RedBuilt™

**Open-Web Trusses**

- Design Flexibility
- Economical Truss Solutions
- Limited Product Warranty


- Outstanding Strength-to-Weight Performance
- Easy Installation
- Custom Manufacturing

Specify Open-Web trusses for your next project using RedSpec™ single-member sizing software.

Download your free copy at RedBuilt.com.

RedBuilt.com • 1.866.859.6757
Welcome to RedBuilt

RedBuilt is an exciting business offering building solutions for a broad range of commercial and custom residential applications. In addition to pioneering unique manufacturing technologies, RedBuilt provides world-class service and technical support for architects, specifiers and builders.

RedBuilt gives you access to reliable, innovative products, including RedBuilt™ open-web trusses, Red-I™ joists, and RedLam™ LVL beams and headers. And we keep things simple: You'll work with just one service-oriented supplier to get all these products—plus the support you need to build smarter.

RedBuilt: A family of brand-name building products... a source for innovative ideas and solutions... a supplier that's simpler to do business with.
Product Selection
This guide provides specifiers with technical information about the RedBuilt™ open-web truss product line. However, complex or custom applications can often make specifying the right products in the right places a challenge—especially when you have factors such as span, wind or load-carrying capacity and other design constraints to consider. But whatever your project entails, RedBuilt is here to help. Your local RedBuilt technical representative, along with our Design Center teams, can assist you in choosing the best products and designing the best system for your specific application.

Contact us for help with any of the following:
• Product selection
• Building department calculations
• Complete cost analysis
• System selection (system packages can include horizontal framing, main carrying beams, headers, wall framing, mansard framing, and accessories)

Products for Every Application
In addition to open-web trusses, RedBuilt offers a variety of other engineered lumber products that are ideal for use in commercial and custom residential projects. For more information, contact your RedBuilt technical representative or visit redbuilt.com to download literature for products such as Red-I™ joists and RedLam™ LVL.

Unsurpassed Technical Support
RedBuilt has one of the largest networks of technical representatives in the business. Their services include consultation, computer-assisted design and layout, delivery coordination, and installation review. They can suggest cost-reduction techniques and check special application requirements. In addition, they’re backed by a staff of professional engineers who provide comprehensive technical support when needed. Special requests are accommodated wherever practical, and they offer cost analysis, engineering analysis, assistance with building code approvals—even the creation of special product applications for more creative designs. The goal of RedBuilt technical support is to help architects and engineers achieve quality design applications with the most cost-efficient product selection possible.

Resource Efficiency
Consider all of the positive attributes of wood when selecting your building material of choice. In addition to its structural properties, high strength-to-weight ratio, and ease of construction, wood is a naturally occurring, renewable resource that requires less energy to produce than steel or concrete. And it sequesters carbon—whether on the stump or in your structure.

Our RedBuilt™ open-web trusses with RedLam™ LVL chords, as well as other RedBuilt™ products, are made with responsibly sourced fiber. Whether you’re looking for LEED® certification or simply want to ensure efficient use of raw materials, we can help. By making better use of every tree, RedBuilt produces cost-effective, consistently available engineered wood products that reduce environmental impact. The result is a quality wood product that offers superior strength and reliable performance.
DESIGN CENTER SERVICES

Upon request, RedBuilt can provide the following services for the products described in this Open-Web Truss Specifier’s Guide:

• A complete design package including layout drawings (placement diagrams) and detailed design calculations.
• Review and analysis of the application.
• Drawings or calculations sealed by a professional engineer.

Installation Review

Although responsibility for proper installation lies with the contractor-builder, RedBuilt provides detailed suggestions and guidelines for installation. If requested, a RedBuilt representative will visit the site to verify the contractor’s understanding of proper installation. RedBuilt professional engineers also are available to help solve jobsite application problems.

Engineering Responsibility Position Statement

RedBuilt is a manufacturer of proprietary structural components.

It employs a staff of professional engineers to aid in the development, manufacture, and marketing of its products. RedBuilt does not replace or accept the responsibility of the design professional of record for any structure.

RedBuilt accepts the delegation of engineering responsibility only for the products it manufactures, provided that the application conditions are specified by the design professional of record, or other responsible party when a design professional is not engaged. RedBuilt provides engineering in the design of its products and does not displace the need on any project for a design professional of record.

HOW TO SPECIFY TRUSSES FOR MAXIMUM ECONOMY

It is in the designer’s best interest to specify the most economically efficient materials and ensure that their customers are not paying extra for structural components that are oversized for the given loads. However, specifying a minimum depth truss with the maximum plf loading (as shown in the load tables on pages 6–11) may not be the most economical solution.

Designing to the maximum depth allowed for the application, and not maximizing loads in tables, will produce the most economical solution. Keep this and the following two examples in mind when consulting the load tables in this guide:

**Deeper Can Be More Economical**

**Example:**

Minimum Depth (Maximum PLF Capacity)

32”

10-Panel Truss

Economical Depth

36”

9-Panel Truss

Cost Savings of 12%±

**Consider An Alternative Truss Series**

**Example:**

Red-L™ Truss Series (Maximum PLF Capacity)

32”

14-Panel Truss

Red-W™ Truss Series

32”

9-Panel Truss

Cost Savings of 20%±

Red-S™ Truss Series

32”

7-Panel Truss

Cost Savings of 23%±

Top chord bearing at each end provides the easiest installation and the most cost-effective truss system. Note that these are general guidelines only and they are not reflective of all applications. Consult your local RedBuilt technical representative to assist you in specifying the most economical truss solutions for your particular applications.
OPEN-WEB TRUSS DESCRIPTIONS

Red-L™ and Red-W™ Trusses

Chords:
- Red-L™ trusses: 1½" x 3½" MSR lumber*
- Red-W™ trusses: 1½" x 4¾" MSR lumber

Webs:
1" and 1¼" diameter tubular steel members varying in gauge and diameter according to requirements.

Weight:
- Red-L™ trusses: 3.75 to 4.25 lbs/ft
- Red-W™ trusses: 4.5 to 5.25 lbs/ft

Depths:
Minimum depth at wall ......................14"
Maximum depth at wall ......................50"
Maximum pitched ridge depth ..............50"
Any depth between minimum and maximum is available.

Red-S™ Trusses

Chords:
Double 1½" x 2.3" RedLam™ LVL

Webs:
1", 1¼", and 1½" diameter tubular steel members varying in gauge and diameter according to requirements.

Weight:
4.75 to 5.75 lbs/ft

Depths:
Minimum depth at wall ......................16"
Maximum depth at wall ......................60"
Maximum pitched ridge depth ..............84"
Any depth between minimum and maximum is available.

Red-M™ and Red-H™ Trusses

Chords:
- Red-M™ trusses: Double 1½" x 3½" MSR lumber*
- Red-H™ trusses: Double 1½" x 5½" MSR lumber*

Webs:
Up to 2" diameter tubular steel members varying in gauge and diameter according to requirements.

Weight:
- Red-M™ trusses: 8 to 9 lbs/ft
- Red-H™ trusses: 10 to 12 lbs/ft

Depths:
Red-M™ Red-H™
Minimum depth at wall ......................20" ....... 24"
Maximum depth at wall ......................60" ....... 72"
Maximum pitched ridge depth ..............72" ....... 114"
Any depth between minimum and maximum is available.


Open-web trusses are intended for dry use, untreated applications.

Building Codes and Product Acceptance: See ICC-ES ESR-1774, L.A. City RR #22614

Truss Profiles

1 Parallel Chord
2 Tapered
3 Pitched
4 Radius Pitched
5 Bow String
6 Barrel
7 Pitched Top Chord/Radius Bottom Chord
8 Scissor
9 Compound Barrel
10 Lenticular

Tightest Curvature Available:
Red-L™ and Red-W™ trusses ...............52' radius
Red-S™ trusses ..............................200' radius
Red-M™ trusses ..............................Camber only
Red-H™ trusses ..............................Camber only

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■ Indicates that the profile is available.

In radius truss applications (Profiles 5, 6, 7, 9, and 10), allowable loads are reduced due to radial stresses. Contact your RedBuilt technical representative for job-specific possibilities.

Maximum top chord slope for Profile 4 (Radius Pitched) is ½:12 for Red-L™ and Red-W™ truss series, and ¾:12 for Red-S™ truss series.
General Notes

- Values shown demonstrate maximum allowable load capacities based on the following assumptions:
  - Simple span, uniformly loaded conditions, with provisions for positive drainage (¼:12 slope, minimum) in roof applications.
  - Span indicates distance from inside face to inside face of bearing.
  - Top chord no-notch bearing clips with 1¾" bearing. Higher values may be possible with other types of bearing clips.

- Straight line interpolations may be made between depths and spans.
- Values in shaded areas may be increased 7% for repetitive-member use.
- Bold italic values are controlled by minimum concentrated load analysis of 2,000 lbs. Higher loads are possible where minimum concentrated load analysis is not required by code. Contact your RedBuilt technical representative for assistance.

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*See page 5 for available depths and profiles. For depths and profiles not shown, contact your RedBuilt technical representative for assistance.

*Red numbers refer to 115% Total Load (TL).
To size floor trusses:
Check both total load (100% TL) and live load (100% LL). When live load is not shown, total load will control. Total load values limit deflection to L/240. Live load values are based on the Commercial Floor Deflection Limit shown on page 35, and assume a nailed floor system. Live load (100% LL) values may be increased with a glue-nailed floor system; contact your RedBuilt technical representative for assistance.

Trusses delivered to the jobsite are custom manufactured to resist only project specific application loads provided by the design professional. Actual trusses may not be able to resist the maximum loads shown in the tables above. For questions regarding actual truss capacity contact your RedBuilt technical representative.

To size roof trusses:
Check the appropriate snow load area (115% TL) or non-snow load area (125% TL) value to determine the maximum allowable total load. Total load (115% TL and 125% TL) values limit truss deflection to L/180. Consult local codes to verify deflection limits required for specific applications.
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General Notes continued on page 9

**Values shown demonstrate maximum allowable load capacities based on the following assumptions:**
- Simple span, uniformly loaded conditions, with provisions for positive drainage (4°-12 slope, minimum) in roof applications.
- **Span** indicates distance from inside face to inside face of bearing.
- Top chord no-notch bearing clips with 2½" bearing for Red-W™ trusses and 3½" bearing for Red-S™ trusses.
- **Shaded areas may be increased for repetitive-member use as possible where minimum concentrated load analysis is not required by code. Contact your RedBuilt technical representative for assistance.**

**General Notes continued on page 9**

**Bold italic** values are controlled by minimum concentrated load analysis of 2,000 lbs. Higher loads are possible where minimum concentrated load analysis is not required by code. Contact your RedBuilt technical representative for assistance.
## RED-S™ TRUSS ALLOWABLE UNIFORM LOAD TABLE (PLF) / PARALLEL CHORD

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See page 5 for additional depths and profiles. For depths and profiles not shown, contact your RedBuilt technical representative for assistance.

### General Notes continued from page 8

To size floor trusses:
Check both total load (100% TL) and live load (100% LL). When live load is not shown, total load will control. Total load values limit deflection to L/240. Live load values are based on the Commercial Floor Deflection Limit shown on page 35, and assume a nailed floor system. Live load (100% LL) values may be increased by a glued-nail floor system; contact your RedBuilt technical representative for assistance.

To size roof trusses:
Check the appropriate snow load area (115% TL) or non-snow load area (125% TL) value to determine the maximum allowable total load. Total load (115% TL and 125% TL) values limit truss deflection to L/180. Consult local codes to verify deflection limits required for specific applications.

Trusses delivered to the jobsite are custom manufactured to the tables in the Resist only project specific application loads provided by the design professional. Actual trusses may not be able to resist the maximum loads shown in the tables above. For questions regarding actual truss capacity contact your RedBuilt technical representative.
## RED-M™ TRUSS ALLOWABLE UNIFORM LOAD TABLE (PLF) / PARALLEL CHORD

### General Notes

- **Values shown** demonstrate maximum allowable load capacities based on the following assumptions:
  - Simple span, uniformly loaded conditions, with provisions for positive drainage (¼-12 slope, minimum) in roof applications.
  - **Span** indicates distance from inside face to inside face of bearing.
  - Top chord Z bearing clips for Red-M™ and Red-H™ trusses. Higher values possible where minimum concentrated load analysis is not required by code. Contact your RedBuilt technical representative for assistance.

### Load Tables

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**Load Tables continued on page 5 for available depths and profiles. For depths and profiles not shown, contact your RedBuilt technical representative for assistance.**

**For spans over 70 feet, see page 32 or contact your RedBuilt technical representative.**

**Trusses delivered to the jobsite are custom manufactured to resist only project specific application loads provided by the design professional. Actual trusses may not be able to resist the maximum load shown in the tables above. For questions regarding actual truss capacity contact your RedBuilt technical representative.**

---

### General Notes continued

- **Values shown** demonstrate maximum allowable load capacities based on the following assumptions:
  - Simple span, uniformly loaded conditions, with provisions for positive drainage (¼-12 slope, minimum) in roof applications.
  - **Span** indicates distance from inside face to inside face of bearing.
  - Top chord Z bearing clips for Red-M™ and Red-H™ trusses. Higher values possible where minimum concentrated load analysis is not required by code. Contact your RedBuilt technical representative for assistance.

**Bold italic values** are controlled by minimum concentrated load analysis of 2,000 lbs. Higher loads are possible where minimum concentrated load analysis is not required by code. Contact your RedBuilt technical representative for assistance.
### General Notes continued from page 10

To size floor trusses:
Check both total load (100% TL) and live load (100% LL). When live load is not shown, total load will control. Total load values limit deflection to L/240. Live load values are based on the Commercial Floor Deflection Limit shown on page 35, and assume a nailed floor system. Live load (100% LL) values may be increased with a glue-nailed floor system; contact your RedBuilt technical representative for assistance.

To size roof trusses:
Check the appropriate snow load area (115% TL) or non-snow load area (125% TL) value to determine the maximum allowable total load. Total load (115% TL and 125% TL) values limit truss deflection to L/180.

Consult local codes to verify deflection limits required for specific applications.

---

### Trusses delivered to the jobsite are custom manufactured to resist only project specific application loads provided by the design professional. Actual trusses may not be able to resist the maximum loads shown in the tables above. For questions regarding actual truss capacity contact your RedBuilt technical representative.

---

**RED-H™ TRUSS ALLOWABLE UNIFORM LOAD TABLE (PLF) / PARALLEL CHORD**

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</table>

*See page 5 for available depths and profiles. For depths and profiles not shown, contact your RedBuilt technical representative for assistance.*

*For spans over 70 feet, see page 32 or contact your RedBuilt technical representative.*

*Red numbers refer to 115% Total Load (TL).*
1 Beveled Plate Requirements

Beveled bearing plates are required for trusses with sloped top chords. 

**Beveled plates serve two functions:**
1. Provide proper bearing for the bearing clip.
2. Avoid interference between the top chord and the bearing plate.

A beveled plate, to suit roof slope, is required at all common bearings and cantilevered bearings.

2 Top Bearing
No-Notch Clip

Bearing capacity varies with chord bearing length

Pre-notched plate not required

3 Bottom Bearing
U-Clip

Bearing capacity varies with chord bearing length

4 Top Bearing
Flush-Mount Clip (Heavy Duty)

Specify for high axial load applications

Maximum slope is ½:12. Contact your RedBuilt technical representative for truss depths less than 21”. See pages 24–26 for additional information on Wind or Seismic Connections.

See page 22 for bearing reaction capacities
**5 Top Chord Bearing**
No-Notch Clip

![Diagram](image)

2x stud wall

**6 Top Chord Bearing on Ledger**
No-Notch Clip

![Diagram](image)

Wall or strap tie as required. Use 10d (0.148” x 1½”) nails maximum. Leave ½” clearance or provide vapor barrier at truss end.

See page 24 for compatible strap ties

**7 Bearing Block at Masonry Wall**

![Diagram](image)

Two Simpson Strong-Tie® ST 2115 (or equivalent, by others) required

½” gap

Treated bearing block installed by RedBuilt

Do not grout solid—leave ½” clearance all around truss

Blocking not shown for clarity

**8 Top Chord Bearing**
Flush-Mount Bearing Clip (Dropped and Non-Dropped)

![Diagram](image)

Red-S™, Red-M™, or Red-H™ trusses dropped with cap plate

4½” minimum with Red-S™ truss

5½” minimum with Red-M™ truss

6” minimum with Red-H™ truss

Red-L™ and Red-W™ non-dropped truss

See page 25 for axial tension or compression capacity information

**9 Red-I™ Joist Butting with Top Chord Bearing Truss**

![Diagram](image)

Web stiffener each side of joist as required

2x plates

Joist hanger

Option: Bearing clips may also be welded directly to steel beam

**10 Typical Top Chord Bearing and Blocking**
No-Notch Clip

![Diagram](image)

Bearing wall as occurs

Blocking to transfer vertical and diaphragm loads
11 Red-W™ Truss Top Chord Bearing
Lateral No-Notch Clip

Bend tab over plate as required
Clip extension; fill all nail holes over plate.

See page 26 for lateral load capacity and for Red-L™ and Red-W™ alternate detail

12 Top Chord Bearing on Steel Beam
No-Notch Clip

3½” minimum, steel beam or stud wall

2,860 lbs reaction capacity at 100% duration of load; higher reactions require more bearing length
Option: Bearing clips may also be welded directly to steel beam

13 Top Chord Bearing Truss Butting with Red-S™ Truss

Red-L™ and Red-W™ trusses
Red-S™ truss
2” high continuous plate

2,860 lbs reaction capacity at 100% duration of load for Red-L™ and Red-W™ trusses; higher reactions require more bearing length

14 Bottom Chord Bearing with Butting Trusses
U-Clip

Metal cross bracing is required for installation (see page 30); additional blocking is required to transfer diaphragm forces

15 Bottom Chord Bearing with Cross Bracing
U-Clip

Metal cross bracing is required for installation (see page 30); additional blocking is required to transfer diaphragm forces

16 Top Chord Bearing at Skewed Wall
No-Notch Clip

¾” diameter bolt by RedBuilt

Elevation of skewed wall must be lowered to accommodate bearing block height
17 Top Chord Bearing Cantilever
No-Notch Clip

Contact your RedBuilt technical representative if cantilever exceeds ½ of main span

18 Bottom Chord Bearing Cantilever
U-Clip

Metal cross bracing is required for installation (see page 30); additional blocking is required to transfer diaphragm forces

Contact your RedBuilt technical representative if cantilever exceeds 1⁄3 of main span

19 Top Chord Extension

20 Double Top Chord Extension

21 Double 2x₈ Outrigger

The following minimum criteria were used to develop the values:

2x4 and 2x6:
Fᵥ = 175 psi
Fᵦ = 2,100 psi
E = 1.8 x 10⁶ psi

2x8:
Fᵥ = 175 psi
Fᵦ = 900 psi
E = 1.6 x 10⁶ psi

Outrigger deflection:
• 2L/360 at LL for floors
  (live load = 0.80 x total load)
• 2L/240 at TL for roofs

(1) Multiply by Cᵥ = 1.2

• Values are limited by the published backspan capacity (plf).
• Members evaluated for 300 lb. point load.
RED-S™ TRUSS DETAILS

22 Top Chord Bearing
S-Clip

23 Bottom Chord Bearing
Angle Clip

24 Top Bearing
Flush-Mount Clip (Heavy Duty)

Specify for high axial load applications

Maximum slope is ½ : 12. Contact your RedBuilt technical representative for truss depths less than 22”. See pages 24–26 for additional information on Wind or Seismic Connections.

25 Beveled Plate Requirements—Top Chord Bearing

Beveled plate is required for all slopes greater than ½ : 12

Beveled plate is required for all slopes when trusses are cantilevered

26 Beveled Plate Requirements—Bottom Chord Bearing

Beveled plate is required for all slopes greater than ¼ : 12

Beveled plate is required for all slopes when trusses are cantilevered

See page 22 for bearing reaction capacities
27 **Top Chord Bearing on Ledger**
Flush-Mount Bearing Clip

![Top Chord Bearing on Ledger](image)

28 **Red-I™ Joist Butting with Red-S™ Truss**
S-Clip

![Red-I™ Joist Butting with Red-S™ Truss](image)

Option: Bearing clips may also be welded directly to steel beam

29 **Top Chord Bearing**
Flush-Mount Bearing Clip (Dropped and Non-Dropped)

![Top Chord Bearing](image)

See page 25 for axial tension or compression capacity information

30 **Top Chord Bearing with Butting Trusses**
S-Clip

![Top Chord Bearing with Butting Trusses](image)

Option: Bearing clips may also be welded directly to steel beam

31 **Bottom Chord Bearing with Cross Bracing**
Angle Clip

![Bottom Chord Bearing with Cross Bracing](image)

Metal cross bracing is required for installation (see page 30); additional blocking is required to transfer diaphragm forces

32 **Top Chord Bearing on Ledger**
S-Clip

![Top Chord Bearing on Ledger](image)

Leave ½" clearance or provide vapor barrier at truss end.
33 Top Chord Bearing Cantilever

Main span Cantilever

Bottom chord bracing may be required

½” maximum overhang per 2x₄ bearing plate

3” minimum

Bottom chord splice kit available for installing over beam

34 Bottom Chord Bearing Cantilever

Main span Cantilever

Metal cross bracing is required for installation (see page 30); additional blocking is required to transfer diaphragm forces

7½” minimum. Inquire about possible reductions.

35 Top Chord Extension

See table

Outrigger deflection:
- 2L/360 at LL for floors (live load = 0.80 x total load)
- 2L/240 at TL for roofs

The following criteria were used to develop the values:

\[ F_v = 285 \text{ psi} \]
\[ F_b = 3,000 \text{ psi}^{(1)} \]
\[ E = 2.0 \times 10^6 \text{ psi} \]

(1) Multiply by size factor = 1.18

Deflection:
- 2L/360 at LL for floors (live load = 0.80 x total load)
- 2L/240 at TL for roofs

36 Double 2x₄ Outrigger

Sheathing layout should be considered when locating this member

Outriggers deeper than 2x4s require that spacer blocks be placed under the truss bearings

The following criteria were used to develop the values:

\[ F_v = 175 \text{ psi} \]
\[ F_b = 2,100 \text{ psi} \]
\[ E = 1.8 \times 10^6 \text{ psi} \]

(1) Multiply by C_f = 1.2

Outrigger deflection:
- 2L/360 at LL for floors (live load = 0.80 x total load)
- 2L/240 at TL for roofs
- Outrigger deflection = \[ \frac{7WL^4}{24EI} + \frac{48WL^6}{3EI} \]
**RED-M™ AND RED-H™ TRUSS DETAILS**

- **Starter strut (2x4 block) by contractor; clips supplied by RedBuilt.**
- **Edge blocking as required.**
- **Installation bracing required, strut bracing supplied by RedBuilt; see page 31.**
- **Floor bridging, Bridging clips supplied by RedBuilt; see page 28.**

### Red-M™ Truss Details

#### 37 Red-M™ Truss Top Chord Bearing
- **S-Clip**
  - Clip will overhang 1/8” with Red-M™ truss
  - 1 1/2” with Red-M™ truss
  - 1 3/4” with Red-H™ truss
  - 2 3/8” with Red-M™ truss
  - 3 1/4” with Red-M™ truss
  - 3 1/2” with Red-M™ truss
  - 3 3/8” with Red-M™ truss

#### 38 Red-M™ Truss Bottom Chord Bearing
- **Angle Clip**
  - Chord can be sloped without beveled bearing plate (some limitations may apply)

#### 39 Top Chord Bearing
- **Z-Clip**
  - Clip will overhang 1/8” with Red-M™ truss
  - 1 1/2” with Red-M™ truss
  - 1 3/4” with Red-H™ truss
  - 2 3/8” with Red-M™ truss
  - 3 1/4” with Red-M™ truss
  - 3 1/2” with Red-M™ truss
  - 3 3/8” with Red-M™ truss

#### 40 Top Chord Bearing
- **P-Clip**

#### 41 Bottom Chord Bearing
- **T-Clip**

#### 42 Top Bearing
- **Flush-Mount Clip (Heavy Duty)**
  - Flange width: 3” with Red-M™ truss
  - 4” with Red-H™ truss
  - Flange thickness: 1/8” with Red-M™ truss
  - 1/6” with Red-H™ truss
  - Second pin optional

**Maximum slope is 1/2 -12. Contact your RedBuilt technical representative for truss depths less than 31”. See pages 24-26 for additional information on Wind or Seismic Connections.**

*See page 22 for bearing reaction capacities.*
43 Beveled Plate Requirements

Beveled plates serve two functions:
1. Provide proper bearing for bearing clips.
2. Avoid interference between top chords and bearing plate.

44 Typical Top Chord Extension

The following criteria were used to develop the values:
- $F_v = 175 \text{ psi}$
- $F_b = 2,100 \text{ psi}$
- $E = 1.8 \times 10^6 \text{ psi}$

Deflection:
- $2L/360$ at LL for floors (live load = 0.80 x total load)
- $2L/240$ at TL for roofs

45 Top Chord Bearing with Butting Trusses

Z-Clip

5½” minimum with Red-M™ truss
7” minimum with Red-H™ truss

46 Top Chord Bearing
Flush-Mount Bearing Clip (Dropped and Non-Dropped)

Dropped

Non-dropped

7” minimum with Red-M™ truss
8” minimum with Red-H™ truss

See page 25 for axial tension or compression capacity information

47 Top Chord Bearing Cantilever

Z-Clip

3/4” maximum overhang per 2x_n bearing plate

3” minimum

Bottom chord splice kit available for installing over beam

5½” minimum with Red-M™ truss
7” minimum with Red-H™ truss

Contact your RedBuilt technical representative if cantilever exceeds 3/4 of the truss span

48 Bottom Chord Bearing Cantilever

T-Clip

Metal cross bracing is required for installation (see page 30); additional blocking is required to transfer diaphragm forces

Centerline of wall preferred

Bottom chord bracing may be required

Contact your RedBuilt technical representative if cantilever exceeds 3/4 of the truss span

49 Typical Bottom Chord Extension

See table

5½” minimum with Red-M™ truss
7” minimum with Red-H™ truss

60”

155
180
195

66”

145
165
180

72”

125
150
150

Allowable Uniform Load Capacity (plf)

<table>
<thead>
<tr>
<th>Length</th>
<th>Red-M™ Floor (100%)</th>
<th>Snow Roof (115%)</th>
<th>Non-Snow Roof (125%)</th>
<th>Red-H™ Floor (100%)</th>
<th>Snow Roof (115%)</th>
<th>Non-Snow Roof (125%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24”</td>
<td>290</td>
<td>330</td>
<td>360</td>
<td>375</td>
<td>430</td>
<td>465</td>
</tr>
<tr>
<td>30”</td>
<td>235</td>
<td>270</td>
<td>295</td>
<td>305</td>
<td>350</td>
<td>380</td>
</tr>
<tr>
<td>36”</td>
<td>200</td>
<td>230</td>
<td>250</td>
<td>255</td>
<td>295</td>
<td>320</td>
</tr>
<tr>
<td>42”</td>
<td>140</td>
<td>170</td>
<td>170</td>
<td>220</td>
<td>255</td>
<td>275</td>
</tr>
<tr>
<td>48”</td>
<td>95</td>
<td>115</td>
<td>115</td>
<td>195</td>
<td>225</td>
<td>245</td>
</tr>
<tr>
<td>54”</td>
<td></td>
<td>175</td>
<td>200</td>
<td>215</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60”</td>
<td></td>
<td>155</td>
<td>180</td>
<td>195</td>
<td></td>
<td></td>
</tr>
<tr>
<td>66”</td>
<td></td>
<td>145</td>
<td>165</td>
<td>180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>72”</td>
<td></td>
<td>125</td>
<td>150</td>
<td>150</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Values are limited by the published backspan capacity (plf).
* Members evaluated for 300 lb. point load.

5½” minimum with Red-M™ truss
7” minimum with Red-H™ truss

Contact your RedBuilt technical representative if cantilever exceeds 1/3 of the truss span

See page 25 for axial tension or compression capacity information

Slopes Requiring a Beveled Plate

<table>
<thead>
<tr>
<th>Bearing Condition</th>
<th>S-Clip</th>
<th>Angle Clip</th>
<th>P-Clip</th>
<th>Flush Mount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low End 2x8</td>
<td>&gt;3/4”</td>
<td>&gt;3/4”</td>
<td>N.A.</td>
<td>See detail 42</td>
</tr>
<tr>
<td>2x6</td>
<td>&gt;3/4”</td>
<td>&gt;3/4”</td>
<td>N.A.</td>
<td></td>
</tr>
<tr>
<td>2x4</td>
<td>&gt;3/4”</td>
<td>&gt;3/4”</td>
<td>N.A.</td>
<td></td>
</tr>
<tr>
<td>High End</td>
<td>&gt;3/4”</td>
<td>&gt;3/4”</td>
<td>N.A.</td>
<td></td>
</tr>
<tr>
<td>Cantilevers</td>
<td>All slopes</td>
<td>N.A.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
49 Concentrated Loads

Concentrated and Non-Uniform Loads
For the most efficient use of RedBuilt™ products carrying concentrated loads or non-uniform loads, and/or used in conditions other than simple spans, consult your RedBuilt technical representative for precise sizing. As a general rule, extra members should be added to the system to carry concentrated loads such as bearing partitions, air-conditioners, and other mechanical equipment. Handling concentrated loads in this manner usually provides the most economical system and also helps ensure more uniform deflection.

50 Side-Loaded Double Truss Assembly

Load transfer blocks are required only when the load is imposed from the side.

<table>
<thead>
<tr>
<th>Truss Series</th>
<th>Maximum Load Per Transfer Block</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red-L™, Red-W™</td>
<td>700 lbs</td>
</tr>
<tr>
<td>Red-S™, Red-M™</td>
<td>1,200 lbs</td>
</tr>
<tr>
<td>Red-H™</td>
<td>1,300 lbs</td>
</tr>
</tbody>
</table>

51 Header Detail

<table>
<thead>
<tr>
<th>Truss Series</th>
<th>Maximum Allowable Header Clip Load Per Truss</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single Truss</td>
</tr>
<tr>
<td></td>
<td>Reaction</td>
</tr>
<tr>
<td>Red-L™ and Red-W™</td>
<td>2,190 lbs</td>
</tr>
<tr>
<td>Red-S™</td>
<td>4,170 lbs</td>
</tr>
<tr>
<td>Red-M™</td>
<td>3,540 lbs</td>
</tr>
<tr>
<td>Red-H™</td>
<td>9,640 lbs</td>
</tr>
</tbody>
</table>

52 Loads on Cantilever

Inverted bearing clip may be required to transmit load directly to pin.

53 Non-Bearing Partitions

Perpendicular to Truss

Clip attached to truss only
Required clearance equal to deflection

Parallel to Truss

Fasten ledger to load transfer blocks as specified by RedBuilt.
Spacing requirements for load transfer blocks vary per design. May not be required at every panel.
Diagonal bracing may be required to prevent truss rotation.

Truss depth, design load, and web angle may limit header size. Check feasibility with your local RedBuilt technical representative.
### Open-Web Truss Bearing Clip Capacities

#### Single- and Double-Chord Bearing Clip Capacities

<table>
<thead>
<tr>
<th>Truss Series</th>
<th>Clip Type</th>
<th>Detail Number</th>
<th>Bearing Location (Top or Bottom)</th>
<th>Bearing Length (min.)</th>
<th>Reaction Capacity (lbs) at 160%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red-L</td>
<td>6&quot; No-Notch</td>
<td>2 T</td>
<td>1¾&quot;</td>
<td>10d x 1½” (Common)</td>
<td>315 655 595 835 1,120</td>
</tr>
<tr>
<td></td>
<td>6&quot; No-Notch</td>
<td>2 B</td>
<td>2¾&quot;</td>
<td>16d x 3¾” (Common)</td>
<td>515 990 975 990 990</td>
</tr>
<tr>
<td></td>
<td>U-Clip</td>
<td>3 B</td>
<td>2¾&quot;</td>
<td>SD9 x 1½” (SD9 x 2½”)</td>
<td>1,200 2,090 2,090 2,090 2,090</td>
</tr>
<tr>
<td>Red-W</td>
<td>6&quot; No-Notch</td>
<td>2 T</td>
<td>1¾&quot;</td>
<td>16d x 4½” (Common)</td>
<td>1,200 2,310 2,310 2,310 2,310</td>
</tr>
<tr>
<td></td>
<td>U-Clip</td>
<td>3 B</td>
<td>2¾&quot;</td>
<td>16d x 3½” (Common)</td>
<td>1,570 3,000 3,000 3,000 3,000</td>
</tr>
<tr>
<td>Red-S</td>
<td>S-Clip</td>
<td>22 B</td>
<td>2¾&quot;</td>
<td>16d x 3½” (Common)</td>
<td>1,200 2,090 2,090 2,090 2,090</td>
</tr>
<tr>
<td></td>
<td>U-Clip</td>
<td>3 B</td>
<td>3½&quot;</td>
<td>16d x 3½” (Common)</td>
<td>1,200 2,310 2,310 2,310 2,310</td>
</tr>
<tr>
<td>Red-M</td>
<td>Z-Clip(1)</td>
<td>39 B</td>
<td>2¼&quot;</td>
<td>16d x 3½” (Common)</td>
<td>1,200 2,310 2,310 2,310 2,310</td>
</tr>
<tr>
<td></td>
<td>P-Clip</td>
<td>40 B</td>
<td>4½&quot;</td>
<td>16d x 3½” (Common)</td>
<td>1,570 3,000 3,000 3,000 3,000</td>
</tr>
<tr>
<td>Red-H</td>
<td>Z-Clip(1)</td>
<td>39 B</td>
<td>3½&quot;</td>
<td>16d x 3½” (Common)</td>
<td>1,200 2,090 2,090 2,090 2,090</td>
</tr>
<tr>
<td></td>
<td>P-Clip</td>
<td>40 B</td>
<td>3½&quot;</td>
<td>16d x 3½” (Common)</td>
<td>1,570 3,000 3,000 3,000 3,000</td>
</tr>
</tbody>
</table>

### Single- and Double-Chord Flush-Mount Bearing Clip Capacities

<table>
<thead>
<tr>
<th>Truss Series</th>
<th>Clip Type</th>
<th>Detail Number</th>
<th>Bearing Location (Top or Bottom)</th>
<th>Bearing Length (min.)</th>
<th>Fastener Quantity</th>
<th>Capacities (lbs) at 160%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red-L</td>
<td>No-Notch(1)</td>
<td>2 Top</td>
<td>1¾&quot;</td>
<td>10d x 1½&quot; (Common)</td>
<td>315 655 595 835 1,120</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flush-Mount</td>
<td>4 Top</td>
<td>1¾&quot;</td>
<td>16d x 3¾&quot; (Common)</td>
<td>515 990 975 990 990</td>
<td></td>
</tr>
<tr>
<td></td>
<td>U-Clip</td>
<td>3 Bottom</td>
<td>2¾&quot;</td>
<td>16d x 3¾&quot; (Common)</td>
<td>1,200 2,090 2,090 2,090 2,090</td>
<td></td>
</tr>
<tr>
<td>Red-W</td>
<td>No-Notch(1)</td>
<td>2 Top</td>
<td>1¾&quot;</td>
<td>16d x 4½” (Common)</td>
<td>1,200 2,310 2,310 2,310 2,310</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flush-Mount</td>
<td>4 Top</td>
<td>1¾&quot;</td>
<td>16d x 3½” (Common)</td>
<td>1,570 3,000 3,000 3,000 3,000</td>
<td></td>
</tr>
<tr>
<td>Red-S</td>
<td>S-Clip</td>
<td>22 Top</td>
<td>2¼&quot;</td>
<td>16d x 3½” (Common)</td>
<td>1,200 2,090 2,090 2,090 2,090</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Angle Clip</td>
<td>23 Bottom</td>
<td>3½&quot;</td>
<td>16d x 3½” (Common)</td>
<td>1,570 3,000 3,000 3,000 3,000</td>
<td></td>
</tr>
<tr>
<td>Red-M</td>
<td>Z-Clip(1)</td>
<td>39 Top</td>
<td>2¾&quot;</td>
<td>16d x 3½” (Common)</td>
<td>1,200 2,310 2,310 2,310 2,310</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-Clip</td>
<td>40 Top</td>
<td>4½&quot;</td>
<td>16d x 3½” (Common)</td>
<td>1,570 3,000 3,000 3,000 3,000</td>
<td></td>
</tr>
<tr>
<td>Red-H</td>
<td>Z-Clip(1)</td>
<td>39 Top</td>
<td>3½&quot;</td>
<td>16d x 3½” (Common)</td>
<td>1,200 2,090 2,090 2,090 2,090</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-Clip</td>
<td>40 Top</td>
<td>3½&quot;</td>
<td>16d x 3½” (Common)</td>
<td>1,570 3,000 3,000 3,000 3,000</td>
<td></td>
</tr>
</tbody>
</table>

(1) Increased bearing length is required when truss slope meets or exceeds ¼:12.
(2) Sloped applications may require longer bearing lengths.
(3) Use a Douglas fir bearing plate (or equivalent).
- Values are based on bearing plate material (with $f_{c,⊥} = 405$ psi, $SG = 0.42$) unless noted with (3).

* A maximum overhang of ¼” is allowed for all flush-mount bearing clips for published design loads.
54 Top Chord Bearing

Inside face of support

Centerline of bearing clip

A

B

C

D

E

55 Bottom Chord Bearing

Metal cross bracing is required for installation (see page 30); additional blocking is required to transfer diaphragm forces.

Inside face of support

Centerline of bearing clip

A

B

C

D

E

56 Bottom Chord Bearing without Vertical Web

Inside face of support

Centerline of bearing clip

A

B

C

D

E

57 Bottom Chord Cantilever

Metal cross bracing is required for installation (see page 30); additional blocking is required to transfer diaphragm forces.

Inside face of support

Centerline of bearing clip

A

B

C

D

E

When possible, locate bottom chord bearing clip at centerline of support

Dimensions for Detailing

<table>
<thead>
<tr>
<th>Truss Series</th>
<th>Bearing Clip</th>
<th>Top Chord Bearing(1)</th>
<th>Bottom Chord Bearing(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>Red-W™</td>
<td>9&quot;</td>
<td>9&quot;</td>
<td>2½&quot;</td>
</tr>
<tr>
<td>Red-S™</td>
<td>1½&quot;</td>
<td>1½&quot;</td>
<td>2¼&quot;</td>
</tr>
<tr>
<td>Angle Clip</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Red-M™</td>
<td>1½&quot;</td>
<td>1½&quot;</td>
<td>3½&quot;</td>
</tr>
<tr>
<td>Angle Clip</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>P-Clip</td>
<td>1½&quot;</td>
<td>1½&quot;</td>
<td>3½&quot;</td>
</tr>
<tr>
<td>Z-Clip</td>
<td>1½&quot;</td>
<td>1½&quot;</td>
<td>3½&quot;</td>
</tr>
<tr>
<td>T-Clip</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Red-H™</td>
<td>1½&quot;</td>
<td>2½&quot;</td>
<td>4½&quot;</td>
</tr>
<tr>
<td>Z-Clip</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>T-Clip</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

(1) Minimum support width equals A + B (2 x A at bottom chord cantilever).
(2) Actual pin to end distance is based on forces in truss chord. Minimum cut-off may not be acceptable.
(3) Based on 2012 NDS® minimum end distance of 3.5D.
(4) P-Clip geometry is dependent on the starter web angle and top chord slope.

Legend

A = Face of support to centerline of bearing clip
B = Centerline of bearing clip to end of chord
C = Pin to end of chord
D = Bearing clip height
E = Pin to end of chord with vertical web
# WIND OR SEISMIC CONNECTIONS

## Wall and Strap Ties for Open-Web Trusses

Listed below is a small sample of the various nail-based straps and ties offered by Simpson Strong-Tie® Company Inc. Please consult their catalog or the USP Structural Connectors® catalog for additional options.

### Strap Tension Tie Nailing and Allowable Tension Loads

<table>
<thead>
<tr>
<th>Design Category</th>
<th>Maximum Ledger Size</th>
<th>Model No.</th>
<th>Non-Cracked Concrete</th>
<th>Cracked Concrete</th>
<th>CMU Wall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind and SDC A–B</td>
<td>4x</td>
<td>PAI18(1)</td>
<td>9 10d x 1½&quot; 1,820 10d x 1½&quot; 1,820 10d x 1½&quot; 1,055</td>
<td>9 10d x 1½&quot; 1,820 10d x 1½&quot; 1,820 10d x 1½&quot; 1,055</td>
<td>9 10d x 1½&quot; 1,820 10d x 1½&quot; 1,820 10d x 1½&quot; 1,055</td>
</tr>
<tr>
<td>SDC C–F</td>
<td>4x</td>
<td>PAI23(1)</td>
<td>14 10d x 1½&quot; 2,830 14 10d x 1½&quot; 2,830 14 10d x 1½&quot; 1,805</td>
<td>14 10d x 1½&quot; 2,830 14 10d x 1½&quot; 2,830 14 10d x 1½&quot; 1,805</td>
<td>14 10d x 1½&quot; 2,830 14 10d x 1½&quot; 2,830 14 10d x 1½&quot; 1,805</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PAI28(1)</td>
<td>16 10d x 1½&quot; 3,370 16 10d x 1½&quot; 3,370 16 10d x 1½&quot; 2,705</td>
<td>16 10d x 1½&quot; 3,370 16 10d x 1½&quot; 3,370 16 10d x 1½&quot; 2,705</td>
<td>16 10d x 1½&quot; 3,370 16 10d x 1½&quot; 3,370 16 10d x 1½&quot; 2,705</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PAI35(1)</td>
<td>18 10d x 1½&quot; 2,335 – – –</td>
<td>18 10d x 1½&quot; 2,335 – – –</td>
<td>18 10d x 1½&quot; 2,335 – – –</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MPAI32</td>
<td>16 10d x 1½&quot; 2,865 – – –</td>
<td>16 10d x 1½&quot; 2,865 – – –</td>
<td>16 10d x 1½&quot; 2,865 – – –</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MPAI44</td>
<td>24 10d x 1½&quot; 2,865 – – –</td>
<td>24 10d x 1½&quot; 2,865 – – –</td>
<td>24 10d x 1½&quot; 2,865 – – –</td>
</tr>
</tbody>
</table>

(1) LSL cap plate required for strap nailing.
* Table information adapted from Simpson Strong-Tie® catalog Wood Construction Connectors 2017–2018, page 89.
* For applicable notes and additional information, see the Simpson Strong-Tie catalog.

### Bolted Wall Ties

<table>
<thead>
<tr>
<th>Simpson Tie</th>
<th>Required Fasteners</th>
<th>Allowable Tension Load (lbs) at 160%</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTT19</td>
<td>10d x 1½&quot; Nails</td>
<td>1,310</td>
</tr>
<tr>
<td>LTT20B(2)</td>
<td>16d x 2½&quot; Nails</td>
<td>1,355</td>
</tr>
<tr>
<td>LTT31</td>
<td>16d x 2½&quot; Nails</td>
<td>1,350</td>
</tr>
<tr>
<td>HTT4(1)</td>
<td>16d x 1½&quot; Nails</td>
<td>3,610 4,235 4,455</td>
</tr>
<tr>
<td>HTT5(1)</td>
<td>16d x 1½&quot; Nails</td>
<td>4,350 5,090 4,555</td>
</tr>
<tr>
<td>HTT5KT(1)</td>
<td>16d x 1½&quot; Nails</td>
<td>5,445</td>
</tr>
<tr>
<td>HTT5-¾(1)</td>
<td>16d x 1½&quot; Nails</td>
<td>4,065 5,090 4,830</td>
</tr>
</tbody>
</table>

(1) LSL cap plate required for strap nailing.
* For applicable notes and additional information, see the Simpson Strong-Tie catalog.

### Strap Ties

<table>
<thead>
<tr>
<th>Simpson Tie</th>
<th>Required Nails</th>
<th>Nail Size</th>
<th>Allowable Load (lbs) at 160%</th>
</tr>
</thead>
<tbody>
<tr>
<td>MST37(1)(2)</td>
<td>42</td>
<td>16d x 1½&quot;</td>
<td>5,080</td>
</tr>
<tr>
<td>MST48(1)(2)</td>
<td>50</td>
<td>16d x 1½&quot;</td>
<td>5,310</td>
</tr>
<tr>
<td>MST148(1)</td>
<td>48</td>
<td>10d x 1½&quot;</td>
<td>5,065</td>
</tr>
<tr>
<td>MST160(1)</td>
<td>60</td>
<td>10d x 1½&quot;</td>
<td>5,080</td>
</tr>
<tr>
<td>MST172(1)</td>
<td>72</td>
<td>10d x 1½&quot;</td>
<td>5,080</td>
</tr>
<tr>
<td>LSTI49</td>
<td>32</td>
<td>10d x 1½&quot;</td>
<td>2,975</td>
</tr>
<tr>
<td>LSTI73</td>
<td>48</td>
<td>10d x 1½&quot;</td>
<td>4,205</td>
</tr>
<tr>
<td>LSTA36(1)</td>
<td>24</td>
<td>10d x 3&quot;</td>
<td>1,640</td>
</tr>
<tr>
<td>MSTA36(1)</td>
<td>26</td>
<td>10d x 3&quot;</td>
<td>2,050</td>
</tr>
</tbody>
</table>

(1) LSL cap plate required for strap nailing.
(2) Not suitable for Red-S™ trusses.
* Values consider full strap nailing.
* Table information adapted from Simpson Strong-Tie® catalog Wood Construction Connectors 2017–2018, pages 301–304.

### Bolted Wall Ties

<table>
<thead>
<tr>
<th>Simpson Tie</th>
<th>Required Fasteners</th>
<th>Allowable Tension Load (lbs) at 160%</th>
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</thead>
<tbody>
<tr>
<td>LTT19</td>
<td>10d x 1½&quot; Nails</td>
<td>1,310</td>
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<tr>
<td>LTT20B(2)</td>
<td>16d x 2½&quot; Nails</td>
<td>1,355</td>
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<td>LTT31</td>
<td>16d x 2½&quot; Nails</td>
<td>1,350</td>
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<td>HTT4(1)</td>
<td>16d x 1½&quot; Nails</td>
<td>3,610 4,235 4,455</td>
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<td>HTT5(1)</td>
<td>16d x 1½&quot; Nails</td>
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<td>HTT5KT(1)</td>
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<td>HTT5-¾(1)</td>
<td>16d x 1½&quot; Nails</td>
<td>4,065 5,090 4,830</td>
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</tbody>
</table>

(1) LSL cap plate required for strap nailing.
* For applicable notes and additional information, see the Simpson Strong-Tie catalog.


---

**Wall or strap ties as required**

**Masonry or concrete wall**

---

**DO NOT attach bottom chord to wall when using any top chord bearing truss**

---

Also see detail 6 on page 13 for more information.
Truss bottom chord bracing may be required by building code provisions for wind uplift design when roof trusses do not have directly applied ceilings. Project engineer shall specify wind load; contact your RedBuilt representative for specific wind bracing stability requirements.

60 **Cross Bracing with 2x4 Nailer**

Metal cross bracing by RedBuilt (see plan for locations). Attach bracing as trusses are installed.

2x4 nailer by others. Attach to truss bottom chord with two 10d x 3” nails minimum. Splice nailer together with three 10d x 3” nails each side through 2x4 x 24” block (1’ on either side of splice).


61 **Cross Bracing with Bridging Row**

Metal cross bracing by RedBuilt (see plan for locations). Attach bracing as trusses are installed.

*For wind bracing on Red-L™ and Red-W™ trusses. Cross bracing may not actually cross.*
65 Red-L™ and Red-W™ Trusses with Shear Block

3 1/4" x 3 1/4" x 15" shear block (attached by RedBuilt)

HD5B connected with two 3/4" bolts each side (by RedBuilt)

Lead and rod hardware by others

The Design Professional of Record is responsible for the rod-to-holdown and concrete/cmu connection design.

Maximum truss assembly tension capacity is 3,500 lbs at 160%. Truss geometry, especially at shallow depths, may limit capacity. Contact your RedBuilt technical representative for more information.

66 Red-L™, Red-W™, and Red-S™ Trusses with Steel Connector

1 1/8" x 3 1/8" LSL each side (attached by RedBuilt)

Pre-manufactured steel connectors (attached by RedBuilt)

Rod and rod hardware by others

The Design Professional of Record is responsible for the rod-to-holdown and concrete/cmu connection design.

Maximum truss assembly tension capacity is 4,770 lbs for Red-L™ and Red-W™ trusses; and 7,120 lbs for Red-S™ trusses at 160%. Truss geometry may limit capacity. Contact your RedBuilt technical representative for more information.

67 Red-M™ Truss with Wall Tie

HD3B (by others) each side of chord, connected with two 5/8" through bolts. Truss chord, filler, and filler holes to be field-drilled by others.

Maximum truss assembly tension capacity is 4,320 lbs with MSR chords and 4,770 lbs with RedLam™ LVL chords at 160%. Truss geometry may limit capacity. Contact your RedBuilt technical representative for more information.

68 Red-H™ Truss with Wall Tie

HD5B (by others) each side of chord, connected with two 3/4" through bolts. Truss chord, filler, and filler holes to be field-drilled by others.

Maximum truss assembly tension capacity is 5,180 lbs with MSR chords and 7,120 lbs with RedLam™ LVL chords at 160%. Truss geometry may limit capacity. Contact your RedBuilt technical representative for more information.

69 Red-W™ Truss Top Chord Bearing

Lateral No-Notch Clip

Bend tab over plate as required

Clip extension; fill all nail holes over plate.

Maximum truss assembly tension capacity is 3,500 lbs at 160%. Truss geometry, especially at shallow depths, may limit capacity. Contact your RedBuilt technical representative for more information.

69A Red-L™ and Red-W™ Truss

Standard No-Notch Clip (Alternate)

Fasteners into chord cut-off (pre-drilling recommended)

2x8 plate

See TB-100 Lateral Capacity of Open-Web Truss Bearing Clips for allowable load and additional information.
70 RedBuilt™ Open-Web Truss with Cap Plate

Cap plates provide the following functions:

- Transfer seismic/wind strap loads (LSL cap plate only).
- Enhance diaphragm nailing capabilities.
- Provide diaphragm shear transfer at continuous panel joints (required at all high shear diaphragms).
- Eliminate interference between subpurlins and truss pins in panelized roof systems.
- Required to provide adequate attachment base for structural insulated panels (SIPs) or Tectum deck applications.

71 Double Chord Open-Web Truss with SIP or Tectum Panels

Fastener larger than conventional nails

2x cap plate

When uplift on cap plate-to-truss connection exceeds 104 plf, contact your RedBuilt representative

72 Typical Double Chord Open-Web Truss with 2x_ Subpurlin

1½" x 3½" MSR or LSL cap plate (LSL adds strap capacity)

2x4 subpurlin, typical

Space subpurlins to avoid interference with pins

73 Double Chord Open-Web Truss with Continuous Panel Joint

Continuous panel joint

Option: Sheathing cap plate can serve as continuous joint nailer

Nail spacing is limited by truss chords. See page 36.
**Bridging**

Bridging is used to make each truss act with those next to it (load sharing) and minimize or equalize deflections from non-uniform loads. Bridging should not be confused with bracing, which has a different purpose.

**Roof Systems** usually do not require bridging because differential deflections, vibrations, etc. are typically not a problem with roof systems. However, bridging is required for load sharing with Red-L™ and Red-W™ trusses because they have single-member chords and are commonly used in relatively long spans with wide on-center spacing.

**Floor Systems** perform better under typical loads—particularly with regard to deflection and vibration—if they have an effective bridging system.

---

### Red-L™ and Red-W™ Trusses

Bridging is required for all floor and roof applications.

#### Lap approximately 12"

- **Five 16d (3½”) nails**
- **Bridging clip supplied and installed by RedBuilt**
- **1½” nails by RedBuilt**

2x bridging is designed to transfer a 500 lb load. Field bend bridging clip approximately 30 degrees before nailing to bridging row.

---

#### Bridging Rows

<table>
<thead>
<tr>
<th>Truss Bridging</th>
<th>Span</th>
<th>No. of Rows</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Roof Truss Bridging(1)</strong></td>
<td>≤ 16’</td>
<td>1</td>
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<tr>
<td></td>
<td>&gt; 16’ to 35’</td>
<td>2</td>
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<td>&gt; 35’ to 55’</td>
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<td>&gt; 55’</td>
<td>4</td>
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<tr>
<td><strong>Floor Truss Bridging(2) Without a Directly Applied Ceiling</strong></td>
<td>≤ 10’</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>&gt; 10’ to 24’</td>
<td>2</td>
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<tr>
<td></td>
<td>&gt; 24’ to 32’</td>
<td>3</td>
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<tr>
<td></td>
<td>&gt; 32’</td>
<td>4</td>
</tr>
<tr>
<td><strong>Floor Truss Bridging(2) With a Directly Applied Ceiling</strong></td>
<td>≤ 22’</td>
<td>1</td>
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<tr>
<td></td>
<td>&gt; 22’ to 32’</td>
<td>2</td>
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<td></td>
<td>&gt; 32’ to 42’</td>
<td>3</td>
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<tr>
<td></td>
<td>&gt; 42’</td>
<td>4</td>
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</tbody>
</table>

(1) Additional bracing may be required when trusses are to be installed out of plumb greater than ¼”. Contact your RedBuilt representative.

(2) Bridging is required in cantilevers when the length of cantilever exceeds three times the truss depth.

---

#### Sawn Lumber Bridging

**Floor or Roof**

<table>
<thead>
<tr>
<th>Maximum On-Center Truss Spacing</th>
<th>Minimum Size of Continuous Bridging Member</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Doug Fir #2</td>
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<tr>
<td>16”</td>
<td>2x4</td>
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<td>19 2/3”</td>
<td>2x6</td>
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<tr>
<td>24”</td>
<td>2x6</td>
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<tr>
<td>32”</td>
<td>2x6</td>
</tr>
<tr>
<td>48” (Floor/ Roof)</td>
<td>2x8 / 2x8</td>
</tr>
</tbody>
</table>

---

### Red-S™, Red-M™, and Red-H™ Trusses

**Roof:** Bridging not required, except for long-span modular-installation applications. See page 32.

**Floor:** Bridging required at 12’ on-center maximum. See Sawn Lumber Bridging table above for bridging sizes.

---

#### 74 Red-S™ Trusses

Bridging with 12” lap splices

Five 16d (3½”) nails

Bridging clip supplied and installed by RedBuilt

Field bend the bridging clip approximately 30 degrees before nailing to the bridging row

---

#### 75 Red-M™ and Red-H™ Trusses

Bridging with 12” lap splices

Five 16d (3½”) nails

Bridging clip supplied and installed by RedBuilt
### Installation Info.

**Allowable Duct Sizes**

**Rectangular Ducts**
- Duct size may not apply near bearings. Consult your RedBuilt representative in these cases.

### Red-L™ and Red-W™ Trusses

<table>
<thead>
<tr>
<th>Truss Depth</th>
<th>Round Duct Size</th>
<th>Rectangular Duct Height</th>
<th>Rectangular Width</th>
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### Red-S™ Trusses

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### Red-M™ Trusses

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### Red-H™ Trusses

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<td>19&quot; 18&quot; 17&quot; 16&quot;</td>
<td>6&quot;</td>
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</tbody>
</table>

**General Notes**

- Widths shown are the minimum allowable openings based on heaviest loads (shortest panels). Check with your RedBuilt representative for more precise sizing, including larger openings.
- Tables are applicable only for uniform loads.

For trusses designed for office floor conditions requiring concentrated loads, or for any other non-uniform loads, contact your RedBuilt representative.
Open-web trusses require installation bracing to prevent lateral buckling of the chord members until they are stabilized by connection to the sheathing and by permanent bracing of the completed structure (as designed). Installation bracing includes strut bracing rows, cross bracing at bottom chord bearing conditions, bottom chord restraint, and braced end wall or diaphragm restraint adequate to support the strut bracing rows. The criteria used for this installation bracing assume either of the following conditions:

- The truss carries its own weight plus the weight of applied sheathing and two 250-pound workers concentrated at 1/3 points of the span;
- An unloaded truss with a 30 mph wind

Bracing for construction loads equivalent to or beyond these loads is the responsibility of the installer. Bracing must be installed as each truss is put in position.

All trusses are laterally unstable until properly braced. The longer the span, the more care is required. Adequate restraint is necessary at all stages of construction.

Complete stability is not achieved until all bracing and decking is completely installed and properly fastened.

Installation bracing and procedures, as well as the safety of the workers, are the responsibility of the installer.

For more information, see RedBuilt’s Open-Web Truss Installation Guide (available online at redbuilt.com).

**Typical Application**

![Diagram of typical application](image)

- Bottom chord restraint at midspan for double chord trusses at spans over 40'
- Laterally braced end wall, beam, or ledger
- 2x4 starter strut (by others)
- Cross bracing at bottom bearing
- Strut bracing row spacing. See page 31.
- Bottom chord restraint at midspan for double chord trusses at spans over 40'
- No connection (unless otherwise noted)
- Cross bracing by RedBuilt

**General Notes**

- Bottom chord restraints are 1x4 (minimum) nailers and are attached to the top of the bottom chord with two 8d (2 1/2") nails for double chord trusses only. Materials are to be provided by the installer.
- Bridging, when specified, may be used instead of bottom chord restraint.

**Permitted Installation Tolerances**

**Truss Chord Alignment Tolerance**

- Maximum 1/2"

  To provide proper performance, trusses should not vary more than 1/2" from a straight line.

**Vertical Alignment Tolerance**

- Bottom chord of truss should not be out of square with deck by more than 1/4:12 of truss depth. Example: 1/4" for a 24" depth truss.

**Overhang Tolerance at Bearing**

- (Red-S™ bearing shown)

  - 1/4" maximum overhang for all truss-bearing hardware

  (1) 1/2" maximum overhang for Red-M™ series trusses with Z-Clip or P-Clip bearing hardware

**Cross Bracing**

- Cross bracing by RedBuilt

Cross bracing is provided for all open-web trusses at bottom chord bearing conditions. Install cross bracing as each truss is set. Maximum lateral load is 500 lbs per truss.
Strut Bracing

Installation bracing is required for all open-web truss applications. RedBuilt’s recommended method for bracing is to use the strut bracing supplied by RedBuilt. Strut bracing rows should be spaced equally, per the on-center spacing noted in the Required Spacing table below. On roof systems, strut bracing is attached to the top of upper chord members. On floor systems it is attached to the bottom of the upper chord members to avoid interference with the direct attachment of sheathing. See detail below.

### Bottom Chord Restraint for Red-S™, Red-M™, and Red-H™ Trusses

- **Bottom chord restraint is required to stabilize the bottom chord and is typically provided by the installer.**
- **Bracing may be required at cantilevers as determined by RedBuilt.**

### Required Spacing

<table>
<thead>
<tr>
<th>Truss Series</th>
<th>Strut Bracing Row Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red-S™</td>
<td>10’ o.c.</td>
</tr>
<tr>
<td>Red-W™</td>
<td>14’ o.c.</td>
</tr>
</tbody>
</table>

### General Notes

- Installation bracing is required, strut bracing is supplied by RedBuilt. See spacing and sheathing requirements above.
- Sheath and nail per project architect, engineer, or local building code. See page 36 for allowable nailing into truss chords.

---

**Maximum Number of Erected Trusses Before Sheathing is Required**

<table>
<thead>
<tr>
<th>Truss Series</th>
<th>Span</th>
<th>&lt; 30’</th>
<th>&lt; 40’</th>
<th>&lt; 50’</th>
<th>&lt; 60’</th>
<th>&lt; 70’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red-L™</td>
<td></td>
<td>40</td>
<td>27</td>
<td>21</td>
<td>17</td>
<td>14</td>
</tr>
<tr>
<td>Red-W™</td>
<td></td>
<td>40</td>
<td>27</td>
<td>21</td>
<td>17</td>
<td>14</td>
</tr>
<tr>
<td>Red-S™</td>
<td></td>
<td>29</td>
<td>20</td>
<td>15</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Red-M™</td>
<td></td>
<td>20</td>
<td>14</td>
<td>11</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Red-H™</td>
<td></td>
<td>14</td>
<td>9</td>
<td>7</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

* Per bay of trusses.

---

**Starting Bracing—No Laterally Braced End Wall or Beam**

Middle of Bay

- Bridging or nailers as shown by RedBuilt

End of Bay

- Nailer required at midspan for spans beyond 40’-0”.
- Bridging may serve in place of nailers. See bridging information on page 28.

---

**General Notes**

- Bottom chord restraint is required to stabilize the bottom chord and is typically provided by the installer.
- **Bracing may be required at cantilevers as determined by RedBuilt.**
Long Spans (Over 70 Feet)

RedBuilt™ open-web trusses with spans over 70 feet are available only if all of the following additional requirements are satisfied. Review each of these requirements with your RedBuilt representative prior to sizing and detailing our products in any application involving spans beyond 70 feet.

1. There must be a responsible architect and/or engineer of record throughout the design and construction period of the project.

2. The responsible architect or engineer must include the following statement in the job specifications:

   “The trusses shall be installed in rigid modules at least 8 feet in width, accurately assembled in a jig with final sheathing permanently and totally attached while on the ground. Specified bridging shall be installed in each module as detailed.”

3. Only structural panel sheathing will be permitted.

4. The purchaser-contractor must sign an addendum to our standard purchase agreement that contains the above requirements.

5. Prior to execution of the purchase agreement, the specifications and details of the job must be submitted to and reviewed by RedBuilt engineering along with a description of the installation procedures proposed to be used. Review will be solely with respect to the above requirements.

The sketches shown at right show possible rigid modules that would satisfy the condition specified in requirement 2 above.
MATERIAL WEIGHTS

Refer to local building codes for live load design requirements.

Composition Roofing
- 2-15 and 1-90 lb .......................................................... 1.7 psf
- 3-15 and 1-90 lb .......................................................... 2.2 psf
- 3-ply and gravel .......................................................... 5.6 psf
- 4-ply and gravel .......................................................... 6.0 psf
- 5-ply and gravel .......................................................... 6.5 psf
- Insulated Roof Membrane Assembly (IRMA) 2” thick ................. 13.0 psf
- Single-ply roofs (insulation not included)
  - Ballasted system ....................................................... 13.0 psf
  - Mechanically fastened ................................................ 2.0 psf
  - Fully adhered .......................................................... 2.0 psf

Douglas Fir Sheathing*
(Based on 36 pcf for plywood, 40 pcf for OSB)
- ½” plywood .................................................................. 1.5 psf
- ¾” plywood .................................................................. 1.8 psf
- 1” plywood .................................................................. 2.3 psf
- 1¼” plywood ................................................................ 3.4 psf
- ½” OSB ....................................................................... 1.7 psf
- ¾” OSB ....................................................................... 2.0 psf
- 1” OSB ....................................................................... 2.9 psf
- 1¼” OSB .................................................................... 3.7 psf
* For southern pine weights, increase Douglas fir weights by 10%.

Miscellaneous Roofing Materials
- Corrugated galvanized steel
  - 16 ga ................................................................. 2.9 psf
  - 20 ga ................................................................. 1.8 psf
  - 22 ga ................................................................. 1.5 psf
  - 24 ga ................................................................. 1.3 psf
- Asphalt shingles ......................................................... 2.5 psf
- Wood shingles .......................................................... 3.0 psf
- Clay tile ..................................................................... 9.0 to 14.0 psf
- Slate (3/4” thick) ....................................................... 15.0 psf

Rigid Insulation (1” thick)
- Hemlock ................................................................. 1.2 psf
- Cork .................................................................... 0.7 psf
- Gold bond ............................................................... 1.5 psf
- Polystyrene foam .................................................... 0.2 psf
- Foamglass ............................................................... 0.8 psf
- Rigid fiberglass ...................................................... 1.5 psf

Roll or Batt Insulation (1” thick)
- Rock wool .............................................................. 0.2 psf
- Glass wool .............................................................. 0.1 psf

Floors
- Hardwood (nominal 1") ............................................. 4.0 psf
- Concrete (1” thick)
  - Regular ............................................................... 12.0 psf
  - Lightweight ......................................................... 8.0 to 10.0 psf
- Gypsum concrete (¾” thick) ...................................... 6.5 psf
- Sheet vinyl ............................................................. 0.5 psf
- Carpet and pad ...................................................... 1.0 psf
- ¾” ceramic or quarry tile ......................................... 10.0 psf

Ceilings
- Acoustical fiber tile .................................................. 1.0 psf
- ½” gypsum board .................................................... 2.2 psf
- ¾” gypsum board .................................................... 2.8 psf
- Plaster (1” thick) ...................................................... 8.0 psf
- Metal suspension system (including tile) ................. 1.8 psf

To calculate total dead load, use a minimum of 1.5 psf for “miscellaneous” with all dead loads.

Weights of Douglas Fir Framing Members

<table>
<thead>
<tr>
<th>Nominal Size (in.)</th>
<th>12”</th>
<th>16”</th>
<th>24”</th>
</tr>
</thead>
<tbody>
<tr>
<td>2x4</td>
<td>1.4 psf</td>
<td>1.1 psf</td>
<td>0.7 psf</td>
</tr>
<tr>
<td>2x6</td>
<td>2.2 psf</td>
<td>1.7 psf</td>
<td>1.1 psf</td>
</tr>
<tr>
<td>2x8</td>
<td>2.9 psf</td>
<td>2.2 psf</td>
<td>1.5 psf</td>
</tr>
<tr>
<td>2x10</td>
<td>3.7 psf</td>
<td>2.8 psf</td>
<td>1.9 psf</td>
</tr>
<tr>
<td>2x12</td>
<td>4.4 psf</td>
<td>3.3 psf</td>
<td>2.2 psf</td>
</tr>
<tr>
<td>3x6</td>
<td>3.6 psf</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4x6</td>
<td>5.0 psf</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4x8</td>
<td>6.8 psf</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4x10</td>
<td>8.6 psf</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4x12</td>
<td>10.4 psf</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
* For southern pine weights, increase Douglas fir weights by 10%.

Weights of Sprinkler Lines

<table>
<thead>
<tr>
<th>Size of Pipe</th>
<th>Schedule 40, Standard Pipe (Dry/pcf)</th>
<th>Schedule 10, Thin Wall Pipe (Dry/pcf)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dry (pcf)</td>
<td>Wet (pcf)</td>
</tr>
<tr>
<td>1”</td>
<td>1.7</td>
<td>2.1</td>
</tr>
<tr>
<td>1½”</td>
<td>2.3</td>
<td>3.0</td>
</tr>
<tr>
<td>2”</td>
<td>3.7</td>
<td>5.2</td>
</tr>
<tr>
<td>2½”</td>
<td>5.8</td>
<td>7.9</td>
</tr>
<tr>
<td>3”</td>
<td>7.6</td>
<td>10.8</td>
</tr>
<tr>
<td>3½”</td>
<td>9.2</td>
<td>13.5</td>
</tr>
<tr>
<td>4”</td>
<td>10.9</td>
<td>16.4</td>
</tr>
<tr>
<td>5”</td>
<td>14.8</td>
<td>23.5</td>
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<td>6”</td>
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<tr>
<td>8”</td>
<td>28.6</td>
<td>50.8</td>
</tr>
<tr>
<td>10”</td>
<td>40.5</td>
<td>74.6</td>
</tr>
</tbody>
</table>

Approximate Weights of RedBuilt™ Products

<table>
<thead>
<tr>
<th>Trusses</th>
<th>Series</th>
<th>PLF Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red-L™</td>
<td>3.75-4.25</td>
<td></td>
</tr>
<tr>
<td>Red-W™</td>
<td>4.50-5.25</td>
<td></td>
</tr>
<tr>
<td>Red-S™</td>
<td>4.75-5.75</td>
<td></td>
</tr>
<tr>
<td>Red-M™</td>
<td>8.00-9.00</td>
<td></td>
</tr>
<tr>
<td>Red-H™</td>
<td>10.00-12.00</td>
<td></td>
</tr>
<tr>
<td>Red-145™</td>
<td>2.2-3.5</td>
<td></td>
</tr>
<tr>
<td>Red-165™</td>
<td>3.0-5.8</td>
<td></td>
</tr>
<tr>
<td>Red-190™</td>
<td>4.2-6.6</td>
<td></td>
</tr>
<tr>
<td>Red-190H™</td>
<td>4.6-7.1</td>
<td></td>
</tr>
<tr>
<td>Red-190HS™</td>
<td>6.0-9.1</td>
<td></td>
</tr>
</tbody>
</table>

Joists

<table>
<thead>
<tr>
<th>Joists</th>
<th>Series</th>
<th>PLF Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red-L™</td>
<td>42.0</td>
<td></td>
</tr>
</tbody>
</table>

Structural Composite Lumber

<table>
<thead>
<tr>
<th>Series PLF Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0E RedLam™ LVL</td>
</tr>
</tbody>
</table>

* For additional information on sprinkler systems, see RedBuilt's Sprinkler System Installation Guide (available online at redbuilt.com)
**SNOWDRIFT LOADING**

Wind direction, site exposure, and roof type and shape are some of the factors that can dramatically influence the accumulation of snow on a roof structure. ASCE 7 (Minimum Design Loads for Buildings and Other Structures) and the applicable building code, as well as other local state and regional codes, provide guidelines for calculating snowdrift loadings on all types of building construction.

Drifts usually occur at locations of discontinuity in a roof, such as at parapet walls, valleys, or where a high roof meets a low roof. Closer on-center spacing or additional support may be required at these locations.

The examples above illustrate potential snowdrift conditions. The project design professional is responsible for determining any additional loads due to snow drifting.

**TECHNICAL SUPPORT AND ANALYSIS**

**Technical Support Organization and Functions**

RedBuilt has four strategically located Design Centers staffed by professional engineers and designers. Their role is to provide technical support and service to our RedBuilt representatives, the professional design community, and the manufacturing plants. Design Center personnel have access to extensive test data, production standards, building code product acceptance criteria, and the most current computer design software.

The Design Centers work closely with our RedBuilt representatives and can provide the following services:

- Review and analysis of potential applications submitted by our RedBuilt representatives
- Drawings showing placement, bearing conditions, dimensions, and installation suggestions
- Custom design of the product
- Assistance in resolving field problems should they arise

This design guide contains technical data and design information frequently required by the design professional when using our products. Because of the variety of possible conditions, the design professional is strongly encouraged to request support from RedBuilt Design Centers through one of our representatives.

**Product Application Assumptions**

Our warranty is subject to an adequate supporting structure for our products. The design of the entire structure is not the role of RedBuilt, nor can we assume accountability for the full function of the roof or floor system. We can only be responsible for the internal design integrity of our own products, which are structural components of roof and floor systems that are necessarily designed by others.

Our warranty is also subject to continuous lateral support to the compression chord of our products unless specific design provisions account for other lateral support conditions. Continuous lateral support is provided by 8d (2½”) nails at 24” on-center (minimum) for Red-L™ and Red-W™ trusses; and by 8d (2½”) nails at 12” on-center (minimum), staggered, to each of the double chord members for Red-S™, Red-M™, and Red-H™ trusses; all connected to an adequate diaphragm or total lateral strength system.

The magnitude, direction, and location of all design loads are as specified by the building designer. The review of this loading by our personnel is only for purposes of designing our product.

Other application assumptions are referenced on the terms and conditions of our purchase agreement contract.

**Analysis Procedure**

RedBuilt™ open-web trusses are analyzed as pin-connected trusses with continuity in the top chord member, which receives the superimposed loading. Allowable truss-member forces are designated in the product acceptance criteria or derived from material stresses therein. Chord members are analyzed considering both net section at panel points and gross sections between the panels. Allowable web member forces consider gross and net sections, pin bearing and buckling. Pin-connection details consider allowable bearing in the wood for both parallel and perpendicular-to-grain direction. Reaction detail analysis includes allowable bearing, induced moments where applicable, and detail stresses. Stress and deflection are calculated by the displacement method. All of the above is substantiated through continual testing.
RedBuilt Recommended Deflection Criteria

Full-scale tests have shown repeatedly that RedBuilt™ products have deflection characteristics that are consistently predictable by calculation, with minimal set after load withdrawal.

The graph below shows that RedBuilt’s recommended deflection limit for residential and commercial floors is more restrictive than the minimum required by typical building codes. The floor load tables shown on pages 6–11 were developed based on the Commercial Floor Deflection Limit shown in the graph below.

Floors:
- Maximum deflection at live load limited as indicated below
- Movable partition loads need not be considered

Roofs:
- Sloped Roofs—¼” to 12” per foot, maximum deflection L/180 at total load
- Plaster Ceilings—Also check L/360 at live load

Deflection calculations can be closely approximated by standard beam formulas, assuming that the chord members act as the resistance to deflection with the modulus of elasticity (E) of the chords adjusted to allow for the deflection of the webs. Thus, the product of the moment of inertia (I) and the effective modulus of elasticity (E) is as shown in the Truss Rigidity Properties table below.

For uniformly loaded simple spans, the mid-span deflection (in inches) becomes:

\[ \Delta = \frac{22.5wL^4}{EI} \]

Where:
- \( w \) = Uniform load in plf
- \( L \) = Span in feet
- \( d \) = The average pin-to-pin depth of the truss in inches, which is the average depth of the truss minus the following:
  - Red-L™ and Red-W™ trusses …………………….. 1.5 inches
  - Red-S™ trusses …………………………………. 2.3 inches
  - Red-M™ trusses …………………………………. 3.5 inches
  - Red-H™ trusses …………………………………. 5.5 inches

Truss Rigidity Properties

<table>
<thead>
<tr>
<th>Truss Series</th>
<th>EI Truss Only (Roof)</th>
<th>EI Nailed Floor</th>
<th>EI Glue-Nailed Floor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red-L™</td>
<td>5.26 x 10^6d^2</td>
<td>5.69 x 10^6d^2</td>
<td>6.03 x 10^6d^2</td>
</tr>
<tr>
<td>Red-W™</td>
<td>6.78 x 10^6d^2</td>
<td>7.20 x 10^6d^2</td>
<td>7.54 x 10^6d^2</td>
</tr>
<tr>
<td>Red-S™</td>
<td>6.94 x 10^6d^2</td>
<td>7.41 x 10^6d^2</td>
<td>7.79 x 10^6d^2</td>
</tr>
<tr>
<td>Red-M™</td>
<td>10.06 x 10^6d^2</td>
<td>10.60 x 10^6d^2</td>
<td>11.02 x 10^6d^2</td>
</tr>
<tr>
<td>Red-H™</td>
<td>15.93 x 10^6d^2</td>
<td>16.54 x 10^6d^2</td>
<td>17.03 x 10^6d^2</td>
</tr>
</tbody>
</table>

Note: For live load applications greater than 50 psf, check the L/600 deflection limit using a 50 psf live load, and check the code-prescribed deflection limit using the full live load.

Camber Criteria

The manufacture of RedBuilt™ open-web trusses includes the ability to provide a specified camber for appearance. Camber must be considered on an individual job basis, although certain policies derived from successful experiences are indicated. If camber is not specified in the order, our policy and considerations of other related job information will be used by our design department toward its selection.

Although excessive camber in any product may cause problems in framing, it is recommended that these policies be followed closely to avoid the serious problems caused by inadequate camber. In the case of flat roofs, the camber policy will be strictly adhered to unless it is shown that an adequate drainage system is provided to avoid ponding water and the resulting overloads.

Camber selection in structural members should include consideration for matching requirements of adjacent members of different length, as well as cantilevers meeting at a common elevation. In addition, consideration should be given to concentrated loads, non-load bearing walls, and special drainage problems. A RedBuilt representative is available to assist you in developing the camber requirements.
General Design Info.

Sound Assemblies and Noise Measurement

The ability of a wall or floor/ceiling system to reduce airborne sound transmission is measured using ASTM E90, and reported using the ASTM E413 Sound Transmission Class (STC) rating system. The ratings listed below—originally developed by the Acoustical and Insulation Materials Association and now considered a standard throughout the industry—are a practical reference for a range of STC numbers. In general, the higher the number, the better the acoustical performance. It is important to note that this table is valid only for a given level of background noise and should be used only for generalized comparisons.

Floor/ceiling systems can also be rated for impact noise transmitted through an assembly. Ratings are determined using the ASTM E492 Impact Insulation Class (IIC) system, and like STC ratings, a high IIC rating indicates significantly reduced impact noise.

**STC Ratings**

- 25 Normal speech can be understood quite clearly
- 30 Loud speech can be understood fairly well
- 35 Loud speech audible but not intelligible
- 42 Loud speech audible as a murmur
- 45 Must strain to hear loud speech
- 48 Some loud speech barely audible
- 50 Loud speech not audible

**Testing**

The acoustical assemblies provided below on page 37 have been tested and rated by recognized acoustical laboratories, and the ratings shown are well within the acceptable range for multi-family buildings. However, in order to achieve these ratings, precautions should be taken to prevent flanking noise and sound leaks, and to ensure that actual construction conforms to the assembly shown.

**Fire Details**

For Fire Assemblies and other construction-related fire information, please refer to resources on our website at redbuilt.com.

**Sound Assemblies and Noise Measurement**

The ability of a wall or floor/ceiling system to reduce airborne sound transmission is measured using ASTM E90, and reported using the ASTM E413 Sound Transmission Class (STC) rating system. The ratings listed below—originally developed by the Acoustical and Insulation Materials Association and now considered a standard throughout the industry—are a practical reference for a range of STC numbers. In general, the higher the number, the better the acoustical performance. It is important to note that this table is valid only for a given level of background noise and should be used only for generalized comparisons.

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**Minimum Nail Spacing**

<table>
<thead>
<tr>
<th>Nail Type</th>
<th>Nail Size</th>
<th>Face</th>
<th>Truss Chord</th>
<th>Rim Board, Header, Beam</th>
<th>Edge</th>
</tr>
</thead>
<tbody>
<tr>
<td>8d</td>
<td>0.113&quot; x 2½&quot;</td>
<td>2&quot;</td>
<td>4&quot;</td>
<td>3&quot;</td>
<td>4&quot;</td>
</tr>
<tr>
<td>10d</td>
<td>0.128&quot; x 3&quot;</td>
<td>2&quot;</td>
<td>6&quot;</td>
<td>3&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>12d</td>
<td>0.188&quot; x 3½&quot;</td>
<td>2&quot;</td>
<td>6&quot;</td>
<td>4½(3)</td>
<td>6&quot;</td>
</tr>
<tr>
<td>16d</td>
<td>0.250&quot; x 3½&quot;</td>
<td>3&quot;</td>
<td>6&quot;</td>
<td>4½(3)</td>
<td>6&quot;</td>
</tr>
</tbody>
</table>

1. 14 gauge staples may be a direct substitute for 8d nails if a minimum penetration of 1½" into the flange is maintained.
2. Minimum spacing must be 5" for four rows of nails.
3. Spacing may be reduced to 5" where nail penetration does not exceed 1½".
   - If more than one row of nails is used, offset rows at least ½" and stagger. Maintain ¾" minimum edge distance.
   - Nailing pattern to be per plans and specifications, and nail spacing should comply with criteria listed on this page.
   - For member stability, nail sheathing to the full length of the member (24" on-center, maximum).

**SOUND DETAILS**

Do not use nails smaller than 8d (2½") or larger than 16d (3½")

**Fire Assembly Details**

For Fire Assemblies and other construction-related fire information, please refer to resources on our website at redbuilt.com.

**Sound Assemblies and Noise Measurement**

The ability of a wall or floor/ceiling system to reduce airborne sound transmission is measured using ASTM E90, and reported using the ASTM E413 Sound Transmission Class (STC) rating system. The ratings listed below—originally developed by the Acoustical and Insulation Materials Association and now considered a standard throughout the industry—are a practical reference for a range of STC numbers. In general, the higher the number, the better the acoustical performance. It is important to note that this table is valid only for a given level of background noise and should be used only for generalized comparisons.

Floor/ceiling systems can also be rated for impact noise transmitted through an assembly. Ratings are determined using the ASTM E492 Impact Insulation Class (IIC) system, and like STC ratings, a high IIC rating indicates significantly reduced impact noise.
General Design Info.

**SOUND DETAILS**

81

- 40 oz pad and 44 oz carpet
- 1¾" Homasote® floor decking
- 5⁄8" gypsum board
- Resilient channels at 24" o.c.
- 3" fiberglass

Laboratory Test
- STC = 47
- INR = +18
- KAL 224-35-65

82

- 40 oz pad and 44 oz carpet
- 1½" concrete
- ½" sheathing
- Open-web truss
- 5⁄8" gypsum board

Laboratory Test
- STC = 46
- INR = +11
- KAL 224-38-65

83

- 40 oz pad and 44 oz carpet
- 1¾" Homasote® floor decking
- 5⁄8" gypsum board
- Resilient channels at 24" o.c.
- Rock wool batts

Laboratory Test
- STC = 50
- INR = +14
- KAL 858-5-70

84

- 1½" concrete
- ¼" sheathing
- 15 lb asphalted felt
- 5⁄8" mastical gypsum concrete
- Open-web truss
- SHEETROCK® gypsum board

Laboratory Test
- STC = 60
- INR = -7
- KAL 858-4-70

85

- 1½" lightweight concrete
- ¾" sheathing
- Open-web truss
- 5⁄8" gypsum board
- Resilient channels at 24" o.c.

Laboratory Test
- STC = 58
- INR = +29 with pad and carpet
- RAL No. TL 70-44

86

- 1¾" Homasote® floor decking
- 40 oz. pad and 44 oz. carpet
- 5⁄8" gypsum board
- Resilient channels at 24" o.c.

Laboratory Test
- STC = 48
- INR = +14
- IIC = 65
- KAL 858-4-70

87

- 40 oz pad and 44 oz carpet
- ½" sheathing
- Rosin-impregnated paper
- ¾" sheathing
- Open-web truss
- 5⁄8" gypsum board
- Resilient channels at 24" o.c.

Laboratory Test
- STC = 48
- INR = +11 with pad and carpet
- RAL No. TL 70-48

88

- 1½" concrete
- ¼" sheathing
- 15 lb asphalted felt
- 5⁄8" mastical gypsum concrete
- Open-web truss
- SHEETROCK® gypsum board

Laboratory Test
- STC = 53
- INR = -18
- KAL 858-4-70
- INR = +18 with pad and carpet
- RAL No. IN 70-1 & IN 70-2

Fibrex® is a registered trademark of Fibrex Insulations Inc. SHEETROCK® is a registered trademark of USG Corporation. Homasote® is a registered trademark of Homasote Company. Thermafiber® is a registered trademark of Thermafiber, Inc.
Q1: How do I develop the most cost effective solution when using open-web trusses?
A1: The open-web truss load tables show the maximum load-carrying capacity of a given truss, but not necessarily the most cost-effective truss type or depth for the application. You can also use the Specifying Economical Trusses section on page 4 of this guide or you can contact your local RedBuilt representative at 1-866-859-6757 for assistance in finding the most economical solution for your application.

Q2: Can RedBuilt™ open-web trusses be used as drag struts?
A2: Yes. RedBuilt can design the chords of open-web trusses for specific axial loads. These loads must be provided by the design professional.

Q3: What is MSR lumber?
A3: Machine stress rated (MSR) lumber refers to sawn lumber that is mechanically evaluated for strength and stiffness, and then visually graded. Sawn lumber that is rated as MSR is regarded as high-quality material, and MSR is the only grade of sawn lumber used by RedBuilt in open-web truss chord components.

Q4: Are your open-web trusses covered by a warranty?
A4: Yes. RedBuilt warrants that its products will be free from manufacturing errors or defects in workmanship and material. In addition, provided that the product is correctly installed and used, the company warrants the adequacy of its design for the normal and expected life of the building. A copy of the warranty can be found on the back cover of this guide or on our website at www.RedBuilt.com.

Q5: Does RedBuilt provide any sprinkler system or fire-rated assembly details?
A5: Yes. RedBuilt provides a number of sprinkler system suspension and fire assembly details in AutoCAD® format, which can be downloaded from our website at redbuilt.com on the AutoCAD Details page.

Q6: What type of certification and quality assurance do open-web trusses have?
A6: RedBuilt™ open-web trusses are manufactured in accordance with rigorous standards, and they are monitored by a third-party quality control agency (PFS Corporation). These standards are modeled after ISO 9000.

Q7: How can I contact a RedBuilt representative?
A7: You can find your local RedBuilt representative by calling 1-866-859-6757 or visiting our website at redbuilt.com.

Q8: Can I modify or repair RedBuilt™ open-web trusses?
A8: On rare occasions, repairs or modifications can be made to RedBuilt™ open-web products—but only if the materials and instructions are provided by RedBuilt. Contact your local RedBuilt representative for more information or call 1-866-859-6757.

Q9: Can I treat open-web products with fire-retardant or preservative?
A9: RedBuilt does not recommend or warrant the use of field-applied treatments. The use of these products may reduce the design load-carrying capacity of the members. Instead, RedBuilt requires that dry-use conditions be maintained.

Q10: Why are some RedBuilt™ open-web trusses painted red on one end?
A10: Many truss applications require the use of non-symmetrical trusses. Typically this is due to non-uniform design loading patterns. Non-symmetrical trusses are marked with red paint on one end, and the layout drawings provided by RedBuilt will specify where the red end is to be installed.

Q11: Do RedBuilt™ open-web trusses meet the requirements set forth in the U.S. Green Building Council’s (USGBC) Leadership in Energy and Environmental Design (LEED) standard?
A11: LEED–NC (new construction) is a commonly used building rating system designed to accelerate the development of green building practice. While products such as RedBuilt™ open-web trusses are not LEED certified on an individual basis, they may contribute to point totals for a “whole building” certification. For example, the following items may be viewed as contributors toward points in the LEED rating system:

- The Low Emitting Materials section (EQ 4.4) recognizes composite wood that is free from urea-formaldehyde resins. RedBuilt does not use urea-formaldehyde resins in any of its engineered lumber products. Material Safety Data Sheets (MSDS) are available at redbuilt.com.
- RedBuilt™ products may qualify for Regional Materials (MR 5.1 and 5.2) for projects located within a 500 mile radius of Portland, OR.
- Tubular steel webs and bearing clips used in RedBuilt open-web trusses may qualify for Recycled Content (RC 4.1 and 4.2). For more information consult your RedBuilt technical representative.
1.0 General

1.1 Scope
This work includes the complete furnishings and installation of all RedBuilt™ open-web trusses, as shown on the drawings herein specified and necessary to complete the work.

1.2 Code Approvals
These products shall be designed and manufactured to the standards set forth in the International Code Council Report No. ESR-1774.

1.3 Related Work Specified Elsewhere
A. Carpentry and millwork
B. Glu-laminated members

1.4 Design
A. Products: RedBuilt™ products shall be designed to fit the dimensions and loads indicated on the plans.
B. Design Calculations: When requested, a complete set of design calculations shall be prepared by RedBuilt.

1.5 Submittals
A. Drawings: Drawings showing layout and detail necessary for determining fit and placement in the building shall be provided by RedBuilt.
B. Production: Fabrication and/or cutting shall not proceed until the architect and/or engineer have approved the submittal package.

2.0 Products

2.1 Materials
Materials shall comply with ICC-ES Report No. ESR-1774. Chord members, web members, connecting pins and bearing hardware/attachments shall be of material and size as required by design.

2.2 Fabrication
The trusses shall be manufactured by RedBuilt in a plant listed in the report referred to above and under the supervision of an approved third-party inspection agency.

2.3 Tolerances
Length, bearing-to-bearing:
- For trusses up to 30 ft: ± 1/8"
- For trusses greater than 30 ft: ± 1/4"
Depth: ± 1/8"

CAMBER

<table>
<thead>
<tr>
<th>Span</th>
<th>Individual Truss Tolerance Variation from Design</th>
<th>Variation Between Any Two Trusses of the Same Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 30’</td>
<td>± 1/8”</td>
<td>1/4”</td>
</tr>
<tr>
<td>&gt;30’ to 60’</td>
<td>± 1/4”</td>
<td>1/4”</td>
</tr>
<tr>
<td>&gt;60’ to 120’</td>
<td>± 1/2”</td>
<td>1/2”</td>
</tr>
</tbody>
</table>

2.4 Identification
Each of the trusses shall be identified by a stamp indicating the truss series, ICC-ES report number, manufacturer’s name, plant number, date of fabrication, and the independent inspection agency’s logo.

2.5 Hardware
Not applicable.

3.0 Execution

3.1 Installation
RedBuilt™ open-web trusses, if stored prior to installation, shall be stored in a vertical position and protected from the weather. They shall be handled with care so they are not damaged. The open-web trusses shall be installed in accordance with the plans and any RedBuilt drawings and installation suggestions. Temporary construction loads that cause stresses beyond design limits are not permitted. Installation bracing is required to keep trusses straight and plumb, and to ensure adequate lateral support for the individual trusses and the entire system until the sheathing material has been applied. RedBuilt’s recommended method for bracing is to use the strut bracing supplied by RedBuilt.

3.2 Installation Review
Prior to enclosing the trusses, the Contractor shall give notification to the RedBuilt representative to provide an opportunity for review of the installation.

3.3 Performance Standards
Not applicable.

3.4 Fire Rating/Sound Rating
Fire and sound ratings are to be established in accordance with the assemblies detailed in ICC-ES Report No. ESR-1774, or the Directory of Listed Products published by Intertek Testing Services.

3.5 Warranty
The products delivered shall be free from manufacturing errors or defects in workmanship and material. The products, when correctly installed and maintained, shall be warranted to perform as designed for the normal and expected life of the building.

4.0 Alternates and/or Equals

4.1 Base Bid
Due to the customized detailing and engineering characteristics of the roof and/or floor framing assembly, it is a requirement that open-web trusses be used in the base bid.

4.2 Alternate Manufacturers
Other manufacturers’ bids are to be listed in the alternate section of your proposal. All framing plans, detailing, and calculations for the alternate bids will be reviewed by the owner, architect, and engineer for structural performance, possible conflicts with related trades, and compatibility with the overall building requirements and building code.

4.3 Alternate Products
Alternate products will only be permitted if written approval and acceptance is obtained by both architect and owner at least seven days prior to the bid date. Any monetary savings that may be realized by using an alternate product shall be forwarded to the owner.

4.4 Acceptable Alternatives
At the discretion of the specifier of record, accepted alternates will be listed on the final addendum prior to the bid date.
SERVICE AND SUPPORT YOU CAN COUNT ON.

RedBuilt is committed to creating superior structural solutions. How? By offering efficient structural building products supported by a broad range of services.

• Our team of RedBuilt representatives—one of the industry’s largest—isn’t afraid to get its hands dirty. We can help with technical information, installation questions or code compliance.

• At RedBuilt, our goal is to help you build solid and durable structures. A limited warranty for our products is in effect for the expected life of the building.

• Call us with a problem that you believe may be caused by our products, and our representative will contact you within one business day to evaluate the problem and help solve it—GUARANTEED.

PRODUCT WARRANTY

RedBuilt warrants that its products will be free from manufacturing errors or defects in workmanship and material. In addition, provided the product is correctly installed and used, the company warrants the adequacy of its design for the normal and expected life of the building.

Kurt Liebich, President & CEO

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REPRESENTATIVE INFORMATION