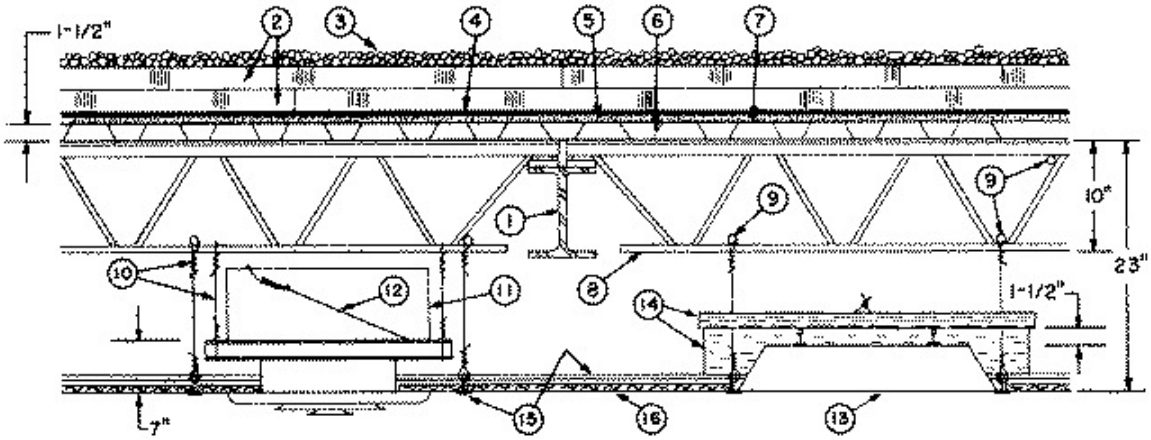
Design No. P235
December 09, 2002

Restrained Assembly Rating — 1 Hr.

Unrestrained Assembly Rating — 1 Hr.

Unrestrained Beam Rating — 1 Hr.



1. Steel Beam — W8x15, min size.

2. **Foamed Plastic* —** Rigid foamed plastic insulation, 2 by 4 ft board. Boards installed with end joints staggered 2 ft. May be bonded to the membrane or installed without adhesion after final asphalt coat has cooled. When applied in more than one layer, successive layers shall be installed over preceding layer without attachment.

OC CELFORTEC INC — Min thickness 1 in., max thickness 8 in.

OWENS CORNING SPECIALTY & FOAM PRODUCTS — Min thickness 1 in., max thickness 8 in.

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

THE DOW CHEMICAL CO — Min thickness 1 in., max thickness 8 in., extruded polystyrene foamed plastic boards.

2A. **Roof Insulation-Foamed Plastic* —** Alternate to Item 2. 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 Built-Up Roof Covering (Item 4) or single-ply roofing membrane (Item 4A). See Foamed Plastic* (BRYX) category in the Building Materials Directory or Foamed Plastic* (CCVW) category in the Fire Resistance Directory for list of Classified companies.

3. **Crushed Stone or Concrete Pavers —** Spread on top of foamed plastic at a rate of 10 psf min.

4. **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).

4A. **In lieu of Item 4, roof covering consisting of single-ply Roofing Membrane* —** that is either ballasted, adhered or mechanically attached as permitted under the respective Classified company's Classification. See Fire Resistance Directory-Roofing Membranes (CHCI).

5. **Gypsum Board —** (Classified or Unclassified) — Supplied in sheets nom 2 by 4 ft to 4 by 12 ft, by nom 1/2 in. thick. Min density 41.5 pcf. Gypsum wallboard thicker than 1/2 in. may be used provided that the wallboard's density remains equal to or greater than 41.5 pcf. Applied perpendicular to steel roof deck direction with adhesive. 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.

6. **Steel Roof Deck —** Min 1-1/2 in. deep, 31 or 36 in. wide, fluted galv steel deck. Min 0.028 in. thick (24 gauge). Flutes approx 6 in. OC, crests approx 4 in. wide. Welded to supports 12 in. OC Side lap joints of adjacent units welded or secured together with No. 12 by 1 in. self-drilling, self-tapping steel screws midway between steel 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 15 in OC side laps of adjacent units welded or secured together with No. 12 by 1 in. self-drilling, self-tapping steel screws midway between steel joists.

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

7. **Adhesive* —** Applied between crests of steel roof deck and gypsum wallboard in -1/2 in. wide ribbons 6 in. OC at 0.4 gal per 100 sq ft.

BMCA INSULATION PRODUCTS INC

8. **Steel Joists —** Type 10H4 or 12K3, min size; spaced max 6 ft OC and welded to end supports.

9. **Bridging —** Steel bars, 1/2 in. diam welded to top and bottom chords of each joist. Bridging on bottom chords of each joist shall be spaced 24 in. OC to provide attachment points for hanger wires supporting the steel framing members.

10. **Hanger Wire —** No. 12 SWG galv steel wire, twist-tied to lower chord of joists or bridging bars. Located 48 in. O.C. along main runners; additional hanger wires to occur at all four corners of light fixtures, at midpoint of cross tees adjacent to light fixtures and duct outlets, and adjacent to main runner splices. Additional hanger wires also required on cut cross tees over 2 ft long at walls.

11. **Air Duct —** Min 0.031 in. thick (22 gauge) galv steel. Total area of duct openings not to exceed 144 sq in. per each 100 sq ft of ceiling area. Area of ind duct opening not to exceed 144 sq in. Max dimension of opening 12 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. O.C. suspended by 12 SWG galv steel wire.

12. **Damper —** Min 0.056 in. thick (16 gauge) galv steel, sized to overlap duct opening 1-1/2 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).

13. **Fixtures, Recessed Light —** (Bearing the UL Listing Mark). Fluorescent lamp type, steel housing, 2 by 4 ft size. Fixtures spaced so their area does not exceed 24 sq ft 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.

13A. **Fixture Stabilizer —** (Not shown). For use with the Type 1650 metal pans (See Item 15B); one min 0.047 in. thick (16 MSG) galv steel channel yoke per light fixture, 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 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.

14. **Fixture Protection — Batts and Blankets* —** 1-1/4 in. thick, cut into pieces to form a three-sided enclosure. The fixture protection consists of a 30 by 48 in. top piece and two 6 by 30 in. end pieces. Scrap pieces of steel framing members (Item 15; main runners or cross tees), 10 to 14 in. long, shall be used as spacers on top of the light fixture. The spacers shall be located as required to maintain a min 1 in. clearance between the top of the light fixture and the fixture protection top piece. The spacers and top piece are laid in place and the end pieces are held in place by slipping them between the fixture housing and the hanger wire at each corner of the fixture. In addition, the top piece shall be secured to each end piece with 18 SWG galv steel wire threaded through the pieces and twist-tied. The long sides of the top piece are slit to accommodate the cross tee hanger wires on both sides of the fixture. When Type BV48/24 light fixtures are used, fixture protection shall consist of a top piece resting on spaces. The top piece length shall be a min of 53 in. and the width a min of 11-3/4 in. The top piece shall be centered over the fixture and the ends allowed to drape over the fixture ends. The edges of the top piece shall be slit as necessary to accommodate hanger wires. The spacers shall consist of scrap pieces of cross tees oriented parallel to and spaced approximately 6 in. from the ends of the light fixture and at mid-point. End pieces of batts 30 in. long by 6-1/2 in. high are held in place against the metal end panels with No. 18 SWG galv steel wire.

The wire is placed against the end piece at about mid height and twist-tied to the hanger wires at corners of the fixture module. In addition, the end piece shall be secured with No. 18 SWG galv steel wire running vertically from the main runner to the light fixture hanger wire and twist-tied.

THERMAFIBER L L C — Type FR.

14A. **Fixture Protection — Acoustical Material* —** For use with "high hat" light fixtures (Item 13B). 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.

15. **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.

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

USG INTERIORS INC — Types DXL, DXLZ, SDXL.

15A. **Steel Framing Members* —** 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.

ARMSTRONG WORLD INDUSTRIES INC — Types AFG, AFG-A

BPB AMERICA INC — Types PAC, PCH, PCS

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

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. 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 15B). 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 15A). 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.

16. **Acoustical Material* —** Nom 24 by 48 in. 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 ½ in. profile.

Panel Dimensions Nom, in.	Types
24 by 48 by 5/8 or 3/4	FR-83
24 by 48 by 3/4	FR-X1

EMCO LTD — Types FR-83, FR-X1 . See **Acoustical Materials** (BYIT), EMCO Ltd., for specific tile details.

USG INTERIORS INC — Types FR-83, FR-84, FR-X1 . See Acoustical Materials (BYIT), USG Interiors, Inc., for specific tile details.

17. **Hold-Down Clip —** (Not shown) — No. 25 MSG spring steel, placed over bulb of each cross tee and spaced 2 ft O.C. One leg of each clip is to be cut off when placed over bulb of cross tee adjacent to long side of light fixture.

18. **Accessible Hold-Down Clip —** (Not shown) — No. 27 MSG painted steel. To be used in lieu of hold-down clips (Item 17) on each access panel in ceiling.

19. **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