

Restrained Assembly Ratings — 1 and 1-1/2 Hr.

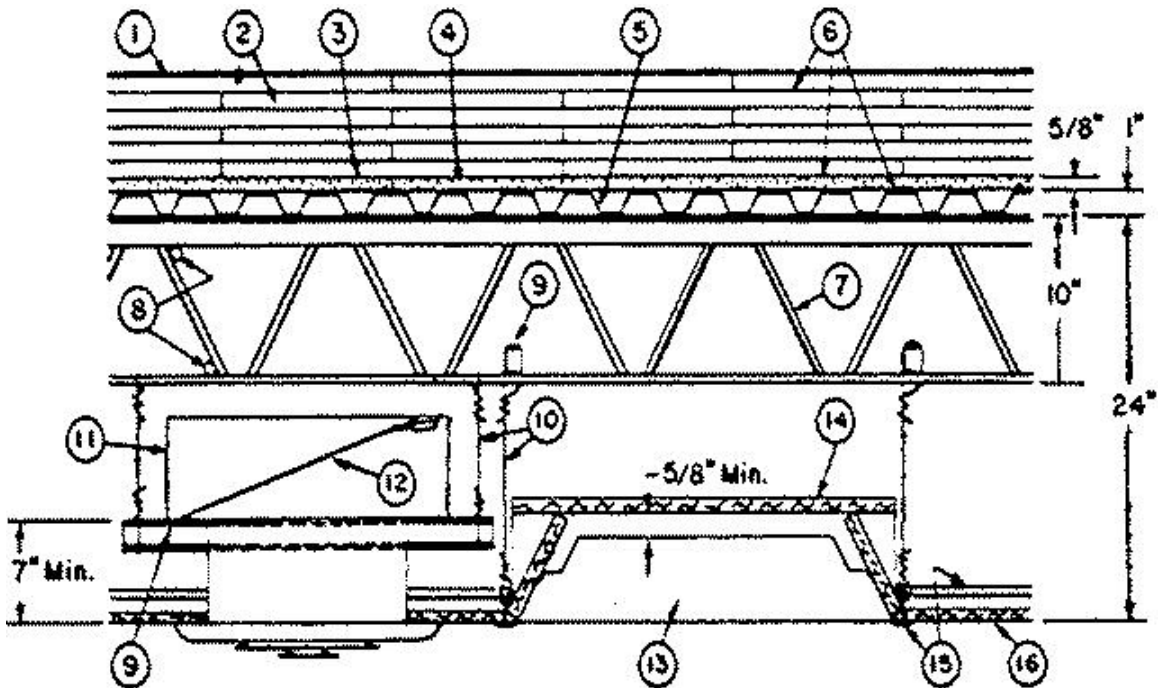
(See Items 2, 11, 12, 15 and 16)

Unrestrained Assembly Ratings — 1 and 1-1/2 Hr.

(See Items 2, 11, 12, 15 and 16)

Unrestrained Beam Ratings — 1 and 1-1/2 Hr.

(See Items 2, 11, 12, 15 and 16)



Beam — (Not Shown) — W6x12, min size. As alternate to steel beam, joist girders -(Not Shown)- 20 in. min depth and 13 lb/lin ft. min weight.

1. Roof Covering* — Consisting of hot mopped or cold application 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).

1A. In lieu of Item 1, 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 — Roofing Membranes (CHCI).

1B. Metal Roof Deck Panels — (Not shown)In addition to or in lieu of Item 1, the roof covering may consist of a mechanically fastened metal roof deck panel assembly. See Fire Resistance Directory — Metal Roof Deck Panels (CETW).

2. Mineral and Fiber Boards* — 24 by 48 in. min size, max size 48 by 96 in. to be applied in one or more layers. Boards to be installed perpendicular to gypsum wallboard direction with end joints staggered 2 ft in adjacent rows. When applied in more than one layer, each layer of board to be offset in both directions from layer below a min of 12 in. in order to lap all joints. Min thickness 1 in. (No limit on max overall thickness).

When only one layer is used it may be bonded to gypsum wallboard or laid loosely. When two or more layers are used the insulation may be fastened to steel roof deck (through wallboard) with mechanical fasteners (Item 6A) and/or bonded to wallboard or vapor barrier and/or bonded to additional layers of insulation with adhesive (Item 6) or hot asphalt (Item 6B). Adhesive may be omitted from between components secured together by mechanical fasteners.

BMCA INSULATION PRODUCTS INC — Permalite rigid mineral fiber boards.

FIBREX INSULATIONS INC — FBX Baseboard and FBX Capboard.

GAF MATERIALS CORP — GAFTEMP Perlite rigid mineral fiber boards.

JOHNS MANVILLE INTERNATIONAL INC — Rigid mineral fiber boards.

OWENS CORNING HT INC, DIV OF OWENS CORNING — Rigid glass fiber boards.

ROXUL INC — Toprock.

SIPLAST INC — Rigid glass fiber boards

2A. In lieu of Item 2, for use with Roofing Membrane* — (Item 1B), insulation consisting of:

Foamed Plastic* — Nom 24 by 48 in. foamed plastic insulation boards to be placed on top of sheathing material Item 1B.

THE DOW CHEMICAL CO — Min thickness 2 in., Max thickness 8 in., extruded polystyrene foamed plastic boards. The unfaced boards shall be covered with crushed stone or concrete pavers, at a rate of 10 psf, min.

OC CELFORTEC INC — Min thickness 2 in., max thickness 8 in., extruded polystyrene foamed plastic boards, to be placed on top of sheathing material (Item 1B) and covered with crushed stone or concrete pavers at a rate of 10 psf, min.

OWENS CORNING SPECIALTY & FOAM PRODUCTS — Min thickness 2 in., max thickness 8 in., extruded polystyrene foamed plastic boards, to be placed on top of sheathing material (Item 1B) and covered with crushed stone or concrete pavers at a rate of 10 psf, min.

VERSICO INC — 4-3/8 in. thick, concrete mortar faced extruded polystyrene, PMR Insulation Board.

T CLEAR CORP — 4-3/8 in. thick, concrete mortar faced extruded polystyrene Lightguard Boards.

2B. Roof Insulation — Mineral and Fiber Boards* and/or Building Units* — As an alternate to Items 2 and 2A, the roof insulation may consist of one layer of Type PK Building Unit* (composite mineral board and urethane foam) with the mineral board facing down, or Type PK Plus Building Units* bonded to gypsum board (Item 4) or vapor barrier (Item 3) with adhesive (Item 6) or hot asphalt (Item 6B), or fastened to steel deck (through the gypsum board) with mechanical fasteners (Item 6A). As an option, additional one or more layers of any thickness Mineral and Fiber Boards* and/or Building Units* fastened with hot asphalt, adhesive, or mechanical fasteners may be used.

BMCA INSULATION PRODUCTS INC — Mineral and Fiber Boards*, Building Units* — Type PK or PK Plus.

2C. Roof Insulation — Foamed Plastic* — As an alternate to Items 2 through 2B, any thickness polystyrene foamed plastic insulation boards bearing the UL Classification Marking, having a density of 2.5 pcf max, shall be installed on top of min 1 in. thick Mineral and Fiber Boards*

(Item 2) and covered with either the Built-Up Roof Covering (Item 1) or single-ply roofing membrane (Item 1A). The 1 in. thick Mineral and Fiber Boards to be installed over the gypsum wallboard (Item 4). See Foamed Plastic* (BRYX) category in the Building Materials Directory or Foamed Plastic* (CCVW) category in the Fire Resistance Directory for list of manufacturers.

2D. Foamed Plastic* — As an alternate to Items 2 through 2C, polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in., to be applied in one or more layers over the gypsum wallboard (Item 4). Min thickness is 1.3 in. for the 1 hr ratings and 2.0 in. for the 1-1/2 h ratings. No limit on max overall thickness. 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 layer below a min of 6 in. in order to lap all joints.

APACHE PRODUCTS CO — Pyrox.

ATLAS ROOFING CORP — AC Foam II, AC Foam III.

BPB AMERICA INC — Types L, O.

FIRESTONE BUILDING PRODUCTS CO, DIV OF BFS DIVERSIFIED PRODUCTS L L C — "ISO 95+FK", "ISO 95+GL", "ISO 95+GRF", "ISO 95+GW", "ISO 300".

GAF MATERIALS CORP — Isotherm R.

HUNTER PANELS — H Shield.

JOHNS MANVILLE INTERNATIONAL INC — ENRGY 2, ENRGY 3, ISO-1, PSI 25.

LOADMASTER SYSTEMS INC — Loadmaster Polyisocyanurate Insulation.

RMAX INC — Multi-Max FA, Multi-Max FA-3 .

STEVENS ROOFING SYSTEMS, DIV OF JPS ELASTOMERICS CORP — "Stevens ISO 2000", "Stevens ISO 3000"

2E. Building Units — As an alternate to Item 2 through 2D, 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 is 1.3 in. for the 1 hr ratings and 2.0 for the 1-1/2 hr ratings. No limit on max overall thickness. Boards to be installed over the gypsum wallboard (Item 4) with end joints staggered a min. of 6 in. in adjacent rows.

ATLAS ROOFING CORP — AC Foam Nailbase Insulation, Vented — R.

FIRESTONE BUILDING PRODUCTS CO, DIV OF BFS DIVERSIFIED PRODUCTS L L C — Hailgard

JOHNS MANVILLE INTERNATIONAL INC — Type Nailboard

2F. Foamed Plastic* — As an alternate to Items 2 through 2E (for 1 hr. ratings only). Extruded polystyrene foamed plastic boards to be installed in one or more layers over gypsum wallboard (Item 4). Joints of gypsum wallboard to be covered with 4 in. wide foil tape. Min thickness is 1 in. when a min 1/2 in. thick layer of mineral and fiber board (Item 2) is installed on top of the foamed plastic. Min thickness is 3 in. when the mineral and fiber board (Item 2) is omitted. No limit on max thickness. All joints between layers offset min 6 in.

THE DOW CHEMICAL CO

OWENS CORNING SPECIALTY &

FOAM PRODUCTS

2G. Building Units* — As an alternate to Items 2 through 2F. Polyisocyanurate foamed plastic insulation boards faced on the underside (or both sides) with mineral fiber board. Min thickness of the polyisocyanurate core is 1.3 in. for 1 hr ratings and 2.0 in. for 1-1/2 hr ratings. No limit on max overall thickness. Boards to be installed with end joints staggered a min of 6 in. in adjacent rows. Adhesive (Item 3) may be applied between the building units and the vapor retarder (or gypsum wallboard if vapor retarder is not used).

FIRESTONE BUILDING PRODUCTS CO, DIV OF BFS DIVERSIFIED PRODUCTS L L C — "ISO 95+ Composite".

JOHNS MANVILLE INTERNATIONAL INC — Fesco-Foam.

2H. Building Units* — As an alternate to Items 2 through 2G, polyisocyanurate foamed plastic insulation boards faced on the underside with wood fiber board. Min thickness of the polyisocyanurate core is 1.3 in. for the 1 hr ratings and 2.0 in. for the 1-1/2 hr ratings. 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, DIV OF BFS DIVERSIFIED PRODUCTS L L C — ISO 95+ Wood Fiberboard Composite

JOHNS MANVILLE INTERNATIONAL INC — ENRGY-2 Plus

2I. Building Units* — Not Shown — As an alternate to Items 2 through 2H, 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 building units are applied over gypsum wallboard (Item 4). The thickness of the panel depends upon the thinnest portion of the polyisocyanurate insulation. The following dimensions apply to the polyisocyanurate insulation, min 1.3 in. thick for the 1 hr ratings and 2.0 in. for the 1-1/2 hr ratings. There is no limit on the max insulatoin thickness.

GAF MATERIALS CORP — Type INSUL-AIR.

JOHNS MANVILLE INTERNATIONAL INC — Type ISO-VENT.

2J. Building Units* — As an alternate to Items 2 through 2I, 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 is 1.3 in. for 1 hr ratings and 2.0 in. for the 1-1/2 hr ratings. No limit on overall thickness. boards to be installed with end joints staggered a min of 6 in. in adjacent rows. Adhesive (Item 3) may be applied between the building units and the vapor retarder (or gypsum wallboard if vapor retarder is not used).

JOHNS MANVILLE INTERNATIONAL INC — Fesco-Foam, ENRGY-2 Plus , ENRGY 2 Gypsum Composite, ISO-VENT.

2K. Roof Insulation - Mineral and Fiber Boards* — Not Shown - Optional, Applied in one or more layers over Foamed Plastic (Item 2D) to be applied with adhesive (Item 6), asphalt or coal tar pitch (Item 6B) or mechanically fastened (Item 6A).

JOHNS MANVILLE INTERNATIONAL INC — Fesco, RetroFit, Dura Board

3. Sheathing Material* — (Optional) — Vinyl film vapor barrier, applied with adhesive to gypsum wallboard. Adjacent sheets overlapped 2 in.

BMCA INSULATION PRODUCTS INC

3A. In lieu of Item 3, for use only with Foamed Plastic insulation (Item 2A), Roofing Membrane* — loosely laid over gypsum wallboard.

AMERICAN HYDROTECH INC — Type Hydro-Seal.

FIRESTONE BUILDING PRODUCTS CO, DIV OF BFS DIVERSIFIED PRODUCTS L L C

W R GRACE & CO - CONN

CONSTRUCTION PRODUCTS DIV — Type GRM350.

3B. Sheathing Material* — (Optional) — In lieu of Item 3 or 3A, a self-adhered rubberized asphalt roofing underlayment membrane which may be placed on top of the gypsum wallboard (Item 4) or on the roof insulation (Item 2 or any nonpolystyrene foamed plastic insulation covered as an alternate to Item 2).

W R GRACE & CO - CONN

CONSTRUCTION PRODUCTS DIV — Grace Ice and Water Shield, Grace Select, Grace Ultra, and Grace Basik.

3C. Sheathing Material* — (Optional) — In lieu of Items 3, 3A and 3B, a self-adhered rubberized asphalt roofing underlayment membrane which may be placed on top of gypsum wallboard or on the roof insulation.

CARLISLE COATINGS & WATERPROOFING INC — CCW-707.

4. Gypsum Board — (Classified or unclassified) — Supplied in sheets nom 2 by 4 ft to 4 by 12 ft, by nom 5/8 in. thick. Min weight 2.0 psf. Applied perpendicular to steel roof deck direction with adhesive or laid loosely. End joints to occur over crests of steel roof deck with end joints staggered 2 ft in adjacent rows.

See Gypsum Board (CKNX) category for names of manufacturers.

5. Steel Roof Deck — Min 1 in. deep, min 25 in. wide, fluted painted or galv steel deck. Min 0.019 in. thick (26 gauge). Flutes approx 4 in. OC, crests approx 2-3/4 in. wide. As an alternate, 1-1/2 in. deep, min 18 in. wide fluted galv steel deck. Min 0.029 in. thick (22 gauge), flutes 6 in. OC, crest width ranging from 3-1/2 to 5 in. 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.

Classified Steel Floor and Form Units* — Noncomposite fluted or corrugated, min 0.023 in. thick (24 gauge), 24 to 36 in. wide, 1-5/16, 1-1/2, 2 or 3 in. deep painted or galv steel units. Spacing of welds attaching units to supports shall not exceed 12 in. OC Adjacent units welded together 36 in. OC along side joints.

CONSOLIDATED SYSTEMS INC — Types B, BI, F.

6. Adhesive* — Optional — May be applied between crests of steel roof deck and gypsum wallboard in 1/2 in. wide ribbons 8 in. OC at 0.4 gal per 100 sq ft. May also be applied in 1/2 in. wide ribbons 6 in. OC, at 0.4 gal per 100 sq ft, between gypsum wallboard and vapor barrier, and between vapor barrier and mineral and fiber boards, or directly between gypsum boards and roof insulation when vapor barrier is omitted. May also be applied at the same rate between layers of roof insulation.

BMCA INSULATION PRODUCTS INC

6A. **Mechanical Fasteners** — (Not shown) — Any steel nail or steel clip type fastener designed for the purpose may be used to attach one or more layers of insulation to steel roof deck (through gypsum board). As an alternate, the gypsum wallboard may be attached directly to the steel roof deck with the mechanical fasteners.

6B. **Hot Asphalt or Coal Tar Pitch** — (Not shown) — May be used as an alternate to adhesive between layers of roof insulation at a rate not to exceed 35 lb per 100 sq ft.

7. **Steel Joists** — Type 10J4 or 12K1 min size. 10K1 size may be used for a limited span of 12 ft-0 in. max. As alternate, any LH-Series steel joist spanning no greater than 60 ft may be used. For spans greater than 60 ft., LH-Series joists may be used provided that their vertical deflection under published total load shall not be greater than 1/244 of the joist span. Joist may be spaced a max 72 in. OC and welded to end supports.

8. **Bridging** — Steel bars, 1/2 in. diam welded to top and bottom chords of each joist.

8A. **Lateral Bracing** — (Not shown) — Castelite beams shall be braced top and bottom with min 1-1/4X1-1/4X1/8 in. angles, approximately located at third points of the span.

9. **Cold Rolled Channels** — No. 16 MSG cold-rolled steel channels, 1-1/2 in. deep with 9/16 in. flanges. Placed on lower chord of joists and secured with 18 SWG galv steel wire. Installed perpendicular to joists, located as required to provide hanger wire attachment points.

When steel joists are spaced more than 5 ft. OC, two cold-rolled channels placed back to back and tied together with double strand of 18 SWG galv steel wire at 24 in. OC. The double channels installed perpendicular to the joists and spaced a max of 48 in. OC may be placed on top of the joists' bottom chord and tied to each joist with a double strand of 18 SWG galv steel wire or suspended below the joists with 12 SWG galv steel wire wrapped around the cold-rolled channels and with the other end wrapped around the bottom chord of the joists.

9A. **Cold Rolled Channels** — (Not shown) — for use with Item 7A) - No. 16 MSG cold-rolled channels, 1-1/2 in. deep with 9/16 in. flanges, suspended from beams by 12 SWG galv steel hanger wire. Channels installed perpendicular to beams, located as required to provide hanger wire attachment points. When beams are spaced greater than 5 ft. OC, two cold-rolled channels placed back to back and tied together 24 in. OC with double strand of 18 SWG galv steel wire. Doubled channels oriented perpendicular to and suspended from the beams, spaced a max of 48 in. OC to provide the hanger wire attachment points.

10. **Hanger Wire** — No. 12 SWG galv steel wire twist-tied to steel joists or cold-rolled steel channels. When the ceiling consists of nom 24 by 24 or 24 by 48 in. panels, hanger wires spaced max of 48 in. OC on main runners adjacent to cross tee intersections. Hanger wires to occur at all four corners of light fixtures, at midspan of cross tees adjacent to 4 ft light fixtures, air duct outlets, and adjacent to each main runner splice. When the ceiling consists of nom 20 by 60 in. panels, hanger wires shall be spaced 40 in. OC along main runners, one wire shall occur at each corner of light fixtures, at midspan of all cross tees, and adjacent to each main runner splice.

11. **Air Duct** — Min 0.019 in. thick (26 gauge) galv steel. Total area of duct openings not to exceed 255 sq in. per each 100 sq ft of ceiling area. Area of individual duct opening not to exceed 255 sq in. Max dimension of opening 18 in. Inside and outside faces of duct throat protected with 1/16 in. thick ceramic fiber paper laminated to the metal. For the 1 hr **Assembly and Beam Ratings** only, the ceramic fiber paper laminated to the inside and outside faces of the duct throat may be omitted. For the 1 hr **Assembly and Beam Ratings** only, the total area of duct openings per 100 sq ft of ceiling area may be increased to 576 sq in., with the area of ind duct opening not to exceed 576 sq in. Max dimension of opening 30 in. Duct supported by 1-1/2 in. deep, min 0.053 in, thick (16 gauge) cold-rolled steel channels spaced not over 48 in. OC suspended by 12 SWG galv steel wire.

As an alternate to the galv steel duct, air ducts fabricated from rigid Air Duct Materials* may be used in lieu of steel ducts. Total area of duct openings not to exceed 57 sq in. per each 100 sq ft of ceiling area. Area of individual duct opening not to exceed 113 sq in. Max dimension of opening

12 in. The sheet steel duct drop or outlet is positioned at the center of a 24 in. long min 0.029 in. thick (22 gauge) sheet steel duct liner. The sheet steel duct drop is insulated with a nom 1 in. thick, 5 pcf density rigid glass fiber material. The ducts are supported by min 0.053 in. thick (16 gauge) 1-1/2 in. cold-rolled steel channels suspended from the joists with 12 SWG galv hanger wire. Channels are located directly below the sheet steel duct liner, one on each side of the duct drop and are spaced between duct drops at 72 in. OC for ducts up to 36 in. wide and 48 in. OC for ducts between 36 and 60 in. wide.

CERTAINTED CORP — Rigid, Class I.

KNAUF FIBER GLASS GMBH — Rigid, Class I.

12. **Damper** — Min 0.056 in. thick (16 gauge) galv steel, sized to overlap duct opening 2 in. min. Protected on both sides with 1/16 in. thick ceramic fiber paper laminated to the metal and held open with a Fusible Link (Bearing the UL Listing Mark). For the 1 hr Assembly and Beam Ratings only, Duct Outlet Protection System A, as described in the Design Information Section, may be used in lieu of the damper described above.

12A. **Air Terminal Units*** — (Not shown) — May be used as an alternate to air duct outlets with surface mounted diffusers (Item 11) for the **1 Hr. Assembly Ratings Only**. A max of 16 lin ft of diffuser slot is allowed for each 100 sq ft of ceiling area. Units must be supported from the structural steel or from cold-rolled steel channels tied to the structural steel and installed in accordance with accompanying installation instructions.

13. **Fixtures, Recessed Light** — (Bearing the UL Listing Mark). Fluorescent lamp type, steel housing, nom 2 by 4 ft or 20 by 60 in. size. Fixtures spaced so their area does not exceed 24 sq ft per 100 sq ft of ceiling area. When 20 by 60 in. fixtures are used, fixture stabilizers (Item 13A) shall be used in addition to the hanger wires at midspan of the cross tees. Wired in conformance with the National Electrical Code. Fixture and ballasts must be considered for these ambient temperature conditions before installation.

13A. **Fixture Stabilizer** — (Not shown) — Required for 2 by 4 ft and 20 by 60 in. size light fixtures when metal pans (Item 15B) are used and only for 20 by 60 in. size fixtures when metal pans are not used. One 16 MSG painted steel channel formed as a yoke, secured to the web at midspan of cross tee on each side of fixture.

13B. **Fixtures, Recessed Light** — (Bearing the UL Listing Mark) — (Not Shown) — As an alternate to Item 13, incandescent lamp type, steel housing, nom 6-1/2 in. diam by 7-1/2 in. high. Each fixture provided with a nom 6-1/2 in. by 10 in. painted steel base plate screw-attached to the "high hat" fixture with four 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 supported from roof structure or from cold-rolled steel channel, independent of ceiling cross tees, with steel hanger wires secured to steel bar hangers near each corner of the base plate. A max of two "high hat" fixtures may be substituted for each nom 24 by 48 in. fixture permitted in the ceiling (max six "high hat" fixtures per 100 square ft of ceiling area). Wired in conformance with the National Electrical Code.

13C. **Alternate Recessed Light Fixtures -** — (Not shown) As an alternate to the fluorescent lamp lighting fixture, High Intensity Discharge (HID) lighting fixture may be used at a spacing of three per min 100 sq ft of ceiling area. These fixtures are used in conjunction with the nom 24 by 24 in. acoustical panels. The fixture consists of 20 MSG or heavier steel mounting pan having 23-3/4 by 23-3/4 in. outside dimensions and a 13-1/2 in. diam opening at it's center with a 5/8 in. high stiffening return flange at all four sides. The reflector and reflector top are made of spun aluminum. The total height of the reflector and the reflector top is 17-1/2 in. The total weight of the fixture with lamp and ballast shall not exceed 40 lb. The 24 by 24 in. suspension system module containing the HID fixture shall be supported at each corner by a hanger wire. Electrical wiring of the fixture shall conform with the National Electrical Code.

14. **Fixture Protection — Acoustical Material*** — 5/8 in. thick, cut to form a five sided enclosure, trapezoidal in cross-section, approx 1/2 in. longer and wider and 5/8 in. higher than the

light fixture housing. For 2 by 4 ft fixture the protection consists of a 23-3/4 by 47-3/4 in. top piece, two 5-7/8 by 47-3/4 in. side pieces, and two 4 -1/2 by 23-3/4 in. end pieces. For 20 by 60 in. fixture the protection consists of a nom 20 by 60 in. top piece, two nom 6 by 60 in. side pieces, and two nom 4-1/2 by 20 in. end pieces. The top edge of each fixture protection side piece may be provided with a 1 in. deep by max 20 in. long notch near its midpoint. The side and top pieces are laid in place and the end pieces are held in place with three 8d nails spaced 8 in. OC. (S)=Surface perforations.

ARMSTRONG WORLD INDUSTRIES INC — Type 5/8 in. P (S); 5/8 in. PC (S).

14A. Fixture Protection — Acoustical Material* — For use with "high hat" light fixtures (Item 13B). Five sided enclosure, rectangular in cross section, approx 1 in. longer and wider than fixture with sufficient depth to provide 1 in. clearance to the top of the fixture. Pieces cut from same acoustical material used in the ceiling (Item 16) and assembled using Type 8d nails. One side of the fixture protection enclosure may be cut 1 in. shorter than the height of the enclosure such that a 1 in. high clearance is maintained between its top and the top of the enclosure.

14B. Fixture Protection For Alternate Fixture (Item 13C) - Acoustical Material* — (Not shown)-Five sided box enclosure with 1 in. high opening at top of two opposite sides. Pieces cut from the same acoustical material as Item 19. Top piece is 23-3/4 by 23-3/4 in. size; two opposite side pieces each is 23-3/4 in. long by the height of the fixture plus 1 in.; remaining two opposite side pieces each is 22-1/2 in. long by the height of the fixture. Pieces assembled with 8d nails spaced 6 in. OC.

15. Steel Framing Members* — Main runners and cross tees in combinations listed below.

A. Main runners nom 12 ft long, spaced 4 ft OC. Cross tees nom 4 ft long, installed perpendicular to main runners and spaced 2 ft OC. Cross tees nom 2 ft long, installed perpendicular to 4 ft cross tees and spaced 4 ft OC. For nom 24x24 and 24x48 in. panels.

ARMSTRONG WORLD INDUSTRIES INC — Types AFG, AFG-A. For the 1 hr Assembly and Beam Ratings only, Type AFG-A steel framing members may be used. Types AFG-LT and AFG-MX steel framing members for use with 24 by 24 in. panels. Type GLBP (consisting of main runners, 4 ft cross tees and steel straps) for use with 24 by 48 in. Type P or PC lay-in panels.

BAILEY METAL PRODUCTS LTD — Type BEF.

BPB AMERICA INC — Types PAC, PCH, PCS. When Type PAC steel framing members are used, the Assembly and Beam Ratings are 1 hr .

CHICAGO METALLIC CORP — Types 250, 260, 1250, 1260, 1850, 1860. When Types 260, 1260, 1860 steel framing members are used, the Assembly and Beam Ratings are 1 hr.

B. Main runners nom 10 ft long spaced 60 in. OC. Cross tees nom 5 ft long, installed perpendicular to main runners and spaced 20 in. OC. For nom 20x60 in panels.

CHICAGO METALLIC CORP — Types 250, 260, 1250, 1260, 1850, 1860.

C. C. Main runners 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. 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.

USG INTERIORS INC — Types DXL, DXLZ, SDXL.

CGC INTERIORS, DIV OF CGC INC — Types DXL, DXLZ, SDXL.

15A. Steel Framing Members* — For use with metric size panels described under Item 16. Main runners nom 3000 or 3600 mm long, spaced 1200 mm OC. Cross tees nom 1200 mm long, installed perpendicular to main runners and spaced 600 mm OC. Cross tees nom 600 mm long, installed perpendicular to 1200 mm cross tees (midway between main runners) spaced 1200 mm OC. 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 ½ in. profile. For 600 by 600 or 1200 mm lay-in panels.

CGC INTERIORS, DIV OF CGC INC — Types DXL, DXLZ, SDXL.

USG INTERIORS INC — Types DXL, DXLZ, SDXL.

15B. Steel Framing Members* — **Metal pans** — (Not shown) (Optional) — Channel-shaped metal pans in various colors and finishes, installed perpendicular to cross tees or main runners and spaced 4 or 6 in. O.C. The flange edges of the metal pans engage and interlock with the vertical tabs of the corresponding grid adapters with tabs 4 or 6 in. O.C. (See Item 15C). End laps joints of the metal pans shall occur adjacent to main runners or cross tees. The metal pans shall each be supported by at least two main runners or cross tees.

CHICAGO METALLIC CORP — Type 1650.

15C. Steel Framing Members* — **Grid adapter** — (Not shown) (Optional) — For use with Type 1650 metal pans (See Item 15B). Angle shaped adapter with a looped return flange; installed parallel to cross tees or main runners by engaging return flange of adapter to the flange of the cross tee or main runner. The 48 or 24 in. long adapters are intended for use with cross tees or main runners, respectively.

CHICAGO METALLIC CORP — Type 1650.

15D. Steel Framing Members* — **Filler strips** — (Not shown) (Optional) — For use with Type 1650 metal pans. Filler strips are 0.018 to 0.024 in. thick, steel or aluminum, 13/32 or 5/8 in. deep by 3/4 in. wide, placed between the metal pans.

CHICAGO METALLIC CORP — Type 1650.

15E. Steel Framing Members* — 9/16 in. wide narrow flange grid may be used as an alternate to 15/16 in. wide flange grid systems. Main runners, nom 12 ft long spaced 4 ft OC. Cross tees, nom 4 ft long, installed perpendicular to main runners and spaced 2 ft OC. Cross tees, nom 2 ft long, installed perpendicular to 4 ft cross tees and spaced 4 ft OC. Type FSLK or PFSLK for use with Type P, nom 24 by 24 in. square edge or tegular edge lay-in panels. Type FSL for use with Type P, nom 24 by 24 in. tegular edge lay-in panels. Grid modules containing light fixtures must employ a fixture centering clip at each corner. The 24 gauge electrogalvanized steel clip is nested on the flange of the intersecting grid tees, has two 1-7/16 in. high legs with their sides perpendicular to each other and a U-shaped return at the top of each leg for engaging over the bulb of the intersecting grid tees. When 9/16 in. wide flange grid is used, max Assembly and Beam Ratings are 1 hr.

ARMSTRONG WORLD INDUSTRIES INC — Types FSL, FSLK, PFSLK for 1 hr assembly and beam ratings only. Type FSLK and Type PFSLK cross tees may be used interchangeably with either Type FSLK or PFSLK main runners.

15F. Steel Framing Members* — 9/16 in. wide narrow flange grid may be used as an alternate to 15/16 in. wide flange grid systems. Main runners, nom 12 ft long, spaced 4 ft OC. Cross tees, nom 4 ft long, installed perpendicular to main runners and spaced 2 ft OC. Cross tees, nom 2 ft long, installed perpendicular to 4 ft cross tees and spaced 4 ft OC. For use with Type P, nom 24 by 24

in. square edge lay-in panels. When 9/16 in. wide flange grid is used, max Assembly and Beam Ratings are 1 hr.

BPB AMERICA INC — Type PE for 1 hr assembly and beam ratings only .

CHICAGO METALLIC CORP — Type 4050 for 1 hr assembly and beam ratings only.

16. **Acoustical Material*** — Nom 24 by 24 or 48 in. or 20 by 60 in. lay-in panels. Border panels supported at walls by min 0.016 in. thick (26 gauge) painted steel angle with 7/8 in. legs; or, min 0.016 in. thick (26 gauge) painted steel channel, 1-5/8 in. deep with 7/8 in. flanges. (S)=Surface perforations.

Nom Panel Size	Restrained Assembly Rating Hr	Unrestrained Assembly & Beam Rating Hr	Acoustical Mtl Type
24 x 24	1 hr.	1 hr.	BF, P or PC
24 x 48 or 20 x 60	1-1/2 hr.	1 hr.	PC
24 x 48 or 20 x 60	1-1/2 hr.	1-1/2 hr.	P

ARMSTRONG WORLD INDUSTRIES INC — Type 5/8 in. P (S); 5/8 in. PC (S); 3/4 in. BF (S).

Type P or PC (S, P) 15 mm thick 600x600 or 1200 mm. These metric size panels may only be used with metric size grid described under item 15A. Hourly ratings shown for 24x24 in. size panels apply to 600x600 mm size panels while ratings shown for 24x48 in. panels apply to 600x1200 mm size panels.

16A. **Acoustical Materials* - Antenna Panel** — (Optional, Not Shown) - When the ceiling is composed of nom 24 by 24 in. lay-in panels, a lay-in acoustical ceiling panel with integral high frequency antennae may be included in the ceiling. Thickness, type and edge detail of antenna panel to match surrounding acoustical ceiling panels. Antenna panel to be installed in accordance with accompanying instructions. A max of one antenna panel may be used per each 100 sq ft of ceiling area.

ARMSTRONG WORLD INDUSTRIES INC

17. **Speaker Assemblies For Fire Resistance*** — (Optional, Not Shown) — The speaker assemblies consist of speakers, speaker enclosures and their accessories. The ceiling penetration from the speaker enclosure shall not exceed 11-7/8 by 11-7/8 in. for the square speaker enclosures and 12 in. in diam for the round speaker enclosures. The speaker assemblies are installed in accordance with the installation instructions provided. A max of two 144 sq in. speaker assemblies per 100 sq ft of ceiling area is allowed.

ATLAS/SOUNDOLIER, DIV OF AMERICAN TRADING & PRODUCTION CORP

See **Speaker Assemblies For Fire Resistance (CHML)**, Atlas/Soundolier, Div of American Trading & Production Corp. for specific types.

17A. **Speaker Assemblies For Fire Resistance*** — (Optional, Not Shown) — As an alternate to Item 17, speaker panels may be included in the ceiling when the ceiling is composed of nom 24 by 24 or 48 in. lay-in panels. Nom 24 by 24 in. metal-framed lay-in speaker panels installed in accordance with the accompanying installation instructions. Hanger wires are required on the main runners and on the nom 4 ft long cross tees at all four corners of the speaker panel. Each speaker panel to be covered with a nom 24 by 24 in. panel of the same acoustical material used in the ceiling. Acoustical material panel to be centered over and supported by the metal "bridge" of the

speaker panel. A max of one speaker panel is allowed per 100 sq ft of ceiling area with a min center-to-center spacing of 10 ft between speaker panels.

18. **Hold-Down Clips** — (not shown) — No. 24 MSG spring steel, places over cross-tees 2 ft OC.

*Bearing the UL Classification Mark

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