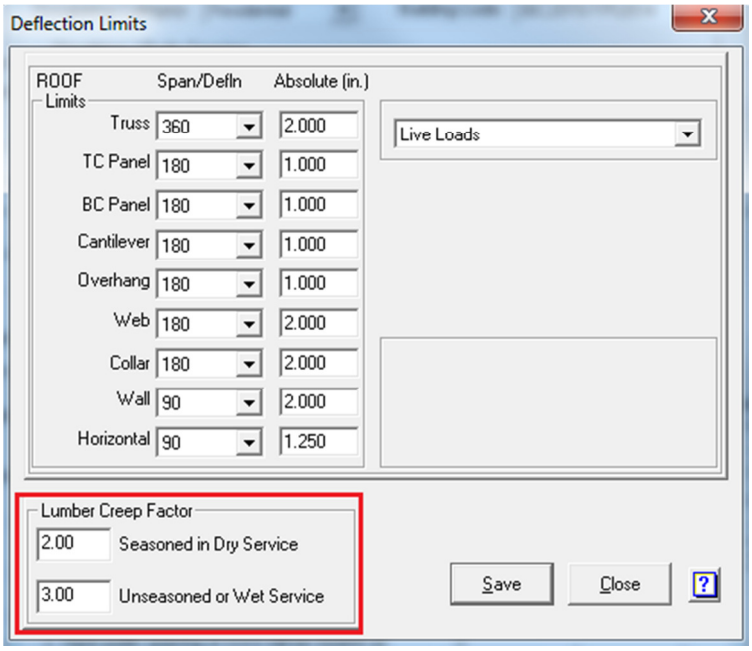
2015 IBC / IRC building codes are now available for adoption at the state and local level. While the 2015 codes might take some time for some municipalities to adopt, it is always good to know about the latest code reference design standards. ANSI/TPI 1-2014 is referenced in the 2015 IBC / IRC and this article summarizes the significant changes made between the ANSI/TPI 1-2007 and ANSI/TPI 1-2014 that affect the truss designs.

Deflection Criteria.

The deflection criteria have been revised in the last three editions of ANSI/TPI. The 2007 edition specified creep factors for total deflection calculations of 1.5 for seasoned (dry) and 2.0 for unseasoned (wet) conditions. In the 2014 edition these values have been updated to 2.0 and 3.0, respectively. Although these values are larger, how these values are being used has changed. The seasoned lumber factor of 2.0 will produce smaller deflection and the unseasoned lumber factor 3.0 will produce the same deflection. Creep factors are stored in Edit > Design Info > Deflection and are updated for IRC2015/TPI2014 and IBC2015/TPI2014 starting in MiTek Engineering version 7.6.



The Engineering Truss Drawing now shows Vert(CT) (the Creep Total vertical deflection) instead of Vert(TL) (the Total Load vertical deflection) to indicate the new method of checking deflection with ANSI/TPI 1-2014. The horizontal deflection also changed to show Horz(CT) (the Creep Total horizontal deflection) instead of Horz(TL) (the Total Load horizontal deflection).

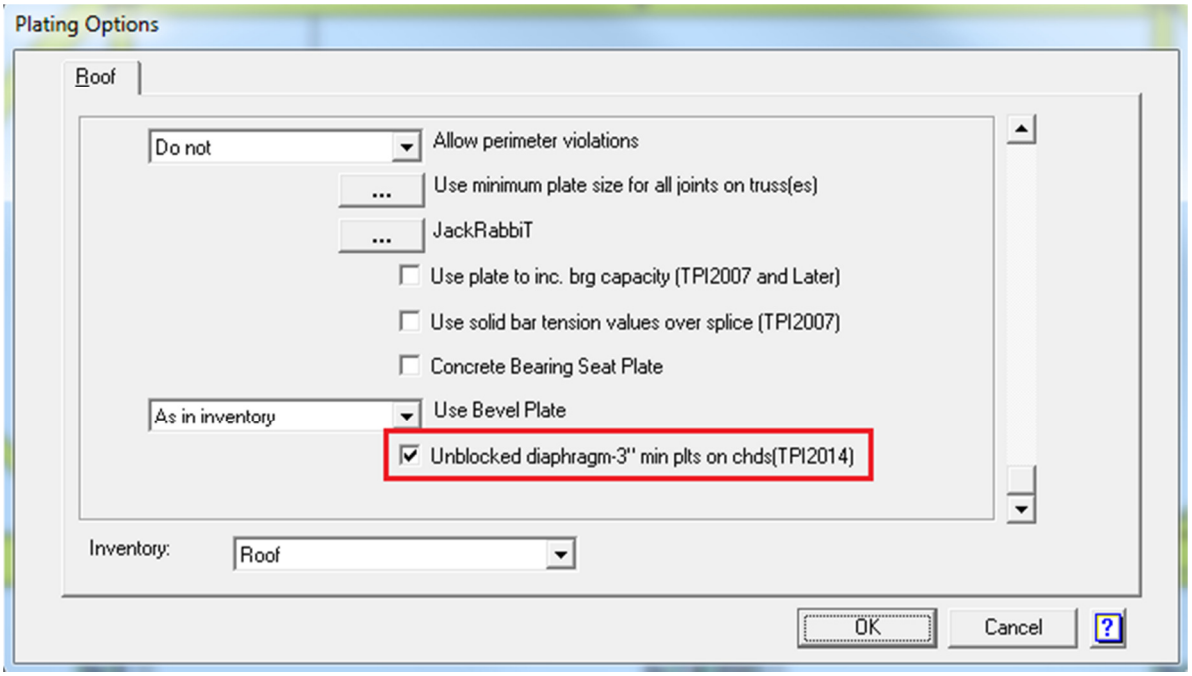
DEFL.	in	(loc)	l/defl	L/d
Vert(LL)	-0.29	I-K	>999	360
Vert(CT)	-0.43	I-K	>834	180
Horz(CT)	0.02	H	n/a	n/a
Wind(LL)	-0.06	K	>999	240

Any time the creep factor is changed from its default, a note displays in Notes section on the Engineering Truss Drawing:

8) Bottom chord live load (40.0 psf) and additional bottom chord dead load (10.0 psf) applied only to room. I-K
9) "Semi-rigid pitchbreaks including heels" Member end fixity model was used in the analysis and design of this truss.
10) This truss is designed for a creep factor of 3.00, which is used to calculate the Vert(CT) deflection per ANSI/TPI 1.
11) Attic room checked for L/360 deflection.

Minimum Plates Requirement for Chord-to-Chord Joints at Unblocked Roof Diaphragms.

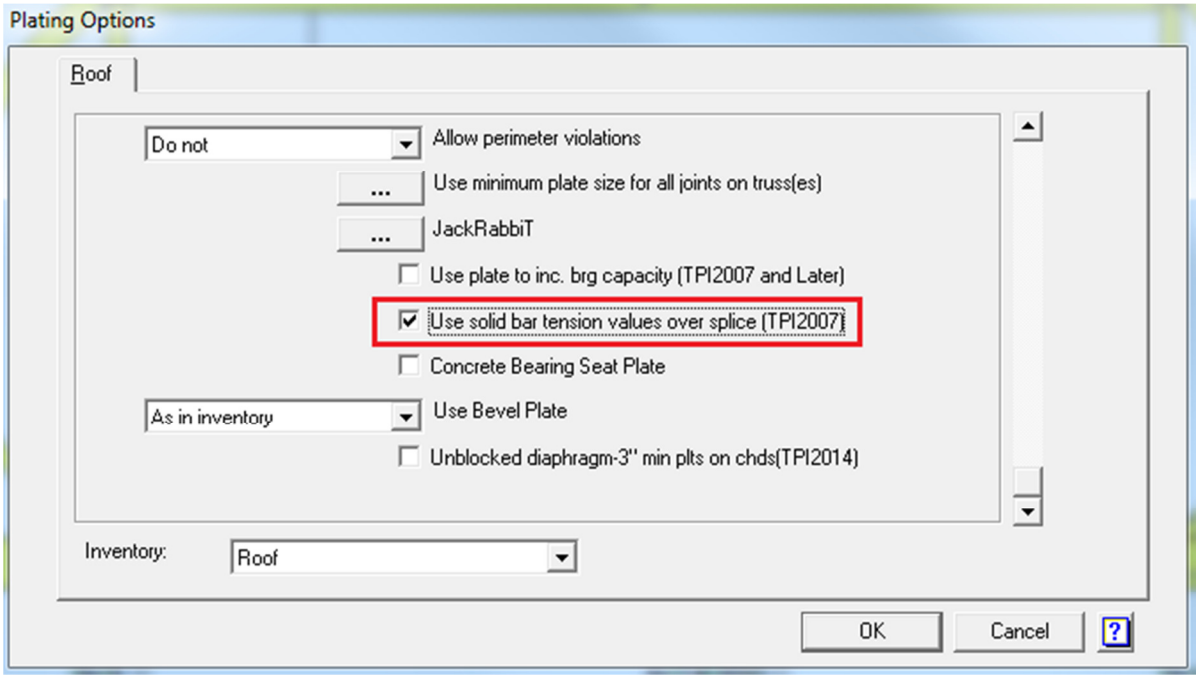
When a truss is required to transfer a diaphragm load perpendicular to the plane of a truss across joints in unblocked roof diaphragms, such as where a change in roof pitch takes place, section 6.2.2.5.1 of ANSI/TPI 1-2014 requires the use of a minimum 3" wide plate to transfer this load. A new setting is available starting in MiTek Engineering version 7.6 that will use a minimum 3" wide plate at all perimeter joints and splices to take care of this requiement. It can be activated in Edit>Plate Options:



Solid Bar Plating.

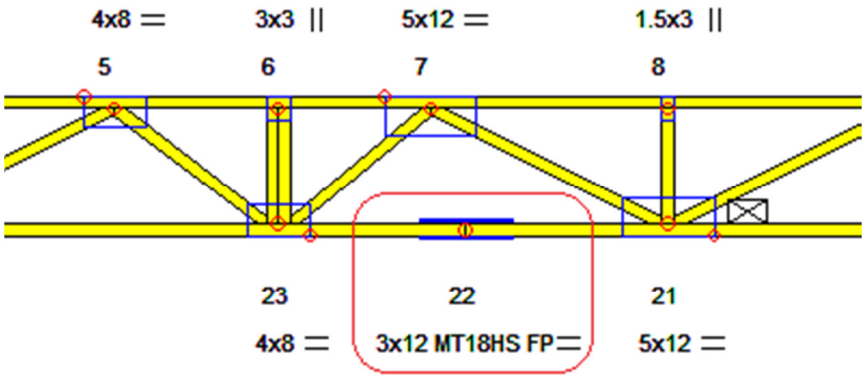
ANSI/TPI 1-2007 required that the tension value for connector plates be established with the minimum net section over the splice. MiTek established our ICC-ES research reports with an additional alternative value for when the solid section of the plate was over the splice. This method has now been added to ANSI/TPI 1-2014, but with more restrictive requirements than MiTek had with our design method.

Special measures should be taken to ensure that the shop understands the high degree of accuracy required on splice joints when solid bar tension values are used. ANSI/TPI 1-2014 only allows for a 1/16" positioning tolerance, making it very difficult to use this option in production. Although we do not recommend using this feature as a rule, as it requires stringent quality control, it may allow you to plate some joints that you could not otherwise. This setting can be activated in Edit>Plate Options:



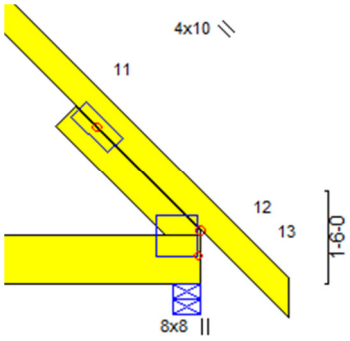
New Moment Check for Floor Plate Splices.

The new section 8.7.2 Design of Splice Joints with Plates on Top and Bottom was included to account for moment on flat chord (floor truss) splices. It is possible that designers may see some higher gauge plates at top and bottom chord splices of floor trusses.



Bearing perpendicular to grain.

A 0.3 factor was added to one of the calculations for compression stress perpendicular to the grain ($F_{c\perp}$) in the ANSI/TPI 1-2014. This limit may affect deeper members, like 2x8 and larger depths that are not supported at intermediate points along their depth. Full height blocking reinforcement may be required to prevent buckling at bearings where it previously was not required based on the ANSI/TPI 1-2007 calculation. If full height blocking is required, a note displays in Notes section on the Engineering Truss Drawing:



9) WARNING: Required bearing size at joint(s) 25, 12 greater than input bearing size.
10) Solid blocking is required on both sides of the truss at joint(s), 12.
11) "Semi-rigid pitchbreaks including heels" Member end fixity model was used in the analysis and design of this truss.

For additional information, or if you have questions regarding changes in the ANSI/TPI 1-2014 please, contact MiTek Engineering department.