

# BXUV.D219

## 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. D219

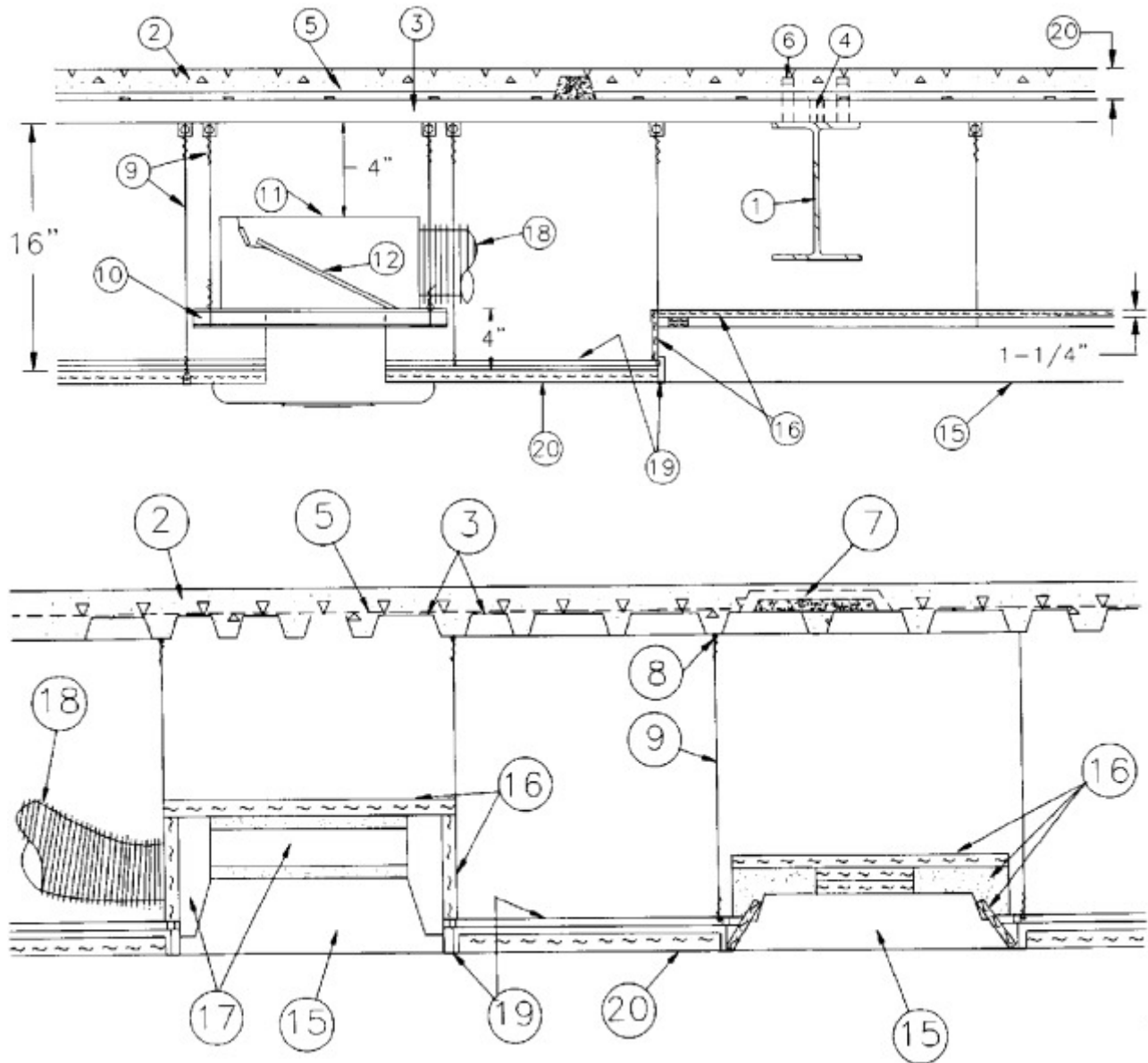
**Restrained Assembly Ratings – 1, 1-1/2, 2 and 3 Hr**  
(See Items 2, 3, 7, 11, 12, 19, 19A, and 20)

**Unrestrained Assembly Ratings – 1, 1-1/2, 2 and 3 Hr**  
(See Items 2, 3, 7, 11, 12, 19, 19A, and 20)

**Unrestrained Beam Ratings – 1, 1-1/2, 2 and 3 Hr**  
(See Items 11, 12, 19, 19A, and 20)

**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** — W8 X 15, min size. As an alternate to steel beams, standard steel joists, Type 10J3, 12K1 or LH Series joists of any size may be used as an alternate to steel beams. Joist girders, 20 in. min depth and 13 lb/lin ft min weight may also be used as alternate to steel beams. As an alternate to steel beams or standard joists, custom made steel joists designed as composite or noncomposite with the concrete slab, per S.J.I. specifications, for a max tensile stress of 30 KSI. Min depth of custom made joists shall be 10 in. with min area of steel for top and bottom chord members of 0.96 and 0.77 sq in. respectively. Min area of steel for end diagonal web member shall be 0.444 sq in. Min area of steel of the first six interior web members shall be 0.406 sq. in. min area of steel for all other interior web members shall be 0.196 sq in. Custom made joists designed noncomposite with concrete slab. Steel filler pieces of proper size, 1 to 2 in. long shall be welded to and between the top chord angles midway between all top chord panel points. Spacing of joists not limited. Lateral bracing required per Steel Joist Institute specifications. A min clearance of 8 in. shall be maintained between bottom chord of joists and face of ceiling.

2. **Normal Weight or Light Weight Concrete** — Carbonate or siliceous aggregate, 150 (+ or -) 3 pcf unit weight, 3000 psi compressive strength, vibrate. Lightweight concrete, expanded shale or slate aggregate by rotary kiln method or expanded clay aggregate by rotary kiln or sintered grate method; 110 (+ or -) 3 pcf unit weight, 3000 psi compressive strength, 4 to 7 percent entrained air, vibrated. See Item No. 20 for concrete topping thickness required for hourly ratings.

3. **Steel Floor And Form Units\*** — Composite or non-composite, 1-1/2, 2 or 3 in. deep, min 22 MSG galv fluted units and/or composite 1-5/8, 2 or 3 in. deep, min 20/20 MSG galv cellular units. When a blend of fluted and cellular units is used, the concrete topping thickness shall be measured from the top plane of the cellular units. Welded to supports 12 in. OC. Adjacent units button-punched or welded together 36 in. OC at side joints. See Item No. 20 for hourly ratings with various combinations of steel floor units.

**CANAM GROUP INC** — 36 in. wide Type P-3623, P-3606, P-3615 and 24 in wide Type P-2432 composite, Type P-3606 and P-3615 non-composite; 24 in. wide Type LF3; 36 in. wide Types 1.5B, 1.5BI, 1.5BL and 1.5BLI.

**CANAM STEEL CORP** — 36 in. wide Type P-3623, P-3606, P-3615 and 24 in wide Type P-2432 composite, Type P-3606 and P-3615 non-composite.

**CANAM STEEL CORP** — 30 or 36 in. wide Types BL, BLC; 24 in. wide Types LF2, LF2C, LF3, LF3C, NL, NLC.

**KAM INDUSTRIES LTD, DBA CORDECK** — QL Type 24 or 36 in. wide, 2 or 3 in. 99, AKX, WKX; 24 in. wide, 3 in. GKX, GKXH.

**DECK WEST INC** — 36 in. wide Type 2-DW or 3-DW.

**KAM INDUSTRIES LTD, DBA CORDECK** — Hi-Bond Types 24 in. wide 3KA1F24; 30 in. wide 3KF30, 3P30 and 24 in. wide WDR2, WDR3.

**NEW MILLENNIUM BUILDING SYSTEMS L L C** — 24 or 36 in. wide Types 2.0CD, 3.0CD, 2.0CFD, 3.0CFD, 3.0CFDES; 24, 30 or 36 in. wide Types 1.5CD, 1.5CDI, 1.5CFD. Fluted units may be phos/painted or galvanized.

**VERCO DECKING INC - A NUCOR CO** — FORMLOK™ deck types PLB, B, BR, PLN3, N3, PLN, N, PLW2, W2, PLW3, W3. Units may be galvanized, phos./ptd. or mill finish. Units may be cellular with the suffix "CD" added to the product name, respectively.

**VULCRAFT, DIV OF NUCOR CORP** — 24, 30 or 36 in. wide Types 1.5 VL, 1.5VLI, 1.5PLVLI; 24 or 36 in. wide Types 2VLI, 2.0PLVLI, 2VLP, 2.0PLVLP, 3VLI, 3.0PLVLI, 3VLP, 3.0PLVLP. Types 1.5VLI, 1.5PLVLI, 2VLI, 2.0PLVLI, 3VLI, 3.0PLVLI units may be phos./ptd. 36 in. wide Type 1.5 SB; 24 or 36 in wide Types 2.0 SB, 3.0 SB, 36 in. wide Type High Strength 1.5 SBI, 36 in. wide Type High Strength 1.5 SBN. Units may be phos/ptd.

**Alternate Construction** — Non-composite units of the same type listed above may be used provided allowable loading is calculated on the basis of non-composite design.

4. **Joint Cover** — 2 in. wide pressure-sensitive cloth tape. Where fluted and cellular floor units are installed end-to-end, galv steel angles shall be tack welded to the cellular floor units in such a manner as to cover the cells.

5. **Welded Wire Fabric** — 6 X 6 - W1.4 X W1.4.

6. **Shear Connectors** — (Optional) — Studs, 3/4 in. diam with 1-1/4 in. diam by 1/2 in. thick head or equivalent per AISC specifications. Min 1/2 in. concrete cover required above top of shear connector.

7. **Electrical Inserts** — Preset electrical inserts Classified as "**Outlet Boxes and Fittings Classified for Fire Resistance**". Unless specified otherwise for a particular preset electrical insert type, the spacing of the preset electrical inserts shall be not less than 24 in. OC along cellular steel floor units with not more than one preset electrical insert in each 4 sq ft of floor area.

(1) **KAM INDUSTRIES LTD, DBA CORDECK** Inserts.

#### **(Tapmate II-FN, II-EAFN; Series KEB)**

Installed per accompanying installation instruction over factory-punched holes in QL-AKX or QL-WKX floor units. Inserts are used in the pre-active, active, or abandoned condition. The holes cut in the insert cover for passage of wires shall be no more than 1/8 in. larger diam than the wire. For abandonment of Tapmate inserts, see installation instructions. Abandonment requires use of KEB-PC insert cover with no holes in it (for all Tapmate inserts), or a KEB-PC2 or -PC2-A1 abandonment cover for Tapmate II-EAFN only.

The Tapmate II-FN insert may use KEB-HP-1 outlet box fittings in lieu of the KEB-PC flush cover fittings.

For 2 h Restrained and Unrestrained Assembly Ratings only, installed per accompanying installation instructions over factory punched holes in 24 in. wide QL-GKX floor units alternating with 36 in. wide, 3 in. deep QL-99 fluted units. Inserts are used in the pre-active, active or abandoned condition. The holes cut in insert cover for passage of wires shall be no more than 1/8 in. larger diameter than the wire. For abandonment of Tapmate inserts, see installation instructions.

#### **(Tapmate VI)**

Installed per accompanying installation instructions over factory-punched holes in 3 in. Type QL-GKX, 24 in. wide cellular steel floor units. Refer to installation instructions for Classified assemblies.

**KAM INDUSTRIES LTD, DBA CORDECK** — Tapmate II-FN, II-EAFN; Series KEB; Tapmate IV-FN-S, IV-FN-H, IV-EAFN; Series KED, Tapmate VI.

(2) **Wiremold Co. and Kam Industries LTD d/b/a Cordeck** Inserts.

**(N-R-G Bloc IV Preset Inserts; FAKM-II, RAKM-II, S36BB, S36CC, S36PB, S36PP, S38CC, S38BB, S38PB, S38PP, FPCTC, FPBTC, FPFPTC Service Fittings or Type S3AXBP abandonment plate)**

The NRG Bloc IV preset insert is furnished by **KAM INDUSTRIES LTD d/b/a CORDECK**. The service fitting components are furnished by **WIREMOLD CO.** Installed per accompanying installation instructions over factory-punched holes in 3 in. deep K-Type cellular steel floor units (furnished by **KAM INDUSTRIES LTD d/b/a CORDECK**). Either Type RAKM-II, FAKM-II, S36BB, S36CC, S36PB, S36PP, S38CC, S38BB, S38PB, S38PP, FPCTC, FPBTC, FPFPTC service fittings or Type S3AXBP abandonment plate are installed with Type N-R-G Bloc IV Series preset inserts per accompanying installation instructions. Refer to installation instructions for Classified assemblies.

**(PK Series Preset Insert; FAKM-II, RAKM-II, S36BB, S36CC, S38CC, S38BB, FPCTC, FPBTC Service Fittings or Type S3AXBP abandonment plate)**

For 2 h Restrained and Unrestrained Assembly Ratings only, installed per accompanying installation instructions over factory punched holes in 24 in. wide WDR2 or WDR3 floor units. Either Type FAKM-II, RAKM-II, S36BB, S36CC, service fittings or Type S3AXBP abandonment plate are installed with Type PK Series preset inserts per accompanying installation instructions. Refer to installation instructions for Classified Assemblies.

**WIREMOLD CO** — Type N-R-G Bloc IV Series inserts; Type RAKM-II, FAKM-II, S36BB, S36CC, S36PB, S36PP, S38CC, S38BB, S38PB, S38PP, FPCTC, FPBTC, FPFPTC service fittings or Type S3AXBP abandonment plate. Type PK Series inserts; Type RAKM-II, FAKM-II, S36BB, S38CC, S38BB, FPCTC, FPBTC service fittings or Type S3AXBP abandonment plate

8. **Hanger Clips** — Min 0.045 in. thick (18 gauge) galv steel, 2 in. wide, 3-1/2 in. long, hooked at one end for attachment over male leg of steel floor units, spaced as required for hanger wire attachment.

8A. **Hanger Clips** — (Not shown) — For use with 2 and 3 in. QL-99, -AKX, -WKX floor units. Min 0.045 in. thick (18 gauge) galv steel, 1-5/8 in. overall width (horizontal leg) and 3-3/4 in. long (vertical leg). The horizontal leg ends with a hook and a lip. The hook is 3/32 in. wide and inclined 8 deg to the vertical to fit over the vertical leg at the side joint of the units.

9. **Hanger Wire** — No. 12 SWG galv steel, pigtailed in concrete through steel floor units, prior to concrete placement, or attached to hanger clips (Items No. 8 or 8A). Hanger wires spaced 48 in. OC or at every other main runner/cross tee intersection, whichever dimension is smaller, along main runners. One hanger wire to occur at all four corners of light fixtures, at midspan of cross tees adjacent to 4 ft long light fixtures and air duct outlets, and adjacent to each main runner splice. Additional hanger wires required at the midspan of cross tees running parallel and nearest to the walls and near the end of cut cross tees longer than 2 ft. which abut walls.

10. **Cold-Rolled Channels** — Min 0.053 in. thick (16 gauge) cold-rolled steel channels, 1-1/2 in. deep, placed under air duct and supported by hanger wires at each end, spaced not over 48 in. OC and on each side of duct outlet to support air duct.

11. **Air Duct** — No. 24 MSG min galv steel. Total area of duct openings not to exceed 144 sq in. per each 100 sq ft of ceiling area with the total area of each individual duct opening not to exceed 144 sq in. Where permitted as described in Item No. 20, the total area of duct openings may be increased to 576 sq in. per each 100 sq ft of ceiling area with the area of each individual duct opening not to exceed 576 sq in. Max dimension of 144 sq in. opening is 12 in. Max dimension of 576 sq in. opening is 30 in. Where air duct penetrates through a suspension system member, each cut end of the suspension system member near the duct outlet must be independently supported by a hanger wire.

12. **Damper** — No. 22 MSG galv steel, sized to overlap duct opening 2 in. min. Protected on both surfaces with 1/16 in. thick ceramic fiber paper and held open with a Fusible Link (bearing the UL Listing Mark). Where permitted as described in Item No. 20, Duct Outlet Protection System A as described in the Design Information Section may be used in lieu of the damper described above.

13. **Air Terminal Units\* — Linear Air Diffusers** — (Optional-Not Shown) — 4 ft long units. Located in openings formed by two cross tees spaced 2 in. OC on each side of a 20 by 48 in. light fixture when ceiling is composed of nom 24 by 48 in. lay-in panels. Linear air diffuser to be located on one side of fixture with a linear air return (Item No. 14) to be located on opposite side of fixture to complete the 2 by 4 ft grid module. Linear air diffusers attached to web of each cross tee with steel sheet metal screw at midpoint.

Each linear air diffuser supported by 12 SWG hanger wire at its quarter-points. A max of 12 lin ft of linear air diffuser is allowed per each 100 sq ft of ceiling area.

**14. Air Terminal Units\* — Linear Air Returns —** (Optional-Not Shown) — 4 ft long units. Located in openings formed by two cross tees spaced 2 in. OC on each side of a 20 by 48 in. light fixture when ceiling is composed of nom 24 by 48 in. lay-in panels. Linear air return to be located on one side of fixture with a linear air diffuser (Item No. 13) to be located on opposite side of fixture to complete the 2 by 4 grid module. Linear air returns attached to web of each cross tee with steel sheet metal screw at midpoint. Each linear air return supported by 12 SWG hanger wire at its midpoint. A max of 12 lin ft of linear air return is allowed per each 100 sq ft of ceiling area.

**15. Fixtures, Recessed Light —** (Bearing the UL Listing Mark) — Recessed light fixture with steel housing, 1 by 4 ft, 2 by 2 ft, 2 by 4 ft, and 20 by 48 in. size. The nom 1 by 4 ft, 2 by 2 ft, and 2 by 4 ft fixtures may be provided with or without vented sides for air boots (Item No. 17). Air boots must be used in conjunction with fixtures designed for that purpose. The nom 1 by 4 ft, 2 by 2 ft, and 2 by 4 ft fixtures may be provided with or without vented tops for air return purposes. Linear air diffusers (Item No. 13) and linear air returns (Item No. 14) must be used in conjunction with nom 20 by 48 in. fixtures. When nom 1 by 4 ft fixtures are used, aggregate of fixtures not to exceed four per 100 sq ft of ceiling area. When nom 2 by 2 ft fixtures are used, aggregate of fixtures not to exceed five per 100 sq ft of ceiling area. When nom 2 by 4 ft or 20 by 48 in. fixtures are used, aggregate of fixtures not to exceed three per 100 sq ft of ceiling area. Wired in conformance with the National Electrical Code. Fixtures and ballasts must be considered for these ambient temperature conditions before installation.

**15A. Fixture, Recessed Light —** (Bearing the UL Listing Mark) — (Not Shown) — As an alternate to Item 15 for 1 or 2 hr assembly ratings only. Incandescent lamp type, steel housing, nom 6-1/2 in. diam by 7-1/2 in. high. Each fixture provided with a nom 7-3/4 in. by 12-1/2 in. base plate screw-attached top the "high hat" fixture with three steel screws. Base plate to be provided with steel bar hangers designed to span across nom 24 in. spacing of cross tees for fixture support. Fixture secured to cross tees with steel clips provided at the end of the steel bar hangers. A max of two "high hat" fixtures may be substituted for each nom 24 in. by 48 in. fixture permitted in the ceiling max five "high hat" fixtures per 100 sq ft of ceiling. For use with USG Interiors LLC steel framing members and acoustical materials only. Wired in accordance with National Electrical Code.

**16. Fixture Protection - Acoustical Material\*** — 5/8 in. thick, cut into pieces to form a five-sided enclosure, rectangular or trapezoidal in cross section dependent upon fixture type, approx 1/2 in. longer and wider than the fixture with sufficient depth to provide at least 1-1/4 in. clearance between the fixture and the enclosure. The pieces are held together by 8d nails. The 1-1/4 in. clearance shall be provided by spacers placed on top of fixture but located away from the ballasts. When non-air-handling or air-return fixtures are used, a max 1-1/4 in. separation may be maintained between the long fixture protection side pieces and the top piece. When air-supply light fixtures with air boots are used, fixtures and air boots shall be fully-enclosed except for the opening needed to accommodate connection to air supply duct.

**BUILDING PRODUCTS OF CANADA CORP** — Types FR-83, FR-X1, FR-4, M. See **Acoustical Materials** (BYIT), Building Products Of Canada Corp., for specific tile details.

**USG INTERIORS LLC** — Type FR-83, FR-X1, FR-4, M. See **Acoustical Materials** (BYIT), USG Interiors LLC, for specific tile details.

**16A. Alternate Fixture Protection - Batts and Blankets\*** — 1-1/4 in. thick, cut into pieces to form five-sided enclosures as described above. Pieces held together by 18 SWG galv steel tie wire.

**THERMAFIBER INC** — Type FR.

**16B. Fixture Protection - Acoustical Material\*** — For use with "high hat" light fixtures (Item 15A). Five sided enclosure, rectangular in cross section, cut from the same acoustical material used in the ceiling assembly. Two side pieces measuring 8 in. high by 23-3/4 in. long resting upon ceiling tile, two end pieces measuring 6-3/4 in. high by 16 in. long resting upon steel bar hangers and one top piece measuring 14 in. by 18 in. resting upon side and end pieces with 18 in. dimension parallel with end pieces. Enclosure secured with four 8d nails installed through side pieces into end pieces near the top of the assembly.

**16C. Fixture Protection - Luminaires, Luminaire Assemblies and Luminaire Enclosures Classified for Fire Resistance\*** — (Not Shown) - As an alternate to Items 16, 16A and 16B, luminaire enclosure kits consisting of pre-cut pieces of faced batts and assembly hardware may be used to form a five-sided rectangular enclosure over recessed light fixture. Luminaire enclosure kit to be installed in accordance with the accompanying installation instructions. When air-supply light fixtures with air boots are used, fixtures and air boots shall be fully-enclosed except for the opening needed to accommodate connection to air supply duct.

**SPI LLC – SafeLite®**

**THERMAFIBER INC – FixtureShield**

17. **Air Boots** – No. 24 MSG galv steel air boots with internal glass fiber insulation are installed in pairs, along both sides of air-supply light fixtures, and are connected by a 24 MSG galv steel cross-over duct.

18. **Air Duct Connector** – 6 in. diam. Any Class O or Class I Air Duct Connector bearing the UL Listing Mark.

19. **Steel Framing Members\*** – Main runners 10 or 12 ft long, spaced 48 in. OC. Cross tees nom 4 ft long installed perpendicular to main runners and spaced 24 in. OC. When nom 1 by 4 ft light fixtures are used, additional 4 ft long cross tees installed along length center-line of 2 by 4 ft grid modules; a field-cut nom 12 by 48 in. lay-in panel, bearing a min 3/8 in. on suspension members, fills in the remainder of such modules. When nom 20 by 48 in. light fixtures and air terminal units (Item 13 and 14) are used, additional 4 ft long cross tees are installed parallel with and 2 in. from the 4 ft cross tees in the 2 by 4 ft grid module where 20 by 48 in. light fixtures is to be installed. The ends of the 4 ft long cross tees forming the sides of the 20 by 48 in. grid module shall engage field-punched routes in the web of each main runner. The field-punched routes must be identical to factory-punched routes and shall be effected using a tool designed for that purpose and provided by the steel framing member manufacturer. When the ceiling is composed of nom 24 by 24 in. lay-in panels, cross tees nom 2 ft long installed perpendicular to 4 ft cross tees, midway between main runners, spaced 48 in. OC-For 24 by 24 or 48 in. lay-in panels.

**CGC INC** – Types DXL, DXLA, DXLZ, DXLZA, SDXL, SDXLA, ZXLA. When Type DXLA, DXLZA, SDXLA, ZXLA is used, the Assembly and Beam Ratings are 2 hr.

**USG INTERIORS LLC** – Types DXL, DXLA, DXLZ, DXLZA, SDXL, SDXLA or ZXLA. When Type DXLA, DXLZA or SDXLA or ZXLA is used, the Assembly and Beam Ratings are 2 hr.

19A. **Steel Framing Members\*** – Main runners, nom 10 or 12 ft long, spaced 4 ft OC. Cross tees, nom 4 ft long, installed perpendicular to main runners and spaced 2 ft OC. When nom 2 by 2 ft lay-in panels are used, nom 2 ft long Cross tees installed perpendicular to 4 ft cross tees at midspan, spaced 4 ft OC. When Type DXLT or DXLTZ steel framing members are used, the assembly and beam ratings are 1-1/2 hr.

**CGC INC** – Types DXLT, DXLTZ.

**USG INTERIORS LLC** – Types DXLT, DXLTZ.

20. **Acoustical Material\*** – Nominal 5/8 or 3/4 in. thick lay-in panels in nominal panel sizes and types tabulated below. Border panels supported at walls by min. 0.016 in thick painted steel angle with 7/8 in legs or min. 0.016 in thick painted steel channel with a 1 by 1-9/16 by 1/2 in profile.

| Nom Panel Size, In. | Acoustical Mtl Type | Concrete Topping Thkns, In. | Steel Floor Unit Type | Restrained & Unrestrained Assembly Rating, Hr | Unrestrained Beam Rating, Hr |
|---------------------|---------------------|-----------------------------|-----------------------|-----------------------------------------------|------------------------------|
| 24 by 24            | FR-X1 +++           | 2-1/2                       | F, C or B             | 2                                             | 2                            |
| 24 by 24            | GR-1 +++            | 2-1/2                       | F, C or B             | 2                                             | 2                            |
| 24 by 24            | FR-83 +++           | 2-1/2                       | F, C or B             | 2                                             | 2                            |
| 24 by 24            | M +++               | 2-1/2                       | F, C or B             | 2                                             | 2                            |
| 24 by 24            | FR-4+++             | 2-1/2                       | F, C or B             | 2                                             | 2                            |
| 24 by 24            | FR-X1 ++            | 2-1/2                       | F                     | 2                                             | 3                            |
| 24 by 24            | GR-1 ++             | 2-1/2                       | F                     | 2                                             | 3                            |

|          |           |       |            |   |   |
|----------|-----------|-------|------------|---|---|
| 24 by 24 | FR-83 ++  | 2-1/2 | F          | 2 | 3 |
| 24 by 24 | M ++      | 2-1/2 | F          | 2 | 3 |
| 24 by 24 | FR-4++    | 2-1/2 | F          | 2 | 3 |
| 24 by 24 | FR-X1 ++  | 3-1/2 | F          | 3 | 3 |
| 24 by 24 | GR-1 ++   | 3-1/2 | F          | 3 | 3 |
| 24 by 24 | FR-83 ++  | 3-1/2 | F          | 3 | 3 |
| 24 by 24 | M ++      | 3-1/2 | F          | 3 | 3 |
| 24 by 24 | FR-4++    | 3-1/2 | F          | 2 | 3 |
| 24 by 24 | FR-X1 +   | 2-1/2 | C or B     | 2 | 2 |
| 24 by 24 | GR-1 +    | 2-1/2 | C or B     | 2 | 2 |
| 24 by 24 | FR-83 +   | 2-1/2 | C or B     | 2 | 2 |
| 24 by 24 | M +       | 2-1/2 | C or B     | 2 | 2 |
| 24 by 24 | FR-4+     | 2-1/2 | C or B     | 2 | 2 |
| 24 by 48 | FR-X1 +++ | 2-1/2 | F, C or B  | 2 | 2 |
| 24 by 48 | GR-1 +++  | 2-1/2 | F, C, or B | 2 | 2 |
| 24 by 48 | FR-83 +++ | 2-1/2 | F, C or B  | 2 | 2 |
| 24 by 48 | M +++     | 2-1/2 | F, C or B  | 2 | 2 |
| 24 by 48 | FR-4+++   | 2-1/2 | F, C or B  | 2 | 2 |
| 24 by 48 | FR-X1 ++  | 2-1/2 | F or B1    | 2 | 3 |
| 24 by 48 | GR-1 ++   | 2-1/2 | F or B1    | 2 | 3 |
| 24 by 48 | FR-83 ++  | 2-1/2 | F or B1    | 2 | 3 |
| 24 by 48 | M ++      | 2-1/2 | F or B1    | 2 | 3 |
| 24 by 48 | FR-4++    | 2-1/2 | F or B1    | 2 | 3 |
| 24 by 48 | FR-X1 +   | 3-1/4 | B1         | 3 | 3 |
| 24 by 48 | GR-1 +    | 3-1/4 | B1         | 3 | 3 |
| 24 by 48 | FR-83 +   | 3-1/4 | B1         | 3 | 3 |
| 24 by 48 | M +       | 3-1/4 | B1         | 3 | 3 |
| 24 by 48 | FR-4+     | 3-1/4 | B1         | 3 | 3 |

F = All fluted steel floor units; C = All cellular steel floor units; B = Any blend of fluted and cellular floor units; B {1} = Blend of one cellular steel floor unit to one or more fluted steel floor units.

+ - Hourly ratings apply when used in conjunction with Duct Outlet Protection System A.

++ - Hourly ratings apply when used in conjunction with either the larger duct outlets (576 sq in. per 100 sq ft of ceiling area) or Duct Outlet Protection System A, but not both.

+++ - Hourly ratings apply when used in conjunction with both the larger duct outlets (576 sq in. per 100 sq ft of ceiling area) and Duct Outlet Protection System A.

**BUILDING PRODUCTS OF CANADA CORP** — 5/8 or 3/4 in. Type FR-4; 5/8 or 3/4 in. Type FR-83; 3/4 in. Type FR-X1; 5/8 in. Type M. When 5/8 in. thick Type FR-83 is used, maximum Ratings are 2 Hr. See **Acoustical Materials** (BYIT), Building Products Of Canada Corp., for specific tile details.

**USG INTERIORS LLC** — 5/8 or 3/4 in. Type FR-4; 5/8 or 3/4 in. Type FR-83 ; 3/4 in. Type FR-X1; 5/8 in. Type M . When 5/8 in. thick Type FR-83 is used, maximum Ratings are 2 Hr. See **Acoustical Materials** (BYIT), USG Interiors LLC, for specific tile details.

**21. Hold Down Clips** — (Not shown) — No. 28 MSG spring steel. When ceiling is composed of nom 24 by 24 in. lay-in panels, one clip placed over bulb of cross tee near cross tee midpoint. When ceiling is composed of nom 24 by 48 in. lay-in panels, two clips placed over bulb of each cross tee near cross tee quarter-points. One leg of each clip is to be cut off when placed over bulb of cross tee adjacent to long side of light fixture.

**22. Accessible Hold-Down Clips** — (Not Shown) — No. 28 MSG spring steel. To be used in lieu of hold-down clips on each access panel in ceiling.

**23. Discrete Products Installed in Air-handling Spaces\*** — Automatic Balancing Valve/Damper (Not Shown - Optional) — For use with item 12. Valve/Damper to be provided with ducted installation with steel duct per damper manufacturer's instructions. Automatic Balancing Valve/Damper shall be installed within duct such that it is not directly above the ceiling radiation damper.

**METAL INDUSTRIES INC** — Model ABV-4, ABV-5, ABV-6

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

Last Updated on 2021-05-11

---

The appearance of a company's name or product in this database does not in itself assure that products so identified have been manufactured under UL's Follow-Up Service. Only those products bearing the UL Mark should be considered to be Certified and covered under UL's Follow-Up Service. Always look for the Mark on the product.

UL permits the reproduction of the material contained in the Online Certification Directory subject to the following conditions: 1. The Guide Information, Assemblies, Constructions, Designs, Systems, and/or Certifications (files) must be presented in their entirety and in a non-misleading manner, without any manipulation of the data (or drawings). 2. The statement "Reprinted from the Online Certifications Directory with permission from UL" must appear adjacent to the extracted material. In addition, the reprinted material must include a copyright notice in the following format: "© 2021 UL LLC"