Truss deflection may be something you do not give much thought to when designing trusses. Unfortunately, meeting the code permitted deflection ratio does not always guarantee satisfactory performance. Regardless of what the codes say, most people regard large levels of deflection as a sign of structural deficiency. Paying attention to deflection may be the key to whether your customer is satisfied with you as a supplier and continues to buy your products.

Deflection of a truss is generally based on the amount of vertical movement from its original position due to the loads applied to the members.
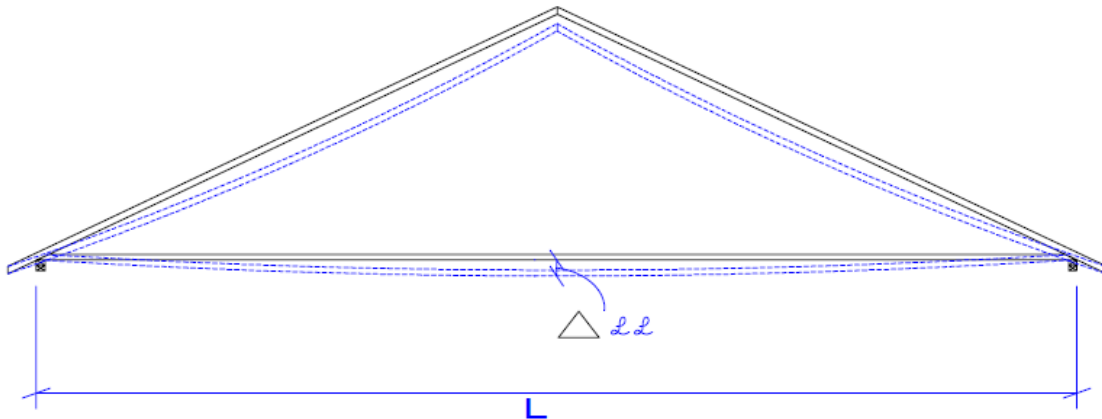

The amount of deflection depends on the span and stiffness of the members, and the magnitude of the loads applied. Codes provide the maximum allowable deflection limits for floor and roof trusses, which is based solely on the truss span. Generally, for roof trusses, the deflection in inches due to live load cannot exceed the span in inches divided by 240 (L/240) and due to total load L/180. For floor trusses, the deflection in inches due to live load cannot exceed the span in inches divided by 360 (L/360) and due to total load L/240. To meet code deflection criteria, a 40-foot span roof truss could have live load deflection 2 inches, which does not ensure satisfactory performance.

MiTek engineers recommend using the deflection limits listed below.

Roof Trusses should use the following settings:

In MiTek 20/20 Engineering go to Setup – Job – Design Info – Deflection:
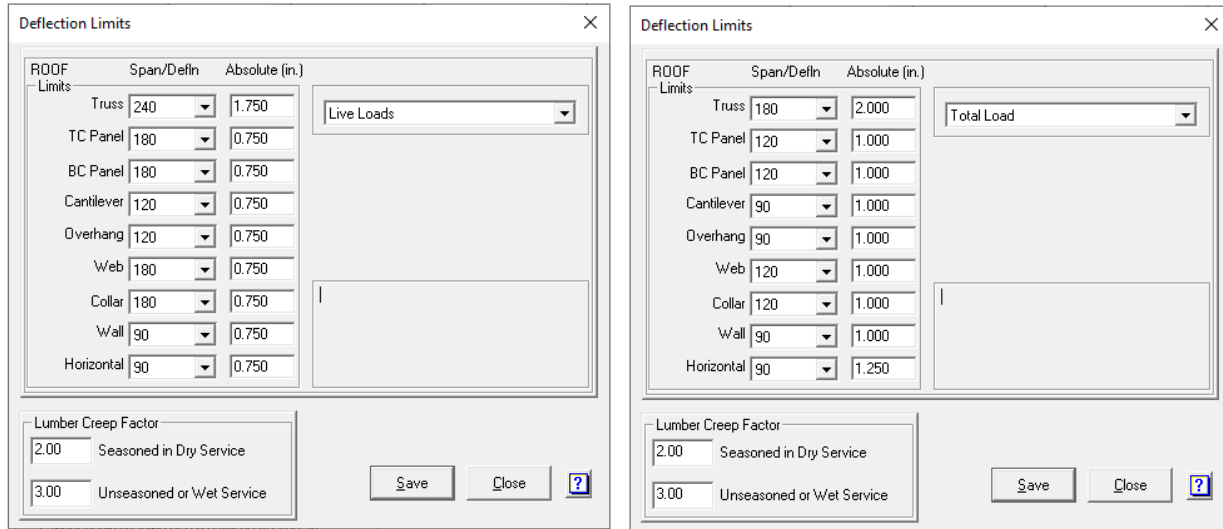
In Structure with Truss Design go to File – Setup – Job Properties - Job Settings – Design – Building Code Settings:

Roof Truss Live Load Deflection	
RT-LL Truss Span/Deflection Limit	240
RT-LL Truss Absolute	1.750
RT-LL TC Panel Span/Deflection Limit	180
RT-LL TC Panel Absolute	0.750
RT-LL BC Panel Span/Deflection Limit	180
RT-LL BC Panel Absolute	0.750
RT-LL Cantilever Span/Deflection limit	120
RT-LL Cantilever Absolute	0.750
RT-LL Overhang Span/Deflection Limit	120
RT-LL Overhang Absolute	0.750
RT-LL Web Span/Deflection Limit	180
RT-LL Web Absolute	0.750
RT-LL Collar Span/Deflection Limit	180
RT-LL Collar Absolute	0.750
RT-LL Wall Span/Deflection Limit	90
RT-LL Wall Absolute	0.750
RT-LL Horizontal Span/Deflection Limit	90
RT-LL Horizontal Absolute	0.750

Roof Truss Total Load Deflection	
RT-TL Truss Span/Deflection Limit	180
RT-TL Truss Absolute	2.000
RT-TL TC Panel Span/Deflection Limit	120
RT-TL TC Panel Absolute	1.000
RT-TL BC Panel Span/Deflection Limit	120
RT-TL BC Panel Absolute	1.000
RT-TL Cantilever Span/Deflection Limit	90
RT-TL Cantilever Absolute	1.000
RT-TL Overhang Span/Deflection Limit	90
RT-TL Overhang Absolute	1.000
RT-TL Web Span/Deflection Limit	120
RT-TL Web Absolute	1.000
RT-TL Collar Span/Deflection Limit	120
RT-TL Collar Absolute	1.000
RT-TL Wall Span/Deflection Limit	90
RT-TL Wall Absolute	1.000
RT-TL Horizontal Span/Deflection Limit	90
RT-TL Horizontal Absolute	1.250

Please note the settings for cantilever and overhang are half that of the main span.

Deflection due to wind load is not often a governing condition, however, there are certain instances where it may control. Long overhang/cantilevers and tall end verticals exposed to wind can be limited by deflection.
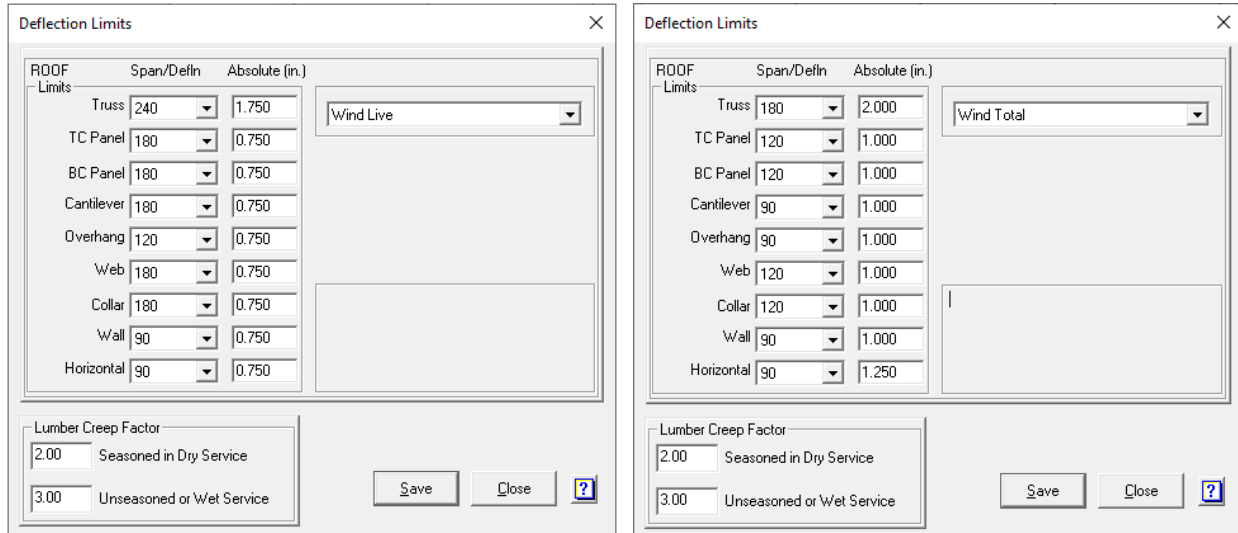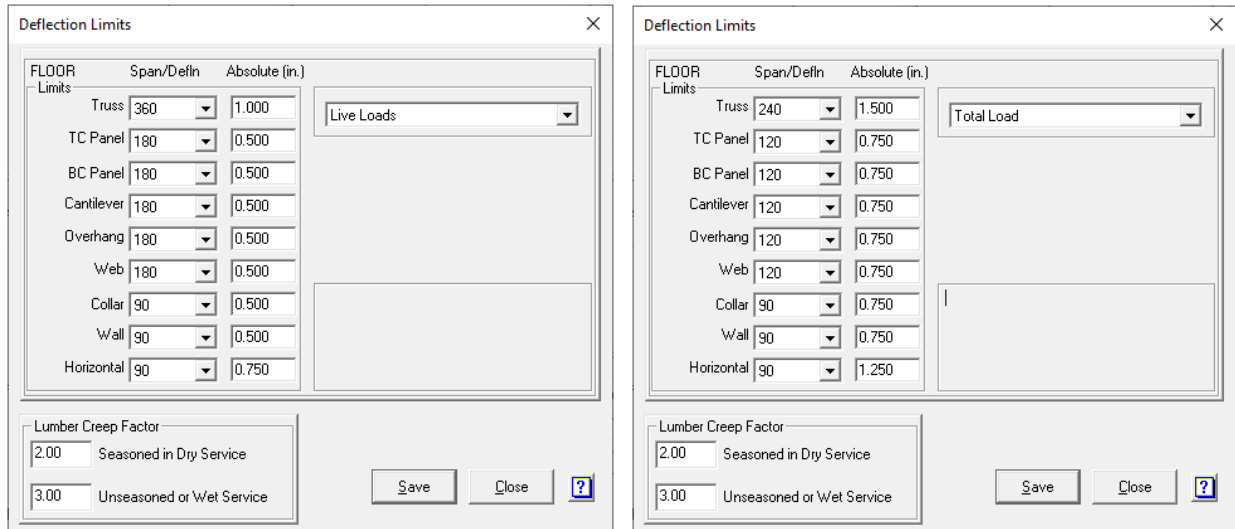

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Roof Truss Wind Live Deflection	
RT-WLL Truss Span/Deflection Limit	240
RT-WLL Truss Absolute	1.750
RT-WLL TC Panel Span/Deflection Limit	180
RT-WLL TC Panel Absolute	0.750
RT-WLL BC Panel Span/Deflection Limit	180
RT-WLL BC Panel Absolute	0.750
RT-WLL Cantilever Span/Deflection Limit	120
RT-WLL Cantilever Absolute	0.750
RT-WLL Overhang Span/Deflection Limit	120
RT-WLL Overhang Absolute	0.750
RT-WLL Web Span/Deflection Limit	180
RT-WLL Web Absolute	0.750
RT-WLL Collar Span/Deflection Limit	180
RT-WLL Collar Absolute	0.750
RT-WLL Wall Span/Deflection Limit	90
RT-WLL Wall Absolute	0.750
RT-WLL Horizontal Span/Deflection Limit	90
RT-WLL Horizontal Absolute	0.750

Roof Truss Wind Total Deflection	
RT-WTL Truss Span/Deflection Limit	180
RT-WTL Truss Absolute	2.000
RT-WTL TC Panel Span/Deflection Limit	120
RT-WTL TC Panel Absolute	1.000
RT-WTL BC Panel Span/Deflection Limit	120
RT-WTL BC Panel Absolute	1.000
RT-WTL Cantilever Span/Deflection Limit	90
RT-WTL Cantilever Absolute	1.000
RT-WTL Overhang Span/Deflection Limit	90
RT-WTL Overhang Absolute	1.000
RT-WTL Web Span/Deflection Limit	120
RT-WTL Web Absolute	1.000
RT-WTL Collar Span/Deflection Limit	120
RT-WTL Collar Absolute	1.000
RT-WTL Wall Span/Deflection Limit	90
RT-WTL Wall Absolute	1.000
RT-WTL Horizontal Span/Deflection Limit	90
RT-WTL Horizontal Absolute	1.250

Structure with Truss Design

Floor Trusses should use the following settings:

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Floor Truss Live Load Deflection	
FT-LL Truss Span/Deflection Limit	360
FT-LL Truss Absolute	1.000
FT-LL TC Panel Span/Deflection Limit	180
FT-LL TC Panel Absolute	0.500
FT-LL BC Panel Span/Deflection Limit	180
FT-LL BC Panel Absolute	0.500
FT-LL Cantilever Span/Deflection Limit	180
FT-LL Cantilever Absolute	0.500
FT-LL Overhang Span/Deflection Limit	180
FT-LL Overhang Absolute	0.500
FT-LL Web Span/Deflection Limit	180
FT-LL Web Absolute	0.500
FT-LL Collar Span/Deflection Limit	90
FT-LL Collar Absolute	0.500
FT-LL Wall Span/Deflection Limit	90
FT-LL Wall Absolute	0.500
FT-LL Horizontal Span/Deflection Limit	90
FT-LL Horizontal Absolute	0.750

Floor Truss Total Load Deflection	
FT-TL Truss Span/Deflection Limit	240
FT-TL Truss Absolute	1.500
FT-TL TC Panel Span/Deflection Limit	120
FT-TL TC Panel Absolute	0.750
FT-TL BC Panel Span/Deflection Limit	120
FT-TL BC Panel Absolute	0.750
FT-TL Cantilever Span/Deflection Limit	120
FT-TL Cantilever Absolute	0.750
FT-TL Overhang Span/Deflection Limit	120
FT-TL Overhang Absolute	0.750
FT-TL Web Span/Deflection Limit	120
FT-TL Web Absolute	0.750
FT-TL Collar Span/Deflection Limit	80
FT-TL Collar Absolute	0.750
FT-TL Wall Span/Deflection Limit	80
FT-TL Wall Absolute	0.750
FT-TL Horizontal Span/Deflection Limit	80
FT-TL Horizontal Absolute	1.250

Structure with Truss Design

If a stiffer floor system is desired, architects and engineers often specify the live load deflection criteria L/480. In this situation, it is recommended that the total load deflection be increased to L/360 in order to achieve a corresponding increase in overall stiffness. This applies to other common settings for live and total load deflections, such as 600/480 or 720/600.

MiTek Engineering software allows you to limit the truss deflection to a specific absolute value, in inches. Although the deflection ratio may allow for much higher deflections based on the truss span, it is recommended to set the absolute deflection that won't produce aesthetic issues.

In addition to immediate load induced deflection, wood trusses will also experience what is called creep. Creep is a property of wood that causes trusses under a sustained long-term load to deflect more with time. Creep can increase the calculated immediate dead load deflection by as much as two times.

Trusses are frequently cambered for the dead load portion of the deflection. Camber is upward curvature built into the truss to counteract dead load deflections. This gives a flat, level ceiling line after dead loads are applied. Cambering for design loads that exceed actual dead loads results in arched ceiling line that may be undesirable.

Differential deflection can also be a problem. For example, if you compare deflections of a truss with an interior support adjacent to a clear span truss under the same loading condition, the clear span truss is likely to deflect more than the adjacent truss with the interior support and that difference can be noticeable even if both trusses meet code deflection criteria.

A truss designer can bring potential issues mentioned above to the attention of the building designer, so the correction can be made during design phase and truss performance problems can be avoided.

For additional information, or if you have questions, please contact the MiTek Engineering department.