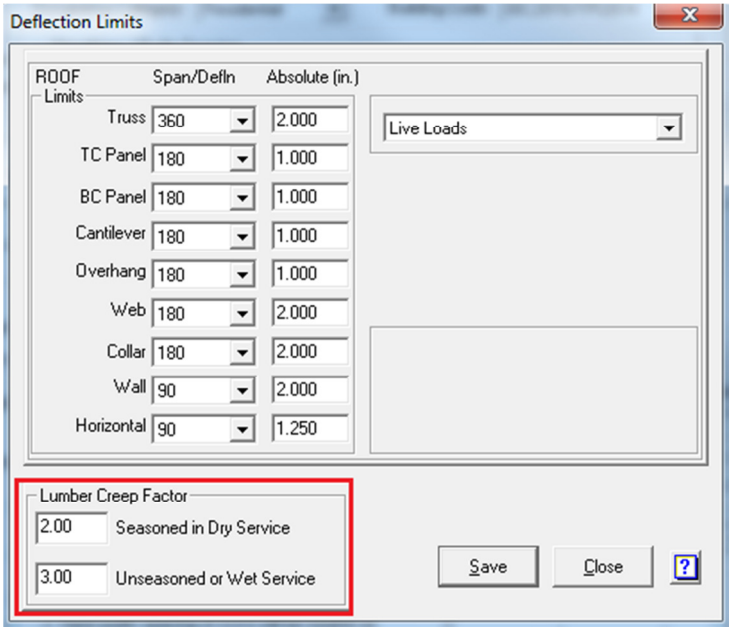
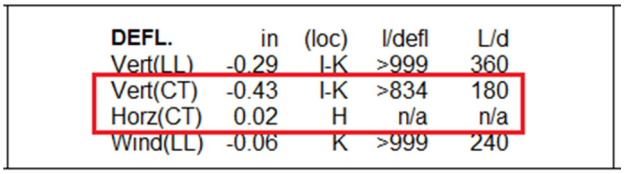
Creep Factor in ANSI/TPI 1-2014

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 must be 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).



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.

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

**** In the 2015 IBC, Table 1604.3, the "D + L" column references footnote d. This states, "The defection limit for the D+L load combination only applies to the deflection due to the creep component of long-term dead load deflection plus the short-term live load deflection." On MiTek designs, when it specifies Vert(CT), it is stating this defection. This deflection is the live load deflection plus the creep component of the dead load deflection.*

When a K_{cr} factor of 2.0 is used, this factor is multiplied times the dead load to produce a defection that is comprised of the creep component of the long-term dead load deflection plus the dead load deflection itself. In ANSI/TPI 1-2014, the deflection calculations were changed to match the requirement of the Building Code. To do this, the dead load is removed from the calculation when calculating the Δ_{cr}. This is why ANSI/TPI 1-2014 and the MiTek program use the formula: $\Delta_{cr} = \Delta_{LL+} (K_{cr} - 1) \times \Delta_{DL}$. We are matching the requirements of the Building Code. See TPI 1-2014 Commentary Section 7.6 ii for further details.

This deflection calculation checks for the deflection movement after the structure is built, i.e. once the dead load is already on the building. At this point, the trusses will only move based on the live loads that are applied to them and based on the additional dead load movement due to creep.