



# **Seismic Technical Guide**

## CertainTeed Acoustical Suspension Systems



## **PURPOSE OF SEISMIC INSTALLATION REQUIREMENTS FOR SUSPENDED CEILINGS**

- Provide a suspension system strong enough to resist lateral forces imposed upon it without failing
- Prevent panels from falling during a seismic event
- Limit structural damage to ceiling grid during a seismic event
- Provide life safety to building occupants during seismic events

## **ADOPTION OF THE INTERNATIONAL BUILDING CODE**

The International Building Code (IBC) is in use or adopted in 50 states, the District of Columbia, Guam, Northern Mariana Islands, New York City, the U.S. Virgin Islands, Puerto Rico and all Federal Agencies.

## **CODE ENFORCEMENT**

The building code presents minimum design/performance requirements and in some instances prescriptive guidance. The code also sets forth limitations and conditions of use. It is important to know that while the building code establishes the requirements, the code official has the power to enforce its provisions. The code official also has the latitude to allow materials and methods of construction that are not addressed in the code. As with all code issues, the local authority having jurisdiction (AHJ) is the final arbiter for application of the IBC at that location.



## HOW SEISMIC DESIGN CATEGORIES ARE DETERMINED

A project's seismic design category (A-F) is typically identified and specified by a professional engineer or a registered architect. The identified seismic design category can be found in Section 1 of the project specification and on page one of the project structural drawings. International Building Code allows two paths to determine Seismic Design category — IBC Section 1613 or ASCE 7 Section 11.6. The IBC states that a Seismic Design Category must be established for each construction project based on:

- Anticipated ground motion
- Soil type in a specified geographic area
- Occupancy category

These factors are used to evaluate and establish a seismic design category of A, B, C, D, E or F. The installation of ceilings can be divided into three tiers of increasing requirements:

- Categories A & B installations must meet requirements established in ASTM C636. There are no additional seismic requirements.
- Category C installations must follow ASTM C636 and ASTM E580
- Category D, E, or F installations must follow ASTM C636, ASCE 7 Section 13.5.6 and ASTM E580



# IBC CONVENTIONAL SEISMIC INSTALLATION REQUIREMENTS SUMMARY

		SEISMIC DESIGN CATEGORY			
		Category C per 2012 & 2015 IBC	Categories D,E,F per 2012 & 2015 IBC	Category C per 2018 IBC	Categories D,E,F per 2018 IBC
<b>REFERENCES</b>	Corresponding American Society of Civil Engineers (ASCE) Reference Standard	ASCE 7-10	ASCE 7-10	ASCE 7-16	ASCE 7-16
	Corresponding ASTM Reference Standard	ASTM E580	ASTM E580	ASTM E580	ASTM E580
<b>LIMITATIONS</b>	Weight Limitations	2.5 psf	4 psf	2.5 psf	4 psf
<b>EXEMPTIONS</b>	Ceiling areas less than 144 ft <sup>2</sup>	Exempt	Exempt	Exempt	Exempt
	Drywall ceilings (screw-attached)	Exempt	Exempt	Exempt	Exempt
<b>BASIC INSTALLATION REQUIREMENT</b>	Minimum strength of vertical wire connection device to the structure	Not required	90 lbs.	Not required	90 lbs.
	Vertical hanger wire 12-gauge @ 4' o.c.	Required	Required	Required	Required
	1 in 6 max plumb of vertical hanger wires	Required	Required	Required	Required
	Rigid bracing for ceiling plane elevation changes	Not required	Required	Not required	Required
	Partition attachment (see ASCE 7 / 13.5.8.1 for exceptions)	Only if ceiling can move laterally	Bracing must be independent of ceiling	Only if ceiling can move laterally	Bracing must be independent of ceiling
<b>GRID REQUIREMENTS</b>	Main runner classifications (per ASTM C635)	Intermediate or Heavy Duty	Heavy Duty	Intermediate or Heavy Duty	Heavy Duty
	Minimum main runner and cross tee connection strength	60 lbs.	180 lbs.	60 lbs.	180 lbs.
<b>PERIMETER REQUIREMENTS</b>	Hangers at perimeter components (not more than 8" from wall)	Not required (unless angle is < 7/8")	Required	Not required (unless angle is < 7/8")	Required
	Grid end/wall details	3/8" gap off all walls	Tight on 2-adjacent walls. 3/4" gap off opposite 2-adjacent walls	3/8" gap off all walls	Tight on 2-adjacent walls. 3/4" gap off opposite 2-adjacent walls
	Perimeter angle molding width	Min. 7/8" (or use perimeter wires)	Min. 2"	Min. 7/8" (or use perimeter wires)	Min. 2"
	Cut ends of system components must be prevented from spreading (stabilizer bars)	Required	Required	Required	Required
<b>LATERAL BRACING REQUIREMENTS</b> (For areas > 1000 S.F.)	Horizontal restraint (splay wires or rigid bracing) within 2" of intersection and splayed 90° apart at 45° angles (areas over 1,000 ft <sup>2</sup> )	Not required	Required	Not required	Required
	Compression posts (struts) 12' o.c. in both directions, starting 6' from walls	Not required	Required	Not required	Required
	Splay bracing connection strength	Not required	Required (200 lbs.)	Not required	Required (250 lbs.)
	Separation joint assembly (or bulkhead braced to structure)	Not required	Required	Not required	Required
<b>SEISMIC SEPARATION</b> (For areas > 2500 S.F. with L-W ratio ≤ 4)	Separation joint assembly (or bulkhead braced to structure)	Not required	Required	Not required	Required

## IBC CONVENTIONAL SEISMIC INSTALLATION REQUIREMENTS SUMMARY

### SEISMIC DESIGN CATEGORY

		Category C per 2012 & 2015 IBC	Categories D,E,F per 2012 & 2015 IBC	Category C per 2018 IBC	Categories D,E,F per 2018 IBC	
<b>LIGHT FIXTURE ATTACHMENT</b>	Light fixture (all types) mechanically attached to grid is required per NEC 410-16 (two per fixture unless independently supported)	Required	Required	Required	Required	
	Surface-mounted fixtures attached to grid	Must be attached to ceiling with positive clamping devices that are connected to the structure or vertical hanger wires	Must be attached to ceiling with positive clamping devices that are connected to the structure or vertical hanger wires	Must be attached to ceiling with positive clamping devices that are connected to the structure or vertical hanger wires	Must be attached to ceiling with positive clamping devices that are connected to the structure or vertical hanger wires	
	Pendant-hung fixtures directly supported from structure with 9-gauge wire (or approved alternate)	Required	Required	Required	Required	
	<b>Rigid lay-in or can light fixtures</b>					
	< 10 lbs. - one wire to structure (may be slack)	Required	Required	Required	Required	
	10 to 56 lbs. - two wires from fixture to structure (may be slack)	Required	Required	Required	Required	
	> 56 lbs. - supported directly to structure by approved hangers	Required	Required	Required	Required	
	Rigid conduit attached to light fixtures	Forbidden	Permitted	Forbidden	Permitted	
	<b>Air Terminals</b>					
	< 20 lbs. - positively attached to grid	Required	Required	Required	Required	
20 to 56 lbs. - positively attached to grid and two 12-gauge wires to structure (may be slack)	Required	Required	Required	Required		
> 56 lbs. - directly supported to the structure	Required	Required	Required	Required		
Sprinkler heads and other penetration clearance	Minimum 3/8" on all sides	Minimum 2" diameter opening or a swing joint	Minimum 3/8" on all sides	Minimum 2" diameter opening or flexible sprinkler hose fitting		
Cable trays and electrical conduit independently supported and braced	Not required	Required	Not required	Required		
<b>SERVICES WITHIN THE CEILING</b>						

#### NOTES:

Consult your local authority having jurisdiction for information specific to your region. Note that some installations do not fall under the jurisdiction of the IBC in many states, such as schools and hospitals.

# IBC CONVENTIONAL SEISMIC INSTALLATION REQUIREMENTS SUMMARY

		<b>SEISMIC DESIGN CATEGORY</b>	
		<b>Seismic Design Category C per ESR 3336 (Alternate Method)</b>	<b>Seismic Design Categories D, E, F per ESR 3336 (Alternate Method)</b>
<b>REFERENCES</b>	Corresponding American Society of Civil Engineers (ASCE) Reference Standard	2012 & 2015 IBC - ASCE 7-10	2012 & 2015 IBC - ASCE 7-10
	Corresponding IBC or ASTM Reference Standard	2012 & 2015 IBC - ASTM E 580	2012 & 2015 IBC - ASTM E 580
<b>LIMITATIONS</b>	Weight Limitations	2.28 psf (2.5 for EZ Stab Bolt Slot/Tier Drop only)	4.0 psf
<b>EXEMPTIONS</b>	Ceiling areas less than 144 ft <sup>2</sup>	Exempt	Exempt
	Drywall ceilings (screw-attached)	Exempt	Exempt
<b>BASIC INSTALLATION REQUIREMENT</b>	Minimum strength of vertical wire connection device to the structure	Not required	2012 & 2015 IBC 90 pounds
	Vertical hanger wire 12-gauge @ 4' o.c.	Required	Required
	1 in 6 max plumb of vertical hanger wires	Required	Required
	Rigid bracing for ceiling plane elevation changes	Not required	Required
	Partition attachment	Allowed only if ceiling is allowed to move laterally	Bracing independent of ceiling splay bracing
<b>GRID REQUIREMENTS</b>	Main runner classifications (per ASTM C635)	Intermediate or Heavy Duty	Heavy Duty
	Minimum main runner and cross tee connection strength	60 lbs.	180 lbs.
<b>PERIMETER REQUIREMENTS</b> (Integration of CertainTeed Seismic Perimeter Clip/CTSPC-2)	Perimeter vertical hanger wires not more than 8" from wall	Not required unless angle is less than 7/8"	Required
	Grid end/wall details	Tight on 2-adjacent walls. 3/8" gap off opposite 2-adjacent walls	Tight on 2-adjacent walls. 3/4" gap off opposite 2-adjacent walls
	Perimeter closure (wall angle) width	Minimum 7/8" with CTSPC-2	Minimum 7/8" with CTSPC-2 screwed to wall (2-screws/clip)
	Perimeter tee ends tied together at perimeters (Stabilizer Bars)	Required (CTSPC-2 satisfies requirement)	Required (CTSPC-2 satisfies requirement)
<b>LATERAL BRACING REQUIREMENTS</b> (For areas > 1000 S.F.)	Horizontal restraint (Assemblies begin 6-ft from wall and are 12-ft on-center both directions. Assembly = 4-splay wires + strut to structure. Rigid bracing allowed as alternative assembly.)	Not required	Required
	Splay bracing connection strength	Not required	2012 & 2015 IBC - 250 pounds
<b>SEISMIC SEPARATION</b> (For areas > 2500 S.F. with L-W ratio ≤ 4)	Seismic separation joint (or bulkhead braced to structure)	Not required	Required

## IBC CONVENTIONAL SEISMIC INSTALLATION REQUIREMENTS SUMMARY

		SEISMIC DESIGN CATEGORY	
		Seismic Design Category C per ESR 3336 (Alternate Method)	Seismic Design Categories D, E, F per ESR 3336 (Alternate Method)
<b>LIGHT FIXTURE ATTACHMENT</b>	Light fixture (all types) mechanically attached to grid is required per NEC 410-16 (two per fixture unless independently supported)	Required	Required
	Surface-mounted fixtures attached to grid	2012 & 2015 IBC - Must be attached to ceiling with positive clamping devices that are connected to the structure or vertical hanger wires	2012 & 2015 IBC - Must be attached to ceiling with positive clamping devices that are connected to the structure or vertical hanger wires
	Pendant-hung fixtures directly supported from structure with 9-gauge wire (or approved alternate)	Not required	Required
	<b>Rigid lay-in or can light fixtures</b>		
	< 10 lbs. - one wire to structure (may be slack)	Required	Required
	10 to 56 lbs. - two wires from fixture to structure (may be slack)	Required	Required
	> 56 lbs. - supported directly to structure by approved hangers	Required	Required
	Rigid conduit attached to light fixtures	Forbidden	Permitted
<b>SERVICES WITHIN THE CEILING</b>	<b>Air Terminals</b>		
	< 20 lbs. - positively attached to grid	Not required	Required
	20 to 56 lbs. - positively attached to grid and two 12-gauge wires to structure (may be slack)	Not required	Required
	> 56 lbs. - directly supported to the structure	Not required	Required
	Sprinkler heads and other penetration clearance	Minimum 3/8" on all sides	2012 & 2015 IBC - Minimum 2" diameter opening or flexible sprinkler hose fitting
	Cable trays and electrical conduit independently supported and braced	Not required	Required

### NOTES:

Consult your local authority having jurisdiction for information specific to your region. Note that some installations do not fall under the jurisdiction of the IBC in many states, such as schools and hospitals.

## ADDITIONAL RESOURCES ON SEISMIC CODES AND REQUIREMENTS

### Contact CertainTeed Ceilings Technical Services

Phone: 1-800-233-8990

#### Visit these code related websites:

- American Society for Testing and Materials (ASTM): [www.astm.org](http://www.astm.org)
- National Institute of Building Sciences: [www.nibs.org](http://www.nibs.org)
- International Code Council: [www.icc-es.org](http://www.icc-es.org)
- U.S. Geological Survey: [www.usgs.gov](http://www.usgs.gov)
- Ceilings Interior Systems Construction Association (CISCA): [www.CISCA.org](http://www.CISCA.org)
- American Society of Civil Engineers (ASCE): [www.ASCE.org](http://www.ASCE.org)
- ICC certified (ESR-3336) and City of Los Angeles Building Code compliant via ESR-3336 LABC Supplement

## CERTAINTEED SEISMIC SUSPENSION SYSTEMS (ESR-3336)

The International Code Council (ICC-ES) recognizes CertainTeed Seismic Suspension Systems as code-compliant solutions (ESR-3336). This evaluation and confirmation by ICC-ES provides evidence supporting the CertainTeed Suspension System and Perimeter Clip System as a code-compliant alternative to IBC requirements. CertainTeed's ICC-ES evaluation allows the utilization of 7/8" wall angle for ceiling installations in IBC Categories D, E, and F when used with the CertainTeed Perimeter Clip (CTSPC-2). The ICC-ES allows you to meet seismic code requirements without the risk of delaying your construction schedule and eliminating the need for the conventional IBC installation components (2" wall angle and stabilizer bars). The ICC-ES evaluation also allows the use of two fixed walls instead of a floating ceiling when used with the CertainTeed Perimeter Clip for Category C.

## CATEGORIES A-F: CERTAINTEED SEISMIC SUSPENSION SYSTEMS

Product Categories	Categories A-B	Category C	Categories D-F	ESR-3336
15/16" EZ Stab Classic System	x	x	x	x
15/16" EZ Stab Classic Aluminum Capped System	x	x	x	x
15/16" EZ Stab Classic Environmental System	x	x	x	x
9/16" EZ Stab Elite Narrow System	x	x	x	x
9/16" EZ Stab Bolt Slot System - 1/8" Reveal	x	x	x	x
15/16" EZ Stab Cleanroom System	x	x	x	x



## CertainTeed Seismic Perimeter Clip Design and Use (Categories C, D, E, and F)

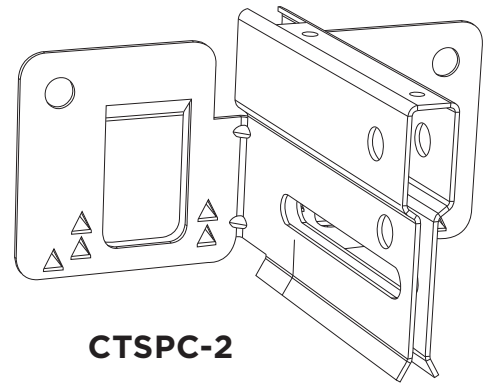
The CertainTeed Seismic Perimeter Clip (CTSPC-2) is designed to fit CertainTeed main runners and cross tees. This clip allows for an alternative installation method using 7/8" wall angle instead of the required 2" wall angle and stabilizer bar construction. The CTSPC-2 accessory meets the seismic performance criteria set forth by the IBC to stabilize main runners and cross tees at the ceiling's perimeter as detailed in ICC-ES report 3336.

### CertainTeed Seismic Perimeter Clip (CTSPC-2) Installation

The CTSPC-2 clip is easy to install with clearly visible dimension markers on the clip showing the required 3/8" or 3/4" clearance of the grid to the wall. The rounded shape of the stop bumps allows for flexible clip adjustment during installation, and screw holes provide easy attachment to the tee when necessary.

#### To Install:

1. Firmly grasp clip and press down over the bulb of cut suspension member. It will snap into place with an audible click. (A properly seated clip will be able to move along the cut suspension member.)
2. Engage clip back tabs in desired location behind wall angle.



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### Category C: Requirements and Benefits

- Grid can be tight on two adjoining walls — using the CTSPC-2 clip
- Intermediate duty or heavy duty main runners

### Categories D, E, and F: Requirements and Benefits

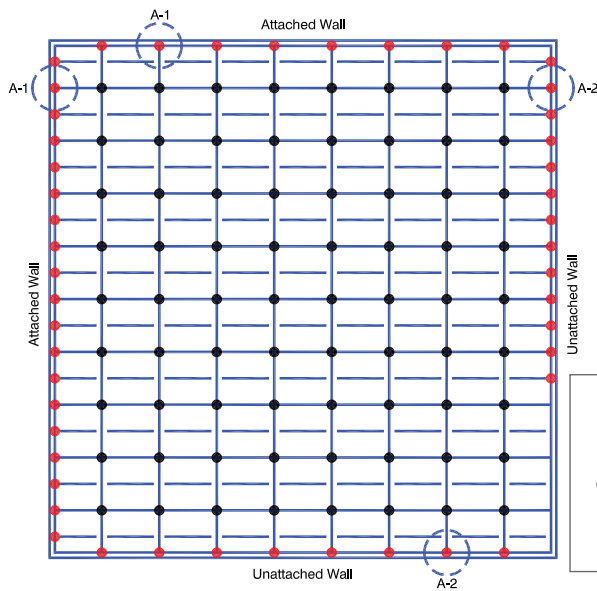
- Eliminates 2" wall angle, allows for 7/8" wall angle
- Grid must be tight on the two adjoining attached walls— use the CTSPC-2 clip or pop rivets
- Heavy duty main runners only
- Use CTSPC-2 clip with 3/4" clearance on unattached walls

### Benefits of Using the CTSPC-2

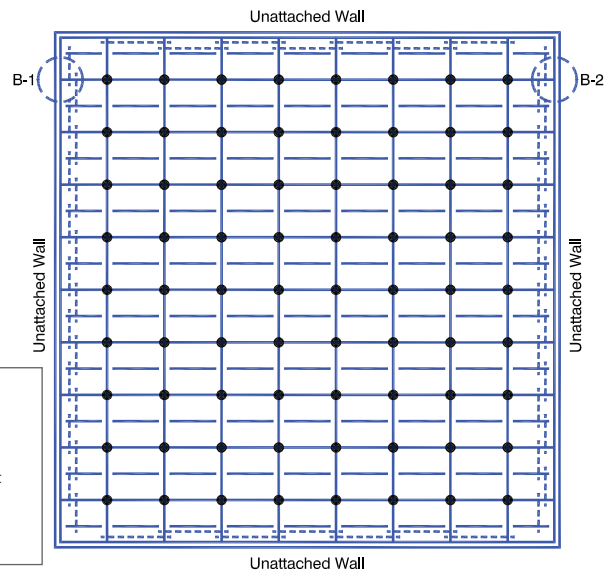
- Installs easily, saving time and money
- Meets code requirements
- Makes it easy to square the system
- Eliminates stabilizer bars allowing easier access to plenum

## Category C Perimeter Requirements

### CertainTeed Seismic Perimeter Clip (CTSPC-2) Installation (ESR-3336)



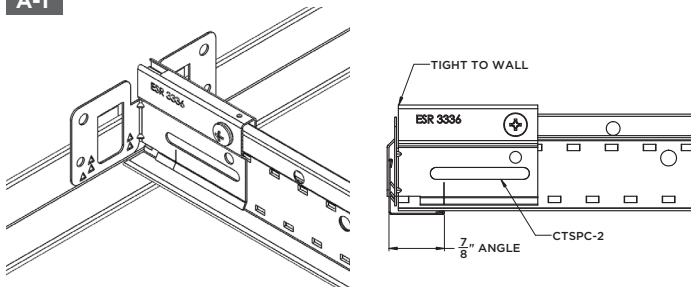
### IBC Conventional Installation



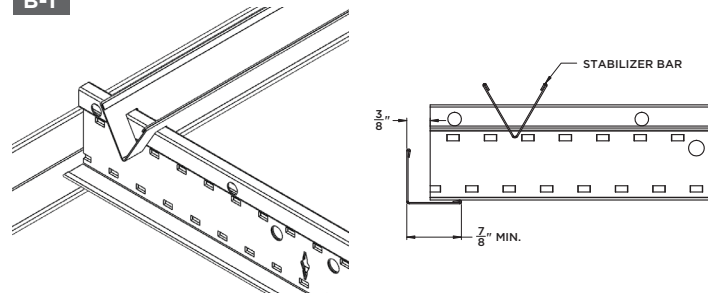
#### Legend

- 12 Gauge Wire
- ⊗ Horizontal Restraint
- CTSPC Clip
- - - Stabilizer Bars

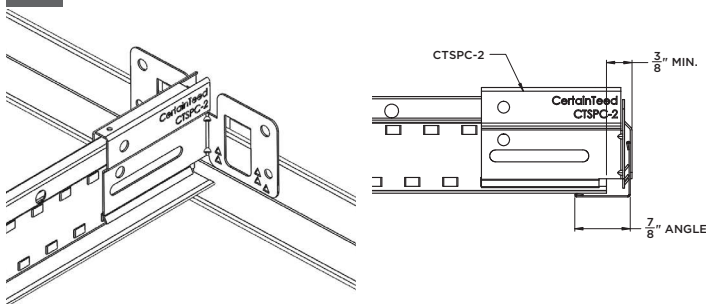
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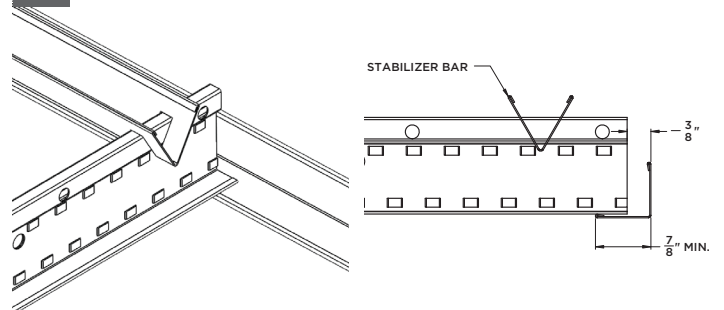
B-1



A-2



B-2



#### Requirements per ESR 3336

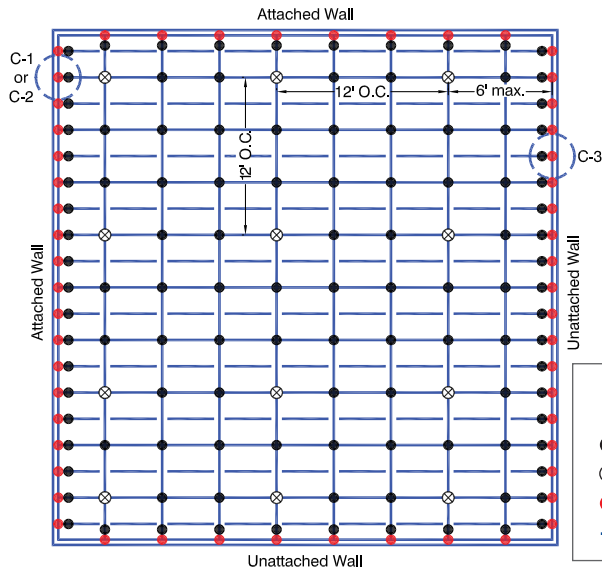
- Minimum 7/8" wall angle
- Grid may be cut tight on two adjoining walls
- Minimum 3/8" clearance on two unattached walls
- CTSPC-2 clip maintains main runner and cross tee spacing: no other components, such as stabilizer bars, are required
- Intermediate duty main runners

#### Requirements per IBC

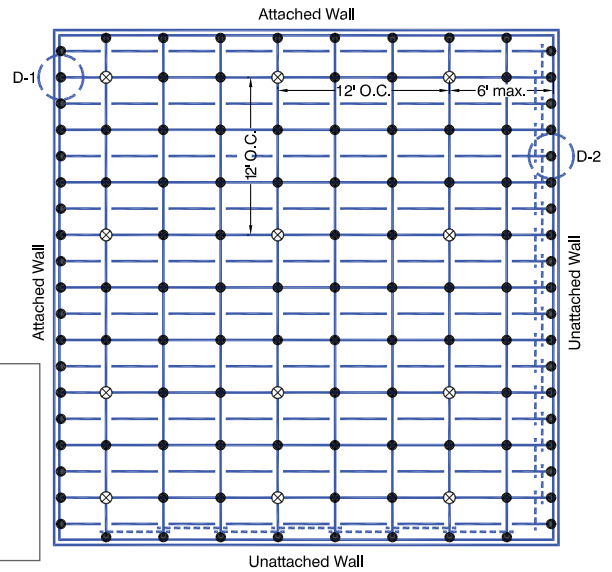
- Minimum 7/8" wall angle
- Grid must not be attached to wall or wall angle
- Minimum 3/8" clearance on all walls
- Ends of main runners and cross tees must be tied together (stabilizer bars) to prevent spreading
- Intermediate duty main runners

# Categories D, E, and F Perimeter Requirements

## CertainTeed Seismic Perimeter Clip (CTSPC-2) Installation (ESR-3336)

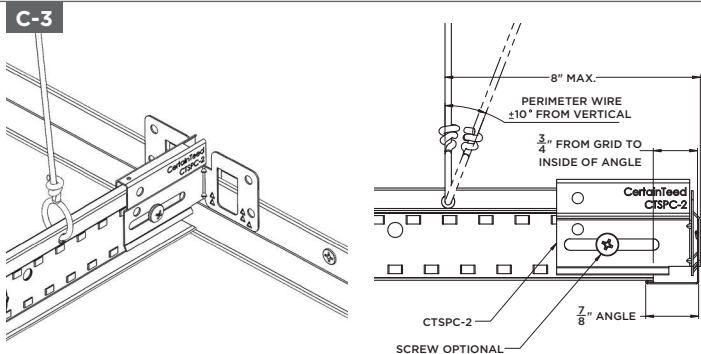
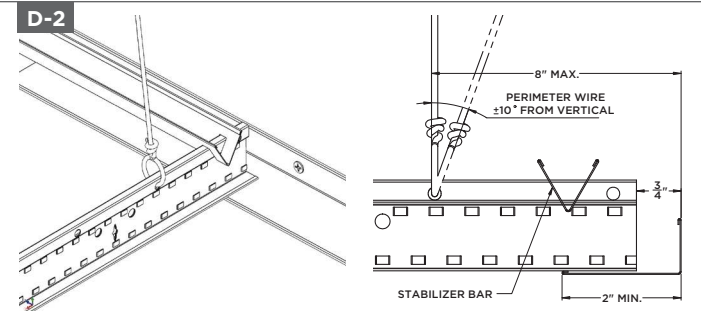
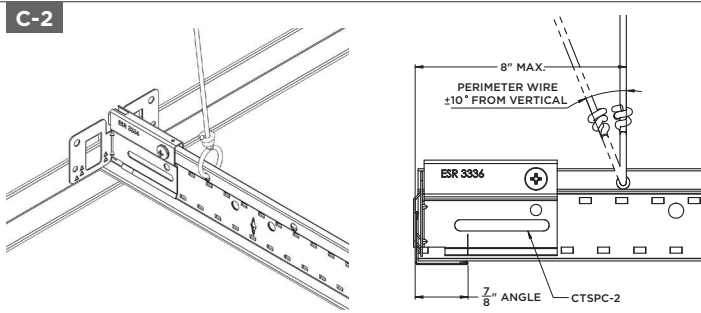
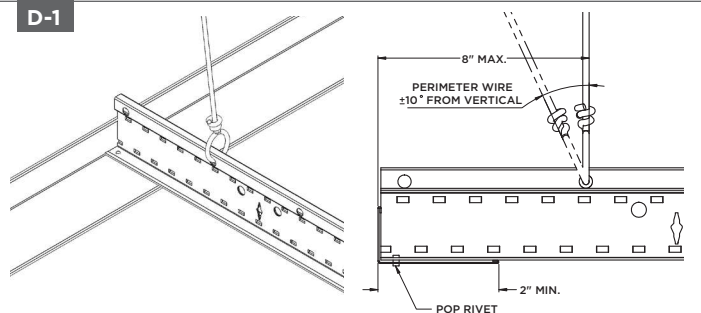
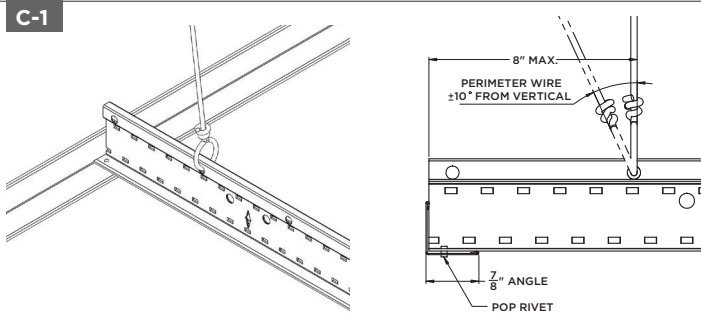


## IBC Conventional Installation



**Legend**

- 12 Gauge Wire
- ⊗ Horizontal Restraint
- CTSPC-2 Clip
- - - Stabilizer Bars



### Requirements per ESR 3336

- Minimum 7/8" wall angle
- Grid must be attached on two adjacent walls - opposite walls require CTSPC-2 clips with 3/4" clearance
- CTSPC-2 maintains main runner and cross tee spacing: no other components, such as stabilizer bars, are required
- Heavy duty main runners only (as identified in ESR-3336 and Page 8 of this document)

### Requirements per IBC

- Minimum 2" wall angle
- Attached grid on two adjacent walls with pop rivets, screws or other means
- Ends of main runners and cross tees must be tied together to prevent spreading
- 3/4" clearance at perimeter/unattached walls
- Heavy duty main runners only

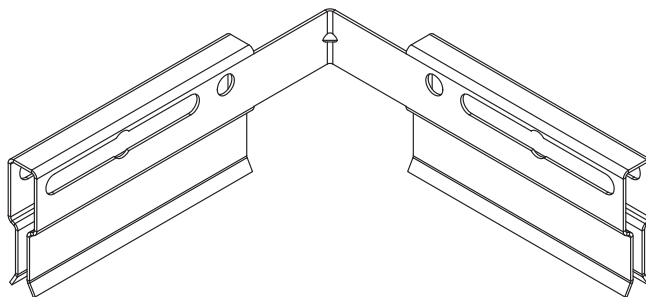
## ADDITIONAL RESOURCES ON SEISMIC CODES AND REQUIREMENTS

### Seismic Separation Joint Requirements (Categories D, E, and F)

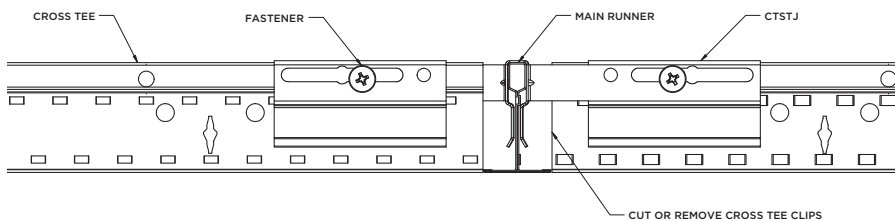
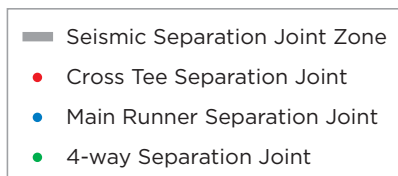
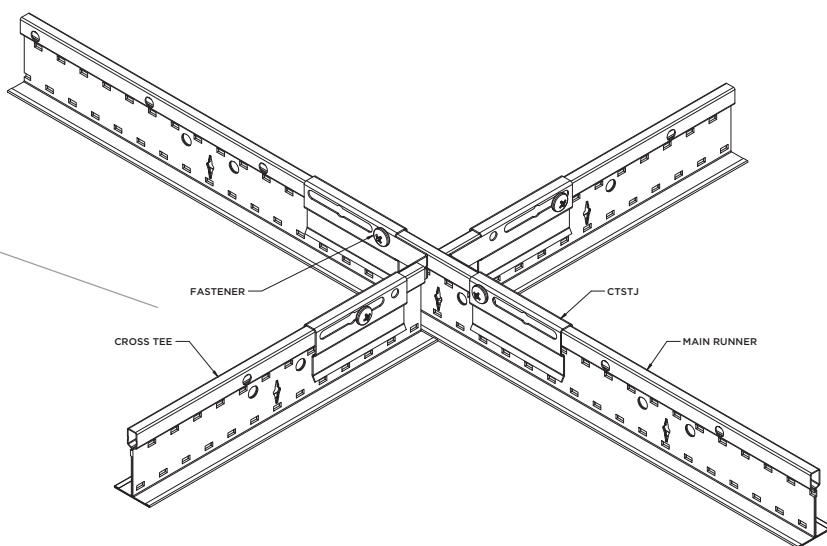
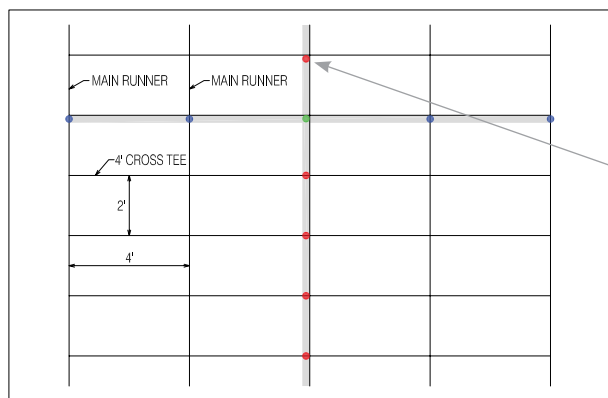
Seismic separation joints are prescribed for seismic design categories D, E and F by the International Building Code (IBC) through reference to ASCE 7 mandates that ceiling areas exceeding 2,500 ft<sup>2</sup> (232 m<sup>2</sup>), must have seismic separation joints or full height partitions that divide the ceiling into areas not exceeding 2,500 ft<sup>2</sup>. The length to width ratios in these areas must not be greater than 4:1.

### CertainTeed Seismic Transition Joint Clip (CTSTJ)

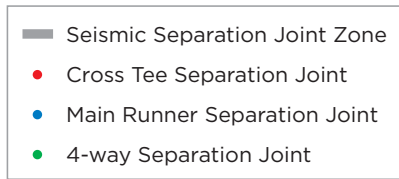
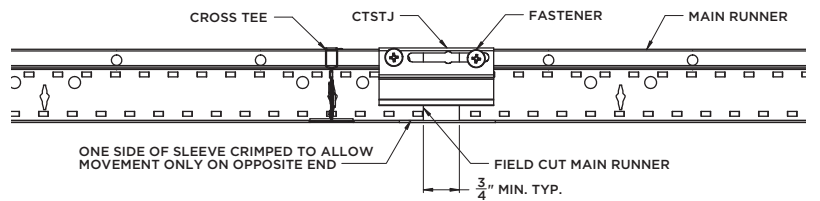
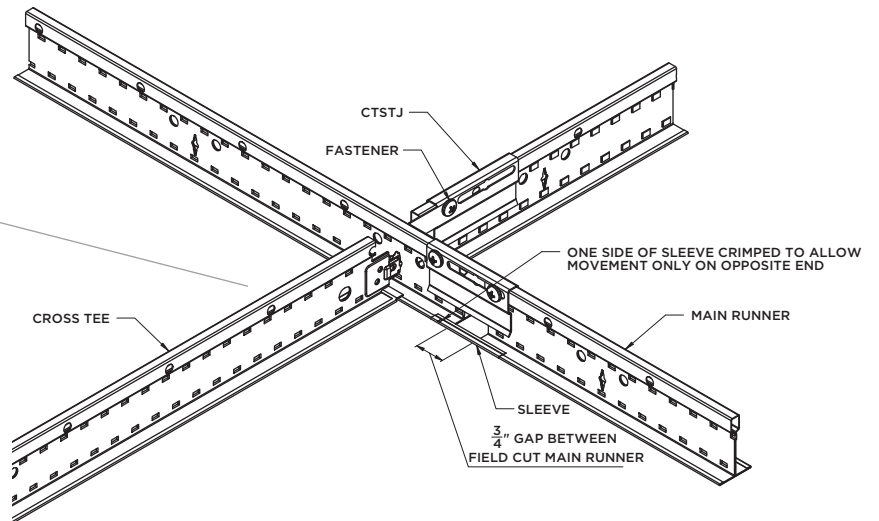
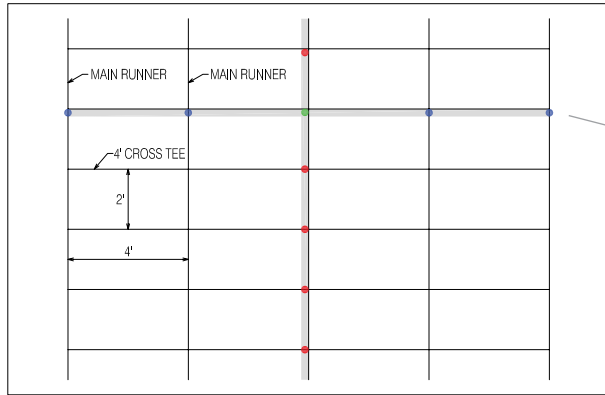
- Aesthetically masks presence of separation joint
- Saves time with a reliable installation method
- Non-directional and can be used on either main tees or cross tees
- Allows for full acoustical panel at the joint
- Easier to keep the ceiling system square
- Eliminates the need for additional hanger wires
- Has clip placement (over the bulb of the tee) that does not interfere with typical light fixtures



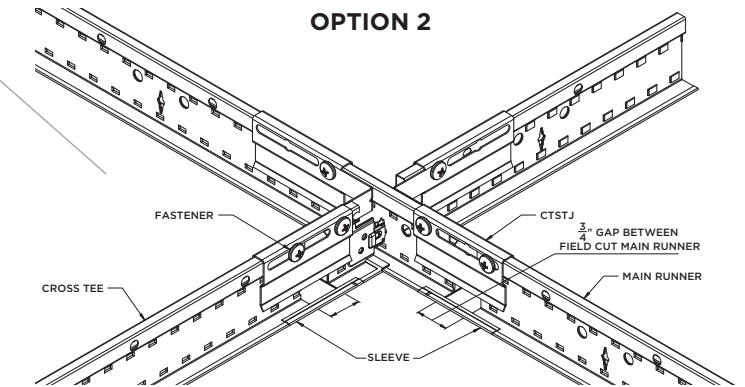
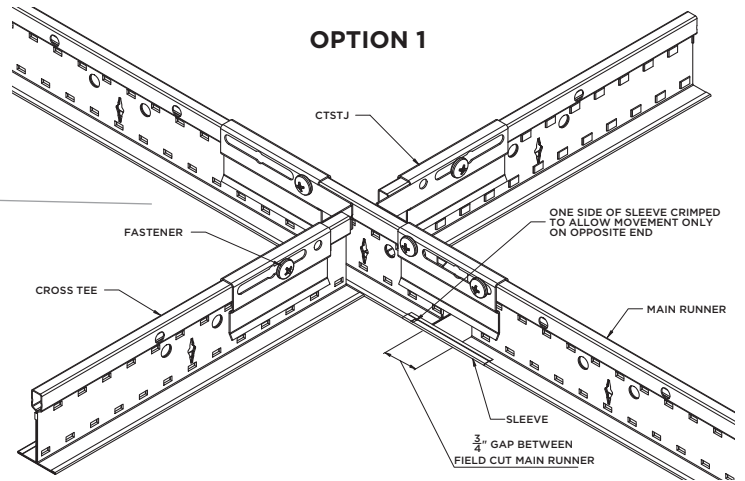
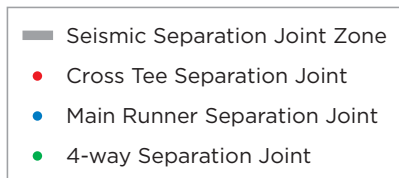
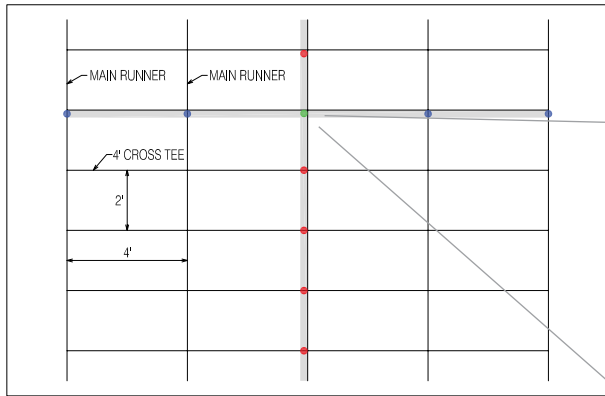
### Construction (Cross Tee Separation Joint)



## Construction (Main Runner Separation Joint)



## Construction (Main Runner Separation Joint)



## Bracing and Restraint for Seismic Installations

Typical seismic bracing for wall-to-wall ceilings consists of individual clusters of four, 12-gauge wires arrayed 90° from one another and attached to the main runner within 2" of a cross tee intersection. The wires are to be angled no more than 45° from the plane of the ceiling. The compression post is attached to the grid at the cluster of wires and extends to the overhead structure.

The compression post should be engineered for the application and the longer its length, the more substantial it must be. Typical post material can be made of EMT conduit or steel stud (see horizontal restraint below).

Note: Information regarding maximum lengths of vertical compression posts is available upon request.

The code also allows for the use of rigid bracing. When a rigid member is used in place of wires it can handle loads in two directions (push and/or pull), so only two lateral bracing members at 90° to each other are required.

The exemption from lateral force bracing for ceilings less than or equal to 1,000 ft<sup>2</sup> (93 m<sup>2</sup>) should not be confused with the exemption for ceilings less than or equal to 144 ft<sup>2</sup> (13.4 m<sup>2</sup>). The 144 ft<sup>2</sup> (13.4 m<sup>2</sup>) exemption is a blanket exemption from all seismic force requirements (2" wall angle, heavy duty main runners, lateral force bracing wires compression posts, etc.). The 1,000 ft<sup>2</sup> exemption is only for lateral bracing.

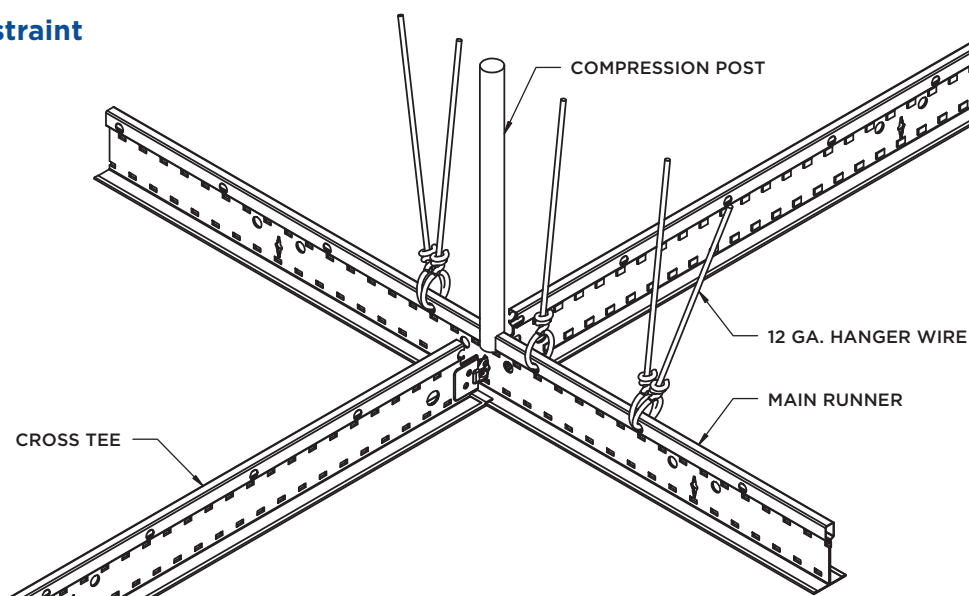
The lateral force bracing consists of both the splay wires and the compression post. Exempting lateral bracing exempts both the splay wires and the compression post. The lateral force bracing must start within 6 ft of two adjacent walls. It is not necessary to end the lateral force bracing within 6 ft of the opposite two walls. The last lateral force brace must only be within 12 ft of the opposite walls.

It is not necessary to run the lateral force bracing wires parallel to the grid layout in plan view. They can be at any arbitrary angle. It is also not necessary that all the lateral force braces have the same orientation. Lateral force bracing should be taut to function correctly.

## Island (Clouds) or Sloped Ceiling Seismic Applications

For island or sloped applications, please reference the CISCA Seismic Construction Handbook and local authority having jurisdiction.

## Horizontal Restraint



## NON-STRUCTURAL BRACING FOR HEAVY DUTY GRID - RIGID BRACING

CertainTeed has partnered with BRACELOK™ to offer its customers GRIDLOK®-10CT, a patented solution for bracing heavy duty grid. GRIDLOK® provides a code-compliant bracing solution that is faster, stronger and more cost effective than traditional processes.

### LIBERATE THE PLENUM™\*

CertainTeed GRIDLOK®-10CT rigid ceiling brace connectors are used as a superior alternate to splay wire and specifically designed rigid braces. CertainTeed GRIDLOK®-10CT provides consistent capacity across ceiling systems, for the life of the ceiling. CertainTeed GRIDLOK®-10CT is approved by ICC-ESR 4187 and tested for OSHPD environments.

#### Wire Limitations:

- Wire connection stretches compromising ceiling level and performance
- Low compression capacity when wire not set at exactly 45 degrees
- Uneven brace capacity across the ceiling diaphragm
- Expensive ceiling failures in large seismic events
- Five connection points to deck above
- Large bracing footprint on deck above
- Wire tears through main runner web in seismic events
- Low resilience in seismic event aftershocks
- Not applicable for ceiling plane elevation changes in Seismic Design

#### Rigid Bracing Benefits:

- Effective performance in compression and tension
- Three bracing connection points on soffit
- Speed of install means cost efficiency
- Labor saving install
- Durable and reliable
- Proven to withstand multiple seismic events
- Required for ceiling plane elevation changes in Seismic Design



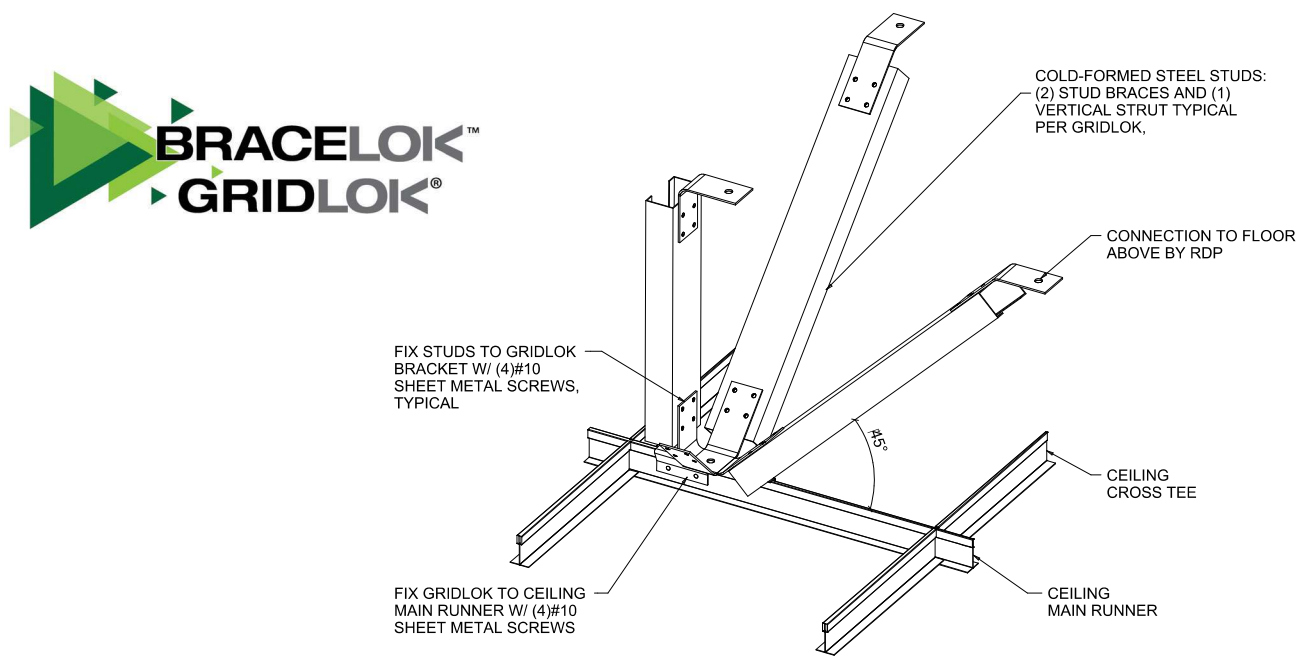
CERTAINTEED GRIDLOK®\*

\*1 trademark pending or registered by Bracelok IP Limited.

## EASILY ACHIEVE EFFECTIVE RIGID BRACING

Historically, there have been limited instruction on constructing rigid ceiling braces. With CertainTeed GRIDLOK®-10CT you achieve:

- Pre-engineered ICC approved design, reducing contractor liability
- Reduction of engineering professional involvement in brace and connection design
- Easy install reduces skilled labor requirements, construct consistent braces every time
- Inspection of braces are simple and fast providing all screws are in place
- Requires only one anchor per connection to the deck
- Unique 360-degree rotation allows moveable connection footprint to the deck
- Click and screw saddle provides secure connection to the grid
- Reduces intercept with HVAC, cable trays and sprinkler pipes in the plenum



### Minimum Brace And Strut Sizes For Different Plenum Heights

Maximum Plenum Height, H (feet-inches)	Cold-formed Steel Members	
	Bracing (45 degrees)	Vertical Strut (90 degrees)
$H \leq 4'-6''$	250S125-27 or 362S162-33	250S125-27 or 362S162-33
$4'-6'' < H \leq 7'-0''$	250S162-33 or 362S162-33	250S162-33 or 362S162-33
$7'-0'' < H \leq 9'-6''$	(2) 362S162-33 or back-to-back	250S162-33 or 362S162-33

To purchase CertainTeed GRIDLOK®-10CT bracing solution, **go online to [www.bracelok.com](http://www.bracelok.com)** for rapid delivery to any US location.

BRACELOK™ and GRIDLOK® are registered trademarks of BRACELOK™

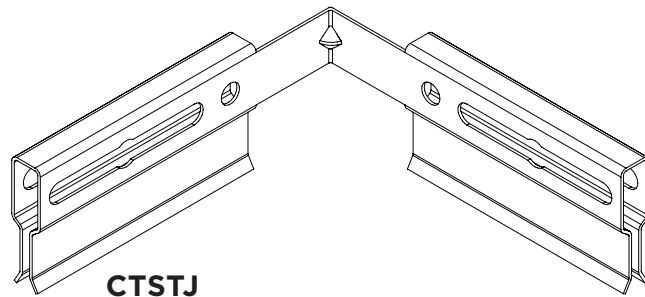
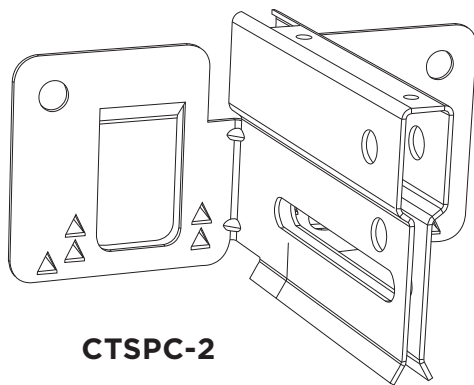
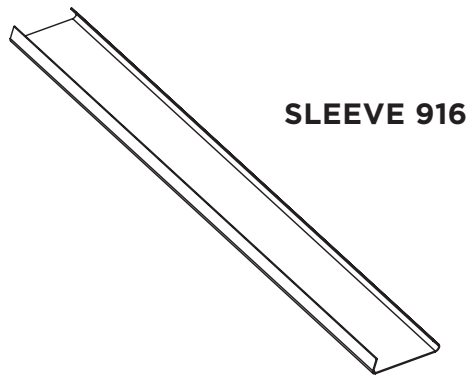
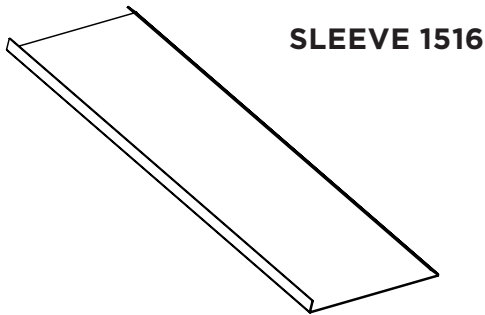


## Seismic Grid Accessories Ease Installation

- Easily integrates with multiple grid profiles
- Two-sided design of CTSPC-2 allows for implementation near any corner
- The CTSTJ clip simplifies installation of single clip in certain seismic applications.
- For more information on accessories please visit:  
[www.certainteed.com/suspension-systems](http://www.certainteed.com/suspension-systems)

## Seismic Grid Accessories

Item #	Description	Packaging
<b>SLEEVE 1516</b>	15/16" Sleeve	100 per carton
<b>SLEEVE 916</b>	9/16" Sleeve	100 per carton
<b>CTSPC-2</b>	Seismic Perimeter Clip	100 per carton
<b>CTSTJ</b>	Seismic Transition Joint Clip	100 per carton



## NOTES





**For more information about Suspension Systems,  
please visit [www.CertainTeed.com/suspension-systems](http://www.CertainTeed.com/suspension-systems).**



**CertainTeed**

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