

**IMPACT STATEMENT**

**Legislation title:** Amend Chapter 24.85 (Seismic Design Requirements for Existing Buildings) to update code references, add language to maintain minimum seismic design loads for existing buildings at current levels , revise definition of structural systems damaged by catastrophic events, provide a definition of occupant load and other previously undefined terms.

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**Presenter name:** Amit Kumar

**Purpose of proposed legislation and background information:**

Discuss why the legislation is being proposed and any important background information.

- Describe the impact of this action on the overall program or project.
- If needed, provide information to more fully explain the purpose of the legislation.
- If there's been previous Council action directly related to this legislation, describe, e.g. "This is the 4<sup>th</sup> contract amendment".
- Indicate if the proposed legislation supports or changes specific City policies.

In 2014, the code referenced by Chapter 24.85, ASCE (American Society of Civil Engineers) 31, was replaced by ASCE 41-13, and ASCE 31 became obsolete.

In addition, the method of calculating the design of seismic upgrade requirements in the ASCE changed. When taking into account the unique characteristics of the Portland area, the new method results in lower seismic upgrade requirements than the current practice. This is inconsistent with the intent of Chapter 24.85. The intent of Chapter 24.85 has not changed. To maintain consistency with the intent of Chapter 24.85, the proposed changes limits the design and evaluation of existing buildings to 75% of the design values for which new buildings are required to be designed, consistent with the 25% lower force levels than that required for new buildings currently.

At the request of the Structural Advisory Board the definition of structural systems damaged by catastrophic events should be revised to be consistent with definition for structural systems damaged by an earthquake. Since this Title deals with Lateral Load Resisting Systems of existing structures, instead of the percentage of damage being related to the net area of the building the definition was revised to relate damage to a percentage of the capacity of the existing lateral load resisting system.

Currently, there is no definition of Occupant Load in Chapter 24.85. This leads to inconsistent methods of calculation of the base number from which seismic upgrade requirements are derived.

The proposed amendments include:

- Updating external code references and adding provisions to ensure design requirements for existing buildings effectively maintain the same level of design loads as they do under current practice;
- Revising the definition of structural systems damaged by catastrophic events to be consistent with those of earthquakes and relate damage to a percentage of the capacity of the existing lateral load resisting system.
- Defining the term Occupant Load to ensure uniform calculation of this base number which triggers the requirement for seismic upgrades; and
- Adding definitions to previously undefined terms for clarity and ease of use.

The amendments will result in further clarity for both external structural engineering professionals and structural engineering staff, will update code references to current external codes, and will result in no additional seismic design requirements for existing buildings.

**Financial and budgetary impacts:**

This legislation will not produce any additional costs for the City.

**Community impacts and community involvement:**

Discuss the impacts of the legislation relating to all of the following if relevant. Describe who is impacted, how they are impacted, how any negative impacts have been addressed, and how the benefits are distributed. Describe how public involvement and input shaped the bureau's recommended action.

- Different communities of people (age-specific, cultural, physical ability, ethnic, racial, religious, language, low-income, under-served populations, etc.).
- Geographic area, neighborhoods.
- Businesses (small, large, specific types); institutions; interest-based organizations.
- City livability (contributes to a prosperous, educated, healthy, equitable Portland).
- Summarize significant objections/concerns and support/agreement.
- Describe how the bureau responded to or incorporated concerns into the proposed legislation.

Indicate who/which groups will be testifying (if known).

BDS staff conducted outreach to the Building Owners and Managers Association (BOMA), the Structural Engineers Association of Oregon (SEAO), the BDS Development Review Advisory Committee (DRAC), and the BDS Structural Engineering Advisory Board. Notice of the proposal was also posted on the BDS website. Approximately 1 month was provided for review and comment.

BDS staff incorporated recommendations from the public participants into the proposed ordinance to the greatest extent possible, specifically including the Structural Engineering Advisory Board's recommendation to include revising the definition of structural systems damaged by catastrophic earthquakes.

The proposed amendments resolve housekeeping issues by adopting the majority of the most recent version of the most referenced external code (ASCE 41-13), but maintaining current effective requirements for seismic design requirements for existing buildings, and adding definitions to previously undefined terms for clarity and ease of use. There are little or no impacts to the professional community, or to the general public in terms of what is required by Section 24.85.

**Budgetary Impact Worksheet**

**Does this action change appropriations?**

- YES: Please complete the information below.
- NO: Skip this section

Fund	Fund Center	Commitment Item	Functional Area	Funded Program	Grant	Sponsored Program	Amount



**City of Portland, Oregon**  
**Bureau of Development Services**  
**Office of the Director**

FROM CONCEPT TO CONSTRUCTION

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June 10, 2015

**To:** Mayor Hales  
 Commissioner Fish  
 Commissioner Fritz  
 Commissioner Novick  
 Commissioner Saltzman

**From:** Paul L. Scarlett, Director  
 Bureau of Development Services

PLS

**Regarding: Proposed Amendments to the Seismic Design Requirements for Existing Buildings**

**I. RECOMMENDATION**

Amend Chapter 24.85 (Seismic Design Requirements for Existing Buildings) to update code references, add language to ensure seismic design requirements for existing buildings are maintained at the same level as current practice, revise definition of structural systems damaged by catastrophic events, provide a definition of occupant load and other previously undefined terms.

**II. BACKGROUND**

PCC 24.85 was first adopted in 1995. It deals with regulations for the seismic design of existing buildings. It identifies thresholds of when existing buildings are required to be evaluated and upgraded for seismic resistance. The proposed amendments are summarized below.

**I. Update code references and add provisions to ensure design requirements for existing buildings maintain the same level of design loads as they do under current practice.**

Since its last revision in 2004, the code referenced by Title 24.85, ASCE 31, has been replaced by ASCE 41-13 which combines the old ASCE 31-03 and ASCE 41-06. The proposed revision to Chapter 24.85 seeks to update the Chapter to reference the new code ASCE 41-13; the old reference is obsolete. In general the proposed revisions do not alter the intent or the philosophy of the current Title 24.85. The proposed revisions would adopt ASCE 41-13 as the evaluation and upgrade standard in its entirety, with the following exception described below.

Starting with UCBC and then with IEBC and ASCE 31, existing buildings were provided some leniency when they were evaluated and modifications designed to lower force levels than that required for new buildings. Typically, existing buildings are evaluated and designed for 25% lower force levels than that required for new buildings. The new ASCE 41-13 has approached this issue from a different angle by evaluating and designing existing buildings using ground motions associated with more frequent earthquakes. For example, where a new building is designed for collapse prevention performance level in a maximum credible earthquake with a 2% probability of exceedance in 50 years or return period of 2475 years, existing buildings are evaluated and designed for ground motions associated with an earthquake

with a 5% probability of exceedance in 50 years or a return period of 975 years, for the same performance level.

In the Portland metro area analysis has shown that this new approach results in design force levels that are about 52% to 65% of the design loads for new buildings (or 35% -48% lower force level than that required for new buildings, as opposed to the 25% lower force level than is required now). BDS does not believe this analysis to be conservative. In keeping with past precedent and the general desire not to make substantial changes to the intent of the existing Title 24.85, the proposed changes would limit the design and evaluation of existing buildings to 75% of the design values for which new buildings are required to be designed, consistent with the 25% lower force levels than that required for new buildings currently.

In summary, the amendments will result in design force levels that are more consistent with those calculated prior to the adoption by reference of ASCE 41-13, resulting in a neutral impact on the extent of seismic improvements required by the new code versus the previous code.

## **II. Revise Definition of Structural Systems Damaged by Catastrophic Events.**

At the request of the Structural Advisory Board the definition of structural systems damaged by catastrophic events should be revised to be consistent with definition for structural systems damaged by an earthquake. Since this Title deals with Lateral Load Resisting Systems of existing structures, instead of the percentage of damage being related to the net area of the building the definition was revised to relate damage to a percentage of the capacity of the existing lateral load resisting system.

## **III. Define Occupant Load.**

The second proposed change is to add a definition of Occupant Load and how it is to be calculated. Occupant load calculations in Chapter 24.85 are used to determine if more than 149 people are added when a change of occupancy or use is proposed. This number triggers requirements for seismic upgrades. Applicants have been applying the provision of the code inconsistently by proposing occupant loads based on what they believe is the actual use in the building using the exception in Section 1004.1.2 of the 2014 Oregon Structural Specialty Code. This has led to inconsistent occupant load calculations and application of Title 24.85. The proposed definition clarifies that occupant loads are to be calculated using the occupant load factors tabulated in the Oregon Structural Specialty Code, thus providing the user a consistent and clear method to determine the occupant loads.

## **IV. Add definitions to previously undefined terms.**

The third proposed change is to provide definitions to terms used in ASCE 41-13 and Chapter 24.85 for clarity and ease of use.