
**SEISMIC OUT-OF-PLANE FORCES FOR NON-BEARING NON-SHEAR
CONCRETE AND MASONRY WALLS: 2016 CBC**

Disciplines: Structural**History:** Issued 05-08-19

PURPOSE: This Interpretation of Regulations (IR) clarifies requirements relating to non-bearing non-shear concrete and masonry walls on construction projects under the Division of the State Architect’s (DSA) jurisdiction.

1. SCOPE: The requirements of this IR apply to non-bearing non-shear concrete and masonry walls submitted to DSA for review and approval, with prismatic cross sections full height, not supporting any other accessory element and meet one or more of the following:

- Non-bearing non-shear concrete and masonry walls within the building envelope that comply with the definition of “nonbearing wall” per ASCE 7 Section 11.2 and also meet the criteria of “nonparticipating elements” as defined in TMS 402 Section 7.3.1. Where such walls are braced at the top to the primary structure, the bracing connections shall be configured to transfer wall out-of-plane forces only and accommodate the seismic relative displacements for in-plane movement per ASCE 7 Section 13.3.2.
- Site retaining concrete and masonry walls.
- Free-standing site concrete and masonry walls, such as fences, ball walls, or yard walls.

2. DESIGN REQUIREMENTS: Concrete and masonry walls covered under the scope of this IR shall be designed for out-of-plane seismic forces per this section.

2.1 The importance factor used for wall design shall be in accordance with ASCE 7 Section 13.1.3, except site retaining walls shall be in accordance with ASCE 7 Section 15.4.1.1.

In no case shall the importance factor be less than the importance factor assigned to any adjacent building, structure, or assembly area, including the means of egress from the building or structure. In addition, if failure of any wall would affect an emergency vehicle access or any other component required to function for life-safety purposes after an earthquake such as an egress stairway, an importance factor of 1.5 shall be used.

Exception: The importance factor need not be increased where the wall is separated from the building, means of egress, assembly area, or emergency vehicle access, as applicable, by a distance greater than the wall height above adjacent grade.

2.2 Non-bearing non-shear concrete and masonry walls within the building envelope and free-standing site walls shall be designed for out-of-plane seismic forces per ASCE 7 Section 13.3.1. The factors for a_p and R_p shall be in accordance with ASCE 7 Table 13.5-1 as noted below:

- Walls braced to structural frame above its center of mass:
 $a_p = 1.0$ $R_p = 2.5$ $\Omega_0 = 2.5$
- Cantilever walls:
 $a_p = 2.5$ $R_p = 2.5$ $\Omega_0 = 2.5$

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Note: For projects submitted under the 2019 California Building Code (CBC), the out-of-plane seismic forces for ground-supported cantilever walls will be based on ASCE 7-16 Section 15.6.8 and Table 15.4-2 using $R=1.25$, and the Importance Factor will be determined in accordance with ASCE 7-16 Section 15.4.1.1. The provisions in this note are not required to be enforced for projects submitted under the 2016 CBC but may be used by the design professional on a voluntary basis. These provisions will become mandatory under the 2019 CBC.

- 2.3** Site retaining walls supporting more than six feet of backfill height shall be designed for dynamic seismic lateral earth pressures due to earthquake ground motions per ASCE 7 Section 15.6.1 and CBC Section 1803A.5.12(1). Per CBC Section 1807A.2.2, this load shall be considered to be an earthquake load (E) and combined with the wall seismic inertial force (E) from Section 2.2 above and the static lateral earth pressure (H) in accordance with CBC Section 1605A.

References: California Code of Regulations (CCR) Title 24
Part 2: California Building Code, Sections 1605A, 1803A.5.12(1), 1807A.2.2.

This IR is intended for use by the DSA staff and by design professionals to promote statewide consistency for review and approval of plans and specifications as well as construction oversight of projects within the jurisdiction of DSA, which includes State of California public schools (K–12), community colleges and state-owned or state-leased essential services buildings. This IR indicates an acceptable method for achieving compliance with applicable codes and regulations, although other methods proposed by design professionals may be considered by DSA.

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