

# XHBN.HW-D-0740 - Joint Systems

## Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Certified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered Certified.

## XHBN - Joint Systems XHBN7 - Joint Systems Certified for Canada

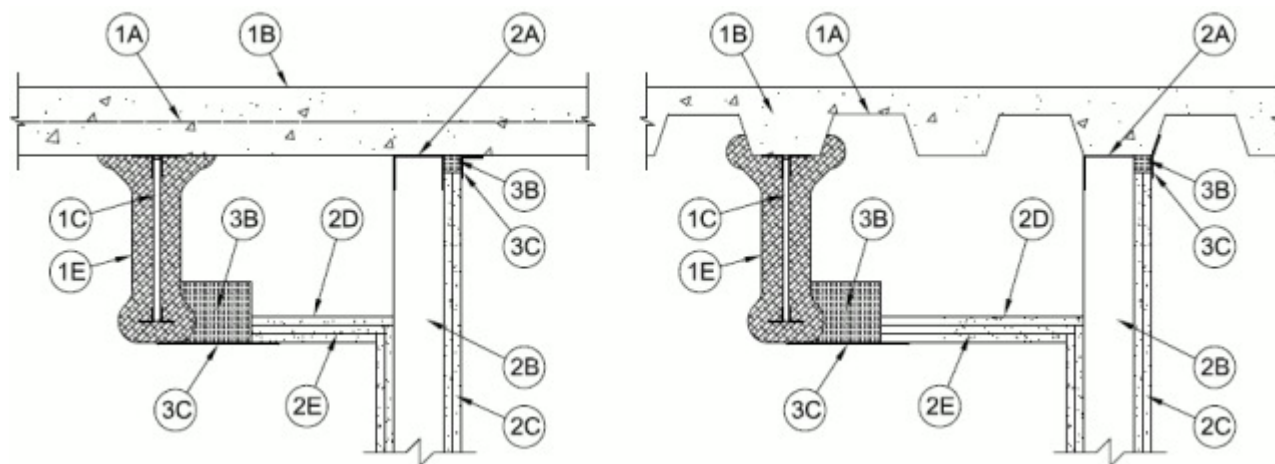
See General Information for Joint Systems

See General Information for Joint Systems Certified for Canada

### System No. HW-D-0740

September 26, 2019

ANSI/UL2079	CAN/ULC S115
Assembly Ratings — 1 and 2 Hr (See Item 2)	F Ratings — 1 and 2 Hr (See Item 2)
Nominal Joint Width - 1-1/2 In.	FT Ratings — 1 and 2 Hr (See Item 2)
Class II Movement Capabilities - 12.5% or 50% Compression or Extension (See Item 3)	FH Ratings — 1 and 2 Hr (See Item 2)
L Rating At Ambient — Less Than 1 CFM/sq ft	FTH Ratings — 1 and 2 Hr (See Item 2)
L Rating At 400 F — Less Than 1 CFM/sq ft	Nominal Joint Width - 1-1/2 In.
	Class II Movement Capabilities - 12.5% or 50% Compression or Extension (See Item 3)
	L Rating At Ambient — Less Than 1 CFM/sq ft
	L Rating At 400 F — Less Than 1 CFM/sq ft



**1. Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D700, D800, or D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the floor assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The floor assembly shall include the following construction features:

A. **Steel Floor and Floor Units\*** — Max 3 in. (76 mm) deep galv steel fluted floor units.

B. **Concrete** — Min 2-1/2 in. (64 mm) thick reinforced concrete, as measured from the top plane of the floor units.

C. **Structural Steel Support** — Steel beam or open-web steel joist, as specified in the individual D700, D800, or D900 Series Floor-Ceiling Design, used to support steel floor units. Structural steel support oriented parallel to the wall assembly. The distance from the lowest elevation of the sprayed structural steel support to the face of the steel wall studs is max 12 in. (305 mm).

D. **Steel Lath** — When structural steel support (Item 1C) consists of open-web steel joists, 3/8 in. (10 mm) diamond mesh expanded steel lath having a nom weight of 1.7 to 3.4 lb per sq yd (0.9 to 1.8 kg/m<sup>2</sup>) shall be installed to completely cover one side of each joist. The lath shall be secured with steel tie wire and shall be fully covered with spray applied fire resistive material.

E. **Spray-Applied Fire Resistive Material\*** — After installation of the ceiling runner (Item 2A) or deflection track (Item 3A, if used), steel floor units (where required by individual D700, D800, or D900 Series Design) and structural steel supports to be sprayed with the thickness of material specified in the individual D700, D800, or D900 Series Design. The flutes of the steel floor units above the structural steel supports and above the ceiling runner (Item 2A) or deflection channel (Item 3A) shall be filled with spray-applied fire resistive material. As an alternate, the spray-applied fire resistive material in the flutes above the ceiling runner may be applied to follow the contour of the steel floor units. Excess material shall be removed from the flanges of the ceiling runner or deflection track beyond the required thickness of spray-applied fire resistive material on the steel floor units. For D900 Series Designs structural steel supports, steel furring and steel lath only to be sprayed in accordance with the specifications in the individual D900 Series Design.

**ISOLATEK INTERNATIONAL** — Type 300, Type 400 or Type II

**GCP APPLIED TECHNOLOGIES INC** — Type MK-6/HY, MK-6/HYES, MK-65 and RG.

**1A. Roof Assembly** — (Not Shown) — As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P700 or P800 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:

A. **Steel Roof Deck** — Max 3 in. (76 mm) deep galv steel fluted roof deck.

**B. Roof Insulation — Mineral and Fiber Board\*** — Min 3/4 in. (19 mm) thick boards applied in one or more layers directly over steel roof deck or over gypsum board sheathing laid atop steel roof deck.

**C. Roof Covering\*** — Hot-mopped or cold-application materials compatible with mineral and fiber board insulation.

**D. Structural Steel Support** — Steel beam or open-web steel joist, as specified in the individual P700 or P800 Series Roof-Ceiling Design, used to support steel floor units. Structural steel support oriented parallel to the wall assembly. The distance from the lowest elevation of the sprayed structural steel support to the face of the steel wall studs is max 12 in. (305 mm).

**E. Steel Lath** — When structural steel support (Item 1D) consists of open-web steel joists, 3/8 in. (10 mm) diamond mesh expanded steel lath having a nom weight of 1.7 to 3.4 lb per sq yd (0.9 to 1.8 kg/m<sup>2</sup>) shall be installed to completely cover one side of each joist which is located within 6 in. (152 mm) of wall assembly. The lath shall be secured with steel tie wire and shall be fully covered with spray applied fire resistive material.

**F. Spray-Applied Fire Resistive Material\*** — After installation of the ceiling runner (Item 2A) or deflection track (Item 3A, if used), steel roof deck and structural steel supports to be sprayed with a thickness of spray applied fire resistive material as specified in the individual P700 or P800, or P900 Series Roof-Ceiling design. The flutes of the steel deck above the structural steel supports and above the ceiling runner (Item 2A) or deflection channel (Item 3A) shall be filled with spray-applied fire resistive material. As an alternate, the spray-applied fire resistive material in the flutes above the ceiling runner may be applied to follow the contour of the steel roof deck. Excess material shall be removed from the flanges of the ceiling runner or deflection track beyond the required thickness of spray-applied fire resistive material on the steel roof deck. For P900 Series Designs structural steel supports, steel furring and steel lath only to be sprayed in accordance with the specifications in the individual P900 Series Design.

**ISOLATEK INTERNATIONAL** — Type 300, Type 400 or Type II

**GCP APPLIED TECHNOLOGIES INC** Type MK-6/HY, MK-6/HYES, MK-65 and RG.

**1B. Roof Assembly** — (Not Shown) — As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P700 or P800 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:

**A. Steel Roof Deck** — Max 3 in. (76 mm) deep galv steel fluted roof deck.

**B. Roof Insulation** — Min 2-1/4 in. (57 mm) thick poured insulating concrete, as measured from the top plane of the steel roof deck.

**C. Roof Covering\*** — Hot-mopped or cold-application materials compatible with insulating concrete.

**D. Structural Steel Support** — Steel beam or open-web steel joist, as specified in the individual P700 or P800 Series Roof-Ceiling Design, used to support steel floor units. Structural steel support oriented parallel to the wall assembly. The distance from the lowest elevation of the sprayed structural steel support to the face of the steel wall studs is max 12 in. (305 mm).

**E. Steel Lath** — When structural steel support (Item 1D) consists of open-web steel joists, 3/8 in. (10 mm) diamond mesh expanded steel lath having a nom weight of 1.7 to 3.4 lb per sq yd (0.9 to 1.8 kg/m<sup>2</sup>) shall be installed to completely cover one side of each joist which is located within 6 in. (152 mm) of wall assembly. The lath shall be secured with steel tie wire and shall be fully covered with spray applied fire resistive material.

**F. Spray-Applied Fire Resistive Material\*** — After installation of the ceiling runner (Item 2A) or deflection track (Item 3A, if used), steel roof deck and structural steel supports to be sprayed with a thickness of spray applied fire resistive material as specified in the individual P700 or P800, or P900 Series Roof-Ceiling design. The flutes of the steel deck above the structural steel supports and above the ceiling runner (Item 2A) or deflection channel (Item 3A) shall be filled with spray-applied fire resistive material. As an alternate, the spray-applied fire resistive material in the flutes above the

ceiling runner may be applied to follow the contour of the steel roof deck. Excess material shall be removed from the flanges of the ceiling runner or deflection track beyond the required thickness of spray-applied fire resistive material on the steel roof deck. For P900 Series Designs structural steel supports, steel furring and steel lath only to be sprayed in accordance with the specifications in the individual P900 Series Design.

**ISOLATEK INTERNATIONAL** — Type 300, Type 400 or Type II

**GCP APPLIED TECHNOLOGIES INC** — Type MK-6/HY, MK-6/HYES, MK-65 and RG.

**2. Wall Assembly** — The 1 or 2 hr fire rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400, V400 or W400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

**A. Steel Floor and Ceiling Runners** — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs (Item 2B). Ceiling runner to be provided with min 2 in. (51 mm) flanges. When deflection channel (Item 3A) is used, flange height of ceiling runner is to be equal to or greater than flange height of deflection channel and the ceiling runner is to nest within the deflection channel with a 1/2 in. (13 mm) to 1-1/4 in. (32 mm) gap maintained between the top of the ceiling runner and the top of the deflection channel. When deflection channel is not used, flange height of ceiling runner shall be min 1/4 in. (6 mm) greater than max extended joint width and ceiling runner is secured to steel floor or roof units (Item 1, 1A or 1B) with steel fasteners or welds spaced max 24 in. (610 mm) OC. Ceiling runner or deflection track to be installed parallel or perpendicular to the steel floor or roof units (Items 1, 1A or 1B) and parallel with structural steel support.

**A1. Light Gauge Framing\* — Slotted Ceiling Runner** — As an alternate to the ceiling runner in Item 2A, ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 2B). Ceiling runner secured to valleys with steel masonry anchors, steel fasteners or welds spaced max 24 in. (610 mm) OC. When slotted ceiling runner is used, deflection channel (Item 3A) shall not be used.

**CALIFORNIA EXPANDED METAL PRODUCTS CO** — CST

**BRADY CONSTRUCTION INNOVATIONS INC, DBA SLIPTRACK SYSTEMS** — SLP-TRK

**MARINO/WARE, DIV OF WARE INDUSTRIES INC** — Type SLT

**SCAFCO STEEL STUD MANUFACTURING CO** — Slotted Track-Type SDLT

**TELLING INDUSTRIES L L C** — True-Action Deflection Track

**A2. Light Gauge Framing\*- Notched Ceiling Runner** — As an alternate to the ceiling runners in Items 2A and 2A1, notched ceiling runners to consist of C-shaped galv steel channel with notched return flanges sized to accommodate steel studs (Item 2B). Notched ceiling runner secured with steel fasteners spaced max 24 in. (610 mm) OC. When notched ceiling runner is used, deflection channel (Item 3A) shall not be used.

**OLMAR SUPPLY INC** — Type SCR

**B. Studs** — Steel studs to be min 3-1/2 in. (89 mm) wide. Studs cut 1/2 in. to 1-1/4 in. (13 to 32 mm) less in length than assembly height with bottom nesting in and secured to floor runner. When slotted ceiling runner (Item 2A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 (13 mm) long wafer head steel screws at midheight of slot on each side of wall. When deflection channel (Item 3A) is used, steel studs attached to ceiling runner (Item 2A) with sheet metal screws located 1/2 in. (13 mm) below the bottom of the deflection channel. When deflection channel is not used, studs to nest in ceiling runner without attachment.

**C. Gypsum Board\*** — Gypsum board sheets installed to a min total 5/8 in. (16 mm) or 1-1/4 in. (32 mm) thickness on each side of wall for 1 and 2 hr fire rated assemblies, respectively. Wall to be constructed as specified in the individual

U400, V400 or W400 Series Design in the UL Fire Resistance Directory except that a max 1-1/2 in. (38 mm) gap shall be maintained between the top of the gypsum board and the bottom plane of the spray applied fire resistive material on the steel deck on both sides of the wall assembly. The screws attaching the gypsum board to the studs along the top of the wall shall be located 1 in. (25 mm) below the bottom of the ceiling runner. No gypsum board attachment screws shall be driven into the ceiling runner or into the optional deflection channel. Where the top of the wall assembly is inaccessible above the lowest elevation of the structural steel support, the gypsum board attachment screws may be omitted.

**D. Z-Furring** — Min 2 x 4 x 2 in. (51 by 102 by 51 mm) to max 2 x 8 x 2 in. (51 by 203 by 51 mm) by min 20 GA steel Z-furring shelf continuous along length of joint on structural member side of wall. Located nominally 1-1/4 in. (32 mm) (1 hr fire rated assembly) or 1-7/8 in. (48 mm) (2 hr fire rated assembly) above lowest elevation of sprayed structural member. The horizontal gap between edge of Z-furring shelf and sprayed structural member at lowest elevation shall be min. 1/2 in. (13 mm) to max 6 in. (102 mm). Z-furring secured to each wall stud on structural member side of wall with one min No. 8 sheet metal screw located nom 1/2 in. (13 mm) from top of furring leg. At splices, adjoining sections of Z-furring shall overlap nom 4 in. (102 mm) and be secured at approx. center of lap with two min No. 8 sheet metal screws located max 2 in. (51 mm) from each lip of the furring shelf.

**E. Gypsum Board\*** — Gypsum board sheets of the same type and thickness as used on the wall shall be cut to size and installed to a min total 1-1/4 in. (32 mm) or 1-7/8 in. (48 mm) thickness to fully cover exposed bottom of steel furring shelf (Item D) for 1 and 2 hr fire rated assemblies, respectively. The mating edges of the gypsum board on the wall and furring shelf shall be staggered such that first layer (closest to z-furring) abuts vertical wall framing, the second layer abuts the first gypsum board layer on the wall and the third layer abuts the second gypsum board layer on the wall. Joints in the layers of gypsum board shall be staggered. The inner two layers of gypsum are secured with two rows of drywall screws located 12 in. (305 mm) on center. The outer layer of gypsum board is secured with two rows of drywall screws located 8 in. (203 mm) on center. All fasteners are staggered between layers and are of sufficient length to penetrate into the furring shelf.

**The hourly fire rating of the joint system is equal to the hourly fire rating of the wall.**

**3. Joint System** — Max vertical separation between bottom plane of steel floor unit and top of gypsum board (at time of installation of joint system) is 1-1/2 in. (38 mm). Max horizontal separation between spray applied fire resistive material on structural support member and z-furring shelf is 6 in. (152 mm). The joint system is designed to accommodate a max 12.5 or 50 percent compression or extension from its installed width as measured between the bottom plane of the spray-applied fire resistive material on the steel floor unit and the top of the gypsum board. The movement capabilities are dependent on the horizontal separation between the spray applied fire resistive material on the structural support member and the surface of the wall. The joint will accommodate max 12.5 percent compression or extension when the horizontal separation between the spray applied fire resistive material on the structural support member and the z-furring shelf is max 3 in. (76 mm). The joint will accommodate max 50 percent compression or extension when the horizontal separation between the spray applied fire resistive material on the structural support member and the z-furring shelf is greater than 3 in. (76 mm) up to a max of 6 in. (152 mm). The joint system shall consist of forming and fill materials, with or without a deflection channel (Item 3A), as follows:

**A. Deflection Channel** — (Optional, Not Shown) — Max 2 in. (51 mm) deep min 24 gauge galv steel channel sized to accommodate ceiling runner (Item 2A). Deflection channel to be installed parallel with structural steel support and located such that a max clearance of 4 in. (102 mm) is present between the finished wall and the spray-applied fire resistive material at the lowest elevation of the structural steel support. Deflection channel secured to steel floor units with steel fasteners or welds spaced max 24 in. (610 mm) OC. The ceiling runner (Item 2A) is installed within the deflection channel to maintain a 1/2 in. to 1-1/4 in. (13 to 32 mm) gap between the top of the ceiling runner and the top of the deflection channel. The ceiling runner nests inside the deflection channel without attachment.

**B. Forming Material\*** — Nom 4 pcf (64 kg/m<sup>3</sup>) density mineral wool batt insulation. Sections of mineral wool batt cut to a width of 4 in. (102 mm) and stacked to attain a thickness which is 50 percent greater than the width of the linear gap between the spray applied fire resistive material on the structural steel member and the z-furring shelf. Stacked sections of mineral wool compressed 33 percent in thickness and installed cut edge first into linear gap until the bottom edge is flush with the bottom surface of the joint. When the spray-applied fire resistive material in the flutes above the wall follows the contour of the steel deck, sections of mineral wool batt cut to the shape of the fluted deck and stacked to a min 6 in. (152 mm) thickness shall be installed in the flutes of the steel floor or roof deck between the top of the deflection channel and the spray-applied fire resistive material. The mineral wool batt insulation is to be installed flush with the gypsum board surface on the side of the wall opposite the structural steel support. Additional

sections of mineral wool batt insulation are compressed 50 percent in thickness and are installed cut edge first to completely fill the gap above the top of the gypsum board.

**INDUSTRIAL INSULATION GROUP L L C** — MinWool-1200 Safing

**JOHNS MANVILLE** — Safing

**ROCK WOOL MANUFACTURING CO** — Delta Board

**ROCKWOOL MALAYSIA SDN BHD** — SAFE

**ROCKWOOL** — SAFE

**THERMAFIBER INC** — Type SAF

**C. Fill, Void or Cavity Material\* — Sealant** — Min 1/8 in. (3.2 mm) wet thickness (min 1/16 in. or 1.6 mm dry thickness) of fill material spray applied over the forming material on each side of the wall. Fill material to overlap a min of 1/2 in. (13 mm) onto the gypsum board and a min 2 in. (51 mm) onto the spray applied material (Item 1E, 1AF or 1BF) on the steel floor or roof unit or on the structural steel support member on each side of the wall. Overlap onto the steel floor or roof units may be decreased to 1/2 in. (13 mm) when spray applied material is omitted.

**SPECIFIED TECHNOLOGIES INC** — SpecSeal AS200 Elastomeric Spray

**\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

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