

MiTek® POSI-STRUT

Engineered Open Web Floor System

INSTALLATION GUIDE

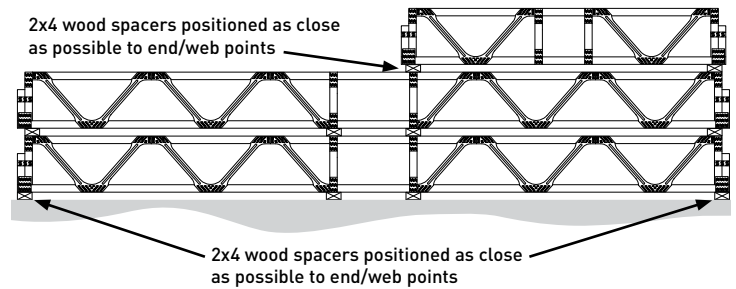
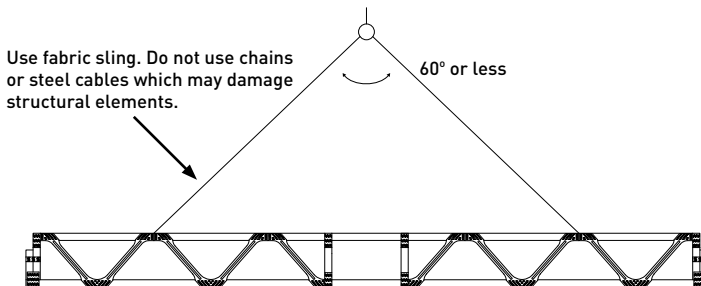
Your MiTek authorized Posi-Strut manufacturer:

IMPORTANT

The following instructions and guidelines are provided to help ensure proper installation, structural integrity and serviceability of the final product. These recommendations are to be considered as general guidelines. Additional precautions may be necessary for certain projects. Contact your Posi-Strut manufacturer for more information.

STORAGE On site storage of the product should be for a limited period of time prior to installation. All Posi-Strut components should be strapped and stacked vertically with the bottom chord clear of the ground, supported on spacers located directly under web points. If stored in a flat position, sufficient bearings should be provided to prevent any lateral bending.

After being strapped together, Posi-Struts should be covered with a waterproof wrap to protect them from short-term exposure as well as inclement weather. When covered, ensure adequate circulation around the trusses. Store and handle with care and protect the ends and edges of the Posi-Strut components from damage.



HANDLING Handle the Posi-Struts with care in a vertical orientation only (not in a flat position) to avoid twisting or sagging. When loading/offloading with a crane, slings should always be attached to the lumber chords, and NOT to the metal webs as this may damage the product (no load should be applied to the metal webs as this may cause damage to the steel itself or withdrawal of the web from the chord). Slings should be attached at panel points closest to the quarter points of the Posi-Strut length.

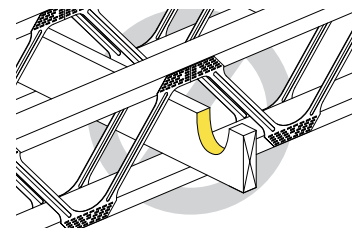
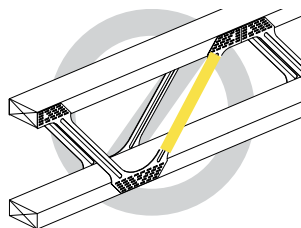
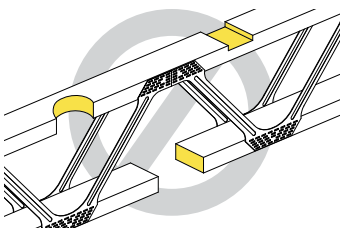
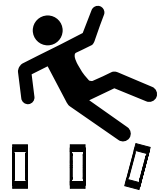
SAFETY Unbraced floor members are unstable. Do not allow anyone to walk on unbraced Posi-Struts. Install all strongbacks, ribbons and bracing at the locations specified on the installation drawings before proceeding to install the subfloor. Posi-Strut trusses must be restrained at all support points to prevent lateral movement or toppling.

DO install proper temporary bracing. Bracing is vital to the safe installation of Posi-Strut floors. Temporary bracing includes diagonal bracing, longitudinal strapping/purlins and permanent strongbacks.

DON'T store building materials on unbraced Posi-Struts. Do not store building materials whose weight exceeds design loads on the floor, even for a short period of time. Weight of materials should be spread out over an area covering a minimum of 3 Posi-Strut trusses (see page 3). Do not apply heavy concentrated construction loads to the Posi-Strut floor.

DO fasten subfloor sheathing. Subfloor sheathing provides lateral support and should be fully fixed (glued and nailed/ screwed) to the Posi-Struts before additional loads are applied to the floor.

DON'T drill holes in the chords, cut or remove the metal webs, notch / cut the chords or the strongbacks.



Posi-Strut trusses are not to be modified in any way on site without the approval of the manufacturer. Any Posi-Strut truss damaged in transport or handling cannot be repaired on site without the advice or approval of a Professional Engineer.

Installation Tips

Proper coordination and open communication between all subcontractors are essential during the design and installation stages of all construction. Too often structural elements are cut, notched or damaged as a result of lack of planning. Performance of the structural elements is affected and in some cases, damage is irreparable and replacement is extremely expensive. Better planning between the different subcontractors saves time and money while ensuring the structural integrity of the building. Please review the installation layout, important dimensions and instructions before starting the installation of the Posi-Strut system. For any questions you may have, please contact your Posi-Strut manufacturer.

SUBFLOOR

To prevent cracks in heavy floor tiles (ceramic, porcelain, slate, etc.), it is important to choose the appropriate type, quality and thickness of subfloor. A minimum of 1" (subfloor and backer board combination) is required to ensure proper support to the finished flooring material. In addition, the backer board must be installed perpendicular to the subfloor and the joints must be overlapped to avoid any dimensional variance.

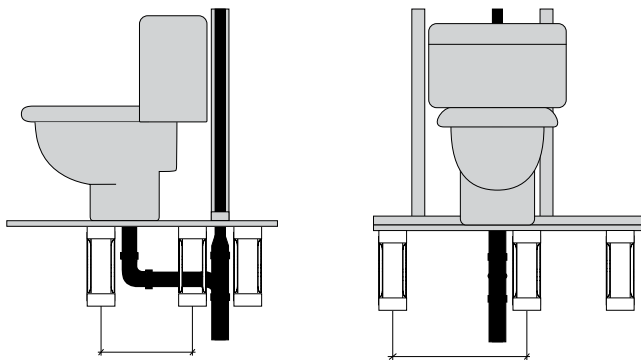
ELECTRICITY

Although electric wires are less intrusive due to their smaller size, the fact remains that the vertical passage of wiring may encounter obstructions caused by the structural elements. Electrical wires should only be attached to the lumber bottom and top chords or wood web verticals and in such a way as to prevent them from touching the metal webs.

PLUMBING

One of the most common cases of damage to structural floor components is the passage of vertical plumbing through the chord of the structural element. Yet, simply planning ahead allows the contractor and subcontractor to properly position the floor trusses. If you need to move a Posi-Strut truss on site, please consult your authorized Posi-Strut manufacturer first. To allow movement of plumbing pipes, it is suggested to install a rubber or foam-like mat around the pipe where it touches the truss.

Vertical plumbing installation



When planning the installation and faced with potential problems with plumbing, electricity or ductwork interfering with the truss, please contact your Posi-Strut manufacturer.

They will check if one of the Posi-Struts can be slightly moved to avoid damaging the truss. If this is not possible, the addition of another Posi-Strut may be necessary. Although this option will be slightly more expensive, it will provide better support and minimize the potential of finished flooring cracking, caused by poor support and deformation of the subfloor.

VENTILATION DUCTS

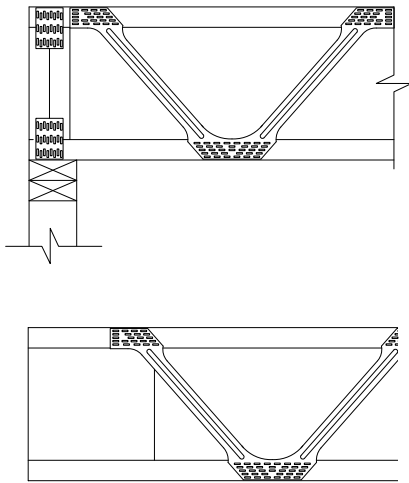
To avoid unpleasant surprises on the job site, it is important to inform your Posi-Strut manufacturer of the positioning and the dimensions of the different ventilation ducts for your project. They can then better advise you on available options, and design the floor according to your specifications. Good planning will allow, when possible, the passage of large ducts through the floor cavity.

Do not overload floor with building materials. Make sure to distribute the loads uniformly on the floor so as not to exceed the design loads. Do not cut, drill into, or alter the Posi-Strut components, nor cut notches in the strongbacks.

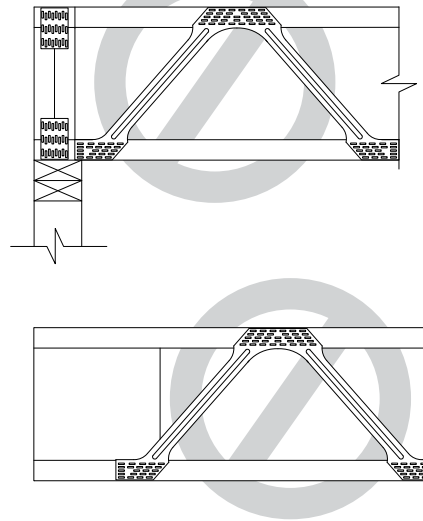
INSTALLATION DIRECTION

Ensure that all Posi-Strut trusses are installed in the correct orientation relative to all supports. There is typically only one correct orientation for installation and depending on the specific project, this may not be evident by simply looking at the truss. In lieu of a marking from the supplier indicating proper TOP, BOTTOM, LEFT and RIGHT directions, consult the engineering drawing for that specific truss. The drawing will always show the correct orientation of the truss relative to its supports.

Orientation as displayed on engineering / shop drawing



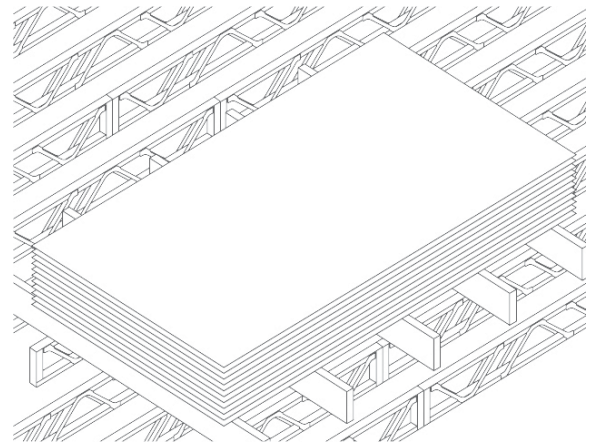
Incorrect truss placement (Truss is upside down)



SHEATHING ALLOWABLE LOADING

The maximum allowable load of sheathing materials temporarily stored on Posi-Strut trusses should not be greater than the design load. For typical residential floor loading with plywood and OSB sheets that are sized 4'x8', and 4'x12', this equates to approximately:

Plywood		OSB	
Thickness	Number of sheets	Thickness	Number of sheets
1/2"	20	7/16"	22
5/8"	16	19/32"	16
3/4"	13	23/32"	13
1.0"	10	7/8"	11



Where the sheets are stacked by hand, they should span lengthways across the trusses. When lifted via crane, they should bear on five bearing blocks the width of which should be 2' longer than the width of the sheathing.

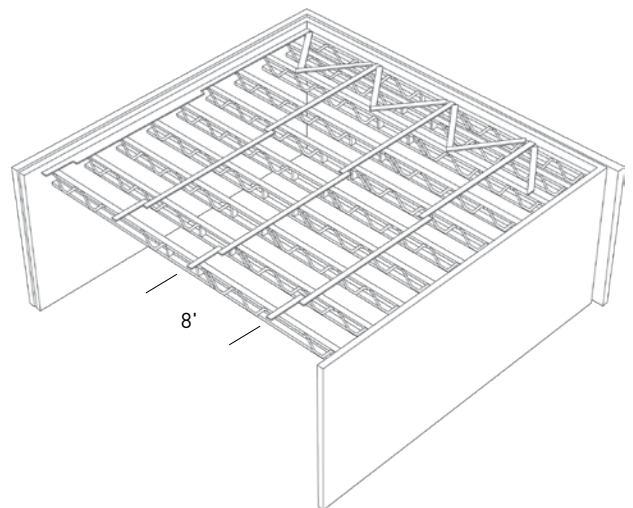
- Notes:
1. Ensure that stacked sheathing materials are supported by at least three trusses.
 2. Construction loads on floors are meant to be short term duration only.

Installation

Posi-Strut trusses are generally placed perpendicular to the load-bearing supporting walls and should be located so that the distance between the centrelines of the trusses does not exceed the design spacing. Always consult the placement plan and ensure to note and plan for all girders, openings and any other special requirements before beginning installation. Proper installation and bracing are vital to the safe construction of Posi-Strut systems.

Recommended installation is as follows:

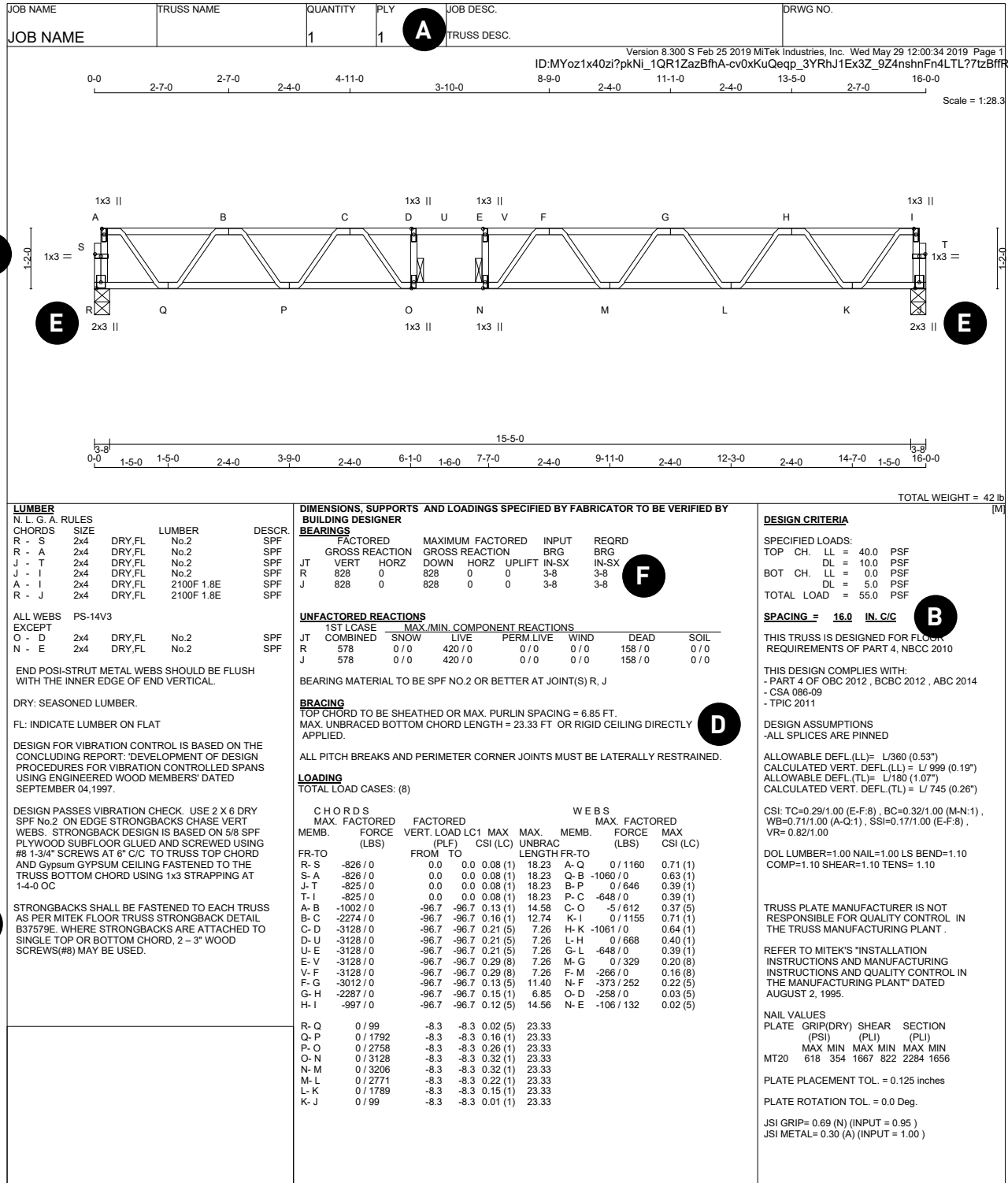
1. Review the layout and identify any multi-ply girders. Connect girder plies ahead of installation according to the connection instructions on page 10 and install the girders into position first.
2. Plan the installation sequence after the girders and place the Posi-Strut trusses close to where they are required. Only remove a minimum number of trusses from storage and place them around the building so that they may be installed in a reasonable period of time. Posi-Strut trusses should be protected from inclement weather and stored as per storage instructions.
3. Make sure that Posi-Strut trusses are installed in their correct orientation. Manufacturers may mark the Posi-Strut truss with the word "TOP", "BOTTOM", "LEFT", "RIGHT". In lieu of any markings, consult the engineering drawings prior to installation. Before lifting the Posi-Strut trusses into place, make sure the correct end of the truss is at the appropriate support (as the end details may be different) and that the Posi-Strut is correctly oriented vertically. If intermediate supports are being used, ensure that they are in the correct position (as shown on the engineering drawings) and that all intended truss bearing points align with the actual supports.
4. For top chord bearing Posi-Strut trusses (with an end vertical at the extension), the gap between the bearing and lumber vertical web must not exceed 1/2" (12 mm). For top chord bearing Posi-Strut trusses (see pages 6 and 7) without an end vertical, the first diagonal must overlap the support by a minimum of 1.0" (25 mm) to ensure proper load transfer.
5. Required bearing length for all trusses should be as indicated on the engineering design drawings but never less than 1.5".
6. Posi-Strut trusses should be installed square and vertical /plumb. The maximum deviation from horizontal should not exceed 1/4" and the maximum deviation from vertical should not exceed 1/16".
7. Temporarily brace the Posi-Strut trusses in place as they are being installed, utilizing temporary strapping/purlins and diagonals as well as permanent strongbacks.
8. Install the strongback bracing as required before closing in the ends. Strongbacks are always installed vertically (not flat oriented) and must be attached tight to the underside of the top chord or tight to the topline of the bottom chord. Strongbacks should be fastened to a minimum of three trusses. Please refer to strongback installation details on page 12.
9. All Posi-Strut trusses must be restrained at all support points to prevent lateral movement or toppling.
10. Complete the installation of all end details (e.g. ribbons) as well as all bottom / top chord bracing as indicated on the engineered drawings.
11. Temporary lateral stability is achieved by providing a diagonally braced system across at least 3 Posi-Strut trusses. Additional diagonal bracing should be added at a maximum of 20' spacing or 10 truss spaces (whichever is less) in long truss runs. Temporary strapping/purlins should be added every 8'. Temporary bracing may be progressively removed as the decking is installed and fixed.
12. It is important to fasten the subflooring to the trusses immediately following the application of construction adhesive. Waiting until the adhesive is dry to screw down the subfloor is a common mistake, one that can cause floor systems to squeak. Temporarily attaching a subfloor with a few nails, only to install screws a few days later, only contributes to the future possibility of floor noises.
13. The maximum load of sheathing materials temporarily stored on the Posi-Strut trusses is limited. Please refer to page 3 and do not overload or exceed the design loads of the truss (even if temporary).
14. Ensure to use only SPF No. 2 or better S-dry/KD (kiln dried) lumber.
15. Ensure nail and screw edge and end distances are as per building code.



Please refer to the BCSI Canada guide section BCSI-B7C, for a complete list of recommendations for temporary and permanent restraint/bracing of 3x2 and 4x2 parallel chord trusses.

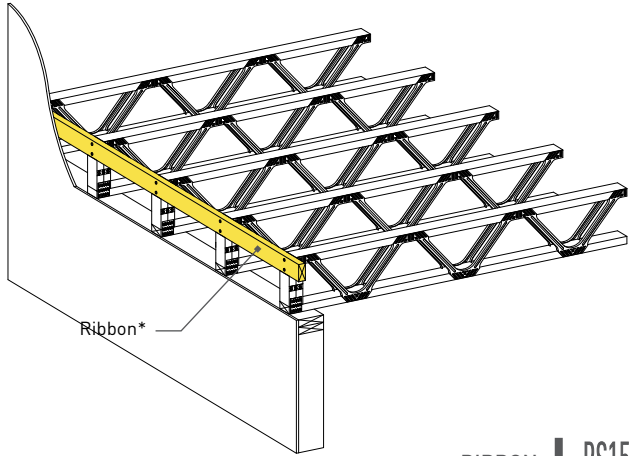
Remember to install the required strongbacks before closing in the ends.

Typical Engineering Report

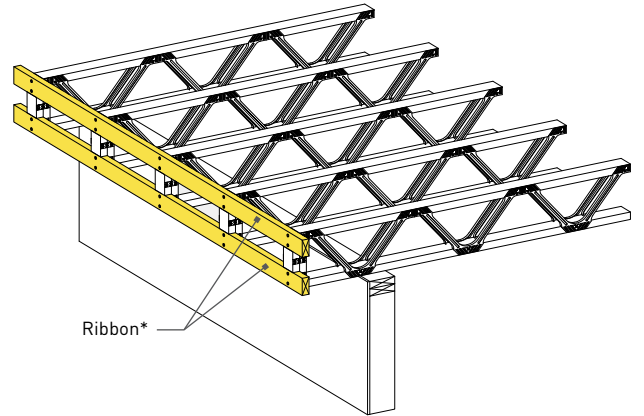


- A. Indicates number of plies. For more than 1 ply, ensure that the connection details are followed prior to installation.
- B. Indicates on-centre spacing. Please refer to layout for accurate placement. Don't exceed on-centre spacing.
- C. Ensure Posi-Strut truss is installed in correct orientation (Left to Right and Top to Bottom).
- D. Ensure strongbacks and top and bottom chord bracing are installed as per Engineering Drawing.
- E. End detail geometry will always be shown on the drawing. Ribbon / rim is typically not shown. Please refer to layout.
- F. Ensure required bearing length is achieved.

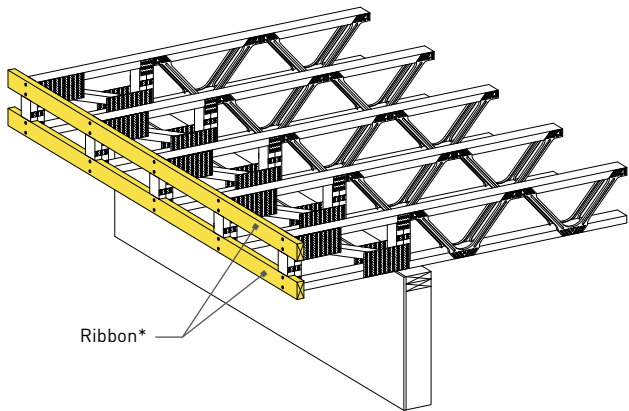
End Installation Details



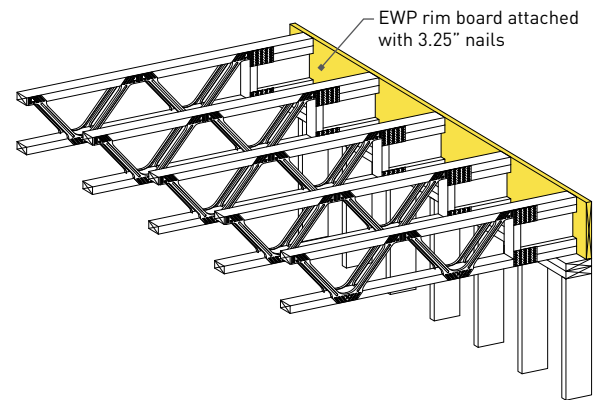
RIBBON | PS150



POSI CANTILEVER DOUBLE RIBBON | PS151



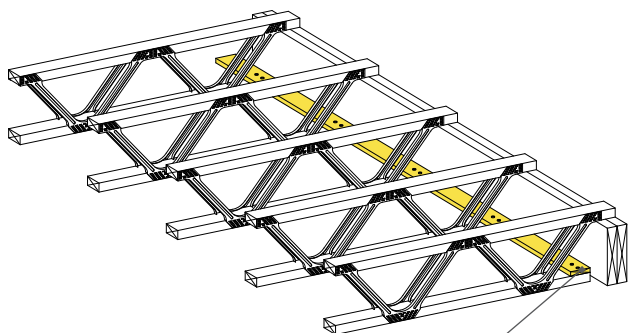
WOOD WEB CANTILEVER DOUBLE RIBBON | PS152



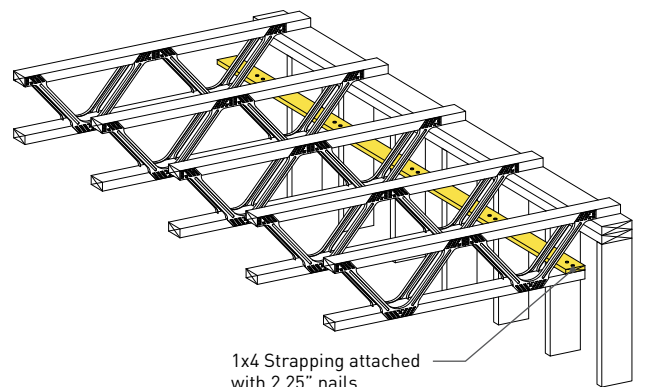
RIM BOARD | PS156

* Ribbond may be 2x3, 2x4 or 2x6 depending on design requirements.

Top Chord Bearing Installation



TOP CHORD BEARING ON BEAM | PS153



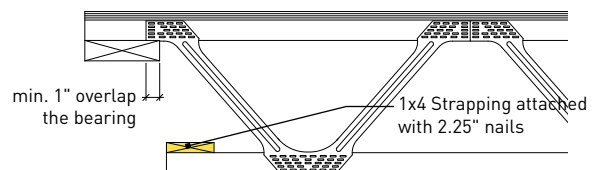
TOP CHORD BEARING ON WALL | PS154

Note concerning top chord bearing installation

In many applications, Posi-Strut does not require the use of hangers. In the top chord bearing condition (with no end vertical detail), the first diagonals must overlap the bearing by a minimum of 1" to ensure proper load transfer.

NOTE: Install 1x4 strapping at 7 feet o.c. as per code if no ceiling is applied against the bottom chord of the Posi-Strut floor.

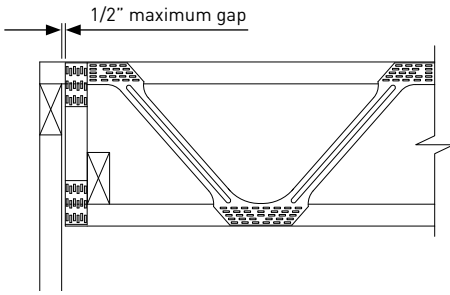
* This document expires December 31, 2021



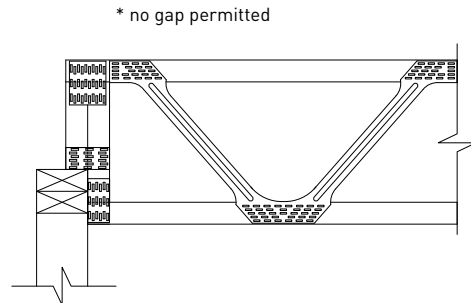
Top Chord Bearing Installation continued

* ensure 1.5" minimum bearing

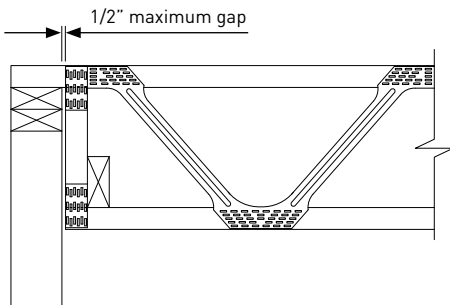
Top chord bearing on Posi/Wood Web Truss



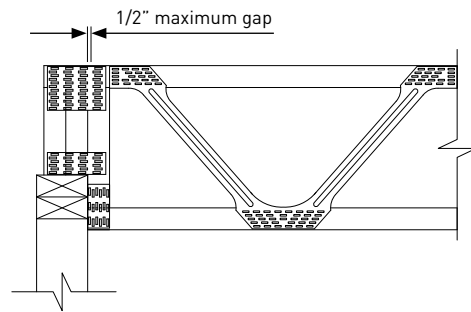
Top chord bearing on wood wall with single block



Top chord bearing on wood wall

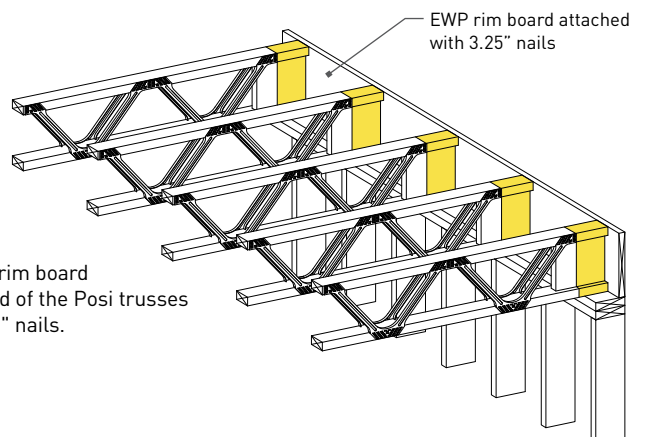
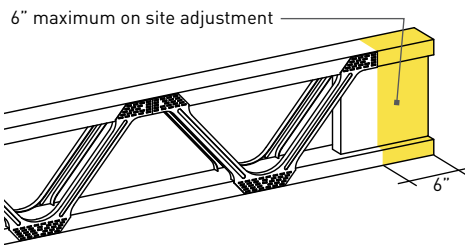


Top chord bearing on wood wall with double block



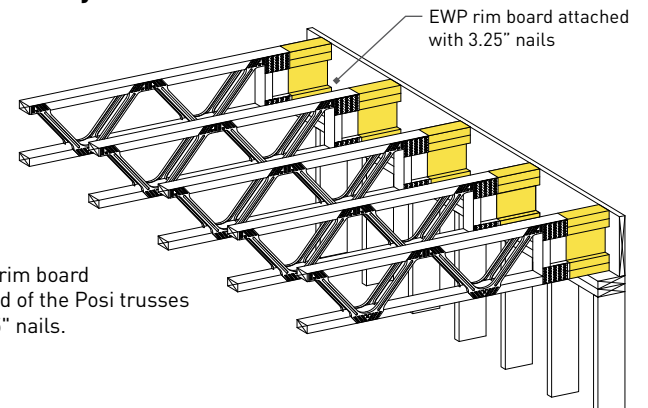
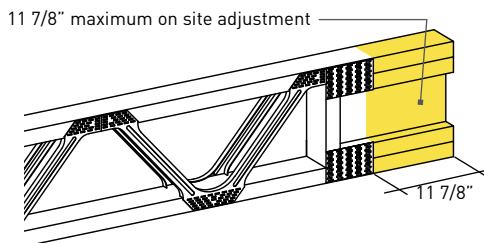
Adjustable End Details

6" ADJUSTABLE END DETAIL (lumber insert)



Install a rim board at the end of the Posi trusses with 3.25" nails.

11 7/8" ADJUSTABLE END DETAIL (I-joist or other proprietary insert)



Install a rim board at the end of the Posi trusses with 3.25" nails.

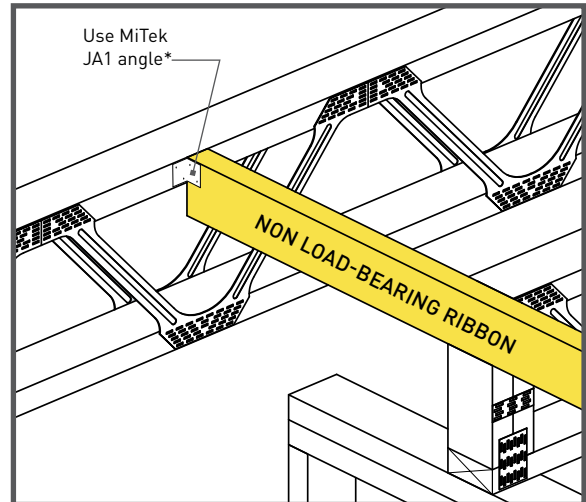
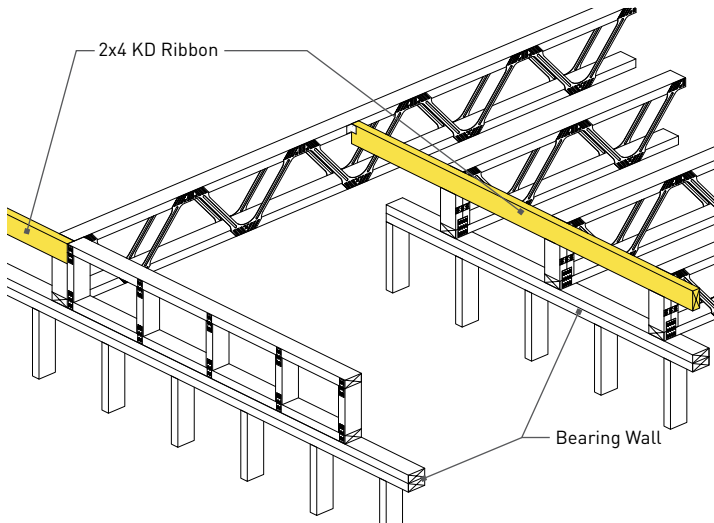
Notes

1. Rim board to be connected as per building design specifications / building code requirements.
2. Blocking as per I-joist manufacturer's requirements.
3. Refer to engineered drawings for further information on trimmable details.

Staircase Assembly Details

STAIRCASE ASSEMBLY WITH BEARING WALL

Since the Posi-Strut engineered floor system is custom designed for your project, various staircase details / connections can be produced to meet specific project requirements. The following are the four most commonly used details / connections.



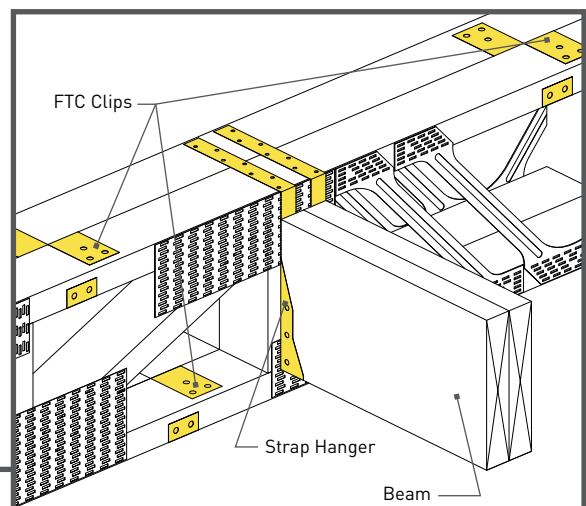
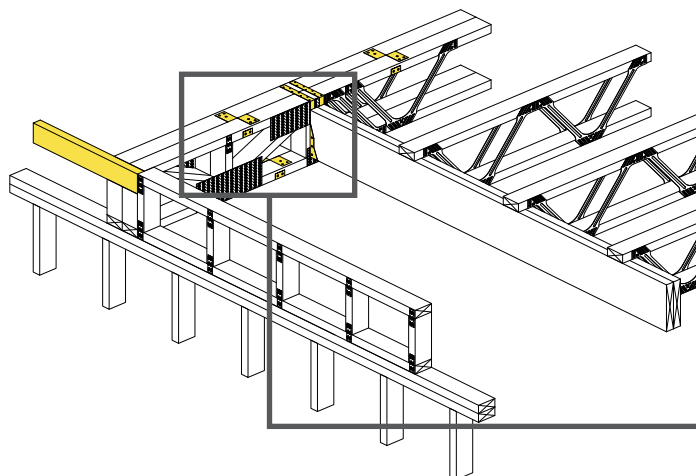
STAIRCASE ASSEMBLY WITH BEARING WALL

PS100

* Consult an engineer for a connection if ribbon is supporting a load-bearing wall from above.

STAIRCASE ASSEMBLY WITH STRAP HANGER CONNECTION

Before installing the double Posi-Strut girder in place, install the FTC clips, or FlatLOK screws, as per the tables on page 10. The clips or screws must be carefully positioned to the correct described locations and as close as possible to the concentrated loads. Install the strap hanger and beam. Important: ensure that the quantity and type of nails used in hanger and FTC connections are as specified by the manufacturer.



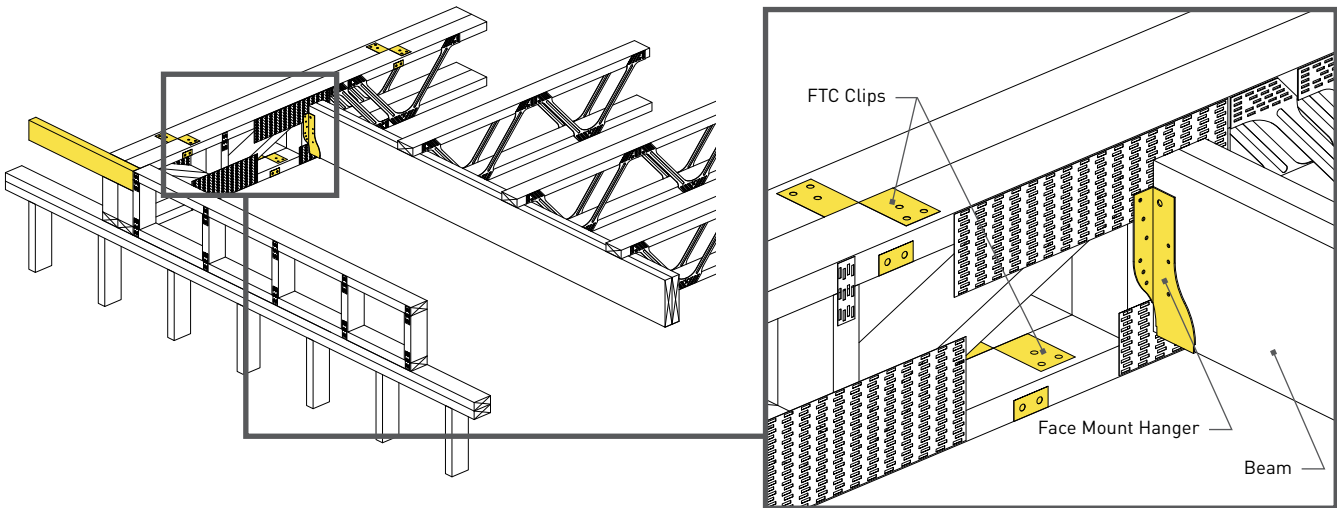
STAIRCASE ASSEMBLY WITH STRAP HANGER CONNECTION

PS102

Staircase Assembly Details continued

STAIRCASE ASSEMBLY WITH FACE MOUNT HANGER CONNECTION

Before installing the double Posi-Strut girder in place, install the FTC clips, or FlatLOK screws, as per the tables on page 10. The clips or screws must be carefully positioned to the correct described locations and as close as possible to the concentrated loads. Install the face mount hanger and beam. **Important:** Ensure that the quantity and type of nails used in hanger and FTC connections are as specified by the manufacturer. Ensure hanger nails are installed into solid wood. Should they fall in between the stacked vertical wood webs or too close to the edge of the web member, verify the adequacy of the connection with the hanger supplier.

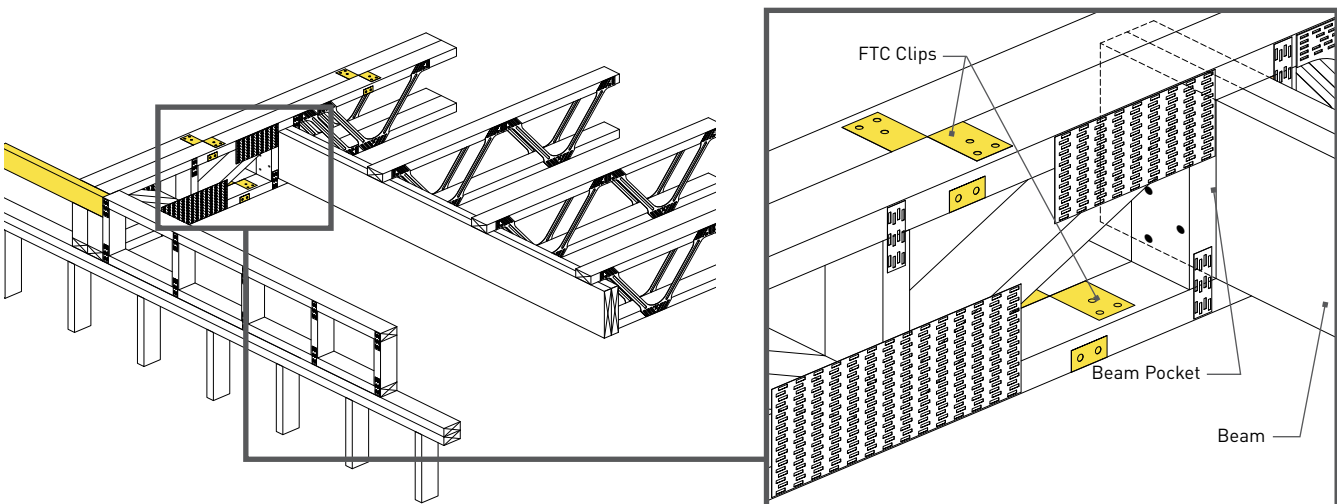


STAIRCASE ASSEMBLY WITH FACE MOUNT HANGER CONNECTION

PS103

STAIRCASE ASSEMBLY WITH BEAM POCKET DETAIL

Before installing the double Posi-Strut girder in place, install the FTC clips, or FlatLOK screws, as the per tables on page 10. The clips or screws must be carefully positioned to the correct described locations and as close as possible to the concentrated loads. Insert the beam in the beam pocket. To fill any gap between the vertical posts and the beam, use strips of plywood. Use nails or FlatLOK screws to ensure good connection between the beam and the vertical wood webs of the Posi-Strut girder. **Important:** Ensure that the quantity and type of nails used in the FTC connections are as specified by the manufacturer.



STAIRCASE ASSEMBLY WITH BEAM POCKET DETAIL

PS101

Double Ply Floor Girder Assembly

ASSEMBLY DETAILS USING FTC FLOOR CLIPS

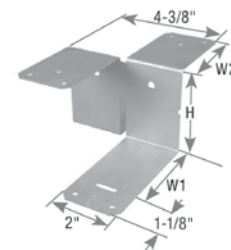
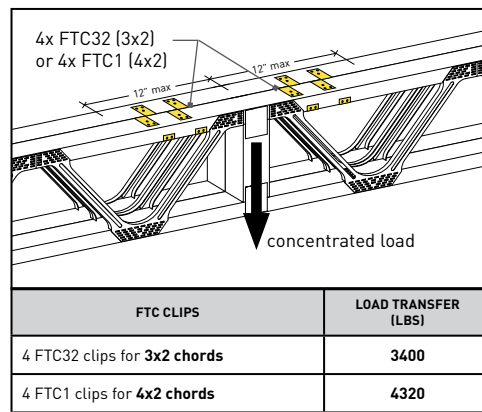
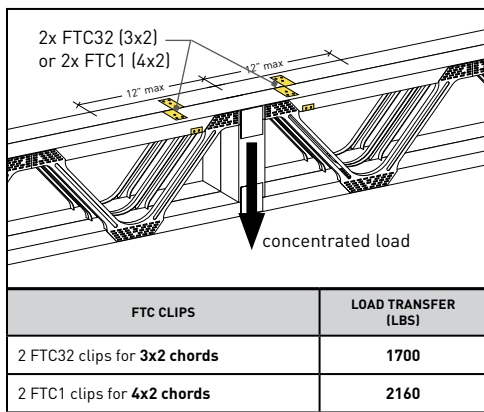
The following details are typical details. Special conditions or geometrical configurations may require an adjustment to the quantity and position of the FTC clips.

Installation:

- Install the FTC clip using 10d x 1-1/2" long [0.148" dia. nails].
- Please review the tables to determine the quantity of FTC required to transfer the load.
- Required FTC are to be installed within 12" of the concentrated load location.
- For higher transfer requirements, consult with the truss engineer.
- For specific details, please contact your Posi-Strut manufacturer.
- FTC clips shall be installed in pairs or multiples of two, symmetrical with respect to the location of the load.
- For additional information on connecting Posi-Strut two-ply girders, refer to the MiTek Structural Products Catalogue available on our website at www.mitek.ca.



typical FTC installation on Posi-Strut



typical FTC load transfer clip

ASSEMBLY DETAILS USING FlatLOK SCREWS

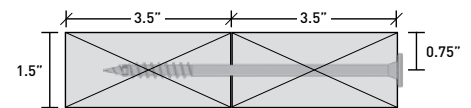
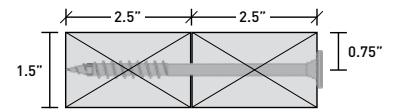
The following details are typical details. Special conditions or geometrical configurations may require an adjustment to the quantity and position of the FlatLOK screws.

Installation:

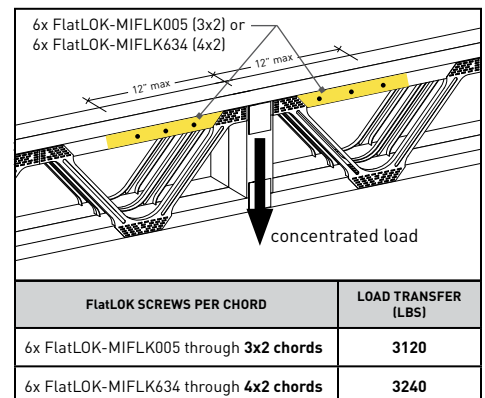
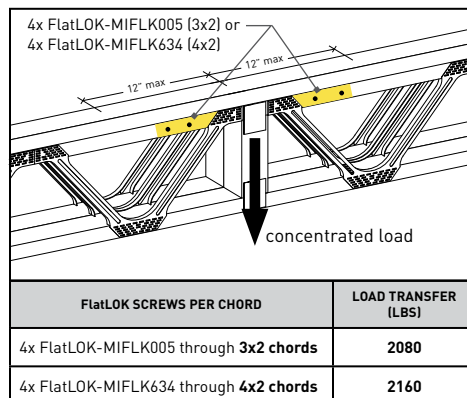
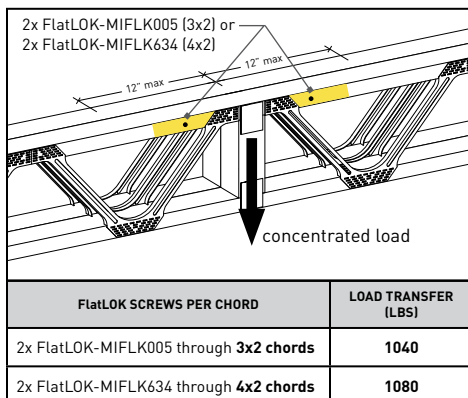
- Using an impact driver or high torque 1/2" variable speed drill (minimum 18V if cordless), bring fastener flush with wood surface. Do not overdrive. No pre-drilling required.
- Required FlatLOK screws have to be installed on the top chord within 12" of the concentrated load location.
- **Do not install screws in the bottom chord (or any other tension member) unless approved by the truss engineer.**
- Ensure a minimum 5" screw spacing parallel to grain.
- Do not drive screws through flanges of Posi-Strut webs. Drive screws directly into lumber.
- For higher transfer requirements, consult with the truss engineer.
- For additional information on connecting Posi-Strut two-ply girders, refer to the MiTek Structural Products Catalogue available on our website at www.mitek.ca.



typical FlatLOK screws



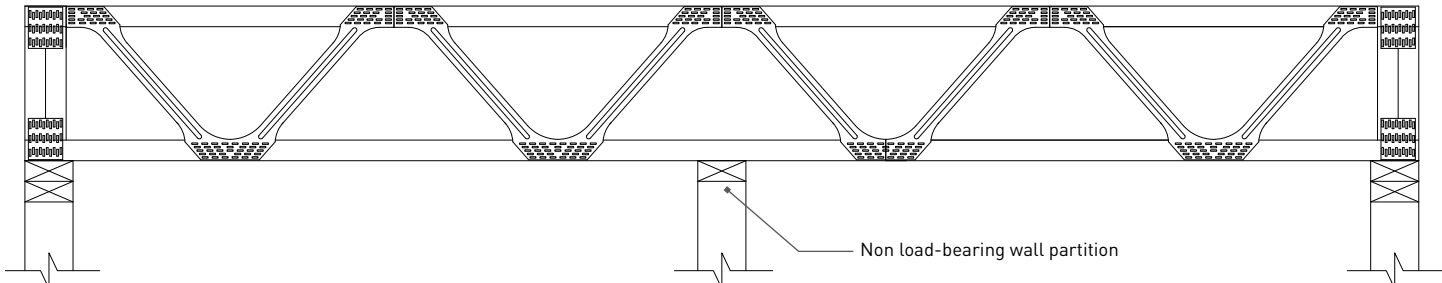
typical FlatLOK installation on Posi-Strut



Non-load-bearing walls

CLEARANCE OVER NON-LOAD BEARING INTERNAL WALLS

Posi-Strut trusses on the upper storey of multi-storey dwellings should be kept clear of internal non-load-bearing walls of the lower storey. It is recommended that the Posi-Strut truss be connected to these internal partition walls using MiTek TR or HTC ties / clips in order to provide lateral stability to the wall below while allowing the Posi-Strut trusses to deflect under load.



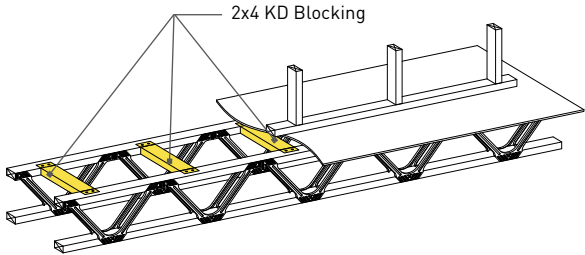
BLOCKING INSTALLATION UNDER NON-LOAD-BEARING WALLS

The placing of non-load bearing partition walls on the Posi-Strut floor system may require additional stiffening of the structure. Building designer to assess the weight of the partition wall. There are two situations:

1. If the length of the partition wall is parallel to the Posi-Strut trusses,
 - a. And the length of the partition wall is 8' or less, no additional truss support is required. However 2x4 blocking is required every 2' o/c to reinforce the subfloor under the non-load bearing partition walls.

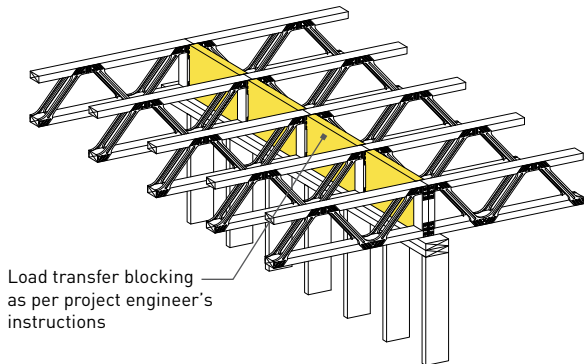
These must be installed with ZC2 clips and with four 10d x 1.5" nails. This reinforcement will not only ensure a better assembly but will also minimize the potential squeaking problem caused by poor wall support or poor wall to floor nailing.

- b. And the length of the partition wall is greater than 8', an additional Posi-Strut truss is required below the partition wall or the weight of the wall must be accounted for in the design.
2. If the length of the partition wall is perpendicular to the Posi-Strut trusses, generally no additional support is required.



Vertical Load Transfer

TYPICAL VERTICAL LOAD TRANSFER

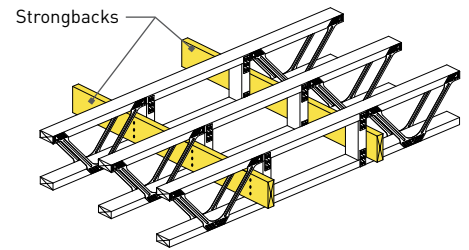


Depending on the different site conditions and load-path requirements, the project engineer may require blocking for vertical load transfer. To the left is a typical example of blocking needed between the trusses to transfer loads from a bearing wall above. This detail indicates only one possibility, but highlights the need to have a proper load path designed for your building.

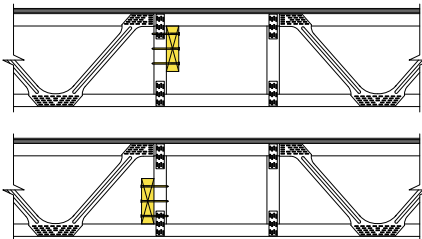
Please consult the project engineer to ensure that load transfer blocking is properly detailed and adequately installed on site. It is also the responsibility of the project engineer to determine the different shear and bracing details required for the project. In addition, trusses cannot support load-bearing walls from above unless specifically designed to do so.

Strongbacks

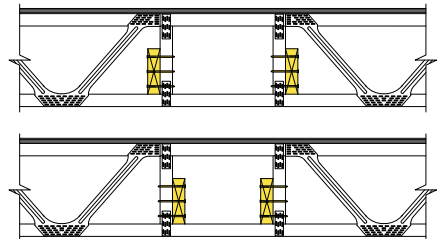
Strongbacks are boards of dimensional lumber (usually 2x6) that are positioned at specific locations within the floor system cavity. These boards act as mini beams, introducing a transverse stiffness element that allows the trusses to work together as **a system**, resulting in increased performance of the floor against vibration. Strongback size, grade and positions vary by project and are typically specified on engineering design drawings that are produced by authorized Posi-Strut manufacturers.



INSTALLATION AGAINST VERTICAL POSTS

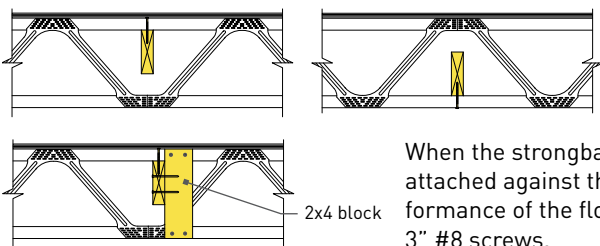


When the strongbacks are positioned against vertical posts, use three 3.25" nails to install the strongbacks. For a stronger connection, use two 3" #8 screws instead of the nails.



It is important to ensure that the strongback is in full contact with the vertical post and the horizontal chord.

INSTALLATION AGAINST THE TOP OR BOTTOM CHORD



When the strongbacks are positioned against a top or bottom chord, use two 3" #8 screws to install the strongbacks. It is important to ensure that the strongback is in full contact with the top or bottom chord.

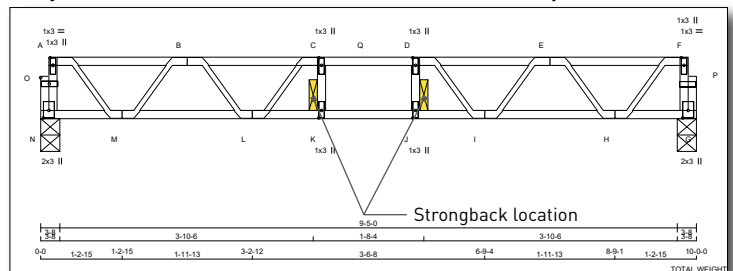
When the strongbacks are positioned against the top or bottom chord, the addition of a 2x4 block attached against the top and bottom of the Posi-Strut chords will improve the assembly and performance of the floor system. Connect the strongback and the block with two 3.25" nails or two 3" #8 screws.

MITEK ENGINEERING DRAWINGS

A copy of all engineering drawings are sent along with the trusses to the job site and are included with the installation layout and installation guide.

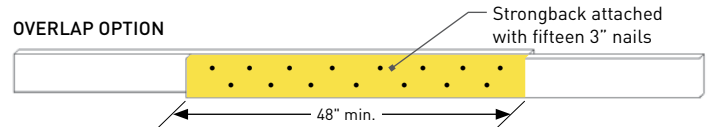
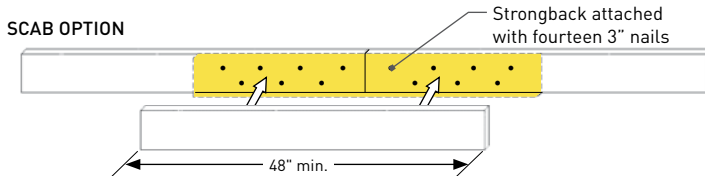
It is essential to consult these documents for specific technical details such as orientation, loading, bearings, spacing and strongback positioning.

Strongback positions (highlighted in yellow) are shown on the Posi-Strut engineering drawings. Position, size, grade and nailing instructions should be respected.



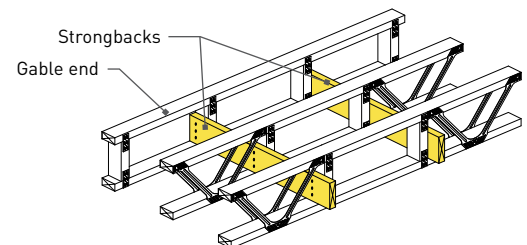
STRONGBACK SPLICING

The following details can be used to connect different strongback pieces. Both connections ensure a good performance of the strongback.



STRONGBACK ATTACHMENT

Strongbacks need to be tightly connected to the perpendicular bearing walls to ensure their performance. Also, the strongbacks need to be attached, with no gap, to the Posi-Strut using three 3.25" nails or two 3" #8 screws.



For any questions you might have, or if a strongback has been damaged during construction, please contact your MiTek authorized Posi-Strut manufacturer. They have the expertise to assist you and answer your questions.

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