

**CODE APPLICATION NOTICE**

**Subject:** Seismic Rehabilitation of  
Existing Buildings

**FILE NO.:** 2-3403A.2.3.3  
(formerly 2-1648A)  
**EFFECTIVE:** 06/19/08

---

**CODE SECTION:** Section 3403A.2.3.3, 2007 California Building Code (CBC)  
Section 1.1 ASCE 41-06 (American Society of Civil Engineers)

**2007 CALIFORNIA BUILDING CODE**

**3403A.2.3.3 Adoption:** *Except for the modifications as set forth in Sections 3411A through 3413A, all additions, alterations, repairs and seismic retrofit to existing structures or portions thereof may be designed and constructed in accordance with the provisions of ASCE 41.*

**ASCE 41-06 Seismic Rehabilitation of Existing Buildings****1.1 Scope**

This standard for the Seismic Rehabilitation of Existing Buildings, referred to herein as "this standard," specifies nationally applicable provisions for the rehabilitation of buildings. Seismic rehabilitation is defined as improving the seismic performance of structural and/or nonstructural components of a building by correcting deficiencies identified in a seismic evaluation.

...

This standard does not preclude a building from being rehabilitated by other procedures approved by the authority having jurisdiction.

...

**PURPOSE:**

The purpose of this CAN is to provide an acceptable approach to seismically retrofit single story hospital buildings utilizing wood frame or light steel frame construction to convert them from level SPC-1 to level SPC-2. These buildings are typically classified as "Building Type 1- Wood, Light Frame" or "Building Type 2- Wood, Commercial and Industrial" as specified in Section 2.2.3, Chapter 6 of the 2007 California Administrative Code (CAC). This methodology does not apply to single story hospital buildings utilizing wood frame or light steel frame construction with roofing membrane (shingles, tile, etc.) weighing more than 10 psf.

Note: This CAN is applicable to projects that are subject to the 2007 CBC, and addresses issues that were previously addressed in Section 1648A of the 2001 CBC and the corresponding CAN 2-1648A. Projects that are subject to the 2001 CBC, shall continue to be subject to Section 1648A of the 2001 CBC and CAN 2-1648A.

**INTERPRETATION:**

The relative safety of single story light wood and light steel frame buildings has long been recognized. These types of buildings were specifically excluded from the definition of “Hospital building” when used as a skilled nursing or intermediate care facility (Health and Safety Code Section 129725(b)(2)). Even though by calculation these buildings may evaluate as an SPC-1, we know from past experience that these building types survive earthquakes without collapse, provided that the building has certain attributes. These attributes include braced cripple walls, adequate connection to the foundation, and, in the case of larger light frame structures, regularly and closely spaced sheathed walls that extend from the foundation to the roof. The SPC-2 criteria is that “These buildings may not be repairable or functional but will not significantly jeopardize life” following strong ground motion. Although these buildings do not normally collapse, there are factors that may jeopardize life as they respond to an earthquake.

Therefore, single-story Building Type 1- Wood, Light Frame structures, and single-story “Building Type 2- Wood, Commercial and Industrial” structures, evaluated per Chapter 6 of the 2007 CAC, as an SPC-1 may be placed in category SPC-2 provided the following items have been mitigated:

1. Cripple Walls per Section 5.6.4, Chapter 6 of the 2007 CAC: This deficiency is considered mitigated with the addition of structural panel sheathing to the inside face of stud of the cripple wall. In addition, single-story hospital buildings utilizing wood frame or light steel frame construction with a floor area greater than 5,000 square feet, this deficiency is considered mitigated provided that the interior shear and or bearing walls are supported below the floor by cripple wall studs with structural panel sheathing and sill plates bolted to the foundation. An acceptable methodology for performing this work is the prescriptive procedure for the repair and / or retrofit of existing buildings specified by the 2006 International Existing Building Code, Appendix Chapter A3.
2. Foundation Bolting per Sections 8.4.7, Chapter 6, 2007 CAC: This deficiency is considered mitigated with the addition of drilled-in anchors to provide the minimum bolt spacing per the structural evaluation procedure.
3. Vertical lateral-force resisting elements must be provided parallel to the length of the building so that, in each resisting direction, there is at least one vertical lateral-force-resisting element within 35 feet of any portion of the building length. Existing sheathed stud walls that extend from the foundation to the roof diaphragm shall be considered to meet this requirement. In buildings made up of multiple diaphragm segments, the vertical lateral-force resisting elements shall be directly attached to the diaphragm segment.
4. Where existing sheathed stud walls do not extend from the ceiling to the roof at a maximum spacing of 35 feet in each direction, existing walls shall be extended to the roof to obtain the maximum spacing of 35 feet. The 35 foot spacing is based

on capacities of typical light frame wood building shear walls subject to the estimated earthquake demands calculated from Article 2, Chapter 6, 2007 CAC. When substantiated by structural calculations, the 35 feet may be increased when the shear capacity and overturning stability of the shear walls is adequate. The extended wall portion in the ceiling space shall be anchored to the wall below at each end to resist uplift forces from the design seismic lateral load. The new studs shall be spaced at a maximum of 24 inches on center.

5. Bearing and non-bearing stud walls within the ceiling to roof space designated to resist in-plane seismic lateral forces shall be covered with sheathing on at least one side with nailing sufficient to resist the in-plane design seismic lateral force and to transfer that shear force from the roof diaphragm to the sheathed wall portion below. Where the existing sheathing of the wall below the ceiling is gypsum board or plaster, the new structural sheathing in the ceiling to roof space shall consist of gypsum board. The maximum shear capacity of the new gypsum board sheathing shall not be taken to be greater than 100 pounds-per-linear foot (5d nails at 7 inches on center). The maximum shear capacity of walls with gypsum board sheathing on two sides shall not be taken to be greater than 200 pounds-per-linear foot (5d nails at 7 inches on center).

The maximum height (from roof to floor)-to-width ratio of the stud wall shall not exceed 1:1 in order to be considered as resisting the in-plane seismic lateral force. This limitation is based on the stability of the shear wall considering that there are no designed holdown anchors at the ends of the wall at the floor level.

**REASON:**

This Code Application Notice is provided to address the recognized performance of building types 1 and 2. It is the Office's interpretation of ASCE 41-06, Section 1.1, which is adopted in Section 3403A.2.3.3 which states "...This code does not preclude a building from being rehabilitated by other procedures approved by authority having jurisdiction."

Original Signed                      06/19/08  
John D. Gillengerten                      Date