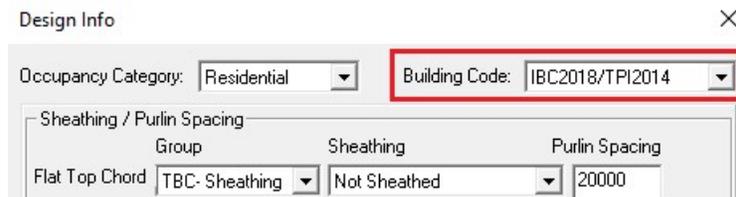


This article summarizes the significant changes made between ASCE 7-10 and ASCE 7-16 that affect truss designs.

While both the 2012 and 2015 IBC referenced the 2010 edition of ASCE 7, the 2018 IBC refers to the 2016 edition of ASCE 7, “Minimum Design Loads and Associated Criteria for Buildings and Other Structures”, which is put out by the American Society of Civil Engineers, and which establishes design loads for buildings.

To update job settings, go to Setup – Job – Design Info and choose IBC2018/TPI2014:



After code is selected, proceed with Loading Changes in Setup – Job – Loading:

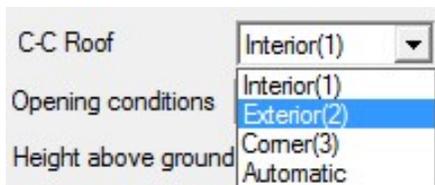


WIND

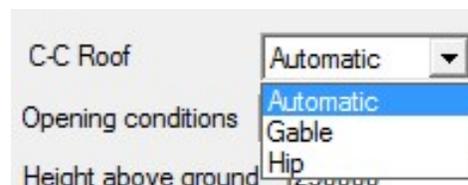
ASCE 7-10 wind maps and wind speeds are updated in ASCE 7-16. Wind speeds for large parts of the country have been reduced for each Risk Category.

While Category III and IV buildings were addressed on a combined map in ASCE 7-10, ASCE 7-16 has a separate wind speed map for Risk Category IV. There are four maps in ASCE 7-16: one for each Risk Category.

External pressure coefficients for component and cladding have increased. Hip and gable roofs are separated. Due to these changes our edit roof zone feature has been modified to specify new zone designations for C-C Roofs. In most cases, the factors are going up. Wind loads will generally increase. We generally recommend the user leaving this setting on “Automatic.” If you have a roof with just hip ends on it, you can set this to “Hip”, or if it just has gable ends on it, you can set it to “Gable”.

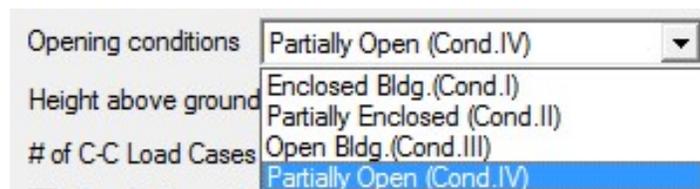


CC Wind Zones ASCE 7-10



CC Wind Zones ASCE 7-16

Enclosure Classification in ASCE 7-16, **Opening conditions**, has four inputs with factors for each. Just like in ASCE 7-10, the options available for all the procedures, are “Enclosed Bldg (Cond I)” and “Partially Enclosed (Cond II)”. But under the CC and Directional procedures in addition to “Open Bldg (Cond III)” you will also find “Partially Open (Cond IV)”. The building enclosure classification should be provided by the building designer. A basic explanation of a Partially Enclosed Building is where one side of the building is open, similar to an airplane hangar. Open Buildings have no walls on any side; a picnic pavilion is an example of an Open Building. Enclosed Buildings are those that only have small opening(s) on each wall (less than 4 sq. ft. or 1% of the wall area.) Partially Open Buildings are those that do not classify as enclosed, partially enclosed, or open. A carport with one solid wall and the others all open would fit in this category. Partially Open has the same internal pressure as Enclosed and basically is treated as enclosed with regards to the directional and envelope methods for MWFRS.



A Ground Elevation Factor is added in ASCE 7-16 to account for variations in air density at different altitudes. Entering the correct Ground Elevation above Sea Level can result, as an example, in 17% reduction in design wind loads in Denver.

The *Occupancy categories* described in the drop-down menu of the MiTek Engineering software are *Risk Categories*. Definitions are pretty much the same, just a change of nomenclature. For a more complete description, refer to MiTek Engineering Technical Article [“ASCE 7 Occupancy Categories”](#).

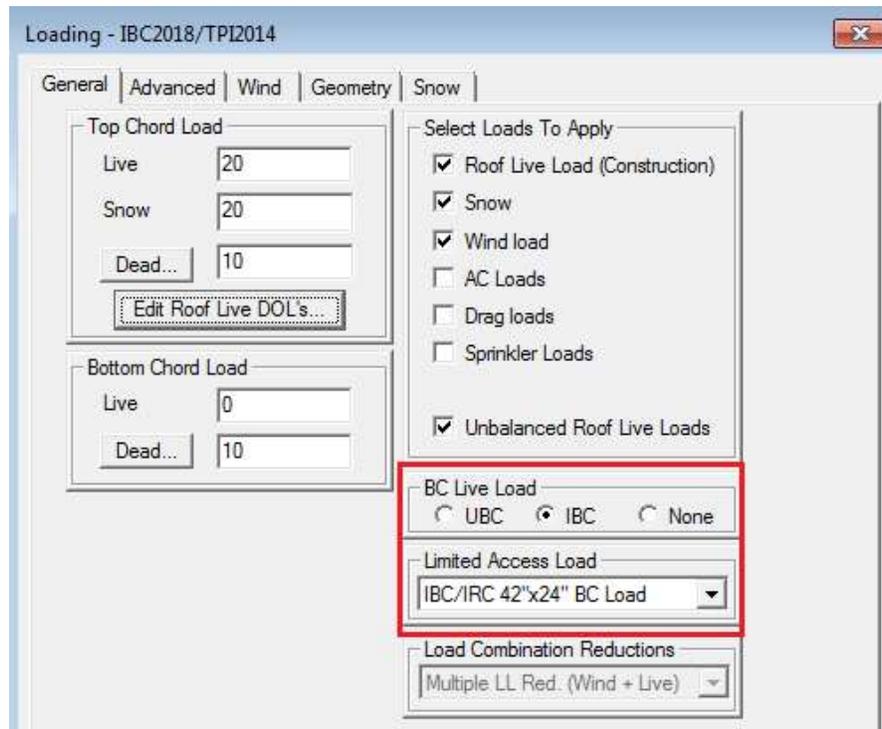
SNOW

Snow load maps in ASCE 7-16 incorporate regional snow data for site specific case study zones. Seven states specify snow load by county instead of using the map.

There are some changes in the unbalanced snow load requirements that will mostly affect small trusses.

If you design trusses for the Arctic Circle or mountain tops, you will need to check on Windswept Area in the Snow dialog window.

IBC/IRC BOTTOM CHORD LIVE LOADS



Both the IRC and IBC require a non-concurrent 10 psf bottom chord live load for attic areas without storage (IBC BC Live Load). Non-concurrent means that the bottom chord live load is applied in a separate load case without the top chord or any other live loads. Both codes also have a 20 psf live load for attic areas with limited storage, defined as any area in which a 42" high by 24" wide box would fit within the open spaces of a truss. This load is applied concurrently with the top chord or any other live loads. Both codes, IBC2018 and IRC2018, require that you have a minimum 10 psf bottom chord live load in the remaining portions of the bottom chord where the 20 psf live load is not applied. This is taken care of by the MiTek program when this load is applied. Please note, for the IRC, there are exceptions where the 20 psf live load is not required: for bottom chord slopes of 2:12 and greater, and when the required insulation depth is greater than the bottom chord member depth. The insulation exception may make it rare that the 42"x24" load is required on IRC designs. Given that energy codes require the use of insulation over livable spaces, it is likely that the 42-inch limited access live load will only be applicable to trusses over a non-insulated garage. Please also note that there is no "insulation exemption" in IBC. Of course, it is important to remember to check with local codes as many jurisdictions modify the requirements of this load.

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