

SECTION 5. Chapter 8.72 of the Santa Monica Municipal Code is hereby amended to read as follows:

Chapter 8.72 Mandatory Seismic Retrofit Requirements for Soft, Weak or Open Front Walls in Light, Wood-Framed Buildings

8.72.010 Purpose.

The purpose of this Chapter is to promote public welfare and safety by reducing the risk of death or injury that may result from the effects of earthquakes on existing wood-frame multi-story buildings with soft, weak or open front walls (Soft Story Buildings). This Chapter creates minimum standards to mitigate hazards from structural deficiencies in soft story, weak or open front wall buildings. Adherence to these minimum standards will improve the performance of these buildings during earthquakes and reduce, but not necessarily prevent the loss of life, injury or earthquake-related damage.

8.72.020 Scope and Applicability.

a) The provisions of this Chapter shall apply to all buildings of wood-frame construction, or wood-frame portions thereof, where:

1. The structure was built under building code standards enacted before November 10, 1980; and

2. The ground floor portion of the structure contains parking or other similar open floor space that causes soft, weak or open-front wall lines, and there exists one or more stories above.

b) Buildings described in subsection (a) have completed all required seismic retrofit work, with a lateral load resisting analysis and structural design plans, and

obtained valid final approval from the City of Santa Monica prior to the adoption of this Ordinance, are exempt from the requirements this Chapter, except that:

1. Buildings with pole structures supporting the soft, weak or open front walls shall be subject to this Chapter regardless of previous retrofit status;
2. Buildings of three or more stories having horizontal structural irregularities of Type 2, 3, 4, or 5 listed in ASCE 7-10 "Horizontal Structural Irregularities" Table 12.3-1, shall be subject to this Chapter regardless of previous retrofit status.

c) An owner of any buildings within the scope of this Chapter shall demonstrate compliance with the mandatory seismic retrofit requirements of this Chapter, as set forth in Section 8.72.050, consistent with the time limits set forth in this Chapter.

8.72.030 Definitions.

ASCE 7-10 (March 7, 2013) is a standards publication by the American Society of Civil Engineers entitled "Minimum Design Loads for Buildings and Other Structures." It provides requirements for general structural design. This publication is referenced in Chapter 35 of the California Building Code.

Cripple Wall is a wood-framed stud wall extending from the top of the foundation wall to the underside of the lowest floor framing of the building.

Ground Floor is any floor within the wood-frame portion of a building whose elevation is immediately accessible from an adjacent grade by vehicles or pedestrians. The ground floor portion of the structure does not include any floor that is completely below adjacent grades.

Open-Front Wall Line is an exterior wall line, without vertical elements of the lateral force-resisting system, which requires tributary seismic forces to be resisted by

diaphragm rotation or excessive cantilever beyond parallel lines of shear walls. Diaphragms that cantilever more than 25 percent of the distance between lines of lateral force resisting elements from which the diaphragm cantilevers shall be considered excessive. Exterior exit balconies of six feet or less in width shall not be considered excessive cantilevers.

Soft Wall Line is a wall line, the lateral stiffness of which is less than what is required by story drift limitations or deformation compatibility requirements of this Chapter. In lieu of the engineering analysis required by this Chapter to determine whether a wall line's lateral stiffness is less than the aforementioned story drift limitations or deformation compatibility requirements, a soft wall line may be defined as a wall line in a story where the wall stiffness is less than 70 percent of the stiffness of the exterior wall above for the direction under consideration.

Story is as defined in the California Building Code, but includes any basement or underfloor space of a building with cripple walls exceeding four feet in height.

Story Strength is the total strength of all seismic-resisting elements sharing the same story shear in the direction under consideration.

Wall Line is any length of a wall along a principal axis of the building used to provide resistance to lateral loads.

Weak Wall Line is a wall line at the ground floor where the wall strength is less than 80 percent of the strength of the wall above in the direction under consideration.

8.72.050 Engineering Analysis and Design.

(a) **Scope of analysis.** This Chapter requires the alteration, repair, retrofit, replacement or addition of structural elements and their connections to meet the strength

and stiffness requirements set forth in this Chapter, except as modified herein. The structural evaluation required by this Chapter shall analyze and identify structural deficiencies in accordance with ASCE 7-10. As part of the structural evaluation, the lateral-load-path analysis shall include the resisting elements and connections from the wood diaphragm immediately above any soft, weak or open wall lines to the foundation. Stories above the weak wall line shall be considered in the analysis but need not be structurally strengthened.

(b) Design base shear and design parameters. The design force in a given direction shall be 75% of the design base shear specified in the seismic provision of ASCE 7-10. The value of response modification coefficient, R , need not be less than 3.5, provided the strengthening systems are not cantilevered column systems and the strengthened structure will not have vertical structural irregularities of either Type 1a, 1b, 5a or 5b listed in ASCE 7-10, "Vertical Structural Irregularities" Table 12.3-2.

(c) Lateral vertical systems. Strengthening systems with concrete walls or masonry walls, or steel braced frames shall not be permitted.

(d) Horizontal structural irregularities in buildings with three or more stories. Structures with three or more stories having horizontal structural irregularities of either Type 2, 3, 4, or 5 listed in ASCE 7-10, "Horizontal Structural Irregularities" Table 12.3-1, shall be altered to meet the additional requirements of those sections referenced in the table for the entire story with weak or open wall lines.

(e) Alternate analysis, base shear and design parameters. Alternate design methodologies that improve the whole first story seismic performance that are at least equivalent to those prescribed by this Chapter and that achieve the life safety objectives

established by this Chapter may be submitted to the City for alternative analysis for base shear and design parameters.

(f) Additional anchorage requirements for buildings on hillsides. Where any portion of a building within the scope of this Chapter is constructed on or into a slope steeper than one-unit vertical in three units horizontal (33-percent slope), the lateral-force-resisting system, at and below the base level diaphragm, shall also be analyzed for the effects of concentrated lateral loads caused at the building base from the hillside conditions and comply with the provisions of the City of Santa Monica Building Code.

(g) Story drift limitations. The calculated story drift for each retrofitted story shall not exceed the allowable deformation compatible with all vertical load-resisting elements and 0.025 times the story height. The calculated story drift shall not be reduced by the effects of horizontal diaphragm stiffness, but shall be increased when these effects produce rotation. Drift calculations shall be in accordance with ASCE 7-10 requirements.

(h) Pole structures. The effects of rotation and soil stiffness shall be included in the calculated story drift where lateral loads are resisted by vertical elements whose required depth of embedment is determined by pole formulas. The coefficient of subgrade reaction used in deflection calculations shall be based on an approved geotechnical investigation conducted in accordance with approved geotechnical engineering reports.

(i) P-Delta effect. The requirements of the California Building Code shall apply, except as modified herein. All structural framing elements and their connections not required by the design to be part of the lateral force resisting system shall be designed and detailed to be adequate to maintain support of design dead plus live loads when subject to the expected deformations caused by seismic forces. The stress analysis of

cantilever columns shall use an effective length factor of 2.1 for the direction normal to the axis of the beam.

(j) **Ties, continuity and collectors.** All parts of the structure included in the scope of analysis shall be interconnected and the connection shall be capable of resisting the seismic force created by the parts being connected as required per the California Building Code.

8.72.060 Time limits for compliance.

The owner of any building covered by this Chapter shall comply with the following time limits.

Action by Building Owner	Time Limits from Date of Service of Order
Structural Evaluation Report	2 Years or 24 Months
Application for Building Permit and Submission of Plans	3 Years or 36 Months
Final Approval	6 Years or 72 Months

SECTION 6. Chapter 8.76 of the Santa Monica Municipal Code is hereby amended to read as follows:

Chapter 8.76 Mandatory Seismic Retrofit Requirements for Existing Welded Steel Moment Frame Structures

8.76.010 Purpose.

The provisions of this Chapter are intended to promote the public welfare and safety by reducing the risk of death or injury that may result from the effects of earthquakes on Existing Welded Steel Moment Frame Buildings. The welded connections