



BXUV.P741

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. P741

Restrained Assembly Ratings — 1, 1-1/2 or 2 Hr (See Items 6 and 6A)

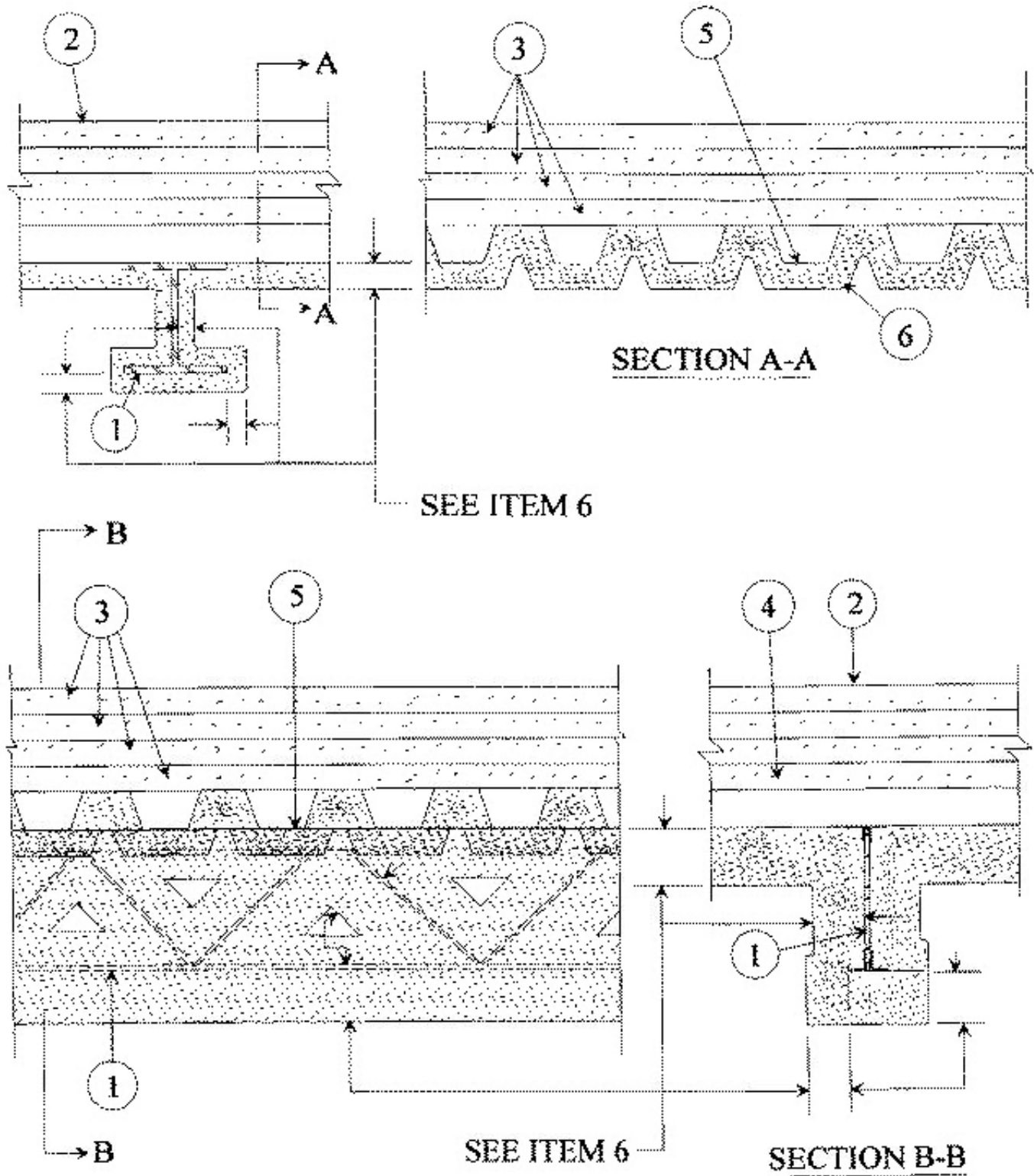
Unrestrained Assembly Ratings — 0, 1, 1-1/2 or 2 Hr (See Items 6 and 6A)

Unrestrained Beam Ratings — 1, 1-1/2 or 2 Hr (See Items 6 and 6A)

Restricted Load Condition — See Item 6

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. **Beam** — Min W6x16 or Steel Joist - Min 10K1 (See Item 6).

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

2A. In lieu of Item 2, roof covering consisting of single-ply Roofing Membrane* that is either ballasted, adhered or

mechanically attached as permitted under the respective manufacturer's Classification. See Fire Resistance Directory - Roof Membrane (CHCI).

2B. Metal Roof Deck Panels* — (Not shown) — In addition to or in lieu of Item 2 or 2A, the roof covering may consist of a mechanically fastened metal roof deck panel assembly. See Fire Resistance Directory — Metal Roof Deck Panels (CETW).

3. Roof Insulation — Foamed Plastic — Polyisocyanurate foamed plastic insulation boards nom 48 by 48 or 96 in., to be applied in one or more layers. Boards to be installed with end joints staggered a min of 6 in. No limit on max overall thickness.

ATLAS ROOFING CORP — AC Foam II, Tapered AC Foam II, AC Foam II NH, Tapered AC Foam II NH, AC Foam III, AC Foam III NH, Tapered AC Foam III NH, AC Foam IV, AC Foam Supreme, AC Foam Supreme NH, AC Foam Recover Board, AC Foam Recover Board NH

MULE-HIDE PRODUCTS CO INC — POLY ISO 2

CARLISLE SYNTEC SYSTEMS, A DIVISION OF CARLISLE CONSTRUCTION MATERIALS, LLC — Types HP, HP-H, HP-N, HP-W, SecurShield CD, InsulBase NH, SecurShield NH, SecurShield HD Composite NH, Polyiso HP-F NH, InsulBase RL, SecurShield RL, Polyiso HP-F

DOW ROOFING SYSTEMS L L C — "Dow Termico Polyisocyanurate Insulation", "Dow Termico ISO HP-FR".

FIRESTONE BUILDING PRODUCTS CO L L C — "ISO 95+ GL", "ISO 95+ FK", "ISO 95+ CAN", "ISO 95+ GL NH", "ISOGARD HD Composite Board" or "RESISTA", "ISOGARD GL", "ISOGARD CG".

GAF — EnergyGuard™, EnergyGuard™ RA, EnergyGuard™ NH.

When EnergyGuard™ or EnergyGuard™ NH are used, Assembly and Beam ratings are limited to 1 hr and requires thickness of **Spray-Applied Fire Resistance Materials*** (CHPX) Item 6 or 6A on deck, beam and/or joist specified for 2 hr ratings.

HUNTER PANELS, A DIVISION OF CARLISLE CONSTRUCTION MATERIALS, LLC — H Shield, H-Shield-F, H-Shield-CG, H-Shield-C, H-Shield Premier, H-Shield HD Composite, H-Shield HD Composite CG, H-Shield RL, H-Shield CG RL, H Shield NH, H-Shield-F NH, H-Shield-CG NH, H-Shield-C NH, H-Shield Premier NH, H-Shield HD Composite CG NH.

MULE-HIDE PRODUCTS CO INC — Poly ISO 1, Tapered Poly ISO 1, Poly ISO 1-DWD, Tapered Poly ISO 1-DWD, Poly ISO 1-HD, Poly ISO 1-HD90, Poly ISO 1-HD-Composite

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.

LOADMASTER SYSTEMS INC — Loadmaster Polyisocyanurate Insulation.

MARTIN FIREPROOFING CORP — "Perform-A-Deck I"

RMAX, A BUSINESS UNIT OF SIKA CORPORATION — Multi-Max-3, Multi-Max FA-3, Ultra-Max, Ultra-Max Plus, Tapered Ultra-Max Plus, Tapered Thermarroof-3, Tapered Thermarroof FA-3, Tapered Ultra-Max.

SIKA SARNAFIL INC — Sarnatherm-R Insulation, Sarnatherm-R CG Insulation, Sarnatherm-R Tapered Insulation, Sarnatherm-R CG Tapered Insulation.

SOPREMA INC — Sopra-ISO s, Sopra-ISO s Tapered, Sopra-ISO+ s, Sopra-ISO+ s Tapered, Sopra-ISO H+ s, Sopra-ISO H+ s Tapered.

VERSICO INC — MP-H, VersiCore MP-H, WeatherBond XP, MP-HF, WeatherBond XP-HF, SecurShield, WeatherBond XFP, SecurShield CD, WeatherBond XFP CD, SecurShield HD Composite, WeatherBond XFP HD Composite, VersiCore MP-H NH, WeatherBond XP NH, SecurShield NH, WeatherBond XFP NH, VersiCore RL, SecurShield RL, Polyiso MP-HF NH

3A. Building Units* — Not Shown — As an alternate to Item 3, 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 minimum thickness shall follow table under item 6. There is no limit on the max insulation thickness.

JOHNS MANVILLE — Type ISO-VENT.

3B. Building Units* — Not Shown — As an alternate to Item 3, Polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in., faced on the top surface with oriented strand board. Min thickness of the polyisocyanurate core shall follow table under item 6. No limit on max overall thickness. Boards to be installed with end joints staggered a min of 6 in. in adjacent rows. Adhesive (item 8) may be applied between the building units and/or the gypsum board (if used).

ATLAS ROOFING CORP — ACFoam Nailbase Insulation, ACFoam Nail Base Insulation NH, Vented R, ACFoam CrossVent, ACFoam CrossVent NH, ACFoam III Nail Base Insulation, ACFoam III Nail Base Insulation NH, ACFoam III CrossVent, ACFoam III CrossVent NH

FIRESTONE BUILDING PRODUCTS CO L L C — Nail Base.

THE DOW CHEMICAL CO — Hy-Therm Nail-Line.

3C. Roof Insulation-Mineral and Fiber Boards* — (Not Shown) Optional, Applied in one or more layers over the Foamed Plastic (Item 3) to be applied with adhesive, asphalt or coal tar pitch (Item 9) or mechanically fastened (Item 10).

JOHNS MANVILLE

3D. Building Units* — As an alternate to Item 3, polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in., faced on the top surface with oriented strand board. Min thickness of the polyisocyanurate core shall follow table under item 6. No limit on max overall thickness. Boards to be installed with end joints staggered a min of 6 in. in adjacent rows.

JOHNS MANVILLE — Nailboard.

3E. Building Units* — As an alternate to Item 3, polyisocyanurate foamed plastic insulation boards faced on the underside (or both sides) with mineral fiber board. Min thickness of the polyisocyanurate core shall follow table under item 6. No limit on max overall thickness. Boards to be installed with end joints staggered a min of 6 in. adjacent rows. Adhesive (Item 8) may be applied between the building units and/or the gypsum board (if used).

FIRESTONE BUILDING PRODUCTS CO L L C — "ISO 95+ Composite"

JOHNS MANVILLE — Fesco-Foam.

3F. Building Units* — As an alternate to Item 3, polyisocyanurate foamed plastic insulation boards faced on the underside with wood fiber board. Min thickness of the polyisocyanurate core shall follow table under item 6. No limit on max overall thickness. Boards to be installed with end joints staggered a min of 6 in. in adjacent rows.

FIRESTONE BUILDING PRODUCTS CO L L C — "ISO 95+ Composite".

JOHNS MANVILLE — ENRGY-2 Plus.

3G. Building Units* — As an alternate to Item 3, polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in., faced on the top surface with gypsum board. Min thickness of the polyisocyanurate core shall follow table under item 6. No limit on overall thickness. Boards to be installed with end joints staggered a min of 6 in. in adjacent rows. Adhesive (Item 8) may be applied between the building units and/or the gypsum board (if used).

JOHNS MANVILLE — ENRGY 2 Gypsum Composite.

3H. Roof Insulation - Mineral and Fiber Boards* — As an alternate to Item 3, to be applied in one or more layers with or without adhesive. When more than one layer is required, each layer of board to be offset in both directions from layer below a min of 6 in. in order to lap all joints. Min thickness is 2 in. when Item 2A or 2B is used. Min thickness is 1 in. otherwise.

GAF — GARTEMP Perlite.

JOHNS MANVILLE

ROCKWOOL — Toprock.

3I. Roof Insulation - Foamed Plastic* — (Not Shown) As an alternate to Item 3 through 3H, polystyrene foamed plastic insulation boards, applied in one or more layers over gypsum wallboard. Min. thickness is 1.0 in. with no max overall thickness. Max density 2.5 pcf. When applied in more than one layer, each layer to be offset in both directions from layer below a min. of 6 in. in order to lap all joints. Boards secured to gypsum wallboard (if used) with asphalt glaze coat or adhesive (Item 8). Adhesive and/or asphalt glaze coat may be omitted when Item 2A is used. See Foamed Plastic (BRYX) category in the Building Materials Directory or Foamed Plastic (CCVW) category in the Fire Resistance Directory of for names of manufacturers.

3J. Foamed Plastic* — Optional - (Not Shown) - Used in addition to the foam insulation required to achieve fire rating:

3Ja. Foamed Plastic* — Optional - (Not Shown) - Maximum 1 in. thick polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in. Boards may be applied as the top layer in addition to the specified minimum thickness of any roofing system described herein, as long as the roofing system states that there is no limit on maximum thickness. Joints offset in both directions from layer below.

FIRESTONE BUILDING PRODUCTS CO L L C — "ISOGARD HD"

3Jb. Foamed Plastic* — Optional — (Not Shown) — Maximum 5/8 inch thick polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in. Boards may be applied as the top layer in addition to the specified minimum thickness of any roofing system described herein, as long as the roofing system states that there is no limit on maximum thickness. Joints offset in both directions from layer below.

RMAX, A BUSINESS UNIT OF SIKA CORPORATION — "Ultra-Max HD"

SIKA SARNAFIL INC — "Sarnatherm Roof Board-R"

3Jc. Foamed Plastic* — Optional — (Not Shown) — Maximum 1/2 inch thick polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in. Boards may be applied as the top layer in addition to the specified minimum thickness of any roofing system described herein, as long as the roofing system states that there is no limit on maximum thickness. Joints offset in both directions from layer below.

CARLISLE SYNTEC SYSTEMS, A DIVISION OF CARLISLE CONSTRUCTION MATERIALS, LLC — SecurShield HD, SecurShield HD Plus, SecurShield HD NH, SecurShield HD Plus NH, SecurShield HD RL

HUNTER PANELS, A DIVISION OF CARLISLE CONSTRUCTION MATERIALS, LLC — H-Shield HD, H-Shield HD90, H-Shield HD RL, H-Shield HD NH, H-Shield HD90 NH

VERSICO INC — SecurShield HD, WeatherBond XFP HD Cover Board, SecurShield HD Plus, WeatherBond XFP HD Plus Cover Board, SecurShield HD NH, WeatherBond XFP HD NH Cover Board, SecurShield HD Plus NH, WeatherBond XFP HD Plus NH Cover Board, SecurShield HD RL

3Jd. Foamed Plastic* — Optional — (Not Shown) — Maximum 1 inch thick polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in. Boards may be applied as the top layer in addition to the specified minimum thickness of any roofing system described herein, as long as the roofing system states that there is no limit on maximum thickness. Joints offset in both directions from layer below.

ATLAS ROOFING CORP — AC Foam HD CoverBoard and AC Foam CoverBoard FR

3K. Roof Insulation — Foamed Plastic* — As an alternate to Items 3 through 3H — Polyurethane foamed plastic roof insulation. Formed by the simultaneous spraying of two liquid components applied over the gypsum board (item 4) in accordance with the manufacturer's instructions. Min. 1 in. thickness. No limit on max thickness. When used, gypsum board (item 4) is required .

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

4. Gypsum Board — (Not Shown) — (Classified or Unclassified) — May be used to obtain various Restrained or Unrestrained Assembly Ratings as described in Item 6. Supplied in sheets nom 4 by 8 or 12 ft by 5/8 in. thick. Min weight 2.2 psf. Applied perpendicular to steel roof deck direction with end joints staggered 2 ft in adjacent rows. End joints to occur over crests of steel roof units.

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

GEORGIA-PACIFIC GYPSUM L L C ([View Classification](#)) — CKNX.R6937

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 1-1/2 in. deep and 36 in. wide galv fluted steel deck. Min gauge is No. 22 MSG. Ends overlapped at supports a min 2 in. and welded to supports 6 in. OC. Sidelaps button-punched together 24 in. OC at midspan. As an alternate to button-punching, adjacent units may be welded or fastened with 1/2 in. long hex head, self-drilling, self-tapping steel screws, 24 in. OC at midspan.

5A. Steel Roof Deck — (Unclassified) — Min 1-1/2 in. deep and 36 in. wide galv fluted steel deck. Min gauge is No. 22 MSG. Ends overlapped at supports a min 1-1/2 in. and welded to supports 12 in. OC and at side laps. Side laps fastened with 1/2 in. long hex head, self-drilling, self-tapping steel screws spaced a max of 36 in. OC. **Classified Steel Floor and Form Units*** Noncomposite 1-1/2 to 3 in. deep, 24 to 36 in. wide, min 22 MSG galvanized steel fluted units. Ends overlapped at supports a min 1-1/2 in. and welded to supports 12 in. OC and at side laps. Side laps fastened with 3/4 in. long No. 12 self-drilling, self-tapping steel screws at 36 in. OC. As alternate to screw fasteners adjacent units may be button-punched or welded together 36 in. OC along side joints.

ASC STEEL DECK, DIV OF ASC PROFILES L L C — Types BH-36, BHN-36, BHN-35-1/4, DGB-36, B-36, BN-36, BN-35-1/4, NH-32, NHN-32, DGN-32, N-32, and NN-32. All units may be galvanized or Prime Shield™. Non-cellular decks may be vented designated with a "V" suffix to the product name.

CANAM GROUP INC — 36 in. wide Type P-3606 or P-3615; 24 in. wide P-2436, or P-2404; 36 in. wide Types 1.5B, 1.5BI.

CANAM STEEL CORP — 36 in. wide Type P-3606 or P-3615 or 24 in. wide P-2436, P-2404, P-2403, or P-2438.

CANAM STEEL CORP — Types B, BI, F, NS and NI. Units may be ptd/ptd.

NEW MILLENNIUM BUILDING SYSTEMS L L C — Type B, BD, BI, F, FD, N, ND, NW32, and NW32I. Units may be phos/painted or galvanized.

VERCO DECKING INC - A NUCOR CO — Deck types PLB, HSB, PLN3, HSN3, PLN, N; FORMLOK™ deck types PLB, B, PLN3, N3, PLN, N. Units may be galvanized or phos./ptd. Deck may be vented or non-vented.

VULCRAFT, DIV OF NUCOR CORP — Galv Types 1.5B, 1.5BI, 1.5PLB, 1.5F, 3N, 3NI, 3.0PLN, 3NL-32, 3NI-32, 3PLN-32, ptd/ptd units may be used for ratings up to 2 h; Types BW, B High Strength, BW High Strength, N. Units may be ptd/ptd.

6. Spray-Applied Resistive Material* — Applied by mixing with water and spraying in more than one coat to final thicknesses as shown in the illustration above and in the table below to steel surfaces which must be clean and free of dirt, loose scale and oil. Steel deck surface must be "spatter" coated with Type DK2 Spray-Applied Fire Resistive Materials prior to application of spray-applied resistive material. Spray-applied resistive materials applied in accordance with the manufacturer's application instructions. Min average and min individual density of 15/14 pcf, respectively. For method of density determination, see Design Information Section. Thickness of the spatter coat is included in the total final thickness of the protection material.

Restrained Assembly Rating	Unrestrained Assembly Rating	Unrestrained Beam Rating	On Beam	On 10K1 Joist	On 10K1 Joist at 4ft or less OC
1	0**	1	3/8, 1/2	11/16	5/8
1	1	1	3/8, 1/2	11/16*, 3/4	9/16
1	1	1	3/8, 1/2	11/16*, 3/4	9/16
1	1	1	3/8, 1/2	11/16*, 3/4	9/16
1	1	1	3/8, 1/2	11/16*, 3/4	9/16
1-1/2	1	1	3/8, 1/2	11/16*, 7/8	5/8*, 7/8
1-1/2	1	1	3/8, 1/2	11/16*, 7/8	5/8*, 7/8
1-1/2	1	1	3/8, 1/2	11/16*, 7/8	5/8*, 7/8
1-1/2	1	1	3/8, 1/2	11/16*, 7/8	5/8*, 7/8
1-1/2	1-1/2	1-1/2	5/8,13/16	1-3/16*, 1-1/4	15/16
1-1/2	1-1/2	1-1/2	5/8,13/16	1-3/16*, 1-1/4	15/16
1-1/2	1-1/2	1-1/2	5/8,13/16	1-3/16*, 1-1/4	15/16
1-1/2	1-1/2	1-1/2	5/8,13/16	1-3/16*, 1-1/4	15/16

2	1	1	3/8, 1/2	1-5/16	1-5/16
2	1	1	3/8, 1/2	1-5/16	1-5/16
2	1	1	3/8, 1/2	1-5/16	1-5/16
2	1	1	3/8, 1/2	1-5/16	1-5/16
2	2	2	7/8,1-1/8	1-1/2*, 1-11/16	1-5/16
2	2	2	7/8,1-1/8	1-1/2*, 1-11/16	1-5/16
2	2	2	7/8,1-1/8	1-1/2*, 1-11/16	1-5/16
2	2	2	7/8,1-1/8	1-1/2*, 1-11/16	1-5/16

* The 10K1 joist thicknesses indicated by the asterisk in the above table are applicable when the joist stress is limited to 24 ksi.

For beams, the second thickness provided in the table above is applicable when the thickness applied to the beam lower flange edges is reduced by one-half.

Restrained Assembly Rating	Unrestrained Assembly Rating	Unrestrained Beam Rating	Minimum Insulation Thickness	On Deck with Gypsum Board#	On Deck with out Gypsum Board#
1	0**	1	3	N/A	13/16
1	1	1	3	3/4	1
1	1	1	2	3/4	1
1	1	1	1	1	1-1/8
1	1	1	0	1-1/2	1-1/2
1-1/2	1	1	3	1	1-1/4
1-1/2	1	1	2	1	1-5/16
1-1/2	1	1	1	1	1-9/16
1-1/2	1	1	0	2-1/8	2-1/8
1-1/2	1-1/2	1-1/2	3	1	1-1/4
1-1/2	1-1/2	1-1/2	2	1	1-5/16
1-1/2	1-1/2	1-1/2	1	1-1/2	1-9/16
1-1/2	1-1/2	1-1/2	0	2-1/8	2-1/8
2	1	1	3	1-1/4	1-9/16

2	1	1	2	1-1/4	1-3/4
2	1	1	1	2-1/16	2-1/16
2	1	1	0	2-11/16	2-11/16
2	2	2	3	1-1/4	1-9/16
2	2	2	2	1-1/4	1-3/4
2	2	2	1	2-1/16	2-1/16
2	2	2	0	2-11/16	2-3/4

The required minimum thickness of Spray-Applied Fire Resistive Materials on the steel deck is increased by 1/16 in. for 1-1/2 hr Unrestrained Assembly Rating and 1/4 in. for 2 hr Unrestrained Assembly Rating when Item 8 is used.

** When the maximum clear span of the steel decking is 5 ft. 3 in. or less, the Unrestrained Assembly Rating is 1 hr.

SOUTHWEST FIREPROOFING PRODUCTS CO — Types DK, 4, 5, 5EF, 5GP, 5AR, 5GP/AR, 5EF/AR, 5MD/AR, 5MD, 8GP, 8EF, 8MD, 9GP, 9EF, 9MD.

6A. Spray-Applied Resistive Material* — Applied by mixing with water and spraying in more than one coat to final thicknesses as shown in the illustration above and in the table below to steel surfaces which must be clean and free of dirt, loose scale and oil. Steel deck surface must be "spatter" coated with Type DK3 Spray-Applied Fire Resistive Material prior to application of spray-applied resistive material. Types 7GP and 7HD spray-applied resistive material applied in accordance with the manufacturer's application instructions. Min average and min individual density of 19/18 pcf, respectively. For method of density determination, see Design Information Section. Thickness of the spatter coat is included in the total final thickness of the protection material.

Restrained Assembly Rating	Unrestrained Assembly Rating	Unrestrained Beam Rating	On Beam	On 10K1 Joist	On 10K1 Joist at 4ft or less OC
1	0**	1	3/8, 1/2	11/16	5/8
1	1	1	3/8, 1/2	11/16*, 3/4	9/16
1	1	1	3/8, 1/2	11/16*, 3/4	9/16
1	1	1	3/8, 1/2	11/16*, 3/4	9/16
1	1	1	3/8, 1/2	11/16*, 3/4	9/16
1-1/2	1	1	3/8, 1/2	11/16*, 7/8	5/8*, 7/8
1-1/2	1	1	3/8, 1/2	11/16*, 7/8	5/8*, 7/8
1-1/2	1	1	3/8, 1/2	11/16*, 7/8	5/8*, 7/8
1-1/2	1	1	3/8, 1/2	11/16*, 7/8	5/8*, 7/8
1-1/2	1-1/2	1-1/2	5/8, 13/16	1-3/16*, 1-1/4	15/16

1-1/2	1-1/2	1-1/2	5/8,13/16	1-3/16*, 1-1/4	15/16
1-1/2	1-1/2	1-1/2	5/8,13/16	1-3/16*, 1-1/4	15/16
1-1/2	1-1/2	1-1/2	5/8,13/16	1-3/16*, 1-1/4	15/16
2	1	1	3/8, 1/2	1-5/16	1-5/16
2	1	1	3/8, 1/2	1-5/16	1-5/16
2	1	1	3/8, 1/2	1-5/16	1-5/16
2	1	1	3/8, 1/2	1-5/16	1-5/16
2	2	2	7/8,1-1/8	1-1/2*, 1-11/16	1-5/16
2	2	2	7/8,1-1/8	1-1/2*, 1-11/16	1-5/16
2	2	2	7/8,1-1/8	1-1/2*, 1-11/16	1-5/16
2	2	2	7/8,1-1/8	1-1/2*, 1-11/16	1-5/16

* The 10K1 joist thicknesses indicated by the asterisk in the above table are applicable when the joist stress is limited to 24 ksi.

For beams, the second thickness provided in the table above is applicable when the thickness applied to the beam lower flange edges is reduced by one-half.

Restrained Assembly Rating	Unrestrained Assembly Rating	Unrestrained Beam Rating	Minimum Insulation Thickness	On Deck with Gypsum Board#	On Deck with out Gypsum Board#
1	0**	1	3	N/A	13/16
1	1	1	3	3/4	1
1	1	1	2	3/4	1
1	1	1	1	1	1-1/8
1	1	1	0	1-1/2	1-1/2
1-1/2	1	1	3	1	1-1/4
1-1/2	1	1	2	1	1-5/16
1-1/2	1	1	1	1	1-9/16
1-1/2	1	1	0	2-1/8	2-1/8
1-1/2	1-1/2	1-1/2	3	1	1-1/4
1-1/2	1-1/2	1-1/2	2	1	1-5/16

1-1/2	1-1/2	1-1/2	1	1-1/2	1-9/16
1-1/2	1-1/2	1-1/2	0	2-1/8	2-1/8
2	1	1	3	1-1/4	1-9/16
2	1	1	2	1-1/4	1-3/4
2	1	1	1	2-1/16	2-1/16
2	1	1	0	2-11/16	2-11/16
2	2	2	3	1-1/4	1-9/16
2	2	2	2	1-1/4	1-3/4
2	2	2	1	2-1/16	2-1/16
2	2	2	0	2-11/16	2-3/4

The required minimum thickness of Spray-Applied Fire Resistive Materials on the steel deck is increased by 1/16 in. for 1-1/2 hr Unrestrained Assembly Rating and 1/4 in. for 2 hr Unrestrained Assembly Rating when Item 8 is used.

** When the maximum clear span of the steel decking is 5 ft. 3 in. or less, the Unrestrained Assembly Rating is 1 hr.

SOUTHWEST FIREPROOFING PRODUCTS CO — Types 7GP and 7HD.

6B. **Sprayed Fiber*** — (Optional, Not Shown) Sprayed Fiber, Classified for Noncombustible Building Materials, ASTM (BICW), having a maximum applied density of 3.5 pcf applied over Spray-Applied Fire Resistive Material (Item 6 and 6A) on both Steel Floor and Form Units (Item 5 and 5A) and Supports (Item 1) in accordance with the following tables:

Allowable Sprayed Fiber Thickness over SFRM applied to Steel Deck (Item 5 and 5A)

Installed SFRM Thickness (in.) on Deck	SFRM Density (pcf)	
	15	19
11/16	5	5
3/4	5	5
13/16	5	5
7/8	5	5
1	5	5
1 1/16	5	5
1 1/8	5	5

1 3/16	5	5
1 1/4	5	5
1 5/16	5	5
1 3/8	5	5
1 1/2	5	5
1 9/16	5	5
1 5/8	5	5
1 3/4	5	5
1 13/16	4 13/16	5
2	4	5
2 1/16	3 3/4	4 3/4
2 1/8	3 1/2	4 7/16
2 3/16	3 3/16	4 1/16
2 5/16	2 11/16	3 3/8
2 3/8	2 7/16	3 1/16
2 11/16	1 1/16	1 3/8
2 3/4	13/16	1
2 13/16	9/16	11/16
2 15/16	0	0

Allowable Sprayed Fiber Thickness over SFRM applied to Beams (Item 1)

Installed SFRM Thickness (in.) on Beam	SFRM Density (pcf)		
	15	15*	19
3/8	5	3 3/16	5
1/2	5	2 11/16	5
5/8	5	2 1/8	5
13/16	4 13/16	1 5/16	5

7/8	4 9/16	1 1/16	5
1 1/8	3 1/2	0	4 7/16

* Thicknesses for Type DK only

Allowable Sprayed Fiber Thickness over SFRM applied to Joists (Item 1)

Installed SFRM Thickness (in.) on Joist	SFRM Density (pcf)		
	15	15*	19
9/16	5	4 13/16	5
5/8	5	4 9/16	5
11/16	5	4 5/16	5
3/4	5	4	5
7/8	5	3 1/2	5
15/16	5	3 3/16	5
1 3/16	5	2 1/8	5
1 1/4	5	1 7/8	5
1 5/16	5	1 5/8	5
1 1/2	5	13/16	5
1 11/16	5	0	5

* Thicknesses for Type DK only

THERMACOUSTIC IND — Type TC-417 2333658

7. Metal Lath (Optional, not shown) — Metal lath may be used to facilitate the spray application of spray-applied resistive materials on steel bar joists and trusses. The diamond mesh, 3/8 in. expanded steel lath, 1.7 to 3.4 lb/sq yd is secured to one side of each steel joist with No. 18 SWG galv steel wire at joist web and bottom chord members, spaced 15 in. O.C. max. When used, the metal lath is to be fully covered with spray-applied resistive materials with no min thickness requirements.

7A. Nonmetallic Fabric Mesh (Optional, not shown) — As an alternate to metal lath, glass fiber fabric mesh, weighing approximately 2.5 oz/sq yd, polypropylene fabric mesh, weighing approximately 1.25 oz/sq yd or equivalent, may be used to facilitate the spray application. The mesh is secured to one side of each joist web member. The method of attaching the mesh must be sufficient to hold the mesh and the spray-applied resistive materials in place during application until it has

cured. An acceptable method to attach the mesh is by embedding the mesh in minimum 1/4 in. long beads of hot melted glue. The beads of glue shall be spaced a maximum of 12 in. O.C. along the top chord of the bar joist. Another method to secure the mesh is by 1-1/4 in. long by 1/2 in. wide hairpin clips formed from No. 18 SWG or heavier steel wire.

8. Adhesive* - (Optional) — (Bearing the UL Classification Marking for Roof Systems (TGFU)) - The gypsum wallboard or the first layer of roof insulation may be secured with adhesive to the steel crest surfaces. Also used to attach the gypsum wallboard to the first layer of insulation and each additional layer of insulation. Applied at a max rate of 19.8 g/ft². When FAST 100 adhesive is used, additional **Spray-Applied Fire Resistance Materials* (CHPX)** is required on the deck for the 1-1/2 and 2 hr Unrestrained Assembly Ratings. The thickness specified for the deck shall be increased by 1/16 in. for 1-1/2 hr Unrestrained Assembly Rating and 1/4 in. for 2 hr Unrestrained Assembly Rating.

CARLISLE SYNTEC SYSTEMS, A DIVISION OF CARLISLE CONSTRUCTION MATERIALS, LLC — FAST 100

9. Asphalt or Coal Tar Pitch* — (Optional) - (Not shown) - The gypsum board (item 4) or the first layer of roof insulation may be secured with asphalt or coal tar pitch to the steel crest surfaces at a max rate of 15 lb/100 sq ft. Also used to attach the first layer of insulation to gypsum board (item 4) and each additional layer of roof insulation, applied at a max rate of 25 lb/100 sq ft.

10. Mechanical Fasteners - (Optional) — (Not shown) - Mechanical screw-type fastener with metal or plastic washer designed for the purpose may be used to attach one or more layers of insulation to steel roof deck.

11. Metal Lath — (Not Shown) — Where Type 7HD is applied to steel deck, 3/8 in. metal ribbed lath weighing 3.4 lb/yd² shall be secured to the underside of the steel deck with S-12 by 3/8 in. long pan head, self-tapping steel screws spaced 12 in. OC in all directions. Steel screws shall be fitted with 1/2 in. diameter steel washers. Adjacent pieces of lath shall be overlapped 1 in. min.

*** 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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