



ADMINISTRATIVE BULLETIN

NO. AB-108

DATE : *Draft #5, February 11, 2014*

SUBJECT : **Permit Processing and Issuance**

TITLE : **Application of California Existing Building Code, Appendix Chapter A3**

PURPOSE : The purpose of this Bulletin is to detail procedures for the application of California Existing Building Code (CEBC), Appendix Chapter A3, Prescriptive Provisions for Seismic Strengthening of Cripple Walls and Sill Plate Anchorage of Light, Wood-Frame Residential Buildings.

REFERENCE : • 2013 California Existing Building Code (CEBC), Appendix Chapter A3

DISCUSSION : The 2013 CEBC, Appendix Chapter A3 has been adopted as part of the California Code of Regulations, Title 24, Part 10. This code supplements the California Building Code, Title 24, Part 2. It provides prescriptive provisions for voluntary seismic strengthening of foundations, cripple walls and sill plate anchorage of certain wood-frame residential buildings.

Due to restrictions on cripple wall height, the prescriptive provisions of CEBC, Appendix Chapter A3 apply to a limited number of buildings in San Francisco. Where the prescriptive limits for height of cripple walls are exceeded, buildings may be considered to meet CEBC, Appendix Chapter A3 when approved by the Department.

The voluntary implementation of the strengthening provisions of CEBC, Appendix Chapter A3 can be expected to reduce earthquake damage in residential buildings, however such provisions are not intended to meet any specific seismic performance goal. The strengthening of individual buildings will result in an improvement in the resilience of citywide building stock and will aid the City in meeting its earthquake resilience goals such as residential shelter-in-place.

The use of these prescriptive provisions will assist San Francisco building owners in strengthening buildings by providing a clear set of construction requirements and by allowing building owners to qualify for assistance from various seismic improvement programs. Building owners using the prescriptive provisions will not need to engage the services of a registered design professional and will generally find that seismic improvement design and construction costs are reduced.

The complete adopted text of CEBC, Appendix Chapter A3 may be found at:
http://www.ecodes.biz/ecodes_support/free_resources/2013California/13Building/PDFs/Chapter%20A3-%20Prescriptive%20Provisions%20for%20Seismic%20Strengthening.pdf

SCOPE

It is the intent of the Department of Building Inspection to allow the application of the provisions of CEBC, Appendix Chapter A3 to residential buildings of Occupancy Classifications R-3 and R-3.1.

IMPLEMENTATION

In addition to meeting the specific requirements of CEBC, Appendix Chapter A3, the following requirements apply:

1. All wall bracing panels shall be of plywood of five or more plies or other specifically approved materials.
2. Anchors that attach a preservative-treated sill plate to the foundation shall be galvanized. [Note: Galvanization shall be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.]
3. Stud space ventilation holes provided at the bottom of wall bracing panels shall be of nominal three inch diameter to allow inspection of anchors and sill bolts.
4. For unreinforced masonry foundations, suitability of existing foundation strength may be based on the opinion of a registered design professional in accordance with CEBC, Appendix Chapter A3, Section A 304.2.2. Such opinion is to be provided to the Department in a signed and stamped letter or otherwise as part of submittal documents.
5. Cripple walls meeting these prescriptive requirements must meet maximum height requirements along each wall line only for the location and percentage of wall length as required by Table A-3A. Cripple walls in other locations may be more than four feet in height and may contain doors, windows or solid walls.
6. Buildings in which the prescriptive limits for height of cripple walls or other specific elements or assemblies of CEBC, Appendix Chapter A3 are exceeded and buildings having portions built on piers or posts will be issued permits as meeting CEBC, Appendix Chapter A3 when analysis is provided by a registered design professional or is otherwise provided in a manner acceptable to the Department that work on such elements or assemblies provides strength at least equivalent to the prescriptive requirements.

PLAN REVIEW AND PERMIT ISSUANCE

On-line, over-the-counter and other expedited forms of permit issuance shall be allowed for work that fully complies with CEBC, Appendix Chapter A3.

If proposed work does not conform to all prescriptive requirements or exceeds the scope of CEBC, Appendix Chapter A3, either over-the-counter plan review or submittal of permit application shall be required. Submitted applications will be processed in accordance with standard Department procedures.

PERMIT SUBMITTAL DOCUMENTS

Each building permit application that is submitted to comply with CEBC, Appendix Chapter A3 must clearly state in the "Project Description" portion of the application, "This Permit is for work to be performed in general conformance with California Existing Building Code, Appendix Chapter A3."

For Permits that Conform to all Prescriptive Requirements of CEBC, Appendix Chapter A3

A simplified plan shall accompany a permit application submitted for work that meets all of the requirements of CEBC, Appendix Chapter A3 and this bulletin. Such plan shall include:

1. approximate length and height along each wall line.
2. number of stories above each wall line or portion of wall line
3. approximate percentage of each wall line or portion of wall line proposed to be braced

This plan need not be prepared by a licensed design professional.

Plan review is not required for permits that fully comply with A3. Field inspection by Department staff shall verify conformance with prescriptive requirements.

For Permits that Do Not Conform to all Prescriptive Requirements of CEBC, Appendix Chapter A3

Submittal documents prepared by a licensed design professional must accompany a permit application for work that does not conform to all of the prescriptive requirements of CEBC, Appendix Chapter A3. Such submittal documents must show:

1. A plan of the floor(s) or level(s) to be reinforced showing
 - a. approximate length and height along each wall line.
 - b. number of stories above each wall line or portion of wall line.
 - c. approximate percentage of each wall line or portion of wall line proposed to be braced.
 - d. approximate location of proposed bracing.
2. For cripple walls that are proposed to be braced that are over 4 feet in height in buildings up to two stories, or over 14 inches in height for three story buildings, a stamped and signed analysis by a registered design professional or other submittal documentation determined acceptable by the Department shall be submitted showing that the proposed alternatives are equivalent to CEBC, Appendix Chapter A3 in strength, deflection and capacity.
3. For new perimeter or partial perimeter foundation construction, engineered foundation plans meeting the requirements of the San Francisco Building Code prepared by a registered design professional shall be submitted.

PLAN REVIEW BY OTHER AGENCIES

Review by agencies other than the Department of Building Inspection shall be in accordance with standard plan review guidelines.

Specific conditions of permit approval may be required by other City agencies. Project sponsors should carefully review all comments and notes on plans and permits regarding such conditions of approval.

FEES

Fees for plan review and permit issuance by all agencies shall be as detailed in San Francisco codes and regulations

TRIGGERED CODE REQUIREMENTS

Water heater bracing is required to be part of all CEBC, Appendix Chapter A3 seismic strengthening work. For approved water heater bracing details, see www.sfdbi.org/...

Smoke detectors and carbon monoxide detectors are required to be installed at the time of this work.

Water conservation devices for toilets and showers may be required to be installed at the time of this work. For more information on these requirements, please see www.sfdbi.org/...

INSPECTION AND SPECIAL INSPECTION

The following requirements apply to all construction work undertaken to comply with CEBC, Appendix Chapter A3.

A copy of building permit(s) and all approved construction documents issued for the work shall be available on the job site for reference by Department inspection staff.

Special Inspection is not required for adhesive, expansion, or other foundation anchor elements or for other construction when work is strictly in accordance with the prescriptive requirements of CEBC, Appendix Chapter A3. Special inspection may be required for other elements as designated by the Department in accordance with the requirements of San Francisco Building Code, Chapter 17. Approved construction documents should be carefully reviewed for any such special inspection requirements.

Final inspection shall be made by Department inspection staff confirming completion of all work necessary to conform to CEBC, Appendix Chapter A3, including proper installation of wall bracing elements.

COMPLETION OF WORK

Completion of seismic improvement work conforming to CEBC, Appendix Chapter A3 will result in the issuance of a Certificate of Final Completion and Occupancy (CFC). This CFC will be issued following final inspection, submittal and approval of any Special Inspection documents, and verification of compliance with all conditions of approval. The CFC document will become part of the permanent record of the building.

RECORDKEEPING AND REPORTING

A list of buildings by street address and by block and lot number for which work has been completed to strengthen according to CEBC, Appendix Chapter A3 will be maintained and made public on the Department's website.

Tom Hui, P.E., Acting Director
Department of Building Inspection

Date

Approved by Building Inspection Commission on

Attachment A: Excerpts from CEBC Appendix Chapter A-3

Attachment B: Earthquake Brace+Bolt Annotated Resource List:
<http://www.earthquakebracebolt.com/Education/Section1-Introduction.aspx>

Attachment A (partial excerpt....)

2013 California Existing Building Code (CEBC), Appendix Chapter A3

SECTION A301 GENERAL

A301.1 Purpose. The provisions of this chapter are intended to promote public safety and welfare by reducing the risk of earthquake-induced damage to existing wood-frame residential buildings. The requirements contained in this chapter are prescriptive minimum standards intended to improve the seismic performance of residential buildings; however, they will not necessarily prevent earthquake damage.

This chapter sets standards for strengthening that may be approved by the *Enforcing Agency* without requiring plans or calculations prepared by a *registered design professional*. The provisions of this chapter are not intended to prevent the use of any material or method of construction not prescribed herein. The *Enforcing Agency* may require that construction documents for strengthening using alternative materials or methods be prepared by a *registered design professional*.

A301.2 Scope. The provisions of this chapter apply to residential buildings of light-frame wood construction containing one or more of the structural weaknesses specified in Section A303.

Exception: The provisions of this chapter do not apply to the buildings, or elements thereof, listed below. These buildings or elements require analysis by a *registered design professional* in accordance with Section A301.3 to determine appropriate strengthening:

1. Group R-1, R-2 or R-4 occupancies with more than four dwelling units.
 2. Buildings with a lateral-force-resisting system using poles or columns embedded in the ground.
 3. Cripple walls that exceed 4 feet (1219 mm) in height.
 4. Buildings exceeding three stories in height and any three-story building with cripple wall studs exceeding 14 inches (356 mm) in height.
 5. Buildings where the *Enforcing Agency* determines that conditions exist that are beyond the scope of the prescriptive requirements of this chapter.
 6. Buildings or portions thereof constructed on concrete slabs on grade.
- **A301.3 Alternative design procedures.** *The details and prescriptive provisions herein are not intended to be the only acceptable strengthening methods permitted. Alternative details and methods may be used where designed by a registered design professional or approved by the code official. Where approved by the Enforcing Agency, alternative prescriptive standards that address one or more of the weaknesses listed in Section A303 may be used. Approval of alternatives shall be based on a demonstration that the method or material used is at least equivalent in*

terms of strength, deflection and capacity to that provided by the prescriptive methods and materials.

Where analysis by a registered design professional is required, such analysis shall be in accordance with all requirements of the building code, except that the seismic forces may be taken as 75 percent of those specified in the building code.

- **SECTION A302 DEFINITIONS**

For the purpose of this chapter, in addition to the applicable definitions in the building code, certain additional terms are defined as follows:

ADHESIVE ANCHOR. An assembly consisting of a threaded rod, washer, nut and chemical adhesive approved by the *Enforcing Agency* for installation in existing concrete or masonry.

CRIPPLE WALL. A wood-frame stud wall extending from the top of the foundation to the underside of the lowest floor framing.

ENFORCING AGENCY. *The designated department or agency as specified by statute or regulation.*

EXPANSION ANCHOR. *An approved post-installed anchor, inserted into a pre-drilled hole in existing concrete or masonry, that transfers loads to or from the concrete or masonry by direct bearing or friction or both.*

PERIMETER FOUNDATION. A foundation system that is located under the exterior walls of a building.

SNUG-TIGHT. As tight as an individual can torque a nut on a bolt by hand, using a wrench with a 10-inch-long (254 mm) handle, and the point at which the full surface of the plate washer is contacting the wood member and slightly indenting the wood surface.

WOOD STRUCTURAL PANEL. *A panel manufactured from veneers, wood strands or wafers or a combination of veneer and wood strands or wafers bonded together with waterproof synthetic resins or other suitable bonding systems. Examples of wood structural panels are:*

- **Composite panels.** *A wood structural panel that is comprised of wood veneer and reconstituted wood-based material and bonded together with waterproof adhesive;*
- **Oriented strand board (OSB).** *A mat-formed wood structural panel comprised of thin rectangular wood strands arranged in cross-aligned layers with surface layers normally arranged in the long panel direction and bonded with waterproof adhesive; or*
- **Plywood.** *A wood structural panel comprised of plies of wood veneer arranged in cross-aligned layers. The plies are bonded with waterproof adhesive that cures on application of heat and pressure.*

SECTION A303 STRUCTURAL WEAKNESSES

For the purpose of this chapter, structural weaknesses shall be *one or more of the conditions* as specified below.

1. Sill plates or floor framing that are supported directly on the ground without *a foundation system that conforms to the building code*.
2. A perimeter foundation system that is constructed only of wood posts supported on isolated pad footings.
3. Perimeter foundation systems that are not continuous.

Exceptions:

1. Existing single-story exterior walls not exceeding 10 feet (3048 mm) in length, forming an extension of floor area beyond the line of an existing continuous perimeter foundation.
2. Porches, storage rooms and similar spaces not containing fuel-burning appliances.
4. A perimeter foundation system that is constructed of unreinforced masonry or stone.
5. Sill plates that are not connected to the foundation or that are connected with less than what is required by the building code.

Exception: When approved by the *Enforcing Agency*, connections of a sill plate to the foundation made with other than sill bolts may be accepted if the capacity of the connection is equivalent to that required by the building code.

6. Cripple walls that are not braced in accordance with the requirements of Section A304.4 and Table A3-A, or cripple walls not braced with diagonal sheathing or wood structural panels in accordance with the building code.

----- ENTIRE TEXT of CEBD Appendix Chapter A3 TO BE ATTACHED -----

Attachment B: Earthquake Brace+Bolt Annotated Resource List
<http://www.earthquakebracebolt.com/Education/Section1-Introduction.aspx>

Annotated resource list at website includes

- [Earthquake Safety Guide for homeowners \(FEMA 530\)](#)
- [Housebuilders' Guide to Earthquake Resistant Design and construction \(FEMA 232\)](#)
- [Earthquake Hazard Mitigation](#)
- [International Existing Building Code \(IEBC\)](#)
- [Seismic Retrofit Guidelines \(FEMA P 50-1\)](#)
- [Techniques for the Seismic Rehabilitation of Existing buildings \(FEMA 547\)](#)
- [Residential Seismic Retrofit Strengthening Plan](#)
- Home Earthquake Retrofit Series:
 - [How to Complete the house Assessment Checklist](#)
 - [Guide to Completing an Earthquake Retrofit Plan for Wood-Frame Residential Buildings](#)

[Guidelines for Earthquake Bracing of Residential Water Heaters](#)

[Reconstruction and Replacement of Earthquake Damaged Masonry Chimneys](#)

[How the City of San Leandro Can Help You Strengthen Your house For the Next Big Earthquake in the Bay Area](#)

[Prescriptive Earthquake Hazard Reduction of Existing Light-Wood-framed Residential Structures Not More Than Three Stories in Height](#)

Follow-up needs

General

- This program requires building owner assistance materials for use in applying these requirements
 - Flow chart
 - Shopping list
 - Simplified instructions
 - Template for drawing plans
- California Earthquake Authority program materials regarding training and rebates must be readily available