

1 [Building Code - Seismic Standards]

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3 **Ordinance amending the Building Code, by amending, and adding various sections**  
4 **concerning seismic standards and making conforming changes; making environmental**  
5 **findings; making findings pursuant to California Health and Safety Code, Section**  
6 **17958.5; and directing the Clerk of the Board to forward this legislation to the California**  
7 **Building Standards Commission.**

8 NOTE: Additions are *single-underline italics Times New Roman*;  
9 deletions are *strike-through italics Times New Roman*.  
10 Board amendment additions are double-underlined;  
11 Board amendment deletions are ~~strikethrough-normal~~.

11

12 Be it ordained by the People of the City and County of San Francisco:

13 Section 1. Findings.

14 (a) The Building Inspection Commission, at a duly noticed public hearing on January  
15 18, 2012, heard the attached legislation in accordance with San Francisco Charter Section  
16 D3.750-5.

17 (b) Environmental Findings. The Planning Department has determined that the  
18 actions contemplated in this ordinance comply with the California Environmental Quality Act  
19 (California Public Resources Code Sections 21000 et seq.). Said determination is on file with  
20 the Clerk of the Board of Supervisors in File No. 130029 and is incorporated  
21 herein by reference.

22 (c) Health and Safety Code Section 17958.5 Findings Based on Local Climatic,  
23 Geological, or Topographical conditions for amendments to Sections 3401.8, 3402.1,  
24 3405.2.1, 3405.4.1, and 3405.4.2.

25

1 (1) Geological. Certain structures in San Francisco are at increased risk for  
2 earthquake-induced structural damage due to proximity to at least two major active fault lines.

3 (2) Geological. Certain buildings in San Francisco are at increased risk for  
4 earthquake-induced failure and consequent fire damage due to local hazardous microzones,  
5 slide area, and local liquefaction hazards.

6 (3) Other amendments contained in this legislation are not a building standard, and no  
7 local finding is required.

8 Section 2. The San Francisco Building Code is hereby amended by amending Section  
9 1604.11.1, 1604.11.3, 3401.8, 3402.1, 3403.4.1.1, 3404.7.1, 3404.7.2, 3405.1.3, 3405.2.1,  
10 3408.4.1 and adding Section 3401.10, 3405.4.1, 3405.4.2, to read as follows:

11 *1604.11. Revise the following sections:*

12 **1604.11. Minimum lateral force for existing buildings.**

13 1604.11.1 **General.** This section is applicable to existing buildings when invoked by  
14 Section ~~3401.8~~ 3401.10. This section may be used as a standard for voluntary upgrades.

15 An existing building or structure which has been brought into compliance with the  
16 lateral force resistance requirements of the San Francisco Building Code in effect on or after  
17 May 21, 1973, shall be deemed to comply with this section except when a vertical extension  
18 or other alterations are to be made which would increase the mass or reduce the seismic  
19 resistance capacity of the building or structure.

20 1604.11.3 **Seismic forces.** Buildings and structures shall comply with the applicable  
21 provisions of Sections 1613, except that, when compliance with this section is required by  
22 Section ~~3401.8~~ 3401.10, then structures and elements may be designed for seismic forces of  
23 not less than 75 percent of those given in Section 1613, and the building separation limitations  
24 of Section 1613.8 do not apply.

1 When upper floors are exempted from compliance by Section ~~3401.8~~ 3401.10, the lateral  
2 forces generated by their masses shall be included in the analysis and design of the lateral  
3 force resisting systems for the strengthened floor. Such forces may be applied to the floor  
4 level immediately above the topmost strengthened floor and distributed in that floor in a  
5 manner consistent with the construction and layout of the exempted floor.

6 In lieu of meeting the specific requirements of this section, an alternative lateral  
7 analysis procedure incorporating inelastic behavior may be submitted and approved in  
8 accordance with rules and regulations adopted by the Building Official pursuant to Section  
9 104A.2.1.

10 *3401.8. Replace section number 3401.8 in the San Francisco Building Code with a new*  
11 *section number as follows:*

12 ~~3401.8~~ 3401.10 **Lateral force design requirements for existing buildings.** Whenever  
13 other provisions of this code require compliance with this section, the lateral force provisions  
14 of Section 1604.11 shall apply to the entire building or structure except as otherwise provided  
15 therein.

16 *3401.8. Revise this section as follows:*

17 **3401.8 Alternative compliance.** Work performed in accordance with the International  
18 Existing Building Code shall be deemed to comply with the provisions of this chapter.

19 **Exceptions:** 1. [OSHPD 2 & 3] Section 3401.8 not permitted by OSHPD.

20 2. Requirements of Section 3404.7.1 shall still apply.

21 *3402.1. Add the following definition:*

22 **3402.1 Definitions.**

23 **DISPROPORTIONATE DAMAGE.** *A condition of earthquake-related damage where:*

24 *1. The 0.3-second spectral acceleration at the building site as estimated by the United States*

25 *Geological Survey for the earthquake in question is not more than 0.40 g; and*

1           2. In any story, the vertical elements of the lateral-force-resisting system have suffered damage  
2           such that the lateral load-carrying capacity of the structure in any horizontal direction has been  
3           reduced by more than 10 percent from its predamage condition.

4           3403.4.1 Revise this section as follows:

5           3403.4.1.1 **Horizontal additions.** Horizontal additions shall meet the following  
6 requirements:

7           When the cumulative area of horizontal additions, excluding basement additions,  
8 exceeds 30 percent of the area of the original building or structure, excluding basements, and  
9 the additions are structurally interconnected to, or not separated to comply with Section  
10 1604.3.7, the entire structure shall comply with Section ~~3401.8~~ 3401.10.

11           For the purpose of this section, the term "original building or structure" shall mean the  
12 building or structure as it existed on May 21, 1973. The combined building or structure may be  
13 used for more restrictive occupancy classifications as determined in Chapter 3 only when the  
14 structure as a whole meets the requirements in this code for such occupancy.

15           3404.7. Revise this section as follows:

16           3404.7. **Substantial change.**

17           3404.7.1 **Non-structural alterations.** Whenever alteration work in a building or  
18 structure involves substantial changes to elements such as walls, partitions or ceilings, on 2/3  
19 or more of the number of stories excluding basements, the building or structure as a whole  
20 shall comply with Section ~~3401.8~~ 3401.10. The term "substantial change" includes the addition,  
21 removal, repair or modification of such elements. All such work included in alteration permits  
22 issued within two years of the date of a permit application shall be included in the  
23 determination of whether the application is proposing substantial change to the building or  
24 structure.

1           3404.7.2 **Structural alterations.** When more than 30 percent, cumulative since May  
2 21, 1973, of the floor and roof areas of the building or structure have been or are proposed to  
3 be involved in substantial structural alteration, the building or structure shall comply with  
4 Section ~~3401.8~~ 3401.10. The areas to be counted towards the 30 percent shall be those areas  
5 tributary to the vertical load carrying components (joists, beams, columns, walls and other  
6 structural components) that have been or will be removed, added or altered, as well as areas  
7 such as mezzanines, penthouses, roof structures and infilled courts and shafts.

8           **EXCEPTIONS:**

9           1. When such alterations involve only the lowest story of a wood frame building or  
10 structure and Section 3408 does not apply, only the lateral force resisting components in and  
11 below that story need comply with Section ~~3401.8~~ 3401.10, or

12           2. When such alterations involve the lowest story of a Type V building or structure of  
13 R3 occupancy and that floor's proposed use is as a garage, that level is exempt from Section  
14 3404.7.2. Such alterations need not be counted as part of the cumulative total of tributary area  
15 of structural alterations.

16           *3405.1 Revise this section as follows:*

17           3405.1.3 **Repairs.** Unless otherwise approved by the building official, all structural  
18 damage shall be repaired.

19           Repairs to buildings or structures which have sustained substantial structural damage  
20 to lateral force resisting elements shall comply with the minimum lateral force design  
21 requirements of Section ~~3401.8~~ 3401.10 or with the code under which the building or structure  
22 was designed, whichever is more restrictive.

23           Damage may be caused by events or a combination of events, including, but not  
24 limited to, fire, explosion, structural pest or wood-destroying organism attack, earthquake,  
25 wind storm, vehicular impact, ground subsidence or failure, or the collapse or dislodgement of

1 any portion of any adjacent building or structure. The removal or alteration of structural  
2 elements as part of the work described in an approved building permit application shall not be  
3 considered to be "damage."

4 *3405.2. Revise this section as follows:*

5 **3405.2.1 Evaluation.** The building shall be evaluated by a registered design  
6 professional, and the evaluation findings shall be submitted to the code official within 60 days  
7 of completion of the evaluation. The evaluation shall establish whether the damaged building, if  
8 repaired to its predamage state, would comply with the provisions of this code for wind and  
9 earthquake loads. Evaluation for earthquake loads shall be required if the substantial  
10 structural damage was caused by or related to earthquake effects or if the building is in  
11 Seismic Design Category C, D, E or F.

12 Wind loads for this evaluation shall be those prescribed in Section 1609. Earthquake  
13 loads for this evaluation, if required, shall be permitted to be 75 percent of those prescribed in  
14 Section 1613. Values of  $R$ ,  $\Omega_0$  and  $C_d$  for the existing seismic force-resisting system shall be  
15 those specified by this code for an ordinary system unless it is demonstrated that the existing  
16 system will provide performance equivalent to that of an intermediate or special system.

17 *3405.4. Revise this section as follows:*

18 **3405.4. Less than substantial structural damage.**

19 *3405.4.1 Disproportionate damage. Buildings with disproportionate damage shall be subject to*  
20 *the requirements of Section 3405.2 for earthquake evaluation and rehabilitation as if they had*  
21 *substantial structural damage to vertical elements of the lateral-force-resisting system.*

22 *Permit applications for required rehabilitation work shall be submitted to the Department*  
23 *within one (1) year after the earthquake, and the work shall be completed as specified in Table B of*  
24 *Section 106A.4.4.*

1        3405.4.2 Other damage. For damage less than substantial structural damage *that is not*  
2 *disproportionate damage*, repairs shall be allowed that restore the building to its predamage  
3 state using materials and strengths that existed prior to the damage. New structural members  
4 and connections used for this repair shall comply with the detailing provisions of this code for  
5 new buildings of similar structure, purpose and location.

6            *3408.4. Revise this section as follows:*

7            3408.4.1 Change of occupancy. In addition to the other requirements of this code, the  
8 term "comply with the requirements of this code for such division or group of occupancy," as  
9 used in this section, shall also mean compliance with the lateral force provisions of Section  
10 ~~3401.8~~ 3401.10 when the change results in an increase of more than 10 percent in the  
11 occupant load of the entire building or structure, and which also increases the occupant load  
12 by more than 100 persons as compared to the occupant load of the existing legal use or the  
13 use for which the building was originally designed.

14            EXCEPTIONS:

15            1. When a change of occupancy or use involves only one story of a building or  
16 structure, only the lateral force resisting elements in that story and all lateral force resisting  
17 elements below need comply with Section ~~3401.8~~ 3401.10.

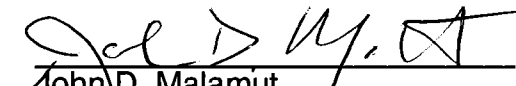
18            2. A change from a Group R, Division 3 to a Group R, Division 1 or Division 2  
19 Occupancy caused by the construction of a third dwelling unit in the lowest story of a building  
20 or structure shall comply with Section ~~3401.8~~ 3401.10 as provided in Exception 1 above.

21            Section 3. The Board hereby directs the Clerk to forward this legislation to the  
22 California Building Standards Commission for its review.

23            Section 4. Effective Date. This ordinance shall become effective 30 days from the  
24 date of passage, but in no case shall it be effective earlier than the Clerk of the Board's filing  
25 of the legislation with the California Building Standards Commission.

1 Section 5. This section is uncodified. In enacting this Ordinance, the Board intends to  
2 amend only those words, phrases, paragraphs, subsections, sections, articles, numbers,  
3 punctuation, charts, diagrams, or any other constituent part of the Building Code that are  
4 explicitly shown in this legislation as additions, deletions, Board amendment additions, and  
5 Board amendment deletions in accordance with the "Note" that appears under the official title  
6 of the legislation.

7  
8 APPROVED AS TO FORM:  
9 DENNIS J. HERRERA, City Attorney

10 By:   
11 John D. Malamut  
12 Deputy City Attorney