MiTek[®] POSI-STRUT Engineered Open Web Floor System

INSTALLATION GUIDE

Your MiTek authorised Posi-Strut manufacturer:

IMPORTANT

The following instructions and guidelines are provided to help ensure proper installation, serviceability, and structural integrity 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 bending, twisting or droopping. 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 Posi-Struts like all 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 pro-

ceeding to install the subfloor. Posi-Strut trusses must be restrained at all support points to prevent lateral movement or toppling.

D0 install proper temporary bracing. Bracing is vital to the safe installation of Posi-Strut floors. Temporary bracing includes purlins, diagonal bracing 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. Do not apply heavy concentrated construction loads to the Posi-Strut floor. Please refer to BCSI section B4 for construction loads.

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.

2x4 wood spacers positioned as close as possible to end/web points 2x4 wood spacers positioned as close as possible to end/web points Use fabric sling. Do not use chains 60° or less or steel cables which may damage structural elements.

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 the manufacturer or Professional Engineer.

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 and in such a way as to prevent them from touching the metals 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 recommended 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 Posi-Strut truss 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.

Material	Height
Gypsum Board	12"
Plywood or OSB	16"
Asphalt Shingles	2 bundles
Concrete Block	8"
Clay Tile	3-4 tiles high

Place material next to outside Load bearing wall or directly over interior Load bearing wall.

Position stacks of materials flat with the longest dimension perpendicular to the Trusses as show in the graphic to the right.

Notes:

- 1. Ensure that stacked sheathing materials are supported by at least three trusses.
- 2. This table is based on trusses designed with a Live load of 40 psf or greater. For

other loading conditions, contact a Registered Design Professional.

- Stack heights assume short-term duration of Load. Install stacks of materials as quickly as possible.
- 4. Limit stack heights to those provided in the table and stacking periods to approximately one week, unless alternative information is provided by the Building Designer, Truss Designer or Truss Manufacturer.



Posi-Strut trusses are generally placed perpendicular to the load-bearing supporting walls and should be located so that the distance between the centerlines 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 truss 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 instructions on page 10 and install the girders into position first.
- 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-Struts without an end vertical, the first diagonal must overlap the support by a minimum of 1.0" (25 mm) to ensure proper load transfer.
- 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".
- 6. Temporarily brace the Posi-Strut trusses in place as they are being installed with temporary purlins/diagonals as well as permanent strongbacks.
- 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 either the topside of the

bottom chord or the bottom side of the top chord. Strongbacks should be fastened to a minimum of three trusses. Please refer to strongback installation details on page 12.

- 8. All Posi-Strut trusses must be restrained at all support points to prevent lateral movement or toppling.
- Complete the installation of all end details (e.g. ribbons) as well as all bottom / top chord bracing as indicated on the engineered drawings.
- 10. 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 20' spacing or 10 truss spaces (whichever is less) in long truss runs. Temporary purlins should be added every 8'. Temporary bracing may be progressively removed as the decking is installed and fixed.
- It is also 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.
- 12. 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).



Please refer to the USA BCSI - BCSI-B7, 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 you fasten trusses together to act as a single unit as per standard industry detail, or loads are to be evenly applied to all plies.
- B. Ensure Posi-Strut truss is installed in correct orientation (Left to Right and Top to Bottom).
- C. End detail geometry will always be shown on the drawing. Ribbon / rim is typically not shown. Please refer to layout plan.
- D. Indicates on-center spacing. Please refer to layout plans for accurate placement. Don't exceed on-center spacing.
- E. Ensure required bearing length is achieved.
- F. Notes may vary per Truss Design Drawing.

End Installation Details



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

Top Chord Bearing Installed



Top chord bearing on Posi/Wood Web Truss

1/2" maximum gap

Top chord bearing on wood wall



Top chord bearing on wood wall with single block

* ensure 1.5" minimum bearing



Top chord bearing on wood wall with double block



Adjustable End Details

6" ADJUSTABLE END DETAIL (lumber insert)



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



2. Refer to engineered drawings for actual trimmable length.

Notes

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 STRAP HANGER CONNECTION

Before installing the double Posi-Strut girder in place, install the FTC clips, or MiTek Pro Series screws, as per the tables on page 10. Double Posi-Strut girder must be designed for the appropriate concentrated loads. 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

STAIRCASE ASSEMBLY WITH FACE MOUNT HANGER CONNECTION

Before installing the double Posi-Strut girder in place, install the FTC clips, or MiTek Pro Series screws, as per the tables on page 10. Double Posi-Strut girder must be designed for the appropriate concentrated loads. 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

STAIRCASE ASSEMBLY WITH BEAM POCKET DETAIL

Before installing the double Posi-Strut girder in place, install the FTC clips, or MiTek Pro Series screws, as the per tables on page 10. Double Posi-Strut girder must be designed for the appropriate concentrated loads. 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 webs and the beam, use strips of plywood. Use nails or MiTek Pro Series screws to ensure good connection between the beam and 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 POCKET BEAM DETAIL

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.
- All 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 our website at MiTek-US.com





typical FTC installation on Posi-Strut



typical FTC load transfer clip

0.75

typical screw installation

on Posi-Stru

ASSEMBLY DETAILS USING PRO SERIES AND FLatLOK SCREWS

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

Installation:

- Truss plies are to be held tight together prior to application of screw with gap not exceeding 1/8".
- Screw heads to be on loaded face with minimum end distance of 4" in all members.
- Screws shall not be installed in areas where lumber wane exceeds 1/4".
- Screw locations may be adjusted up to 3" to avoid other hardware or lumber defects.
- Sheathing shall be mechanically attached to each truss top chord with fasteners at 12" o.c. max.
- Maximum 4 vertical webs for concentrated load ply to ply transfers.
- Do not overdrive screws. No pre-drilling required.
- All screws have to be installed on the top chord within 12" of the concentrated load location.
- Ensure a minimum 4" 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.



as per chart on right

(Single Top Chord)

Up to 7 screws in top chord @

o.c. screws in vertical web

MAX CONC. LOAD (LBS) VERTICAL EACH EACH SP WEB SCREWS SCREWS ADDL SPF ADDL LENGTH IN EACH VERTICAL OR HF VERTICAL PER OR DF (in) TC VERTICAL SP OR DF SPF OR HF 3 1680 1200 4 2240 1600 5 2800 2000 3360 2400 6 3920 2800 7 7 4480 +560 3200 +400 8 1 12 7 2 5040 +1120 3600 +800 16 7 3 5600 +1680 **//**000 +1200 7 20 4 6160 +2240 4400 +1600



1.5

CLEARANCE OVER NON-LOAD BEARING INTERNAL WALLS

Posi-Strut trusses on the upper story of multi story dwellings, should be kept clear of internal non-load bearing walls of the lower story. 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-loading 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.

- 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 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. For more information, please use the MiTek Strongback detail located on MiTek-us.com. The detail is titled MII-STRGBCK.



INSTALLATION AGAINST VERTICAL POSTS



When the strongbacks are positioned against vertical web, use three 3.0" 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 perfect contact with the vertical post and the horizontal chord.

INSTALLATION AGAINST 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.

STRONGBACK SPLICING AND ATTACHMENT

A 2x6 strongback oriented vertically may be positioned directly under the top chord or directly above the bottom chord. Securely fastened to the truss using any of the methods illustrated above.

Strongback bracing also satisfies the lateral bracing requirements for the bottom chord of the truss when it is placed on top of the bottom chord, is continuous from end to end, connected with a method other than metal framing anchor, and properly connected, by others, at the ends.

The strongbacks shall be secured at their ends to adequate support, designed by others. If splicing is necessary, use a 4'-0" long scab centered on the splice and joined with (12) - 10d (0.131" x 3") nails equally spaced.

Alternate method of splicing:

Overlap strongback members a minimum of 4'-0" and fasten with (12) - 10d (0.131" x 3") nails staggered and equally spaced. (to be used only when strongback is not aligned with a vertical)



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.



1-800-328-5934 MiTek-US.com © 2020 MiTek Inc. All Rights Reserved. July 2020 #2604