



The following excerpt are pages from the North American Product Technical Guide, Volume 1: Direct Fastening, Edition 15.

Please refer to the publication in its entirety for complete details on this product including data development, product specifications, general suitability, installation, corrosion and spacing and edge distance guidelines.

US & CA: <http://submittals.us.hilti.com/PTGVol1/>

To consult directly with a team member regarding our direct fastening products, contact Hilti's team of technical support specialists between the hours of 7:00am – 6:00pm CST.

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## Ceiling Fastening Systems Selection and Design 3.3.1

### 3.3.1.3 Ceiling Fastener Locations when Installing into Lightweight Concrete over Metal Deck

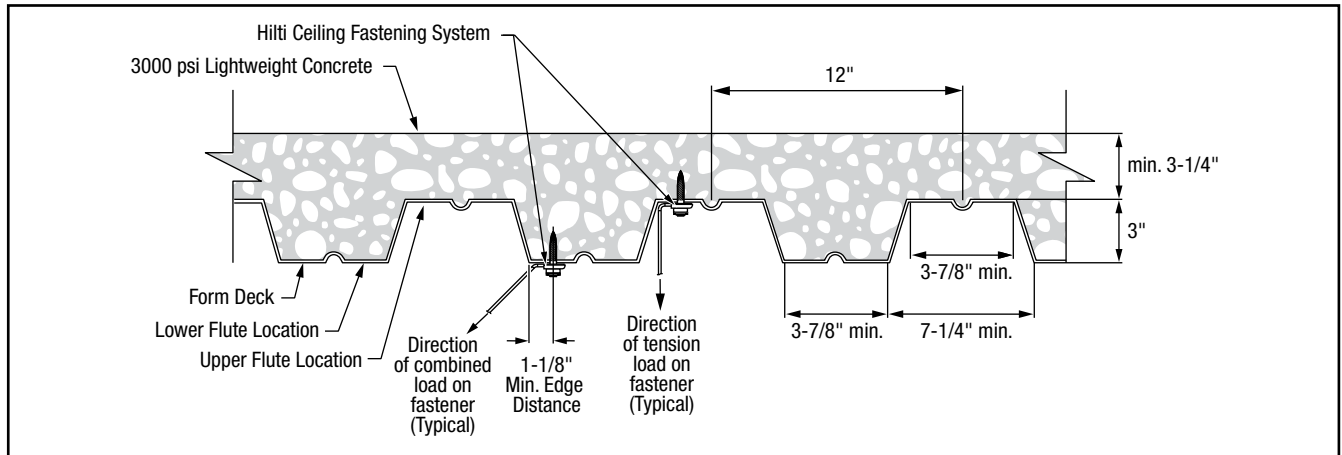


Figure 3: Hilti Ceiling Fastening System Location in 3-in.-Deep Composite Floor Deck, Normal Deck Profile Orientation

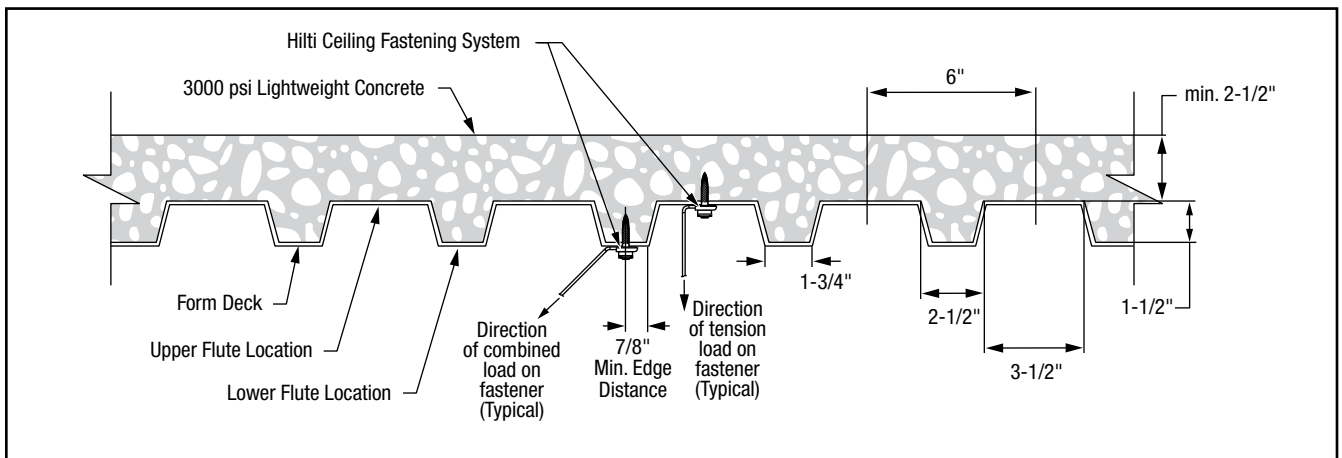


Figure 4: Hilti Ceiling Fastening System Location in 1-1/2-in.-Deep Composite Floor Deck, Normal Deck Profile Orientation

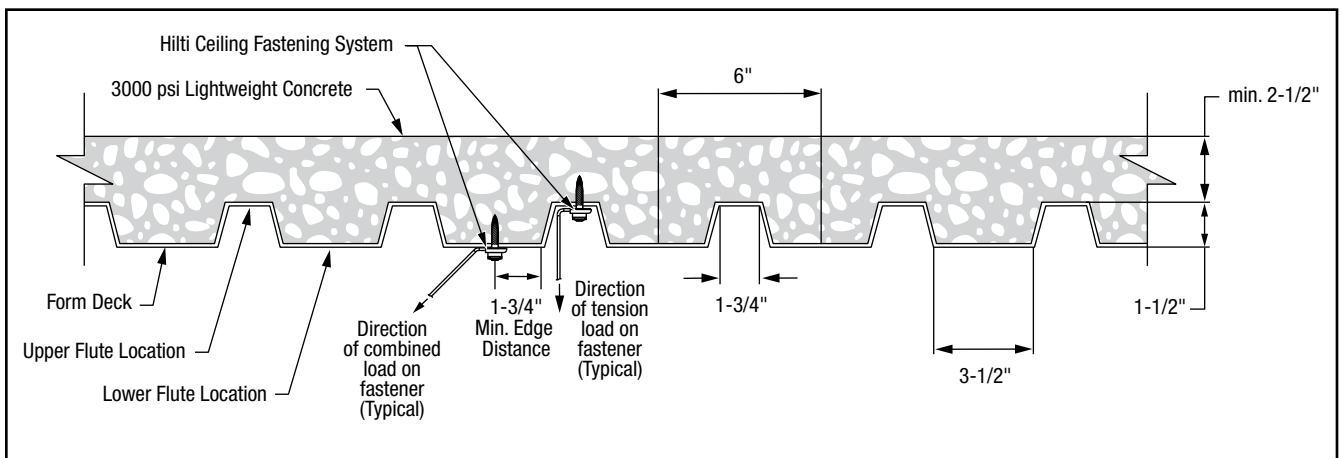


Figure 5: Hilti Ceiling Fastening System Location in 1-1/2-in.-Deep Composite Floor Deck, Inverted Deck Profile Orientation

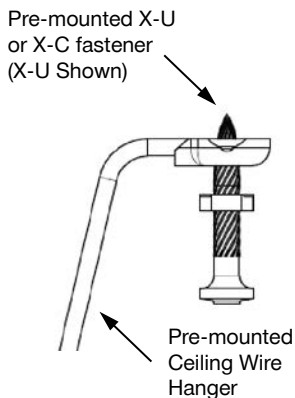
### 3.3.2 Hilti X-CW Ceiling Wire Assemblies

- 3.3.2.1 Product Description
- 3.3.2.2 Material Specifications
- 3.3.2.3 Technical Data
- 3.3.2.4 Installation Instructions
- 3.3.2.5 Ordering Information



#### Approvals

**ICC-ES (International Code Council)**  
ESR-2184  
**COLA (City of Los Angeles)**  
RR 25651



#### 3.3.2.1 Product Description

The X-CW Ceiling Wire Hanger is a state-of-the-art ceiling wire fastening system with an integrated steel wire clamping washer pre-mounted on a Hilti X-U or X-C powder-actuated fastener. This innovative ceiling hanger system has been tested in accordance with the ICC-ES AC70, Acceptance Criteria for Fasteners Power-Driven Into Concrete, Steel and Masonry Elements. Reference ICC-ES ESR-2184.

The pre-mounted steel clamping washer has been specifically designed to restrict wire slippage, therefore no wire

wraps are required on the fastener end. Yielding of the 12 gauge steel hanger wire controls the performance of this ceiling fastening system when properly installed with pre-mounted X-U and X-C powder-actuated fasteners in suitable 4000 psi normal weight concrete base materials. Requirements for wire wraps on the suspended ceiling component end must still be satisfied. Anchorage of seismic bracing channels and compression struts should be done with ICC-ES AC193 qualified post-installed anchors, such as Hilti KB-TZ.

#### 3.3.2.2 Material Specifications

Fastener Fastener	Powder Actuate Fastener Material	Powder Actuated Fastener Plating <sup>5</sup>	Steel Clamping Washer Material	Steel Clamping Washer Plating <sup>5</sup>	Ceiling Wire Material	Ceiling Wire Plating <sup>5</sup>
X-CW Class 1	Carbon Steel	5 µm Zinc <sup>1</sup>	Carbon Steel	5 µm Zinc <sup>2</sup>	Carbon Steel	12 µm Zinc <sup>3</sup>
X-CW INT	Carbon Steel	5 µm Zinc <sup>1</sup>	Carbon Steel	5 µm Zinc <sup>2</sup>	Carbon Steel	Zinc <sup>4</sup>

1 ASTM B633, SC 1, Type III  
2 ASTM A653/A653M, Z120

3 ASTM A641/A641M, Class 1  
4 ASTM A641/A641M, 9.2

5 Reference Section 2.3.3.1 for more information on platings.

#### 3.3.2.3 Technical Data

**Allowable Loads for Hilti X-CW Ceiling Wire Assemblies Installed in Normal Weight Concrete, lb (kN)<sup>1,2,3,4</sup>**

Ceiling Wire Type	Concrete Compressive Strength			
	4000 psi		6000 psi	
	Tension	45-Degree	Tension	45 Degree
X-CW C27	210 (0.93)	210 (0.93)	–	–
X-CW C32	210 (0.93)	210 (0.93)	–	–
X-CW U22	–	–	100 (0.44)	90 (0.40)
X-CW U27	210 (0.93)	210 (0.93)	130 (0.58)	150 (0.67)

- The tabulated allowable loads apply to the X-CW ceiling wire assembly using a minimum safety factor of 5.0 in accordance with ICC-ES AC70 if controlled by powder-actuated fastener pullout or a minimum of 2.0 in accordance with ICC-ES AC308 if controlled by wire yielding and fracture.
- Allowable values are for fasteners installed in concrete having the designated compressive strength at the time of installation.
- Concrete thickness at the point of penetration must be a minimum of the fastener embedment depth plus 1-1/2".
- Multiple fasteners must be used for suspended ceiling applications.

**Allowable Loads for Hilti X-CW Ceiling Wire Assemblies Installed in Structural Lightweight Concrete over Composite Floor Deck, lb (kN)<sup>1,2,3,4</sup>**

Ceiling Wire Type	3000 psi Concrete Compressive Strength			
	Upper flute		Lower flute	
	Tension	45-Degree	Tension	45 Degree
X-CW C27	110 (0.49)	210 (0.93)	100 (0.44)	145 (0.64)
X-CW C32	150 (0.67)	210 (0.93)	100 (0.44)	145 (0.64)
X-CW U27	170 (0.76)	210 (0.93)	150 (0.67)	160 (0.71)

- The tabulated allowable loads apply to the X-CW ceiling wire assembly using a minimum safety factor of 5.0 in accordance with ICC-ES AC70 if controlled by powder-actuated fastener pullout or a minimum of 2.0 in accordance with ICC-ES AC308 if controlled by wire yielding and fracture.
- Allowable values are for fasteners installed in concrete having the designated compressive strength at the time of installation.
- Testing completed in composite floor deck having a minimum thickness of 20 gauge (0.0358") and a minimum yield strength  $F_y = 38$  ksi. Figures 3-5 (Section 3.3.1.3) show nominal flute dimensions, fastener locations and load orientations for the deck profile. Concrete thickness at the point of penetration must be a minimum of the fastener embedment depth plus 1-1/2".
- Multiple fasteners must be used for suspended ceiling applications.