



**CERTIFICATION**



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## **Technical Evaluation Report**

**TER 1011-04**

Trussway Truss Reaction & Bearing  
Capacities  
for Proprietary Top Chord Bearing Floor  
Trusses

**Trussway Industries, LLC**

### **Product:**

**Proprietary truss reaction and  
bearing capacities as tested and  
analyzed**

Issue Date:

April 24, 2014

Revision Date:

March 18, 2020

Subject to Renewal:

April 1, 2021

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COMPANY  
INFORMATION:

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DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

SECTION: 06 02 00 - Design Information

SECTION: 06 05 23 - Wood, Plastic, and Composite Fastenings

SECTION: 06 11 00 - Wood Framing

SECTION: 06 17 00 - Shop-Fabricated Structural Wood

SECTION: 06 17 53 - Shop-Fabricated Wood Trusses

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1 PRODUCT EVALUATED<sup>1</sup>

- 1.1 Proprietary truss reaction and bearing capacities as tested and analyzed

2 APPLICABLE CODES AND STANDARDS<sup>2,3</sup>

## 2.1 Codes

2.1.1 *IBC—12, 15, 18: International Building Code®*2.1.2 *IRC—12, 15, 18: International Residential Code®*

## 2.2 Standards and Referenced Documents

2.2.1 *TPI 1: National Design Standard for Metal-plate-connected Wood Truss Construction*

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<sup>1</sup> Building codes require data from valid [research reports](#) be obtained from [approved sources](#). Agencies who are accredited through ISO/IEC 17065 have met the [code requirements](#) for approval by the [building official](#). DrJ is an ISO/IEC 17065 ANSI-Accredited Product Certification Body – Accreditation #1131.

Through ANSI accreditation and the [IAF MLA](#), DrJ certification can be used to obtain product approval in any [jurisdiction](#) or country that has [IAF MLA Members & Signatories](#) to meet the Purpose of the MLA – “certified once, accepted everywhere.”

Building official approval of a licensed [registered design professional](#) (RDP) is performed by verifying the RDP and/or their business entity complies with all professional engineering laws of the relevant [jurisdiction](#). Therefore, the work of licensed RDPs is accepted by [building officials](#), except when plan (i.e. peer) review finds an error with respect to a specific section of the code. Where this TER is not approved, the [building official](#) responds in writing stating the reasons for [disapproval](#).

For more information on any of these topics or our mission, product evaluation policies, product approval process, and engineering law, visit [drjcertification.org](http://drjcertification.org) or call us at 608-310-6748.

<sup>2</sup> Unless otherwise noted, all references in this TER are from the 2018 version of the codes and the standards referenced therein (e.g., *ASCE 7*, *NDS*, *ASTM*). This material, design, or method of construction also complies with the 2000-2015 versions of the referenced codes and the standards referenced therein.

<sup>3</sup> All terms defined in the applicable building codes are italicized.

### 3 PERFORMANCE EVALUATION

- 3.1 Trussway has undertaken top chord bearing reaction tests on its proprietary floor truss connection details to provide improved floor truss end reaction capacities.
- 3.1.1 This testing provides the data needed to update *TPI 1* Table 7.4-1 Top Chord and Intermediate-Height Bearing Limits, for proprietary use as defined herein.
- 3.1.2 These end reaction limits are for use by Trussway's engineering department exclusively.
- 3.1.2.1 The limits are based on the design methods developed through testing and analysis.
- 3.1.3 Trussway floor truss design will be performed using the methods found in *TPI 1* and the tested performance methods as appropriate.
- 3.2 The design and manufacture of wood floor trusses follows the requirements defined in *TPI 1* as referenced by *IBC Chapter 35* and *IRC Chapter 44*.
- 3.3 *IBC Chapter 23* – Wood
- 2303.4 Trusses.
- 2303.4.1 **Design.** Wood trusses shall be designed in accordance with the provisions of this code and accepted engineering practice. Members are permitted to be joined by nails, glue, bolts, timber connectors, metal connector plates or other approved framing devices.
- 2303.4.6 **TPI 1 specifications.** In addition to Sections 2303.4.1 through 2303.4.5, the design, manufacture and quality assurance of metal-plate-connected wood trusses shall be in accordance with TPI 1. Job-site inspections shall be in compliance with Section 110.4, as applicable.
- 3.4 *IRC Chapter 5* – Floors
- R502.11 Wood trusses.
- R502.11.1 **Design.** Wood trusses shall be designed in accordance with approved engineering practice. The design and manufacture of metal-plate-connected wood trusses shall comply with ANSI/TPI 1. The truss design drawings shall be prepared by a registered professional where required by the statutes of the jurisdiction in which the project is to be constructed in accordance with Section R106.1.
- 3.5 Any code compliance issues not specifically addressed in this section are outside the scope of this TER.
- 3.6 Any engineering evaluation conducted for this TER was performed on the dates provided in this TER and within DrJ's professional scope of work.

### 4 PRODUCT DESCRIPTION AND MATERIALS

- 4.1 A Trussway top chord bearing floor truss is individually described on a truss design drawing (TDD).

### 5 APPLICATIONS

- 5.1 Allowable Trussway Floor Truss Reactions (Table 1, Table 2, Figure 1, Figure 2, Figure 3, Figure 4)

#### *TPI 1* Section 7.4.2 Top Chord Bearing Parallel Chord Trusses.

Top Chord bearing parallel chord Trusses with a gap between the inside of the bearing and the first diagonal or vertical web exceeding ½ in. (13 mm) shall be designed considering effects of shear and bending on the extended chord. In all cases involving gaps that are equal to or less than ½ in. (13 mm) on Top Chord bearing Trusses and for intermediate-height bearing Trusses, reaction at the bearings shall not exceed the limits shown in Table 7.4-1 for the configurations shown, unless otherwise established by test or alternate analysis method.

TABLE 1. ALTERNATE TABLE 7.4-1 TOP CHORD & INTERMEDIATE-HEIGHT BEARING LIMITS FOR TRUSSWAY FLOOR TRUSSES

Bearing Detail Figures 1-3	Number of Top Chords	End Vertical Web	Top Chord	Maximum Allowable R (lbs)	A	B	C
7.4-1 (a)	1	1	4x2	600	½"	⅛"	⅛"
Trussway 7.4-1 (a)	2	0	4x2	1,000	1½"	-	-
7.4-1 (b)	2	1	4x2	1,600	½"	⅛"	⅛"
7.4-1 (b)	2	1	3x2	1,150	½"	⅛"	⅛"
7.4-1 (c)	2	0	4x2	1,600	½"	⅛"	⅛"
7.4-1 (c)	2	0	3x2	1,150	½"	⅛"	⅛"
7.4-1 (d)	2	0	4x2	1,600	½"	-	⅛"
Trussway 7.4-1 (d)	2	0	4x2	2,000	1½"	-	-
7.4-1 (d)	2	0	3x2	1,150	½"	-	⅛"

TABLE 2. TOP CHORD & INTERMEDIATE-HEIGHT BEARING LIMITS FOR 45° BEARING WALL CONDITIONS FOR TRUSSWAY FLOOR TRUSSES

Bearing Detail Figure 4	Number of Top Chords	End Vertical Web	Top Chords	Maximum Allowable R (lbs)	A	A2	B	C
Trussway 7.4-1 (a) (AB)	2	0	4x2	1,000	½"	4"	-	-
Trussway 7.4-1 (d) (AB)	2	0	4x2	1,700	½"	4"	-	-

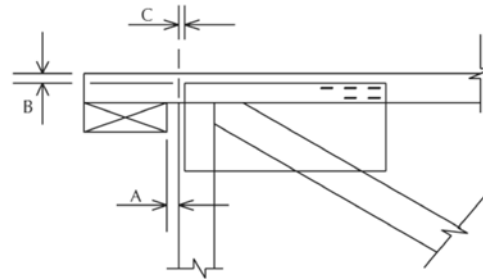
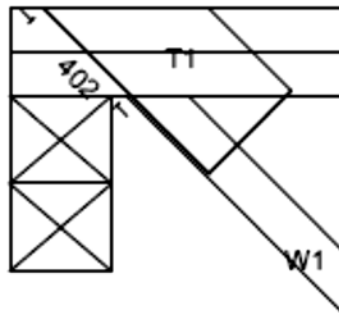


Figure 7.4-1(a)

FIGURE 1. TRUSSWAY ALTERNATIVE BEARING DETAIL (LEFT) & TPI 1 FIGURE 7.4-1(A) (RIGHT)

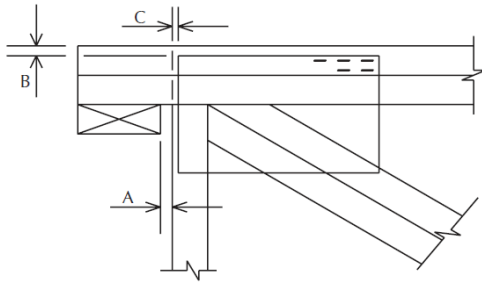


Figure 7.4-1(b)

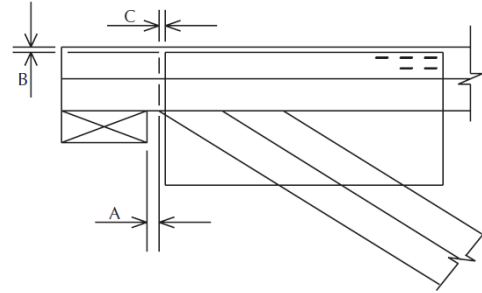


Figure 7.4-1(c)

FIGURE 2. TPI 1 FIGURE 7.4-1(B) & FIGURE 7.4-1(C)

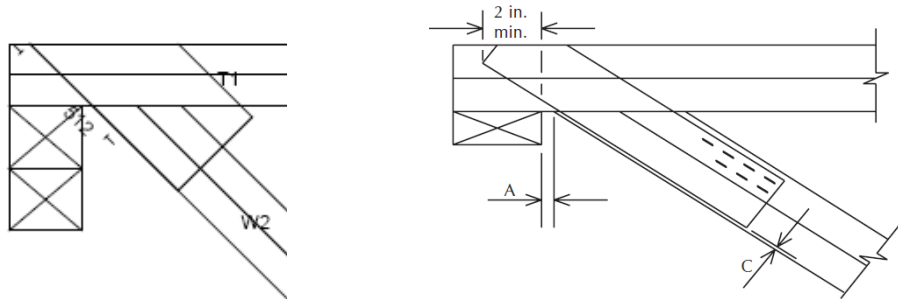
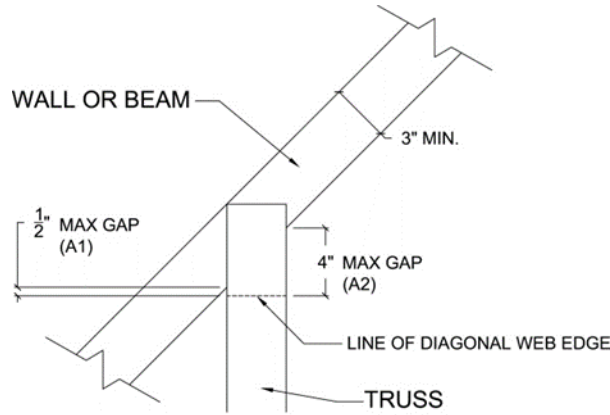


Figure 7.4-1(d)

FIGURE 3. TRUSSWAY ALTERNATIVE BEARING DETAIL (LEFT) & TPI 1 FIGURE 7.4-1(D) (RIGHT)



**PLAN VEIW - ANGLE CUT  
PLATE DETAIL  
(45° BEARING WALL)**

FIGURE 4. TRUSSWAY ALTERNATIVE ANGLED BEARING DETAIL

ANGLE CAN BE VARIED AS LONG AS THE MAXIMUM A1 GAP IS 1/2" & A2 GAP IS 4", OR A1 IS 4" & A2 IS 1/2"

5.2 Truss Availability

- 5.2.1 Trussway proprietary and custom floor trusses are available in numerous configurations with spans, depths and spacing designed specifically for a given project.
- 5.2.2 This application will be defined and shown on the Trussway TDD.

### 5.3 Structural Applications

- 5.3.1 Where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience, and technical judgment.

## 6 INSTALLATION

- 6.1 Installation shall comply with the manufacturer's installation instructions and this TER. In the event of a conflict between the manufacturer's installation instructions and this TER, the more restrictive shall govern.
- 6.2 A copy of the Trussway TDDs and any related installation details shall be available at all times on the jobsite during installation.
- 6.3 Overall design, installation, and performance of Trussway floor trusses is outside the scope of this TER.

## 7 TEST ENGINEERING SUBSTANTIATING DATA

- 7.1 Testing undertaken at the SBC Research Institute (SBCRI), under contract with Qualtim, Inc., including additional calculations and analysis.
- 7.2 Some information contained herein is the result of testing and/or data analysis by other sources which conform to [IBC Section 1703](#) and relevant [professional engineering law](#). DrJ relies on accurate data from these sources to perform engineering analysis. DrJ has reviewed and found the data provided by other professional sources to be credible.
- 7.3 Where appropriate, DrJ's analysis is based on design values that have been codified into law through codes and standards (e.g., *IBC*, *IRC*, *NDS*®, and *SDPWS*). This includes review of code provisions and any related test data that aids in comparative analysis or provides support for equivalency to an intended end-use application. Where the accuracy of design values provided herein is reliant upon the published properties of commodity materials (e.g., lumber, steel, and concrete), DrJ relies upon the grade mark, stamp, and/or design values provided by raw material suppliers to be accurate and conforming to the mechanical properties defined in the relevant material standard.

## 8 FINDINGS

- 8.1 When used in accordance with this TER and a Trussway TDD, the details herein comply with the requirements for the design and manufacture of wood floor trusses as defined in *TPI 1* and referenced by [IBC Section 2303.4](#) and [IRC Section R502.11](#).
- 8.2 [IBC Section 104.11](#) ([IRC Section R104.11](#) and [IFC Section 104.9](#) are similar) states:
- 104.11 Alternative materials, design and methods of construction and equipment.** The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *building official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code...Where the alternative material, design or method of construction is not *approved*, the *building official* shall respond in writing, stating the reasons the alternative was not *approved*.
- 8.3 This product has been evaluated in the context of the codes listed in Section 2 and is compliant with all known state and local building codes. Where there are known variations in state or local codes applicable to this evaluation, they are listed here.
- 8.3.1 No known variations

## 9 CONDITIONS OF USE

- 9.1 When installed in accordance with this TER, Trussway floor truss end reactions are rated for allowable load carrying capacities as defined in this report.
- 9.2 Trussway floor truss end reactions may be used as part of a fire-resistance-rated assembly in accordance with the fire assembly details and all local building code requirements.
- 9.3 Trussway TDDs, truss placement diagrams (TPDs) and any related installation instructions shall be shipped to the jobsite with the Trussway trusses or otherwise be available on the jobsite for inspection.
- 9.4 Trussway trusses are manufactured in Houston, Texas; Fort Worth, Texas; Fountain, Colorado; Orlando, Florida; Fredericksburg, Virginia; and Acworth (Cartersville), Georgia under a quality control program with quality control inspections in accordance with *TPI 1 - 2014* Section 3.1 and 3.2.
- 9.5 Where required by the building official, also known as the authority having jurisdiction (AHJ) in which the project is to be constructed, this TER and the installation instructions shall be submitted at the time of permit application.
- 9.6 Any generally accepted engineering calculations needed to show compliance with this TER shall be submitted to the AHJ for review and approval.
- 9.7 Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed and/or by the Building Designer (e.g., owner or registered design professional).
- 9.8 At a minimum, this product shall be installed per Section 6 of this TER.
- 9.9 This product is manufactured under a third-party quality control program in accordance with IBC Section 104.4 and 110.4 and IRC Section R104.4 and R109.2.
- 9.10 The actual design, suitability, and use of this TER, for any particular building, is the responsibility of the owner or the owner's authorized agent. Therefore, the TER shall be reviewed for code compliance by the building official for acceptance.
- 9.11 The use of this TER is dependent on the manufacturer's in-plant QC, the ISO/IEC 17020 third-party quality assurance program and procedures, proper installation per the manufacturer's instructions, the building official's inspection, and any other code requirements that may apply to demonstrate and verify compliance with the applicable building code.

## 10 IDENTIFICATION

- 10.1 The product(s) listed in Section 1.1 are identified by a label on the board or packaging material bearing the manufacturer's name, product name, TER number, and other information to confirm code compliance.
- 10.2 Additional technical information can be found at [trussway.com](http://trussway.com).

## 11 REVIEW SCHEDULE

- 11.1 This TER is subject to periodic review and revision. For the most recent version of this TER, visit [drjcertification.org](http://drjcertification.org).
- 11.2 For information on the current status of this TER, contact [DrJ Certification](http://DrJ Certification).