in. thick cast-in-place structural steel angle for weld-attachment of mullion mounting clips (Item 2A).

2. Curtain Wall Assembly - The curtain wall assembly shall incorporate the following construction features

A. Multion Mounting Clips — Min 4 in. (102 mm) long angles with one ner 4 in. (102 mm) leg for attachment to edge of floor assembly and with one leg approx 4 in. (102 mm) longer than distance to nearest face of multion. Clips welded to steel angle at edge of floor assembly (Item 1) on each side of vertical mullion (Item 2B) at each floor level. Each clip to be provided with elongated holes to accommodate

(term f) of calculated or related means (term to ) at calculated relation (term b) of port of port of port of term consistency in the originated means (term to be precessed min 3/4 in. (19 mm) below top surface of floor.
B. Framing — The rectangular tubing multions (vertical members) and transoms (horizontal members) shall be min 2-1/2 in. (64 mm) wide by 5 in. (127 mm) deep and shall be formed from min 0.100 in. (2.5 mm) thick aluminum. Multions spaced max 60 in. (1524 mm) OC and secured to multion mounting clips (Item 2A) at each floor level with two 1/2 in, (13 mm) diam by 4 in, (102 mm) long hex head steel bolts in conjunction with steel nuts and washers. Interior face of multiparts to be max 8 in (203 mm) form edge of floor assembly. Transcons framing top and bottom edges of spandrel panels (Item 2C) to be spaced min 72 in. (1829 mm) OC. Transcon forming sill of vision panel (Item 2D) to be located such that its bottom surface is at height of 33 in. (338 mm) above the top surface of the floor (Item 1). C. Spandrel Panels - Nom 1/4 in. (6 mm) thick opaque heat-strengthened glass, nom 1/8 in. (3.2 mm) thick aluminum panels with 1/4 in.

C. Spatial er alles — Nom 14 in (0 min) take opdage reast sering else upgass, han the in (2 min) take administration parties with 14 min. (6 mm) thick dages or non 1-316 in (30 mm) thick polished granite spander panels with 1 in (25 mm) thick gauged edges. Each panel secured in position with aluminum pressure plates in conjunction with gaskets and steel screws.
D. Vision Panels — Nom 1/4 in. (6 mm) thick transparent heat-strengthened glass. Each panel secured in position with aluminum pressure plates in conjunction with glazing gaskets and steel screws.

E. Spandrel Panel Perimeter Angles — Nom 1-1/2 by 1-1/2 in. (38 by 38 mm) No. 22 gauge galvanized steel angles installed around entire perimeter of each spandrel panel. Angles recessed from interior face of framing as necessary to accommodate thickness of curtain wall insulation (Item 2H). Angles notched as necessary to be continuous over mullion mounting clips (Item 2A). Angles screw-attached to mullions and transom along sides and top of each spandrel panel with No. 10 by 1/2 in. (13 mm) long self-drilling, self-tapping steel screws spaced max 12 in. (305 mm) OC. Angle along bottom of each spandrel panel to be screw-attached to leg of angle on mullion at each end without any direct attachment to transon



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### System No. CW-D-2027 (Cont.)



F. Stiff Back Channel — Nom 2-1/2 in. (64 mm) wide by 7/8 in. (22 mm) deep hat-shaped channel formed of 22 gauge galv steel to be installed to stiffen curtain wall insulation between mullions above, below and at elevation of safing joint. One stiff back channel to be located with its centerline approx 6 in, below floor and one stiff back channel to be located with its centerline approx 6 in, above floor. A Indicate with the channels applied with behavior and one sain back channels to be located with its channel applied with address of the stiff back channels is to be located near the midplicit of the staff back channels scured to mullion at each end with channel attachment clip (Item 2G) in conjunction with a No. 8 by 1/2 in. (13 mm) long self-drilling, self-tapping wafer head steel screw or a 3/16 in. diam steel bolt with nut and washer

Consumed tacknement Citys = Nom 1-1/2 by 2-1/2 by 1-1/2 in. (38 by 64 by 38 mm) long angle formed of 16 gauge galv steel. The 2-1/2 in. (64 mm) leg is provided with a 1/4 in. (6 mm) wide by 1-1/2 in. (38 mm) long slot along its centerline for attachment of the stiff back channel. Clips secured to multions mounting clips (Item 2A) and multions, through perimeter angles, with two No. 10 by 1/2 in. (13 mm) long self-drilling, self-tapping steel screws. Channel attachment clips attached to mullion mounting clips to be provided with elongated bills of uning, ser apping the around of movement. Channel cips installed with 2-1/2 in. (64 mm) leg received with ourgene of multiple of the provided with a service of multiple of the provided of the service of multiple of the provided of the service of the

vapor retarder, supplied in min 36 in, (914 mm) wide boards, Insulation boards to be installed with no vertical seams, A full-width board shall be centered at the midheight of floor and tightly fitted between vertical mullions, flush with interior surface of framing. The centered board shall be secured to the stiff back channels (Item 2F) located approx 6 in. (152 mm) above and below the floor with cup head weld pins (Item 2J) spaced max 10 in. (254 mm) OC along each channel. The remainder of the spandrel panel framing above and below the centered full-width board shall be filled in with additional lengths of board cut to fit tightly between mullions and with the horizontal seams between boards sections tightly butted. The boards shall be secured to the spandrel panel perimeter angles with cup head weld pins at ach corner of each board and spaced max 10 in. (254 mm) OC. When faced boards are used, butted seams to be covered with min 4 in.

(102 mm) wide aluminum foil tape. ROCKWOOL MALAYSIA SDN BHD — CurtainRock 80

ROXUL INC - CurtainRock 80

Framing Covers - Curtain Wall Insulation\* — Min 8 in. (203 mm) wide strips cut from the same min 2 in. (51 mm) thick mineral wool batt insulation used for the curtain wall insulation (Item 2H). Framing covers to be centered over mullions, and secured to the spandrel panel perimeter angles (Item 2E) with cup head weld pins (Item 2J) spaced max 12 in. (305 mm) OC. Where more than one spandrel panel occurs between vertically separated vision panels, the horizontal transom between spandrel panels shall also be covered with an 8 in. (203 mm) wide framing cover in the same manner as on the vertical multions. Framing covers on multions to abut the mineral wool batt safing material (Item 3A) above and below floor

- ROCKWOOL MALAYSIA SDN BHD CurtainRock 80
- ROXUL INC CurtainRock 80

J. Weld Pin — No. 12 gauge galv steel weld pin with nom 1-3/16 in. (30 mm) diam galv steel cup head. Cup head weld pins provided in two lengths. One length to be equal to thickness of curtain wall insulation (Item 2H) and second length to be equal to thickness of curtain wall insulation plus thickness of framing cover (Item 2I). Cup head weld pins inserted through curtain wall insulation and mullion covers and

welded to spandrel panel perimeter angles at max OC spangre greenced in Items 2H and 2I. 3. Safing System — Max separation between edge of floor assembly and face of framing member at time of installation is 8 in. (203 mm). The safing system is designed to accommodate vertical shear up to 5% of its installed width. The safing system shall incorporate the following construction features

A. Forming Material" — Nom 4 in. (102 mm) thick, mineral wool batt safing material to be installed in continuous pieces between multion clips. Safing material to be cut to a min 4-1/2 in. (114 mm) width and stacked to a thickness which is at least 25 percent greater than the width of the linear gap between the curtain wall and the edge of the concrete floor slab. The safing material is compressed and inserted cut-edge-first into the linear gap such that its top surface is flush with the top-surface of the floor assembly and such that it is friction-fit between multion mounting angles. Additional piece of safing material to be friction fit into space between multion mounting angles. Additional piece of safing material to be friction fit into space between multion mounting dips at each multion could be additional piece of safing material to be friction fit into space between multion mounting dips at each multion could be additional piece of multips covered with a min 1/2 in. (13 mm) thickness of compressed safing material. ROCKWOCL MALAYSIA SDN BHD — SAFE ROXUL INC - SAFE

INCOLUME Control Co

CFS-SP WB Firestop Joint Spra

Bearing the UL Classification Marl

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# System No. WW-S-0042

ANSI/UL2079 CAN/ULC S115 ssembly Rating — 2 Hr Nominal Joint Width - 1 In FT Rating - 2 H L Rating At Ambient — Less Than 1 CFM/Lin ft Rating At 400 F — Less Than 1 CFM/Lin ft



. Wall Assembly — Min 4 in. thick reinforced lightweight or normal weight (100-150 pcf) structural concrete. Wall may also be constructed of any Transsensory — win + in: and tempored agriculture and the provided and

- 2. Joint System Max with of joint system shall consist of forming and fill materials, as follows: A. Packing Material Min 3 in. thickness of min 4 pcf mineral wool bat insulation firmly packed into joint opening as a permanent form. Packing material recessed from each surface of the wall as required to accommodate the required thickness of fill material. B. Fill, Void or Cavity Material Sealant Min 1/2 in. thickness of fill material applied within the joint on exterior of wall, flush with wall
- DOW CORNING CORP 790 Sealant, 795 Sealant
- MOMENTIVE PERFORMANCE MATERIALS Pensil 300 Sealant
- PECORA CORP Dynatrol II Caulk, 864 Silicone Caulk
- C. Fill, Void or Cavity Material\* Sealant Min 1/2 in thickness of fill material applied within the joint on interior of wall, flush with wall

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC - CP601S Elastomeric Firestop Sealant, CP606 Flexible Firestop Sealant or CFS-S SIL GG Sealan

ring the UL Classification Mark



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Design No. HI/BPF 120-10 PERIMETER FIRE BARRIERS

Firestop Joint Spray CFS-SP WB ASTM E 2307 Table 1.

CONCRETE FLOOR ASSEMBLY: 2 hour rated concrete floor assembly made from either fightweight or normal weight concrete with a der 00 to 150 pcf, having a min. thickness of 6 in. at the joint face. When a longitudinal recess (blockout) is required to contain an architectura system, increase concrete floor assembly thickness to mainiain a min. thickness of 6 in. and accommodate depth of blockout formed in the

The interview of the second se rding to the curtain wall manufactur structions. Connect the mounting attachments to the joint face of the concrete floor assembly (item 1) according to the curtain wall

manufacture's instructions. Auminum Framing: Use holow rectangular aluminum extrusted tubing with min. overall dimensions of 0.100 in. thick, 4 in. high and 2-1/21 wide. Locate multions (vertical aluminum framing) min. 60 in. oc. Locate the transom (horizontal aluminum framing) such that the bottom

were. Uoder innuns (verticar annuns) mit mit gimit to Orico de Locader ere random (voluciora annuns) manna) soci na re ou surface of the transon is at the same height as the log surface of the foor assembly. Gass Panels: Stade and instaliad into auminum fisming (tem 22) in accordance with the curtain wall manufacture's instructions. L H in Inchic case, that strengthemed (HS) or therepred gass with an away with and height less than the autinum faming (tem 22) spacing. Or spacing shall allow gass to be socured to the autinum finaming (tem 22) between the notched shoulders. Socier gass with a firmed height (Laber entration), researce be (autinum extration), mit H - 20 (S for l. hop screers, and a saip for a galino Anchor Brackets (Not shown): Use min. 1/2 in. thick aluminum anchor brackets to serve as part of the mounting attachment

extraion). D. Auminian Advances (Not shown): Use min. 112 in. thick aluminium anchor brackets to serve as part of the mounting attachment (Item 22) rigits ascured to the aluminum framing (Item 23) and the concrete floor assembly (Item 1). No. 10 and duting shown that assess a set of the mounting attachment (Item 22) rigits ascured to the aluminum framing (Item 23) and the concrete floor assembly (Item 1). Co. 11 and rigits and the concrete floor assembly (Item 1). Co. 11 and rigits and the concrete floor assembly (Item 1). Co. 12 and rigits and the concrete floor assembly (Item 1). Co. 12 and rigits and the concrete floor assembly (Item 1). To its select concrete advances, their 21 and co. 11 and rigits and the concrete site of the Min (Itel Car S LS LG co words the the attribute (Itel Car S LS LG co words the the attribute (Itel Car S LS LG co words the concrete site of the the lauminum framing care cotain min 3. In thick min 6 in tail. Itel Care S LS Co words the the control (Itel Care S LS LG concrete site of the their lauminum members of the cotain wall assembly. Contracts a bloor their lauminum members of the cotain wall assembly. Counters of the cotain wall assembly. The compress at lass 116 in and affectors. Use only interest contract with the estimation in the concrete floor basing and intertion control concretes and the interaidance interpret interaition of the compression the lauminum mounter words that installation. Incorporase the flooring construction of parameters in the time word with installation in compression the lauminum contracts 25% into bottom of parameters and there assembly (Item 1) and cotain wall assembly (Item 1). Controls the core shore concrete floor assembly (Item 1) and cotain wall assembly (Item 1

the above min. requirements. Locate the top surface of the packing material flush with the top surface of the concrete floor assembly (Iter B. CERTIETE DANAFOLTIRER: HIE Corporation CERTIFIED PRODUCT: Frestop Joint Sary CFS-SP WB or Silocen Joint Spray CFS-SP SIL FII (void cr Carly Material: Apply over the packing material fluem A) as discussed below. Apply at the thickness specified in Table 1 and overlap the material 12 in: not the adjacent crutin wall assembly and concrete floor slab sessmbly. When the spraying process is stopped and the application flue data stopped and stopped flue data stopped and the application is restarted, overlag the dage of the cured material at least 18 in. with the spray. Reference Product Section of the Interlek Directory for more details on the Lis ornight.







F Rating - 2 H

CFM/Lin f





- . Refer to section 07840 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification
- 2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
- \* Minimum and maximum Width of Joints
- \* Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
- References:
- \* 2013 Underwriter's Laboratories Fire Resistance Directory, Volume 2
- \* 2013 Directory of Listed Materials and Assemblies, Omega Point Laboratories
- \* All governing local and regional building codes

<ul> <li><notes (delete="" after="" and="" block="" designer="" information)="" note="" reading="" replace="" this="" title="" to="" with=""> <ol> <li>Any modification to these details could result in an application/system not meeting the UL or Interlek Classification or the intended temperature or fire ratings.             <li>Details shown are up to date as of February 2015.</li> <li>For additional information on the details, refer to the most current systems found on the Underwrite's Laboratories or Interlek websites</li> <li>Concrimine fabricition and construction details, refer to the most current systems found on the Underwrite's Laboratorics or Interlek websites</li> </li></ol> </notes></li> </ul>						
JOB NUMBER: DRAWN: CHECKED: ISSUE DATE: REVISIONS:						
TYPICAL FIRESTOP PERIMETER JOINT DETAILS <u>SHEET NAME:</u> SHEET NUMBER: CW.6.6	TYPICAL FIRESTOP PERIMETER JOINT DETAILS SHEET NAME: SHEET NUMBER:					