



**1.6** Provide bracing assemblies consisting of a compression strut and four (4) #12 gage splayed bracing wires oriented 90 degrees from each other (see Figure 1) at the following spacing:

1. For school buildings, place bracing assemblies at a spacing not more than 12 ft. by 12 ft. on center.
2. For Essential Services Buildings, place bracing assemblies not more than 8 ft. by 12 ft. on center.
3. Provide bracing assemblies at locations not more than one half (1/2) the spacings given above, from each perimeter wall and at the edge of vertical ceiling offsets.

The slope of these wires shall not exceed 45 degrees from the plane of the ceiling and shall be taut. Splices in bracing wires are not to be permitted without special DSA approval.

4. Suspended acoustical ceiling systems with a ceiling area of 144 square feet or less, and fire rated suspended acoustical ceiling systems with a ceiling area of 96 square feet or less, surrounded by walls which connect directly to the structure above, do not require bracing assemblies when attached to two adjacent walls.

**1.7** Fasten hanger wires with not less than three (3) tight turns. Fasten bracing wires with four (4) tight turns. Make all tight turns within a distance of 1-1/2 inches. Hanger or bracing wire anchors to the structure should be installed in such a manner that the direction of the anchor aligns as closely as possible with the direction of the wire.

**Note:** Wire turns made by machine where both strands have been deformed or bent in wrapping can waive the 1-1/2 inch requirement, but the number of turns should be maintained, and be as tight as possible.

**1.8** Separate all ceiling hanger and bracing wires at least six (6) inches from all unbraced ducts, pipes, conduit, etc. ←

**1.9** When drilled-in concrete anchors or shot-in anchors are used in reinforced concrete for hanger wires, 1 out of 10 must be field tested for 200 lbs. in tension. When drilled-in concrete anchors are used for bracing wires, 1 out of 2 must be field tested for 440 lbs. in tension. Shot-in anchors in concrete are not permitted for bracing wires. If any shot-in or drilled-in anchor fails, see CBC, Section 1923A.3.5.

**Note:** Drilled-in or shot-in anchors require special DSA approval prior to use in prestressed concrete.

**1.10** Attach all light fixtures and ceiling mounted air terminals, to the ceiling grid runners to resist a horizontal force equal to the weight of the fixtures. Screws or approved fasteners are required. ←

**1.11** Flush or recessed light fixtures and air terminals, weighing less than 56 lbs., may be supported directly on the runners of a heavy duty grid system but, in addition, they must have a minimum of two (2) #12 gage slack safety wires attached to the fixture at diagonal corners and anchored to the structure above. All 4 ft. x 4 ft. light fixtures must have slack safety wires at each corner. ←

All flush or recessed light fixtures and air terminals weighing 56 lbs. or more must be independently supported by not less than four (4) taut #12 gage wires, each attached to the fixture and to the structure above regardless of the type of ceiling grid system used. ←

The four (4) taut #12 gage wires, including their attachment to the structure above, must be capable of supporting four (4) times the weight of the unit.

**1.12** All fixtures and air terminals supported on intermediate duty grid systems must be independently supported by not less than four (4) taut #12 gage wires each attached to the fixture or terminal, and to the structure above. ←

**1.13** Support surface mounted light fixtures by at least two positive devices which surround the ceiling runner and which are each supported from the structure above by a #12 gage wire. Spring clips or clamps that connect only to the runner are not acceptable.

Provide additional supports when light fixtures are 8 ft. or longer.

**1.14** Support pendant mounted light fixtures directly from the structure above with hanger wires or cables passing through each pendant hanger and capable of supporting four (4) times the weight of the fixture. A bracing assembly, per Figure 1, is required where the pendant hanger penetrates the ceiling. Special details are required to attach the pendant hanger to the bracing assembly to transmit horizontal forces.

**1.15 Required notes on construction documents:**

Classification of ceiling grid (fill in blanks).

Classification of ceiling grid is \_\_\_\_\_ (1) \_\_\_\_\_ duty.

Manufacturer's catalog number - main runner  (2) (3) .

Manufacturer's catalog number - cross runner  (2) (3) .

Manufacturer's catalog number of detail for runner splice  (3) .

(1) Fill in either "intermediate" or "heavy".

(2) Runners must be rated for duty listed.

(3) Show manufacturer, duty classification and catalog numbers. Show light fixture and air terminal or grille support details for grid duty classification selected. See Items 1.11 and 1.12 above.

**2. ADDITIONAL REQUIREMENTS FOR FIRE RATED CEILINGS:**

**2.1** Provide Underwriter Laboratory (U.L.) design number or State Fire Marshal (SFM) listing number. The components and installation details must conform in every respect with the U.L. or SFM approval for the design number specified. Custom designs which combine components from different approved designs but have not been tested as a complete assembly are not acceptable.

**2.2** For schools and Essential Services Buildings, bracing assemblies are required for each 96 square feet. The first bracing assembly is required not more than four (4) feet from each wall. A minimum of one bracing assembly is required between any two adjacent expansion cut-outs on runners being braced.

**2.3** Pop rivets, screws, or other attachments are not acceptable unless specifically detailed on the drawings and approved by U.L. and SFM.

**3. ADDITIONAL REQUIREMENTS FOR METAL PANELS:** Metal panels and panels weighing more than 1/2 psf, other than acoustical tile, are to be positively attached to the ceiling suspension runners.

**4. SUSPENDED ACOUSTICAL CEILINGS BELOW GYPSUM BOARD**

**CEILINGS:** Where gypsum board or other ceiling finishes are attached to the framing, special details will be required for the vertical hanger wire and lateral bracing wire support connections to the framing.

**5. REUSE OF EXISTING CEILING HANGER WIRES AND SPLAY WIRES:**

**5.1** The gage and spacing of the wires must comply with the current applicable codes.

**5.2** All existing ceiling hanger wires must be tested to 200 lbs. in tension.

**5.3** All existing splayed bracing wires must be field tested to 440 lbs. in tension.

**5.4** If a new wire is to be spliced to an existing wire, the following is required:

1. The architect or structural engineer in general responsible charge must submit to DSA a detail and specification describing how the splice is to be made.
2. All new wires, after being spliced to the existing wires, must be field tested per Items 5.2 and 5.3 above.
3. All field tests must be performed in the presence of the project inspector.

**6. LIST OF DSA PRODUCT ACCEPTANCE FOR SUSPENDED ACOUSTICAL CEILING SYSTEMS**

**DSA**

**Product Acceptance (PA)**

**Report #**

PA-008	Tectum I and Tectum II - Form Board, Acoustical Board and Suspended Ceiling Tile
PA-022	Armstrong Cassettes 800 Series Metal Ceiling System
PA-026	Chicago Metallic Suspended Ceiling System
PA-030	USG Interior Donn Suspended Ceiling Grid Systems
PA-041	Armstrong World Industries Suspended Ceiling System
PA-078	Metaline, Plantostile and Magna T-Cell Suspended Ceiling Systems

**Note:** Alternate manufacturers and systems may be submitted for review and acceptance by the Division of the State Architect.

**Figure 1**  
**SUSPENDED CEILING BRACING ASSEMBLY**

Bracing assemblies are required at spacing indicated in section 1.6 on page 2 of IR 25-2

**Compression struts:**

Steel section with l/r ratio of 200 maximum. Attach to main runners within 2" of cross runner with 2-#12 self-drilling self-tapping (SDST) screws and to structure with 2-#12 x 2" screws at wood or 3/16" diameter anchor at concrete/steel. Compression strut shall not replace hanger wire.

**Note:**  
 See figures 3,4,5,6 for connections of bracing & hanger wire to the structure above















