Monday, July 28, 2025

The Engineer's Corner

SKGA Technical Newsletter

In this issue:

Understanding Live Loads in Parking Garages: What You Need to Know Concerning Passenger and Heavy Vehicles

When designing parking garages, live loads are a crucial factor. The requirements for live loads vary significantly depending on whether the garage is for passenger vehicles or for heavy vehicles, such as trucks and buses. In this article, we will discuss how design live loads are determined and briefly mention the possible impact of electric vehicles on parking garage design.

Live Loads for Passenger Vehicle Garages

For garages built to accommodate passenger vehicles (those with a gross vehicle weight rating up to 10,000 pounds) — such as cars, SUVs, and pickup trucks, the 2024 edition of the International Building Code (2024 IBC) specifies a uniformly distributed minimum live load of 40 psf in Table 1607.1. This load is not permitted to be reduced by the live load reduction provisions of the code, except for vertical members supporting two or more floors, where it is permitted to be reduced by up to 20 percent.

The same uniformly distributed minimum live load is also specified in ASCE 7-22 Table 4.3-1. Prior to ASCE 7-02, the uniformly distributed, live load for passenger vehicle garages used to be 50 psf, subject to the live load reduction provisions of the standard. In ASCE 7-02, it was decreased to 40 psf non-reducible load based on a study by Y. K. Wen of the University of Illinois at Urbana Champaign,

More on live loads for heavy vehicle garages and the impact of electric vehicles on live loads for parking garages is provided is provided in this article.

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DID YOU KNOW

Evolution and Future of Cold-Formed Steel Framing Standards

In 2023, the American Iron and Steel Institute (AISI) abandoned its standards development and construction code advocacy program. Initially transferred the Steel Deck Institute (SDI), framing standards were acquired by to the Steel Framing Industry Association (SFIA) at the end of 2023. This move raised questions about the future of cold-formed steel standards and their adoption into building codes. In December 2024, SFIA began managing the S200 series of standards, the S400 seismic design standard, and twelve of the S900 series test standards. These efforts are supported by the SFIA Standards Committee, which uses the canvass method to develop and maintain standards efficiently.

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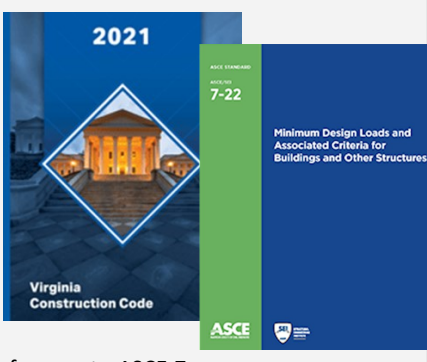
Virginia adopted the 2021 IBC along with ASCE 7-22



The 2021 Virginia Uniform Statewide Building Code (VUSBC) is the current building code for all construction in the Commonwealth of Virginia. The VUSBC is based on the 2021 International Building Code (IBC) with Virginia-specific amendments.

By far the most important Virginia-specific modification is that the reference to ASCE 7-16 in VUSBC Chapter 35 has been replaced by a reference to ASCE 7-22. Thus, Virginia has adopted the 2021 IBC along with ASCE 7-22. To what extent the Commonwealth has examined the compatibility between the adopted code (2021 IBC) and the referenced standard (ASCE 7-22) is unknown to us.

TECHNICAL QUESTIONS

Site Class Determination for Deep Pile Foundations

Q **Is it logical to classify site seismic conditions based on the average shear wave velocity in the top 30 meters, even for high-rise buildings on deep piles that reach bedrock?**

A *Given that deep piles transfer most of the structural load to the bedrock, wouldn't this make the top 30 meters less relevant for site classification?*

While the concern about load transfer to bedrock is valid from a structural perspective, it is important to recognize that site class determination is not based on load transfer mechanics. Instead, it influences the seismic design category, which in turn governs the level of detailing required in the structural design. If site class for all pile-supported structures extending to bedrock were automatically classified as Site Class A or B, the resulting seismic design categories would also be low—often eliminating the need for intermediate or special seismic detailing. The current method, which evaluates the average shear wave velocity in the upper 30 meters of soil, ensures a more conservative and consistent basis for seismic design, regardless of foundation depth.

UPCOMING LIVE WEBINARS

Design for Fire Resistance Using the International Building Code

Register

Speaker: Steve Skalko, P.E.
July 16, 2025 , Wednesday, 1:00 PM to 3:00 PM CST
Earn 2.0 CEUs

The fire presentation will cover the basics for determining minimum resistances for buildings using the 2024 International Building Code. Course material presented includes determining what minimum fire resistances are required for structural elements based on occupancy and type of construction, and code recognized methods to document compliance.

Designing to Minimize Restraint to Shortening Cracks in Post-Tensioned Structures

Register

Speaker: Bryan Allred, S.E.
July 22, 2025 , Tuesday, 1:00 PM to 3:30 PM CST
Earn 2.5 CEUs

Two of the main financial benefits of post-tensioning is the reduction in slab thickness and rebar compared to non-prestressed slabs. The downside side of this reduction is post-tensioned structures can be more susceptible cracking, especially if their inherent movement is prevented or restrained. The webinar will cover the structural layout and details that are primarily used in the post-tensioned structures to minimize restraint to shortening (RTS) cracks. Typical post-tensioning slip details will be explained in conjunction with construction photographs to highlight good and poor construction practices.

NEW UPDATE TO QUICK ANCHOR

QUICK ANCHOR v4.1

We are excited to announce the release of the latest update to Quick Anchor – our trusted anchorage design software just got even better! This new version includes several performance enhancements and bug fixes. Two major features have been added:

- Screw Anchors: Design and analyze screw anchors directly within the software.
- User-Defined Anchors: Create and compare custom anchors with industry standards.

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- $50 OFF new purchases
- $25 OFF upgrades from previous versions

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If you have any questions or any suggestions for topics that could be covered, please contact Kunal Bhaumik at kbhaumik@skghoshassociates.com or call our office at (847)991-2700

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