



ASCE 7-22 SUMMARY



Every six years, The American Society of Civil Engineers updates the ASCE 7 standards for *Minimum Design Loads and Associated Criteria for Buildings and Other Structures*. This standard is a comprehensive set of structural criteria designed to protect the health, safety, and welfare of the public. Additionally, ASCE 7 offers a prescriptive framework to define and apply loads to structural designs predicated on the cumulative collaboration of civil and structural engineers, researchers, construction professionals, and building officials. In the most recent release, the ASCE/SEI 7-22 has updated its standards for structural roof design. These changes directly affect solar racking as it relates to wind, snow, seismic, and tornado loads.

Unirac has preemptively responded to ASCE 7-22 by charging our engineering department to focus on the new code's impact on racking design, testing, and implementation. As a result, Unirac's engineering and design of racking systems and installation standards have been advanced to adhere to the highest level of 7-22 compliance. One of Unirac's core values is a customer-centric approach to safety and reliability, a touchstone which is supported by Unirac's expertise in solar solutions and leadership in the renewable-energy marketplace. In that spirit, the following information is provided as an educational resource for the technical adjustments for wind, snow, seismic, and tornado loads. This data is freely disseminated by Unirac to encourage, inform, and empower our customers in harnessing renewable energy in the safest, most efficient, and most price-effective ways possible.

	CHANGE	IMPACT
 <p>WIND LOADS</p>	<ul style="list-style-type: none"> Basic Wind Speed Increased in Hurricane-Prone Regions. Revised Definition of "Exposed Module" for Pitched Roof. Simplified Pitched-Roof Zones. Simplified the Previous Count of 6 Roof Zones into 3 Updated Roof Zones. Prior Roof Zonings were Listed as 1, 2, 2n, 2e, 2r, 3e, 3r / New 7-22 Roof Zones are Listed as 1, 2, 3. 	<ul style="list-style-type: none"> Potential for Reduced Flush-Mount Spans in Areas along the Gulf Coast. Fewer Modules will be Considered Exposed as Compared to ASCE 7-16. This is Beneficial for Spans and will Allow for Expanded-Spacing Criteria. Slight Reduction in Wind Pressures and Expansion of Zone 1 All The Way To The Eave. Reduced Number of Roof Zones Benefits Designers and Simplifies Span Tables. Beneficial for Spans with the Expansion of Roof Zone 1.
 <p>SNOW LOADS</p>	<ul style="list-style-type: none"> Ground Snow Loads Increased in ASCE 7 Hazard Tool, Snow-Load Factor Decreased to 0.7, and Thermal Factor Increased to 1.2. Increased Minimum Roof Snow Load Applied to Low-Slope Roofs that are Risk Category 2 (Monoslope, Hip, and Gable Roofs with Less than a 15-Degree Pitch). 	<ul style="list-style-type: none"> Net Result of 10-20% Increase in Design Snow Loads for Flush-Mount Systems across the US. This is Detrimental for Spans and Will Decrease Current Spacing Criteria; in Rare Cases, a Customer Might Expect an Increase in Roof Penetrations, Hardware Components, and/or On-Roof Durations for Installers. Buildings May Require Rafter Upgrades Before PV can be Installed. This is Detrimental for Spans and Will Decrease Current Spacing Criteria; in Rare Cases, a Customer might expect an Increase in Roof Penetrations, Hardware Components, and/or On-Roof Durations for Installers.

CHANGE



SEISMIC LOADS

- Modules Must be Tested or Evaluated to Confirm they can Transfer a Horizontal (Seismic) Load.

IMPACT

- There Might be Challenges from some of the More Rigorous AHJs in Seismic Areas (California) for Ballasted Systems that are Not Grid Based.
- Unirac's Engineering Services Team can work with AHJs to present Unirac's Testing Data.
- Unirac has Rigorously Tested our Bay Systems to Ensure that our Racking Systems Comply with All 7-22 Seismic Requirements.



TORNADO LOADS

- New Chapter for Tornado Wind Loads Added in 7-22.

- Only Applies to Risk Categories 3 and 4 and Buildings in Tornado-Prone Areas East of the Rocky Mountains.
- Numerous Criteria Must be Met; Therefore, Adjusting for Tornado Wind Pressures will be Rare.
- Further Comparisons Needed to Quantify Tornado Load Effects on Spans.
- Reach out to Unirac's Engineering Team for Assistance and Information if you are Planning to Install in Risk Category 3 or 4 Areas.

The cumulative effect of the ASCE's 7-22 changes result in flush-mount span adjustments ranging from a 2% reduction to a 10% increase for most regions in the US. This span variation is a beneficial change as we can expect fewer roof penetrations, fewer hardware components, and shortened on-roof durations for installers. These changes will not significantly affect spans when adjusted to rafter spacing multiples. Exceptions where spans may decrease include hurricane-prone regions along the Gulf Coast and areas in the Northeast with higher snow loads.

Unirac is a responsive leader in sustainable energy technology and our customer's safety is a foundational company principle. Unirac is proud to comply with the rigorous safety standards set by the ASCE's 7-22 structural updates. All current and future customers can enjoy the security offered by the Unirac umbrella, and our state-of-the-art racking products will integrate safely and seamlessly into any renewable energy system, nationally and abroad.