Vibration Isolation and Seismic Control
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ASCE 7-16 Critical Code Updates for Wind

Throughout the country, local jurisdictions have started updating their building codes to match ASCE 7-16 and its associated IBC counterparts. Because of this, it is important to investigate the code updates of the wind loads. There are three major code updates in the ASCE 7-16 wind load calculations.

First, the design wind speeds have decreased in the majority of regions throughout the country. This is means that there will not be as much wind shear and uplift forces that will need to be resisted in designs. If a designer wants to verify that the correct design wind speed is being used for a project, they can check by using the ATC website (https://hazards.atcouncil.org).

Next, Risk Category III buildings now have their own design wind speeds. Before, in ASCE 7-10, the wind speeds for Risk Category III and IV were the same. However, for ASCE 7-16, Risk Category III wind speeds are between the values of Risk Category IV and Risk Category II wind speeds.

ASCE Design Wind Speeds for Dallas, TX			
Using ASCE 7-10		**Using ASCE 7-16**	
Risk Category	Wind Speeds (in mph)	Risk Category	Wind Speeds (in mph)
I	105	I	98
II	115	II	105
III	120	III	111
IV	120	IV	116

Lastly, in ASCE 7-16, the equation for calculating wind velocity pressure (26.10-1) was revised to include a ground elevation factor. It's important to note that Northern Nevada (see northern Nevada Amendments) do not allow this ground elevation factor.

$$Q_z=0.00256K_zK_{zt}K_dK_eV^2 \quad (26.10\text{-}1)$$

The ground elevation factor (K_e) reduces the wind velocity pressure based on the project's elevation. There are a few ways to find the appropriate ground elevation factor for a specific project. The elevation factor can be found using Table 26.9-1 and interpolation, using an

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equation (see note 2), or if no ground elevation effects are to be considered, use K_e=1.0 for velocity pressure design (see note 1).

Table 26.9-1 Ground Elevation Factor, K_e

Ground Elevation Factor, Ke		
Ground Elevation above Sea Level		
ft	m	Ground Elevation Factor K_e
<0	<0	see note 2
0	0	1.00
1,000	305	0.96
2,000	610	0.93
3,000	914	0.90
4,000	1,219	0.86
5,000	1,524	0.83
6,000	1,829	0.80
>6,000	>1,829	see note 2

Notes

1.) The conservative approximation K_e=1.00 is permitted in all cases.
2.) The Factor K_e shall be determined from the above table using interpolation or from the following formula for elevations:
$K_e=e^{-0.0000362z_g}$ (z_g = ground elevation in feet)
$K_e=e^{-0.000119z_g}$ (z_g = ground elevation in m)
3.) K_e is permitted to be taken as 1.00 in all cases

Bibliography

Minimum Design Loads for Buildings and Other Structures. ASCE, 2010.
Minimum Design Loads and Associated Criteria for Buildings and Other Structures. ASCE, 2016.
ATC Hazards by Location, ATC, hazards.atcouncil.org/
2018 Northern Nevada Amendments to the, reno.gov/
2012 Northern Nevada Amendments, reno.gov/

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In partnership with FEMA and ASCE, VISCMA also publishes three Seismic Installation and Inspection Manuals designed to assist field personnel.

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