

# ROOF TRUSS JOBSITE PACKAGE

**IMPORTANT DOCUMENTS ENCLOSED!  
PLEASE REVIEW**

## WARNING

- DO NOT CUT TRUSSES OR USE DAMAGED TRUSSES
- DURING INSTALLATION, TRUSSES REQUIRE CAREFUL HANDLING AND TEMPORARY BRACING. ADEQUATE PERMANENT BRACING MUST BE INSTALLED BEFORE ANY LOADS APPLIED.
- CONSULT AN ARCHITECT OR ENGINEER IF TRUSSES ARE CUT OR DAMAGED AND FOR. ANY PARTY WHO CUTS OR DAMAGES A TRUSS SHALL BE RESPONSIBLE FOR THE ENGINEERING DESIGN AND FOR THE COST OF THE REQUIRED REPAIR.

AUTOMATED BUILDING COMPONENTS  
2359 GRAND RD  
NORTH BALTIMORE, OHIO 45872

# **CUSTOMER SERVICE POLICY**

## **CHANGES, ALTERATIONS, REPAIRS:**

Automated Building Components, Inc. (ABC) wants to caution against making agreements relative to the scope of work, changes, alterations, or repairs of products supplied by ABC with anyone other than ABC. It is your responsibility to include ABC in any communication to the above. ABC will not accept back charges regardless of fault unless notified by the customer, and ABC is given two business days to investigate the situation.

## **NOTIFICATION:**

Prompt notification must be given to ABC when any difficulties arise in the field that will require "on-site" repair or re-building of any products supplied by ABC. This notification can be given either to the ABC salesman handling the account, or calling the ABC Customer Service Department at (419) 257-2152 or toll free at (800) 837-2152.

## **INVESTIGATION:**

ABC will have a representative at the job site no later than the day after being apprised to fully investigate the difficulty. If it is an emergency situation that must be handled immediately, it will be treated in just that manner, and ABC won't delay your building program. However, do not proceed with re-working the product in any way for which you anticipate reimbursement without requesting authorization from ABC.

## **JOB SITE RE-WORKING:**

ABC not only wants, but insists on having the opportunity to rectify our mistakes with our own people performing the work. By following this procedure, we get an immediate feed-back as to precisely what happened, and what must be done to prevent its future recurrence. We have qualified people to perform this service, and assure you that ABC will complete any on-site remodeling within a period of time mutually agreed upon as being acceptable.

If an emergency situation arises, requiring immediate action in order to keep the job running on schedule, ABC must be contacted for authorization for customer to correct. At this time, the builder's representative should be in a position to specify exactly what occurred and the number of hours that will be required to rectify. This information will then be recorded by ABC, noting the date, the jobsite address, the specific problem and the time allowed for the repair. By following this method, future disagreements will be eliminated.

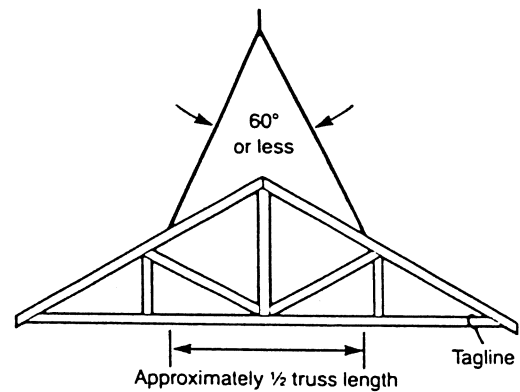
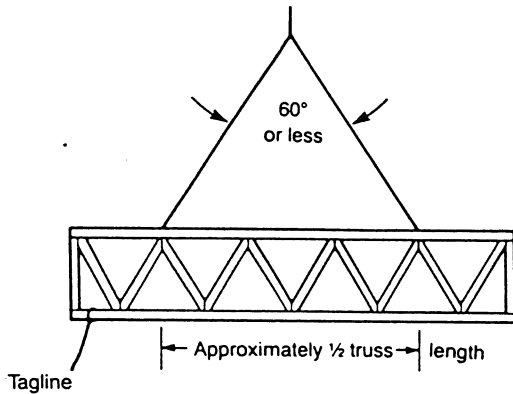
# **CREDIT POLICY**

Payment is expected as stated under "terms" of the invoice. Any late payments will be charged interest fees and assessed to the builder.

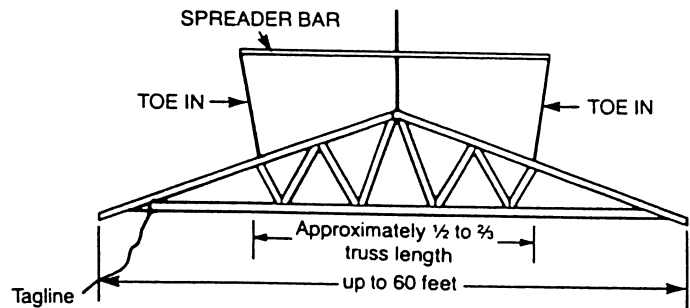
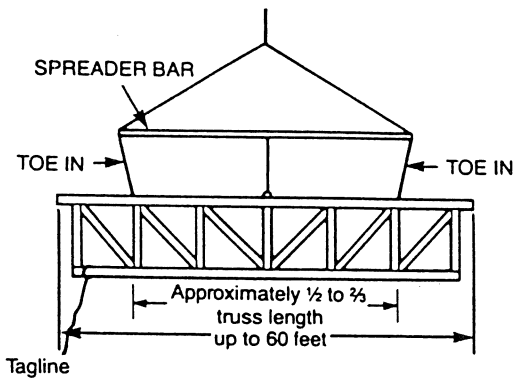
Be extra careful in windy weather and around power lines.

# ERECTION

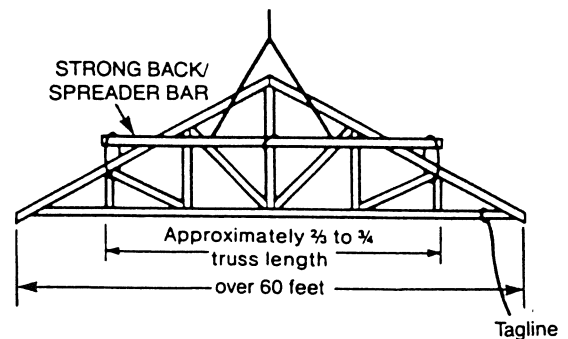
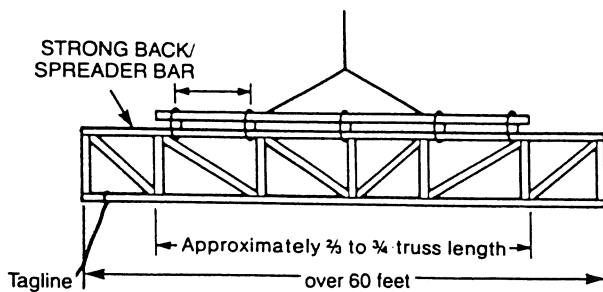
**ALL TRUSSES WHICH ARE ERECTED ONE AT A TIME SHALL BE HELD SAFELY IN POSITION WITH THE ERECTION EQUIPMENT UNTIL SUCH TIME AS ALL NECESSARY BRACING HAS BEEN INSTALLED AND THE ENDS OF THE TRUSSES ARE SECURELY FASTENED.**



Truss sling is acceptable where maximum lateral bending limits are not exceeded.



Use spreader bar in ALL cases when maximum lateral bending limits are exceeded. It should be noted that the lines from the ends of the spreader bar "TOE IN", If these lines should "TOE OUT" they will tend to cause buckling of the truss.



For lifting trusses with spans in excess of 60 feet, it is recommended that a spreader bar be used as illustrated. The spreader bar should be attached to the top chord and web members at intervals of approximately 10 feet. Further, the spreader bar should be at or above the mid-height of the truss so as to prevent overturning. The spreader bar can be of any material with sufficient strength to safely carry the weight of the truss and sufficient rigidity to adequately resist bending of the truss.

# **DO NOT CUT ANY TRUSSES**

**THE CUTTING OF A TRUSS COULD  
JEOPARDIZE THE ROOF & FLOOR  
SYSTEM AND COULD VOID ANY  
WARRANTY.**

**IF YOU ENCOUNTER A PROBLEM  
CALL ABC FOR ASSISTANCE  
FIRST.**

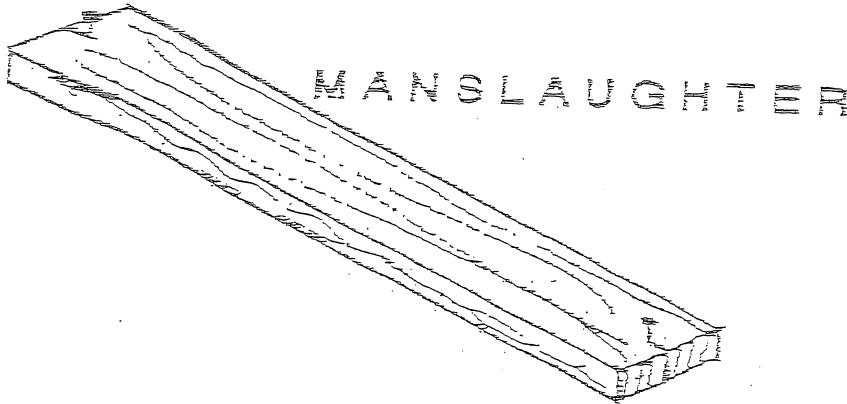
**1-(800) 837-2152**

**THANK YOU!**



WANTED

for



**NAME:**

"KILLER" CLEAT – Alias; "SPACER" STICK, Alias; "BRACING" STICK

**PHYSICAL DESCRIPTION:**

25-1/2" LONG x 2-1/2" OR 3-1/2" WIDE x 3/4" THICK. HAS BEEN KNOWN TO ALTER THICKNESS

**ATTACHED:**

ONE OR TWO 6 OR 8 PENNY NAILS OR EACH END, USUALLY WITH HEADS PROJECTING FOR EASY REMOVAL.

**HABITS:**

HANGS AROUND CONSTRUCTION SITES, PARTICULARLY WHERE WOOD TRUSSES ARE BEING INSTALLED. PRETENDS TO BE LATERAL BRACING. TRIED TO CONVINCED BUILDERS HE IS ALL THE BRACING NEEDED TO SUPPORT TRUSSES, THEN LETS EVERYBODY DOWN-WITH A **CRASH!**

**WARNING:**

SUBJECT IS DANGEROUS AND SHOULD NOT BE APPROACHED WHEN ACITING AS LATERAL BRACING!

**ACTION:**

IF SEEN ON THE JOB SITE, REPORT TO AUTHORITIES AT ONCE AND REFER BUILDERS TO TPI AND WTCA RECOMMENDATIONS FOR "HANDLING AND INSTALLING BRACING" (HIB-91)

# Important Information and General Notes

## General Notes

These general notes are provided to ensure proper installation of Simpson Strong-Tie Company Inc. products and must be followed fully.

- a. Simpson Strong-Tie Company Inc. reserves the right to change specifications, designs and models without notice or liability for such changes.
- b. Steel used for each Simpson Strong-Tie® product is individually selected based on the product's steel specifications, including strength, thickness, formability, finish and weldability. Contact Simpson Strong-Tie for steel information on specific products.
- c. Unless otherwise noted, dimensions are in inches, loads are in pounds.
- d. Unless otherwise noted, welds, screws, bolts and nails may not be combined to achieve highest load value. 8d (0.131" x 2½"), 10d (0.148" x 3") and 16d (0.162" x 3½") specify common nails that meet the requirements of ASTM F1667. When a shorter nail is specified, it will be noted (for example 8d x 1½"). Refer to Simpson Strong-Tie Nailing Guide, NDS (National Design Specification) and ASTM F1667 (American Society of Testing and Materials) for more nail info.
- e. Do not overload. Do not exceed catalog allowable loads, which would jeopardize the connection.
- f. Unless otherwise noted, allowable loads are for Douglas Fir-Larch under continuously dry conditions. Allowable loads for other species or conditions must be adjusted according to the code. The section from the AC13 criteria indicating the range of specific gravity reads as follows: 3.2.3 The species of lumber used shall have a specific gravity not greater than 0.55 as determined in accordance with the NDS. This chart shows specific gravity and perpendicular-to-grain compression capacities for the different wood species:
 

Species	Fc.L	Specific Gravity
Douglas Fir-Larch (DF)	625 psi	0.50
Southern Pine (SP)	565 psi	0.55
Spruce-Pine-Fir (SPF)	425 psi	0.42
Hem Fir (HF)	405 psi	0.43
Glulam	650 psi	0.50
LVL (DF/SP)	750 psi	0.50
LSL (E = 1.3 x 10 <sup>6</sup> )	680 psi	0.50
LSL (E ≥ 1.5 x 10 <sup>6</sup> )	880 psi	0.50
Parallam® PSL	750 psi	0.50
- g. Simpson Strong-Tie Company Inc. will manufacture non-catalog products provided prior approval is obtained and an engineering drawing is included with the order. Steel specified on the drawings as ⅛", ⅜" and ¼" will be 11 ga. (0.120"), 7 ga. (0.179") and 3 ga. (0.239"), respectively. The minimum yield and tensile strengths are 33 ksi and 52 ksi, respectively.
- h. All references to bolts or machine bolts (MBs) are for structural quality through bolts (not lag screws or carriage bolts) equal to or better than ASTM Standard A307, Grade A.
- i. Unless otherwise noted, bending steel in the field may cause fractures at the bend line. Fractured steel will not carry load and must be replaced.
- j. A fastener that splits the wood will not take the design load. Evaluate splits to determine if the connection will perform as required. Dry wood may split more easily and should be evaluated as required. If wood tends to split, consider pre-boring holes with diameters not exceeding 0.75 of the nail diameter (2015 NDS 12.1.5.3). Use a ⅝" bit for Strong-Drive® SDS Heavy-Duty Connector screws and a ⅜" bit for Strong-Drive SD9/SD10 Connector screws.
- k. Wood shrinks and expands as it loses and gains moisture, particularly perpendicular to its grain. Take wood shrinkage into account when designing and installing connections. Simpson Strong-Tie manufactures products to fit common dry lumber dimensions. If you need a connector with dimensions other than those listed in this catalog, Simpson Strong-Tie may be able to vary connector dimensions; contact Simpson Strong-Tie. The effects of wood shrinkage are increased in multiple lumber connections, such as floor-to-floor installations. This may result in the vertical rod nuts becoming loose, requiring post-installation tightening. (Contact Simpson Strong-Tie for information on Takeup Devices.)
- l. Top flange hangers may cause unevenness. Possible remedies should be evaluated by a professional and include using a face-mount hanger, and routing the beam or cutting the subfloor to accommodate the top flange thickness.
- m. Built-up lumber (multiple members) must be fastened together to act as one unit to resist the applied load (excluding the connector fasteners). This must be determined by the Designer.
- n. Some model configurations may differ from those shown in this catalog. Contact Simpson Strong-Tie for details.
- o. Hanger Options (Simpson Strong-Tie Hanger Options Matrix and Hanger Option General Notes pp. 121–123) – some combinations of hanger options are not available. In some cases, combinations of these options may not be installable. Horizontal loads induced by sloped joists must be resisted by other members in the structural system. A qualified Designer must always evaluate each connection, including carried and carrying member limitations, before specifying the product. Fill all fastener holes with fastener types specified in the tables, unless otherwise noted. Hanger configurations, height and fastener schedules may vary from the tables depending on joist size, skew and slope. See the allowable table load for the non-modified hanger, and adjust as indicated. Gauge may vary from that specified depending on the manufacturing process used.
- p. Simpson Strong-Tie will calculate the net height for a sloped seat. The customer must provide the H1 joist height before slope.
- q. Truss plates shown are the responsibility of the Truss Designer.
- r. Do not weld products listed in this catalog unless this publication specifically identifies a product as acceptable for welding, or unless specific approval for welding is provided in writing by Simpson Strong-Tie. Some steels have poor weldability and a tendency to crack when welded. Cracked steel will not carry load and must be replaced. See Simpson Strong-Tie Hanger Options Matrix and Hanger Option General Notes on pp. 121–123 for hangers that may be welded.
- s. Unless noted otherwise, all references to standard-cut washers refer to Type A plain washers (W) conforming to the dimensions shown in ASME B18.22.1 for the appropriate rod size in accordance with 2012 NDS Appendix L. Some products require SAE narrow washers (N) to fit in a tight space and are noted accordingly.
- t. To achieve tabulated values for embedded concrete/masonry products, full consolidation of concrete or grout is required whether mounted to the form prior to the pour or wet set.

## Important Information and General Notes

### General Instructions for the Installer

These general instructions for the installer are provided to ensure proper selection and installation of Simpson Strong-Tie Company Inc. products and must be followed carefully. These general instructions are in addition to the specific installation instructions and notes provided for each particular product, all of which should be consulted prior to and during installation of Simpson Strong-Tie Company Inc. products.

- a. All specified fasteners must be installed according to the instructions in this catalog. Incorrect fastener quantity, size, placement, type, material, or finish may cause the connection to fail. Prior to using a particular fastener, please consult the Fastener Guide in this catalog.
  - 16d fasteners are common nails (0.162" dia. x 3 1/2" long) and cannot be replaced with 16d sinkers (0.148" dia. x 3 1/4" long) for full load value unless otherwise specified.
  - Unless otherwise noted screws may not be used to replace nails in connectors unless approved and recommended by the Designer/Engineer of Record. Unless stated otherwise, Simpson Strong-Tie cannot and does not make any representations regarding the suitability of use or load-carrying capacities of connectors with screws replacing nails.
  - When using stainless-steel connectors, use stainless-steel fasteners. When using ZMAX®/HDG galvanized connectors, use fasteners that meet the zinc coating specifications of ASTM A153 or other fasteners allowed in this catalog.
- b. Fill all fastener holes as specified in the installation instructions for that product. Refer to p. 27 for the requirements of the various shapes of fastener hole.
- c. Do not overdrive nails. Overdriven nails reduce shear capacity.
- d. Use the materials specified in the installation instructions. Substitution of or failure to use specified materials may cause the connection to fail.
- e. Do not add fastener holes or otherwise modify Simpson Strong-Tie Company Inc. products. The performance of modified products may be substantially weakened. Simpson Strong-Tie will not warrant or guarantee the performance of such modified products.
- f. Install products in the position specified in the catalog.
- g. Do not alter installation procedures from those set forth in this catalog.
- h. The proper use of certain products requires that the product be bent. For those products, installers must not bend the product more than one time (one full cycle).
- i. Bolt holes shall be at least a minimum of 1/32" and no more than a maximum of 1/16" larger than the bolt diameter (per the 2012 NDS, Section 11.1.3.2 and AISI S100-07, Table E3a if applicable).
- j. Install all specified fasteners before loading the connection.
- k. Some hardened fasteners may have premature failure if exposed to moisture. These fasteners are recommended to be used in dry interior applications.
- l. Use proper safety equipment.
- m. Welding galvanized steel may produce harmful fumes; follow proper welding procedures and safety precautions. Welding should be in accordance with A.W.S. (American Welding Society) standards. Unless otherwise noted Simpson Strong-Tie® connectors cannot be welded.
- n. Pneumatic or powder-actuated fasteners may deflect and injure the operator or others. Pneumatic nail tools may be used to install connectors, provided the correct quantity and type of nails (length and diameter) are properly installed in the nail holes. Tools with nail hole-locating mechanisms should be used. Follow the manufacturer's instructions and use the appropriate safety equipment. Overdriving nails may reduce allowable loads. Contact Simpson Strong-Tie. Powder-actuated fasteners should not be used to install connectors, unless noted otherwise. Reference pp. 207 and 209 for top-flange hanger installation with powder-actuated fasteners.
- o. Joist shall bear completely on the connector seat, and the gap between the joist end and the header shall not exceed 1/8" per ICC-ES AC261, ASTM D1761 and ASTM D7147 test standards (unless specifically noted otherwise).
- p. Fasteners are permitted to be installed through metal truss plates when approved by the Truss Designer in accordance with ANSI/TPI 1-2014, Section 7.5.3.4 and 8.9.2. Installation of Simpson Strong-Tie® Strong-Drive® SDS Heavy-Duty Connector screws through metal connector plates requires the plates to be pre-drilled using a maximum of a 3/32" bit. Do not drive nails through the truss plate on the opposite side of single-ply trusses which could force the plate off the truss.
- q. For cold-formed steel applications, all screws shall be installed in accordance with the screw manufacturer's recommendations. All screws shall penetrate and protrude through the joined materials a minimum of 3 full exposed threads per AISI Standard for Cold Formed Steel Framing — General Provisions, Section D1.3, if applicable.
- r. Nuts shall be installed such that the end of the threaded rod or bolt is at least flush with the top of the nut.
- s. When installing hurricane ties on the inside of the wall special considerations must be taken to prevent condensation on the inside of the completed structure in cold climates.
- t. Unless otherwise noted, connectors shown in this catalog have been designed to be installed at the time the framing members are installed. Contact Simpson Strong-Tie for retrofit suitability of specific connectors including those manufactured in accordance with the hanger options section of this catalog.

# Important Information and General Notes

## Limited Warranty

Simpson Strong-Tie Company Inc. warrants catalog products to be free from defects in material or manufacturing. Simpson Strong-Tie Company Inc. products are further warranted for adequacy of design when used in accordance with design limits in this catalog and when properly specified, installed and maintained. This warranty does not apply to uses not in compliance with specific applications and installations set forth in this catalog, or to non-catalog or modified products, or to deterioration due to environmental conditions.

Simpson Strong-Tie® connectors are designed to enable structures to resist the movement, stress and loading that results from impact events such as earthquakes and high-velocity winds. Other Simpson Strong-Tie products are designed to the load capacities and uses listed in this catalog. Properly-installed Simpson Strong-Tie products will perform in accordance with the specifications set forth in the applicable Simpson Strong-Tie catalog. Additional performance limitations for specific products may be listed on the applicable catalog pages.

Due to the particular characteristics of potential impact events, the specific design and location of the structure, the building

materials used, the quality of construction, and the condition of the soils involved, damage may nonetheless result to a structure and its contents even if the loads resulting from the impact event do not exceed Simpson Strong-Tie catalog specifications and Simpson Strong-Tie connectors are properly installed in accordance with applicable building codes.

All warranty obligations of Simpson Strong-Tie Company Inc. shall be limited, at the discretion of Simpson Strong-Tie Company Inc., to repair or replacement of the defective part. These remedies shall constitute Simpson Strong-Tie Company Inc.'s sole obligation and sole remedy of purchaser under this warranty. In no event will Simpson Strong-Tie Company Inc. be responsible for incidental, consequential, or special loss or damage, however caused.

**This warranty is expressly in lieu of all other warranties, expressed or implied, including warranties of merchantability or fitness for a particular purpose, all such other warranties being hereby expressly excluded. This warranty may change periodically – consult our website [strongtie.com](http://strongtie.com) for current information.**

## Terms and Conditions of Sale

### Product Use

Products in this catalog are designed and manufactured for the specific purposes shown, and should not be used with other connectors not approved by a qualified Designer. Modifications to products or changes in installations should only be made by a qualified Designer. The performance of such modified products or altered installations is the sole responsibility of the Designer.

### Indemnity

Customers or Designers modifying products or installations, or designing non-catalog products for fabrication by Simpson Strong-Tie Company Inc. shall, regardless of specific instructions to the user, indemnify, defend and hold harmless Simpson Strong-Tie Company Inc. for any and all claimed loss or damage occasioned in whole or in part by non-catalog or modified products.

### Non-Catalog and Modified Products

Consult Simpson Strong-Tie Company Inc. for applications for which there is no catalog product, or for connectors for use in hostile environments, with excessive wood shrinkage, or with abnormal loading or erection requirements.

Non-catalog products must be designed by the customer and will be fabricated by Simpson Strong-Tie in accordance with customer specifications.

Simpson Strong-Tie cannot and does not make any representations regarding the suitability of use or load-carrying capacities of non-catalog products. Simpson Strong-Tie provides no warranty, express or implied, on non-catalog products. F.O.B. Shipping Point unless otherwise specified.

## Conversion Charts

### Metric Conversion

Imperial	Metric
1 in.	25.40 mm
1 ft.	0.3048 m
1 lb.	4.448 N
1 Kip	4.448 kN
1 psi	6,895 Pa

### Bolt Diameter

in.	mm
3/8	9.5
1/2	12.7
5/8	15.9
3/4	19.1
7/8	22.2
1	25.4

### If Common Rafter Roof Pitch is ...

Rise/Run	Slope
1/12	5°
2/12	10°
3/12	14°
4/12	18°
5/12	23°
6/12	27°
7/12	30°
8/12	34°
9/12	37°
10/12	40°
11/12	42°
12/12	45°

### Then Hip/Valley Rafter Roof Pitch becomes ...

Rise/Run	Slope
1/17	3°
2/17	7°
3/17	10°
4/17	13°
5/17	16°
6/17	19°
7/17	22°
8/17	25°
9/17	28°
10/17	30°
11/17	33°
12/17	35°

### US Standard Steel Gauge Equivalents in Nominal Dimensions

Ga.	Min. Thick. (mil)	Approximate Dimensions		Thickness of Steel Sheets (in.)		
		in.	mm	Uncoated Steel	Galvanized Steel (G90)	ZMAX® (G185)
3	229	1/4	6.0	0.239	—	—
7	171	3/16	4.5	0.179	0.186	—
10	118	1/8	3.5	0.134	0.138	0.140
11	111	1/8	3.1	0.120	0.123	0.125
12	97	7/64	2.7	0.105	0.108	0.110
14	68	5/64	2.0	0.075	0.078	0.080
16	54	1/16	1.6	0.060	0.063	0.065
18	43	3/64	1.3	0.048	0.052	0.054
20	33	1/32	1.0	0.036	0.040	0.042
22	27	1/32	1.0	0.030	0.033	0.035

Use these Roof Pitch to Hip/Valley Rafter Roof Pitch conversion tables only for hip/valley rafters that are skewed 45° right or left. All other skews will cause the slope to change from that listed.

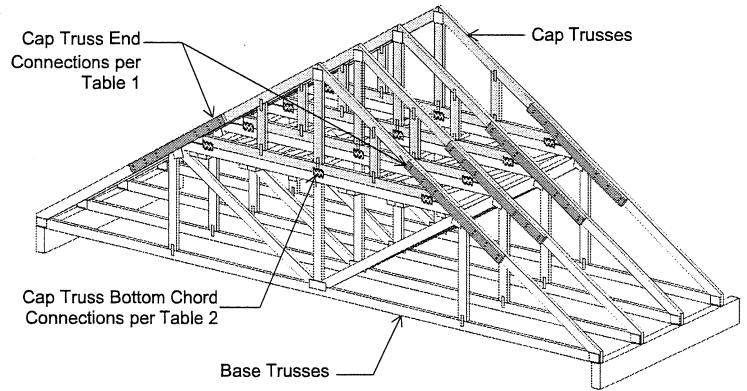
Steel thickness may vary according to industry mill standards.

This detail provides minimum connection requirements between a cap truss and a base truss of a piggyback assembly for assemblies that meet the following conditions and design requirements:

- the cap truss has continuous bearing or bearings at 2' o.c. max.;
- the cap truss contains vertical web members at 4' o.c. max.;
- the cap trusses are spaced no greater than 24" o.c.;
- the pitch does not exceed 12/12;
- the cap truss span does not exceed 36';
- the cap truss is not a mono truss;
- the cap truss supports no point loads or drag loads (see detail TD-CPS-0002 for drag load connection requirements)

**Design Requirements:**

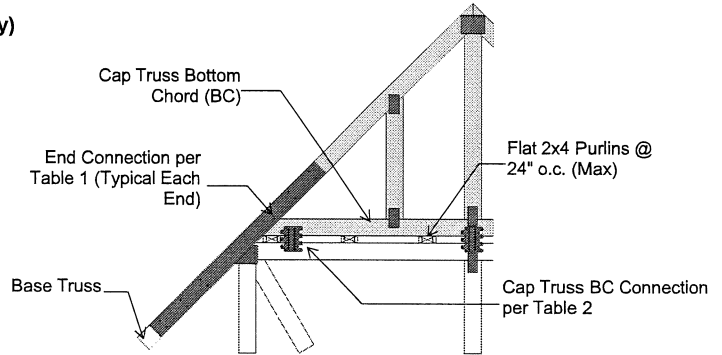
Max. Wind Speed: 140 mph (nominal) Load Duration Factor: 1.6  
 Max. Mean Roof Height: 30' Lumber: SPF or Better  
 Exp. Category: B or C (Min. SG = 0.42)



**TABLE 1 - Connection Requirements At Each End of Cap Truss (One Face Only)**

Cap Truss Span	Max. Wind Speed (mph)		End Connection Options	Fasteners <sup>1</sup>
	Nominal	Ultimate		
Up to 18'	100	125	Sheathing - See Note 2	---
	140	180	4' 2x Scab LSTA18 or CS20 Strap	16-10d nails 14-10dx1.5 nails
36' or Less	120	150	4' 2x Scab	16-10d nails
	130	160	LSTA18 or CS20 Strap	14-10dx1.5 nails
	140	180	6' 2x Scab LSTA30 or CS18 Strap	24-10d nails 10-SDS 1/4x3 20-10dx1.5

See footnotes below

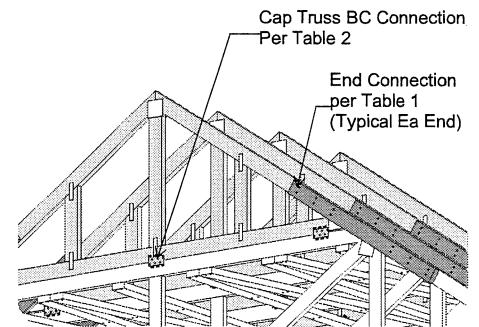


**Figure 1 - Typical Piggyback Assembly with 1/2" Gap Between Cap and Base**

**TABLE 2 - Connection Requirements Along Cap Truss Bottom Chord**

Condition	Max. Wind Speed (mph)		Connection Options Along BC	Fasteners
	Nominal	Ultimate		
With 1.5" Gap (See Fig 1)	140	180	Nails into purlins installed on base truss at 24" o.c. (max)	Purlin-to-Base: 2-10d nails (ea purlin) Cap-to-purlin: 2-10d toe-nails (ea purlin)
			(3) 7"x7"x7/16" Plywood/OSB Gussets (each face)	6-6d nails per Gusset (see note 1)
			(3) LTP5 Framing Angles (one face)	8-8dx1.5 nails per LTP5 (see note 1)
No Gap (See Fig 2)	130	160	(2) LTP4 Framing Angles (one face)	12-8dx1.5 nails per LTP4 (see note 1)
	140	180	Toe-Nails @ 24" o.c.	2-10d toe-nails along BC @ 24" o.c.
			(3) 7"x7"x7/16" Plywood/OSB Gussets (each face)	6-6d nails per Gusset (see note 1)
			(3) LTP4 Framing Angles (one face)	12-8dx1.5 nails per LTP4 (see note 1)

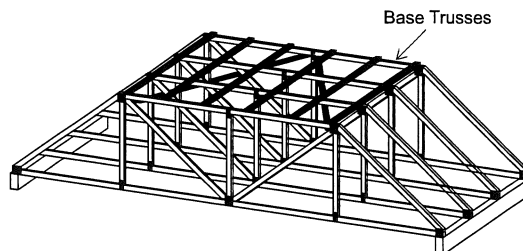
1. Where noted, install half of the specified fasteners in each member being connected.
2. An additional end connection is not required for wind speeds up to 100 mph (nominal) and cap truss spans up to 18' if the sheathing is continuous and extends at least 12" beyond the intersection.
3. When using (2) connectors along the cap truss BC, install one at each end of the bottom chord; when using (3) connectors, install one on each end and one in the center of the bottom chord.
4. NAILS: 10d=0.148" dia.x3" long, 10dx1.5=0.148" dia.x1½" long, 8dx1.5=0.131" dia.x1½" long, 6d=0.113" dia.x2" long



**Figure 2 - Typical Piggyback Assembly with No Gap Between Cap and Base**

**Bracing for the Base Truss Flat Top Chord in a Piggyback Assembly**

The flat top chords of the supporting base trusses must be adequately braced to prevent them from buckling out from under the cap trusses. One option for accomplishing this is with flat 2x4 purlins in combination with diagonal bracing that gets repeated at max. 10' intervals. Other methods may be required as specified in the Construction Documents. See BCSI-B3 for additional information.

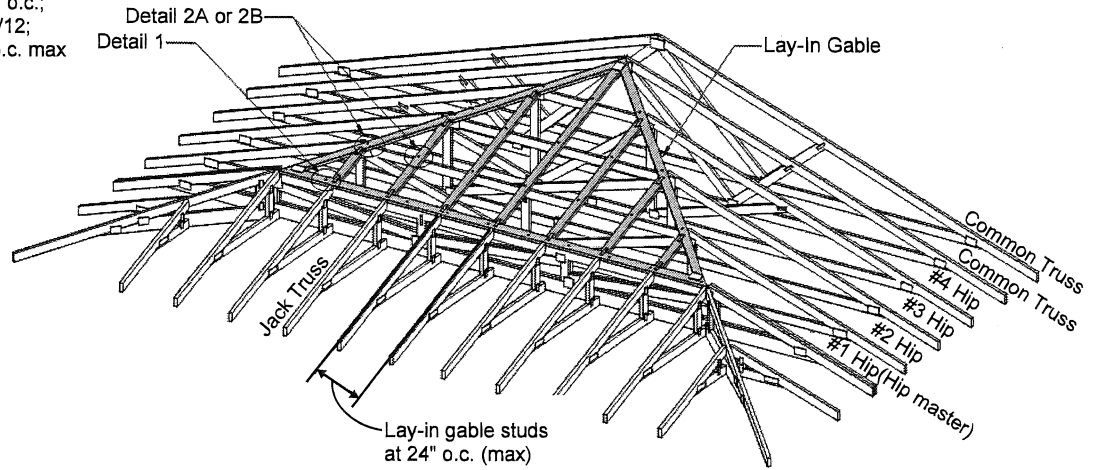


This detail provides minimum connection requirements between a lay-in gable frame and the supporting hip trusses. The lay-in gable is placed on top of the step-down hip trusses to provide a nailing surface for the roof sheathing. The lay-in gable must be attached to the top chord of the hip trusses at each intersecting location as specified in this detail. This detail is only applicable to the following conditions and design requirements:

- the hip truss spacing does not exceed 24" o.c.;
- the hip end roof pitch does not exceed 12/12;
- the lay-in gable has studs spaced at 24" o.c. max

**Design Requirements:**

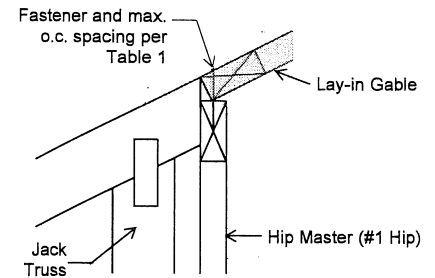
Max. Wind Speed: 130 mph (nominal)  
Max. Mean Roof Height: 30'  
Exp. Category: B or C  
Load Duration Factor: 1.6  
Lumber: SPF or Better (Min. SG = 0.42)



**TABLE 1 – Maximum On-Center Spacing of Fasteners for Attachment of Lay-in Gable to Hip Master (Detail 1)**

Fastener Type <sup>2,3</sup>	Max. Wind Speed			
	100 mph Nominal (125 mph Ultimate)		130 mph Nominal (160 mph Ultimate)	
	SPF/HF	DF/SP	SPF/HF	DF/SP
10d	6" o.c.	9" o.c.	3" o.c.	6" o.c.
16d	9" o.c.	12" o.c.	6" o.c.	9" o.c.
0.220"x4" SDWS <sup>1</sup>	48" o.c.	48" o.c.	48" o.c.	48" o.c.
WSNTL3S <sup>1</sup>	16" o.c.	24" o.c.	12" o.c.	16" o.c.

1. Use a minimum of (2) fasteners.
2. Fasteners shall have min 1" penetration into hip master top chord or ledger.
3. NAILS: 10d = 0.148" dia. x 3" long, 16d = 0.162" dia. x 3.5" long

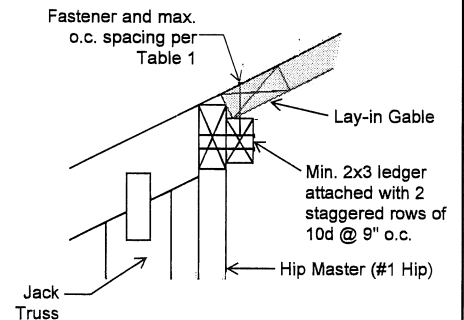


**DETAIL 1**

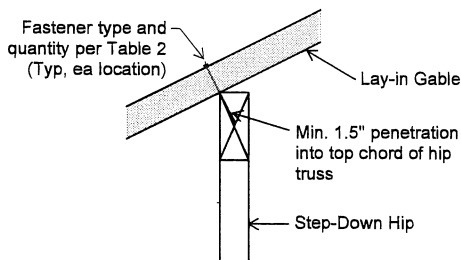
**TABLE 2 – Required Number of Fasteners for Attachment of Lay-in Gable to Step-Down Hip Trusses at Each Intersecting Location (Details 2A & 2B)**

Fastener Type/ Connection <sup>1</sup>	Max. Wind Speed			
	100 mph Nominal (125 mph Ultimate)		130 mph Nominal (160 mph Ultimate)	
	SPF/HF	DF/SP	SPF/HF	DF/SP
<b>Detail 2A</b>				
10d	3	2	n/a	n/a
16d	2	2	n/a	3
0.220"x4" SDWS	1	1	1	1
WSNTL3S	2	1	2	2
<b>Detail 2B</b>				
LTS12 Strap	6-10d x 1.5" nails per strap			

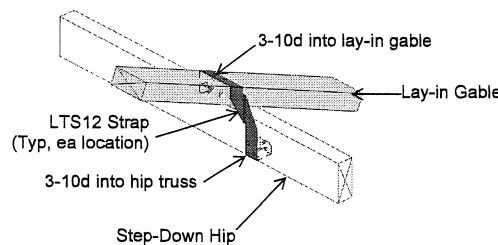
1. NAILS: 10d = 0.148" dia. x 3" long, 16d = 0.162" dia. x 3.5" long



**ALTERNATE DETAIL 1**



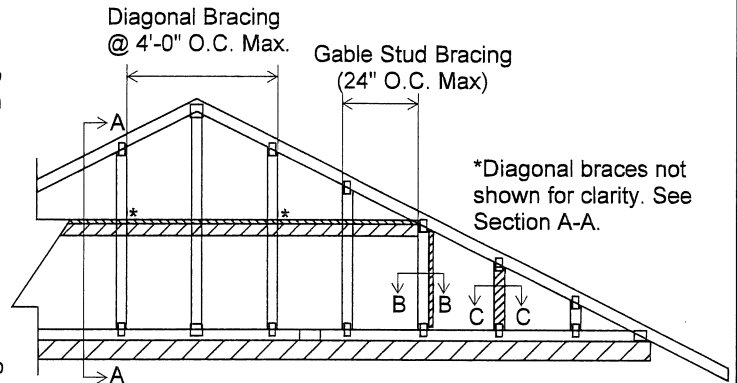
**DETAIL 2A**



**DETAIL 2B**

**NOTES:**

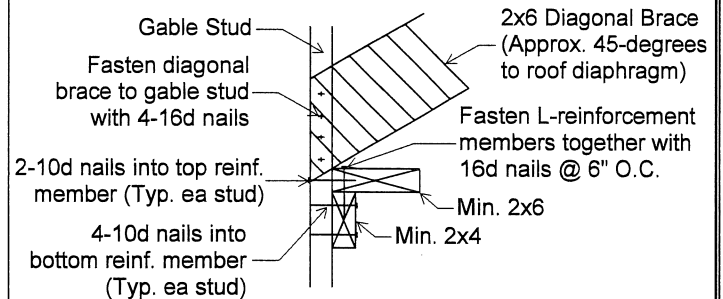
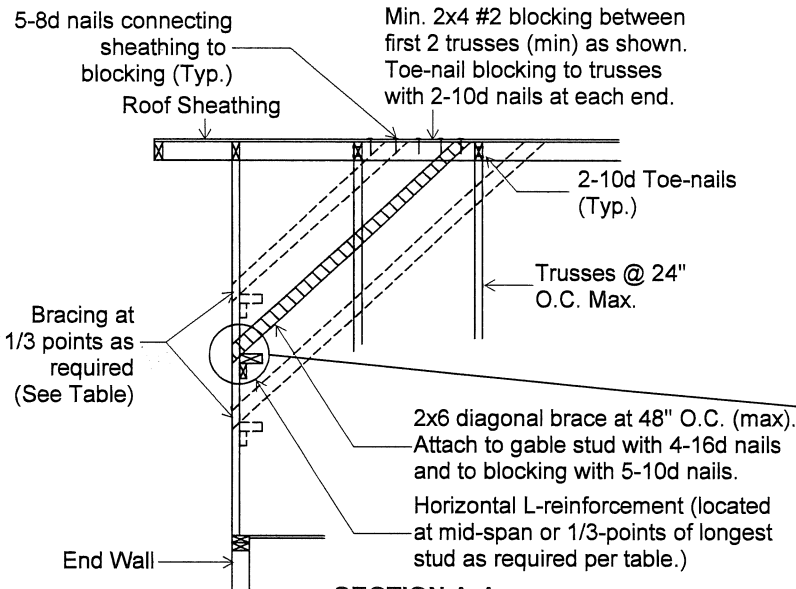
1. This detail provides bracing/reinforcement options for the gable studs to resist the out-of-plane wind loading. Refer to the individual truss design drawing for bracing/reinforcement requirements for resisting the vertical (in-plane) loads assumed in the design of the gable end frame. Additional bracing/reinforcement at the end of the building and/or at the gable end wall may be required. Refer to the Building Designer/Construction Documents for all gable end frame and roof system bracing requirements. For additional information, see BCSI-B3.
2. This detail does not apply to structural gables.
3. Connection requirements between the gable end frame and the wall to be specified by the Building Designer.
4. The gable end frame must match the profile of the adjacent trusses. Do not use a gable end frame with a flat bottom chord next to trusses with sloped bottom chords, such as scissor or vaulted trusses.



**GABLE END WITH STUD BRACING/REINFORCEMENT**

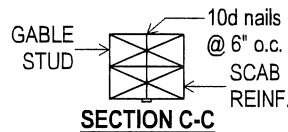
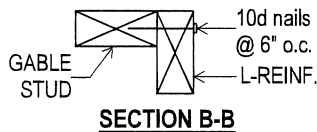
MINIMUM GABLE STUD SIZE, SPECIES & GRADE	MAX. GABLE STUD SPACING	WITHOUT BRACE	L-REINFORCEMENT	SCAB REINFORCEMENT	DIAGONAL BRACING @ MID-SPAN <sup>2</sup>	DIAGONAL BRACING @ 1/3 POINTS <sup>2</sup>
		MAXIMUM STUD LENGTH <sup>3</sup>				
2X4 SPF STUD or STANDARD	12" O.C.	5-1-12	9-0-12	10-3-12	10-3-12	15-5-12
	16" O.C.	4-8-4	8-3-0	9-4-8	9-4-8	14-0-12
	24" O.C.	4-1-0	7-0-0	8-2-4	8-2-4	12-3-8

1. L- and Scab Reinforcements shall be minimum 2x4 stud grade and must be a minimum of 90% of the gable stud length. Fasten the reinforcement member to the gable stud with 10d nails @ 6" o.c.
2. Attach horizontal reinforcing member at mid-span (or 1/3 points as required) of the longest stud and install diagonal bracing @ 4' o.c. (max) as shown in Section A-A.
3. Tabulated maximum stud lengths are based on components and cladding wind pressures using the wind design parameters listed in the detail limitations. Gable stud deflection criteria is L/240.



**NOTE:** Diagonal braces over 6'-3" require a 2x4 T-brace attached to one narrow edge. Diagonal braces over 12'-6" require 2x4s attached on both narrow edges. The braces must cover 90% of the diagonal brace and shall be fastened to the narrow edge with 10d nails at 6" o.c. (min. 3" end distance). When attached on both narrow edges, stagger the nails on each side by 3".

**SECTION A-A**

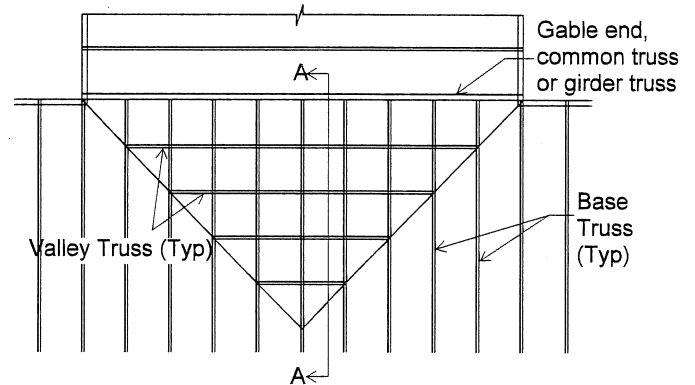


**DETAIL LIMITATIONS:**  
Max. Mean Roof Height: 30'  
Category: II  
Exposure: B or C  
Load Duration Factor: 1.6  
Wind Speed: 90 mph Nominal

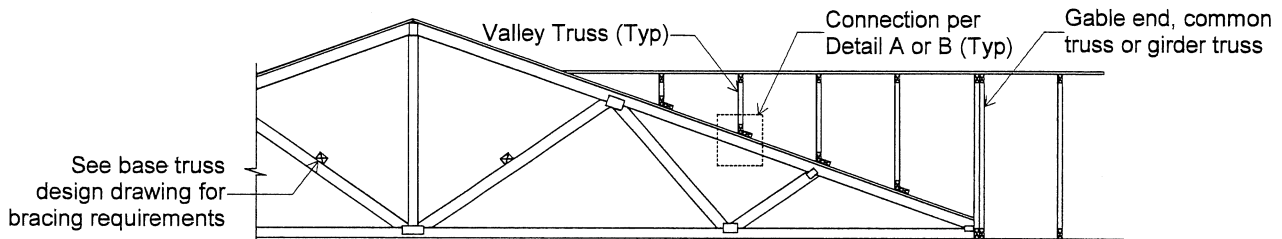
Wind Speed Equivalent	Nail Dimension	
	Nominal	(Ultimate)
90 mph	16d	3.5" x 0.162"
115 mph	10d	3" x 0.148"
	8d	2.5" x 0.131"

**NOTES:**

1. This detail provides information for attaching valley trusses to the roof trusses below (referred to as base trusses) for roof pitches from 3/12 to 10/12 (for max. 120 mph nominal or 150 mph ultimate wind velocity).
2. Refer to the individual truss design drawings for pertinent design information.
3. The total load on the valley trusses must not exceed 65 psf.
4. The maximum spacing of valley studs is 48" o.c.
5. If structural sheathing is not installed on the top chords of the base trusses (beneath the valley trusses), the base trusses must be designed with a purlin spacing equal to (or greater than) the on-center spacing of the valley trusses, as measured along the slope of the base truss top chord.

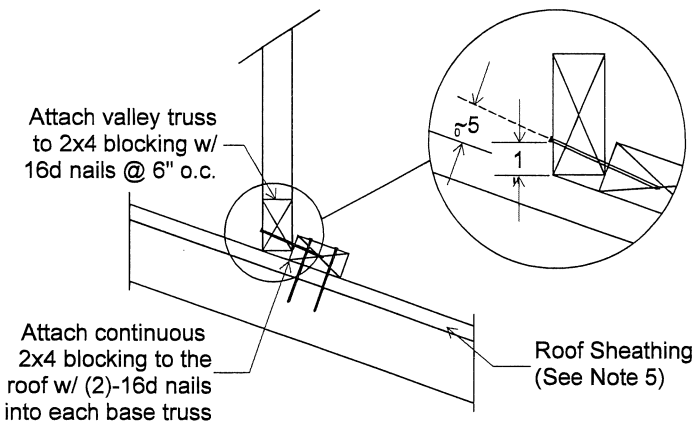


**Typical Plan View - Valley Trusses**

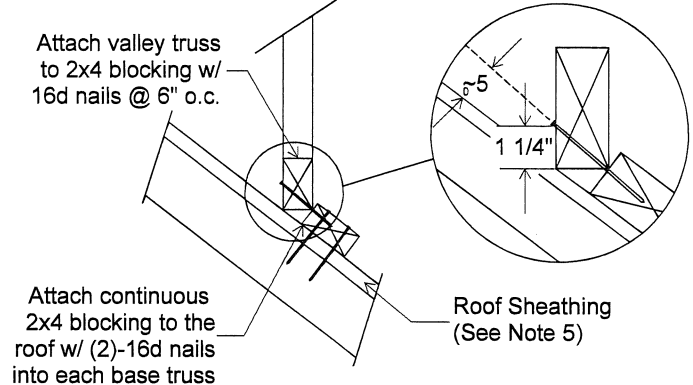


**SECTION A-A: Typical Valley Truss Side View**

**Detail A - Roof Pitches 3/12 to 6/12**



**Detail B - Roof Pitches > 6/12 to 10/12**



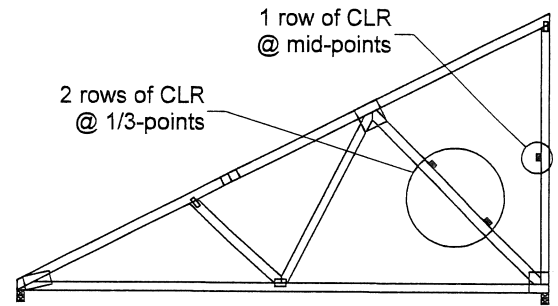
**DETAIL LIMITATIONS:**

Max. Mean Roof Height: 30'  
Category: II, Exposure: B or C  
Wind Speed: 120 mph Nominal  
Load Duration Factor: 1.6  
Lumber: Min SPF (SG=0.42)  
Max. Spacing of the valley and base truss: 24" o.c.

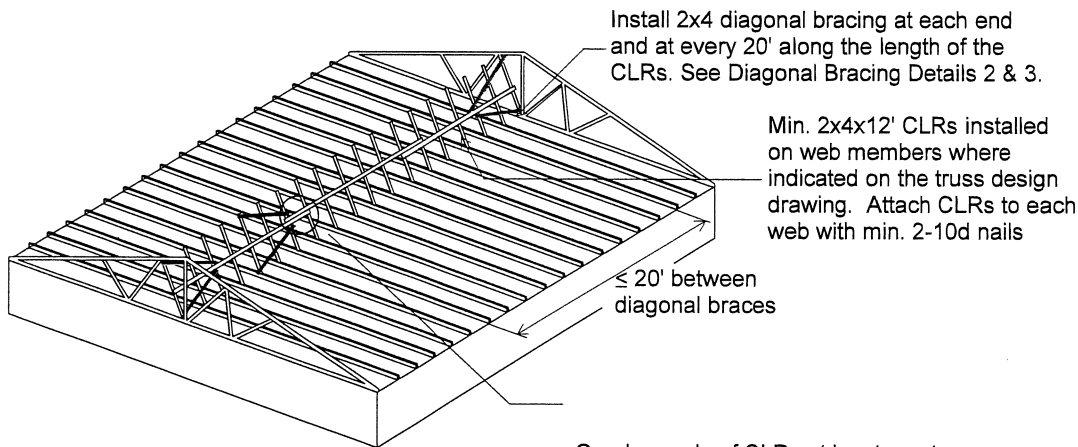
Wind Speed Equivalent		Nail Dimension
Nominal	Ultimate	16d = 3.5" x 0.131"
120 mph	(150 mph)	



This detail provides information for laterally restraining and bracing web members to prevent lateral buckling using continuous lateral restraints (CLRs) in combination with diagonal bracing. In addition to the CLRs indicated on the truss design drawing, diagonal bracing must be installed as indicated in this detail and BSCI-B3. See WEBREINFORCE for web reinforcement options that may be used as an alternative to this detail when installing CLRs and diagonal bracing is not practical or desired. Properly attached full-length sheathing satisfies (may replace) any bracing requirements specified for end vertical webs. Refer to the Construction Documents for additional bracing requirements.

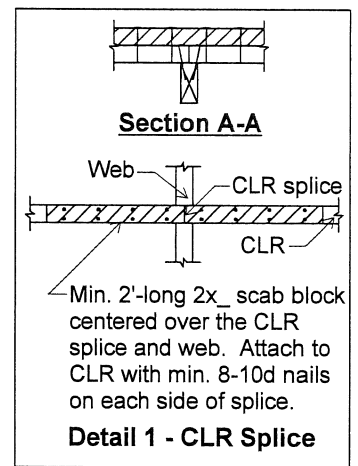


**WEB MEMBERS WITH LATERAL RESTRAINT**

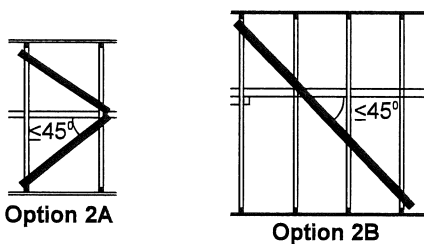


Note: Not all truss members shown for clarity.

Overlap ends of CLRs at least one truss spacing or use splice detail (see Detail 1)

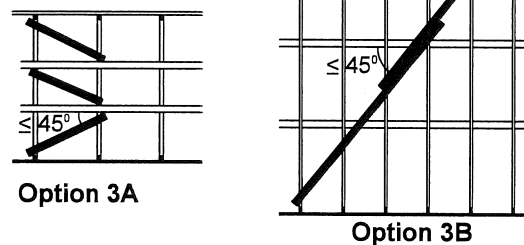


For webs with one row of CLRs, diagonal bracing shall be installed using Option 2A or 2B. Attach diagonal braces to each truss with min. 2-10d nails.



**Detail 2 - Diagonal Bracing for 1 Row of CLRs**

For webs with 2 rows of CLRs, diagonal bracing shall be installed using Option 3A or 3B. Attach diagonal braces to each truss with min. 2-10d nails.



**Detail 3 - Diagonal Bracing for 2 Rows of CLRs**

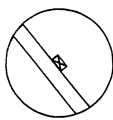
**DETAIL LIMITATIONS:**

1. Restraint and Bracing Material min. 2x4 stress graded lumber.
2. This detail does not address permanent building stability bracing to resist lateral forces acting on the building.
3. This detail shall not supersede any project-specific truss member permanent bracing design for the roof framing structural system.

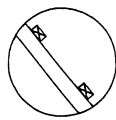
**Nail Dimensions:**  
10d = 3" x 0.128"

**NOTES:**

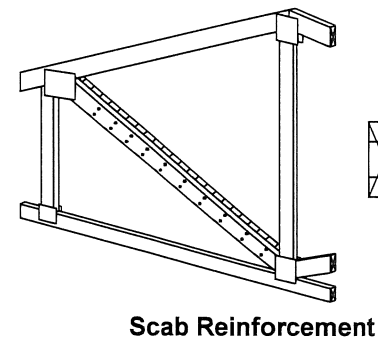
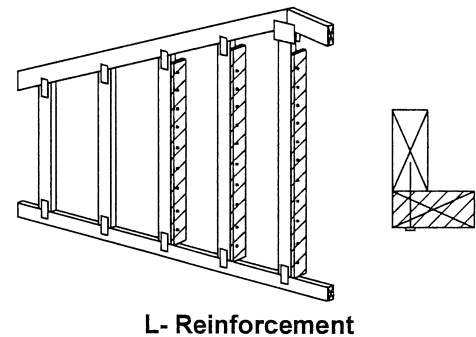
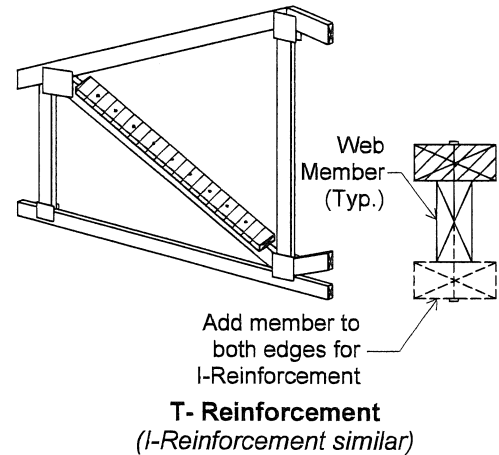
1. This detail provides web reinforcement options that may be used as an alternative to continuous lateral restraint (CLR) when installing CLRs in combination with diagonal bracing is not practical or desired.
2. Refer to the truss design drawing for web lateral restraint requirements. A ☒ on the truss design drawing indicates that continuous lateral restraint is required at the locations shown (either at the midpoint or 1/3-points of the web member). Refer to the tables below for acceptable web reinforcement options that may be used in place of one or two rows of CLR.
3. This detail may not be used to substitute CLRs for T-, L-, I- or scab reinforcements that are specified on the truss design drawing.
4. T-, L-, I- and scab web reinforcements must be the same or better species and grade of the web member as indicated on the truss design drawing.
5. All reinforcements must extend to within 6" of each end of the web member.
6. This detail does not apply to single-ply webs that exceed 14' in length.



**1 Row of CLR @  
Web Mid-point**



**2 Rows of CLRs  
@ Web 1/3 points**



WEB REINFORCEMENT OPTIONS FOR SINGLE-PLY TRUSSES <sup>1</sup>						
Specified Web Member Lateral Restraint (CLRs)	Web Member Size	Acceptable Web Reinforcement Substitutions - Type & Size				Reinforcement-to-Web Connection Requirements
		T-	L-	Scab	I-	
1 Row @ Mid-point	2x4	2x4	2x4	2x4	---	16d gun nails @ 6" on-center
	2x6	2x6	2x6	2x6	---	
	2x8	2x8	2x8	2x8	---	
2 Row @ 1/3-points	2x4	No substitutions allowed			2-2x4	
	2x6	No substitutions allowed			2-2x6	
	2x8	No substitutions allowed			2-2x8	

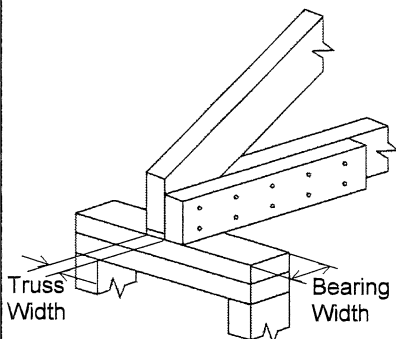
WEB REINFORCEMENT OPTIONS FOR 2-PLY TRUSSES <sup>2</sup>						
Specified Web Member Lateral Restraint (CLRs)	Web Member Size	Acceptable Web Reinforcement Substitutions - Type & Size				Reinforcement-to-Web Connection Requirements
		T-	L-	Scab	I-	
1 Row @ Mid-point	2x4	2x4	2x4	---	---	16d gun nails @ 6" on-center
	2x6	2x6	2x6	---	---	
	2x8	2x8	2x8	---	---	
2 Row @ 1/3-points	2x4	No substitutions allowed			2-2x4	
	2x6	No substitutions allowed			2-2x6	
	2x8	No substitutions allowed			2-2x8	

1. The maximum allowable web length for single-ply trusses is 14'.
2. For 2-ply trusses, the reinforcement must be nailed to both plies of the web with the nailing pattern specified in the table.
3. For the scab reinforcement, 2 rows of 10d gun nails @ 6" o.c may be used in place of 16d gun nails for attaching the reinforcement to the web.
4. For I-reinforcement, attach each 2x\_member to opposite edges of the web using the nailing pattern specified in the table.

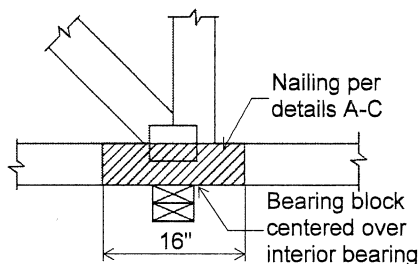
**Nail Dimension**  
16d = 3.5" x 0.131"  
10d = 3" x 0.120"

**NOTES:**

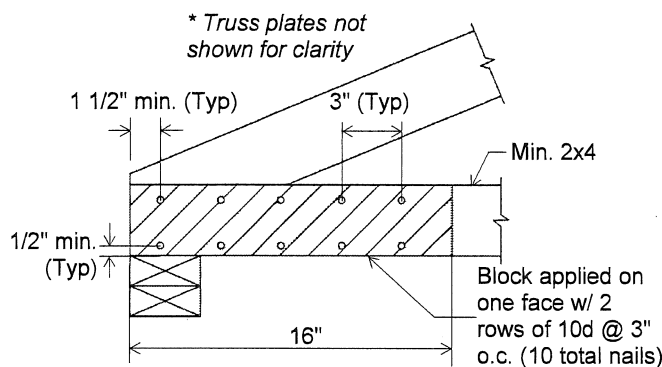
1. This detail provides information for attaching a bearing block to one face of a single-ply truss to increase the allowable reaction of the truss.
2. Refer to the individual truss design drawing for the bottom chord size and other design information.
3. The bearing blocks must be min. 16" long and the same size, species and grade as the truss bottom chord.
4. If the truss bottom chord species is different than the bearing material, the lower of the listed reactions for Details A-C shall apply. Values listed for SP do not apply to Non-Dense (ND) grades.



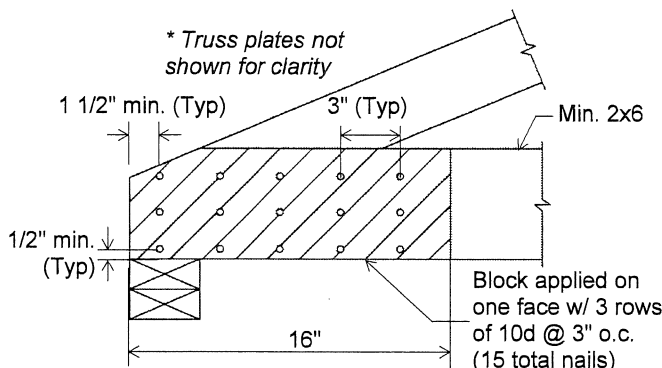
**Fig. 1 Bearing Block at End of Truss**



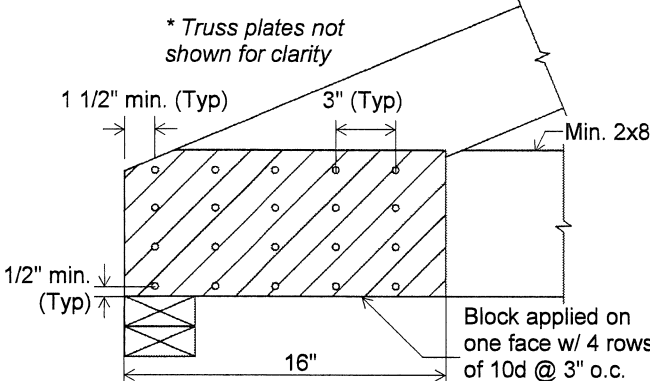
**Fig. 2 Bearing Block at Interior Bearing**



**Detail A - Bearing Block Detail for 2x4 Bottom Chord (Interior Bearing Similar - See Fig. 2)**



**Detail B - Bearing Block Detail for 2x6 Bottom Chord (Interior Bearing Similar - See Fig. 2)**



**Detail C - Bearing Block Detail for 2x8 or Larger Bottom Chord (Interior Bearing Similar - See Fig. 2)**

**Maximum Reactions for Bearing Block Details A-C (Single-Ply Truss with Bearing Block on One Face)**

Detail	Bottom Chord (BC) Size	Lumber Species	Max. Reaction	
			3.5" Brg Width	5.5" Brg Width
A	2x4	SP	4185 lbs.	5880 lbs.
		DF	4395 lbs.	6270 lbs.
		HF	3090 lbs.	4305 lbs.
		SPF	3175 lbs.	4450 lbs.
B	2x6	SP	4795 lbs.	6490 lbs.
		DF	4955 lbs.	6830 lbs.
		HF	3575 lbs.	4790 lbs.
		SPF	3645 lbs.	4920 lbs.
C	2x8 or larger	SP	5405 lbs.	7100 lbs.
		DF	5510 lbs.	7385 lbs.
		HF	4060 lbs.	5275 lbs.
		SPF	4115 lbs.	5390 lbs.

**DETAIL LIMITATIONS:**

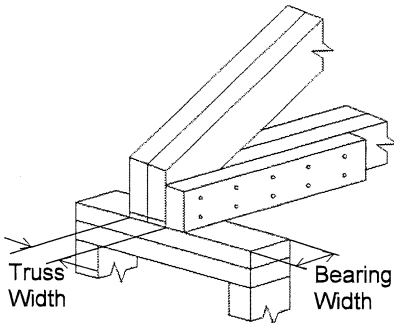
Load Duration Factor: 1.15

**Nail Dimension**

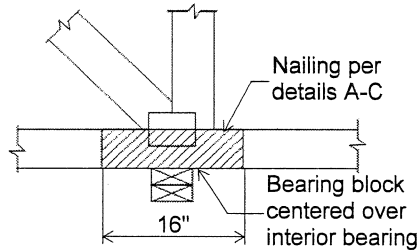
10d = 3" x 0.131"

**NOTES:**

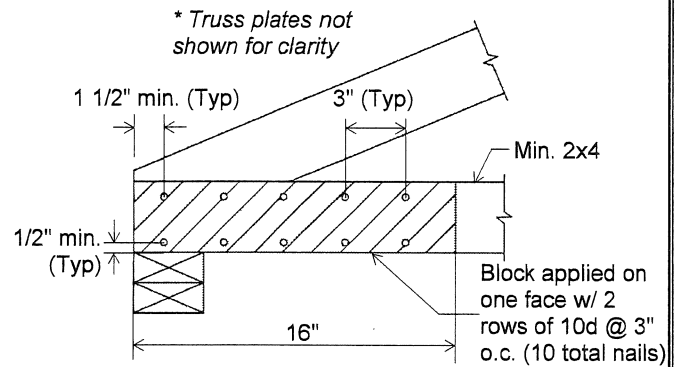
1. This detail provides information for attaching a bearing block to one face of a 2-ply truss to increase the allowable reaction of the truss.
2. Refer to the individual truss design drawing for the bottom chord size and other design information.
3. The bearing blocks must be min. 16" long and the same size, species and grade as the truss bottom chord.
4. If the truss bottom chord species is different than the bearing material, the lower of the listed reactions for Details A-C shall apply. Values listed for SP do not apply to Non-Dense (ND) grades.



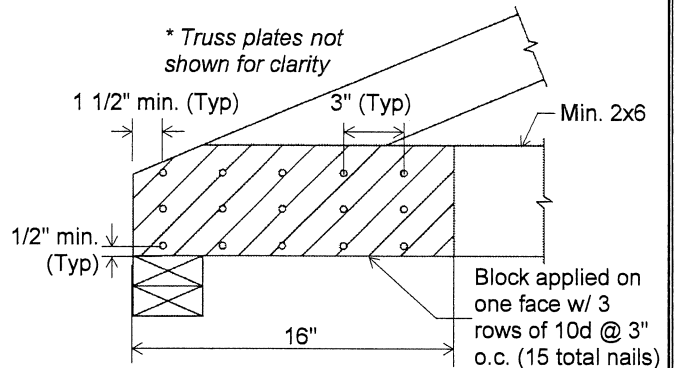
**Fig. 1 Bearing Block at End of Truss**



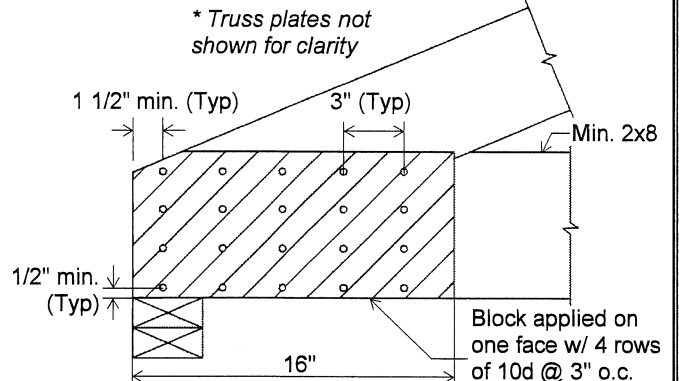
**Fig. 2 Bearing Block at Interior Bearing**



**Detail A - Bearing Block Detail for 2x4 Bottom Chord (Interior Bearing Similar - See Fig. 2)**



**Detail B - Bearing Block Detail for 2x6 Bottom Chord (Interior Bearing Similar - See Fig. 2)**



**Detail C - Bearing Block Detail for 2x8 or Larger Bottom Chord (Interior Bearing Similar - See Fig. 2)**

**Maximum Reactions for Bearing Block Details A-C (2-Ply Truss with Bearing Block on One Face)**

Detail	Bottom Chord (BC) Size	Lumber Species	Max. Reaction	
			3.5" Brg Width	5.5" Brg Width
A	2x4	SP	7150 lbs.	10540 lbs.
		DF	7680 lbs.	11430 lbs.
		HF	5220 lbs.	7650 lbs.
		SPF	5405 lbs.	7955 lbs.
B	2x6	SP	7760 lbs.	11150 lbs.
		DF	8235 lbs.	11985 lbs.
		HF	5700 lbs.	8130 lbs.
		SPF	5875 lbs.	8425 lbs.
C	2x8 or larger	SP	8370 lbs.	11760 lbs.
		DF	8795 lbs.	12545 lbs.
		HF	6185 lbs.	8615 lbs.
		SPF	6350 lbs.	8900 lbs.

**DETAIL LIMITATIONS:**

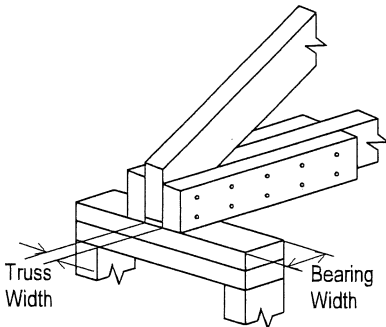
Load Duration Factor: 1.15

**Nail Dimension**

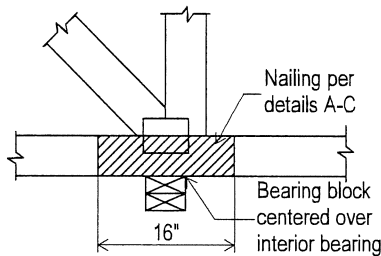
10d = 3. x 0.131"

**NOTES:**

1. This detail provides information for attaching a bearing block to both faces of a single-ply truss to increase the allowable reaction of the truss.
2. Refer to the individual truss design drawing for the bottom chord size and other design information.
3. The bearing blocks must be min. 16" long and the same size, species and grade as the truss bottom chord.
4. If the truss bottom chord species is different than the bearing material, the lower of the listed reactions for Details A-C shall apply. Values listed for SP do not apply to Non-Dense (ND) grades.



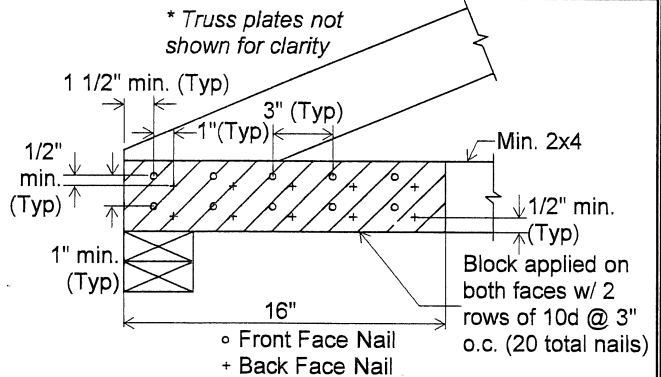
**Fig. 1 Bearing Block at End of Truss**



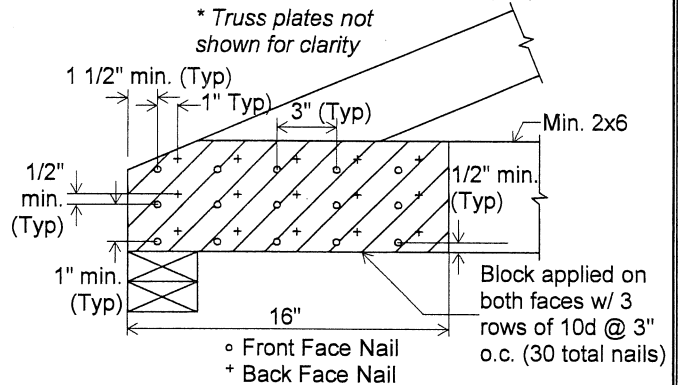
**Fig. 2 Bearing Block at Interior Bearing**

**Maximum Reactions for Bearing Block Details A-C  
(Single-Ply Truss with Bearing Block on Both Face)**

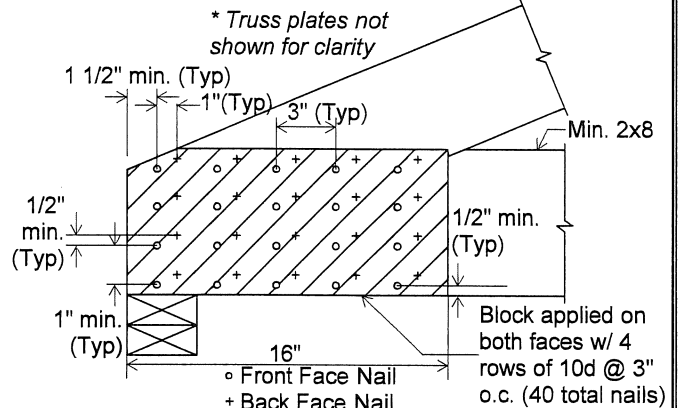
Detail	Bottom Chord (BC) Size	Lumber Species	Max. Reaction	
			3.5" Brg Width	5.5" Brg Width
A	2x4	SP	5405 lbs.	7100 lbs.
		DF	5510 lbs.	7385 lbs.
		HF	4060 lbs.	5275 lbs.
		SPF	4115 lbs.	5390 lbs.
B	2x6	SP	6625 lbs.	8320 lbs.
		DF	6630 lbs.	8505 lbs.
		HF	5025 lbs.	6240 lbs.
		SPF	5060 lbs.	6335 lbs.
C	2x8 or larger	SP	7840 lbs.	9535 lbs.
		DF	7745 lbs.	9620 lbs.
		HF	5990 lbs.	7205 lbs.
		SPF	6005 lbs.	7280 lbs.



**Detail A - Bearing Block Detail for 2x4 Bottom Chord  
(Interior Bearing Similar - See Fig. 2)**



**Detail B - Bearing Block Detail for 2x6 Bottom Chord  
(Interior Bearing Similar - See Fig. 2)**



**Detail C - Bearing Block Detail for 2x8 or Larger Bottom Chord  
(Interior Bearing Similar - See Fig. 2)**

**DETAIL LIMITATIONS:**

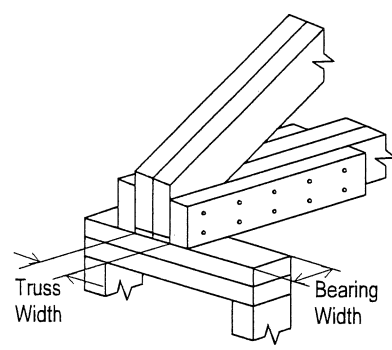
Load Duration Factor: 1.15

**Nail Dimension**

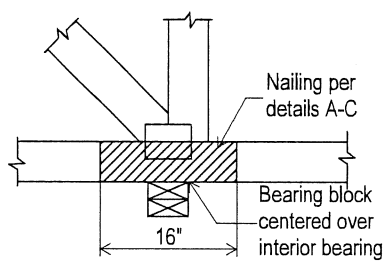
10d = 3" x 0.131"

**NOTES:**

1. This detail provides information for attaching a bearing block to both faces of a 2-ply truss to increase the allowable reaction of the truss.
2. Refer to the individual truss design drawing for the bottom chord size and other design information.
3. The bearing blocks must be min. 16" long and the same size, species and grade as the truss bottom chord.
4. If the truss bottom chord species is different than the bearing material, the lower of the listed reactions for Details A-C shall apply. Values listed for SP do not apply to Non-Dense (ND) grades.



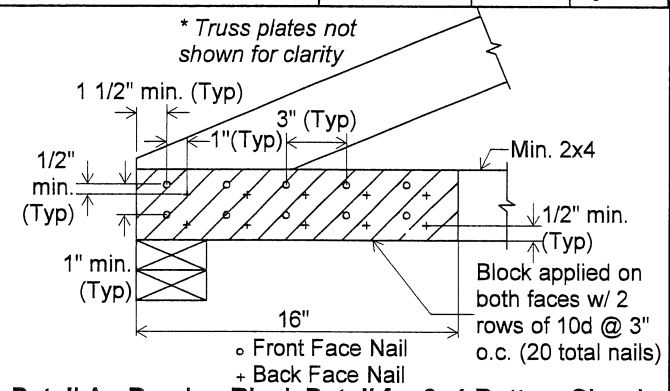
**Fig. 1 Bearing Block at End of Truss**



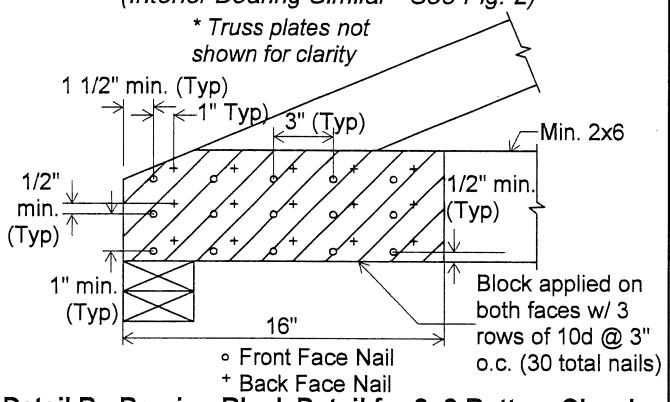
**Fig. 2 Bearing Block at Interior Bearing**

**Maximum Reactions for Bearing Block Details A-C  
(2-Ply Truss with Bearing Block on Both Face)**

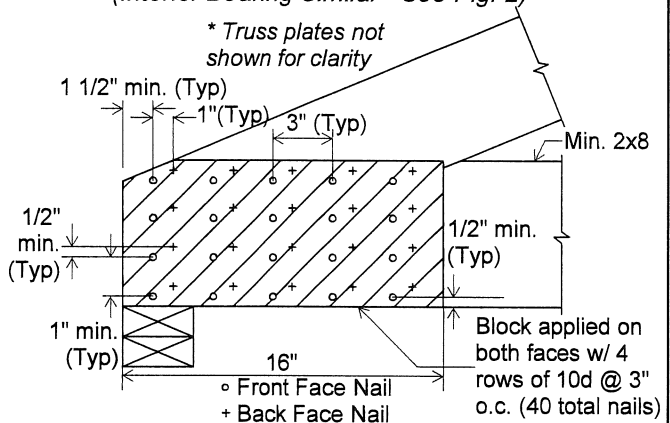
Detail	Bottom Chord (BC) Size	Lumber Species	Max. Reaction	
			3.5" Brg Width	5.5" Brg Width
A	2x4	SP	8370 lbs.	11760 lbs.
		DF	8795 lbs.	12545 lbs.
		HF	6185 lbs.	8615 lbs.
		SPF	6350 lbs.	8900 lbs.
B	2x6	SP	9590 lbs.	12980 lbs.
		DF	9910 lbs.	13660 lbs.
		HF	7150 lbs.	9580 lbs.
		SPF	7290 lbs.	9840 lbs.
C	2x8 or larger	SP	10810 lbs.	14200 lbs.
		DF	11025 lbs.	14775 lbs.
		HF	8115 lbs.	10545 lbs.
		SPF	8235 lbs.	10785 lbs.



**Detail A - Bearing Block Detail for 2x4 Bottom Chord  
(Interior Bearing Similar - See Fig. 2)**



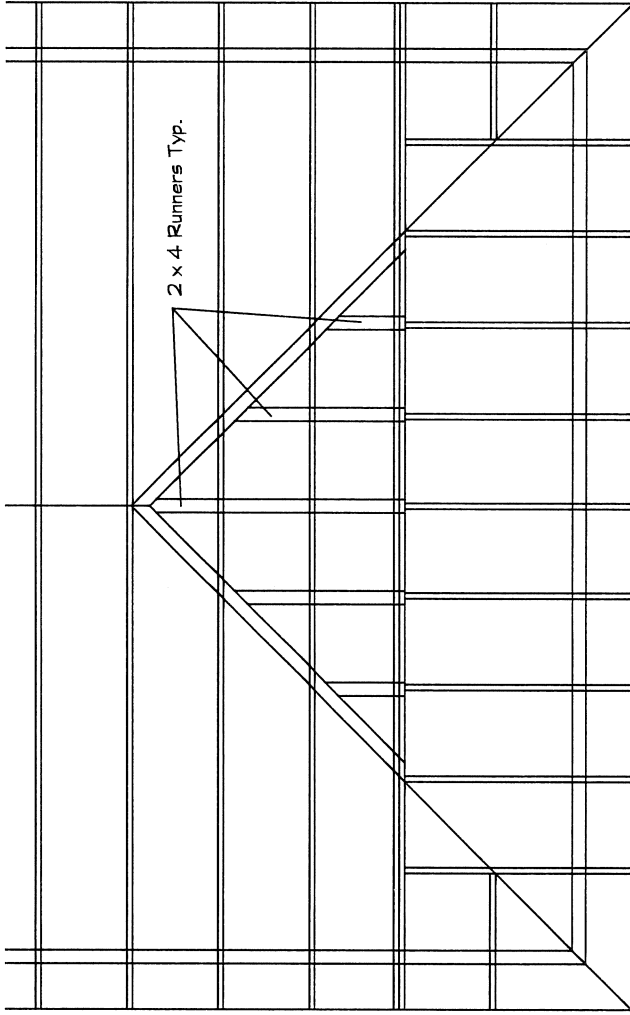
**Detail B - Bearing Block Detail for 2x6 Bottom Chord  
(Interior Bearing Similar - See Fig. 2)**



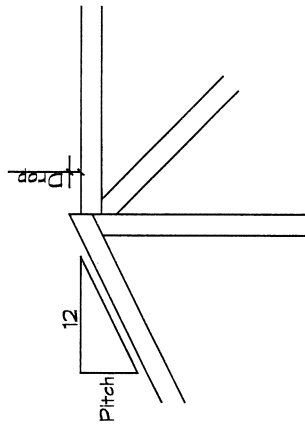
**Detail C - Bearing Block Detail for 2x8 or Larger Bottom Chord  
(Interior Bearing Similar - See Fig. 2)**

**DETAIL LIMITATIONS:**  
Load Duration Factor: 1.15

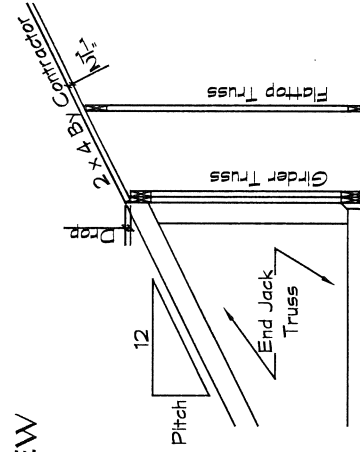
**Nail Dimension**  
10d = 3" x 0.131"



PLAN VIEW



FRONT VIEW



SECTION CUT

DRAWN BY:	D. ELLIOTT
SCALE:	NOT TO SCALE
DATE:	12/21/2017
INVOICE # / TRUSS TYPE:	Hip End Runner Detail

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