

**SDCI**

# Director's Rule 2-2017

<b>Applicant:</b>  City of Seattle Department of Construction and Inspections	<b>Page</b> 1 of 3	<b>Supersedes:</b>
	<b>Publication:</b> February 6, 2017	<b>Effective:</b> March 17, 2017
<b>Subject:</b>  Alternate for the use of lateral force-resisting systems in buildings between 160 and 185 feet in height	<b>Code and Section Reference:</b>  Seattle Building Code  Section 1613.5.2	
	<b>Type of Rule:</b>  Code Interpretation	
	<b>Ordinance Authority:</b>  SMC Section 3.06.040	
<b>Index:</b>  Seattle Building Code	<b>Approved</b>  (signature on file) Nathan Torgelson, Director	<b>Date</b>  3/15/17

## PURPOSE AND RULE

This Director's Rule establishes alternate design requirements for the use of lateral force-resisting systems with a structural height between 160 feet and 185 feet for which the 2015 Seattle Building Code's adoption of ASCE 7-10 Section 12.2.5.4 is applied.

## AUTHORITY

As an alternative to the 2015 Seattle Building Code's adoption of ASCE 7-10 Section 12.2.5.4 with the additional design requirements for transfer diaphragms, foundations, and shear walls, buildings with a steel eccentrically braced frame, steel special concentrically braced frame, steel buckling-restrained braced frame, steel special plate shear wall, or special reinforced concrete shear wall seismic force-resisting system may have a structural height increase from 160 feet to 185 feet provided that both of the following structural measures are taken:

1. The structure shall not have an extreme torsional irregularity as defined in ASCE 7-10 Table 12.3-1 (horizontal structural irregularity Type 1b).

2. The steel eccentrically braced frames, steel special concentrically braced frames, steel buckling-restrained braced frames, steel special plate shear walls or special reinforced cast-in-place concrete shear walls in any one plane shall resist no more than 60 percent of the total seismic forces in each direction, neglecting accidental torsional effects.

For the purposes of seismic design, structural height shall be measured in accordance with all of the following:

1. Per ASCE 7-10, the structural height shall be measured from the seismic base to the highest level of the seismic force-resisting system.
2. The highest level of the seismic force-resisting system shall be defined as the roof of the highest occupied story in the building.
3. The seismic base shall be determined in accordance with the definition of "Base" in ASCE 7-10 Section C11.2.
4. Uncovered, occupied roof decks are permitted at the structural height limit.
5. Stair, elevator, mechanical and electrical penthouses, as allowed by SBC 1509.2, are permitted to extend above the structural height limit. This includes minimally sized stair and elevator lobbies.
6. The seismic force-resisting system for building elements allowed in Item 5 may be of any code defined lateral system. This does not preclude an extension of the main seismic force-resisting system above the roof of the highest occupied story.
7. The mass of all structure(s) and equipment above the structural height limit, including all penthouses and mechanical equipment, shall be small in comparison to the average mass of the tower floors below.

A Code Modification Request per SBC 104.4 is required by SDCI in order to apply this rule.

## **BACKGROUND**

The Seattle Building Code adopts ASCE 7-10 and its requirements for the maximum permitted structural height for different seismic force-resisting systems. Per ASCE 7-10 the maximum structural height of prescriptively designed steel eccentrically braced frame, steel special concentrically braced frame, steel buckling-restrained braced frame, steel special plate shear wall, or special reinforced concrete shear wall seismic force-resisting systems is 160 feet. This height may be increased to 240 feet when regularity and redundancy requirements of Section 12.2.5.4 are satisfied. The 2015 SBC has additional design requirements for those systems exceeding 160 feet. These requirements include increasing the design forces on transfer diaphragms, foundations, and shear walls.

The City of Seattle's Land Use Code allows zoning height limits to be exceeded with additional height incentives in some areas of the city. The zoning requirements define height differently than building code structural height. This has resulted in a number of

tall buildings being proposed to have a structural height somewhat greater than 160 feet.