

July 2020

2018 International Building Code (IBC) – How could new wind loading requirements affect you?

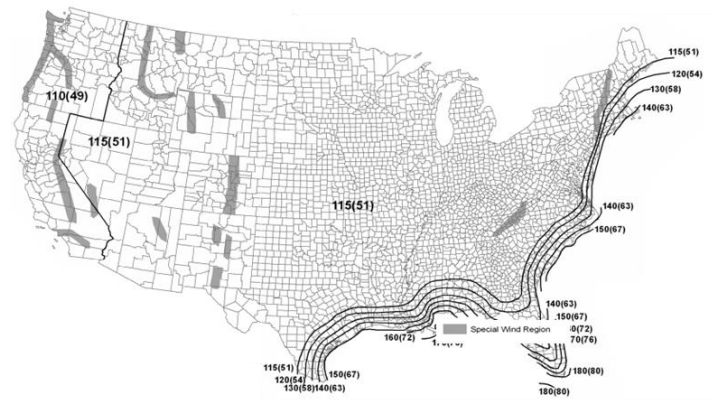
With more states and jurisdictions adopting the 2018 International Building Code (IBC), it is important to be aware of the impact of changes from the new code. The 2018 IBC follows the most recent release of the American Society of Civil Engineers (ASCE), *ASCE 7-16 Minimum Design Loads and Associated Criteria for Buildings and Other Structures*. This publication addresses two major changes regarding wind loading requirements: New Wind Speed Contour Maps and New Roof Design Zones. Both changes will affect the typical metal building design.

Wind Speed Contour Maps

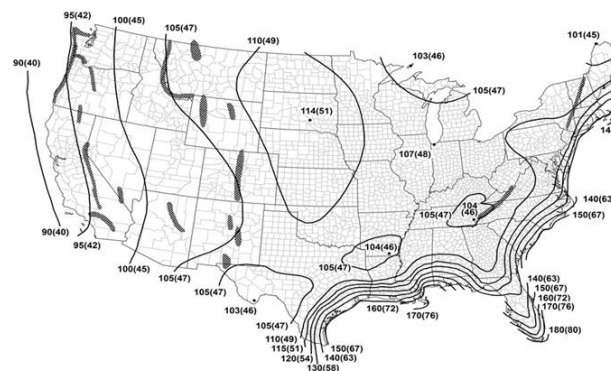
ASCE 7-16 developed new basic wind speed maps for each risk category building or other structure. Figure 1 compares the two wind speed maps from ASCE 7-10 (Figure 1-a) and ASCE 7-16 (Figure 1-b).

While the old map had fewer ranges of wind speed across the United States, the new map divides it into more regions and specific wind speeds for each one. As examples, the previous wind speed for Category II for the West Coast was 110 mph, and now is reduced to a range between 90-100 mph. Also, the Western States, as well as the Central Region were all in the same range of 115 mph wind speed and are now split into different ranges from 95-114 mph. Overall, wind speeds decreased across the country, except on the East Coast and the Gulf Coast, with some specific changes and slight increase.

The major point of this is the importance in increasing the awareness of possible region and/or jurisdiction requirements related to minimum basic wind speed before the design of a metal building or other structure and the importance of consulting the Engineer of Record or Local Building Code Department and be sure to use the proper basic wind speed.



(a) ASCE 7-10



(b) ASCE 7-16

Figure 1: Basic Wind Speeds for Occupancy Cat. II Buildings and Other Structures (from ASCE 7-10 and ASCE 7-16)

Roof Design Zones

There were significant changes on the Roof Design Zones from ASCE 7-10 to ASCE 7-16. For low slope roofs ($\theta < 1.5:12$), an additional zone (Zone 1', highlighted in yellow) was created and the edge zones are now Zones 1 and 2 (blue and magenta, respectively). Corner Zone 3 is now an "L" shape with increased widths of $0.6h$ (highlighted in green).

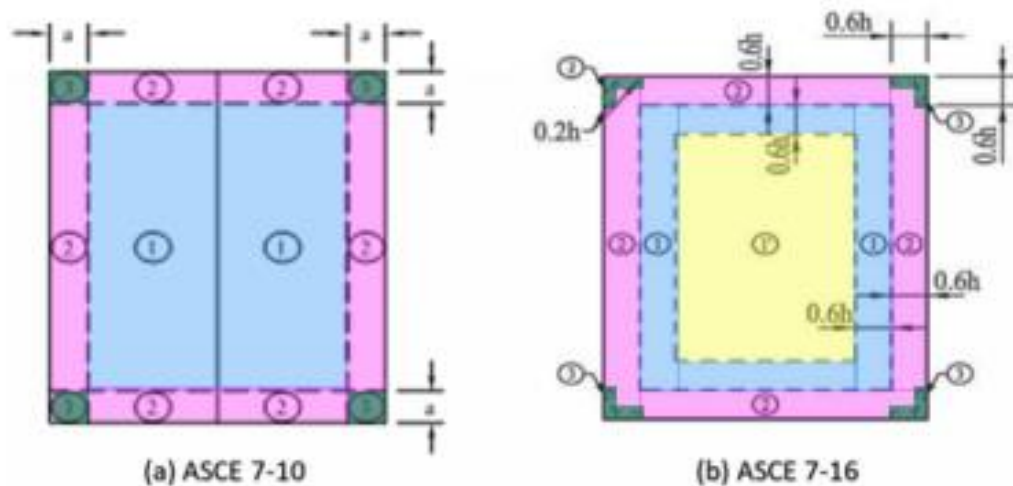


Figure 2: Roof Design Zones for Gable Slope $\theta < 7^\circ$ ASCE 7-10 vs. ASCE 7-16

Major takeaways from 2018 IBC new roof design criteria:

- New roof zones resulted in increased pressure and suction wind loads, especially in Zones 2 and 3. This might cause the need of tighter purlin spacing, potentially leading to more expensive roof systems;
- Thicker gage panel and/or purlins may be necessary to meet new loading requirements;
- Increased fastener requirements and seam reinforcement for floating roof systems leading to increased erection time;
- Roof design wind pressure and suction loads have increased due to updated roof zones, but wind speeds have decreased in most regions of the United States. Specifying the correct Basic Wind Speed for design is crucial to maintain a competitive pricing on projects;
- Overall pricing of re-quoted buildings could be affected by the transition to 2018 IBC.