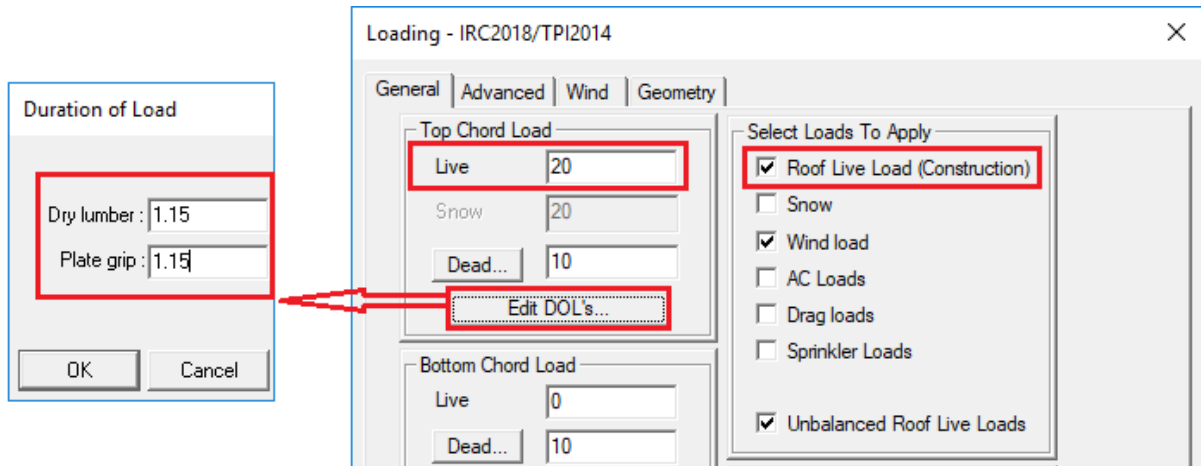


This whole discussion is not meant to be a detailed dissertation on engineering and loading but rather a laymen’s discussion to help a user know which selections to make in the General Loading Tab (in MiTek 20/20 Engineering) or in Building Code Settings (in Structure with Truss Design). The loading specification is the responsibility of the building designer.

There are three main ways to setup the truss top chord loading for roof trusses in MiTek Engineering software.

The **FIRST OPTION**, which is the most simple, is to use the ground snow load directly from the snow map and enter that as a Top Chord Live Load (TCLL) and call it Roof Live Load (Construction). Make sure that the Load Duration Factor (DOL) (Construction DOL in Structure with Truss Design) for dry lumber and plate grip is set to 1.15, since we are using live load to represent snow load. A DOL equal to 1.25 is NOT acceptable for this option.



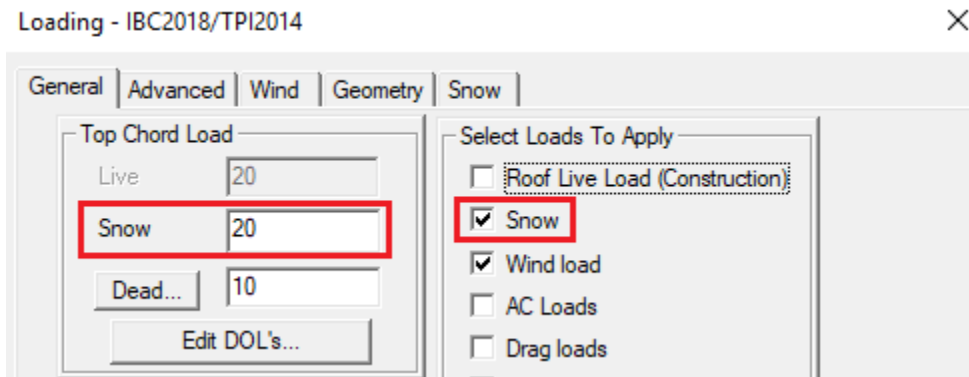
*General Loading Tab in MiTek 20/20 Engineering*

<b>Loading General - Roof Load</b>	
Roof Top Chord Live Load (Construction)	Yes
Unbalanced Live Load	Yes
Roof Top Chord Live Load	20.0 lb/ft <sup>2</sup>
Roof Top Chord Dead Load	10.0 lb/ft <sup>2</sup>
Roof Bottom Chord Live Load	0.0 lb/ft <sup>2</sup>
Roof Bottom Chord Dead Load	10.0 lb/ft <sup>2</sup>
<b>Loading - Snow</b>	
Consider Snow Load	No
<b>Load Duration Factors</b>	
Dead Only DOL	Dry Lumber: 0.9 Plate Grip: 0.9 Plate Metal: 0.9
Construction DOL	Dry Lumber: 1.15 Plate Grip: 1.15 Plate Metal: 1
Floor DOL	Dry Lumber: 1 Plate Grip: 1 Plate Metal: 1

*Building Code Settings in Structure with Truss Design*

This option is the one used the most due to its simplicity and long standing history. It is based on the “prescriptive codes” like the International Residential Code (IRC). One disadvantage to using this as your default loading is that you have to remember to turn on “Snow” when running a commercial job as this option only works for residential (one or two family dwellings) jobs, except in the south where snow loading is not generally considered. Another possible disadvantage to this option could occur on certain truss designs with a steep pitch, where the snow load would be greatly reduced if option to run “Snow” is used.

The **SECOND OPTION** is to run “Snow” loads per ASCE 7 as shown here, which can be used for both commercial and residential jobs:



*General Loading Tab in MiTek 20/20 Engineering*

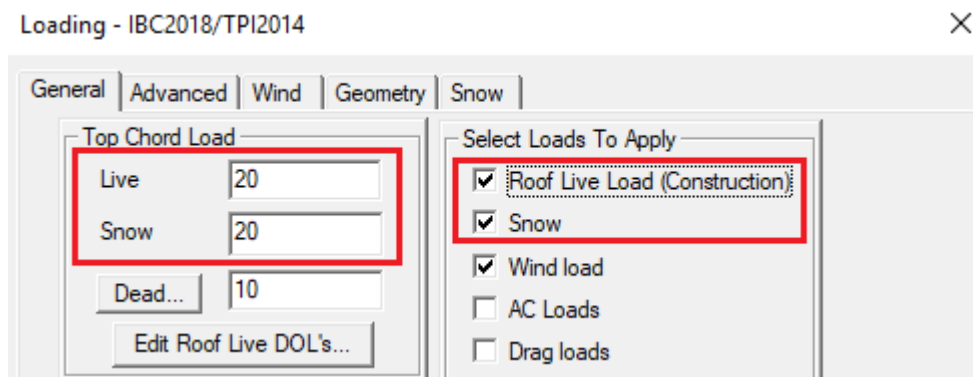
<b>Loading General - Roof Load</b>	
Roof Top Chord Live Load (Construction)	No
Roof Top Chord Dead Load	10.0 lb/ft <sup>2</sup>
Roof Bottom Chord Live Load	0.0 lb/ft <sup>2</sup>
Roof Bottom Chord Dead Load	10.0 lb/ft <sup>2</sup>
<b>Loading - Snow</b>	
Consider Snow Load	Yes
Design Method	ASCE 7-16
Snow Load Location	Ground (Pg)
Snow Load	20.0 lb/ft <sup>2</sup>

*Building Code Settings in Structure with Truss Design*

The main advantage to using this as your default setting is you would not have to make any changes when running a commercial or residential job. On certain trusses with a steep pitch and no flat sections of top chord you could get a more competitive design than using the uniform live load approach. In this option it is important to tell the software if the snow load you have input is a roof or ground value to insure a proper design.

Plate Offsets (X,Y)– [5:0-1-12,0-2-0], [12:0-4-0,0-4-12], [15:0-4-0,0-4-8]		
<b>LOADING (psf)</b>		
TCLL	19.0	
(Ground Snow=20.0)		
TCDL	10.0	
BCLL	0.0 *	
BCDL	10.0	
<b>SPACING-</b>	2-0-0	
Plate Grip DOL	1.15	
Lumber DOL	1.15	
Rep Stress Incr	YES	
Code	IBC2018/TPI2014	
<b>CSI.</b>		
TC	0.40	
BC	0.67	
WB	0.68	
Matrix-AS		

The **THIRD OPTION** is a combination of the first two options and is to run both Roof Live Load (Construction) and Snow as shown here:



*General Loading Tab in MiTek 20/20 Engineering*

<b>Loading General - Roof Load</b>		
Roof Top Chord Live Load (Construction)		Yes
Unbalanced Live Load		Yes
Roof Top Chord Live Load		20.0 lb/ft <sup>2</sup>
Roof Wall Dead Load		15.0 lb/ft <sup>2</sup>
<b>Loading - Snow</b>		
Consider Snow Load		Yes
Design Method		ASCE 7-16
Snow Load Location		Ground (Pg)
Snow Load		20.0 lb/ft <sup>2</sup>

*Building Code Settings in Structure with Truss Design*

This option is perhaps the most costly of the three options. It does have its appeals though in that you can satisfy a building designer that specifies both a snow load and a live load in the specifications.



## Ways to Input Top Chord Live Load in MiTek 20/20 Engineering and Structure with Truss Design

Plate Offsets (X,Y)-- [5:0-1-12,0-2-0], [12:0-4-0,0-4-12], [15:0-4-0,0-4-8]

LOADING (psf)		SPACING-	CSI.
TCLL (roof)	20.0	2-0-0	TC 0.37
Snow (Ps/Pg)	15.4/20.0	Plate Grip DOL 1.15	BC 0.67
TCDL	10.0	Lumber DOL 1.15	WB 0.65
BCLL	0.0 *	Rep Stress Incr YES	Matrix-AS
BCDL	10.0	Code IBC2018/TPI2014	

One possible disadvantage in using this option for MiTek 20/20 Engineering user would be that you need to make sure the Engineering program reports the actual live and snow load. The functionality “Show both Roof and Snow Loads in the Loading section” option must be activated in Setup – Output Setup – Engineering Output tab. Otherwise the engineering drawings would show TCLL only, which can confuse a building designer and / or a building inspector.

The bottom line is that no one way is the best at all times and for all fabricators in all areas of the country. Designers should look at the type of work they do (commercial or residential) and the snow load from the map for the area they do business to setup their defaults. Many fabricators today ship to a large area and they will need to make sure they design correctly for the area where the job is located.

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