

ICC-ES Evaluation Report

ESR-4722

Reissued June 2024

This report also contains:

- LABC Supplement
- CBC Supplement
- FBC Supplement

Subject to renewal June 2026

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DIVISION: 06 00 00— WOOD, PLASTICS AND COMPOSITES Section: 06 17 36— Metal-Web Wood Joists	REPORT HOLDER: MITEK INC. 	EVALUATION SUBJECT: MITEK® POSI-STRUT® METAL WEBS	
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1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2024 and 2021 [International Building Code® \(IBC\)](#)
- 2024 and 2021 [International Residential Code® \(IRC\)](#)

For evaluation for compliance with codes adopted by the [Los Angeles Department of Building and Safety \(LADBS\)](#). See the [ESR-4722 LABC and LARC Supplement](#).

Property evaluated:

- Structural

2.0 USES

MiTek's POSI-STRUT® metal webs are used as structural web truss members in parallel chord wood trusses in light wood-frame construction. The POSI-STRUT® is intended to transmit axial tension and/or axial compression forces between wood members (chords).

MiTek's POSI-STRUT® metal webs may be used under the IBC; and under the IRC when an engineered design is prepared in accordance with IRC Section R301.1.3.

3.0 DESCRIPTION

The POSI-STRUT® is a V-shaped web member manufactured from No. 20 gage, ASTM A653 Grade 40 steel, with a minimum G60 galvanization coating. The modular dimensions of POSI-STRUT® metal webs are shown in [Table 1](#). Each arm of the "V" is formed into a channel shape. The POSI-STRUT® is symmetrical about a vertical center line through the lower intersection of the two arms. A truss plate is formed integrally with the upper ends of the two arms and at the lower intersection of the two arms. The teeth are identical to those of the MT20™ truss plate described in evaluation report [ESR-1988](#). The number of teeth punched at the upper ends of the diagonal arms and at the lower intersection of the two arms is shown in [Table 1](#). The POSI-STRUT® metal web can be separated into two arms at the vertical center line of the "V". Each separated arm is referred to as a "broken" web. The term "unbroken" refers to POSI-STRUT® metal web members which have not been separated.

4.0 DESIGN AND INSTALLATION

4.1 Design:

This report includes design values for pairs of POSI-STRUT® metal webs installed on opposite sides of truss top and bottom chords. Top chord and bottom chord bearing details are shown in [Figure 1](#). Bearing contact

must be provided for the full width of the chord and the corresponding bearing length must be as determined by the allowable stress perpendicular to grain for the species and grade of lumber used. Chord splice and end block connector plates must be Type MT20™ as detailed in evaluation report [ESR-1988](#) and must be sized in accordance with the design values indicated in the report.

Truss top chords must be laterally supported, and the ends of the trusses must be restrained to prevent rollover, which is normally provided by sheathing attached to the top chord and to end walls or shear transfer panels. The fabrication tolerances for metal web placement are noted in [Figure 2](#). Splice locations must be provided in the design of the truss and must account for the forces at their location.

Chords must be designed as continuous members, with combined axial and bending stresses in accordance with ANSI/TPI 1 (National Design Standard for Metal Plate Connected Wood Truss Construction). Deflections are limited as set forth in the code using beam formulas based on the full cross-sectional areas of the top and bottom chords and the assigned modulus of elasticity for the lumber used or using a design program following the truss design procedures in ANSI/TPI 1. Allowable vertical shear design values for web members are noted in [Table 2](#).

4.2 Installation:

The POSI-STRUT® metal web trusses must be fabricated and installed in accordance with the manufacturer's published installation instructions, the approved construction documents (engineering drawings and specifications), this report, and the applicable code. In case of conflict, the most stringent governs.

Trusses are fabricated by pressing the POSI-STRUT® metal webs into the sides of 2-inch by 3-inch or 4-inch wood members or MSR lumber to form a Warren truss configuration. The teeth of the POSI-STRUT® metal webs must be fully embedded in the wood members so that no gaps remain between the toothed area of the metal webs and the wood members. The contact area must be free of knots.

4.3 Fire-resistive Floor-ceiling and Roof-ceiling Assembly:

Fire-resistive floor-ceiling and roof-ceiling assemblies including the POSI-STRUT® metal webs are described in listing report [ESL-1388](#).

5.0 CONDITIONS OF USE:

The POSI-STRUT® metal webs described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1** Wood lumber members of the POSI-STRUT® metal web truss must have a moisture content not exceeding 19 percent at the time of assembly. Wet service factors from ANSI/TPI 1 Section 6.4 must be applied to the table values when the lumber's moisture content exceeds 19 percent.
- 5.2** Evaluation of the POSI-STRUT® metal web with fire-retardant-treated or preservative-treated wood is outside the scope of this report.
- 5.3** Materials, coatings, and general design considerations must be in accordance with Chapter 6 of ANSI/TPI 1.
- 5.4** Truss member design procedures must be in accordance with Chapter 7 of ANSI/TPI 1.
- 5.5** Metal connector plate joint design must be in accordance with Chapter 8 of ANSI/TPI 1.
- 5.6** Truss designs that contain metal webs must be prepared and sealed by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.7** Trusses with damaged metal webs must not be used. Damaged metal webs include dents, bends, cracks, cuts or holes in the metal other than specified characteristics described in the product specifications as intended features of the metal web.
- 5.8** Design of diaphragms is beyond the scope of this evaluation report.
- 5.9** Metal web use is limited to prefabricated trusses. Compliance with IBC Section 2303.4 or 2024 IRC Sections R502.12 and R802.10 (2021 IRC Sections R502.11 and R802.10), as applicable, is required.
- 5.10** This report includes design values for pairs of POSI-STRUT® metal webs installed on opposite faces of truss members. For items not covered by this report, such as truss design, fabrication, quality assurance and special inspection, refer to ANSI/TPI 1, engineering drawings and the applicable code.
- 5.11** The POSI-STRUT® metal webs are manufactured under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the [ICC-ES Acceptance Criteria for Metal Webs for Parallel Chord Wood Trusses \(AC387\)](#), dated December 2020 (editorially revised May 2024).

7.0 IDENTIFICATION

- 7.1** Boxes containing POSI-STRUT[®] metal webs are labeled with the MiTek name, the POSI-STRUT[®] metal web model number, and either the evaluation report number (ESR-4722) or the number of the ICC-ES index evaluation report for MiTek ([ESR-2685](#)). Additionally, each POSI-STRUT[®] metal web is identified by an imprint of “PS” embossed into the surface of one leg of each V-shaped strut followed by the size of the specific metal web.
- 7.2** The report holder’s contact information is the following:

MITEK INC.
16023 SWINGLEY RIDGE ROAD
CHESTERFIELD, MISSOURI 63017
(314) 434-1200
www.mitek-us.com

TABLE 1—POSI-STRUT[®] METAL WEB DIMENSIONS AND NUMBER OF TEETH

POSI-STRUT [®] MODEL	NOMINAL HEIGHT (in.)	NOMINAL WIDTH (in.)	NUMBER OF TEETH AT UPPER ENDS	NUMBER OF TEETH AT LOWER INTERSECTION
10	9.25	23.824	44	68
10V2	9.25	23.824	44	68
12	11.25	23.824	44	68
12I	11.875	24.924	44	68
13	12.75	26.462	44	68
14	14	28.66	44	68
14V3	14	28	44	68
16	16	28.152	44	68
16V3	16	28	44	68

TABLE 2—ALLOWABLE CAPACITIES IN POUNDS PER PAIR OF POSI-STRUT[®] WEBS^{1,2,3}

POSI-STRUT [®] MODEL	WEB TYPE	Allowable Vertical Shear (lbs./pair)							
		Southern Pine SG = 0.55		Douglas Fir SG = 0.50		Hem-Fir SG = 0.43		Spruce-Pine-Fir SG = 0.42	
		Unbroken	Broken	Unbroken	Broken	Unbroken	Broken	Unbroken	Broken
10	Single Compression	477		442		380		371	
	Double Compression	954		883		760		742	
	Single Tension	680	477	618	442	531	380	519	371
	Double Tension	910	783	827	725	711	623	695	609
10V2	Single Compression	602		567		488		477	
	Double Compression	1248		1135		976		953	
	Single Tension	656	624	596	567	513	488	501	477
	Double Tension	757	731	701	665	603	572	589	559
12	Single Compression	715		662		569		556	
	Double Compression	1430		1324		1138		1112	
	Single Tension	715	775	662	731	569	628	556	614
	Double Tension	767	765	710	696	611	598	597	584
12I	Single Compression	700		636		547		534	
	Double Compression	1400		1273		1094		1069	
	Single Tension	707	700	643	636	553	547	540	534
	Double Tension	741	710	674	645	579	555	566	542
13	Single Compression	671		610		525		512	
	Double Compression	1230		1220		1049		1025	
	Single Tension	821	671	746	610	642	525	627	512
	Double Tension	809	756	749	700	645	602	630	588
14	Single Compression	756		687		591		577	
	Double Compression	1372		1372		1182		1155	
	Single Tension	756	846	687	769	591	661	577	646
	Double Tension	811	820	765	746	658	641	643	626
14V3	Single Compression	644		597		513		501	
	Double Compression	1195		1193		1026		1002	
	Single Tension	644	658	597	598	513	514	501	502
	Double Tension	720	689	667	650	573	559	560	546
16	Single Compression	695		632		544		531	
	Double Compression	1391		1264		1087		1062	
	Single Tension	732	695	677	632	583	544	569	531
	Double Tension	839	767	762	697	656	599	640	585
16V3	Single Compression	598		553		476		465	
	Double Compression	1195		1107		952		930	
	Single Tension	624	598	577	553	497	476	485	465
	Double Tension	718	698	665	646	572	556	559	543

For SI Units: 1 pounds = 4.448 N.

¹Single and double compression values are the same for unbroken and broken webs.²Values for single and double tension differ for unbroken and broken webs. Table values for single and double tension are formatted as "Unbroken Web Design Value | Broken Web Design Value".³The NDS code-prescribed adjustments for duration of load (C_D) and member repetition (C_r) associated with sawn lumber do not apply for any of the compression capacities.

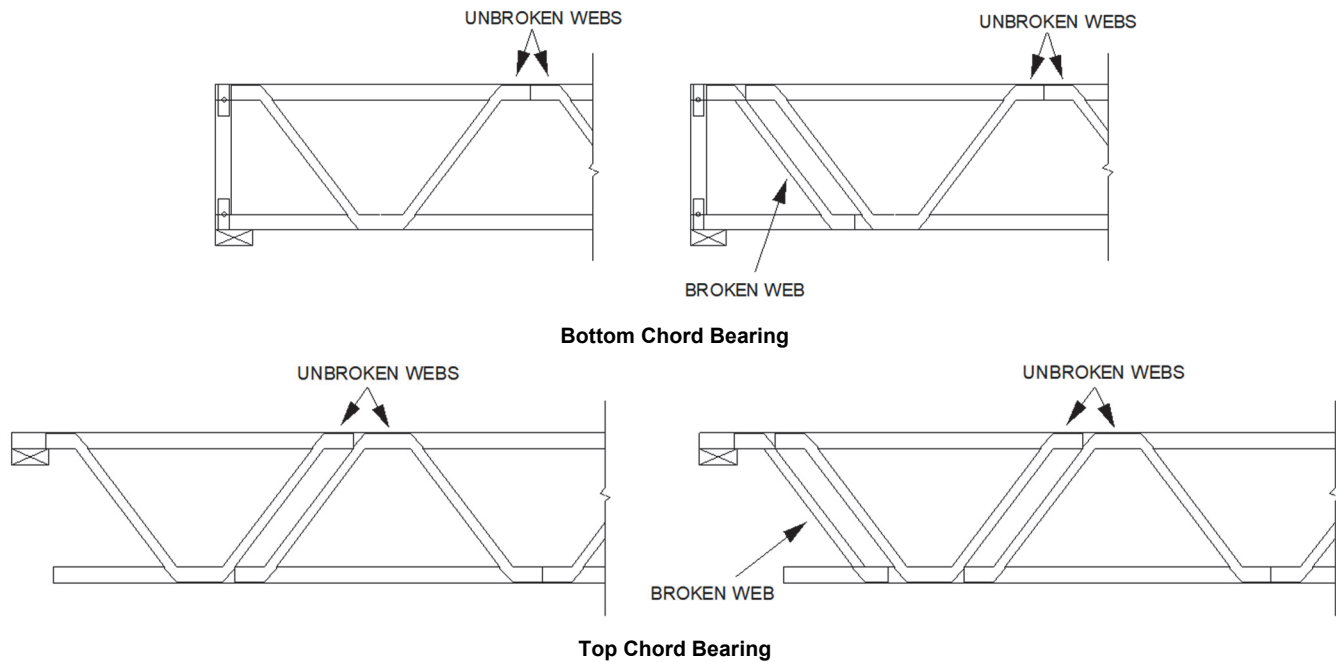


FIGURE 1—END BEARING DETAILS

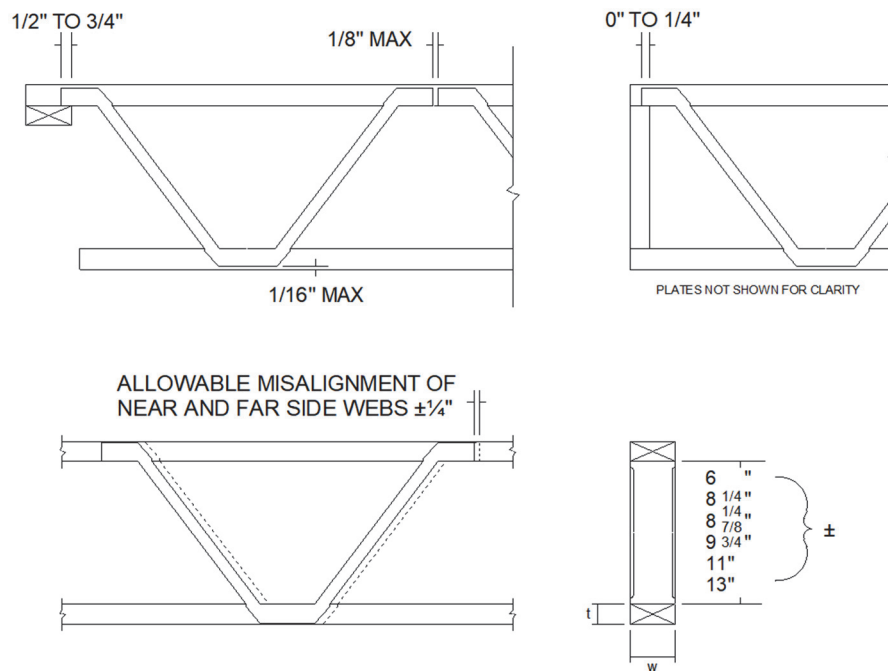


FIGURE 2—WEB-POSITIONING TOLERANCES

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 17 36—Metal-Web Wood Joists

REPORT HOLDER:

MITEK INC.

EVALUATION SUBJECT:

MITEK® POSI-STRUT® METAL WEBS

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that the MiTek's POSI-STRUT® metal webs, described in ICC-ES evaluation report [ESR-4722](#), have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2023 *City of Los Angeles Building Code* (LABC)
- 2023 *City of Los Angeles Residential Code* (LARC)

2.0 CONCLUSIONS

The MiTek's POSI-STRUT® metal webs, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4722](#), comply with the LABC Chapter 23, and the LARC, and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The MiTek's POSI-STRUT® metal webs described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-4722](#).
- The design, installation, conditions of use and identification of the MiTek's POSI-STRUT® metal webs are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report [ESR-4722](#).
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16, 17 and 23 and LARC Sections R502.11 and R802.10, as applicable.
- No teeth of the Posi-Strut Metal Web must be installed within ½ inch (12.7 mm) of the ends of truss chords.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.

This supplement expires concurrently with the evaluation report, reissued June 2024.

ICC-ES Evaluation Report

ESR-4722 CBC and CRC Supplement

Reissued June 2024

This report is subject to renewal June 2026

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 17 36—Metal-Web Wood Joists

REPORT HOLDER:

MITEK INC.

EVALUATION SUBJECT:

MITEK® POSI-STRUT® METAL WEBS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that MiTek's POSI-STRUT® metal webs, described in ICC-ES evaluation report ESR-4722, have also been evaluated for compliance with the codes noted below.

Applicable code edition(s):

- 2022 California Building Code (CBC)

For evaluation of applicable Chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2022 California Residential Code (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The MiTek's POSI-STRUT® metal webs, described in Sections 2.0 through 7.0 of the evaluation report ESR-4722, comply with CBC Chapter 23, provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 16, 17 and 23, as applicable.

2.1.1 OSHPD: The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

2.1.2 DSA: The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

2.2 CRC:

The MiTek's POSI-STRUT® metal webs, described in Sections 2.0 through 7.0 of the evaluation report ESR-4722, comply with CRC Sections R301.1.3, R502.11 and R802.10, provided the design and installation are in accordance with the 2021 *International Residential Code*® (IRC) provisions noted in the evaluation report and the additional requirements of CRC Chapters 3, 5 and 8, as applicable.

This supplement expires concurrently with the evaluation report, reissued June 2024.

ICC-ES Evaluation Report

ESR-4722 FBC Supplement

Reissued June 2024

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 17 36—Metal-Web Wood Joist

REPORT HOLDER:

MITEK INC.

EVALUATION SUBJECT:

MITEK POSI-STRUT® METAL WEBS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that MiTek's POSI-STRUT® metal webs, recognized in ICC-ES evaluation report ESR-4722, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2023 *Florida Building Code—Building*
- 2023 *Florida Building Code—Residential*

2.0 CONCLUSIONS

MiTek's POSI-STRUT® metal webs, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-4722, complies with the *Florida Building Code—Building* and *Florida Building Code—Residential*, provided the design requirements are determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-4722 for the 2021 *International Building Code*® meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable, with the following conditions:

Use of the POSI-STRUT® metal webs has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* or the *Florida Building Code—Residential* with the following exception:

- Protection of metal must be in accordance with the *Florida Building Code—Building* Section 2222.6.

For products falling under Florida Rule 61G20-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official when the report holder does not possess an approval by the Commission).

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