ICC-ES Evaluation Report

ESR-5372

Issued March 2025

Subject to renewal March 2026

DIVISION: 06 00 00—WOOD, PLASTICS, AND COMPOSITES **Section: 06 05 23—Wood, Plastic, and Composite Fastenings**	**REPORT HOLDER: DECKSTRUC, LLC**	**EVALUATION SUBJECT: LATERAL ANGLE BRACKET AND DECKSTRUC DECK LEDGER BRACKET ASSEMBLY**	

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2024, 2021 and 2018 *International Building Code*® (IBC)
- 2024, 2021 and 2018 *International Residential Code*® (IRC)

Property evaluated:

- Structural

2.0 USES

The lateral angle bracket and Deckstruc Deck Ledger Bracket Assembly described in this report are used as wood framing connectors in accordance with Section 2304.10 of the IBC. The lateral angle bracket is used to resist axial force in wood joist and transfer it to the supporting wood member as shown in Figure 1. The Deckstruc Deck Ledger Bracket Assembly is specifically used to attach ledger boards to band joists in lieu of traditional screws that are typically installed through the deck ledger board, wall covering, and into the band joist.

The lateral angle bracket and Deckstruc Deck Ledger Bracket Assembly (referred hereafter as bracket assembly) may also be used in structures regulated under the IRC when an engineered design is submitted to, and approved by the code official, in accordance with Section R301.1.3 of the IRC.

3.0 DESCRIPTION

3.1 Lateral Angle Bracket:

The lateral angle bracket is L4X3X$^{1}/_{4}$-inch angle. The angle is 6.5-inch (165.1 mm) long and has two $^{9}/_{16}$-inch (14.3 mm) predrilled holes, spaced at 4 inches (101.6 mm), for ½-inch (12.7 mm) bolts installation in each leg. Compatible washers must be used at the head and nut of each bolted connection.

3.2 Deckstruc Deck Ledger Bracket Assembly:

The bracket assembly consists of four main steel components that are bolted to each other: two fabricated angles with longitudinal slots, C9 x 13.4 steel channel, and W6 x 15 steel support with a fillet welded 6 x 2 x $^{1}/_{4}$-inch (152.4 x 50.8 x 6.35 mm) bearing plate as shown in Figure 2. The two slotted angels are attached to the steel channel with a minimum of three $^{1}/_{2}$ x 2-inch (12.7 x 50.8 mm) carriage bolts and matching nuts. $2^{1}/_{2}$ x $2^{1}/_{2}$ x $^{3}/_{8}$-inch (63.5 x 63.5 x 9.53 mm) spacer plates are used, depending on the installation

condition, as shown in Figure 3. The W6 x 15 steel support is attached to the steel channel with two $^5/_8$ x $3^1/_2$-inch (15.875 x 88.9 mm) through bolts and matching nuts. The nuts are tack-welded to their steel components after installation to prevent nut loosening over time. The C9 x 13.4 steel channel in the bracket assembly is intended to bear on at least two stacked 2x4-inch sawn lumber horizontal plates (top plates of wall assembly) as shown in Figures 2 and 5. The maximum on-center spacing between the studs supporting the wood plates should be 16 inches (406 mm). The two slotted angels in the bracket assembly are supported by wood joists with maximum on-center spacing of 19.2 inches (488 mm).

For use of the Deckstruc Deck Ledger Bracket Assembly at wall corner (referred here after as corner bracket assembly), the assembly consists of the W6 x 15 steel support with a fillet welded bearing plate only as shown in Figure 4.

3.3 Material:

3.3.1 Lateral Angle Bracket:

The lateral angle bracket is made from ASTM A36 carbon steel with a minimum yield stress of 36 ksi (250 MPa) and minimum tensile strength of 58 ksi (400 MPa). The angle is coated with ALKYD primer.

3.3.2 Deckstruc Deck Ledger Bracket Assembly:

Steel components of the bracket assembly (including the spacer plates) are made from ASTM A36 carbon steel with a minimum yield stress of 36 ksi (250 MPa) and minimum tensile strength of 58 ksi (400 MPa). The steel components are coated with ALKYD primer. All welds (between bearing plate and W6 x 15 and between legs of fabricated angle) are Grade E70.

3.3.3 Use with Treated Wood:

The lumber treater or the report holder of this report (DeckStruc, LLC) should be contacted for recommendation on minimum corrosion resistance of the steel bracket assembly or lateral angle bracket in contact with the specific proprietary preservative treated or fire-retardant treated lumber.

3.3.4 Wood Members:

Wood members with which the bracket assemblies and lateral angle brackets are used must be either sawn lumber or structural glued laminated timber having a maximum moisture content of 19 percent (16 percent for structural glued laminated timber), except as noted in Section 4.1 of this report.

3.3.4.1 For Lateral Angle Bracket: Wood members must be at least 2x8-inch sawn lumber with minimum specific gravity of 0.55. The lateral angle bracket should not extend beyond the top or bottom of the wood members as shown in Figure 1.

3.3.4.2 For Deckstruc Deck Ledger Bracket Assembly: The band board must be 2x10-inch sawn lumber with a minimum specific gravity of 0.55 (southern yellow pine #2 or stronger). Horizontal wood plates under the channel of bracket assembly must be at least two 2x4 wood members with a minimum specific gravity of 0.42 (spruce-pine-fir #2 or stronger). The maximum structural sheathing thickness is $^3/_4$ inches (19.1 mm). The joists supporting the slotted angles in bracket assemblies must be at least 2x10-inch sawn lumber with a minimum specific gravity of 0.55 (southern yellow pine #2 or stronger). The slotted angles may be supported by I-joists, when at least 2x8 sawn lumber blocking with minimum specific gravity of 0.55 (southern yellow pine #2 or stronger) is attached to the I-Joist web as shown in Figure 6. Wall studs must have a minimum specific gravity of 0.42 (spruce-pine-fir #2 or stronger).

3.3.5 Fasteners:

Fasteners used in contact with preservative treated of fire-retardant treated lumber must comply with IBC Section 2304.10.6 or IRC Section R304.3 (2021 and 2018 IRC Section R317.3), as applicable. The lumber treater or the report holder of this report (DeckStruc, LLC) should be contacted for recommendation on minimum corrosion resistance of fasteners and connection capacities of fasteners used with the specific proprietary preservative treated or fire-retardant treated lumber.

3.3.5.1 Lateral Angle Bracket: Fasteners that are used to attach the lateral angle brackets must be ½-inch (12.7 mm) galvanized bolts complying with ASTM A307 Grade A with matching hex nuts complying with ASTM A563 Grade A and washers. Refer to Figure 1 for fastening details.

3.3.5.2 Bracket Assembly: Fasteners that are used to attach the bracket assemblies must be $^5/_8$ x $3^1/_2$-inch (15.875 x 88.9 mm) galvanized bolts complying with ASTM A307 Grade A with matching hex nuts

complying with ASTM A563 Grade A and washers, and $^5/_8$ x 4-inch (15.875 x 101.6 mm) galvanized lag screws complying with ANSI/ASME Standard B18.2.1. Refer to Figures 2 through 6 for more fastening details. General

4.0 DESIGN AND INSTALLATION

4.1 Design:

See Table 1 for the maximum allowable design loads (ASD) per bracket assembly or lateral angle bracket. The provided capacities include the load duration factor, C_D, corresponding with the applicable loads in accordance with the NDS.

Tabulated allowable loads apply to products connected to wood used under dry conditions and where sustained temperatures are 100°F (37.8°C) or less. When products are installed to wood having a moisture content greater than 19 percent (16 percent for structural glued laminated timber), or where wet service is expected, the allowable loads must be adjusted by the wet service factor, C_M, specified in the NDS. When products are installed in wood that will experience sustained exposure to temperatures exceeding 100°F (37.8°C), the allowable loads in this report must be adjusted by the temperature factor, C_t, specified in the NDS.

Connected wood members must be analyzed for load carrying capacity at the connection in accordance with the NDS.

Design information provided to the code official shall include the following:

- Number, location and spacing of bracket assemblies or lateral angle brackets.
- Maximum design loads anticipated at each bracket assembly or lateral angle bracket, in accordance with the applicable code.
- Allowable loads of the bracket assembly or lateral angle bracket, as specified in this report.
- Size, grade, type, quantity, and corrosion protection covering of the fasteners used to secure the bracket assemblies or lateral angle bracket to the building framing members, consistent with this report.
- Species, grade, size, and specific gravity of the wood members in which the bracket assembly or lateral angle bracket is attached.

4.2 Installation:

See Figure 1 for typical installation of the lateral angle bracket and Figures 4 through 6 for typical installation of the bracket assembly. Installation of lateral angle brackets and bracket assemblies shall comply with this report, the applicable codes, and the manufacturer's published installation instructions. In the event of a conflict between this report and the manufacturer's published installation instructions, this report governs. The manufacturer's published installation instructions shall be available at the jobsite at all times during installation.

Attachment of bracket assemblies on both sides of the same joist is not allowed. The minimum on-center spacing between bracket assemblies must be at least twice the on-center spacing between its supporting joists, which the slotted angles are attached to. From Figure 3, the minimum on-center spacing between bracket assemblies ranges from 24 to 38.4 inches (610 to 975 mm). The maximum on-center spacing between DeckStruc Bracket Assemblies, as specified by the manufacturer, is 48 inches (1219 mm).

5.0 CONDITIONS OF USE:

The lateral angle brackets and bracket assemblies described in this report comply with, or are a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 The construction documents prepared or reviewed by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed specifying the bracket assemblies and/or the lateral angle brackets must indicate compliance with this evaluation report and applicable codes and must be submitted to the code official for approval.

5.2 Adjustment factors noted in Section 4.1 and the applicable codes must be considered, where applicable.

5.3 Connected wood members and fasteners must comply, with Sections 3.3.4 and 3.3.5 of this report, respectively.

5.4 Use of lateral angle brackets or bracket assemblies with preservative treated or fire-retardant treated wood must be in accordance with Section 3.3.3 of this report. Use of fasteners with preservative treated or fire-retardant treated wood must be in accordance with Section 3.3.5 of this report.

5.5 Design of the connected wood members is outside the scope of this evaluation report and must be determined by a registered design professional in accordance with the applicable codes.

5.6 The lateral angle brackets and bracket assemblies in this report 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 Joist Hangers and Similar Devices (AC13), dated October 2018 (editorially revised February 2024).

7.0 IDENTIFICATION

7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-5372) along with the name, registered trademark, or registered logo of the report holder (DeckStruc, LLC) must be included in the product label.

7.2 In addition, the bracket assemblies are identified with the product name (Deckstruc Deck Ledger Bracket Assembly).

7.3 The report holder's contact information is the following:

DECKSTRUC, LLC
2 BRACO INTERNATIONAL BOULEVARD
WILDER, KENTUCKY 41076
(859) 250-4899
www.deckstruc.com
info@deckstruc.com

TABLE 1—ALLOWABLE (ASD) LOADS FOR LATERAL ANGLE BRACKET AND DECKSTRUC DECK LEDGER BRACKET ASSEMBLY [1, 2, 3]

PRODUCT	ALLOWABLE TENSION FOR ANGLE BRACKETS AND DOWNLOAD FOR BRACKET ASSEMBLIES (lbs)						NOTES FOR ADDITIONAL INSTALLATION REQUIREMENTS
	C_D = 1.00		C_D = 1.15		C_D = 1.25		
	Based on Ultimate Load / 3	Based on 1/8" Deflection	Based on Ultimate Load / 3	Based on 1/8" Deflection	Based on Ultimate Load / 3	Based on 1/8" Deflection	
Lateral Angle Bracket [4]	750		750		750		See Figure 1
Corner Bracket Assembly [5]	595	814	684	814	744	814	See Figure 4
Middle Bracket Assembly with Sawn Lumber Wood Joists [5]	2186	806	2514	806	2732	806	See Figure 5
Middle Bracket Assembly with Prefabricated Wood I-Joists [5]	2162	1197	2486	1197	2702	1197	See Figures 5 and 6

For **SI** Units: 1 inch = 25.4 mm, 1 lb = 4.448 N

[1] The tabulated allowable loads have been adjusted for the load duration factor, C_D, as shown, in accordance with the NDS. The tabulated allowable loads do not apply to loads of other load durations, and are not allowed to be adjusted for other load durations. See Section 4.1 and 4.2 for additional design and installation requirements.

[2] The tabulated allowable loads are for installations to wood members complying with Section 3.3.4 of this report with the fasteners specified in Section 3.3.5.

[3] Evaluating the torsional capacity of the bracket assemblies or lateral angle brackets is outside the scope of this evaluation report.

[4] The allowable (ASD) design tension values were determined in accordance with the NDS and AISC 360.

[5] The allowable (ASD) design download (gravity load) should be the least of the ultimate load divided by a safety factor of 3 and the load at 1/8" deflection. The provided download values at 1/8" deflection were conservatively determined, while considering no rotation restraint for the supported ledger board by attached joists.

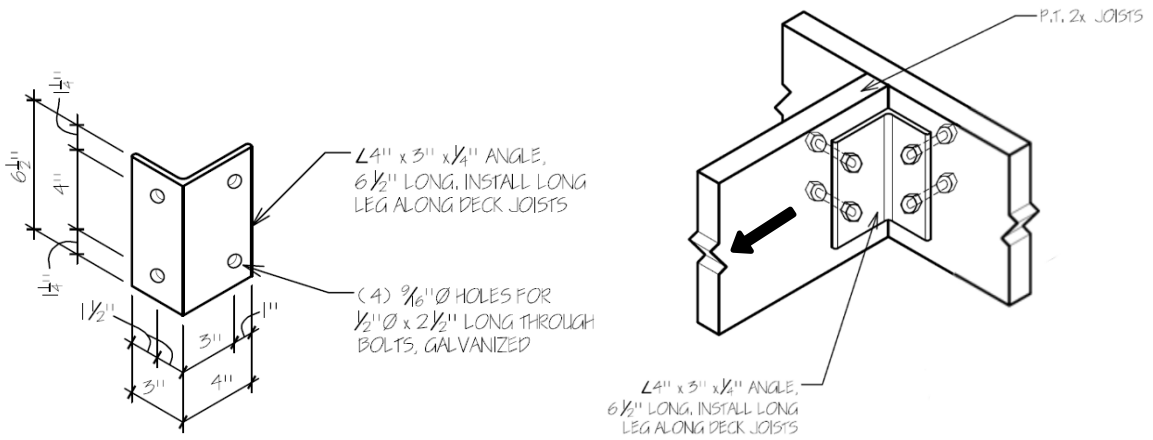


FIGURE 1—LATERAL ANGLE BRACKET

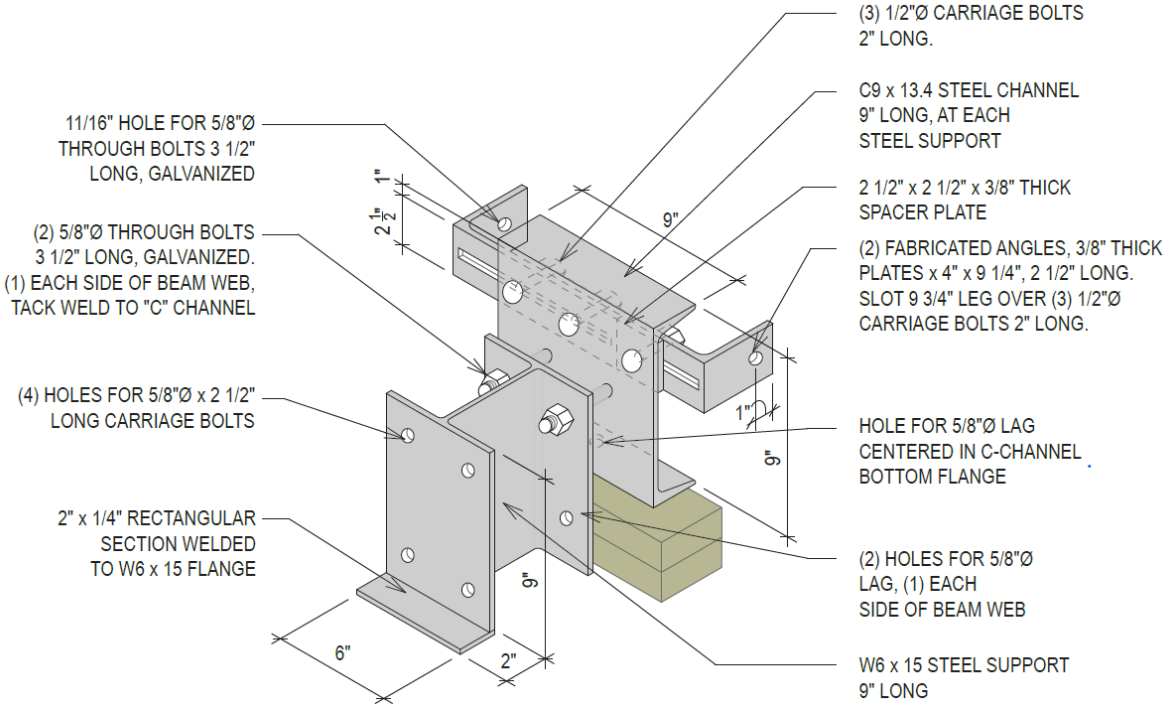


FIGURE 2—DECKSTRUC DECK LEDGER BRACKET ASSEMBLY

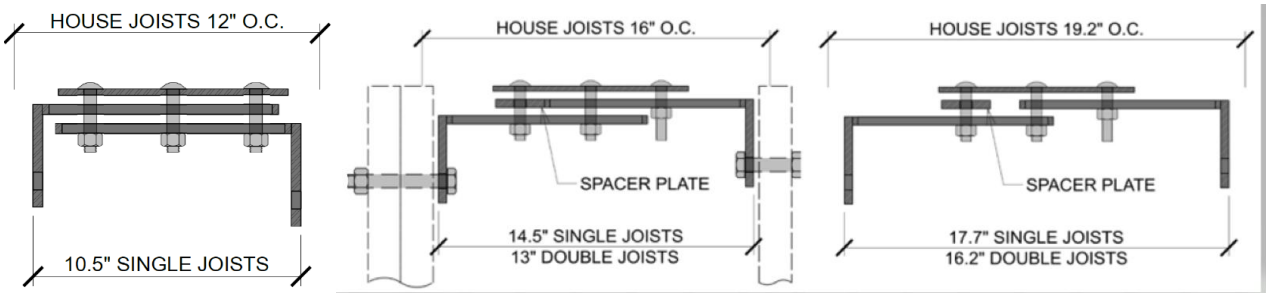


FIGURE 3—CONNECTION BETWEEN ANGLES AND CHANNEL IN DECKSTRUC DECK LEDGER BRACKET ASSEMBLY

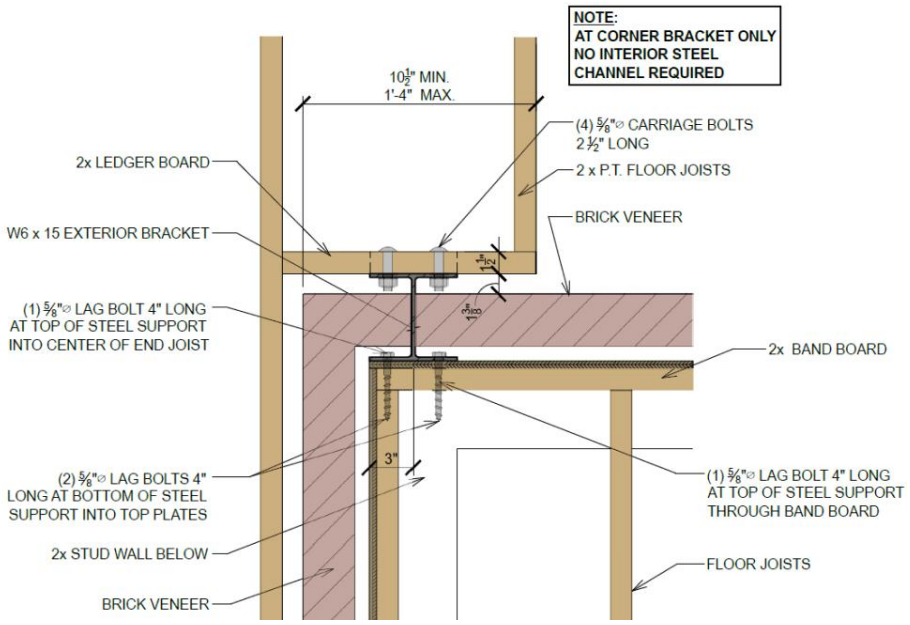
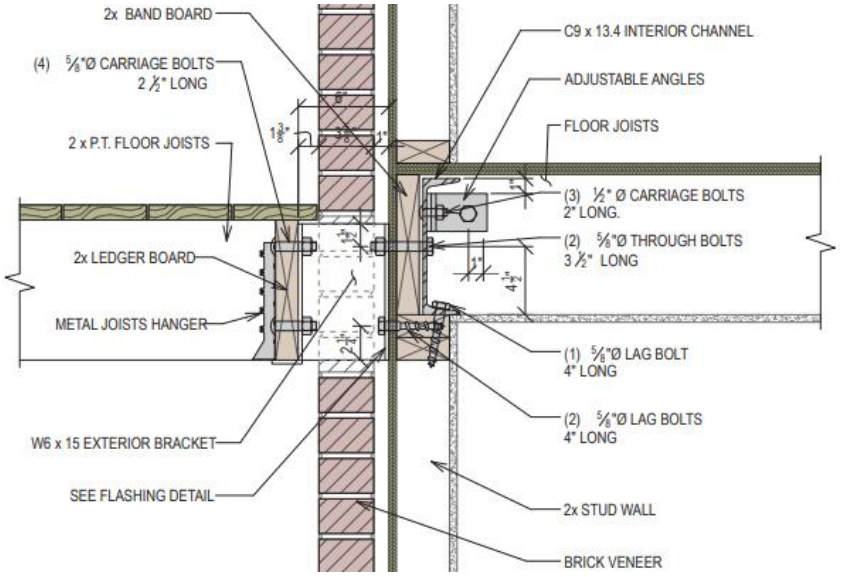
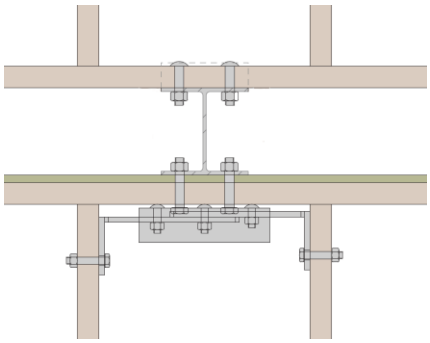


FIGURE 4—CORNER DECKSTRUC DECK LEDGER BRACKET ASSEMBLY (Plan View)



Elevation View



Plan View

FIGURE 5—TYPICAL INSTALLATION OF THE DECKSTRUC DECK LEDGER BRACKET ASSEMBLY

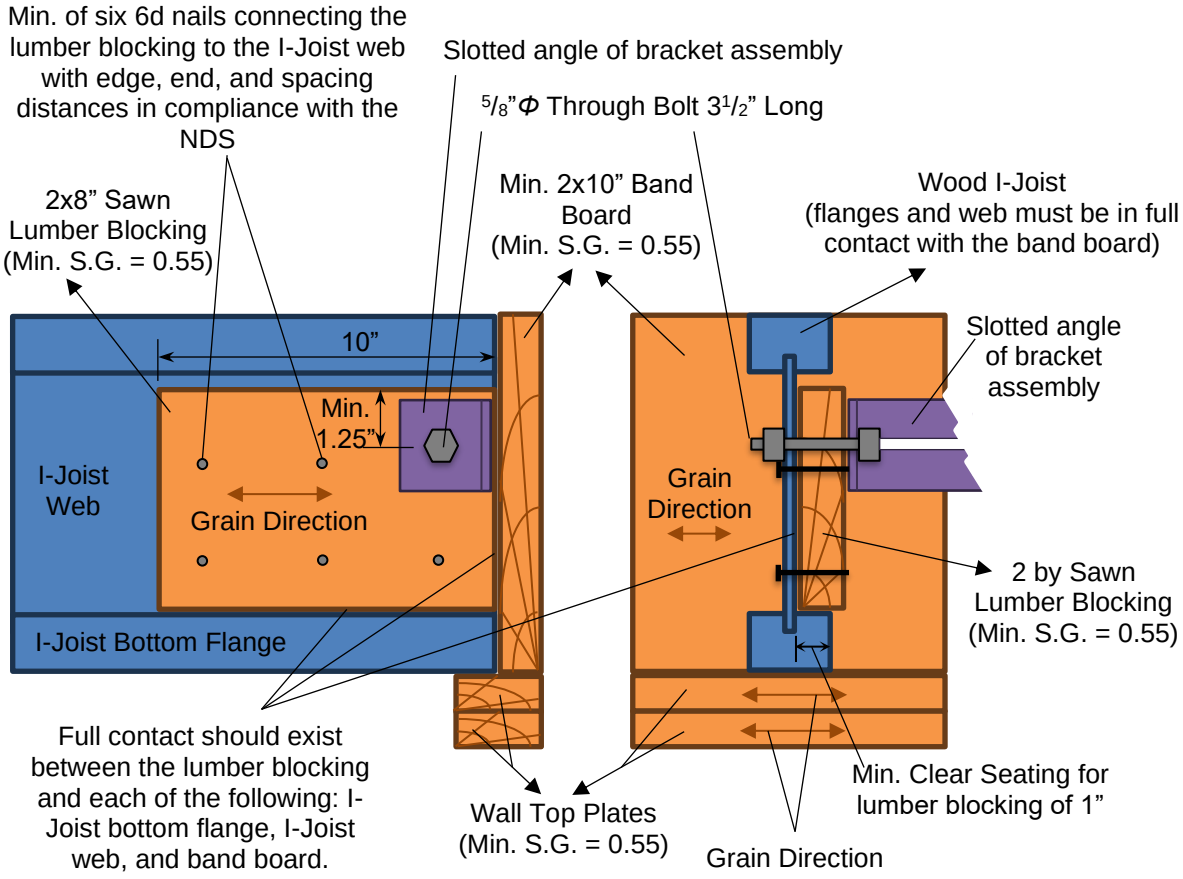


FIGURE 6—SLOTTED ANGLES ATTACHMENT TO I-JOIST IN DECKSTRUC DECK LEDGER BRACKET ASSEMBLY