

# SUSPENDED ACOUSTICAL CEILING PER 2006 IBC



**City of Boulder City**  
Community Development Department

Building and Safety Division  
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## SUSPENDED ACOUSTICAL CEILING NOTES

### REQUIRED REFERENCES

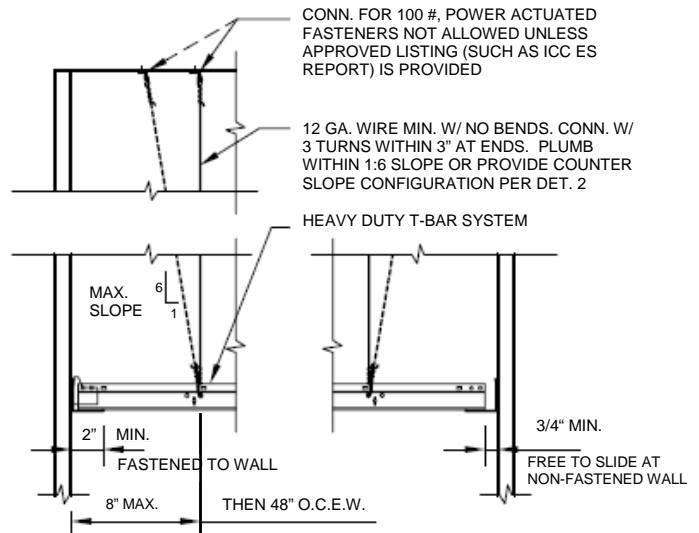
1. SUSPENDED ACOUSTICAL CEILINGS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM C 635 AND ASTM C 636, AND, FOR SEISMIC DESIGN CATEGORIES D, E & F, IN ACCORDANCE WITH THE CISCA (CEILING AND INTERIORS SYSTEMS CONSTRUCTION ASSOCIATION) *GUIDELINES FOR SEISMIC RESTRAINT FOR DIRECT-HUNG SUSPENDED CEILING ASSEMBLIES (ZONES 3-4)* AS MODIFIED BY ASCE 7-05 SEC. 13.5.6.22 INCLUDING SUB-SECTIONS A-H. (CBC 803.9.1.1 AND ASCE 7-07 13.5.6.22)

### T-BAR GRID & VERTICAL SUPPORT

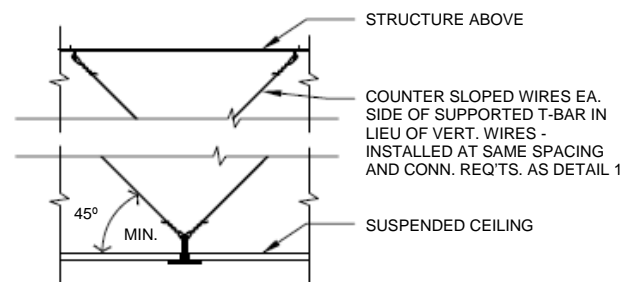
2. THE PERIMETER SUPPORTING CLOSURE ANGLE SHALL BE 2" MIN. WIDE (UNLESS LISTED CLIPS FOR THIS PURPOSE ARE USED, IN WHICH CASE, PROVIDE COPY OF ICC ES REPORT AND REFER TO REPORT ON DRAWINGS/DETAILS.) IN EACH ORTHOGONAL DIRECTION, ONE END OF THE CEILING GRID SHALL BE ATTACHED TO THE CLOSURE ANGLE, AND THE OTHER END SHALL REST ON THE SUPPORTING ANGLE WITH A 0.75" CLEARANCE TO THE WALL AND BE FREE TO SLIDE. (ASCE 7-05 SEC. 13.5.6.22 B) PERIMETER CLOSURE ANGLE ENDS, AND ENDS OF MAIN T-BAR AND CROSS T-BAR MEMBERS, SHALL BE TIED TOGETHER. (CISCA GUIDELINES FOR SEISMIC RESTRAINT)
3. A HEAVY DUTY T-BAR GRID SYSTEM SHALL BE USED AS DEFINED IN ASTM C 635 (ASCE 7-05 SEC. 13.5.6.22 A). THE MINIMUM MAIN T-BAR AND CROSS T-BAR CONNECTION STRENGTH SHALL BE 180 LBS. (CISCA GUIDELINES FOR SEISMIC RESTRAINT)
4. MAIN AND CROSS RUNNERS SHALL BE SUPPORTED TO STRUCTURE ABOVE BY A MIN. 12 GAUGE VERTICAL SUPPORT WIRES, BEGINNING 8" MAX. FROM WALLS AND EVERY 4' O.C. BOTH WAYS. (CISCA GUIDELINES FOR SEISMIC RESTRAINT & ASTM C 636 2.1.3 & 2.1.6 & 2.3.2-4). VERTICAL SUPPORT WIRES SHALL BE PLUMB WITHIN 1:6 OR REPLACED WITH TWO COUNTERSLOPING WIRES AT 45 DEGREES MIN. TO HORIZONTAL. (ASTM C 636 2.1.4) VERTICAL SUPPORT WIRES SHALL BE ATTACHED WITH 3 TURNS AT ENDS WITHIN A 3" LENGTH. WIRES SHALL NOT ATTACH TO OR BEND AROUND INTERFERING MATERIAL OR EQUIPMENT AND SHALL BE INSTALLED TO PREVENT ANY SUBSEQUENT DOWNWARD MOVEMENT. (ASTM C 636 2.3.2-4)
5. THE CONNECTION DEVICE FROM VERTICAL WIRE TO THE STRUCTURE MUST SUSTAIN A MIN. 100 LBS. (CISCA GUIDELINES FOR SEISMIC RESTRAINT). SUSPENDED CEILING ANCHORS FOR TENSION IN CONCRETE OR MASONRY SHALL NOT BE POWER ACTUATED FASTENERS (UNLESS APPROVED AND LISTED FOR SUCH LOADING, IN WHICH CASE, PROVIDE COPY OF ICC ES REPORT AND REFER TO REPORT ON DRAWINGS/DETAILS.) (ASCE 7-05 SEC. 13.4.5 & 13.4.6)

### LATERAL SUPPORT

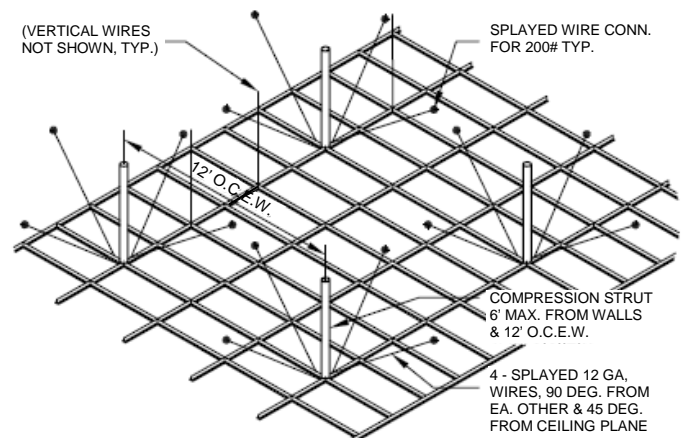
6. FOR CEILINGS OVER 1,000 S.F., PROVIDE HORIZONTAL RESTRAINT OF THE CEILING TO THE STRUCTURAL SYSTEM (COMPRESSION STRUTS WITH 4 SPLAY WIRES). TRIBUTARY AREAS OF THE HORIZONTAL RESTRAINT SHALL BE APPROXIMATELY EQUAL. EXCEPTION: RIGID BRACES ARE PERMITTED TO BE USED INSTEAD OF DIAGONAL SPLAY WIRES (ASCE 7-05 SEC. 13.5.6.22 C).
7. LATERAL FORCE COMPRESSION STRUTS SHALL BE OF EMT CONDUIT OR METAL STUDS OR OTHER APPROVED STRUTS. BRACES SHALL COMMENCE A MAX. OF 6' FROM WALLS AND BE SPACED A MAX. OF 12' O.C. THROUGHOUT. SPLAY WIRES AND BRACES TO BE SECURELY ATTACHED TO THE GRID AND THE SUPPORTING STRUCTURE. (CISCA GUIDELINES FOR SEISMIC RESTRAINT)
8. SEISMIC SPLAY WIRES SHALL BE FOUR (4) 12 GAUGE WIRES ATTACHED TO THE CEILING GRID WITHIN 2" OF THE STRUTS AND TO THE STRUCTURE ABOVE. SPLAY WIRES ARE TO BE ARRAYED 90 DEGREES FROM EACH OTHER AND A MAXIMUM OF 45 DEGREES FROM THE PLANE OF THE CEILING. SPLAY BRACING CONNECTION STRENGTH SHALL BE 200 LBS, OR DESIGNED PER ASCE 7-05 CHAPTER 13. (CISCA GUIDELINES FOR SEISMIC RESTRAINT)
9. FOR CEILINGS OVER 2,500 S.F., PROVIDE A SEISMIC SEPARATION JOINT OR FULL-HEIGHT PARTITION WALL (FOR SEPARATION INTO 2,500 S.F. AREAS) UNLESS ADEQUATE DOCUMENTATION IS PROVIDED BY A LICENSED DESIGNER JUSTIFYING THE INSTALLATION. (ASCE 7-05 SEC. 13.5.6.22 D)
10. CHANGES IN CEILING HEIGHT SHALL BE PROVIDED WITH POSITIVE BRACING. (ASCE 7-05 SEC. 13.5.6.22 F)



DETAIL 1 - TYPICAL CONNECTIONS



DETAIL 2 - COUNTER SLOPE OPTION



DETAIL 3 - LATERAL BRACING LAYOUT

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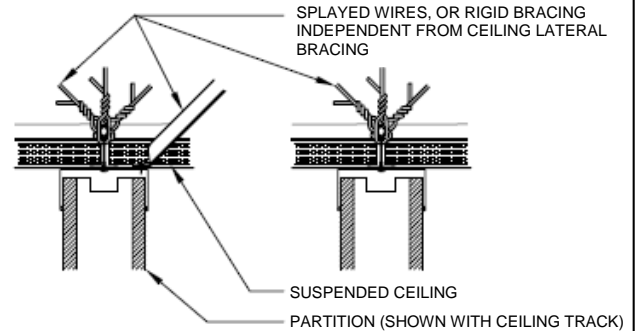
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## SUSPENDED ACOUSTICAL CEILING NOTES (CONTINUED)

### PARTITION LATERAL BRACING

11. PARTITION BRACING SHALL BE INDEPENDENT FROM SPLAY BRACING FOR CEILING GRID SYSTEM. PARTITION BRACING SHALL BE BY SEPARATE SPLAY WIRES IN BOTH DIRECTIONS PERPENDICULAR TO THE WALL, OR BY RIGID BRACES, OR BY A COMBINATION OF BOTH. DETAILS SHALL BE SHOWN ON THE DRAWINGS. (CISCA GUIDELINES FOR SEISMIC RESTRAINT & CBC 1614A.1.12-10)



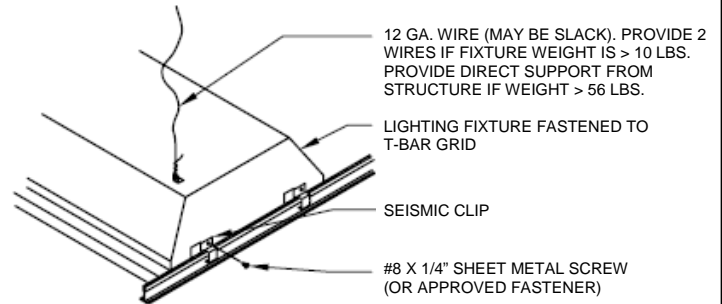
**DETAIL 4 - PARTITION LATERAL BRACING**

### WIRING, LIGHTING, AIR TERMINALS & FIRE SPRINKLERS

12. CABLE TRAYS AND ELECTRICAL CONDUITS SHALL BE SUPPORTED INDEPENDENTLY OF THE CEILING. (ASCE 7-05 SEC. 13.5.6.22 G). ALL WIRING METHODS AND MATERIALS IN SUSPENDED CEILINGS SHALL BE APPROVED FOR THAT APPLICATION. NON-METALLIC SHEATHED CABLE IS NOT APPROVED FOR OPEN WIRING IN SUSPENDED CEILINGS. ALL WIRING AND OTHER COMPONENTS USED IN PLENUM CEILINGS MUST BE SPECIFICALLY APPROVED FOR THAT USE. (CISCA GUIDELINES FOR SEISMIC RESTRAINT)

13. ALL SURFACE MOUNTED LIGHT FIXTURES AND HVAC TERMINALS FOR SUSPENDED CEILINGS SHALL BE SECURELY FASTENED TO THE CEILING MEMBERS BY BOLTS, SCREW, RIVETS OR LISTED CLIPS SPECIFICALLY APPROVED FOR USE WITH THE TYPE OF FRAMING AND FIXTURES. (CISCA GUIDELINES FOR SEISMIC RESTRAINT AND CEC 410.16) LIGHT FIXTURES SHALL BE INSTALLED AS FOLLOWS:

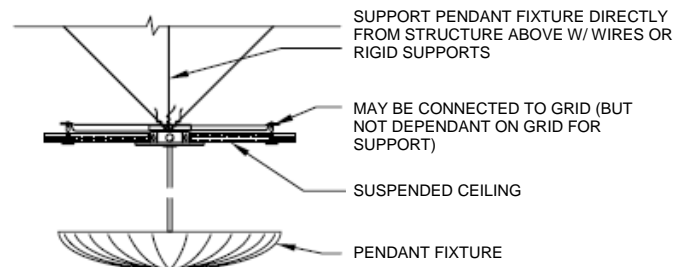
- A. LIGHT FIXTURES WEIGHING LESS THAN 10 POUNDS SHALL HAVE ONE 12 GA. WIRE HANGER CONNECTED FROM THE FIXTURE TO THE STRUCTURE ABOVE (WIRE MAY BE SLACK).
- B. FIXTURES WEIGHING MORE THAN 10 POUNDS AND LESS THAN 56 POUNDS SHALL HAVE TWO (2) 12 GAUGE WIRES AT OPPOSING CORNERS TO THE STRUCTURE ABOVE (WIRES MAY BE SLACK).
- C. FIXTURES WEIGHING MORE THAN 56 POUNDS MUST BE DIRECTLY ATTACHED TO THE STRUCTURE ABOVE BY APPROVED HANGERS (NOT DEPENDANT ON CEILING GRID FOR SUPPORT).
- D. PENDANT HUNG FIXTURES MUST BE ATTACHED TO THE STRUCTURE ABOVE BY ONE 9 GAUGE WIRE OR APPROVED ALTERNATE (NOT DEPENDANT ON CEILING GRID FOR SUPPORT).



**DETAIL 5 - LIGHTING FIXTURE**

14. HVAC TERMINALS SHALL BE INSTALLED AS FOLLOWS (CISCA GUIDELINES FOR SEISMIC RESTRAINT):

- A. HVAC TERMINALS WEIGHING LESS THAN 20 POUNDS SHALL BE POSITIVELY ATTACHED TO GRID.
- B. HVAC TERMINALS WEIGHING MORE THAN 20 POUNDS AND LESS THAN 56 POUNDS SHALL BE POSITIVELY ATTACHED TO GRID AND SHALL HAVE TWO (2) 12 GAUGE WIRES AT OPPOSING CORNERS TO THE STRUCTURE ABOVE (WIRES MAY BE SLACK).
- C. HVAC TERMINALS WEIGHING MORE THAN 56 POUNDS MUST BE DIRECTLY ATTACHED TO THE STRUCTURE ABOVE BY APPROVED HANGERS (NOT DEPENDANT ON CEILING GRID FOR SUPPORT).

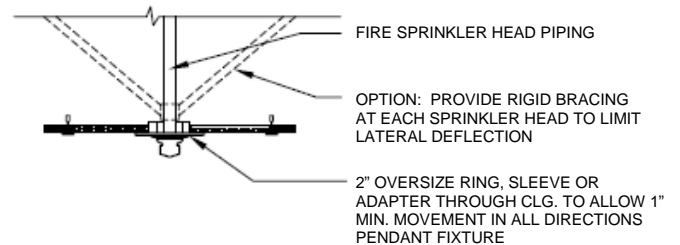


**DETAIL 6 - PENDANT FIXTURE**

15. ALL FIRE SPRINKLER PIPING AND LAYOUT TO BE APPROVED BY THE FIRE DEPARTMENT PRIOR TO INSTALLATION OF CEILING TILES. (CISCA GUIDELINES FOR SEISMIC RESTRAINT) EXCEPT WHERE RIGID BRACES ARE USED TO LIMIT LATERAL DEFLECTION, FIRE SPRINKLER HEADS SHALL HAVE A 2" OVERSIZE RING, SLEEVE OR ADAPTER THROUGH THE CEILING TO ALLOW FOR AT LEAST 1" OF MOVEMENT IN ALL DIRECTIONS. (ASCE 7-05 SEC. 13.5.6.22 E)

### SPECIAL CASES (FIRE RATED CEILINGS, HOSPITALS, ETC.)

16. ACOUSTICAL CEILING SYSTEMS THAT ARE PART OF FIRE-RESISTIVE-RATED CONSTRUCTION SHALL BE INSTALLED IN THE SAME MANNER USED IN THE ASSEMBLY TESTED AND COMPLY WITH THE PROVISIONS OF CHAPTER 7. (CBC 803.9.1.2). FOR FIRE RESISTIVE MAIN RUNNERS, ALL EXPANSION RELIEF CUTOUTS SHALL BE WITHIN 3" OF A VERTICAL SUPPORT WIRE. (ASTM C 636 - 2.3.5)
17. FOR BUILDINGS UNDER THE OSHPD & DSA REQUIREMENTS OF THE CBC (HOSPITALS, ETC.). (SEE CHAPTER 16A SECTION 1614A.1.11 FOR A SERIES OF SPECIAL SUSPENDED CEILING REQUIREMENTS)



**DETAIL 7 - FIRE SPRINKLER HEAD**