ROOF & FLOOR TRUSSES

www.mii.com

MiTek®

MITEK® PRODUCTS & SERVICES

Headquartered in St. Louis, Missouri, MiTek Industries, Inc. is the leading supplier of connector plates, truss manufacturing equipment, design software and engineering services for the worldwide component industry.

For more than 35 years MiTek companies have developed and refined their connector plates into the state-of-the-art products they are today... consistent and dependable!

With MiTek you're assured of the best quality. MiTek connector plates are manufactured under strict quality control and undergo extensive testing in our R & D facility.

MiTek's connector plates meet or exceed all building code and industry association requirements. Acceptances include ICC-ES, Florida-Dade County and LA City.

MiTek also offers the very best in framing layout and engineering software for roof and floor trusses, as well as wall panel design. These programs provide our fabricators with fast and accurate layout and design capabilities.

Our engineering department is available to review and seal our customers' designs. With offices in North Carolina, Missouri, Florida and California, MiTek's professional engineers can furnish sealed engineering for all 50 states!

Look to a MiTek fabricator for the best the industry has to offer! This brochure reviews the benefits of using wood roof and floor trusses, but MiTek fabricators also offer a full line of builders hardware and a complement of other building components including wall panels and steel framing.

At MiTek, we are committed to providing the best products and services in the industry and will continue our tradition of customer support.

MiTek®

WHY USE WOOD TRUSSES?

CONTRACTORS AND BUILDERS KNOW.

Contractors and builders know that a MiTek engineered roof or floor truss ensures quality and efficiency.

MiTek Trusses Save Money

Because costs are known in advance, there's no guesswork. Your site erection time is greatly reduced and dollar losses from job site material shortages and pilferage are eliminated.

MiTek Trusses Are Reliable

Every MiTek truss has been individually designed and that design is checked and approved by licensed engineers for structural adequacy.

MiTek Trusses Are Versatile

MiTek trusses provide more design flexibility, inside and out, than conventional framing. Offering numerous custom design options, our trusses present an economical and structurally superior method for rapid erection.

ADVANTAGES OF TRUSSES OVER CONVENTIONAL FRAMING

For Architects/Developers

- Savings in design costs-one basic structural design for shell with minor floor plan variations
- Better project cost control, with component costs known in advance
- Better cash flow with earlier occupancy due to reduced on-site labor
- Faster shell completion time
- Using trusses of smaller dimension lumber, in place of beams and columns
- Greater flexibility in locating plumbing, duct work, and electrical wiring
- Floor plan freedom in locating interior partitions often without additional support required

For Contractors/Builders

- Pre-determined, pre-engineered truss system
- Fewer pieces to handle and reduced installation time
- Wide 3-1/2" nailing surface for easy floor deck application
- Eliminate notching and boring joists for electrical wiring and plumbing
- Floor trusses offer better availability and less in-place cost than 2x8 or 2x10 joists
- Factory-manufactured components to exact span requirements
- Reduced HVAC, plumbing, and electrical subcontractor time on job
- No column pads to pour, no steel beams and posts to place
- Job site material pilferage and cutting waste reduced

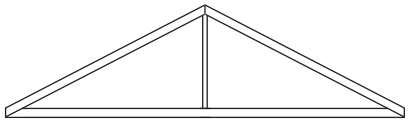
FOR THE HOMEOWNER

- ✓ Lower construction costs
- ✓ Clearspan flexibility
- ✓ More flexibility in architectural appearance and floor plans
- ✓ Easier remodeling possibilities in moving interior walls

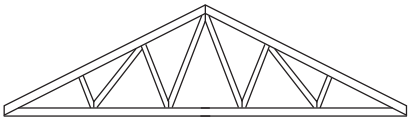
MiTek®

TRUSS TYPES

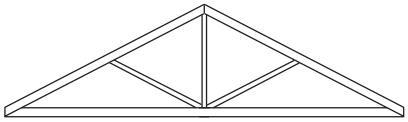
Basic Roof Truss Configurations



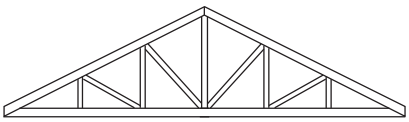
KINGPOST



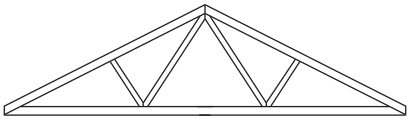
DOUBLE FINK



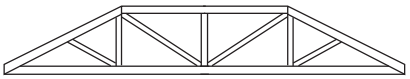
QUEENPOST



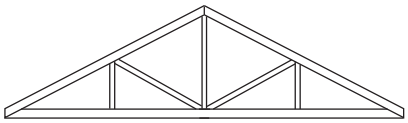
DOUBLE HOWE



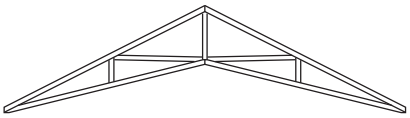
FINK



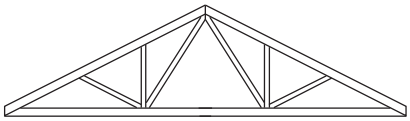
HIP



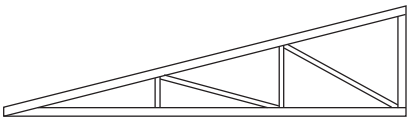
HOWE



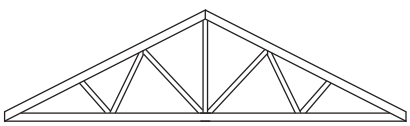
SCISSORS



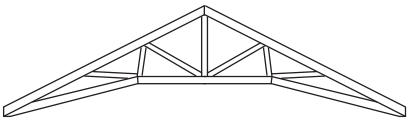
FAN



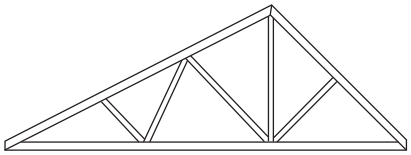
MONOPITCH



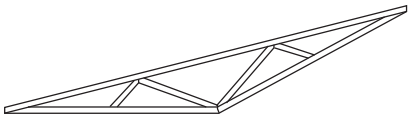
MODIFIED QUEENPOST



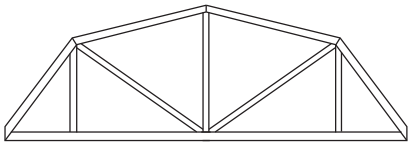
CAMBERED



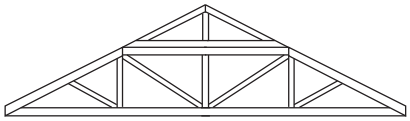
Dual Pitch



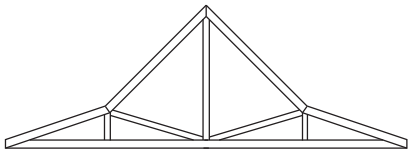
Inverted



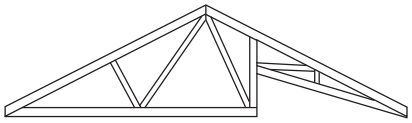
Gambrel



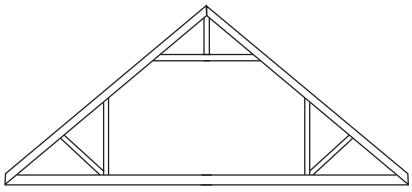
Piggyback



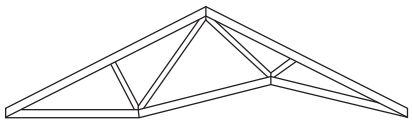
Polynesian



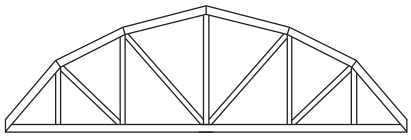
Studio



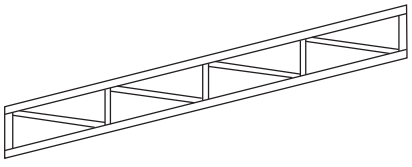
Attic



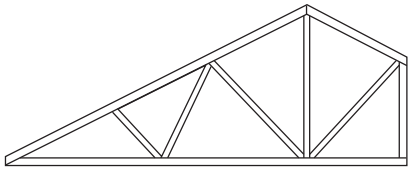
Cathedral



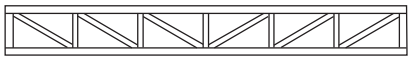
Bowstring



Sloping Flat



Stub

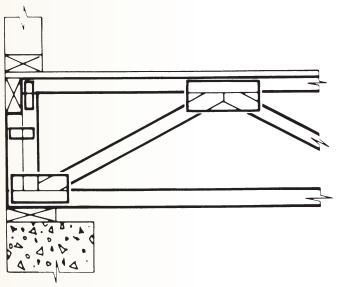


Flat

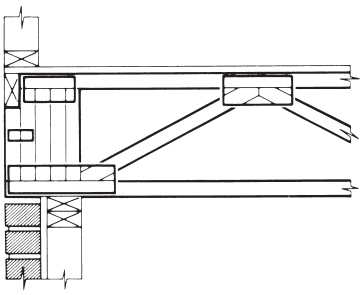
MiTek®

FLOOR TRUSS CONSTRUCTION DETAILS

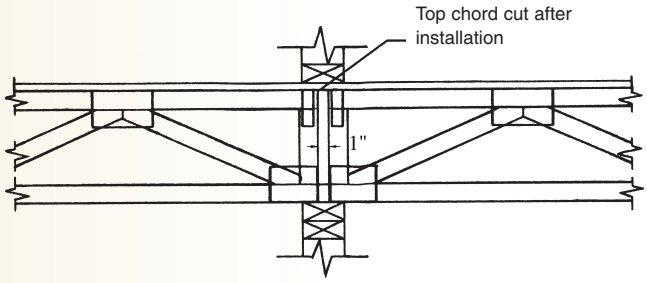
Support Details



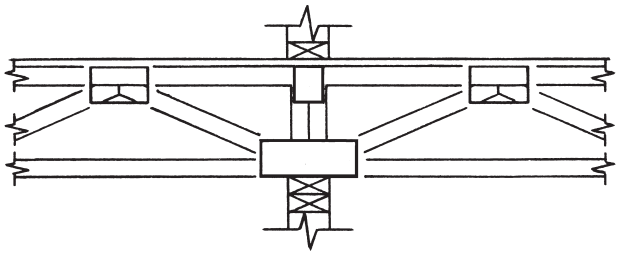
Bottom Chord Bearing on
Exterior Frame or Masonry Wall



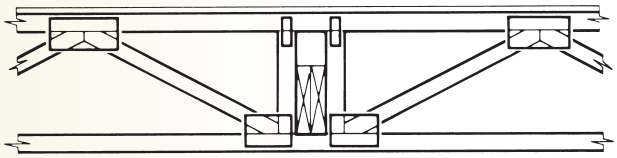
Bottom Chord Bearing
on Exterior Frame Wall with Masonry Fascia Wall



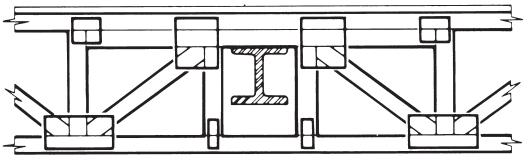
Intermediate Bearing - Simple Span Trusses



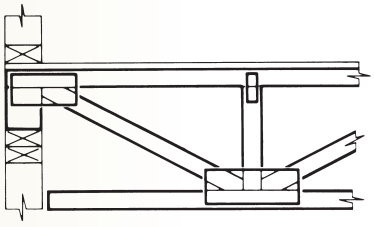
Intermediate Bearing - Continuous Floor Truss
Special Engineering Required



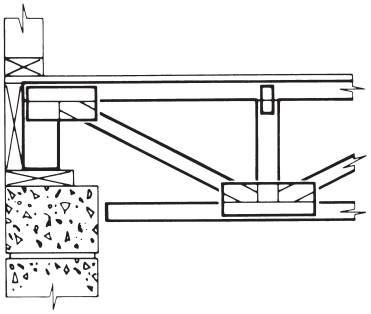
Header Beam Pocket -
Floor Truss Supporting Header Beam
Special Engineering Required



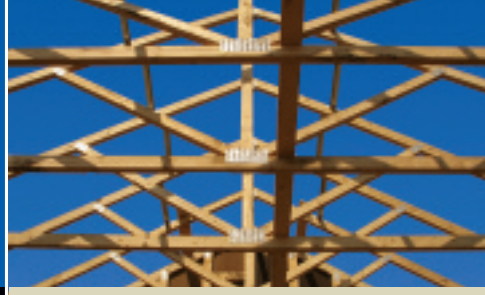
Intermediate Bearing -
Floor Truss Supported by Steel or Wood Beam
Special Engineering Required



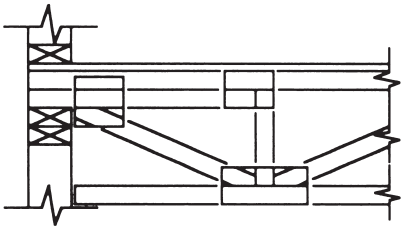
Top Chord Bearing on Frame Wall



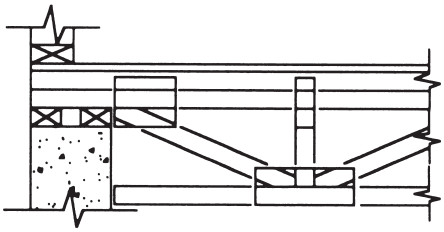
Top Chord Bearing on Masonry Wall



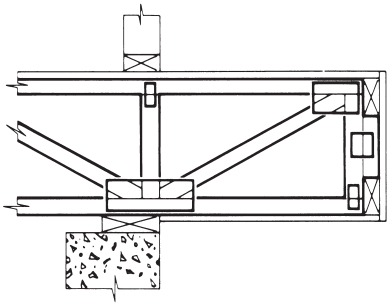
Support Details



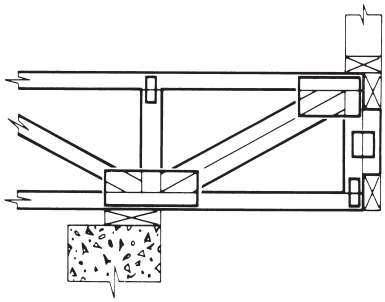
Extended Top Chord Bearing
Span Limited by Engineering



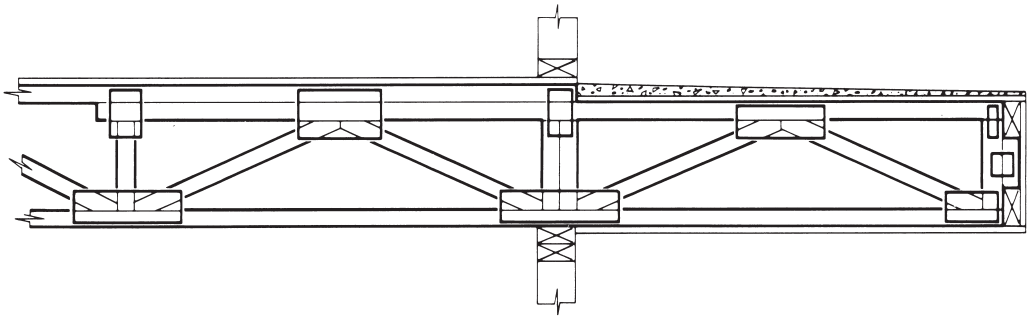
Extended Top Chord Bearing
Span Limited by Engineering



Balcony Cantilever
Special Engineering Required

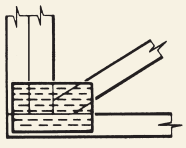


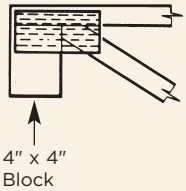
Load-Bearing Wall Cantilever
Special Engineering Required

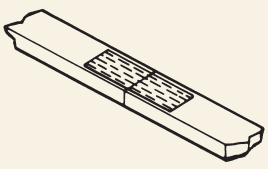


Dropped Chord Balcony Cantilever
Special Engineering Required

JOINT DETAILS

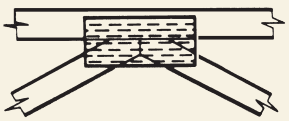


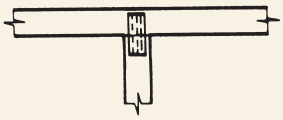


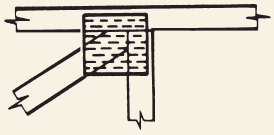


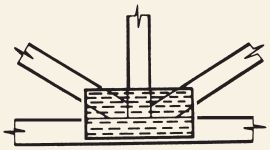
Chord Pre-Splice

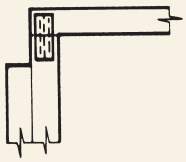
JOINT DETAILS











MiTek®

FLOOR TRUSS CONSTRUCTION DETAILS

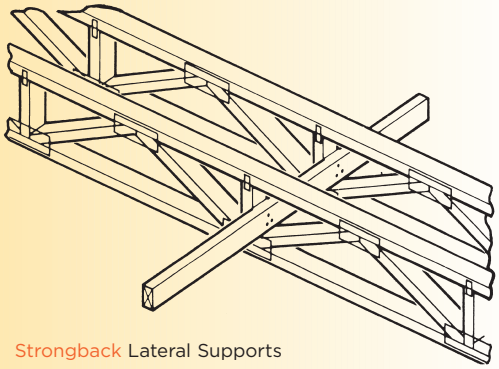
STRONGBACK SUPPORTS

Cantilever and Jack Details

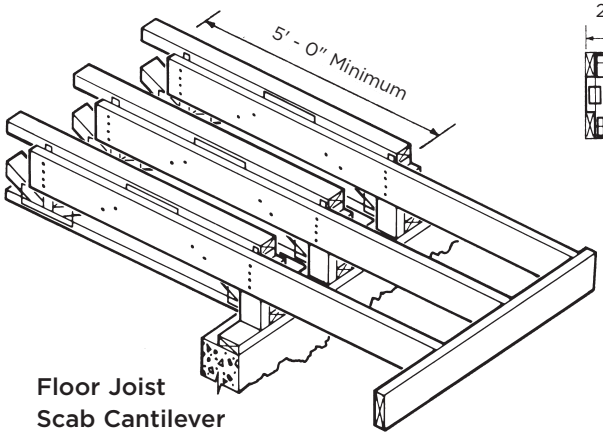
LATERAL BRACING SUGGESTIONS

2x6 “Strongback” lateral supports should be located on edge approximately every 10 feet along the floor truss.

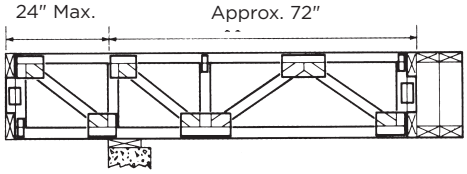
They should be securely fastened to vertical webs. Blocking behind the vertical web is recommended while nailing the strongback. The strongbacks should either be secured to adjacent partition walls or alternate “X” bridging should be used to terminate the bracing member.



Strongback Lateral Supports



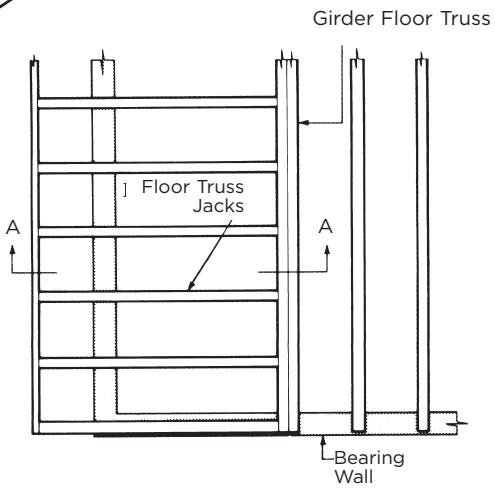
Floor Joist Scab Cantilever



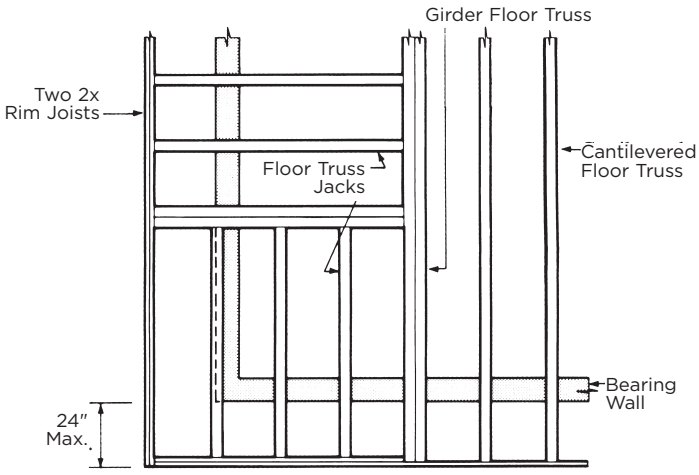
Section AA - Floor Truss Jacks

Notes

- Special engineering required for girder floor trusses
- Slope for drainage, as required
- Cantilever span controlled by lumber size, grade and deflection limitations



Floor Cantilevered Perpendicular to Floor Truss Span



Floor Cantilevered Perpendicular and Parallel to Floor Truss Span

GLOSSARY OF TERMS

4x2 Member A 2x4 lumber section used as a structural component oriented such that its 3-1/2" (4" nominal) face is horizontal.

Apex/Peak The uppermost point of a truss.

Axial Force A push (compression) or pull (tension) acting along the length of a member. Usually measured in pounds or kips (1,000 lbs.) or metric equivalent.

Axial Stress The axial force acting at a point along the length of a member divided by the cross-sectional area of the member. Usually measured in pounds per square inch.

Balcony Cantilever A floor truss cantilever serving only as a balcony with no additional wall loading acting on the cantilever portion.

Beam Pocket A rectangular opening within a truss to accept a header beam for positive load transfer.

Bearing A structural support, usually a wall, that occurs at the top or bottom chord or between the end points of a roof or floor truss.

Bending Moment A measure of the bending effect on a member due to forces acting perpendicular to the length of the member.

Bending Stress The force per square inch of area acting at a point along the length of a member, resulting from the bending moment applied at that point. Usually measured in pounds per square inch or metric equivalent.

Bottom Chord The continuous 4x2 member forming the bottom of the truss.

Bottom Chord Bearing A floor truss support condition in which the truss load is transferred to the bearing or support through the bottom chord "sitting" on the support.

Butt Cut Slight vertical cut at the outside edge of truss bottom chord made to ensure uniform span and tight joints - usually 1/4 inch.

Camber An upward curvature built into a truss during fabrication to counteract downward deflection of the loaded truss.

Cantilever The portion of a truss extending beyond the exterior face of a support (excluding the overhang).

Chase The opening in some floor trusses or structural components in which the mechanical equipment (ducts, plumbing, etc.) runs, typically a rectangular opening at the centerline. (Also referred to as a Duct Opening.)

Check A lengthwise separation of wood fibers, usually extending across the rings of annual growth, caused chiefly by strains produced in seasoning.

Chord Splice A connection of the 4x2 chord member between joints, joined by pre-splice connector plates into the 3-1/2" faces and occasionally side plates into the 1-1/2" edges.

Clear Span Horizontal distance between interior edges of supports.

Combined Stress The combination of axial and bending stresses acting on a member simultaneously, such as occurs in the top chord (compression + bending) or bottom chord (tension + bending) of a truss.

Combined Stress Index (CSI) The summation of axial and bending stresses divided by their respective allowable stresses for a specific truss member. This ratio, or index, represents the structural "efficiency" of the member. The CSI shall not exceed 1.00.

Concentrated Load Loading applied at a specific point, such as a load-bearing wall running perpendicular to a truss, or a roof-mounted A/C unit hanging from a truss.

Connector Plate Pre-punched metal toothed connectors located at the joints and splices of a truss and designed to transfer the forces which occur at those locations.

Continuous Lateral Restraint (Brace) A member placed and connected at right angles to a chord or web member of a truss to prevent out of plane buckling.

Cripple Rafter Infill rafter installed to continue the roof line - fixed to valley board in valley construction.

Dead Load Any permanent load such as the weight of roofing, flooring, sheathing, insulation or ceiling material, as well as the weight of the truss itself.

Design Loads The dead and live loads which a truss is engineered to support.

Deflection The maximum vertical displacement of a structural member due to applied loading. (Live load deflection is the displacement due to live load.)

Depth The overall distance from the top of the top chord to the bottom of the bottom chord.

Dimensional Take-Up The adjustment necessary to alter standard repetitive floor truss panel lengths to achieve the desired overall truss span. Take-up can be made at one end, both ends, or in the center.

Doubled Chords The use of two 4x2 members along specified top or bottom chord panels to achieve added strength.

Dropped Cantilever The use of overlapping 4x2 floor truss top chord members to frame a balcony cantilever with a "step-down" of 1-1/2" or 3" to provide positive drainage or application of concrete deck.

Duration of Load (DDL) Increase A percentage increase in the stress permitted in a member, based on the length of time that the load causing the stress acts on the member. The shorter the duration of the load, the higher the percent increase in allowable stress.

End Detail The end detail provides the support condition and necessary web orientation and panel length to create the desired truss span.

Engineer Sealed Drawing A truss design where loading requirements, lumber species, sizes, grades and connector plate requirements are detailed and a certified engineer's seal is affixed.

Extended Top Chord Bearing A floor truss support condition in which the truss load is transferred to the support through the top chord member extending to "sit" on the support.

Fan Truss A floor truss with 30" top chord panels and 60" bottom chord panels and a fan web configuration.

Forces Axial compression or tension in structural components due to applied loads.

Girder A structural member carrying large loads due to attachment of trusses framing into the girder (commonly called tie-in trusses).

Girder Truss Usually a multiple-ply truss designed to carry other trusses over an opening.

Header Beam A short beam typically supporting framing adjacent to a stair opening, running perpendicular to the floor trusses.

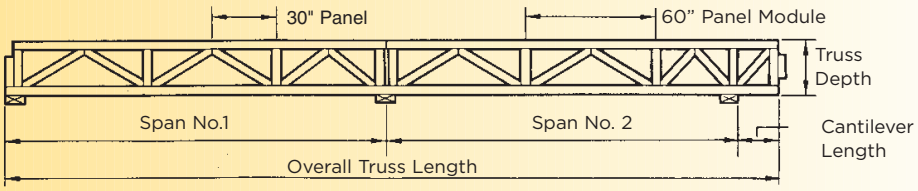
Header Truss A truss with 4x2 chords typically supporting roof, wall and/or upper floor loads, spanning over door or window openings. (For example, a garage door header truss.)

Heel Point on a truss at which the top and bottom chords intersect.

Heel Cut See Butt Cut.

Heel Height Vertical overall measurements at the end of a truss where the top and bottom chords meet.

Interior Bearing Any intermediate support condition in addition to the two exterior supports. A truss joint must be located above an interior bearing.



TYPICAL FLOOR TRUSS

Jack Rafter Infill rafter installed to continue the roof line - fixed from wall plate to hip board in hip end construction.

Joint The intersection of two or more members. (Also referred to as a Panel Point.)

Joint Splice A splice of a chord member at a chord-and-web joint.

Kneewall A short partition stud wall to increase a wall height, typically from the concrete wall plate to the floor decking.

Level Return A lumber filler placed horizontally from the end of an overhang to the outside wall to form a soffit.

L/D Ratio The ratio of the truss span (L) to its depth (D), both dimensions in inches.

Live Load Any temporary applied load to a floor truss chord; typically roof live load is snow, while floor live loads are furniture, human occupancy, storage.

Load-Bearing Wall A wall specifically designed to transfer a roof load and/or upper floor load into the foundation.

Machine Stress Rated Lumber (MSR) Lumber which has been individually tested by a machine at the lumber mill to determine its structural design properties. MSR Lumber is designated by a flexural (bending) stress and Modulus of Elasticity, e.g., 1650F-1.5E.

Moisture Content of Wood The amount of moisture in wood expressed as a percentage of its oven-dry weight.

Moments A structural measure of the effects of bending on a member due to applied loading.

Overall Rise Vertical distance from bottommost part of the bottom chord to uppermost point on the top chord.

Overhang The extension of the top chord of a truss beyond the heel measured horizontally.

PCT Abbreviation for Parallel Chord Truss.

PLF Pounds per lineal foot, acting along a structural member, usually equal to the uniform load (PSF) times the truss spacing.

PSF Pounds per square foot of uniform load.

Panel Length The distance between the centerlines of two consecutive joints along the top or bottom chord.

Panel The chord segment defined by two adjacent joints.

Panel Point The point where a web or webs intersect a chord.

Peak Point on truss where the sloped top chords meet.

Pitch Inches of vertical rise for each 12 inches of horizontal run.

Plate A horizontal wood framing member, typically the top and bottom 2x4 members of a stud wall or the 2x6 sill plate bolted to a concrete wall for floor structural attachment. This provides the truss bearing.

Plenum Typically, the use of the entire floor truss cavity formed by the floor above and the ceiling below as a supply or return air “duct”.

Plumb Cut Top chord end cut to provide for vertical (plumb) installation to fascia (face trim board).

Pre-Splice Plates Connector Plates pressed into the top and bottom 3-1/2″ faces of two 4x2 chord members prior to final floor truss assembly to achieve a structural chord splice.

Purlins Lumber (secondary structural components) spanning between trusses to support roof covering (sheathing).

1/4 Point point on triangular, Fink or Howe truss where the webs connect to the top chord.

1/3 Point Point on triangular, Fink truss where the webs connect to the bottom chord.

Reaction The total load transferred from the uniform load (PSF) applied to the truss deck, then into the truss, and ultimately, to the truss bearing or support.

Ridge Line formed by truss peaks.

Rim Joist An exterior transition member supporting the decking edge and wall sheathing, usually tying the ends of floor trusses together. (Also referred to as a Ribbon or Band Board.)

Scab Additional timber connected to the face of a truss member to effect a splice, extension or general reinforcement.

Shop Drawing Provides detailed information for cutting of individual truss members.

Slope See Pitch.

Spacing The centerline-to-centerline distance between trusses.

Span The overall distance between adjacent interior supports or to the outside of supports when at the end of a truss. (See detail above.)

Splice Point (Top & Bottom chord splice). The point at which two chord members are joined together to form a single member. It may occur at a panel point or between panel points.

Square Cut End of top chord cut perpendicular to slope of the member.

Strongback A 2x6 lateral brace, used in a vertical orientation, running perpendicular to the trusses, and attached to the truss vertical web members.

Support The structural element resisting the truss, usually a wall or beam. (Also referred to as a Bearing.)

Symmetrical Truss Truss with the same configuration of members and design loading occurring on each side of truss centerline.

Top Chord The 4x2 member forming the top of the truss.

Top Chord Bearing A floor truss support condition in which the truss load is transferred to the bearing or support through the top chord or a 4x4 block end detail. With a 4x4 block, this is referred to as an intermediate height bearing.

Truss A pre-built component that functions as a structural support member. A truss employs one or more triangles in its construction.

Truss-clip Metal component designed to provide structural connection of trusses to wall plates to resist wind uplift forces.

Visual Grade Lumber Lumber which has been visually rated at the lumber mill for structural properties through rules established by national lumber species associations.

Warren Truss A general truss configuration with repetitive web “W” orientation. For floor truss applications, the top and bottom chord panels are typically 30″ length, usually with a 24″ wide rectangular chase or duct opening at the centerline.

Web A vertical or inclined member connecting the top and bottom chords of a truss.

MiTek®