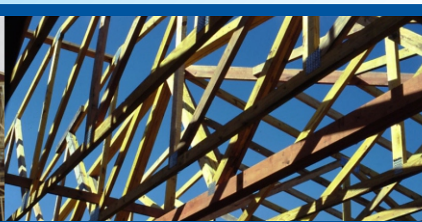
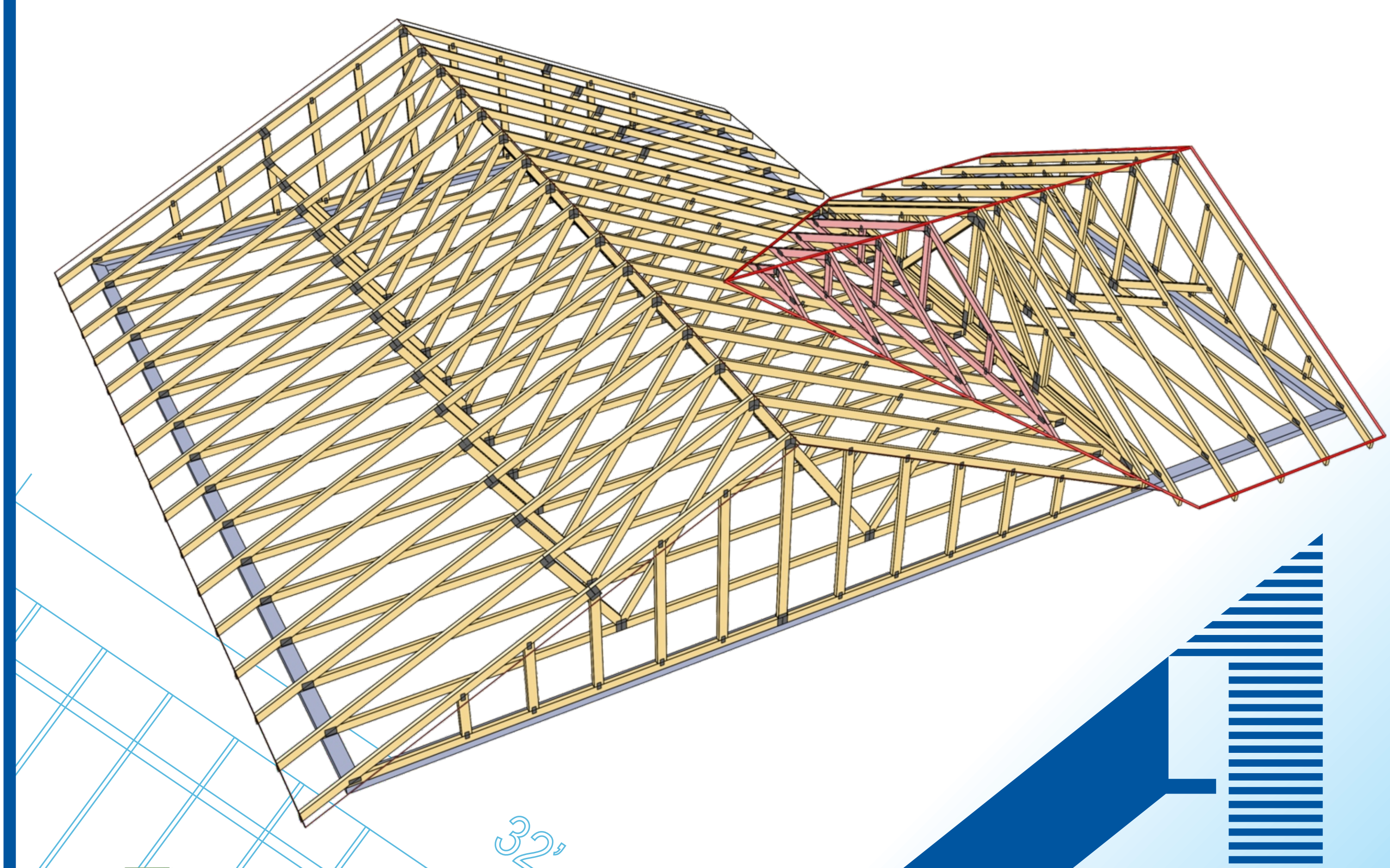




Get more Quality, Flexibility and Labor Savings using ROOF TRUSSES







Wood Roof Trusses are Environmentally Compatible.

A-1 INDUSTRIES

BUILDING A 100 YEAR COMPANY

Get more Quality, Flexibility and Labor Savings using

ROOF TRUSSES

Builders need solutions that help them stay on schedule while maintaining quality construction and profitability. Compared with traditional stick-built roof framing, manufactured wood roof truss systems provide a strong, engineered solution that can be installed quickly and efficiently.

A manufactured truss is an engineered structural component assembled from wood members, metal connector plates, and other mechanical fasteners. The members are arranged in triangles to create a semi-rigid structural framework designed to carry specific roof loads. Each truss is designed in accordance with applicable engineering standards and includes required safety factors for the roof system.

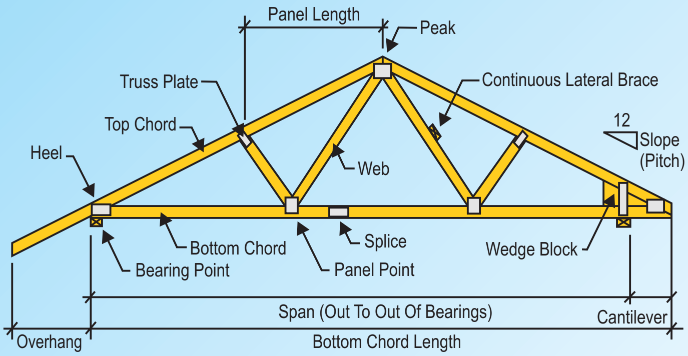
Most builders are familiar with roof truss systems, but they may not realize all the advantages of a manufactured system. Traditional stick-built roofs typically require larger quantities of lumber, and their reserve strength can vary depending on layout, materials, jobsite conditions, and carpenter skill.

Manufactured wood roof trusses can span long distances, creating larger open spaces below with fewer columns and interior bearing partitions. Because they are manufactured in a controlled environment, trusses reduce jobsite variables, help limit material waste, and conserve timber resources. Owners can have peace of mind knowing their roof trusses have been professionally engineered and manufactured for their specific project.

The Benefits of Wood Trusses:

- A wood-trussed home costs less. The total in-place cost of the trussed roof and floor systems is lower. Trusses are delivered to the site, ready to be installed. Labor is saved because trusses can be installed three to four times faster than a carpenter would need to build the roof on-site. The open spaces in the trusses allow ductwork, plumbing, and wiring to be installed quickly and easily. Construction costs also are reduced because the building is “closed-in” faster, there is less pilferage of materials, and it takes less time to clean up the site.
- You get peace of mind – knowing that the trusses were professionally computer-designed, engineered, and factory-built to ensure the highest quality and reliability.
- Trusses allow virtually unlimited architectural versatility. That means designs can include vaulted or studio ceilings inside the home and high-pitched or hipped roofs on the exterior, offering greater aesthetic and functional advantages.
- Proven performance – hundreds of millions of wood trusses have been installed nationwide. In fact, wood trusses are used in more than 75% of all homes built in the U. S. and Canada today.
- Pre-engineered wood trusses are scientifically designed for strength. A pre-engineered framing system eliminates guesswork on the construction site.

Parts of a Truss:



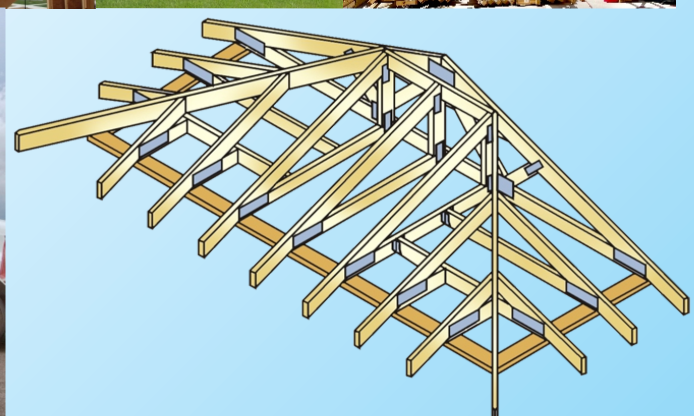
The component manufacturing process is simple and offers the professional builder plenty of time- and cost-saving resources along the way. **Here's how it works:**

House plans are sent by the builder to the truss manufacturer. There are dozens of truss manufacturers operating nationwide, but builders should research the quality and delivery costs before choosing a vendor.

The manufacturer determines what loads the building designer requires to be supported within the home, how many trusses will be required, and their specific placement in the house. The manufacturer then builds the trusses, numbers them for accurate installation, and ships them to the builder on the job site.

A detailed diagram with the placements of the trusses is sent along with the trusses to help the builder place the trusses exactly where they should be installed.

Once the trusses are on site, builders begin to see the benefits. Consistent truss sizing and height make sheathing installation easier, and the open-web design allows utilities to be routed within the roof system without drilling or cutting holes. These benefits reduce the time trade contractors spend on site, speed up construction, and help save the builder money. The technology used in the design and manufacturing of roof trusses makes them a superior choice for builders looking to streamline construction and provide a higher-quality home to their customers.



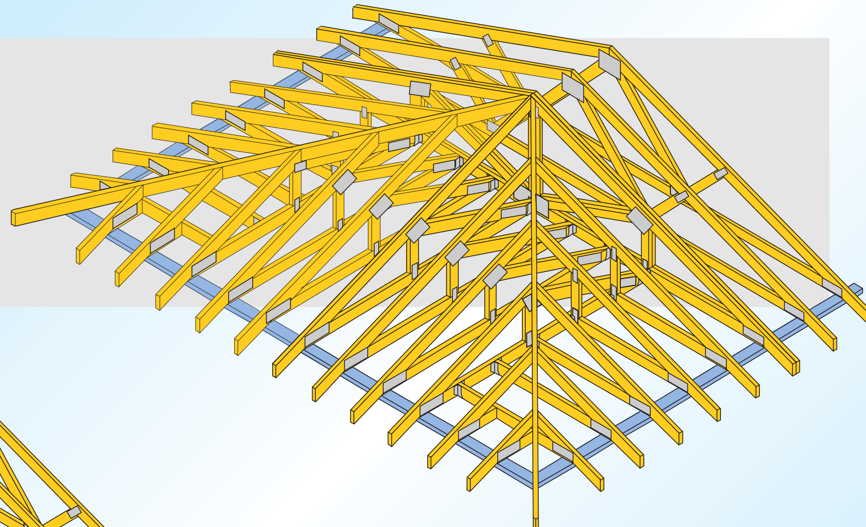
Framing with Trusses

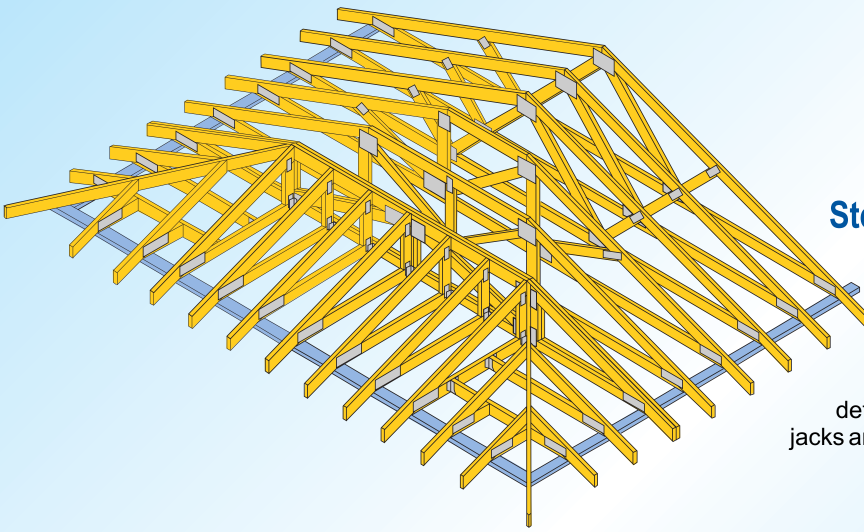
Hip Framing

Trussed hip framing offers the advantage of clear span, an eave or fascia line at the same elevation around the building, and the speed of pre-built components. The end slope may be equal to or different from the side slope. The ceiling line may be flat or sloped. Sloped ceilings have limitations, therefore, consult the truss designer.

Terminal Hip Framing

Best suited for relatively short spans of 26’-0” or less, the hip jacks extend directly to the peak. The distance from the end wall to the face of the girder is equal to one half the span, provided the slopes are equal. The last standard truss is designed as a girder to carry loads transferred by the hip jack.



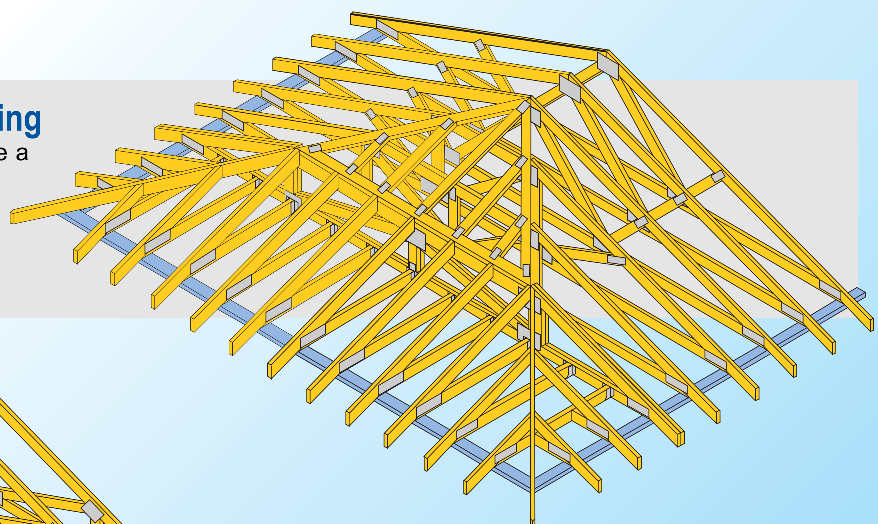


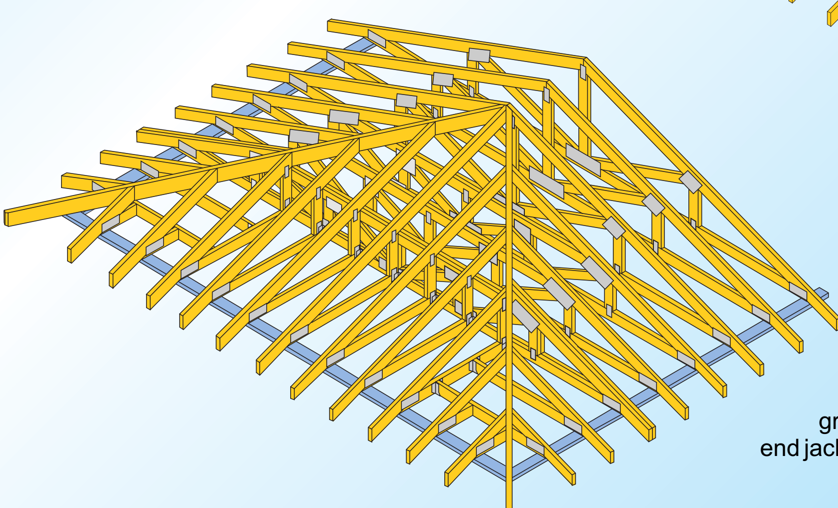
Step Down Hip Framing

Better suited for longer spans, the Step Down hip is the most versatile of all hip types. Each of the “step down” trusses is the same span and has the same overhang as the adjacent standard trusses, but decrease in height to form the end slope. The girder location is generally from 8 to 12 feet from the end wall and is determined by the span to depth ratio. The corner and end jacks are normally pre-built components.

Midwest Hip Framing

The Midwest type hip framing was developed to create a more uniform configuration of each of the trusses in the hip. This hip type also provides for a more uniform structure for attaching the decking. Span capability is the same as the step down hip.

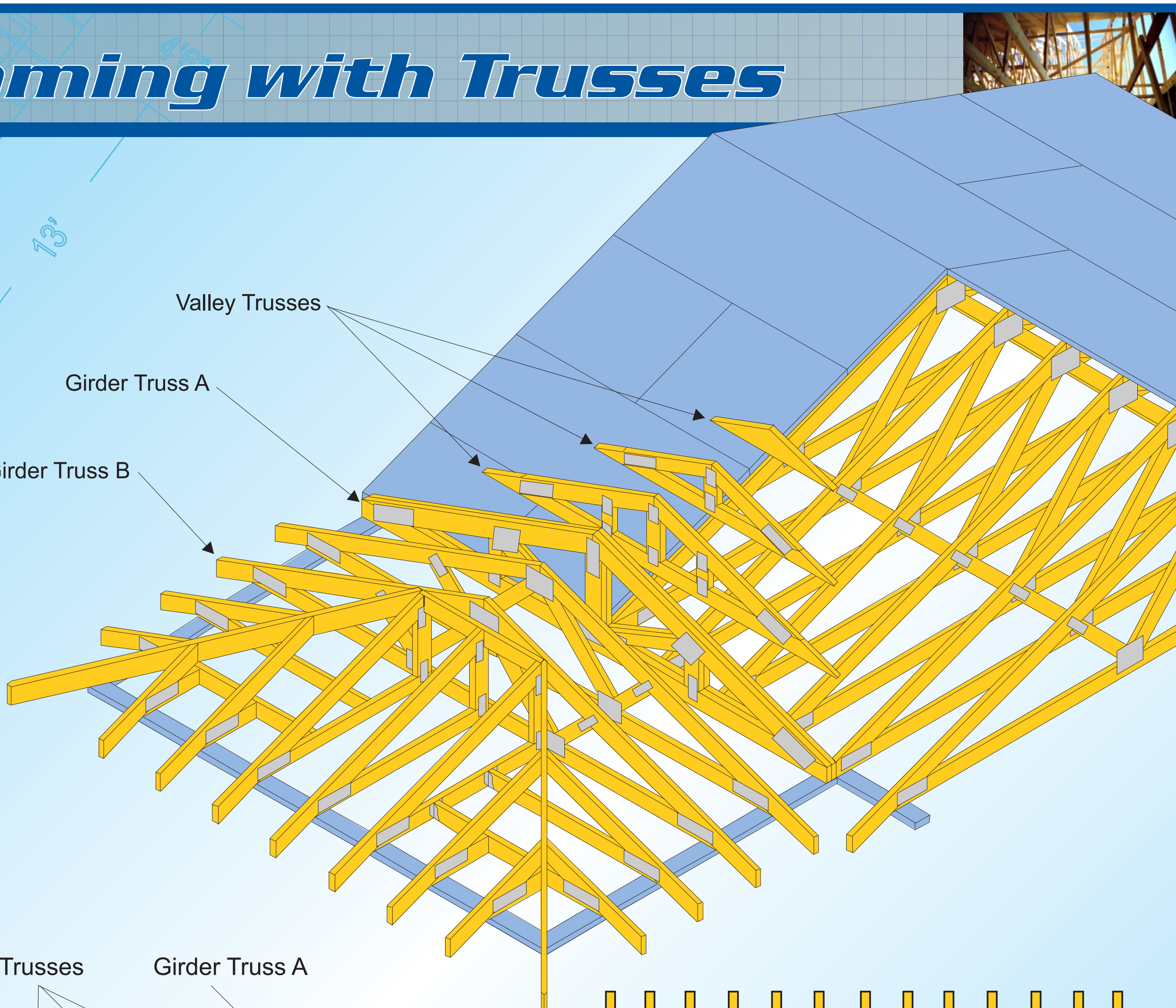


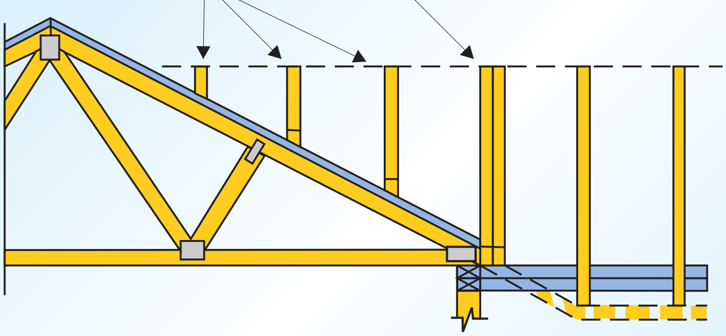


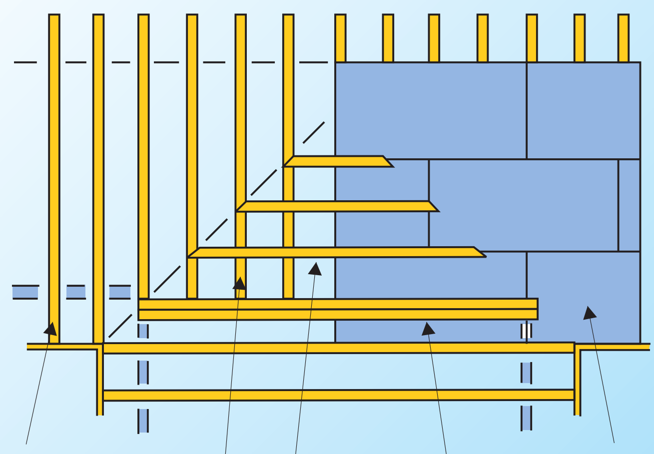
California Hip Framing

Although this type hip framing is used as an alternative to the step down hip, the California hip is similar in span capability and field installation. The base portion of each truss inside the girder is the same, except that the sloping top chord of each successive truss is extended upward greater amounts to form the slope intersection. Corner and end jacks are used to form the area outside the girder.

Framing with Trusses







Girder Trusses

Girder trusses have two main purposes. The first (Girder Truss A) exists in L, T, H and, U-shaped buildings to eliminate the need for an interior load-bearing wall. The girder is used to support one end of the intersecting trusses. The trusses are carried on the bottom chord of the girder by hangers.

The second use of a girder truss (Girder Truss B) is to support perpendicular framing in hip roofs. In some plans girder truss A and B may be one in the same. The hip framing is carried on both the top and bottom chords of the girder truss by nailing or by hangers.

Girder trusses, because of the heavy loads they support, are generally multiple units with larger chord members than the adjacent trusses. Generally, because of the construction of girders, overhangs are not used.

The girder truss may also be designed for "drag strut" loads which are calculated and specified by the building designer.

Valley Framing Sets

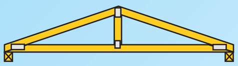
Valley framing sets are primarily used to form a ridge line by framing over the main roof where perpendicular building sections intersect.

Valley trusses are set directly on the main trusses. Sheathing is required for main trusses with 2x4 top chords, and is recommended for other top chord sizes, under valley frames to continue the lateral bracing of the main truss top chords. The bottom chords of the valley trusses are generally beveled to match the slope of the roof below.

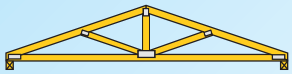
Typical Wood Truss

Configurations

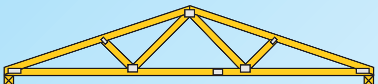
Wood trusses are pre-built components that function as structural support members. A truss commonly employs one or more triangles in its construction. The wood truss configurations illustrated here are a representative sampling. The number of panels, configuration of webs and length of spans will vary according to given applications, building materials and regional conditions. Always refer to an engineered drawing for the actual truss design.



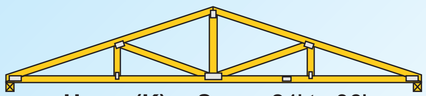
King Post -- Span Up to 16'



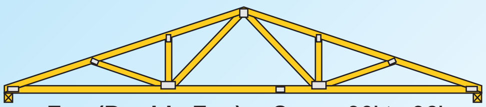
Queen Post (Fan) -- Spans 10' to 22'



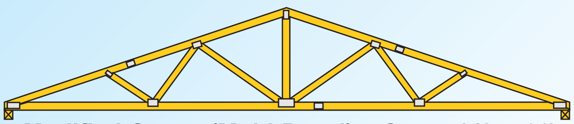
Fink (W) -- Spans 16' to 33'



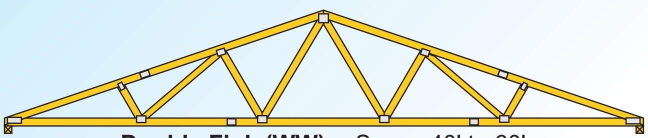
Howe (K) -- Spans 24' to 36'



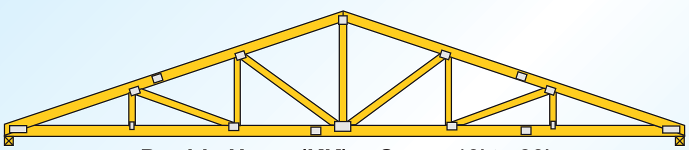
Fan (Double Fan) -- Spans 30' to 36'



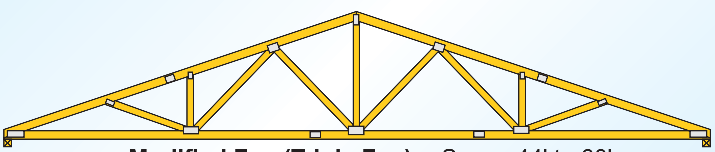
Modified Queen (Multi-Panel) -- Spans 32' to 44'



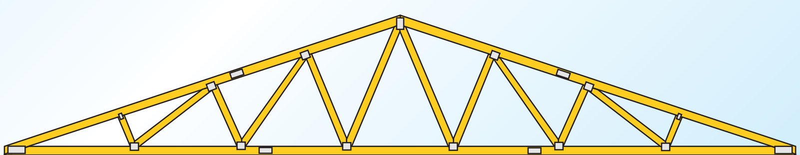
Double Fink (WW) -- Spans 40' to 60'



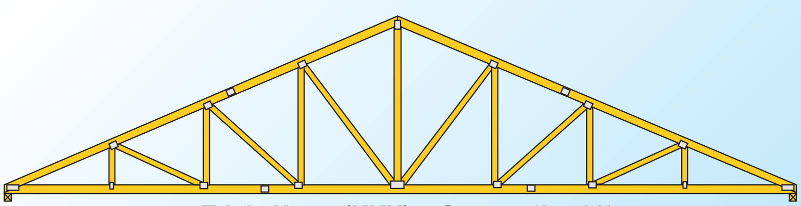
Double Howe (KK) -- Spans 40' to 60'



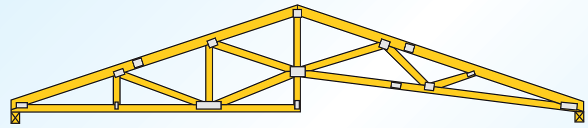
Modified Fan (Triple Fan) -- Spans 44' to 60'



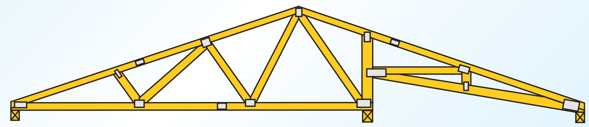
Triple Fink (WWW) -- Spans 54' to 80'



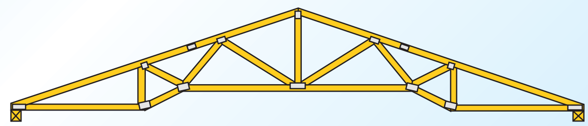
Triple Howe (KKK) -- Spans 54' to 80'



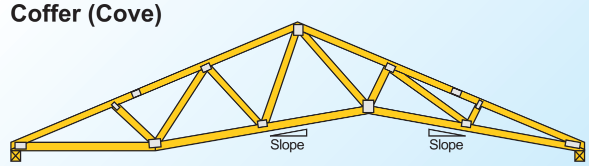
Vault - Two Bearing Points



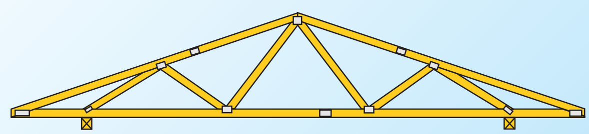
Vault - Three Bearing Points



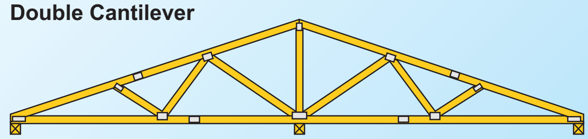
Coffer (Cove)



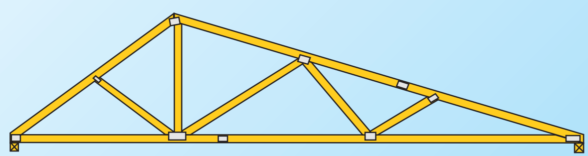
Cathedral (CATH)



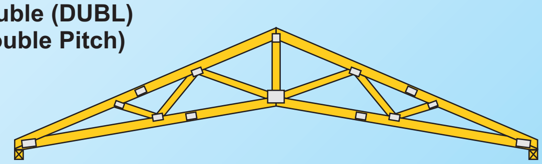
Double Cantilever



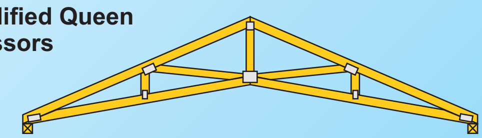
Tri-Bearing



Double (DUBL)
(Double Pitch)



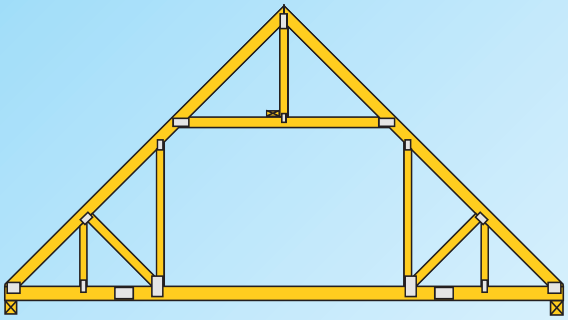
Modified Queen Scissors



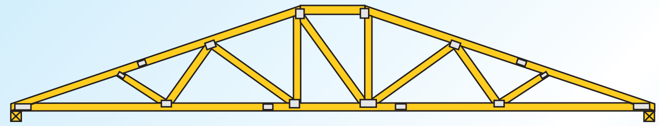
Howe Scissors

Typical Wood Truss

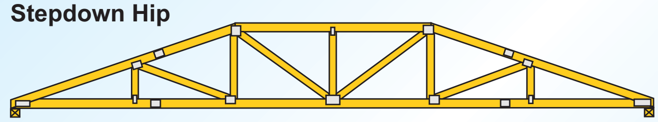
Configurations



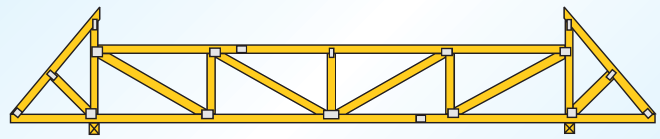
Room-In-Attic



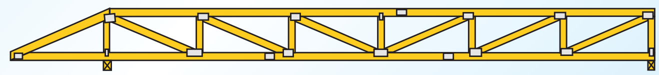
Stepdown Hip



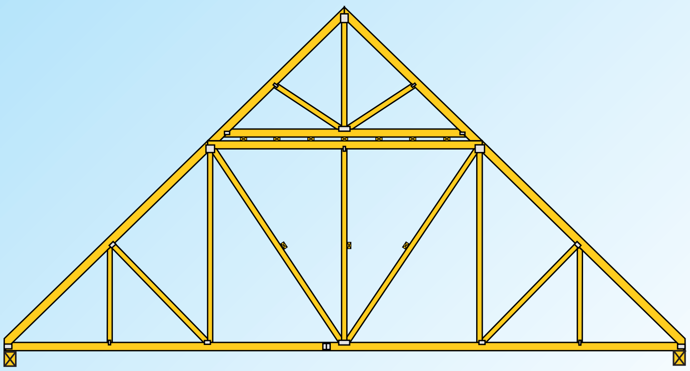
Hip Girder



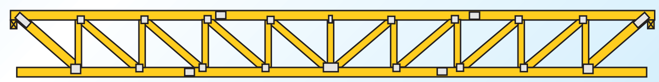
Double Cantilever With Parapets



Flat Truss With Cantilever (Pratt Configuration)

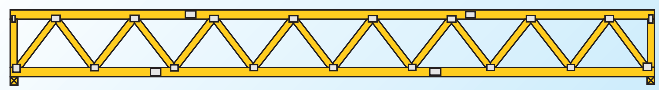


Piggyback

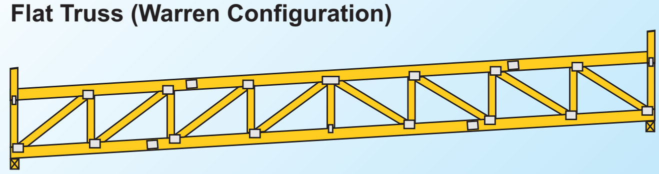


Top Chord Bearing Flat Truss (Pratt Configuration)

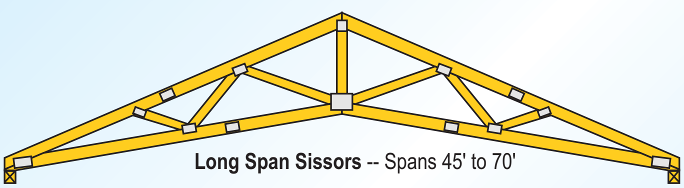
Large, Long Span Trusses require special handling and erection specifications. The installation of wood trusses requires the same high degree of safety awareness as the installation of any other structural material. Spans over 60’ may require complex permanent bracing. Please ask your sales representative for more information.



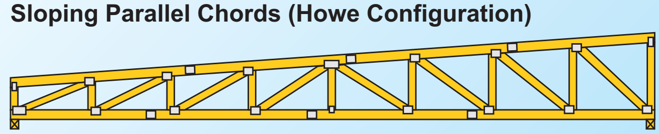
Flat Truss (Warren Configuration)



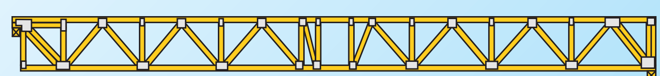
Sloping Parallel Chords (Howe Configuration)



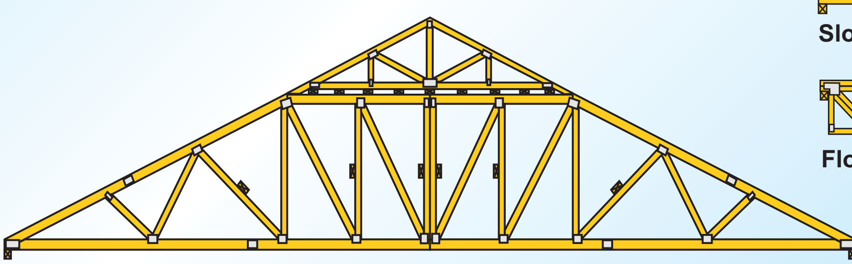
Long Span Sissors -- Spans 45' to 70'



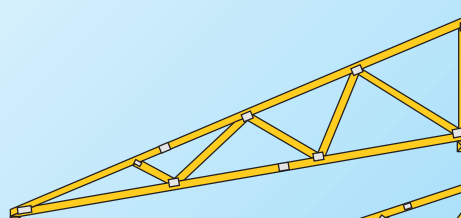
Sloping Top Chord (Howe Configuration)



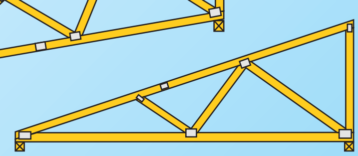
Floor Truss (System 42 - Modified Warren Configuration)



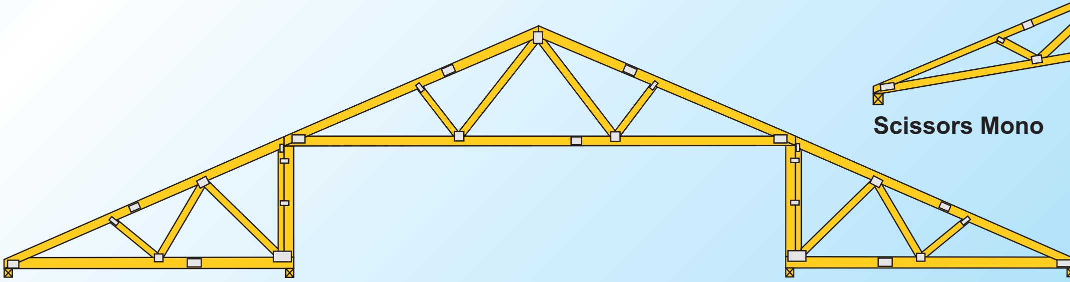
Three Piece Long Span (Field Connected) -- Spans 60' to 80'



Scissors Mono



Mono



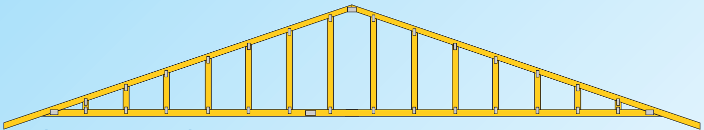
Three Piece Raised Center Bay -- Lengths 50' to 100'+

Proud Fabricator ALPINE® AN ITW COMPANY

Framing with Trusses

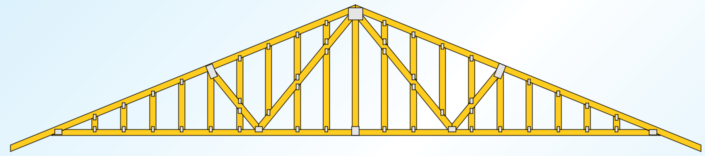
Gable Framing

Gable ends, when not configured in triangles as a truss, are more like stud walls. However, they are structural elements and are analyzed to resist wind and seismic loads as noted on the truss design. The web design or framing pattern is determined by the type of siding, either horizontal or vertical, and the need for a louver in the end of the building. The type of gable required is controlled by the end overhang and the need to match a soffit line.



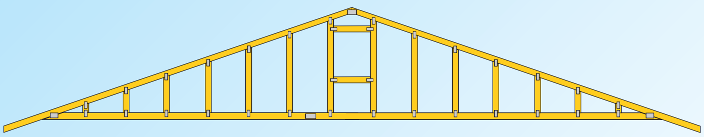
Standard Gable

Stud spacing as necessary to support siding.

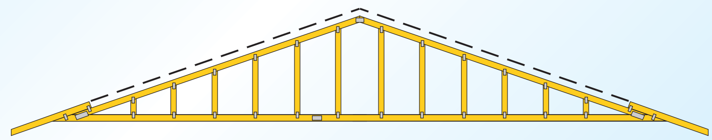


Clear Span Gable

Used when the gable wall does not provide continuous bearing support for the gable framing.

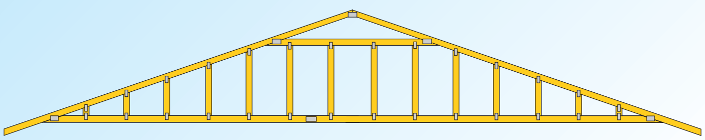


Standard Gable Framed For Rectangular Louver

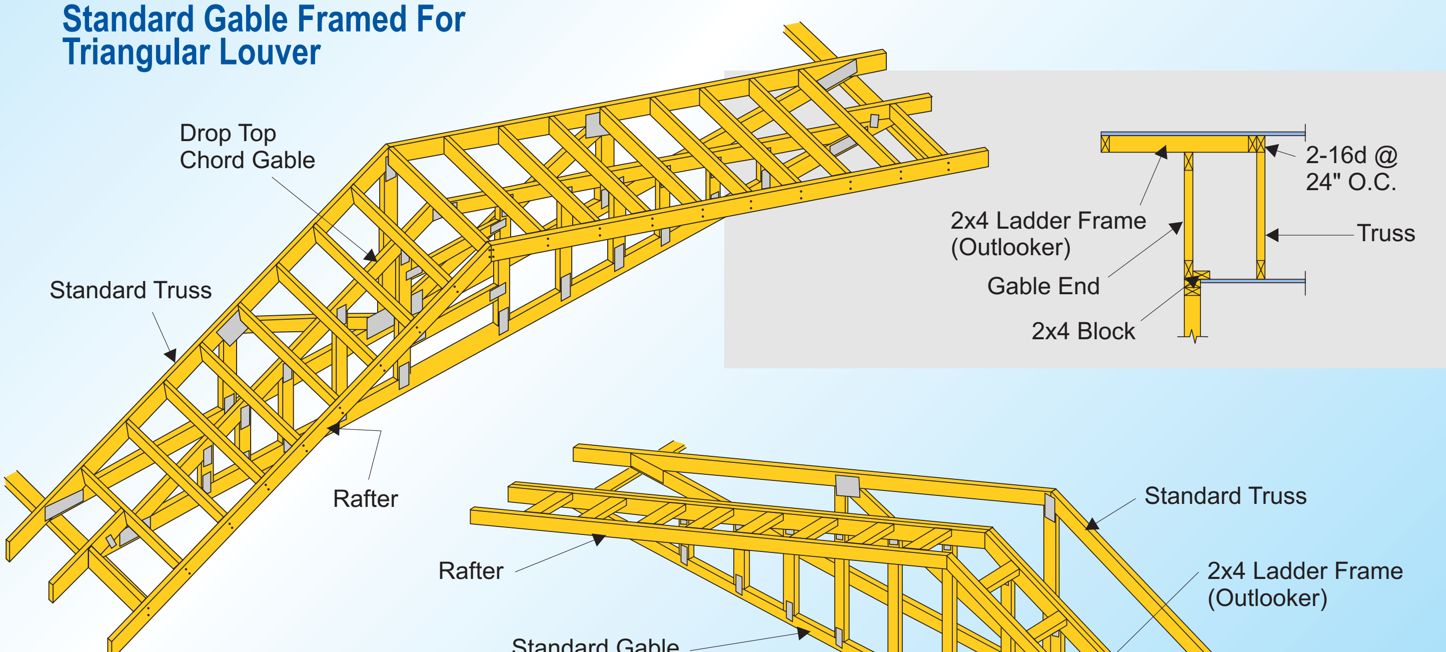


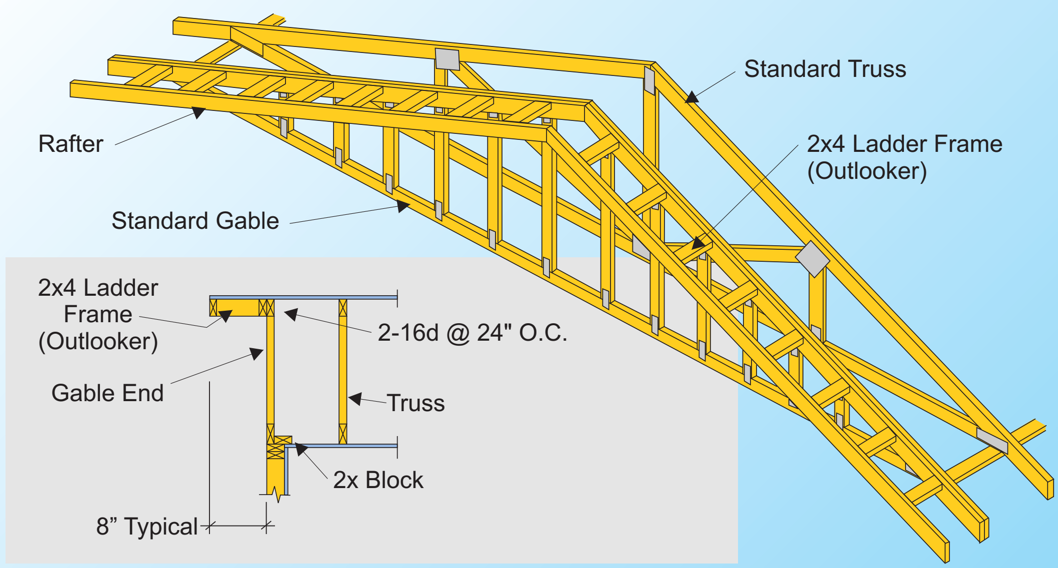
Dropped Top Chord Gable

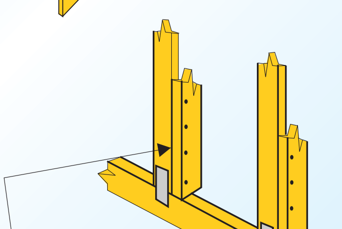
Illustrated with studs. Also available with framing for rectangular, square or triangular louver.



Standard Gable Framed For Triangular Louver







A reinforcing member may be required on some gable end vertical members.

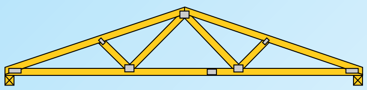
Roof Truss Span Tables

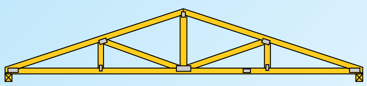
Alpine truss designs are engineered to meet specific span, configuration and load conditions. The shapes and spans shown here represent only a fraction of the millions of designs produced by Alpine Engineers.

Total load(PSF)	55			47			40			40		
Duration factor	1.15			1.15			1.15			1.25		
Live load(PSF)	40 snow			30 snow			20 snow			20 **		
Roof type	shingle			shingle			shingle			shingle		
	55 / 1.15 / 30 snow tile									**construction or rain, not snow load		
Top Chord	2x4	2x6	2x6	2x4	2x6	2x6	2x4	2x6	2x6	2x4	2x6	2x6
Bottom Chord	2x4	2x4	2x6	2x4	2x4	2x6	2x4	2x4	2x6	2x4	2x4	2x6

Common

-- Truss configurations for the most widely designed roof shapes.

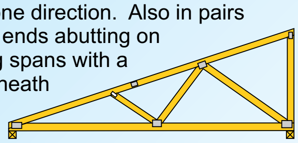




Pitch	Spans in feet to out of bearing											
2/12	24	24	33	27	27	37	31	31	43	33	33	46
2.5/12	29	29	39	33	33	45	37	38	52	39	40	55
3/12	34	34	46	37	39	53	40	44	60	43	46	64
3.5/12	39	39	53	41	44	61	44	50	65	47	52	70
4/12	41	43	59	43	49	64	46	56	69	49	57	74
5/12	44	52	67*	46	58	69*	49	66	74*	53	66	80*
6/12	46	60*	69*	47	67*	71*	51	74*	76*	55	74*	82*
7/12	47	67*	70*	48*	72*	72*	52*	77*	77*	56*	80*	83*

Mono

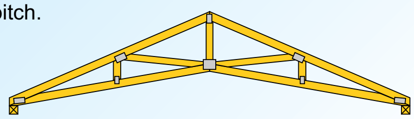
-- Used where the roof is required to slope only in one direction. Also in pairs with their high ends abutting on extremely long spans with a support underneath the high end.



2/12	24	24	33	25	27	38	27	31	41	29	32	44
2.5/12	28	29	40	29	32	43	31	37	46	33	37	49
3/12	30	33	45	31	37	47	34	42	50	36	42	54
3.5/12	33	37	49*	34	41	51*	36	46	54*	39	46	58*
4/12	35	41	52*	36	45*	54*	39	50*	58*	42*	49*	62*
5/12	38*	47*	57*	39*	51*	59*	42*	56*	63*	45*	54*	68*

Scissors

-- Provides a cathedral or vaulted ceiling. Most economical when the difference in slope between the top and bottom chords is at least 3/12 or the bottom chord pitch is no more than half the top chord pitch.

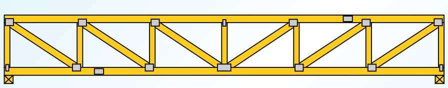


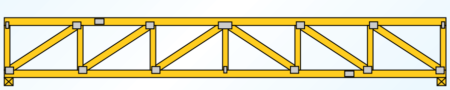
6/12 - 2/12 ‡	40	43	59*	42	49	62*	45	56*	66	48	57*	71*
6/12 - 2.5/12 ‡	37	38	52	38	44	57*	41	50	61*	44	52	66*
6/12 - 3/12 ‡	33	33	45	35	38	52	38	43	56*	40	46	60*
6/12 - 3.5/12 ‡	28	28	38	32	32	44	34	37	50	36	39	54
6/12 - 4/12 ‡	22	22	31	26	26	36	30	30	41	32	32	44

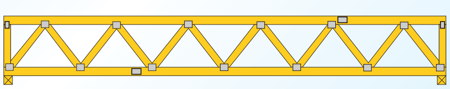
‡ Other pitch combinations available with these spans
For Example, a 5/12 - 2/12 combination has approx. the same allowable span as a 6/12 - 3/12

Flat

-- The most economical flat truss for a roof is provided when the depth of the truss in inches is approximately equal to 7% of the span in inches.







Total load(PSF)	55			47			40			40		
Duration factor	1.15			1.15			1.15			1.25		
Live load(PSF)	40 snow			30 snow			20 snow			20 rain or constn.		
Top Chord	2x4	2x6	2x6	2x4	2x6	2x6	2x4	2x6	2x6	2x4	2x6	2x6
Bottom Chord	2x4	2x4	2x6	2x4	2x4	2x6	2x4	2x4	2x6	2x4	2x4	2x6
Depth	**Spans in feet to out of bearing**											
16"	23	24	25 §	25 §	25 §	25 §	25 §	25 §	25 §	25 §	25 §	25 §
18"	25	27	28	27	27	29 §	29 §	29 §	29 §	29 §	29 §	29 §
20"	27	28	30	28	28	32	31	30	33 §	32	31	33 §
24"	29	30	33	31	31	35	34	33	38	35	34	40
28"	32	32	36	34	33	39	37	36	42	38	37	44
30"	33	33	38	35	35	40	38	37	44	40	39	45
32"	34	34	39	36	36	42	39	39	45	41	40	47
36"	36	36	42	39	38	45	42	41	48	43	43	50
42"	39	39	45	41	41	48	44	44	52	45	46	54
48"	40	42	49	43	44	52	46	47	56	46	49	58
60"	44	47	55	46	49	58	48	53	63	49	55	65
72"	45	51	60	48	54	64	51	57	68	51	59	69

§ = Span Limited by length to depth ratio of 24

NOTES: These overall spans are based on NDS '01 with 4" nominal bearing each end, 24" o.c. spacing, a live load deflection limited to L/240 maximum and use lumber properties as follows: 2x4 f_b=2000 psi f_t=1100 psi E=1.8x10^6 2x6 f_b=1750 psi f_t=950 psi f_c=1900 psi E=1.8x10^6. Allowable spans for 2x4 top chord trusses using sheathing other than plywood (e.g. spaced sheathing or 1x boards) may be reduced slightly. Trusses must be designed for any special loading such as concentrated loads from hanging partitions or air conditioning units, and snow loads caused by drifting near parapet or slide-off from higher roofs. To achieve maximum indicated spans, trusses may require six or more panels. Trusses with an asterisk (*) that exceed 14' in height may be shipped in two pieces. Contact your A-1 representative for more information.

Recommendations for

Handling and Lifting

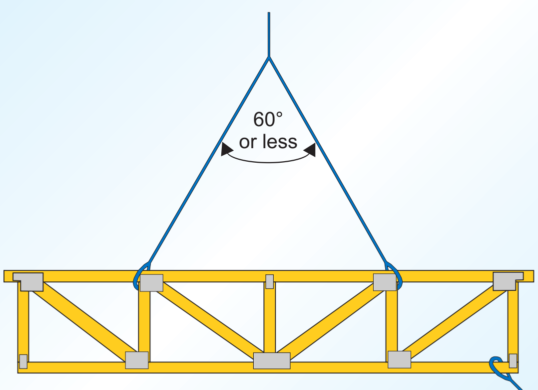
Installing wood trusses requires the same high degree of safety awareness as installing any other structural material. Prudent methods must be used at all times. Trusses may be installed manually, by crane, or by forklift, depending on truss size, wall height, and job conditions. Individual trusses should always be carried vertically to avoid lateral strain and damage to joints and members.

Trusses installed manually are slid into position over the sidewall and rotated into place using poles. The longer the span, the more workers are needed to avoid excessive lateral strain on the trusses. Trusses should be supported at joints and the peak while being raised.

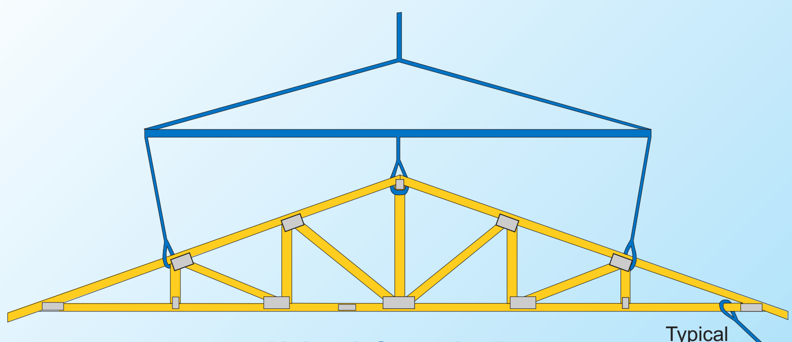
Large trusses require the most planning and attention before lifting and should be installed by a crane or forklift employing chokers, slings, spreader bars, and strongbacks to prevent lateral bending. Trusses may be lifted singly, in banded groups, or preassembled in groups. Planning is essential before lifting any truss. First, determine the proper location of lift points and the type of rigging and lifting procedure that will assure truss balance. Tag lines should always be used to control the movement of trusses during lifting and placement.



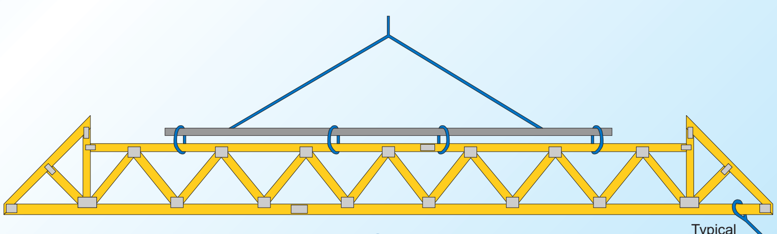




Using A Sling



Using A Spreader Bar



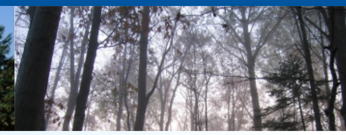
Using A Strongback

Important safety information: Refer to BCSI-2025 Guide to Good Practice for Handling, Installing, Restraining & Bracing of Metal Plate Connected Wood Trusses for more detailed information. This publication is jointly produced by the Truss Plate Institute and Wood Truss Council of America for proper installation methods. Installation procedures are the responsibility of the installer. Job conditions and procedures vary considerably. Every project has different site conditions that can affect the erection process. Before erecting the first truss, everyone involved must understand the installation plan and the intended bracing requirements for a safe, efficient, and accident-free job site. These are only guidelines and may not be proper under all conditions. Visit www.sbccomponents.com for specific details.

Wood Roof and Floor Trusses are

Environmentally Compatible

BUILDING GREEN: Using less gives more.



"Building Green" isn't new to the structural building components industry. In fact, we've been green since 1952! We are committed to helping our builders, remodelers, and homeowners practice environmental responsibility and sustainability by conserving today's resources for tomorrow's children. Every effort is made to offer products that balance design and performance with environmental responsibility. There's no getting around it; the wood you purchase comes from one of the Earth's most renewable resources—trees. Wood is the most energy efficient of major building products.

Components minimize the amount of material used and job site waste created. This is a no-brainer, but it's a good point for builders and general contractors to reinforce. And there's data to prove it! The 1996 SBCA (Formerly WTCA) Framing the American Dream® project reported more than 25 percent material savings (and labor savings of more than 60 percent!) when components were used to frame a 2600-sq.ft. home. **Visit www.sbcindustry.com/fad to learn more**.

Components are designed to utilize materials most efficiently. Don't forget that material efficiency is inherent to the process of component design. Design software enables the designer or technician to value engineer and optimize virtually any component design. This means material is not used when it isn't needed. Many green building rating systems recognize this benefit of components and award points based on their use. The National Resources Defense Council realized this fact in 1998 when they placed trusses high on their list of great products due to optimum value engineering.

Visit **www.sbccomponents.com** for more details on green building component fabrication.

Why Build Green? In the United States, buildings account for:

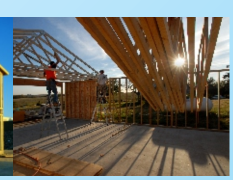
39% of total energy use, 12% of the total water consumption, 68% of total electricity consumption, and 38% of the carbon dioxide emissions.

The built environment dramatically impacts the natural environment, human health, and the economy. We can maximize economic and environmental performance by adopting green building strategies. Green construction methods can be integrated into buildings at any stage, from design and construction to renovation and deconstruction. However, the most significant benefits can be obtained if the design and construction team takes an integrated approach from the earliest stages of a building project. Potential benefits of green building can include:

Environmental benefits: enhance and protect biodiversity and ecosystems, improve air and water quality, reduce waste streams, and conserve and restore natural resources.

Economic benefits: Reduce operating costs, Expand markets for green product and services, Improve occupant productivity, Optimize life-cycle economic performance.

Social benefits: Enhance occupant comfort and health, Heighten aesthetic qualities, Minimize strain on local infrastructure, Improve overall quality of life.



https://archive.epa.gov/greenbuilding/web/html/whybuild.html.

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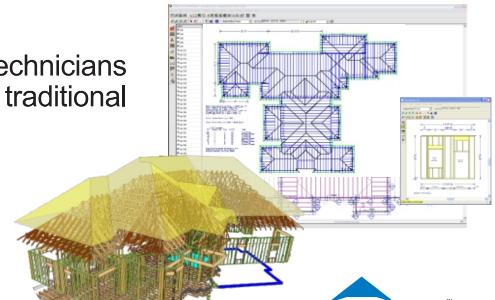
ROOF TRUSSES

Layout, Design and Engineering Software



Using advanced CAD-based design software, A-1's SBCA-certified truss technicians create accurate truss layouts tailored to each project. These designs include traditional plan views and 3-D visualizations that show each component in its proper position, giving builders a clearer understanding of how the framing system will come together before production begins.

From layout and design through manufacturing and delivery, A-1 provides precise, project-specific truss systems that support quality construction, efficient installation, and dependable field performance.

ALPINE IntelliVIEW

SBCA

Bracing is extremely IMPORTANT!! Every roof system needs adequate bracing. The purpose of most bracing is to ensure that the trusses and truss members remain straight and do not bow out of their plane. Inadequate, improper, or incorrectly installed bracing can lead to collapses, failures, and serious accidents. An engineered bracing system will avoid these pitfalls and ensure the structural integrity of the truss system. Trusses need to be braced during installation, which is called temporary bracing, and they need permanent bracing, which will remain installed for the life of the roof system. Follow the recommendations for handling, installing and temporary restraining and bracing of trusses.

Temporary Bracing Guidelines: For metal plate-connected wood truss systems, refer to the Structural Building Components Association's (SBCA) BCSI Guide to Good Practice for Handling, Installing, Restraining & Bracing of Metal Plate Connected Wood Trusses for more detailed information. Truss design drawings may specify permanent lateral restraint or reinforcement locations for individual truss members. For more information, refer to SBCA's BCSI Summary Sheet – Permanent Restraint/Bracing of Chords & Web Members.

To learn more, please visit: **www.sbcacomponents.com**

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