

BXUV.P826

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.

BXUV - Fire Resistance Ratings - ANSI/UL 263 Certified for United States

BXUV7 - Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada

[See General Information for Fire-resistance Ratings - ANSI/UL 263 Certified for United States Design Criteria and Allowable Variances](#)

[See General Information for Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada Design Criteria and Allowable Variances](#)

Design No. P826

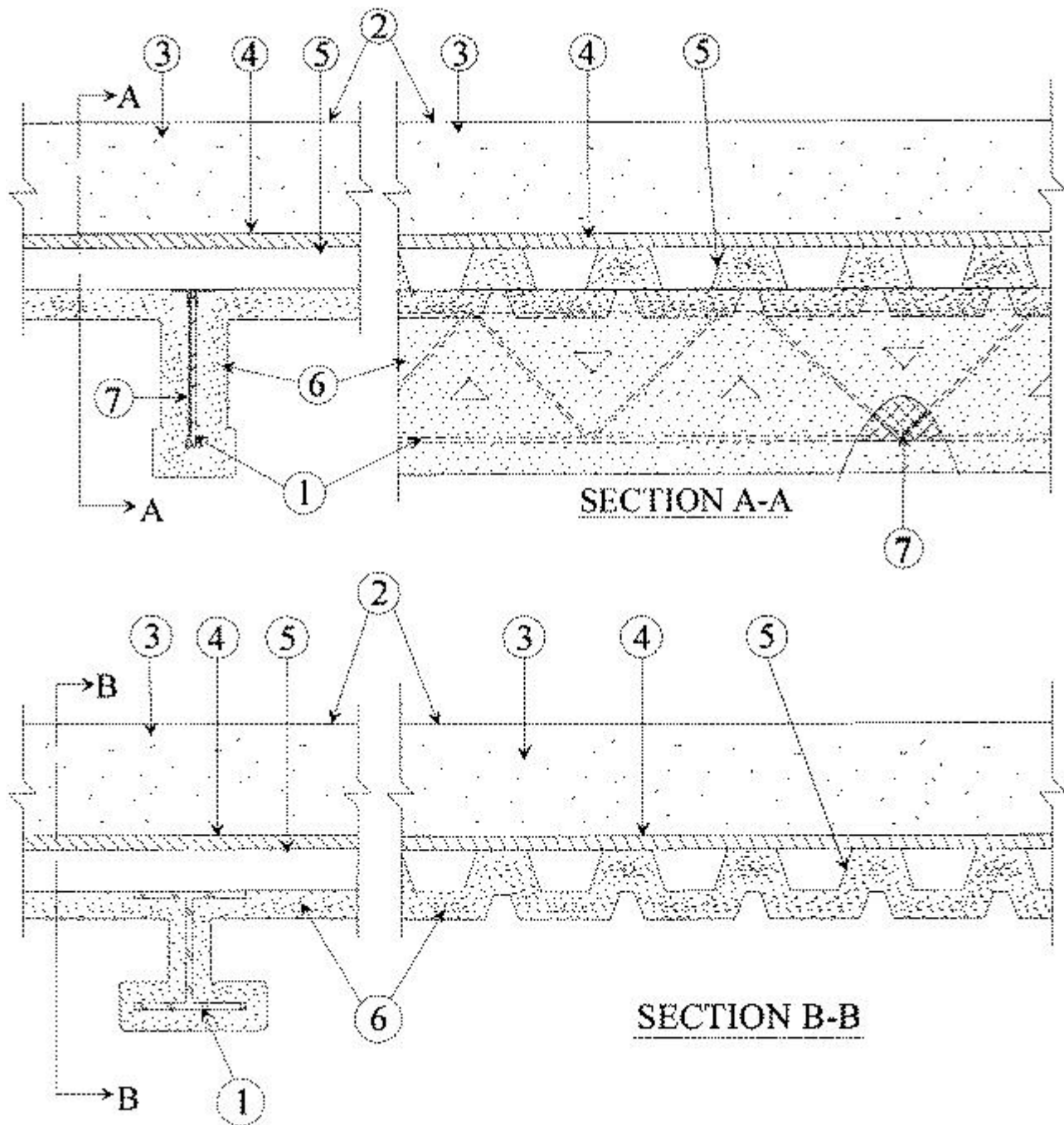
Restrained Assembly Rating — 1, 1-1/2, 2, or 3 Hr (See Item 3A)

Unrestrained Assembly Rating — 1, 1-1/2, 2, or 3 Hr (See Item 3A)

Unrestrained Beam Rating — 1, 1-1/2, 2, or 3 Hr

This design was evaluated using a load design method other than the Limit States Design Method (e.g., Working Stress Design Method). For jurisdictions employing the Limit States Design Method, such as Canada, a load restriction factor shall be used — See Guide [BXUV](#) or [BXUV7](#)

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



1. **Steel Supports** — W6x16 steel beam (min size) or 10K1 steel joist, (min size) having the following properties: Top chords consisting of two 1-1/4 by 1-1/4 by 0.135 in. thick steel angles; Lower chord consisting of two 1 by 1 by 0.113 in. thick steel angles; Bearing plates consisting of two 1-1/4 by 1-1/4 by 0.134 in. thick steel angles, 8 in. in length; Diagonal web members consisting of 0.561 in. diam steel rods.

1A. **Bridging** — (Not shown) — Min 1-1/4 by 1-1/4 by 1/8 in. thick steel angles welded to top and bottom chords of each joist. Number and spacing of bridging angles per Steel Joist Institute specification. Bridging coated with the same thickness of Spray-Applied Fire Resistive Materials as the joist(s)-See Item 6.

2. **Roof Covering*** — Consists of hot mopped or cold application, fluid applied roof coating materials compatible with insulation(s) described herein which provide Class A, B or C coverings. See Roofing Materials and Systems Directory-Roof Covering Materials (TEVT).

3. **Roof Insulation — Foamed Plastic*** — Polyurethane foamed plastic roof insulation. Formed by the simultaneous spraying of two liquid components applied over the gypsum wallboard at a nom thickness of 1 to 5 in. in accordance with the manufacturer's instructions, unless stated otherwise below.

CARLISLE ROOF FOAM AND COATINGS — Types SW-200, PSI-S245-25/30, "Bayseal 2.5," "Bayseal 2.7," "Premiseal 281," "Bayseal 3.0," or "Premiseal 301" may be applied at a nom thickness of 1 to 5 in. UCSC "Durazone SFC II," "Bayseal 2.4," or "Bayseal 2.7P" may be applied at a nom thickness of 1 to 10 in.

BASF CORP — Types FE348-2.5, FE348-2.8, FE348-3.0, ELASTOSPRAY 81255, ELASTOSPRAY 81285, ELASTOSPRAY 81305, SKYTITE C1

BASF CORP — Elastospray 5100-2.0, Elastospray 5100-2.5, Elastospray 81302, Elastospray 81272, Elastospray Alpha System, Elastospray 81252.

HENRY COMPANY L L C — Types RT-2031, RT-2035.

NCFI POLYURETHANES — Types 591, 692, 10-001.

SWD URETHANE CO — Type 525b.

3A. As an alternate to Item 3 — (Not Shown) — Foamed Plastic* — 36 by 48 in. (min size) polyisocyanurate foamed plastic insulation boards applied in one or more layers. Min thickness of 1 in. with a max thickness of 5 in. Boards to be installed with end joints staggered a min of 6 in. in adjacent rows. When applied in more than one layer, each layer to be offset in both directions from the layer below a min of 6 in. in order to lap all joints.

JOHNS MANVILLE — ENRGY 3 25 psi, ENRGY 3, Tapered ENRGY 3, Tapered ENRGY 3 25 psi, ENRGY 3 AGF, Tapered ENRGY 3 AGF, ENRGY 3 25 psi AGF, Tapered ENRGY 3 25 psi AGF, ENRGY 3 CGF, Tapered ENRGY 3 CGF, ENRGY 3 25 psi CGF, Tapered ENRGY 3 25 psi CGF, ISO-3, Tapered ISO-3, ValuTherm, Tapered ValuTherm, ValuTherm 25 psi, Tapered ValuTherm 25 psi, ValuTherm AGF, Tapered ValuTherm AGF, ValuTherm 25 psi AGF, Tapered ValuTherm 25 psi AGF, ValuTherm CGF, Tapered ValuTherm CGF, ValuTherm 25 psi CGF, Tapered ValuTherm 25 psi CGF.

3B. Building Units* — Not Shown — As an alternate to Items 3 and 3A, composite polyisocyanurate foamed plastic insulation board with an adhered nailing surface, nom 48 by 48 or 96 in. may be used with the following limitations. These composite building units have ventilation slots internal to the panels. The thickness of the panel depends upon the thinnest portion of the polyisocyanurate insulation. The following dimensions apply to the polyisocyanurate insulation, min 1 in. thick with a max thickness of 5 in.

GAF — Type INSUL-AIR.

JOHNS MANVILLE — Type ISO-VENT.

3C. Roof Insulation — Foamed Plastic* — Polyurethane foamed plastic roof insulation. Formed by the simultaneous spraying of two liquid components applied over the gypsum wallboard at a nom thickness of 1 to 5 in. in accordance with the manufacturer's instructions. The Rating is only applicable to Restrained and Unrestrained Assembly Ratings of 2 Hr. when 2-1/2" of Spray-Applied Fire Resistive Materials are applied to the deck (Item 6).

LAPOLLA INDUSTRIES INC — Types LPA2500H, LPA2800H, LPA3000H, LPA2500, LPA2800, LPA3000.

4. Gypsum Board* — Any 5/8 in. thick UL Classified Gypsum Board that is eligible for use in Design Nos. L501, G512 or U305.

Nom. 5/8 in. thick, supplied in 4 ft wide sheets. Min weight 2.2 psf. Installed perpendicular to steel roof deck with all joints tightly butted and end joint staggered and offset from steel roof deck side lap lints.

CABOT MANUFACTURING ULC ([View Classification](#)). — CKNX.R25370

AMERICAN GYPSUM CO ([View Classification](#)). — CKNX.R14196

BEIJING NEW BUILDING MATERIALS PUBLIC LTD CO ([View Classification](#)). — CKNX.R19374

CERTAINTED GYPSUM INC ([View Classification](#)). — CKNX.R3660

CGC INC ([View Classification](#)). — CKNX.R19751

CERTAINTED GYPSUM INC ([View Classification](#)). — CKNX.R18482

GEORGIA-PACIFIC GYPSUM L L C ([View Classification](#)) — CKNX.R2717

LOADMASTER SYSTEMS INC ([View Classification](#)) — CKNX.R11809

NATIONAL GYPSUM CO ([View Classification](#)) — CKNX.R3501

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM ([View Classification](#)) — CKNX.R7094

PANEL REY S A ([View Classification](#)) — CKNX.R21796

SIAM GYPSUM INDUSTRY (SARABURI) CO LTD ([View Classification](#)) — CKNX.R19262

THAI GYPSUM PRODUCTS PCL ([View Classification](#)) — CKNX.R27517

UNITED STATES GYPSUM CO ([View Classification](#)) — CKNX.R1319

USG BORAL DRYWALL SFZ LLC ([View Classification](#)) — CKNX.R38438

USG MEXICO S A DE C V ([View Classification](#)) — CKNX.R16089

5. **Steel Roof Deck — Unclassified** — Min 36 in. wide, 1-1/2 in. deep, galv fluted steel deck. Min gauge is 22 MSG. Flutes approx 6 in. OC, crests approx 3-1/2 in. wide, valleys approx 1-1/2 in. wide. Welded to supports 12 in. OC. Adjacent units welded 18 in. OC along side lap joints or mechanically fastened with Type S-10 1/2 in. long steel screws 18 in. OC. **Classified Steel Floor and Form Units*** — Noncomposite, 1-1/2 in. deep, galv units, min gauge is 22 MSG. Welded to supports with welding washers 12 in. OC. Side lap joints of adjacent units welded or secured together with No. 12 by 1/2 in. Self-drilling, Self-tapping steel screws midway between steel joists.

CANAM GROUP INC — Types P-3606 or P-3615; 36 in. wide Types 1.5B, 1.5BI

CANAM STEEL CORP — Types P-3606 or P-3615.

6. **Spray-Applied Fire Resistive Materials*** — Applied by mixing with water and spraying in more than one coat to a final thickness as shown above and on the table below, to steel surfaces which must be clean and free of dirt, loose scale and oil. Min average and min individual density of 15/14 pcf, respectively for Type DC/F, II, or II HS. Min average and min individual densities of 22 and 19 pcf, respectively for Type HP. For method of density determination, refer to Design Information Section.

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Mtl Thkns In.		
			on Deck	on Joist	on Beam
1	1	1	1-1/2	1-5/16	3/4
1-1/2	1-1/2	1-1/2	1-11/16	2	7/8
2	2	2	2-1/2	2-7/16	1-1/8
3	2*	3	2-1/2	3-1/4	1-1/2

ISOLATEK INTERNATIONAL — Type DC/F, HP, II, or II HS, Type EBS or Type X adhesive/sealer optional.

6A. **Spray-Applied Fire Resistive Materials*** — (Not Shown — As an alternate to Item 6) Applied by mixing with water and spraying in one or more coats to the thickness shown below, to steel surfaces which are clean and free of dirt, loose scale and oil. Min average and min individual density of 15 and 14 pcf, respectively, for Types 300, 300AC, 300ES, 300HS, 300N, 3000, 3000ES and SB. For Types

400AC and 400ES min average and min individual density of 22 and 19 pcf, respectively. For method of density determination, see Design Information Section, Sprayed Material. Spray-Applied Fire Resistive Materials on steel deck shall cover screw tips by minimum 1/2 in. The min thickness of Spray-Applied Fire Resistive Materials required for various fire resistance ratings are shown in the table below:

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Min Insulation Thkns In.	Mtl Thkns In.		
				on Deck	on Joist	on Beam
1	1	1	1	1/2	1	7/16
1-1/2	1-1/2	1-1/2	1	3/4	1-3/16	9/16
2	2	2	1	1-1/16	1-3/16	13/16
2	2	2	2	15/16	1-3/16	13/16
3	2*	3	3	2-1/2	1-5/8	1-1/4

BERLIN CO LTD — Types 300, 300ES, 300N or SB.

GREENTECH ASIA PACIFIC SDN BDH — Type 300, 300ES, or 300HS.

GREENTECH THERMAL INSULATION PRODUCTS MFG CO L L C — Types 300, 300AC, or 400AC.

ISOLATEK INTERNATIONAL — Types 300, 300AC, 300ES, 300HS, 300N, SB, 400AC, 400ES, 3000 or 3000ES.

NEWKEM PRODUCTS CORP — Types 300, 300ES, 300N or SB.

6B. **Spray-Applied Fire Resistive Materials*** — (Not Shown — As an alternate to Item 6 and 6A) Applied by mixing with water and spraying in one or more coats to the thickness shown below, to steel surfaces which are clean and free of dirt, loose scale and oil. Min average and min individual density of 17.5 and 16 pcf, respectively for Type 300TW. Min average and min individual density of 22 and 19 pcf, respectively for Type 400. For method of density determination, see Design Information Section, Sprayed Material. Spray-Applied Fire Resistive Materials on steel deck shall cover screw tips by minimum 1/2 in. The min thickness of Spray-Applied Fire Resistive Materials required for various fire resistance ratings are shown in the table below:

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Min Insulation Thkns In.	Mtl Thkns In.		
				on Deck	on Joist	on Beam
1	1	1	1	1/2	1	7/16
1-1/2	1-1/2	1-1/2	1	3/4	1-3/16	9/16
2	2	2	1	1-1/16	1-3/16	13/16
2	2	2	2	15/16	1-3/16	13/16
3	2*	3	3	2-1/2	1-5/8	1-1/4

GREENTECH ASIA PACIFIC SDN BDH — Type 400.

GREENTECH THERMAL INSULATION PRODUCTS MFG CO L L C — Type 400.

ISOLATEK INTERNATIONAL — Types 300TW or 400.

NEWKEM PRODUCTS CORP — Type 400.

6C. **Spray-Applied Fire Resistive Materials*** — (Not Shown — As an alternate to Items 6, 6A and 6B). Applied by mixing with water according to instructions on each bag of material. Mixture can be spray or trowel applied in one or more coats. The steel surfaces must be clean and free of dirt, loose scale, and oil. Min avg density of 44 pcf with min ind value of 40 pcf for Type M-II. Min avg density of 44 pcf with min ind value of 42 pcf for Type TG. For method of density determination, refer to Design Information Section, Sprayed Material.

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Mtl Thkns In.		
			on Deck +	on Joist	on Beam
1	1	1	1-1/2	1-5/16	13/16
1-1/2	1-1/2	1-1/2	1-11/16	2	7/8
2	2	2	2-1/2	2-7/16	1-1/8
3	2*	3	2-1/2	3-1/4	1-1/2

+ - Requires the use of metal lath, Item 5A.

GREENTECH ASIA PACIFIC SDN BDH — Type M-II, investigated for exterior use.

GREENTECH THERMAL INSULATION PRODUCTS MFG CO L L C — Types M-II or TG. Types M-II and TG Investigated for exterior use.

ISOLATEK INTERNATIONAL — Types M-II, or TG. Types M-II and TG Investigated for exterior use.

NEWKEM PRODUCTS CORP — Types M-II, or TG. Types M-II and TG Investigated for exterior use.

7. **Metal Lath** — (Optional) — Metal lath used to facilitate the spray application of the Spray-Applied Fire Resistive Material to the steel joists. Diamond mesh, 3/8 in. expanded steel, min 1.7 lb/sq yd fastened to one side of joists using No. 18 SWG steel wire, located at midheight of every other member or 18 in. OC whichever is less. Both sides of lath must be completely coated with Spray-Applied Fire Resistive Material, but with no min thickness requirements.

7A. **Glassfiber Mesh** — (Optional) — Not Shown — As an alternate to metal lath (Item 7), min 3/32 in. square mesh coated fiberglass scrim fabric, weighing a min of 1.9 oz/sq yd shall be attached to one side of each joist web member. The method of attachment must be sufficient to hold the mesh and the protection material in contact with the joist during its application and curing. An acceptable method of attaching the mesh is by embedding the mesh in min 1/4 in. long beads of hot-melted glue. The beads of glue shall be spaced a max 12 in. OC along the top chord of the bar joists. Another method of attachment is by use of 1-1/4 in. long, 1/2 in. wide hairpin clips formed from 0.064 in. diam steel wire, alternating from top to bottom of the joist web member.

8. **Adhesive*** — Applied to steel roof deck in accordance with manufacturer's instructions.

ISOLATEK INTERNATIONAL — Type EBS or Type X.

* 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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