

Division of the State Architect

STATE HISTORICAL BUILDING SAFETY BOARD

Committee for amendments to the California Historical Building Code

Chapter 8-7

ALTERNATIVE STRUCTURAL REGULATIONS

Chapter 8-8

ARCHAIC MATERIALS AND METHODS OF CONSTRUCTION

Meeting Minutes of June 19th 2007

Division of the State Architect
Oakland Regional Office

Attendees

Alan Dreyfuss, SHBSB, CPF

Gary McGavin, SHBSB, SSC

Loring Wyllie, SHBSB, SEAOC

Una Gilmartin

David Cocke

Tom Winter, SHBSB, Staff

The group started with a discussion of defining “life safety” for the purpose of a base level of structural design. The following language added to 8-702.1 was a proposal. The group continues to look for a definition, possibly one of the existing definitions of “collapse prevention” may be adaptable. There is still the need to look at “hazard” and how that is defined based on the use of “distinct hazard” in other chapters of the CHBC.

8-702.1 These regulations The CHBC shall not be construed to allow the enforcing agency to approve or permit a lower level of safety of structural design and construction than that which is reasonably equivalent to the regular code provisions in occupancies which are critical to the safety and welfare of the public at large, including, but not limited to, public and private schools, hospitals, municipal police and fire stations and essential services facilities. **It is the intent of the CHBC to provide for, as a minimum, a “life safety performance level” as defined by two performance criteria: (a) some margin against either partial or total structural collapse, and (b) the overall risk to life-threatening injury as a result of structural damage is expected to be low.**

The affect of owner specified structural upgrades above that mandated in CHBC were discussed. The group looked at assuring the users understand the CHBC is not a “minimum” standard, but the maximum required standard. Partial upgrades are allowed

and this needs to be expressed in the CHBC. Some possible added language to 8-705.2.2 is proposed below.

8-705.2.2 The architect or engineer shall consider additional measures with minimal loss of, and impact to historical materials which will reduce damage and needed repairs in future earthquakes to better preserve the qualified historical structure in perpetuity. These additional measures shall be presented to the owner for consideration as part of the rehabilitation or restoration. **With consideration of the effect of the additional measures on the historic fabric of the structure.**

Analysis of 8-706.1 requirements looking 1991/94 UCBC, 1994 UBC, 2006 IEBC and the 2006 IBC were discussed. The various standards provide some surprising comparisons that bring out some of the inconsistencies when attempting to convert from the 2001 CHBC to an I-code as a standard. There are many increases and redundancies added to structural design not expected nor needed to meet the CHBC performance requirement for historic buildings.

It was also pointed out that there are significant inconsistencies in more recent codes. Stone masonry is combined with adobe masonry where the two are necessarily treated separately in the CHBC. There is also an inconsistency regarding the use of materials for diaphragms, where straight sheathing with hardwood flooring develops 1500 lbs/ft. Straight sheathing with composition roofing is assigned 750 lbs/ft and plywood sheathing is assigned 675 lbs/ft. The group feels that tables A and B in Chapter 8-8 will probably be retained but the numbers adjusted to suit the amended language.

It was pointed out that there is an issue of how to assess the strength of lumber that was installed before grading rules were established.

The members of the committee agreed to pursue further development of the areas of interest that they had assigned themselves.

1991/94 UCBC for UMB

$$V=0.33ZW = 0.132W \quad Z=.4$$

1994 UBC X .75

$$V=0.138W \text{ Using } R_w = 6 \text{ for concrete shear walls}$$

2006 IBC

$$V = S_{Ds} / R/I = 100 / R/I$$

$$I = 1.25 \text{ more than } 30..?? \text{ assembly and } R = 1.5 \text{ for UMB}$$

2006 IEBC Appendix A

$$V = 0.755 S_{Ds} W / R = 0.50 \text{ FOR UMB (R = 1.5)}$$

But masonry shear strength:

$$\text{from } 0.1V_t + 0.15P_D / A \quad 10 \text{ psi max}$$

$$\text{to: } 0.56V_t = 0.75P_D / A \quad 100 \text{ psi max}$$

all other allowables old code x 3

0.75 x 2006 IBC

concrete shear values

$$V = S_{Ds} / R/I = 100/4 = .025 \times 0.75$$

$$0.1875W$$

Proposed 2006 8-706.1

*Seismic loads need not exceed 0.75 of regular code

*and, Seismic base shear need not exceed:

0.40W for buildings with over 300 occupants

0.30W for buildings with assembly occupancy

*near fault effects of regular code need not be specifically considered for rigid buildings ($T < 0.5$ seconds)

*Based on R values in the regular code provided 75% of base shear is resisted by that system.