City of Pittsburg
Community Development - Building Division
65 Civic Ave, Pittsburg CA 94565
Phone: (925) 252-4910 Fax: (925) 252-4814

CONSTRUCTION CHECKLIST FOR SUSPENDED CEILING INSPECTION

This checklist is intended for use to prepare for an inspection. This is only a general list and is not intended to address all possible conditions, nor does it address any above ceiling fire-stopping, related ceiling assemblies or systems, or other building systems, which may be inspected in conjunction with the ceiling inspection. References are to the 2006 International Building Code (IBC), ASCE 7.02, ASTM C 636-04, and CISCA Guidelines for seismic zones 3-4.

Please verify the following before calling for the ceiling grid inspection.

SEISMIC DESIGN CATERGORIES D,E, AND F

The Pittsburg area falls under seismic design category D, unless otherwise determined by a geological engineer following the guidelines of IBC 1613-2623. Suspended acoustical ceilings are to be installed in accordance with the provisions of ASTM C 636 and per the manufacturer (IBC 803.9.1). In addition to ASTM C 636 and manufacturer's specifications, category D, E, and ceilings are to be designed and installed according to CISCA 3-4 and those requirements listed in ASCE 7-2, 9.6.2.6.2.2 as referenced by IBC Section 1621.1.

WALL MOLDING

- Moldings have a horizontal flange of at least 2''. Unless otherwise requires, the 2'' wall angle is required at the attached and unattached perimeters. (ASCE 7-2, 9.6.2.6.2.2)
- 2'' BERC clips (BERC2) may be used in lieu of the 2'' wall angle for Armstrong systems, when the 7/8'' Armstrong wall molding (#7800) is used and when the seismic strut layout is started within 5 feet of two adjacent walls. (See Armstrong Seismic Installation Instructions)
- The ceiling grid must be attached to the molding at two adjacent walls. (ASCE 7-2, 9.6.2.6.2.2)
- Unattached ends of the grid system must have ¾'' clearance from the wall, and must rest upon and be free to slide on the molding. (ASCE 7-2, 9.6.2.6.2.2)

HANGERS

- Suspension wires must be minimum 12 gage when spaced at 4' or 10 gage at 5'. (CISCA 3-4, pg. 1)
- Hanger wire attachment devices must be capable of supporting 100 lbs. (CISCA 3-4, pg. 1)

- Connections at main beam and at structure must be secured with a minimum of three full turns (360°) or wraps in 3''. (ASTM C 636-04)

PERIMETER SUPPORT

- Terminal ends of each main beam and cross tee must be supported maximum 8''. (CISCA 3-4, pg. 2, section 1)
- Support off wall or ceiling discontinuity with 12 gage wire or approved wall support. These wires must be plumb to within one in six and may attach to the adjacent wall or to the structure above.
- 2'' BERC clips (BERC2) may not be used as alternate to the perimeter wires. (Testing has shown that unbraced sections between and/or adjacent to pods can allow movement up to 3/8'' per section. With the required ¾'' gap at the 2'' wall angle and movement of 3/8'' per section, movement within only four sections will be greater than the 2'' wall angle and can result in failure of the whole system.)
- Connections at main beam and at structure are secured with a minimum of three full turns (360°) or wraps in 3''. (ASTM C 636-04)

PERIMETER SPACERS

- Ends of main runners and cross tees must be tied together (spreader bars) to prevent spreading. (CISCA 3-4, pg. 2 section 1, #4)

- 2'' BERC clips (BERC2) may be used in lieu of spreader bars in Armstrong ceilings. (See about under Wall Molding)

SUSPENDED CEILING SYSTEM

- General note: ASTM C 636, CISCA and technical representatives from various manufactures determine the duty classification of a grid system by the load carrying capacity of the main runners.

- NER reports for manufacturer's system are in site and available for the installer and the inspector. (Contract ICC Evaluation Services, http://icc-es.org/Evaluation_Reports/)

- Main beams must be heavy duty. (ASCE 7-2, 9.6.2.6.2.2)

- Main beam and cross tee intersections and splices must have connection strengths of at least 180 lbs. in compression and in tension. (CISCA 3-4, pg. 1, section 3, #2)

- Cross tees supporting light fixtures must have the same lad carrying capacity as the main beams or be installed with supplemental hangers within 3'' of each corner of each fixture. (CISCA 3-4, pg. 2, section 2) (See also Light Fixtures portion of this checklist) Cross tees supporting mechanical services must have the same load carrying capacity as the main beam or be installed with supplemental hangers within 3'' of each corner of each fixture*. (CISCA 3-4, pg. 2, section 3) (See also Mechanical Services portion of this checklist)

LATERAL FORCE BRACING

- Ceilings constructed of lath and plaster or screw-applied gypsum board attached to suspended

members that are on one level and extend from wall to wall, are exempt from lateral load design requirements. (CISCA 3-4, pg. 1, exception #1)

- Ceiling areas greater than 1000 square feet must have lateral force bracing.

- Rigid bracing may be used instead of diagonal splay wires. (IBC 1621, ASCE 7-2, 9.6.2.6.2.2)

- Bracing must limit ceiling movement to less than ¼'' at the point of attachment. (IBC 1621, ASCE 7-2, 9.6.2.6.2.2)

- Splay wire bracing shall be clusters of four 12 gage wires attached to the main beam within 2'' of the cross tee intersection. Wires are arrayed 90° from each other at an angle not exceeding 45° from the plane of the ceiling. (CISCA 3-4, pg. 2, section1, #3)

- A strut, with stiffness adequate to resist the vertical loads imposed, must be attached to the suspension system and to the structure above at each bracing location (CISCA 3-4, pg. 2, section 1, #3). Install struts specified by manufacturer for proprietary systems or submit an Alternate Methods and Materials Form to the City of Pittsburg for approval. For nonprescriptive ceilings, install the manufacturer's strut, select an approved strut from Table 1, or provide an engineered strut.

- Horizontal restraint points must be no more than 12' on center in each direction, and the first point must be within 6' of each wall unless otherwise required (See Wall Molding, 2'' BERC clip). (CISCA 3-4, pg. 2 section 1, #3)

- Attachment of the bracing wires to the main beam and the structure must be capable of supporting the greater of 200 lbs. or the actual design loads with a safety factor of two. (CISCA 3-4, pg. 2 section 1, #3)

- Bracing members must be spaced a minimum of 6'' from all horizontal piping or ductwork that is not provided with bracing restraints for horizontal forces. (CISCA 3-4, pg. 2 section1, #3)

LIGHT FIXTURES

- All fixtures must be positively attached to the suspension system. The attachment device must be able to withstand 100% of the weight of the fixture acting in any direction. (CISCA 3-4, pg. 2, section 2)

- Cross runners supporting the ends of lighting must have the same carrying capacity (16 lb./ft.) as the main tees or require supplemental No. 12 gage hanger wires attached to the grid members within 3'' of each corner of each fixture supported by a cross tee. (CISCA 3-4, pg. 2, section 1& 2)

- Fixtures weighing 56 lbs. or less must have two 12 gage wires attached at diagonal corners. These wires may be slack. (CISCA 3-4, pg. 2, section 2)

- Fixtures weighing in excess of 56 lbs. must be independently supported from the building structure. (CISCA 3-4, pg.2, section 2)

- Pendant mounted fixtures must be supported directly from the structure using nine gage wires. They may not use the ceiling suspension system for support. (CISCA 3-4, pg. 2, section 2)

MECHANICAL SERVICES

- Mechanical services less than 20 lbs. must be positively attached to the suspension system main beams or to cross tees with the same load carrying capacity. (CISCA 3-4, pg. 2, section 3)

- Terminals or service weighing 20 lbs. to 56 lbs. must have two 12 gage wires connecting them to the ceiling system hangers or to the structure above. (CISCA 3-4, pg.2, section 3)

- Terminals or services weighing more than 56 lbs. must be independently supported. (CISCA 3-4, pg. 2, section 3)

PARTITION ATTACHMENT

- Partitions attached to the ceiling suspension system shall laterally be braced to the building structure. This bracing is to be independent of any ceilings splay wire bracing. (IBC 1621, ASCE 7-2, 9.6.2.8.1)

PENETRATIONS

- Ceilings without rigid bracing must have 2'' oversized trim rings to allow 1'' horizontal movement in all horizontal directions at sprinkler heads and other penetrations. Alternatively, a swing joint that can accommodate 1'' of ceiling movement in all horizontal directions at the top of the sprinkler head extension. (IBC 1621, ASCE 7-2, 9.6.2.6.2.2)

SEISMIC SEPARATION JOINTS

- Ceiling areas greater than 2500 square feet must have seismic separation joints or full height partitions unless analyses are performed to demonstrate that the closure trims and angles provide enough clearance to accommodate the additional ceiling movement. Each area to provide ¾'' clearance as detailed above under Wall Molding. Refer to manufacturer for seismic separation joint or provide alternate system for approval by the City. (IBC 1621, ASCE 7-2, 9.6.2.6.2.2)

SEISMIC SEPARATION JOINTS

- Changes in ceiling plane elevation must have positive bracing. (IBC 1621, ASCE 7-2, 9.6.2.6.2.2)

CABLE TRAYS

- Cable trays and electrical conduits shall be independently supported and braced independently of the ceiling. (IBC 1621, ASCE 7-2, 9.6.2..2.2)

CITY OF PITTSBURG APPROVED STRUTS

TABLE 1
MAXIMUM COMPRESSION STRUT LENGTHS
FOR 180 LB. SEISMIC LOAD

¾'' x 0.059'' CHANNEL	26''
1 ½'' x 9/16'' x 0.059'' CHANNEL	33''
(2) ¾'' x ½'' x 0.059'' CHANNEL, BACK TO BACK	39''
(2) 1 ½ x 9/16'' x 0.059'' CHANNEL, BACK TO BACK	44''
1 5/8'' x 1 ¼'' x 0.0197'' CHANNEL	106''
(2) 1 5/8'' x 1 ¼'' x 0.0197'' CHANNEL, BACK TO BACK	141''
½'' Diameter EMT Conduit, 0.042'' Wall Thickness	47''
¾'' Diameter EMT Conduit, 0.049'' Wall Thickness	61''
1'' Diameter EMT Conduit, 0.057'' Wall Thickness	78''
1 ¼'' Diameter EMT Conduit, 0.065'' Wall Thickness	102''
1 ½'' Diameter EMT Conduit, 0.065'' Wall Thickness	118''
2'' Diameter EMT Conduit, 0.065'' Wall Thickness	150''
2 ½'' Diameter EMT Conduit, 0.072'' Wall Thickness	198''
3'' Diameter EMT Conduit, 0.072'' Wall Thickness	242''
3 ½'' Diameter EMT Conduit, 0.083'' Wall Thickness	277''
4'' Diameter Rigid Conduit, 0.083'' Wall Thickness	312''
5'' Diameter Rigid Conduit, 0.245'' Wall Thickness	376''
6'' Diameter Rigid Conduit, 0.266'' Wall Thickness	450''

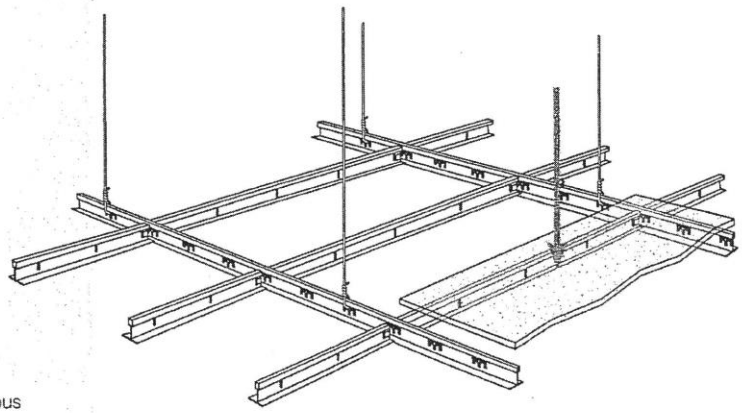
FIELD TECHNICAL INFORMATION
Application recommendations for work at the wall or ceiling

401
6/05

Suspension Systems for Acoustical Lay-in Ceilings

THIS DOCUMENT HAS BEEN APPROVED BY THE BUILDING DEPARTMENT

for official use only



This document provides the various standards for the installation of suspension systems for acoustical lay-in ceilings. Incorporation of this document will provide a more uniform standard for installation and inspection. This document is designed to accomplish the intent of the International Building Code (IBC) with regard to the requirements for seismic design category D for suspended ceilings and related items. Unless supported by engineering or approved by local building department, the suspension system shall be installed per the requirements for Seismic Design Category (SDC) D, E and F per the IBC. Manufacturers' recommendations should be followed

General Recommendations

- Referenced sources per hierarchy: 2003 IBC (International Building Code), American Society of Testing Materials (ASTM C 635, ASTM C 636), American Society of Civil Engineers (ASCE 7-02) and Ceilings and Interior Systems Construction Association (CISCA).
- Partitions that are tied to the ceiling and all partitions greater than 6 feet in height shall be laterally braced to the structure. Bracing shall be independent of the ceiling splay bracing system. *Source IBC section 1621.1.2*

  For further information on bracing of non-load bearing partitions refer to NWCB technical document #201.
- All main beams are to be Heavy Duty (HD). *Source ASCE 7-02 item 9.6.2.6.2.2a*
- All cross tees shall be capable of carrying the design load without exceeding deflection equal to 1/360 of its span. *Source CISCA zones 3-4*

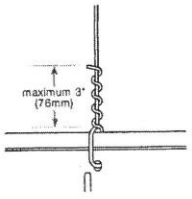


figure 1

- These recommendations are intended for suspended ceilings including grid, panel or tile, light fixtures and air terminals weighing no more the 4 lbs. per square foot. *Source ASCE 7-02 item 9.5.2.5.1*
- All wire ties are to be three tight turns around itself within three inches. Twelve gage Hanger wire spaced 4 foot on center *(figure 1)*. *Source ASTM C 636 item 2.3.4*
- Changes in ceiling planes will require positive bracing.
  Source ASCE 7-02 Section 9.6.2.6.2.2. item f.

figure 2
Lateral force Bracing

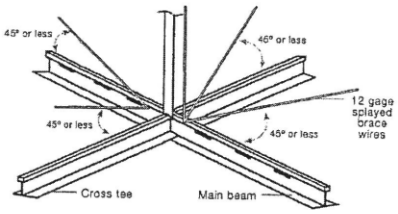


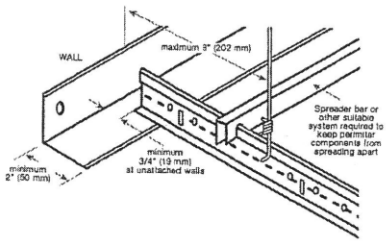
figure 3
Maximum Recommended Lengths for Vertical Struts

EMT CONDUIT	
½" EMT conduit	up to 6'0"
¾" EMT conduit	up to 8'6"
1" EMT conduit	up to 10'0"
1 METAL STUD	
1⅝" metal stud (25 gage)	up to 6'2"
2½" metal stud (25 gage)	up to 10'6"

Source Portland Building Department

Note: Plenum areas greater than 11'0" will require engineering calculations.

figure 4
Wall Molding Requirements



Lateral Force Bracing *(figures 2 and 3)*

- Ceilings constructed of lath and plaster or gypsum board, screw or nail attached to suspended members that support a ceiling on one level extending from wall to wall shall be exempt from the lateral force bracing requirements. *Source CISCA zones 3-4*
- Lateral force bracing is the use of vertical struts (compression posts) and splay wires (see figure 2).
- Lateral force bracing is required for ceilings over 1,000 square feet and not required for ceilings less than 1,000 square feet provided they are surrounded by four walls and braced to structure. *Source ASCE 7-02 section 9.6.2.6.2.2 item c*
- Lateral Force Bracing shall be 12 feet on center (maximum) and begin no farther than 6 feet from walls. *Source CISCA Seismic zones 3-4*
- Splay wires are to be four 12 gage wires attached to the main beam. Wires are arrayed 90° from each other and at an angle not exceeding 45° from the plane of the ceiling. *Source CISCA Seismic zones 3-4*
- Splay wires are to be within 2 inches of the connection of the vertical strut to suspended ceiling. *Source CISCA Seismic zones 3-4*
- Rigid bracing may be used in lieu of splay wires. *Source ASCE section 9.6.2.6.2.2*
- Ceilings with plenums less than 12 inches to structure are not required to have lateral force bracing. *Source Portland Building Department*
- Vertical struts must be positively attached to the suspension systems and the structure above. *Source CISCA 3-4*
- The vertical strut may be EMT conduit, metal studs or a proprietary compression post (see figure 3).

Wall Moldings *(figure 4)*

- Wall moldings (perimeter closure angles) are required to have a horizontal flange 2 inches wide, unless alternate methods are approved prior to installation by the local building department and the designer of record. One end of the ceiling grid shall be attached to the wall molding, the other end shall have a ¾ inch clearance from the wall and free to slide. *Source ASCE 7-02 section 9.6.2.6.2.2 item b*
- The grid shall be attached at two adjacent walls (pop rivets or approved method). *Source CISCA Seismic zones 3-4*
- There shall be a minimum ¾ inch clearance from the end of the grid system at un-attached walls. *Source ASCE 7-02 section 9.6.2.6.2.2 item b*

Spreader Bars *(figure 4)*

- Spreader (spacer) bars or other means approved by local building department shall be used to prevent the ends of the main beams at perimeter walls from spreading open during a seismic event. Perimeter wires shall not be in lieu of spreader bars. *Source CISCA Seismic zones 3-4*
- Wire tying is an acceptable alternative to spreader bars.
- Spreader bars are not required if a 90 degree intersecting cross or main is within 8 inches of the perimeter wall.

Hanger (Suspension) Wires *(figures 5a and 5b)*

- Hanger and perimeter wires must be plumb within 1 in 6 unless (figure 5a) counter sloping wires are provided (figure 5b). *Source ASTM C 636 section 2.1.4*
- Hanger wires shall be 12 gage and spaced 4 feet on center or 10 gage spaced 5 feet on center. *Source ASTM C 636*
- Any connection device at the supporting construction shall be capable of carrying not less than 100 pounds. *Source CISCA zones 3-4*

- For essential facilities, hanger wire connections must be capable of carrying 200 pounds and bracing (splay) wires shall be capable of carrying 440 pounds, shot-in anchors in concrete are not permitted for bracing wires. *Source Department of State Architects (DSA)IR M-3*
- Bracing wires shall be attached to the grid and to the structure in such a manner that they can support a design load of not less than 200 pounds or the actual design load, with a safety factor of 2, whichever is greater (figure 6b). *Source CISCA zones 3-4*
- Powder driven fasteners must be approved for the appropriate loading. *Source ASCE 7-02 section 9.6.1.6.5*
- Terminal ends of each main beam and cross tee must be supported within 8 inches of each wall with a perimeter wire (see figure 4 & 5 b). *Source CISCA zones 3-4*

Electrical fixtures

- Light fixtures weighing less than 10 pounds shall have one 12 gage hanger wire connected from the fixture to the structure above. This wire may be slack. *Source CISCA Seismic zones 3-4*
- Light fixtures weighing more than 10 pounds and less than 56 lbs. shall have two 12 gage wires attached at opposing corners of the light fixture to the structure above. These wires may be slack. *Source CISCA Seismic zones 3-4.*
- Light Fixtures weighing more than 56 lbs. shall be supported by directly from the structure above. These wires must be taut. *Source CISCA Seismic zones 3-4*
- Pendant mounted fixtures shall be directly supported from the structure above using a 9 gage wire or an approved alternate support without using the ceiling suspension system for direct support. *Source CISCA Seismic zones 3-4*
- Tandem fixtures may utilize common wires.

Mechanical Services

- Terminals or services weighing 20 lbs. but not more than 56 lbs. must have two 12 gage wires connecting them to the ceiling system hangers or the structure above. These wires may be slack. *Source CISCA Seismic zones 3-4*
- Terminals or services weighing more than 56 lbs. must be independently supported directly from the structure above. These wires must be taut. *Source CISCA Seismic zones 3-4*

Seismic Separation Joints *(figure 7)*

For ceiling areas exceeding 2500 square feet, a seismic separation joint or full height wall partition that breaks the ceiling shall be provided unless analyses are performed of the ceilings bracing system, closure angles and penetrations to provide sufficient clearance. *Source ASCE 7-02 item 9.5.2.6.2.2 d*

The layout and location of the seismic separation joint shall be per the designer of record and noted on the plans. If a seismic separation joint is required by the designer, the designer may use the generic joint detailed in this document or a proprietary joint. The amount of free movement (gap design) shall be per the designer of record.

Special Inspections

Special inspections may be required by the jurisdiction or municipality. Contact the local building department.

Sprinklers

For ceilings without rigid bracing, sprinkler head penetrations shall have a 2 inch oversize ring, sleeve or adapter through the ceiling tile to allow free movement of at least 1 inch in all horizontal directions. Flexible head design that can accommodate 1 inch free movement shall be permitted as an alternate. *Source ASCE 7-02 9.6.2.6.2.2.item e*

figure 5a

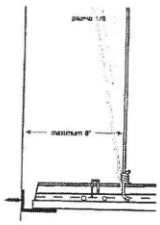


figure 5b • **Countersloping**

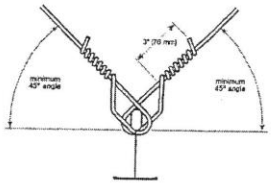


figure 6a

Vertical hanger wire attachment

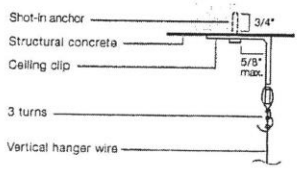


figure 6b

Splayed seismic bracing wire attachment

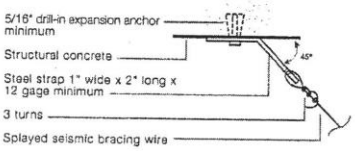
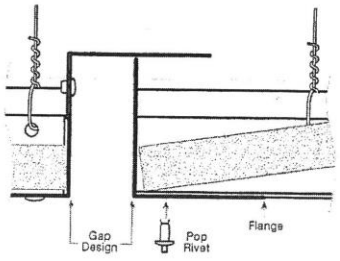


figure 7



GLOSSARY FOR THIS DOCUMENT (regional terminology may vary)

CLOSURE ANGLES
Wall molding that surrounds the perimeter of the suspension system and ceiling tiles.

CROSS TEES
The cross member that interlock with the main beams, also known as cross runners or cross T-bars.

DIFFUSER
A circular or rectangular metal grill used for the passage of air from a ducted system.

ESSENTIAL SERVICE BUILDINGS
Any buildings designed to be used by public agencies as a fire station, police station, emergency operations center, State Patrol office, sheriff's office, or emergency communication dispatch center.

GRID
The main beams and cross tees of the suspension system.

HANGER WIRE
10 or 12 gage soft annealed wire used as primary support for the grid system. Also called suspension wires.

LATERAL FORCE BRACING
The bracing method used to prevent ceiling uplift or restrict lateral movement during a seismic event. Lateral force bracing consists of vertical struts and splay wires.

MAIN BEAM
The primary suspension member supported by hanger wires, also known as the main runner, carrying tee, carrying runner or mains.

MOLDING
A light gauge metal angel or channel fastened to the wall or partition to support the perimeter of an acoustical tile or ceiling.

PERIMETER WIRES
Hanger wires placed within eight inches of the surrounding walls.

PLENUM
The space above a suspended ceiling.

SLACK WIRE
A 12 gage wire that is not tight or taut.

SPREADER or SPACER BAR
A bar with notches to prevent the suspension system from separating, also called a stabilizer bar.

SPLAY WIRES
Wires installed at an angle rather than perpendicular to the grid.

VERTICAL STRUTS
The rigid vertical member used in lateral force bracing of the suspension system. Also known as compression posts, seismic pods, seismic struts. Common materials are electrical conduit (EMT), metal studs or proprietary products.

Northwest Wall and Ceiling Bureau

1032-A NE 65th St.
Seattle, WA 98115
Phone (206) 524-4243
Fax (206) 524-4136
Toll Free (800) 524-4215
info@nwcb.org
www.nwcb.org

NWCB - Oregon
Phone: (503) 295-0333
Fax: (503) 295-2733

B.C. Wall and Ceiling Association
Phone: (604) 597-7180
Fax: (604) 597-7208

Alberta Wall and Ceiling Bureau
Phone: (403) 250-7045
Fax: (403) 291-9515

The NWCB has been serving the construction industry for over forty years. It is recognized as a technical authority, educational body and spokesperson for the wall and ceiling industry. It provides services to architects and the construction community on all matters relating to the diversified wall and ceiling industry.

As the industry's development and coordination organization, the NWCB saw the need to establish a document to provide clarification and the intent of NEHRP (National Earthquake Hazards Reduction Program) an agency of FEMA (Federal Emergency Management Agency). It is meant to serve as a set of recommendations and is not intended for any specific construction project. The NWCB makes no express or implied warranty or guarantee.

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ACCEPTANCE CRITERIA FOR SUSPENDED CEILING FRAMING SYSTEMS

AC368

Approved February 2007

Effective March 1, 2007

PREFACE

Evaluation reports issued by ICC Evaluation Service, Inc. (ICC-ES), are based upon performance features of the International family of codes and other widely adopted code families, including the Uniform Codes, the BOCA National Codes, and the SBCCI Standard Codes. Section 104.11 of the *International Building Code*® reads as follows:

> The provisions of this code are not intended to prevent the installation of any materials or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

Similar provisions are contained in the Uniform Codes, the National Codes, and the Standard Codes.

This acceptance criteria has been issued to provide all interested parties with guidelines for demonstrating compliance with performance features of the applicable code(s) referenced in the acceptance criteria. The criteria was developed and adopted following public hearings conducted by the ICC-ES Evaluation Committee, and is effective on the date shown above. All reports issued or reissued on or after the effective date must comply with this criteria, while reports issued prior to this date may be in compliance with this criteria or with the previous edition. If the criteria is an updated version from the previous edition, a solid vertical line (**I**) in the margin within the criteria indicates a technical change, addition, or deletion from the previous edition. A deletion indicator (→) is provided in the margin where a paragraph has been deleted if the deletion involved a technical change. This criteria may be further revised as the need dictates.

ICC-ES may consider alternate criteria, provided the report applicant submits valid data demonstrating that the alternate criteria are at least equivalent to the criteria set forth in this document, and otherwise demonstrate compliance with the performance features of the codes. Notwithstanding that a product, material, or type or method of construction meets the requirements of the criteria set forth in this document, or that it can be demonstrated that valid alternate criteria are equivalent to the criteria in this document and otherwise demonstrate compliance with the performance features of the codes, ICC-ES retains the right to refuse to issue or renew an evaluation report, if the product, material, or type or method of construction is such that either unusual care with its installation or use must be exercised for satisfactory performance, or if malfunctioning is apt to cause unreasonable property damage or personal injury or sickness relative to the benefits to be achieved by the use of the product, material, or type or method of construction.

www.icc-es.org
Business/Regional Office ■ 5360 Workman Mill Road, Whittier, California 90601 ■ (562) 699-0543
Regional Office ■ 900 Montclair Road, Suite A, Birmingham, Alabama 35213 ■ (205) 599-9800
Regional Office ■ 4051 West Flossmoor Road, Country Club Hills, Illinois 60478 ■ (708) 799-2305

ACCEPTANCE CRITERIA FOR SUSPENDED CEILING FRAMING SYSTEMS

1.0 INTRODUCTION

1.1 Purpose: The purpose of this acceptance criteria is to establish requirements for suspended ceiling framing systems to be recognized in an ICC Evaluation Service, Inc. (ICC-ES), evaluation report under the 2006 *International Building Code®* (IBC). Bases of recognition are IBC Sections 803.9, 1613.1 and 104.11.

The reason for development of this criteria is to clarify requirements in the IBC.

1.2 Scope: This criteria is applicable to suspended metal ceiling framing systems that are used to support acoustical lay-in panels or tiles. This criteria is limited to ceiling assemblies having a maximum dead weight of 4 pounds per square foot, including lighting fixtures (luminaires) and mechanical services, each weighing a maximum of 56 pounds, attached to the ceiling framing system. This criteria is limited to interior applications and to ceilings that are not considered accessible in accordance with Item 32 of IBC Table 1607.1. This criteria is applicable to suspended ceiling framing systems regulated under IBC Section 803.9; ASCE 7, Sections 13.5.6.1 and 13.5.6.2; and CISCA 0-2 and 3-4, as applicable. (The CISCA documents are referenced in ASCE 7, Section 13.5.6.2, and ASCE 7 is referenced in IBC Section 1613.1.) The installation methods of CISCA 0-2 are applicable to ceiling systems with a maximum weight of 2.5 psf.

1.3 Codes and Referenced Standards:

1.3.1 2006 *International Building Code®*, International Code Council.

1.3.2 ASCE 7-05, Minimum Design Loads for Buildings and Other Structures, American Society for Civil Engineers.

1.3.3 CISCA 0-2, Recommendations for Direct-hung Acoustical Tile and Lay-in Panel Ceilings, Seismic Zones 0-2, May 2004, Ceilings and Interior Systems Construction Association.

1.3.4 CISCA 3-4, Guidelines for Seismic Restraint for Direct Hung Suspended Ceiling Assemblies, Seismic Zones 3 & 4, May 2004, Ceilings and Interior Systems Construction Association.

1.3.5 ASTM C 635-00, Specification for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings, ASTM International.

1.3.6 ASTM C 636-04, Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels, ASTM International.

1.3.7 ASTM E 119-00, Standard Test Method for Fire Testing of Building Construction and Materials, ASTM International.

2.0 BASIC INFORMATION

2.1 General: The following information shall be submitted:

2.1.1 Product Description: Complete information concerning material specifications, dimensions and coatings for the ceiling framing system components.

2.1.2 Installation Instructions: Installation details, including requirements, limitations and fastening methods. Installation details shall be consistent with ASTM C 636, CISCA 0-2, CISCA 3-4, and ASCE 7, as applicable.

2.1.3 Packaging and Identification: A description of the method of packaging and field identification of the suspended ceiling framing system components. Identification provisions shall include the evaluation report number.

2.2 Testing Laboratories: Testing laboratories shall comply with Section 2.0 of the ICC-ES Acceptance Criteria for Test Reports (AC85) and Section 4.2 of the ICC-ES Rules of Procedure for Evaluation Reports.

2.3 Test Reports: Test reports shall comply with AC85.

2.4 Product Sampling: Sampling of the suspended ceiling framing system components for tests under this criteria shall comply with Section 3.2 of AC85.

3.0 TEST AND PERFORMANCE REQUIREMENTS

Sections 3.1 through 3.5 of this criteria apply to suspended ceiling framing systems that conform to "Industry Standard Construction" as referenced in ASCE 7, Section 13.5.6.2.

3.1 Physical Properties: Reports of tests shall be submitted verifying yield and tensile strength of metal used to fabricate the framing members used in tests. Yield and tensile strength shall be within 7 percent of specified, or the quality control program shall have a means to ensure the yield and tensile strength of the metal is consistent with the specifications of the materials used in the tests. Corrosion protection on framing members shall be identified.

3.2 Suspended ceiling system framing members shall be tested for uniform gravity loads at a 4-foot span and shall be classified in accordance with ASTM C 635. The allowable uniform load shall be the lesser of the load applied at a deflection of L/360 or the allowable uniform load based on a safety factor of 2 applied to the average maximum test load. When desired by the evaluation report applicant, the allowable midspan concentrated load, as determined analytically from the allowable uniform load, and the allowable uniform load for spans other than 4 feet, shall be determined and reported.

3.3 Connection Tests:

3.3.1 General: Main runners and cross runners of the ceiling system and their splices, intersection connectors, and expansion devices shall be tested for both tension and compression capacity. Tension tests shall be conducted with a 5-degree misalignment, or with a 1-inch eccentricity on a sample not more than 24 inches long on each side of the splice. A minimum of three specimens shall be tested for each connection.

3.3.2 Conditions of Acceptance: For use in Seismic Design Categories A, B and C, the mean ultimate load shall be a minimum of 60 pounds. For use in Seismic Design Categories D, E and F, the mean ultimate load shall be a minimum of 180 pounds or twice the actual load, whichever is greater. The deviation of any individual test result from the mean value shall not exceed 10 percent.

3.4 Connections of vertical hanger wire and bracing wire to suspension members shall be tested in tension and shall demonstrate a minimum capacity of 100 pounds for vertical hanger wire; and 200 pounds or the actual design load, with

a safety factor of 2, whichever is greater, for bracing wires. A minimum of three specimens shall be tested for each configuration.

3.5 The method of attachment of lighting fixtures to framing members shall be tested to demonstrate a capacity of 100 percent of the lighting fixture weight in any direction. Proprietary attachment devices must be qualified under the ICC-ES Acceptance Criteria for Attachment Devices for Recessed Lighting Fixtures (Luminaires) in Suspended Ceiling Systems (AC184).

3.6 Fire-resistance-rated Construction: For use in fire-resistance-rated construction, reports of fire tests in accordance with ASTM E 119 are required.

4.0 QUALITY CONTROL

4.1 Quality documentation complying with the ICC-ES Acceptance Criteria for Quality Documentation (AC10) shall be submitted.

4.2 Third-party follow-up inspections are not required under this acceptance criteria.

5.0 EVALUATION REPORT RECOGNITION

5.1 The evaluation report shall identify the allowable uniform load at a 4-foot span for each suspended ceiling system framing member. When desired by the evaluation report applicant, the allowable mid-span concentrated load, or allowable uniform load at spans other than 4 feet, shall also be identified.

5.2 The evaluation report shall identify the allowable tension and compression values for each suspended ceiling system framing member connection.

5.3 The evaluation report shall include the following conditions of use:

5.3.1 Suspended ceiling systems must be designed in accordance with ASCE 7, Section 13.5.6 . The documents must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.3.2 In Seismic Design Categories C, D, E or F, a quality assurance plan complying with ASCE 7, Section 11A, must be submitted to the code official.

5.3.3 Periodic special inspection must be provided in accordance with ASCE 7, Section 11A.1.3.9, Item 2, as required in ASCE 7, Section 13.5.6.2.2, Item h. A statement of special inspection shall be provided as required in IBC Section 1705.3, Item 4.3.

5.3.4 The ceiling framing system must not be used to provide lateral support for walls or partitions, except as provided for in ASCE 7, Section 13.5.8.1.■