

## **Introduction to 2024 Edition of the IRC/IBC Seismic Design Category Maps and FEMA's Building Code Strategy Implementation to Advance National Building Code Adoption**

July 11, 2024 | Session Overview

### **Speakers**

Jonathan Westcott, P.E., Civil Engineer, Building Science Branch, FEMA Resilience

Kelly Cobeen, S.E., Principal, Wiss Janney Elstner Associates

### **Moderator**

Sara Barrett, P.E., Project Manager, Engineering, National Institute of Building Sciences

## **2024 Seismic Design Category Maps and FEMA'S Building Code Strategy Overview**

The 2024 editions of the Seismic Design Category (SDC) Maps for the International Residential Code (IRC) and International Building Code (IBC) were developed under FEMA's responsibilities within the National Earthquake Hazards Reduction Program (NEHRP).

These maps illustrate the varying earthquake demands considered in the design of buildings and other structures across the U.S. and territories. They also provide general earthquake hazard information and informing earthquake risk reduction projects.

On July 11, 2024, NIBS hosted this webinar with subject matter experts Jonathan Westcott, Civil Engineer, in FEMA's Building Science Branch, and Kelly Cobeen, Principal, Wiss Janney Elstner Associates.

The webinar served as one of FEMA NEHRP's outreach

activities to keep at-risk communities and relevant professionals informed about the latest seismic hazard information for building design and construction. As one of the four NEHRP agencies, FEMA NEHRP's responsibilities include helping translate and implement research results and lessons learned from recent earthquakes into practical guidance through publications, tools, trainings and building code work to improve the Nation's earthquake resilience. These activities advance FEMA's Building Code Strategy.

The concept of the SDC integrates several key factors that influence seismic performance of structures, including potential earthquake ground motions, site soil amplification of ground motions, structure size and configuration, and structure occupancy and use.

Sara Barrett, Project Manager, Engineering, National Institute of Building Sciences, served as moderator for the webinar.

The 2024 Seismic Design Maps for IRC/IBC Fact Sheet and

Webinar material have been developed and delivered through the National Institute of Building Sciences' Building Seismic Safety Council under a FEMA NEHRP A&E contract.

## Building Codes Save

Jonathan Westcott, Civil Engineer, in FEMA's Building Science Branch, shared the history of lessons learned since the creation of NEHRP.

"We have over 40 years of learning from disasters," he said. FEMA's Building Codes Save Study found that the nation is saving \$1.6 Billion in average annualized losses avoided as a result of states and communities across the country adopting hazard-resistant building codes since 2000. Projecting forward, assuming contemporary development and adoption patterns continue, a savings of \$132 Billion is expected by 2040. Improving building codes and their implementation can significantly increase the expected savings.

The webinar featured an introduction to FEMA's Building Code Strategy, advancing the adoption and enforcement of hazard-resistant building codes and standards for FEMA programs and for communities nationwide, and the White House National Initiative to Advance Building Codes.

## Introduction to 2024 Edition Seismic Design Category Maps

The primary objective of the second part of the webinar was to introduce the newly published fact sheet "Introduction to 2024 Edition Seismic Design Category Maps" as well as recently published FEMA P-2192-4 "2020 NEHRP Recommended Seismic Provisions Seismic Design Category Maps for 2024 International Residential Code (IRC) and International Building Code (IBC)." Both of these documents provide background information on the Seismic Design Category (SDC) maps and updates that were made in the 2024 editions.

The SDC maps illustrate the varying seismic hazard in the United States and territories, as used by our building codes for design of new structures, said Kelly Cobeen, Principal, Wiss Janney Elstner Associates. They also provide an illustration of seismic hazard that is useful to more general audiences. The Seismic Design Categories depicted

in the maps consider potential ground motion, site soil amplification, structure size, configuration, occupancy, and use.

Updates to the 2024 IRC Seismic Design Category Maps include:

- The most current seismic hazard data and design map procedures via the USGS's 2018 National Seismic Hazard Models (NSHMs) and the site-specific ground motion procedures of the 2020 NEHRP Recommended Provisions.
- In the 2024 update, the two sets of maps previously included in the 2018 and 2021 IRC editions have been reduced to a single 2024 edition map set.

Updates to the 2024 IBC maps include:

- New in the 2024 edition, IBC seismic hazard maps are now presented as SDC maps, similar but not identical to IRC SDC maps.
- The user of the IBC is no longer required to multiply mapped spectral response accelerations by Site Coefficients  $F_a$  and  $F_v$ . The Site Coefficients have been deleted from both the IBC and ASCE/SEI 7, and the site adjustments are applied in the USGS geodatabase.
- The most current seismic hazard data and design map procedures via the USGS's 2018 National Seismic Hazard Models (NSHMs) and the site-specific ground motion procedures of the 2020 NEHRP Recommended Provisions.

## Building Innovation Webinar Series

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It's our way of extending the Building Innovation annual conference beyond the in-person meeting.

The next webinar – [NASA's Power Project: Global Solar Insolation, Meteorological Parameter Data, and Web Services to Support Sustainable Building Design and Operations](#) – takes place July 31. [Learn more about NIBS events.](#)