Seismic Technical Guide

ASCE7-05 to ASCE7-10

In 2010 the American Society of Civil Engineers published the latest version of ASCE7, *Minimum Design Loads for Buildings and Other Structures*, American Society of Civil Engineers/Structural Engineering Institute (ASCE/SEI). This new version presents some changes for suspended ceilings. This guide details the general changes from ASCE7-05 to ASCE7-10 for suspended ceilings.

Seismic Code Reference Standards

Installation guidelines for suspended ceilings are contained in the International Building Code (IBC) through reference to ASCE7, *Minimum Design Loads for Buildings and Other Structures*, American Society of Civil Engineers/Structural Engineering Institute (ASCE/SEI). Additional guidelines are referenced in the CISCA Guidelines for Zones 3-4, which is also referenced as the basis for installation in Seismic Design Categories D-F and the CISCA Guidelines for Zones 0-2, which is also referenced as the basis for installation in Seismic Design Category C. In 2012 this will change from the CISCA Guidelines to ASTM E580, *Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions.*

Installation Guidelines for Suspended Ceilings

International Building Code (IBC)	2003 IBC	2006 IBC	2009 IBC	2012 IBC
American Society of Civil Engineers (ASCE)	ASCE7-02	ASCE7-05	ASCE7-05	ASCE7-10
Ceilings Interior Systems Construction Association (CISCA) or ASTM International (ASTM)	CISCA Zones 0-2 CISCA Zones 3-4	CISCA Zones 0-2 CISCA Zones 3-4	CISCA Zones 0-2 CISCA Zones 3-4	ASTM E580

The 2010 version of ASCE7 no longer references CISCA Zones 0-2 or CISCA Zones 3-4. In lieu of the CISCA Zones documents it now references ASTM E580. The 2012 version of the IBC will reference the 2010 version of ASCE7.

Summary of Changes

ASCE7-05 to ASCE7-10

Section		ASCE7-05	ASCE7-10	USG Supporting Documents[1]
Section 13.4.5	**Power Actuated Fasteners**	Not allowed in Seismic Design Category D, E, and F	Allowed by exception: Power actuated fasteners in concrete where the service load on any individual fastener does not exceed 90 lb (400 N). Power actuated fasteners in steel where the service load on any individual fastener does not exceed 250 lb (1,112 N).	– **Exemptions** (SC2510) – **Hanger Wire Attachment** (SC2522)
Section 13.5.6	**Exemptions**	There were no exemptions in ASCE 7-05. The exemptions were contained in the CISCA Zones 0-2 and 3-4 reference documents.	Contains two exemptions: 1. Suspended ceilings with areas less than or equal to 144 square feet that are surrounded by walls or soffits that are laterally braced to the structure above are exempt. 2. Suspended ceilings constructed of screw- or nail-attached gypsum board on one level that are surrounded by and connected to walls or soffits that are laterally braced to the structure above are exempt.	– **Suspended Drywall Ceiling Construction** (SC2495) – **Exemptions** (SC2510)
Section 13.5.6.1	**Seismic Forces**		No Changes	
Section 13.5.6.2	**Industry Standard Construction**		No Changes	
Section 13.5.6.2.1	**Seismic Design Category C**	CISCA Guidelines for Zones 0-2	ASTM E580	– **Suspended Ceiling Seismic Assemblies** (SC2233) – **Certification of Performance** (AC3235)
Section 13.5.6.2.2	**Seismic Design Category D through F**	CISCA Guidelines for Zones 3-4	ASTM E580	– **Suspended Ceiling Seismic Assemblies** (SC2233) – **Certification of Performance** (AC3235)
Section 13.5.6.2.2a	**Grid Load Rating**	Heavy Duty	This was deleted and the requirement is now contained in ASTM E580.	– **Suspended Ceiling Seismic Assemblies** (SC2233) – **Certification of Performance** (AC3235)

Summary of Changes

ASCE7-05 to ASCE7-10

Section		ASCE7-05	ASCE7-10	USG Supporting Documents[1]
Section 13.5.6.2.2b	**Perimeter Closure Angle**	Minimum 2.0 in. (50 mm).	Renumbered to 13.5.6.2.2a with the same requirement. Also allows 7/8 in. perimeter closure with a seismic clip (such as the USG ACM7 Seismic Clip) when approved by the Authority Having Jurisdiction (AHJ).	– **Perimeter Cross Tees** (SC2511) – **Seismic Clip Perimeter Interface** (SC2498) – **Certification of Performance** (AC3235) – **ACM7 Seismic Clip Submittal Sheet** (AC3269)
Section 13.5.6.2.2c	**Horizontal Restraint – Lateral Bracing**	Required for ceiling areas exceeding 1,000 ft2 (92.9 m2).	This was deleted and the requirement is now contained in ASTM E580.	– **Seismic Expansion Joints** (SC2496) – **Compression Posts** (SC2497)
Section 13.5.6.2.2d	**Seismic Separation Joint**	Required for ceiling areas exceeding 2,500 ft2 (232m2).	Renumbered to Section 13.5.6.2.2b, the same requirement remains with the aspect ratio now limited to 4:1 and the joints must allow 3/4 in. longitudinal movement.	– **Seismic Expansion Joints** (SC2496) – **Compression Posts** (SC2497)
Section 13.5.6.2.2e	**Penetrations**	Minimum 1 in. (25 mm) in all horizontal directions.	Deleted and now contained in ASTM E580	– **Suspended Ceiling Seismic Assemblies** (SC2233)
Section 13.5.6.2.2f	**Ceiling Plan Elevation Changes**	Changes in ceiling plan elevation shall be provided with positive bracing.	Deleted and now contained in ASTM E580	– **Suspended Ceiling Seismic Assemblies** (SC2233)
Section 13.5.6.2.2g	**Cable Tray and Conduit Support**	Supported independently of the ceiling.	Deleted and now contained in ASTM E580	– **Suspended Ceiling Seismic Assemblies** (SC2233)
Section 13.5.6.2.2h	**Special Inspection**	Suspended ceilings shall be subject to the special inspection requirements of Section 11A.1.3.9	Deleted but remains in Section 11A.1.3.9.	– **Suspended Ceiling Seismic Assemblies** (SC2233)

This is only intended as a quick reference. For a complete listing of these requirements please refer to ASCE7, *Minimum Design Loads for Buildings and Other Structures*, American Society of Civil Engineers/Structural Engineering Institute (ASCE/SEI).

[1] For more information please visit usg.com or seismicceilings.com. The USG resources listed here can be downloaded from these sites.

Product Information
See usg.com for the most up-to-date product information.

Installation
Must be installed in compliance with ASTM C636, ASTM E580, CISCA, and standard industry practices.

Code Compliance
The information presented is correct to the best of our knowledge at the date of issuance. Because codes continue to evolve, check with a local official prior to designing and installing a ceiling system. Other restrictions and exemptions may apply. This is only intended as a quick reference.

ICC Evaluation Service, Inc., Report Compliance
Suspension systems manufactured by USG Interiors, Inc., have been reviewed and are approved by listing in ICC-ES Evaluation Report 1222. Evaluation Reports are subject to reexamination, revision and possible cancellation. Please refer to usgdesignstudio.com or usg.com for current reports.

L.A. Research Report Compliance
DONN brand suspension systems manufactured by USG Interiors, Inc., have been reviewed and are approved by listing in the following L.A. Research Report number: 25764.

Notice
We shall not be liable for incidental and consequential damages, directly or indirectly sustained, nor for any loss caused by application of these goods not in accordance with current printed instructions or for other than the intended use. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from date it was or reasonably should have been discovered.

Safety First!
Follow good safety/industrial hygiene practices during installation. Wear appropriate personal protective equipment. Read MSDS and literature before specification and installation.

USG

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