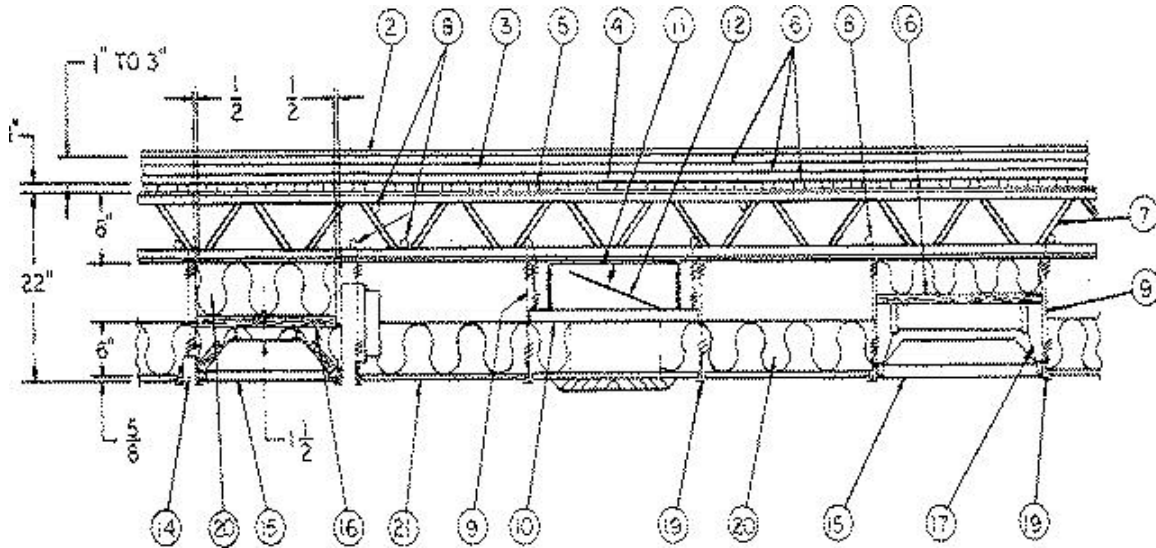


Restrained Assembly Rating — 1 Hr.

Unrestrained Assembly Rating — 1 Hr.

Unrestrained Beam Rating — 1 Hr.



1. **Beam** — W6 x 12, min size (not shown).

2. **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).

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-Roofing Membranes (CHCI).

3. **Mineral And Fiber Boards*** — 24 by 48 in. or larger, to be applied in one or more layers with adhesive between layers and with adhesive to vapor barrier. Boards to be installed perpendicular to steel roof deck direction with end joints staggered 12 in. or more 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. When two or three layers are used, the initial layer(s) may be secured to the steel roof deck with mechanical fasteners (Item 6A) provided the final layer is installed over the mechanical fasteners and secured with adhesive or hot asphalt.

BMCA INSULATION PRODUCTS INC — Permalite.

FIBREX INSULATIONS INC — FBX Baseboard and FBX Capboard.

GAF MATERIALS CORP — GAFTEMP Perlite.

JOHNS MANVILLE INTERNATIONAL INC

OWENS CORNING HT INC, DIV OF OWENS CORNING

ROXUL INC — Toprock.

SIPLAST INC

3A. **Roof Insulation-Foamed Plastic*** — Alternate to Item 3. Any thickness polystyrene foamed plastic insulation boards bearing the UL Classification Marking, having a density of 2.5 pcf max, may be installed on top of min 1 in. thick Mineral and Fiber Boards (Item 3) and covered with Built-Up Roof Covering (Item 2). See Foamed Plastic* (BRYX) category in the Building Materials Directory or Foamed Plastic* (CCVW) category in the the Fire Resistance Directory for list of Classified companies.

4. **Sheathing Material*** — Vinyl film vapor barrier, applied with adhesive to steel roof deck. Adjacent sheets overlapped 2 in.

BMCA INSULATION PRODUCTS INC

5. **Steel Roof Deck** — Min 1 in. deep, 25 in. wide, fluted galv. steel deck. Min 24 MSG. Flutes approx 4 in. OC, crests approx 2-3/4 in. wide. Welded to supports with welding washers 12 in. OC, to occur at side lap joints and at center of deck sections. Side lap joints of adjacent units to be welded or secured together with No. 12 by 1/2 in. self-drilling, self-tapping steel screws midway between joists. Or

Classified Steel Floor and Form Units* — 1-1/2 in. deep, 30 in. or 36 in. wide, fluted galv steel deck, Min 0.028 in. thick (24 gauge). Welded to supports with welding washers 15 in. OC, to occur at side lap joints and at center of deck sections. Side lap joints of adjacent units to be welded or secured together with No. 12 by 1/2 in. self-drilling, self-tapping steel screws midway between joists.

CONSOLIDATED SYSTEMS INC — 30 in. wide Types B, BI, F.

6. **Adhesive*** — Applied in approx 1/2 in. wide ribbons at 0.4 gal per 100 sq ft (approx. 6 inch OC) between layers of mineral and fiber boards, between vapor barrier and deck and between vapor barrier and mineral and fiber boards.

BMCA INSULATION PRODUCTS INC

6A. **Mechanical Fasteners** — (Not shown) — Any steel nail, steel screw or steel clip type fastener designed for the purpose may be used to secure the initial layer(s) of roof insulation to the steel roof deck provided that the final layer of roof insulation is installed over the mechanical fasteners and secured with adhesive (Item 6) or hot asphalt (Item 6B).

6B. **Hot Asphalt** — (Not shown) — May be used as an alternate to adhesive (Item 6) between layers of roof insulation when applied at a rate not exceeding 35 lb per 100 sq ft.

7. **Steel Joists** — Type 8H3, min size, spaced 48 in. O.C. and welded to end supports.

NOTE: Design load shall stress joists to a max bending stress of 22,000 PSI.

8. **Bridging** — Steel Bars, 5/8 in. diam, welded to top and bottom chord of each joist. May be used as support for hanger wires when welded to top of joist bottom chord.

9. **Hanger Wire** — No. 12 SWG galv steel wire, twist-tied to bottom chord of joists, bridging bars, or cold-rolled channels. Located 48 in. O.C. along main runners; additional hanger wires to occur at midspan of all 4 ft long cross tees, at all four corners of light fixtures, at all four corners of panels having air duct penetrations, and adjacent to main runner splices. Additional hanger wires also required on cut cross tees over 2 ft long at walls.

10. **Cold Rolled Channels** — Min 0.053 in. thick (16 gauge) cold-rolled steel channels, 1-1/2 in. deep, with 9/16 in. flanges placed under air duct and supported by hanger wires at each end. Spaced not over 48 in. O.C. and on each side of duct outlet to support air duct. May also be used as support for hanger wires when placed in a vertical position on top of the bottom chord of joists

and cross-tied with 12 SWG galv steel wire. The wire shall be tightly wound on both members and on itself with a min of three twists.

11. **Air Duct** — No. 24 MSG min galv steel. Total area of duct openings not to exceed 576 sq in. per each 100 sq ft of ceiling area with the total area of each ind duct opening not to exceed 576 sq in. Max dimensions of 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 vertical hanger wire.

12. **Damper** — No. 16 MSG galv steel, sized to overlap duct drop opening 2 in. min. Protected on both surfaces with 1/16 in. thick ceramic fiber paper laminated to the steel damper with adhesive and held open with a Fusible Link (Bearing the UL Listing Mark). In lieu of the damper described above, Duct Outlet Protection System A, as described in the Design Information Section may be used with steel ducts. Larger or smaller size prefabricated dampers classified under the Ceiling Dampers category may be substituted for the above damper in accordance with the Classification for the specific damper. Similarly, Classified Air Terminal Units may be used in lieu of the above duct drop penetrations in accordance with the Classification for the specific unit.

13. **Air Terminal Units*** — Linear Air Diffusers — 4 ft long units. Located in openings formed by two cross tees spaced 2 in. O.C. 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 midpoint. A max of 12 lin ft of linear air diffuser is allowed per each 100 sq ft of ceiling area.

TEMPMASTER CORP — Type TBD.

14. **Air Terminal Units*** — Linear Air Returns — 4 ft long units. Located in openings formed by two cross tees spaced 2 in. O.C. 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 ft 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.

TEMPMASTER CORP — Type TBDR.

15. **Fixtures, Recessed Light** — (Bearing the UL Listing Mark). Fluorescent lamp type, steel housing 1 by 4 ft, 2 by 2 ft, 2 by 4 ft, or 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) and with or without vented tops for air return purposes. Air boots must be used in conjunction with fixtures designed for that purpose. Linear air diffusers (Item No. 13) and linear air returns (Item No. 14) may only be used in conjunction with nom 20 by 48 in. fixtures. When nom 1 by 4 ft, 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. When nom 2 by 2 ft fixtures are used, aggregate of fixtures not to exceed four 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 Stabilizer** — (Not shown) — For use with Type 1650 metal pans (See Item 19A); one min 0.047 in. thick (16 MSG) galv steel channel yoke per light fixtures, secured to the web at midspan of cross tee on each side of fixture.

15B. **Fixture Stabilizer** — (Not shown) (Optional) — Min. 0.020 in. thick (25 MSG) painted steel spacer bar formed as an angle with 1 in. legs and hemmed edges and slots perpendicular to and near the ends of the spacer bar for engaging over the bulb of the tees. Engaged over the bulb at midspan of the cross tees on each side of all light fixtures and over the bulb of the adjacent cross tee.

15C. Fixtures, Recessed Light — (Bearing the UL Listing Mark) — (Not Shown) — As an alternate to Item 15, 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 to 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 six "high hat" fixtures per 100 sq ft of ceiling area). For use with USG Interiors, Inc. steel framing members and acoustical materials only. Wired in accordance with National Electrical Code.

16. Fixture Protection-Acoustical Material* — One panel having its length equal to the length of the fixture is centered over and spaced 1-1/2 in. from the top of fixture housing. The width of the top panel for the nom 12 and 24 in. wide fixtures shall be 11 and 23 in., respectively. The 1-1/2 in. clearance shall be provided by scrap pieces of steel framing member tees. For nom 24 by 48 in. fixtures with air boots and crossover duct, a nom 24 in. wide panel is placed directly over the top of the duct and air boots. For non-air handling or return air fixtures, a piece of acoustical material of a length and width equal to the length and height of the fixture, respectively, is placed against each side of the fixture. Another piece, equal to the width of the fixture and of sufficient height to cover the height from the top of the main runner to the top of the panel over the fixture, is placed against each end of the fixture and attached to the top panel with 6d or 8d c.c. nails spaced approx 6 in. OC. Where the fixtures are butted end to end, the acoustical material end pieces at the butting ends are omitted and the top panels are butted together. As an alternate, the top and end panels may be retained in position by means of 18 SWG galv steel tie wire in lieu of nails. No side pieces are required for 20 by 48 in. fixtures equipped with air terminal units, but end pieces similar to those described for the 12 and 24 in. wide fixtures are required.

EMCO LTD — Type 5/8 in. FR-4.

USG INTERIORS INC — Type 5/8 in. FR-4

16A. Fixture Protection — Acoustical Material* — For use with "high hat" light fixtures (Item 15C). 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.

17. Air Boot — 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 crossover duct.

18. Air Duct Connector — Max diam 6 in. (not shown). Any Class O or Class I Air Duct Connector (bearing the UL Listing Mark).

19. Steel Framing Members* — The steel framing members are provided with either steel or aluminum caps on the exposed flange, depending upon the steel framing member type. When aluminum capped members are used additional hanger wires are required along main runners (in addition to those required under item 9) spaced 24 in. OC, i.e., one wire at each intersection of main runners and cross tees. Main runners nom 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 of 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 Nos. 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 fixture is to be installed. The end tabs 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 are installed perpendicular to

4 ft cross tees, midway between main runners, spaced 48, in. OC. For nom 24 by 24 or 48 in. lay-in panels.

ARMSTRONG WORLD INDUSTRIES INC — Type AFG .

BPB AMERICA INC — Types PAC, PCH, PCS. The main runner ends may be riveted to the wall molding along one wall and the cross tee ends may be riveted to the wall molding along one adjacent wall. The rivets are intended to facilitate the ceiling installation, not to replace hanger wires .

CHICAGO METALLIC CORP — Types 250, 260, 1250, 1260, 1850, 1860. The main runner ends may be riveted to the wall molding along one wall and the cross tee ends may be riveted to the wall molding along one adjacent wall. The rivets are intended to facilitate the ceiling installation, not to replace hanger wires.

19A. Steel Framing Members* — The steel framing members are provided with either steel or aluminum caps on the exposed flange, depending upon the steel framing member type. When aluminum capped members are used additional hanger wires are required along main runners (in addition to those required under item 9) spaced 24 in. OC, i.e., one wire at each intersection of main runners and cross tees. Main runners nom 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 of 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 Nos. 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 fixture is to be installed. The end tabs 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 are installed perpendicular to 4 ft cross tees, midway between main runners, spaced 48, in. OC. For nom 24 by 24 or 48 in. lay-in panels.

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

USG INTERIORS INC — Types DXL, DXLZ, SDXL.

19B. 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. OC. 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. OC. (See Item 19B). 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.

19C. Steel Framing Members* — **Grid adapter** — (Not shown) (Optional) — For use with Type 1650 metal pans (See Item 19A). 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.

19D. 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.

20. **Batts and Blankets*** — Nom 24 by 48 by 6 in. or 24 in. wide roll of 6 in. thick glass fiber batt insulation. Each 24 by 48 by 6 in. batt is placed directly on the back of each acoustical lay-in panel and covers both the panel and the steel framing members. The 24 in. wide roll insulation is unrolled perpendicular to the cross tees in between hanger wires and covers both cross tees and panels. Sides of adjacent unrolled batts are butted together while the ends overlap approx 6 to 12 in. Panels over light fixtures are also covered by 6 in. thick batt insulation secured in place by 18 SWG galv steel wire. The size of the batt is equal to that of the panel or slightly larger, but an approx 1/2 in. wide gap between the batts shall be maintained at the fixture sides in order to vent the 1-1/2 in. high space over the fixture.

KNAUF FIBER GLASS GMBH

OWENS CORNING HT INC, DIV OF OWENS CORNING

21. **Acoustical Material*** — Nom 24 by 24 or 48 by 5/8 in. thick lay-in panels. 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.

EMCO LTD — Types FR-4. See **Acoustical Materials (BYIT)**, EMCO Ltd., for specific tile details.

USG INTERIORS INC — Type FR-4. See **Acoustical Materials (BYIT)**, USG Interiors, Inc., for specific tile details.

22. **Speaker Assemblies*** — (Not Shown) Optional. The speaker assemblies consist of speakers, speaker enclosures and their accessories. The ceiling penetration for 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 maximum 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.

*Bearing the UL Classification Mark

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