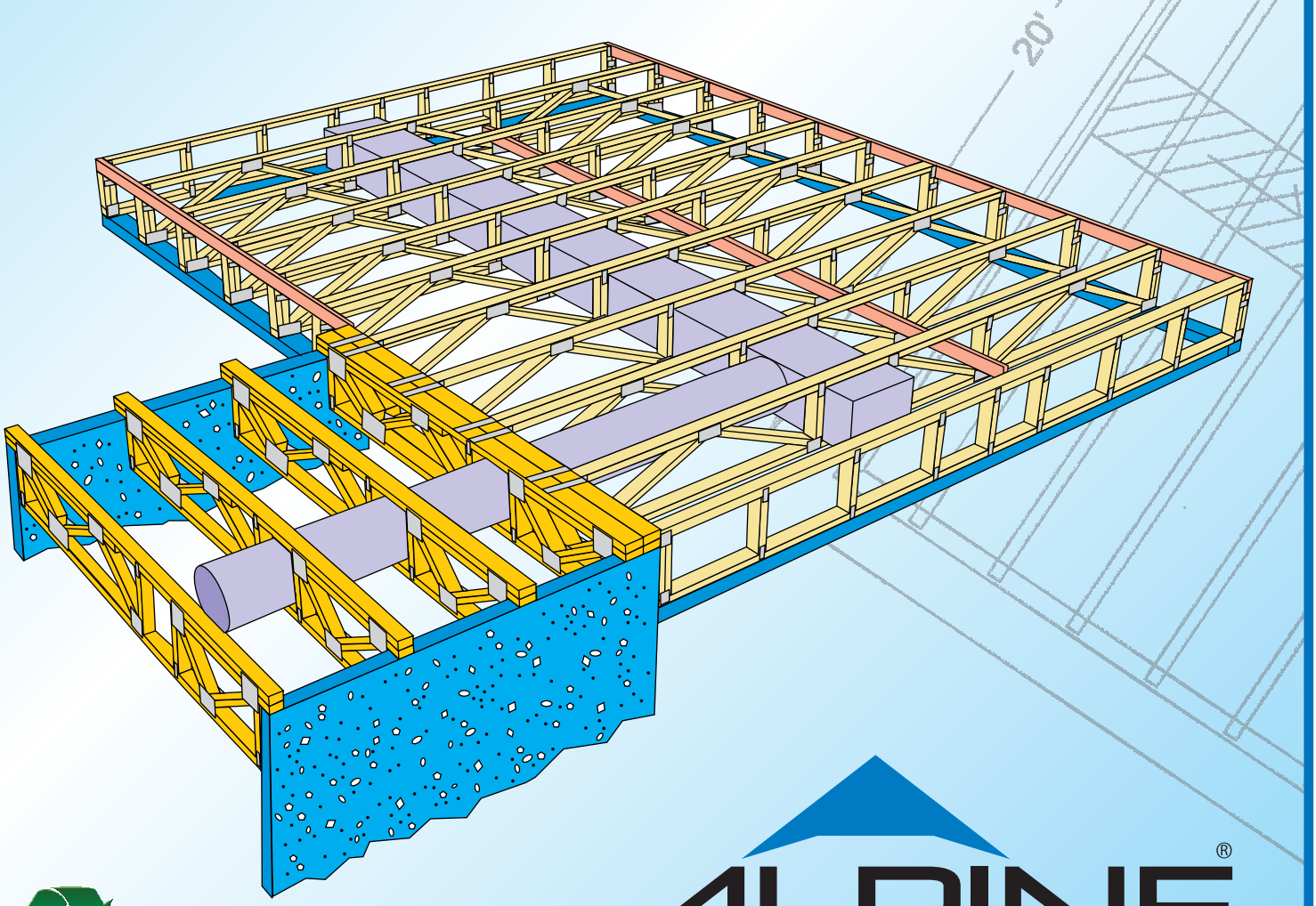
Get more Quality, Flexibility and Labor Savings using

FLOOR TRUSSES



ALPINE®

AN ITW COMPANY

Wood Floor Trusses are Environmentally Compatible.

Get more Quality, Flexibility and Labor Savings using

FLOOR TRUSSES

Builders want solutions that help them stay on schedule and maintain quality construction and profits. When compared to traditional joist construction, manufactured wood floor truss systems are better, stronger, and can be installed faster. A manufactured truss is an engineered structural component assembled from wood members, metal connector plates and other mechanical fasteners. The truss members form a rigid structural framework and are assembled such that the members form triangles. Most builders are familiar with roof truss systems, but may not realize the advantages of a manufactured floor truss system.

The benefits of manufactured wood truss floor systems are many. Floor trusses can span great distances, creating larger open spaces below unobstructed columns and partitions. Truss systems are quicker and easier to install than traditional floor joists, and because they're manufactured in controlled environments, there's less chance of warping, shrinking, and twisting of lumber. Manufactured floor truss systems also save timber resources by reducing the amount of wood waste generated during construction.

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 wood floor truss manufacturer. There are hundreds of truss manufacturers operating nationwide, but builders should research the quality and delivery costs before choosing a vendor.

The building designer determines what loads need to be supported by the floor trusses. Then the truss designer determines how many trusses will be required, and their specific placement on the structure. The manufacturer then builds the trusses, labels them for accurate installation, and ships them to the builder on the jobsite.

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

Once the trusses are on the site, the builder can really start to see the benefits. The consistent size and height of the manufactured floor joist will mean easier sub-floor material installation, and the open web design allows for utilities to be run through in the floor system without drilling or cutting holes. These benefits will reduce the amount of time trade contractors spend on site, speed up construction, and ultimately save the builder money. The technology used in the design and manufacturing of floor trusses makes them a superior choice for builders looking to streamline construction and provide a higher quality home to their customers.

The Benefits of

FLOOR TRUSSES

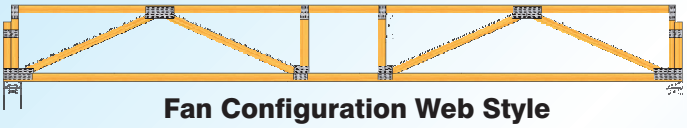
Floor trusses are delivered to your site, ready for installation. No cutting or fitting is required. Strong, lightweight and rigid “System 42” Floor Trusses go up easily and quickly. Often without the use of a crane. Expensive steelworkers, welders or riggers are not required. Your crew can do it all.

Decking and ceiling materials are attached directly to trusses without need for special hardware. And because System 42 trusses can be spaced wider apart, less trusses are required resulting in less nails to drive.

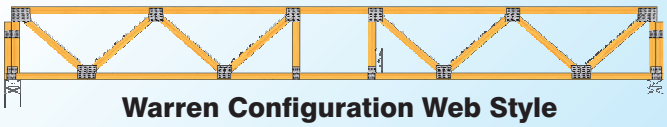
Mechanicals are installed quickly through the open webs without notching or furring. Electricians, A/C contractors and plumbers are off the job quicker.

System 42 provides longer clear spans providing exceptional design flexibility. For this reason, plus their cost saving benefits during construction, more and more architects are specifying System 42 Floor Trusses than ever before.

Two of the most common web patterns for floor trusses:



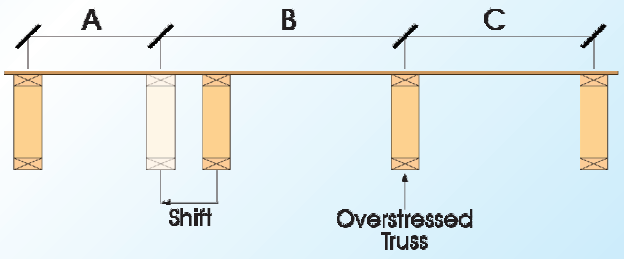
Fan Configuration Web Style



Warren Configuration Web Style

Floor truss are built with open chases for ductwork and have natural open spaces for plumbing and electrical wiring. Floor truss systems are sometimes called System 42's, because to build them manufacturers turn the 2x4's on their side. This allows for shallow depths as well as a 3 1/2" nailing surface. Some floors are built from 2x3's, others from 2x4's. Floor trusses can be manufactured with many different possible end conditions to accommodate different installation needs; around raised walls, pocketed beams, headers around stairways, etc.

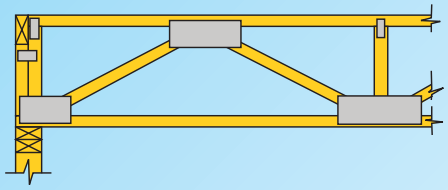
Is it OK to move a floor truss? Typical floor trusses are engineered to be spaced evenly, and the truss design drawing verifies the required truss spacing. Occasionally the need will arise to shift one of the floor trusses from where it was designed to be. When this happens, please contact the truss manufacturer to be sure it works. Sliding a floor truss even a few inches puts more load on the truss you're moving it away from, as shown in the drawing below.



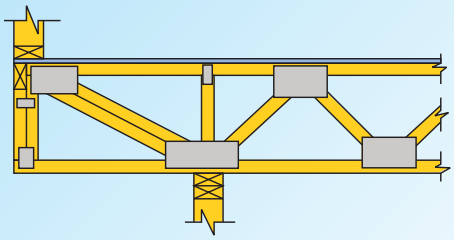
	If you shift it:	*Then overstressed truss carries:*	B
24" on center trusses	3"	6.2% more load than designed for	27"
	6"	12.5% ″	30"
	9"	18.7% ″	33"
16" on center	3"	9.3% more load than designed for	19"
	6"	18.7% ″	22"

Check with the truss manufacturer before shifting a truss !

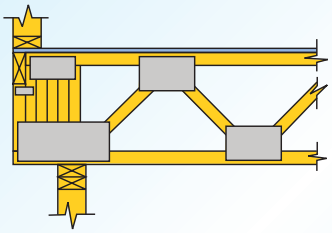
Framing with FLOOR TRUSSES



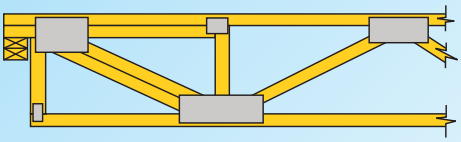
Bottom chord bearing on a stud wall.



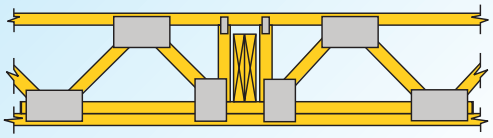
Cantilever with an exterior wall on the end.



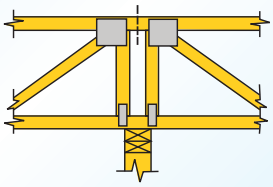
Bottom chord bearing with short cantilever and exterior wall.



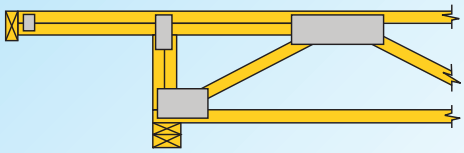
Top chord bearing on stud wall.



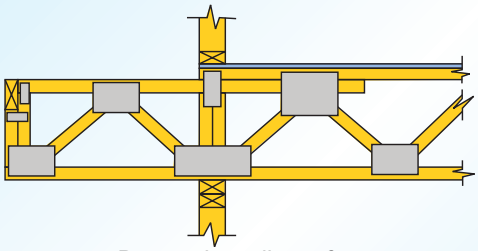
Floor truss designed to carry an interior header.



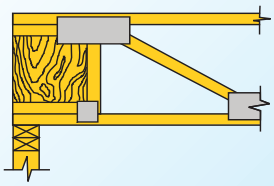
Interior bearing on wall



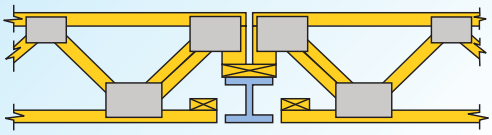
Overhang on a floor truss used on a roof.



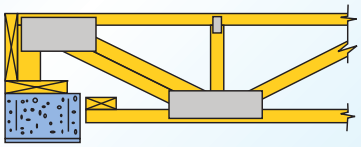
Dropped cantilever for use on exterior balconies.



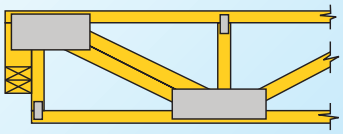
Trimmable end condition with I-Joist insert.



Interior top chord bearing with a variable end height.

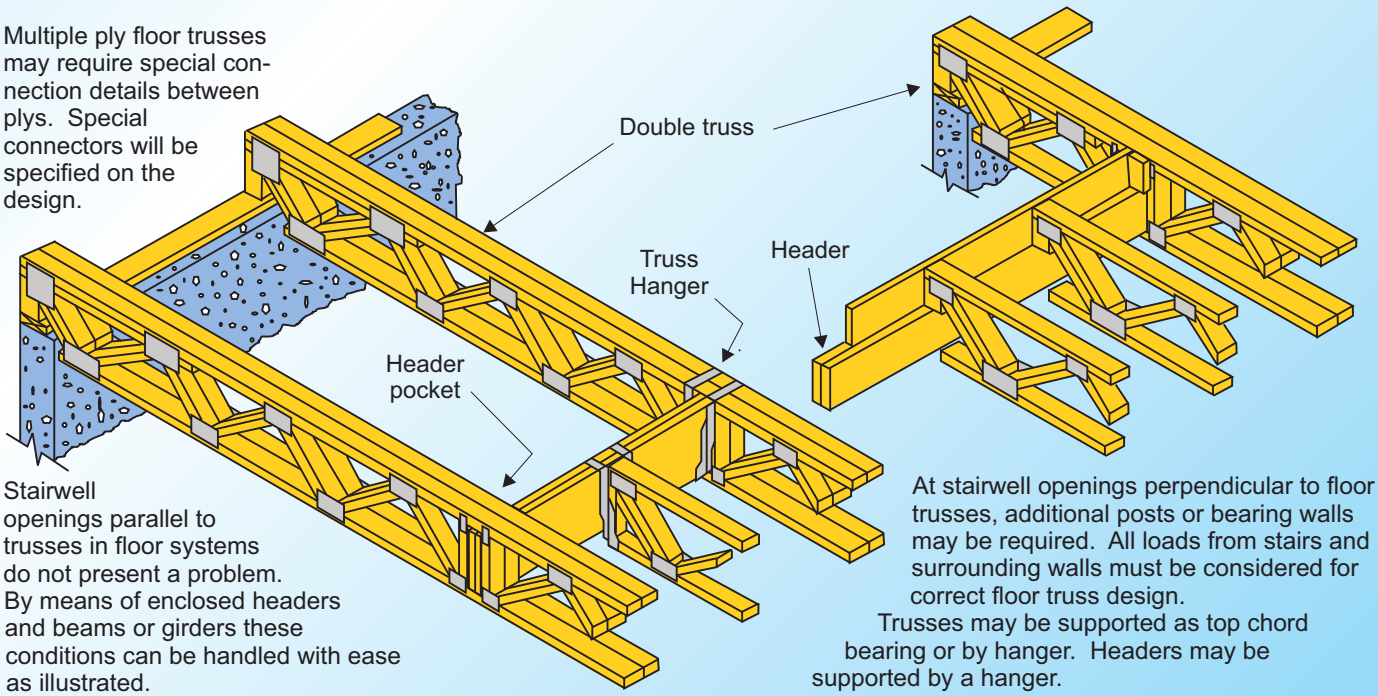


Top chord bearing with a variable end height.



Top chord bearing on stud wall with variable end height.

Multiple ply floor trusses may require special connection details between plys. Special connectors will be specified on the design.



Stairwell openings parallel to trusses in floor systems do not present a problem. By means of enclosed headers and beams or girders these conditions can be handled with ease as illustrated.

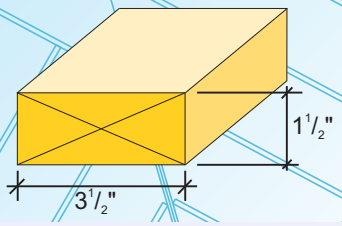
At stairwell openings perpendicular to floor trusses, additional posts or bearing walls may be required. All loads from stairs and surrounding walls must be considered for correct floor truss design.

Trusses may be supported as top chord bearing or by hanger. Headers may be supported by a hanger.

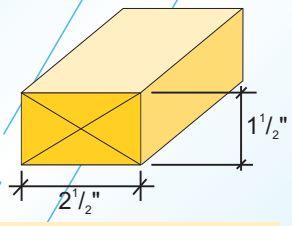
These allowable spans are based on NDS 2005. Maximum deflection is limited by L/360 or L/480[1] under live load. Basic Lumber Design Values are $F_{(b)}$=2000 psi $F_{(t)}$=1100 psi $F_{(c)}$=2000 psi E=1,800,000 psi Duration Of Load = 1.00. Spacing of trusses are center-to-center (in inches).

Top Chord Dead Load = 10 psf. Bottom Chord Dead Load = 5 psf. Center Line Chase = 24" max. Trusses must be designed for any special loading, such as concentrated loads. Other floor and roof loading conditions and a variety of species and other lumber grades are available.

4x2 Lumber



3x2 Lumber



40 PSF Live Load / 55 PSF Total Load

Center Spacing	Deflection Limit	Truss Depth 12"	14"	16"	18"	20"	22"
16" o.c.	L/360	22'2"	24'11"	26'10"	28'8"	30'4"	31'11"
	L/480	20'2"	22'7"	24'11"	27'2"	29'4"	31'5"
19.2" o.c.	L/360	20'9"	22'8"	24'4"	26'0"	27'6"	29'0"
	L/480	18'11"	21'3"	23'6"	25'7"	27'6"	29'0"
24" o.c.	L/360	18'5"	20'1"	21'7"	23'1"	24'5"	25'9"
	L/480	17'7"	19'9"	21'7"	23'1"	24'5"	25'9"

40 PSF Live Load / 55 PSF Total Load

Truss Depth 12"	14"	16"	18"	20"	22"
19'0"	20'9"	22'4"	23'10"	25'3"	26'7"
18'0"	20'2"	22"4'	23'10"	25'3"	26'7"
17'3"	18'9"	20'3"	21'7"	22'10"	24'1"
16'11"	18'9"	20'3"	21'7"	22'10"	24'1"
15'2"	16'7"	17'10"	19'1"	20'2"	21'3"
15'2"	16'7"	17'10"	19'1"	20'2"	21'3"

60 PSF Live Load / 75 PSF Total Load

		12"	14"	16"	18"	20"	22"
16" o.c.	L/360	19'4"	21'4"	23'0"	24'6"	26'0"	27'4"
	L/480	17'7"	19'9"	21'10"	23'9"	25'8"	27'4"
19.2" o.c.	L/360	17'9"	19'4"	20'10"	22'3"	23'7"	24'10"
	L/480	16'7"	18'7"	20'6"	22'3"	23'7"	24'10"
24" o.c.	L/360	15'9"	17'2"	18'6"	19'9"	20'11"	22'0"
	L/480	15'4"	17'2"	18'6"	19'9"	20'11"	22'0"

60 PSF Live Load / 75 PSF Total Load

12"	14"	16"	18"	20"	22"
16'3"	17'9"	19'2"	20'5"	21'8"	22'9"
15'9"	17'8"	19'2"	20'5"	21'8"	22'9"
14'9"	16'1"	17'4"	18'6"	19'7"	20'7"
14'9"	16'1"	17'4"	18'6"	19'7"	20'7"
13'0"	14'2"	15'3"	16'4"	17'3"	18'2"
13'0"	14'2"	15'3"	16'4"	17'3"	18'2"

85 PSF Live Load / 100 PSF Total Load

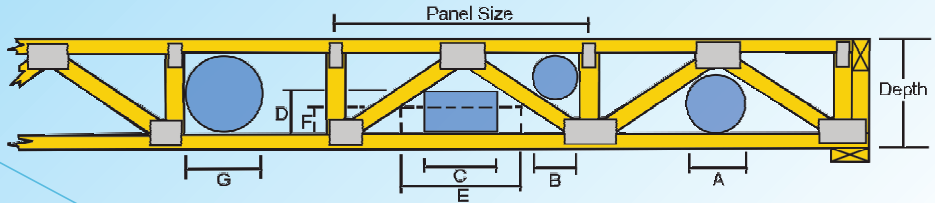
		12"	14"	16"	18"	20"	22"
16" o.c.	L/360	16'11"	18'6"	19'11"	21'3"	22'6"	23'8"
	L/480	15'8"	17'7"	19'5"	21'2"	22'6"	23'8"
19.2" o.c.	L/360	15'4"	16'9"	18'1"	19'3"	20'5"	21'6"
	L/480	14'9"	16'6"	18'1"	19'3"	20'5"	21'6"
24" o.c.	L/360	13'8"	14'10"	16'0"	17'1"	18'1"	19'1"
	L/480	13'8"	14'10"	16'0"	17'1"	18'1"	19'1"

85 PSF Live Load / 100 PSF Total Load

12"	14"	16"	18"	20"	22"
14'1"	15'5"	16'7"	17'8"	18'9"	19'9"
14'0"	15'5"	16'7"	17'8"	18'9"	19'9"
12'9"	13'11"	15'0"	16'0"	16'11"	17'10"
12'9"	13'11"	15'0"	16'0"	16'11"	17'10"
11'3"	12'3"	13'3"	14'1"	14'11"	15'9"
11'3"	12'3"	13'3"	14'1"	14'11"	15'9"

(1) Vibration Control -- Research by Virginia Tech indicates that L/480 live load deflection criteria provides a high degree of resistance to floor vibration (bounce). The building designer desiring this benefit may choose to specify an L/480 live load deflection criteria to be used for the floor trusses.

Duct Openings For Fan Style Floor Trusses With 4x2 Chords & Webs

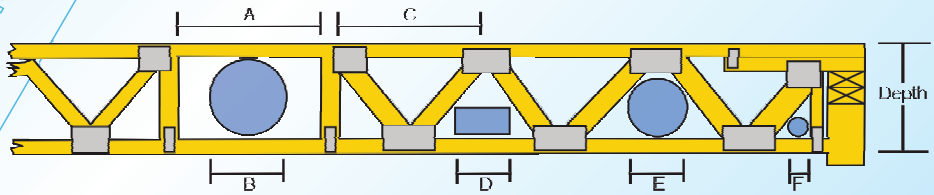


Typical Duct Opening Sizes For 4x2 Fan Style Floor Trusses

Depth	Panel Size	A	B	C	D	E	F	G
10	60	4 1/2	4 1/4	11	4 1/2	16	4	7
11	60	5 1/4	5 1/4	12	5 1/2	15	5	8
11 7/8	60	7 3/4	6 3/4	10	6 1/4	14	5 1/2	8 3/4
12	60	6 1/4	6 1/4	14	6	20	5	9
13	60	7 1/4	7 1/4	12	7	18 1/2	6	10
14	60	8 1/4	8 1/4	17	7	22	6	11
15	60	9 1/4	8 1/2	15	8	25	6	12
16	60	10 1/4	9 1/2	14	9	27	6	13
18	60	12 1/4	10 1/2	14 1/2	10 1/2	26	7	15
20	60	14	11 1/2	14 1/2	12	26	8	17
22	60	16	12 1/2	15	13	30	8	19
24	60	18	13 1/2	16	14	32	8	21
26	60	19	14 1/2	18	15	34	8	23
30	60	22	16	20	17	32	10	24
36	60	25	17 1/2	22	19 1/2	36	10	24

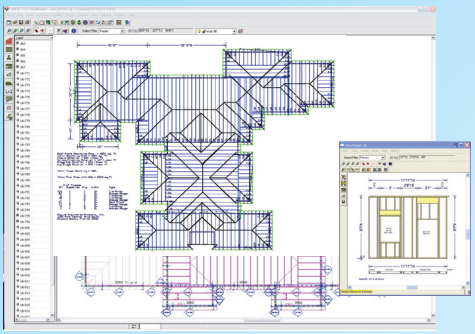
All Dimensions In Inches

Duct Openings For Warren Style Low Joists

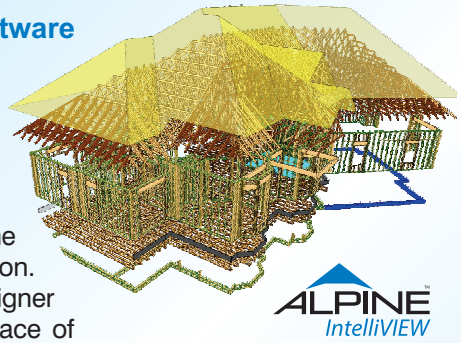


Depth	A	B	C	D	E	F
10	18	7	24	4x6	5	41/2
12	20	9	30	5x9	7	53/4
13	20	10	30	5x11	8	6
14	24	11	30	6x10	81/2	61/2
15	24	12	30	6x12	91/2	7
16	24	13	30	6x13	10	71/2
17	24	14	30	6x14	101/2	71/2
18	24	15	30	7x13	11	8
19	24	16	30	7x14	111/2	83/4
20	24	17	30	7x15	12	81/2
21	24	18	30	8x14	121/2	9
22	24	19	30	8x15	13	9
24	24	21	30	8x16	14	91/4

All Dimensions In Inches



Layout, Design and Engineering Software



Powerful CAD-based design software from Alpine generates traditional plan view layouts, and 3-D graphics that give an accurate picture of a structure from virtually any perspective by showing every component in place. Work confidently with the industry's best fully integrated design solution. Our IntelliVIEW software reduces both designer time and aggravation, giving you more peace of mind with fewer mouse clicks.

Bracing is extremely IMPORTANT!! Every truss 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.

Temporary Bracing Guidelines: For metal plate connected wood truss systems, refer to BCSI-B7 for proper installation bracing guidelines.

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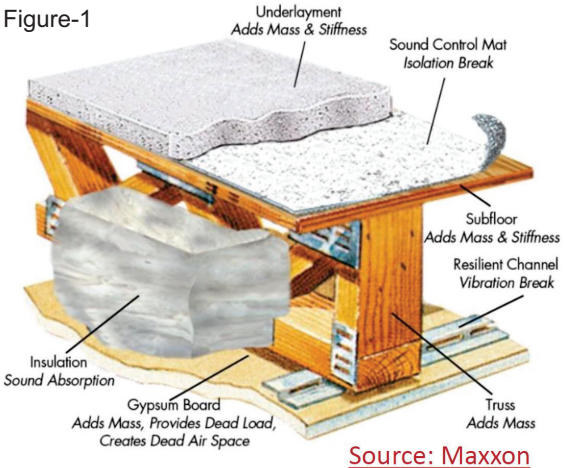
Sound Transmission through Floor Trusses

Common complaints about noise through ceilings in floor trusses include walking, moving furniture, and dropping objects, all of which are considered impact sounds. When addressing noise in floor systems, the Impact Insulation Class (IIC) rating is often the most critical value to consider. In general, IIC values for flooring are similar to their Sound Transmission Class (STS) values, so satisfying the code requirement for one will typically work for the other, if not come close.

Figure-1



Source: Maxxon

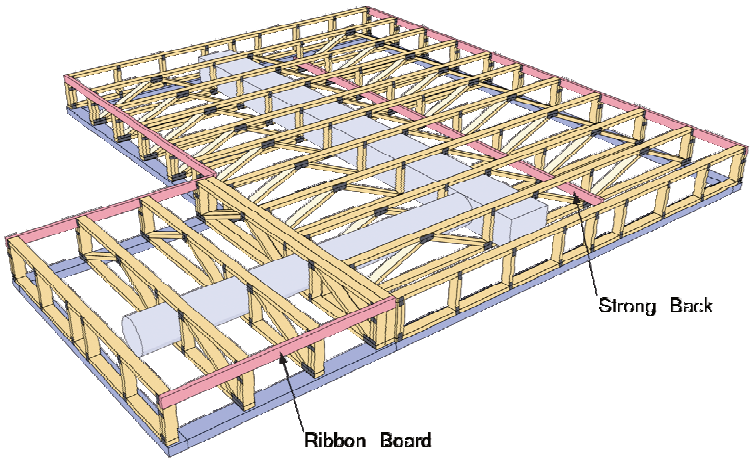
A floor/ceiling's ability to limit sound transmission is not highly dependent on the type of joist or truss to be used, but rather the types of insulation, sheathing, flooring, and subflooring. Most basic floor/ceiling construction materials like gypsum board and hard surface flooring don't provide much IIC value. The best methods for reducing impact noise, besides substantially increasing the floor systems mass, is to use specialized acoustic products such as resilient channels and special acoustic underlayment's, as identified in *Figure-1.*

Many of these measures are effective at reducing only certain types of noise and work in combination with the other measures to create a complete soundproofing system. Batt insulation, for example, is effective for absorbing airborne sounds, but does little or no good against structural/impact noise. While carpeting with a fairly thick layer of padding beneath it is excellent at reducing impact noise, it is not effective against airborne noise. For additional information regarding Sound Transmission in Wood Floor and Roof Trusses, refer to SBCA report: **SRR No. 1601-03**.

Performance Facts using

FLOOR TRUSS SYSTEMS

- Faster Construction / Saves Money
- Longer Clear Spans
- Hides Mechanicals
- Spaced 24" oc., multiple depths
- Cantilever and Balcony Built In
- 3.5 Width Surface to Glue and Nail to
- Cold Air Returns can be Eliminated
- Reduce Field Material Losses
- Pick-up Interior Point Loads
- Custom Designed for your project
- Commercial & Residential Applications
- Trim-able ends for concrete mis-pours
- No Humps in Floors
- Sound and Fire Ratings
- Angled Walls



The System 42 floor truss system provide longer, stronger clear spans and greater design flexibility in locating bearing walls and partitions. Because the System 42 floor truss system can be spaced farther apart, fewer are needed. Delivered to the job site ready for installation, the lightweight, rigid floor trusses go up easily and quickly, often without the use of a crane. Wide (3 1/2"), nailable top and bottom chords speed placement of decking and ceiling material without the need of special fasteners or clips. Mechanicals are installed quickly through the opening between webs without notching or furring. Tradesmen are on and off the job faster resulting in earlier completion dates and lower on-site labor costs.

The innovative software, equipment, products and services available from Alpine, enables our customers to manufacture and sell the finest truss and wall components available in North America. Alpine offers component engineering services, design and management software, production equipment and truss connector plates. The pioneering concept developed for wood trusses was also applied to our revolutionary line of products and services for cold-formed steel components used in commercial applications. Alpine's software includes design and manufacturing programs that work together to quickly produce structural framing components. Our powerful CAD-based software generates highly accurate 3D layouts that show structural framing with every component in place from any perspective. iCommand, part of the IntelliView suite, enables truss manufacturers to manage business their way with unprecedented power and flexibility.

Alpine is part of the Residential Construction (North America) Division of Illinois Tool Works Inc. (NYSE: ITW), a Fortune 250 global multi-industrial manufacturing leader of value added consumables and specialty equipment with related service businesses. Founded in 1912, ITW's recipe for success has been consistent: value added products and outstanding service win the day with customers. ITW places a high premium on the development of highly engineered products and systems – most of which are developed in tandem with customers. And the company continues to ensure that customers receive timely, cost-effective service for the innovative products ITW provides. ITW's more than 50,000 dedicated colleagues around the world thrive in our decentralized, entrepreneurial culture. In 2016, the company achieved revenues of $13.6 billion, with roughly half coming from outside North America. For more information, visit www.itw.com.

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