AGENDA REPORT

Meeting Date: November 13, 2007

Item Number: D-2

To: Honorable Mayor & City Council

From: Sam Lee, Plan Review Manager
George Chavez, City Building Official
Ralph Mundell, Fire Marshal

Subject: A) RESOLUTION OF THE COUNCIL OF THE CITY OF BEVERLY HILLS MAKING EXPRESS FINDINGS AND DETERMINATIONS THAT MODIFICATIONS TO THE CALIFORNIA BUILDING STANDARDS CODE AND FIRE CODE ARE REASONABLY NECESSARY BECAUSE OF LOCAL CLIMATIC, GEOLOGICAL OR TOPOGRAPHICAL CONDITIONS; and

B) AN ORDINANCE OF THE CITY OF BEVERLY HILLS AMENDING THE UNIFORM ADMINISTRATIVE CODE, 1997 EDITION AND ADOPTING BY REFERENCE THE 2007 CALIFORNIA BUILDING CODE, AND AMENDMENTS THERETO; THE 2007 CALIFORNIA ELECTRICAL CODE, AND AMENDMENTS THERETO; THE 2007 CALIFORNIA MECHANICAL CODE, AND AMENDMENTS THERETO; THE 2007 CALIFORNIA PLUMBING CODE, AND AMENDMENTS THERETO; THE UNIFORM SWIMMING POOL, SPA AND HOT TUB CODE, 2006 EDITION, AND AMENDMENTS THERETO; THE CALIFORNIA ENERGY CODE, 2007 EDITION; THE 2007 CALIFORNIA FIRE CODE, AND AMENDMENTS THERETO; AND AMENDING PORTIONS OF TITLE 9 OF THE BEVERLY HILLS MUNICIPAL CODE

Attachments:

1. Resolution
2. Ordinance

RECOMMENDATION

Staff recommends that the City Council hold the public hearing and adopt the Resolution making the express findings for the City amendments to the California Building

Standards Code and Fire Code and conduct second reading of the Ordinance for adoption.

INTRODUCTION

The attached Ordinance provides for adoption of the latest edition of the California Building Standards Code (which encompasses the Building, Mechanical, Plumbing, Energy, Electrical and Fire codes), re-adopts many of the City amendments currently in place, adds additional administrative and seismic provisions and deletes those deemed unnecessary because they can now be handled by the unamended code.

The California Health and Safety Code allow cities to amend the CBSC when deemed necessary and reasonable because of local climatic, geological or topographical conditions, as long as the amendments are more restrictive than the unamended CBSC. The attached Resolution sets for the findings required by the Health and Safety Code.

BACKGROUND

The California Building Standards Commission is responsible for the adoption of the latest model codes every three years. After review and input by various state agencies and other interested parties, public hearings are held by the Commission, which ultimately amends and adopts the selected model codes under the title, California Building Standards Code. Absent a local ordinance adopting and amending the CBSC, the CBSC, without City amendments, would automatically become effective within the City on January 1, 2008. Thus if the City is to retain local amendments deemed important to the health, safety, and welfare of its residents and visitors (some examples of these amendments are requirements pertaining to fire sprinklers, class A non-wood roof and higher seismic design standards), it is necessary to adopt the attached Ordinance to become effective prior to January 1, 2008. The Resolution sets forth the findings required by the Health and Safety Code that support the modifications to the CBSC and the Fire Code. Such modifications are necessary due to the climatic, geological and topographical conditions of the City as set forth in the Resolution.

Added to the administrative amendments is a new provision that requires building owners to provide tenants a habitable place to live during a construction project. Among other things, this amendment requires owners to submit construction means and methods plan, notify tenants, provide security, and in some cases relocate tenants during construction.

The Ordinance also contains structural design amendments. In a continuing effort to create uniformity of codes and regulations in the Los Angeles (LA) region, many of the LA Basin Chapter Structural Code Committee's recommendations have been added. These amendments have been adopted by most of the 85 other jurisdictions throughout the Southern California region and reflect recommendations by the Structural Engineering Association of Southern California and the Los Angeles Task Force that investigated the poor building performance observed in the 1994 Northridge Earthquake.

Lastly, the new code editions numbering system compel the need to revise the current municipal code amendments to correspond to the new codes format. Thus, many of the City's existing amendments were re-adopted under the new numbering system.

FISCAL IMPACT

No financial impact is anticipated.

FOR
Timothy Scranton, Fire Chief

Vincent P. Bertoni AICP, Director of
Community Development

RESOLUTION NO. _____

RESOLUTION OF THE COUNCIL OF THE CITY OF BEVERLY HILLS MAKING EXPRESS FINDINGS AND DETERMINATIONS THAT MODIFICATIONS TO THE CALIFORNIA BUILDING STANDARDS CODE AND FIRE CODE ARE REASONABLY NECESSARY BECAUSE OF LOCAL CLIMATIC, GEOLOGICAL OR TOPOGRAPHICAL CONDITIONS

THE CITY COUNCIL OF THE CITY OF BEVERLY HILLS HEREBY FINDS, DETERMINES, ORDERS AND RESOLVES AS FOLLOWS:

Section 1. Section 17958.5 of the California Health and Safety Code provides that the City may make such changes or modifications to building standards set forth in the California Building Standards Code, including the California Fire Code, as it determines are reasonably necessary because of local climatic, geological or topographical conditions.

Section 2. Ordinance No. _____ includes a number of changes and modifications to the 2007 editions of the California Building Standards Code and Fire Code.

Section 3. The City Council hereby expressly finds that such changes and modifications are necessary because of specific local conditions, including the City's semi-arid climate, the City's topography which is partially in a hillside and mountainous area and partially on an alluvial plain, and the City's geological conditions, which include proximity to earthquake fault zones. The City, as well as the surrounding cities, is located in an area climatically classified as "semi-arid" and prone to winds of high velocity. Moreover, due to the arid nature of the area, the weather during the windy period tends to be very warm and dry. The dry weather conditions, combined with the relatively hilly topography of the City, are very hazardous to the surrounding highly populated areas in as far as flame spread is concerned.

Because of the above-described climatic and topographic conditions, the City and the surrounding cities have historically suffered from occasional structural fires. These have often been difficult to control due to the dry winds carrying sparks and cinders to surrounding structures.

The City is located in a seismically active area and is in close proximity to earthquake fault zones, and it is reasonably foreseeable that an earthquake would render the City particularly vulnerable to devastation.

Because of the above-described geological conditions, the City, in the event of an earthquake, may be unable to dispatch an adequate number of fire personnel and apparatus to suppress fires and conduct rescue operations. Moreover, the conditions within the City likewise occur in surrounding communities, hereby rendering mutual aid assistance problematic, at best. Specific findings justifying and supporting the the modifications to building standards in the

California Building Standards Code and Fire Code contained in Ordinance No. _____, are set forth in Exhibit "A" attached hereto, and are incorporated herein by reference.

Section 4. Based upon the findings set forth in Section 3, above, and Exhibit A hereto, the City Council finds the modifications to the 2007 California Building Standards Code and Fire Code in Ordinance No. _____ to be reasonably necessary for the protection of the public health, safety, and welfare because of local climatic, geological and topographic conditions.

Section 5. If any section, subsection, subdivision, paragraph, sentence, clause or phrase of this resolution is for any reason held to be invalid, such invalidity shall not affect the validity of the remaining portions of this resolution. The City Council of the City of Beverly Hills hereby declares that it would have passed each section, subsection, subdivision, paragraph, sentence, clause or phrase hereof, irrespective of the fact that any one or more sections, subsections, subdivisions, paragraphs, sentences, clauses or phrases be declared invalid.

Section 6. The City Clerk shall certify to the adoption of this resolution and shall cause this resolution and her certification to be entered in the Book of Resolutions of the Council of this City.

PASSED, APPROVED AND ADOPTED this 13th day of November, 2007.

_____
JIMMY DELSHAD
Mayor of the City of Beverly Hills, California

ATTEST:

_____ (SEAL)
BYRON POPE
City Clerk

APPROVED AS TO FORM:

LAURENCE S. WIENER
City Attorney

APPROVED AS TO CONTENT:

VINCENT P. BERTONI, AICP
Director of Community Development

FOR

TIMOTHY SCRANTON
Fire Chief

Exhibit A

Findings for Beverly Hills Amendments

Section 903.2 of the California Building Code is hereby amended as follows:

903.2 Where required. An automatic fire extinguishing system shall be required for all occupancies except U Occupancies which are sheds that are less than five hundred (500) square feet. For requirements for automatic fire extinguishing system to existing structures refer to the California Fire Code as adopted by the City.

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

No change from previous code. This provision requires all new buildings except for sheds (less than 500 sq ft) have an automatic fire extinguishing system.

FINDINGS:

Beverly Hills is located in an area climatically classified as "semi-arid" and prone to winds of high velocity. Moreover, due to the arid nature of the area, the weather during the windy period tends to be very warm and dry. The dry weather conditions, combined with the relatively hilly topography of the City is very hazardous to the surrounding highly populated areas in as far as flame spread is concerned.

Because of the above-described climatic and topographic conditions, the City and the surrounding cities have historically suffered from occasional structural fires. These have often been difficult to control due to the dry winds carrying sparks and cinders to surrounding structures.

Section 907.2.10.1 of the California Building Code is hereby amended as follows:

Section 907.2.10.1 Where required. Smoke alarms for all new and existing R-occupancies shall be installed in the locations described in Sections 907.2.10.1.1 and 907.2.10.1.3.

Section 907.2.10.2 of the California Building Code is amended as follows:

Section 907.2.10.2 Power Source. In existing construction, new construction, and in newly classified Group R occupancies, required smoke alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

Exception: Smoke alarms are not required to be equipped with battery backup in Group R-1 where they are connected to an emergency electrical system.

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

No change from previous code. This provision requires all residences have complying smoke detectors that are hardwired with battery backup.

FINDINGS:

Beverly Hills is located in an area climatically classified as "semi-arid" and prone to winds of high velocity. Moreover, due to the arid nature of the area, the weather during the windy period tends to be very warm and dry. The dry weather conditions, combined with the relatively hilly topography of the City is very hazardous to the surrounding highly populated areas in as far as flame spread is concerned.

Because of the above-described climatic and topographic conditions, the City and the surrounding cities have historically suffered from occasional structural fires. These have often been difficult to control due to the dry winds carrying sparks and cinders to surrounding structures.

Section 1020.1.7 of the California Building Code is hereby amended as follows:

Section 1020.1.7 Smokeproof enclosures. In buildings required to comply with sections 403 or 405 of the California Building Code, or in buildings four or more stories, each of the exit enclosures shall be a smokeproof enclosure or pressurized stairway in accordance with Section 909.20. The system shall be certified by a licensed contractor at the expense of the owner and a report shall be submitted to the City Fire Marshal every five years.

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

This provision requires all new buildings 4 or more stories to provide a pressurized stairway system in order to facilitate exiting during a fire. Certification by a licensed contractor and a report is required to be submitted to the Fire Marshal every 5 years.

FINDINGS:

Beverly Hills is located in an area climatically classified as "semi-arid" and prone to winds of high velocity. Moreover, due to the arid nature of the area, the weather during the windy period tends to be very warm and dry. The dry weather conditions, combined with the relatively hilly topography of the City is very hazardous to the surrounding highly populated areas in as far as flame spread is concerned.

Because of the above-described climatic and topographic conditions, the City and the surrounding cities have historically suffered from occasional structural fires. These have often been difficult to control due to the dry winds carrying sparks and cinders to surrounding structures.

Section 1505.1 of the California Building Code is hereby amended as follows:

Section 1505.1 General. Except as otherwise provided in this section, roof coverings or roof assemblies on any structure regulated by this Code shall be a fire-retardant roof covering or roof assembly that is listed as a Class A assembly in accordance with ASTM E 108 or UL 790. In addition, no wood shall be used as a roof covering material. Noncombustible roof coverings may be applied in accordance with the manufacturer's requirements in lieu of a fire-retardant roofing assembly.

EXCEPTION:
Roof repairs of less than 10 percent of the total roof area on existing structures in any one year period may be repaired with a roof covering that meets the same fire retardant standard as the existing roof.
Section 1505.1.1 is hereby amended to the California Building Code as follows:
Class A roof covering requirement. Notwithstanding any other requirement of the Beverly Hills Municipal Code, no later than July 1, 2013, all roof coverings in the City of Beverly Hills shall be fire retardant Class A.

Section 1505.1.2 and 1505.1.3 of the California Building Code is hereby deleted:

Section 1505.1.2. Deleted

Section 15.5.1.3. Deleted

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

No change from previous code.
These two amendments require the following:

Section 1505.1 – Requires all roofs to be class A non-wood assembly.

Section 1505.2 – Requires all roofs in the city to be class A assembly by July 1, 2013.

FINDINGS:

Beverly Hills is located in an area climatically classified as "semi-arid" and prone to winds of high velocity. Moreover, due to the arid nature of the area, the weather during the windy period tends to be very warm and dry. The dry weather conditions, combined with the relatively hilly topography of the City is very hazardous to the surrounding highly populated areas in as far as flame spread is concerned.

Because of the above-described climatic and topographic conditions, the City and the surrounding cities have historically suffered from occasional structural fires. These have often been difficult to control due to the dry winds carrying sparks and cinders to surrounding structures.

Section 1613.6.1 of the California Building Code is hereby amended as follows:

1613.6.1 Assumption of flexible diaphragm. Add the following text at the end of Section 12.3.1.1 of ASCE 7:

Diaphragms constructed of wood structural panels or untopped steel decking shall also be permitted to be idealized as flexible, provided all of the following conditions are met:

Toppings of concrete or similar materials are not placed over wood structural panel diaphragms except for nonstructural toppings no greater than 1 ½ inches (38 mm) thick.

Each line of vertical elements of the lateral-force-resisting system complies with the allowable story drift of Table 12.12-1.

Vertical elements of the lateral-force-resisting system are light-framed walls sheathed with wood structural panels rated for shear resistance or steel sheets.

Portions of wood structural panel diaphragms that cantilever beyond the vertical elements of the lateral-force-resisting system are designed in accordance with Section 2305.2.5 of the *California Building Code*.

Exception: In lieu of Section 2305.2.5, flexible diaphragm assumption is permitted to be used for buildings up to two stories in height provided cantilevered diaphragms supporting lateral-force-resisting elements from above does not exceed 15 percent of the distance between lines of lateral-force-resisting elements from which the diaphragm cantilevers nor one-fourth the diaphragm width perpendicular to the overhang.

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

This local amendment carries forward the previous 1999 and 2002 LARUCP amendment to limit the maximum span of cantilevered diaphragms supporting lateral-force-resisting elements from above, thereby addressing the problem of poor performance of diaphragms transmitting seismic loads to lateral-force-resisting elements below. This amendment reflects the recommendations by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Task Force that investigated the poor performance observed in 1994 Northridge Earthquake.

FINDINGS:

Local Geological Conditions – The greater Los Angeles/Long Beach region is a densely populated area having buildings constructed over and near a vast array of fault systems capable of producing major earthquakes, including but not limited to the recent 1994 Northridge Earthquake. The proposed modification to limit the maximum span of cantilevered diaphragms that supports lateral-force-resisting elements from above need to be incorporated into the code to assure that new buildings and additions to existing buildings are designed and constructed in accordance with the scope and objectives of the International Building Code.

SECTION 1614
MODIFICATION TO ASCE 7.

1614.1 General. *The text of ASCE 7 shall be modified as indicated in this Section.*

1614.1.1 ASCE 7, 12.2.3.1, Exception 3. *Modify ASCE 7 Section 12.2.3.1 Exception 3 to read as follows:*

3. Detached one and two family dwellings *up to two stories in height* of light frame construction.

Sections 1614, 1614.1 and 1614.1.2 are hereby added to the California Building Code as follows:

SECTION 1614
MODIFICATION TO ASCE 7.

1614.1 General. *The text of ASCE 7 shall be modified as indicated in this Section.*

1614.1.2 ASCE 7, 12.3.1.1. *Modify ASCE 7 Section 12.3.1.1 to read as follows:*

12.3.1.1 Flexible Diaphragm Condition. Diaphragm constructed of untopped steel decking or wood structural panels are permitted to be idealized as flexible in structures in which the vertical elements are steel or composite steel and concrete braced frames, or concrete, masonry, steel, or composite shear walls. Diaphragms of wood structural panels or untopped steel decks in one- and two-family residential buildings of light-frame construction shall also be permitted to be idealized as flexible.

Flexible diaphragm assumption is permitted to be used for buildings up to two stories in height provided cantilevered diaphragms supporting lateral-force-resisting elements from above does not exceed 15 percent of the distance between lines of lateral-force-resisting elements from which the diaphragm cantilevers nor one-fourth the diaphragm width perpendicular to the overhang.

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

This local amendment carries forward the previous 1999 and 2002 LARUCP amendment to limit the maximum span of cantilevered diaphragms supporting lateral-force-resisting elements from above, thereby addressing the problem of poor performance of diaphragms transmitting seismic loads to lateral-force-resisting elements below. This amendment reflects the recommendations by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Task Force that investigated the poor performance observed in 1994 Northridge Earthquake.

FINDINGS:

Local Geological Conditions – The greater Los Angeles/Long Beach region is a densely populated area having buildings constructed over and near a vast array of fault systems capable of producing major earthquakes, including but not limited to the recent 1994 Northridge Earthquake. The proposed modification to limit the maximum span of cantilevered diaphragms that supports lateral-force-resisting elements from above need to be incorporated into the code to assure that new buildings and additions to existing buildings are designed and constructed in accordance with the scope and objectives of the International Building Code.

Section 1614, 1614.1 and 1614.1.3 are hereby added to the California Building Code as follows:

SECTION 1614
MODIFICATION TO ASCE 7.

1614.1 General. *The text of ASCE 7 shall be modified as indicated in this Section.*

1614.1.3 ASCE 7, Section 12.8.1.1. *Modify ASCE 7 Section 12.8.1.1 by amending Equation 12.8-5 as follows:*

$C_s = 0.044\, S_{DS} I \geq 0.01$ (Eq. 12.8-5)

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

Results from the 75% Draft of ATC-63, Quantification of Building System Performance and Response Parameters, indicate that tall buildings may fail at an unacceptably too low of a seismic level unless the minimum base shear level is increased to the value used in ASCE 7-02. Thus it is recommended that the adoption of the minimum base shear is appropriate due to the recent research in PEER and the ATC 63 project. The conclusion suggested that the reduction of the base shear in the previous code led to a trend in which tall buildings had decreasing safety with increasing height. To minimize the potential increased fire-life safety associated with such a seismic failure of tall buildings, this proposed modification increases the minimum base shear level to be consistent with previous edition of the building codes. The propose amendment to the current ASCE 7 is very well supported by the engineering community. Both SEAOSC and other structural engineer organizations from the state level are in support of adopting the revised minimum base shear.

FINDINGS:

Local Geological Conditions – The greater Los Angeles/Long Beach region is a densely populated area having buildings constructed over and near a vast array of fault systems capable of producing major earthquakes, including but not limited to the recent 1994 Northridge Earthquake. Due to the large numbers of tall buildings in this region as well as the increased fire-life safety associated with such a seismic failure, the proposed modification to have a higher minimum base shear consistent with previous edition of the building codes need to be incorporated into the code to assure that new buildings and additions to existing buildings are designed and constructed in accordance with the scope and objectives of the International Building Code.

Section 1614, 1614.1 and 1614.1.4 are hereby added to the California Building Code as follows:

SECTION 1614
MODIFICATION TO ASCE 7.

1614.1 General. *The text of ASCE 7 shall be modified as indicated in this Section.*

1614.1.4 ASCE 7, Table 12.8-2. *Modify ASCE 7 Table 12.8-2 by adding the following:*

Structure Type	C_t	x
Eccentrically braced steel frames *and buckling-restrained braced frames*	0.03 (0.0731)[a]	0.75

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

The Buckling Restrained Steel Frame (BRBF) system was first approved for the 2003 NEHRP Provisions. The values for the approximate period perimeters C_t and x were also approved as part of that original BSSC Proposal 6-6R (2003). It seems to be a simple oversight that these parameters were not carried forward into the 2005 edition of ASCE 7-05. Currently, these two factors can be found in Appendix R of AISC 341-05. There, they function only as a placeholder that will be removed in the next version upon approval by ASCE 7 Task Committee on Seismic. The SEAOSC Steel Committee supports the proposed modification.

FINDINGS:

Local Geological Conditions – The greater Los Angeles/Long Beach region is a densely populated area having buildings constructed over and near a vast array of fault systems capable of producing major earthquakes, including but not limited to the recent 1994 Northridge Earthquake. Clarification on the design parameters for BRBF members need to be incorporated into the code to assure that new buildings and additions to existing buildings are designed and constructed in accordance with the scope and objectives of the International Building Code.

Section 1614, 1614.1 and 1614.1.5 are hereby added to the California Building Code as follows:

SECTION 1614
MODIFICATION TO ASCE 7.

1614.1 General. *The text of ASCE 7 shall be modified as indicated in this Section.*

1614.1.5 ASCE 7, Section 12.8.7. *Modify ASCE 7 Section 12.8.7 by amending Equation 12.8-16 as follows:*

$$\theta = \frac{P_x \Delta \underline{I}}{V_x h_{sx} C_d}$$

(12.8-16)

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

Importance Factor, I, seems to have been dropped from equation 12.8-16 by mistake while transcribing it from NEHRP Recommended Provisions (2003) equation 5.2-16. For buildings with importance factor, I, higher than 1.0, stability coefficient should include the importance factor. The proposed modification is recommended and adopted by OSPHD and DSA-SS as reflected in Section 1614A1.8 to Chapter 16 of the 2007 California Building Code. Furthermore, the SEAOSC Steel Committee supports the proposed modification.

FINDINGS:

Local Geological Conditions – The greater Los Angeles/Long Beach region is a densely populated area having buildings constructed over and near a vast array of fault systems capable of producing major earthquakes, including but not limited to the recent 1994 Northridge Earthquake. Considering that certain important and critical buildings and structures must be operational in the event of an emergency, the need to incorporate this modification into the code will help to assure that new buildings and additions to existing buildings are designed and constructed in accordance with the scope and objectives of the International Building Code.

Section 1614, 1614.1 and 1614.1.6 are hereby added to the California Building Code as follows:

SECTION 1614
MODIFICATION TO ASCE 7.

1614.1 General. *The text of ASCE 7 shall be modified as indicated in this Section.*

1614.1.6 ASCE 7, 12.11.2.2.3. *Modify ASCE 7 Section 12.11.2.2.3 to read as follows:*

12.11.2.2.3 Wood Diaphragms. In wood diaphragms, the continuous ties shall be in addition to the diaphragm sheathing. Anchorage shall not be accomplished by use of toe nails or nails subject to withdrawal nor shall wood ledgers or framing be used in cross-grain bending or cross-grain tension. The diaphragm sheathing shall not be considered effective as providing ties or struts required by this section.

For wood diaphragms supporting concrete or masonry walls, wood diaphragms shall comply with the following:

1. *The spacing of continuous ties shall not exceed 40 feet. Added chords of diaphragms may be used to form subdiaphragms to transmit the anchorage forces to the main continuous crossties.*

2. *The maximum diaphragm shear used to determine the depth of the subdiaphragm shall not exceed 75% of the maximum diaphragm shear.*

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

A joint Structural Engineers Association of Southern California (SEAOSC), Los Angeles County and Los Angeles City Task Force investigated the performance of concrete and masonry construction with flexible wood diaphragm failures after the Northridge earthquake. It was concluded at that time that continuous ties are needed at specified spacing to control cross grain tension in the interior of the diaphragm. Additionally, subdiaphragm shears need to be limited to control combined orthogonal stresses within the diaphragm. Recognizing the importance and need to continue the recommendation made by the task force, but also taking into consideration the improve performance and standards for diaphragm construction today, a proposal to increase the continuous tie spacing limit to 40 ft in lieu of 25 ft and to use 75% of the allowable code diaphragm shear to determine the depth of the sub-diaphragm in lieu of the 300 plf is deemed appropriate and acceptable.

These requirements are variations of Items 4 and 7 of Section 1633.2.9 from the previous 1999 and 2002 LARUCP structural provision that amended the California Building Code. The Los Angeles/Long Beach region is within a very active geological location. The various jurisdictions within this region have taken additional steps to prevent roof or floor diaphragms from pulling away from concrete or masonry walls. This decision was made due to the frequency of this type of failure during the past significant earthquakes. This section was portion of the previous code and has been adjusted to accommodate higher diaphragm shear allowable as noted above.

FINDINGS:

Local Geological Conditions – The greater Los Angeles/Long Beach region is a densely populated area having buildings constructed over and near a vast array of fault systems capable of producing major earthquakes, including but not limited to the recent 1994 Northridge Earthquake. Considering that certain important and critical buildings and structures must be operational in the event of an emergency, the need to incorporate this modification into the code will help to assure that new buildings and additions to existing buildings are designed and constructed in accordance with the scope and objectives of the International Building Code.

Section 1614, 1614.1 and 1614.1.7 are hereby added to the California Building Code as follows:

SECTION 1614
MODIFICATION TO ASCE 7.

1614.1 General. *The text of ASCE 7 shall be modified as indicated in this Section.*

1614.1.7 ASCE 7, Section 12.12.3. *Replace ASCE 7 Section 12.12.3 as follows:*

12.12.3 Minimum Building Separation. *All structures shall be separated from adjoining structures. Separations shall allow for the maximum inelastic response displacement (□M). □M shall be determined at critical locations with consideration for both translational and torsional displacements of the structure as follows:*

$$\Delta_M = C_d \delta_{max} \qquad \textit{(Equation 16-45)}$$

where □max is the calculated maximum displacement at Level x as define in ASCE 7 Section 12.8.4.3.

Adjacent buildings on the same property shall be separated by at least a distance □MT, where

$$\Delta_{MT} = \sqrt{(\Delta_{M1})^2 + (\Delta_{M2})^2} \qquad \textit{(Equation 16-46)}$$

and □M1 and □M2 are the maximum inelastic response displacements of the adjacent buildings.

Where a structure adjoins a property line not common to a public way, the structure shall also be set back from the property line by at least the displacement, □M, of that structure.

Exception: Smaller separations or property line setbacks shall be permitted when justified by rational analysis.

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

Section 12.12.3 of ASCE 7-05 including Supplement No. 1 does not provide requirements for separation distances between adjacent buildings. Requirements for separation distances between adjacent buildings, not structurally connected, were included in previous editions of the IBC and UBC. However, when ASCE 7-05 was adopted by reference for IBC 2006, these requirements were omitted. In addition, ASCE 7-05 defines (δ_x) in Section 12.8.6 to refer to the deflection of Level x at the center of mass. The actual displacement that needs to be used for building separation is the displacement at critical locations with consideration of both the translational and torsional displacements. These values can be significantly different.

This code change fills the gap of this inadvertent oversight in establishing minimum separation distance between adjoining buildings that are not structurally connected. The purpose of seismic separation is to permit adjoining buildings, or parts thereof, to respond to earthquake ground motion independently and thus preclude possible structural and non-structural damage caused by pounding between buildings or other structures.

Reference:

1. IBC 2000 Section 1620.3.6, Building Separations; IBC 2003 Section 1620.4.5, Building Separations;
2. "Recommended Lateral Force Requirements and Commentary, – Section C108.2.11, Building Separations," Structural Engineers Association of California, Sacramento, CA, 1999 Edition;
3. CBC 2002 (UBC 1997) Section 1630.9.2, Determination of $\square_M$; Section 1630.10.1, General; and Section 1633.2.11, Building Separations.

FINDINGS:

Local Geological Conditions – The greater Los Angeles/Long Beach region is a densely populated area having buildings constructed over and near a vast array of fault systems capable of producing major earthquakes, including but not limited to the recent 1994 Northridge Earthquake. The seismic separation is necessary to permit adjoining buildings, or parts thereof, to respond to earthquake ground motion independently and preclude possible structural damage due to pounding between buildings and other structures. The need to incorporate this modification into the code will help to assure that new buildings and additions to existing buildings are designed and constructed in accordance with the scope and objectives of the International Building Code.

Section 1614, 1614.1 and 1614.1.8 are hereby added to the California Building Code as follows:

SECTION 1614
MODIFICATION TO ASCE 7.

1614.1 General. *The text of ASCE 7 shall be modified as indicated in this Section.*

1614.1.8 ASCE 7, 12.12.4. *Modify ASCE 7 Section 12.12.4 to read as follows:*

12.12.4 Deformation Compatibility for Seismic Design Category D through F. For structures assigned to Seismic Design Category D, E, or F, every structural component not included in the seismic force-resisting system in the direction under consideration shall be designed to be adequate for the gravity load effects and the seismic forces resulting from displacement to the design story drift (Δ) as determined in accordance with Section 12.8.6 (see also Section 12.12.1).

Exception: Reinforced concrete frame members not designed as part of the seismic force-resisting system shall comply with Section 21.9 of ACI 318.

Where determining the moments and shears induced in components that are not included in the seismic force-resisting system in the direction under consideration, the stiffening effects of adjoining rigid structural and nonstructural elements shall be considered and a rational value of member and restraint stiffness shall be used.

When designing the diaphragm to comply with the requirements stated above, the return walls and fins/canopies at entrances shall be considered. Seismic compatibility with the diaphragm shall be provided by either seismically isolating the element or by attaching the element and integrating its load into the diaphragm.

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

This local amendment carries forward the previous 1999 and 2002 LARUCP 16-5 amendment adopted by the cities and county of the Los Angeles region regulating return walls and fins/canopies at entrances to ensure the seismic compatibility of the diaphragm. This amendment reflects the recommendations by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Task Force that investigated the poor performance observed in 1994 Northridge Earthquake. The study concluded that stiffness incompatibility between entrance canopies need to be addressed. This decision was made due to the frequency of this type of failure during the past significant earthquakes.

FINDINGS:

Local Geological Conditions – The greater Los Angeles/Long Beach region is a densely populated area having buildings constructed over and near a vast array of fault systems capable of producing major earthquakes, including but not limited to the recent 1994 Northridge Earthquake. This amendment is required to address and clarify special needs for return walls and fins/canopies at entrances. The proposed modification requires seismic compatibility of return walls and fins/canopies at entrances with the diaphragm need to be incorporated into the code to assure that new buildings and additions to existing buildings are designed and constructed in accordance with the scope and objectives of the International Building Code.

Section 1704.4 of the California Building Code is hereby amended as follows

1704.4 Concrete Construction. The special inspections and verifications for concrete construction shall be as required by this section and Table 1704.4.

Exceptions: Special inspection shall not be required for:

1. Isolated spread concrete footings of buildings three stories or less in height that are fully supported on earth or rock, *where the structural design of the footing is based on a specified compressive strength, f'c, no greater than 2,500 pounds per square inch (psi) (17.2 Mpa).*

2. Continuous concrete footings supporting walls of buildings three stories or less in height that are fully supported on earth or rock where:

   2.1. The footings support walls of light-frame construction;
   2.2. The footings are designed in accordance with Table 1805.4.2; or
   2.3. The structural design of the footing is based on a specified compressive strength, f'c, no greater than 2,500 pounds per square inch (psi) (17.2 Mpa), regardless of the compressive strength specified in the construction documents or used in the footing construction.

3. Nonstructural concrete slabs supported directly on the ground, including prestressed slabs on grade, where the effective prestress in the concrete is less than 150 psi (1.03 Mpa).

4. *Not adopted.*

5. Concrete patios, driveways and sidewalks, on grade.

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

One of the significant problems discovered from the studies after the Northridge Earthquake was the extent of poor quality in construction, especially for residential wood frame buildings and/or accessories structures. The requirement to require that special inspectors be provided for work listed under Section 1704 to observe the actual construction will ensure that acceptable standards of workmanship are provided.

FINDINGS:

Local Topographical and Geological Conditions – The greater Los Angeles/Long Beach region is a densely populated area having buildings constructed over and near a vast array of fault systems capable of producing major earthquakes, including but not limited to the recent 1994 Northridge Earthquake. One of the significant problems discovered from the studies after the Northridge Earthquake was the extent of poor quality in construction, especially for residential wood frame buildings and/or accessories structures. Requiring that special inspectors be provided for work listed under Section 1704 to observe the actual construction will ensure that acceptable standards of workmanship are provided. The proposed modification need to be incorporated into the code to assure that new buildings and additions to existing buildings are designed and constructed in accordance with the scope and objectives of the International Building Code.

Section 1805.1 of the 2007 California Building Code is amended to read as follows:

1805.1 General. Footings and foundations shall be designed and constructed in accordance with Sections 1805.1 through 1805.9. Footings and foundations shall be built on undisturbed soil, compacted fill material or *controlled low-strength material (CLSM)*. Compacted fill material shall be placed in accordance with Section 1803.5. CLSM shall be placed in accordance with Section 1803.6.

The top surface of footings shall be level. The bottom surface of footings is permitted to have a slope not exceeding one unit vertical in 10 units horizontal (10-percent slope). Footings shall be stepped where it is necessary to change the elevation of the top surface of the footing or where the surface of the ground slopes more than one unit vertical in 10 units horizontal (10-percent slope). *This stepping requirement shall also apply to the top surface of grade beams supporting walls. Footings shall be reinforced with four 1/2-inch diameter (12.7 mm) deformed reinforcing bars. Two bars shall be place at the top and bottom of the footings as shown in Figure 1805.1.*

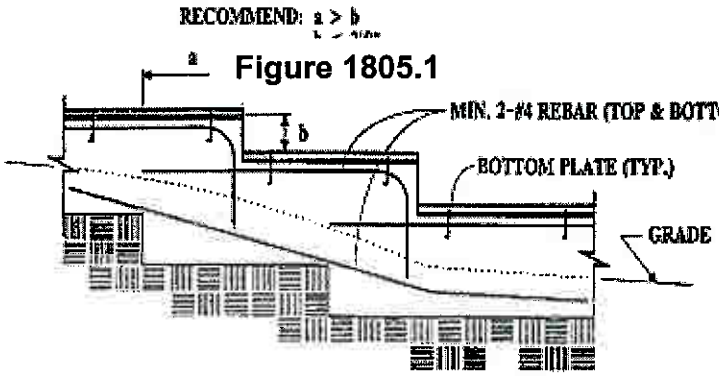

Figure 1805.1

Table 1805.4.2 of the 2007 California Building Code is amended to read as follows:

TABLE 1805.4.2
FOOTINGS
WALLS OF LIGHT-FRAMED CONSTRUCTION [a, b, c, d, e]

STEPPED FOUNDATIONS

NUMBER OF FLOORS SUPPORTED BY THE FOOTING[f]	WIDTH OF FOOTING (inches)	THICKNESS OF FOOTING (inches)
1	12	6
2	15	6
3	18	8[g]

For SI: 1 inch =25.4 mm, 1 foot = 304.8 mm

a. Depth of footings shall be in accordance with Section 91.1805.2
b. The ground under the floor is permitted to be excavated to the elevation of the top of the footing.
c. ~~Interior stud-bearing walls are permitted to be supported by isolated footings. The footing width and length shall be twice the width shown in this table, can footings shall be spaced not more than 6 feet on center.~~*Not adopted.*
d. See Section 1908 for additional requirements for footings of structures assigned to Seismic Design Category C, D, E or F.
e. For thickness of foundation walls, see Section 91.1805.5
f. Footings are permitted to support a roof in addition to the stipulated number of floors. Footings supporting roof only shall be as required for supporting one floor.
~~g. Plain concrete footings for Group R-3 occupancies are permitted to be 6 inches thick.~~

Section 1805.4.5 of the 2007 California Building Code is hereby deleted and replaced with the phrase "Not adopt".

Section 1805.4.6 of the 2007 California Building Code is hereby deleted and replaced with the phrase "Not adopt".

Section 1805.5 of the 2007 California Building Code is hereby deleted in their entirety.

Section 1805.5 is added to read as follows:

1805.5 Foundation walls. *Concrete and masonry foundation walls shall be designed in accordance with Chapter 19 or 21.*

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

Wood foundations without proper protection have proven to be ineffective in supporting structures and buildings due to deterioration caused by presence of water in the soil as well as other material detrimental to wood foundations. Wood retaining walls, when they are not properly treated and protected against deterioration, have performed very poorly and have led to slope failures. Most contractors are typically accustomed to construction in dry weather in the Southern California region and are not generally familiar with the necessary precautions and treatment of wood that makes it suitable for wet applications. With the higher seismic demand placed on buildings and structures in this region, coupled with the dryer weather conditions here as oppose to the northern and eastern part of the country, it is deemed necessary to take precautionary steps to reduce or eliminate potential problems that may result.

FINDINGS:

Local Climatic and Geological Conditions – The greater Los Angeles/Long Beach region is a densely populated area having buildings constructed over and near a vast array of fault systems capable of producing major earthquakes, including but not limited to the recent 1994 Northridge Earthquake. Due to local climatic conditions of Southern California, this region is especially susceptible to more active termite activity and wood attacking insects and microorganisms. The proposed modification to prohibit the use of wood for foundation support or retaining earth lateral pressure need to be incorporated into the code to assure that new buildings and additions to existing buildings are designed and constructed in accordance with the scope and objectives of the International Building Code.

Section 1908.1 is amended to read as shown below and Section 1908.1.17 is added to Chapter 19 of the 2007 California Building Code to read as follows:

1908.1 General. The text of ACI 318 shall be modified as indicated in Sections 1908.1.1 through ~~1908.1.16~~ *1908.1.17*.

1908.1.17 ACI 318, Section 14.8. *Modify ACI 318 Section 14.8.3 and 14.8.4 replacing equation (14-7), (14-8) and (14-9).*

1. Modify equation (14-7) of ACI 318 Section 14.8.3 as follows:

I_{cr} shall be calculated by Equation (14-7), and M_a shall be obtained by iteration of deflections.

$$I_{cr} = \frac{E_s}{E_c}\left(A_s + \frac{P_u}{f_y}\frac{h}{2d}\right)(d-c)^2 + \frac{l_w c^3}{3} \qquad (14\text{-}7)$$

and the value E_s/E_c shall not be taken less than 6.

2. Modify ACI 318 Sec, 14.8.4 as follows:

14.8.4 *– Maximum out-of-plane deflection, □$_s$, due to service loads, including P□ effects, shall not exceed $l_c/150$.*

If M_a, maximum moment at mid-height of wall due to service lateral and eccentric loads, including P□ effects, exceed ($^2/_3$) M_{cr}, □$_s$ shall be calculated by Equation (14-8):

$$\Delta_s = \frac{2}{3}\Delta_{cr} + \frac{M_a - \frac{2}{3}M_{cr}}{M_n - \frac{2}{3}M_{cr}}\left(\Delta_n - \frac{2}{3}\Delta_{cr}\right) \qquad (14\text{-}8)$$

If M_a does not exceed ($^2/_3$) M_{cr}, □$_s$ shall be calculated by Equation (14-9):

$$\Delta_s = \left(\frac{M_a}{M_{cr}}\right)\Delta_{cr} \qquad (14\text{-}9)$$

where:

$$\Delta_{cr} = \frac{5 M_{cr} l_c^2}{48 E_c I_g}$$

$$\Delta_n = \frac{5 M_n l_c^2}{48 E_c I_{cr}}$$

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

Section 14.8 was introduced in ACI 318-99 based on requirements of the Uniform Building Code and experimental research and on the basis that design of slender wall must satisfy both strength and serviceability requirements. ACI 318-05 provision was found to grossly under-estimate service load deflection. This update reduces the differences in serviceability provisions. The revision will essentially replace equations (14-8) and (14-9) with two new equations to reflect the UBC procedure for service load out-of-pane deflection. The proposed revision will be included in ACI 318-08.

FINDINGS:

Local Geological Conditions – The greater Los Angeles/Long Beach region is a densely populated area having buildings constructed over and near a vast array of fault systems capable of producing major earthquakes, including but not limited to the recent 1994 Northridge Earthquake. The proposed modification to ensure that the design of slender wall must satisfy both strength and serviceability requirements need to be incorporated into the code to assure that new buildings and additions to existing buildings are designed and constructed in accordance with the scope and objectives of the International Building Code.

Section 1908.1 is amended to read as shown below and Section 1908.1.18 thru 1908.1.21 is added to Chapter 19 of the 2007 California Building Code to read as follows:

1908.1 General. The text of ACI 318 shall be modified as indicated in Sections 1908.1.1 through ~~1908.1.16~~ *1908.1.21*.

1908.1.18 ACI 318, Section 21.4.4.1. *Modify ACI 318 Section 21.4.4.1 as follows:*

Where the calculated point of contraflexure is not within the middle half of the member clear height, provide transverse reinforcement as specified in ACI 318 Sections 21.4.4.1, Items (a) through (c), over the full height of the member.

1908.1.19 ACI 318, Section 21.4.4. *Modify ACI 318 by adding Section 21.4.4.7 as follows:*

21.4.4.7 – At any section where the design strength, ϕP_n, of the column is less than the sum of the shears V_e computed in accordance with ACI 318 Sections 21.3.4.1 and 21.4.5.1 for all the beams framing into the column above the level under consideration, transverse reinforcement as specified in ACI 318 Sections 21.4.4.1 through 21.4.4.3 shall be provided. For beams framing into opposite sides of the column, the moment components may be assumed to be of opposite sign. For the determination of the design strength, ϕP_n, of the column, these moments may be assumed to result from the deformation of the frame in any one principal axis.

1908.1.20 ACI 318, Section 21.7.4. *Modify ACI 318 by adding Section 21.7.4.6 as follows:*

21.7.4.6 – Walls and portions of walls with $P_u > 0.35P_o$ shall not be considered to contribute to the calculated strength of the structure for resisting earthquake-induced forces. Such walls shall conform to the requirements of Section 1631.2, Item 4 ACI 318 Section 21.11.

1908.1.21 ACI 318, Section 21.9.4. *Modify ACI 318 section 21.9.4 by adding the following:*

Collector and boundary elements in topping slabs placed over precast floor and roof elements shall not be less than 3 inches (76 mm) or 6 d_b thick, where d_b is the diameter of the largest reinforcement in the topping slab.

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

This amendment is intended to carry over critical provisions for the design of concrete columns in moment frames from the UBC. Increased confinement is critical to the integrity of such columns and these modifications ensure that is provided for when certain thresholds are exceeded.

In addition, this amendment carries over from the UBC a critical provision for the design of concrete shear walls. It essentially limits the use of very highly gravity-loaded walls in being included in the seismic load resisting system, since their failure could have catastrophic effect on the building.

Furthermore, this amendment was incorporated in the code based on observations from Northridge earthquake. Rebar placed in a very thin concrete topping slab in some instances popped out of the slab due to insufficient concrete coverage. The modification ensures that critical boundary and collector rebars are placed in sufficiently thick slab to prevent buckling of such reinforcement.

FINDINGS:

Local Geological Conditions – The greater Los Angeles/Long Beach region is a densely populated area having buildings constructed over and near a vast array of fault systems capable of producing major earthquakes, including but not limited to the recent 1994 Northridge Earthquake. The proposed modification need to be incorporated into the code to assure that new buildings and additions to existing buildings are designed and constructed in accordance with the scope and objectives of the International Building Code.

Section 1908.1.15 of the 2007 California Building Code is amended to read as follows:

1908.1.15 ACI 318, Section 22.10. Delete ACI 318, Section 22.10, and replace with the following:

22.10 – Plain concrete in structures assigned to Seismic Design Category C, D, E or F.

22.10.1 – Structures assigned to Seismic Design Category C, D, E or F shall not have elements of structural plain concrete, except as follows:

(a) ~~Structural plain concrete basement, foundation or other walls below the base are permitted in detached one- and two-family dwellings three stories or less in height constructed with stud-bearing walls. In dwellings assigned to Seismic Design Category D or E, the height of the wall shall not exceed 8 feet (2438 mm), the thickness shall not be less than 7½ inches (190 mm), and the wall shall retain no more than 4 feet (1219 mm) of unbalanced fill. Walls shall have reinforcement in accordance with 22.6.6.5.~~ *Concrete used for fill with a minimum cement content of two (2) sacks of Portland cement per cubic yard.*

(b) Isolated footings of plain concrete supporting pedestals or columns are permitted, provided the projection of the footing beyond the face of the supported member does not exceed the footing thickness.

~~Exception: In detached one- and two-family dwellings three stories or less in height, the projection of the footing beyond the face of the supported member is permitted to exceed the footing thickness.~~

(c) Plain concrete footings supporting walls are permitted provided the footings have at least two continuous longitudinal reinforcing bars. Bars shall not be smaller than No. 4 and shall have a total area of not less than 0.002 times the gross cross-sectional area of the footing. ~~For footings that exceed 8 inches (203 mm) in thickness, a~~*A* minimum of one bar shall be provided at the top and bottom of the footing. Continuity of reinforcement shall be provided at corners and intersections.

~~Exceptions:~~

~~1.~~ In detached one- and two-family dwellings three stories or less in height and constructed with stud-bearing walls, plain concrete footings ~~without longitudinal reinforcement supporting walls are permitted~~ *with at least two continuous longitudinal reinforcing bars not smaller than No. 4 are permitted to have a total area of less than 0.002 times the gross cross-sectional area of the footing*.

~~2. For foundation systems consisting of a plain concrete footing and a plain concrete stemwall, a minimum of one bar shall be provided at the top of the stemwall and at the bottom of the footing.~~

~~3. Where a slab on ground is cast monolithically with the footing, one No. 5 bar is permitted to be located at either the top of the slab or bottom of the footing.~~

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

This local amendment carries forward the previous 1999 and 2002 LARUCP amendment to require minimum reinforcement in continuous footings, thereby addressing the problem of poor performance of plain or under-reinforced footings during a seismic event. This amendment reflects the recommendations by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Task Force that investigated the poor performance observed in 1994 Northridge Earthquake.

FINDINGS:

Local Geological Conditions – The greater Los Angeles/Long Beach region is a densely populated area having buildings constructed over and near a vast array of fault systems capable of producing major earthquakes, including but not limited to the recent 1994 Northridge Earthquake. The proposed modification that addresses the problem of poor performance of plain or under-reinforced footings during a seismic event need to be incorporated into the code to assure that new buildings and additions to existing buildings are designed and constructed in accordance with the scope and objectives of the International Building Code.

Section 2205.4 is added to Chapter 22 of the 2007 California Building Code to read as follows:

2205.4 Modifications to AISC 341.

2205.4.1 Part I, Structural Steel Building Provisions Modifications.

2205.4.1.1 Part I, Section 13, Special Concentrically Braced Frames (SCBF) Modifications.

2205.4.1.1.1 AISC 341, Part I, 13, Members. *Add a new section as follows:*

AISC 341, 13.2f – Member Types
The use of rectangular HSS are not permitted for bracing members, unless filled solid with cement grout having a minimum compressive strength of 3000 psi (20.7 MPa) at 28 days. The effects of composite action in the filled composite brace shall be considered in the sectional properties of the system where it results in the more severe loading condition or detailing.

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

Recent test results on braces used in steel concentrically braced frames (SCBF) indicate that many commonly used sections and brace configurations do not meet seismic performance expectations. Specific parameters that were shown to affect the ductility of braces included net-section, section type, width-thickness ratio of the cross section and member slenderness. Square and rectangular cross-section HSS were shown to be particularly susceptible to fracture due to local buckling behavior of the cross section and, therefore, are not recommended by SEAOSC Seismology and Steel Committee for special concentric braced frame applications. Grout-filled HSS members exhibit more favorable local buckling characteristics, significantly altering the post-yield behavior of these sections. Both SEAOSC Seismology and Steel Committee recommend the proposed modification. Furthermore, OSPHD and DSA-SS has taken the same position and added Section 2205A.4.1.5.1 to Chapter 22 of the 2007 California Building Code to reflect this recommendation.

References:

1. AISC. 2005. Seismic Provisions for Structural Steel Buildings, American Institute of Steel Construction Inc., Chicago, IL.

2. Fell,B., Kanvinde,A., Deierlein, G., Myers,A., Fu, X. 2006. "Buckling and fracture of concentric braces under inelastic cyclic loading" Structural Steel Education Council, Steel Tips No.94.

3. Liu, Z., and Goel, S. C. 1988. "Cyclic Load Behavior of Concrete-Filled Tubular Braces." Journal of Structural Engineering 114 (7), 1488-1506.

4. Shaback, B., and Brown, T. 2003. "Behavior of square hollow structural steel braces with end connections under reversed cyclic axial loading." Canadian Journal of Civil Engineering 30, 745-753.

5. Tremblay, R., Archambault, M-H., and Filiatrault, A. 2003. "Seismic Response of Concentrically Brace Steel Frames Made with Rectangular Hollow Bracing Members." Journal of Structural Engineering 129 (12), 1626-1636.

6. Uriz, P., and Mahin, S.A. 2004. "Seismic Performance Assessment of Concentrically Braced Steel Frames." Proceedings of the 13th World Conference on Earthquake Engineering.

FINDINGS:

Local Geological Conditions – The greater Los Angeles/Long Beach region is a densely populated area having buildings constructed over and near a vast array of fault systems capable of producing major earthquakes, including but not limited to the recent 1994 Northridge Earthquake. Recent test studies regarding rectangular and square brace frame members need to be incorporated into the code to assure that new buildings and additions to existing buildings are designed and constructed in accordance with the scope and objectives of the International Building Code.

Section 2305.2.5 of the 2007 California Building Code is amended to read as follows:

2305.2.5 Rigid Diaphragms. Design of structures with rigid diaphragms shall conform to the structure configuration requirements of Section 12.3.2 of ASCE 7 and the horizontal shear distribution requirements of Section 12.8.4 of ASCE 7.

Wood structural panel diaphragms shall not be considered as transmitting lateral forces by rotation.

~~Open-front structures with rigid wood diaphragms resulting in torsional force distribution are permitted, provided the length, l, of the diaphragm normal to the open side does not exceed 25 feet (7620 mm), the diaphragm sheathing conforms to Section 2305.2.4 and the l/w ratio [as shown in Figure 2305.2.5(1)] is less than 1 for one-story structures or 0.67 for structures over one story in height.~~

~~Exception: Where calculations show that diaphragm deflections can be tolerated, the length, l, normal to the open end is permitted to be increased to a l/w ratio not greater than 1.5 where sheathed in compliance with Section 2305.2.4 or to 1 where sheathed in compliance with Section 2306.3.4 or 2306.3.5.~~

Rigid wood diaphragms are permitted to cantilever past the outermost supporting shear wall (or other vertical resisting element) a length, *l*, of not more than 25 feet (7620 mm) or two-thirds of the diaphragm width, w, whichever is smaller. Figure 2305.2.5(2) illustrates the dimensions of *l* and w for a cantilevered diaphragm.

~~Structures with rigid wood diaphragms having a torsional irregularity in accordance with Table 12.3-1, Item 1, of ASCE 7 shall meet the following requirements: the l/w ratio shall not exceed 1 for one-story structures or 0.67 for structures over one story in height, where l is the dimension parallel to the load direction for which the irregularity exists.~~

~~Exception: Where calculations demonstrate that the diaphragm deflections can be tolerated, the width is permitted to be increased and the l/w ratio is permitted to be increased to 1.5 where sheathed in compliance with Section 2305.2.4 or 1 where sheathed in compliance with Section 2306.3.4 or 2306.3.5.~~

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

The proposed amendment continues the application of existing LARUCP amendment 23-2 by prohibiting the use of wood diaphragms in rotation based on numerous failures observed in the 1994 Northridge Earthquake.

FINDINGS:

Local Geological Conditions – The greater Los Angeles/Long Beach region is a densely populated area having buildings constructed over and near a vast array of fault systems capable of producing major earthquakes, including but not limited to the recent 1994 Northridge Earthquake. The proposed modification to place limits on the design of buildings based on rotation and will thereby restrict potential soft-story designs and excessive deflections, which was the cause of extensive damages in the Northridge Earthquake, need to be incorporated into the code to assure that new buildings and additions to existing buildings are designed and constructed in accordance with the scope and objectives of the International Building Code.

Section 2305.3.7.1 is added to Chapter 23 of the 2007 California Building Code to read as follows:

***2305.3.7.1* Hold-down connectors.** *Hold-down connectors shall be designed to resist shear wall overturning moments using approved cyclic load values or 75 percent of the allowable earthquake load values that do not consider cyclic loading of the product. Connector bolts into wood framing require steel plate washers on the post on the opposite side of the anchorage device. Plate size shall be a minimum of 0.229 inch by 3 inches by 3 inches (5.82 mm by 76 mm by 76 mm) in size. Hold-downs shall be re-tightened just prior to covering the wall framing.*

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

Many of the hold-down devices currently used still does not have any acceptance report based on dynamic testing protocol. The amendment continues limiting the allowable capacity to 75% of the evaluation report to provide additional factor of safety for statically tested anchorage devices. Since the IBC now specify the minimum size of steel plate washer, this proposed amendment, for purpose of consistency and uniformity of requirement, revised the size of the steel plate washer used in hold-down connectors to match that in IBC Section 2305.3.11 from the previous 1999 and 2002 LARUCP amendments.

FINDINGS:

Local Geological Conditions – The greater Los Angeles/Long Beach region is a densely populated area having buildings constructed over and near a vast array of fault systems capable of producing major earthquakes, including but not limited to the recent 1994 Northridge Earthquake. The proposed modification to establish certain performance requirements for hold-down connectors, which is essential to preventing failure of a shear wall due to excessive deflection, need to be incorporated into the code to assure that new buildings and additions to existing buildings are designed and constructed in accordance with the scope and objectives of the International Building Code.

Section 2305.3.12 is added to Chapter 23 of the 2007 California Building Code to read as follows:

2305.3.12 Quality of Nails. *Mechanically driven nails used in wood structural panel shear walls shall meet the same dimensions as that required for hand-driven nails, including diameter, minimum length and minimum head diameter. No clipped head or box nails permitted in new construction. The allowable design value for clipped head nails in existing construction may be taken at no more than the nail-head-area ratio of that of the same size hand-driven nails.*

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

The amendment continues the application of existing LARUCP amendment LARUCP 23-7. The word "tolerances" is too broad a term. It is to be replaced with "dimensions", including diameter, minimum length and minimum head diameter. The overdriving of nails into the structural wood panel still remains a concern when pneumatic nail guns are used for shear wall nailing. Box nails were observed to cause massive and multiple failures of the typical 3/8-inch thick plywood during the Northridge Earthquake.

The use of clipped head nails continues to be restricted from being used in shear wall panels where the minimum nail head size must be maintained in order to minimize nails from pulling through sheathing materials. Clipped or mechanically driven nails used in shear wall construction were found to perform much less in previous wood shear wall panel testing done at UCI. The existing test results indicated that, under cyclic loading, the shear panels were less energy absorbent and less ductile. The panels reached ultimate load capacity and failed at substantially less lateral deflection than those using same size hand driven nails.

FINDINGS:

Local Geological Conditions – The greater Los Angeles/Long Beach region is a densely populated area having buildings constructed over and near a vast array of fault systems capable of producing major earthquakes, including but not limited to the recent 1994 Northridge Earthquake. The proposed modification to require mechanically driven nails to have the same dimension as hand driven nail resulting in improve quality of construction and performance of shear wall panels need to be incorporated into the code to assure that new buildings and additions to existing buildings are designed and constructed in accordance with the scope and objectives of the International Building Code.

Sections 2306.3.1, 2306.4.1 and Table 2306.4.1 of the 2007 California Building Code are amended to read as follows:

2306.3.1 Wood structural panel diaphragms. Wood structural panel diaphragms are permitted to resist horizontal forces using the allowable shear capacities set forth in Table 2306.3.1 or 2306.3.2. ~~The allowable shear capacities are permitted to be calculated by principles of mechanics without limitations by using values for fastener strength in the AF&PA NDS, structural design properties for wood structural panels based on DOC PS-1 and DOC PS-2 or wood structural panel design properties given in the APA Panel Design Specification (PDS).~~

2306.4.1. Wood structural panel shear walls. The allowable shear capacities for wood structural panel shear walls shall be in accordance with Table 2306.4.1. These capacities are permitted to be increased 40 percent for wind design. ~~Shear walls are permitted to be calculated by principles of mechanics without limitations by using values for nail strength given in the AF&PA NDS and wood structural panel design properties given in the APA Panel Design Specification.~~ *Wood shear walls shall be constructed of wood structural panels and not less than 4 feet by 8 feet (1219 mm by 2438 mm), except at boundaries and at changes in framing. Wood structural panel thickness for shear walls shall not be less than 3/8 inch thick and studs shall not be spaced at more than 16 inches on center.*

The maximum allowable shear value for three-ply plywood resisting seismic forces is 200 pounds per foot (2.92 kn/m). Nails shall be placed not less than 1/2 inch (12.7 mm) in from the panel edges and not less than 3/8 inch (9.5mm) from the edge of the connecting members for shear greater than 350 pounds per foot (5.11kN/m). Nails shall be placed not less than 3/8 inch (9.5 mm) from panel edges and not less than 1/4 inch (6.4 mm) from the edge of the connecting members for shears of 350 pounds per foot (5.11kN/m) or less.

Any wood structural panel sheathing used for diaphragms and shear walls that are part of the seismic-force-resisting system shall be applied directly to framing members.

Exception: *Wood structural panel sheathing in a horizontal diaphragm is permitted to be fastened over solid lumber planking or laminated decking, provided the panel joints and lumber planking or laminated decking joints do not coincide.*

Table 2306.4.1 of the 2007 California Building Code is hereby deleted in its entirely.

Table 2306.4.1 is added to read as follows:

TABLE 2306.4.1
ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL SHEAR WALLS WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE[a] FOR WIND OR SEISMIC LOADING[b, h, i, j, l, m, n]

PANEL GRADE	MINIMUM NOMINAL PANEL THICKNESS (inch)	MINIMUM FASTENER PENETRATION IN FRAMING (inches)	ALLOWABLE SHEAR VALUE FOR SEISMIC FORCES PANELS APPLIED DIRECTLY TO FRAMING					ALLOWABLE SHEAR VALUE FOR WIND FORCES PANELS APPLIED DIRECTLY TO FRAMING				
			NAIL (common) or staple size[k]	Fastener spacing at panel edges (inches)				NAIL (common) or staple size[k]	Fastener spacing at panel edges (inches)			
				6	4	3	2[e]		6	4	3	2[e]
Structural I Sheathing	3/8	1-3/8	8d (2½"x0.131" common)	200	200	200	200	8d (2½"x0.131" common)	230[d]	360[d]	460[d]	610[d]
		1	1-1/2 16 Gage	116	176	200	200	1-1/2 16 Gage	155	235	310	400
	7/16	1-3/8	8d (2½"x0.131" common)	255	395	505	670	8d (2½"x0.131" common)	255[d]	395[d]	505[d]	670[d]
		1	1-1/2 16 Gage	128	195	259	330	1-1/2 16 Gage	170	260	345	440
	15/32	1-3/8	8d (2½"x0.131" common)	280	430	550	730	8d (2½"x0.131" common)	280	430	550	730
		1	1-1/2 16 Gage	139	210	281	356	1-1/2 16 Gage	185	280	375	475
		1-1/2	10d (3"x0.148" common)	340	510	665[f]	870	10d (3"x0.148" common)	340	510	665[f]	870
Sheathing, plywood siding[g] except Group 5 Species	3/8	1-1/4	6d (2"x0.113" common)	200	200	200	200	6d (2"x0.113" common)	200	300	390	510
		1-3/8	8d (2½"x0.131" common)	200	200	200	200	8d (2½"x0.131" common)	220[d]	320[d]	410[d]	530[d]
		1	1-1/2 16 Gage	105	158	200	200	1-1/2 16 Gage	140	210	280	360
	7/16	1-3/8	8d (2½"x0.131" common)	240	350	450	585	8d (2½"x0.131" common)	240[d]	350[d]	450[d]	585[d]
		1	1-1/2 16 Gage	116	173	233	296	1-1/2 16 Gage	155	230	310	395
	15/32	1-3/8	8d (2½"x0.131" common)	260	380	490	640	8d (2½"x0.131" common)	260	380	490	640
		1-1/2	10d (3"x0.148" common)	310	460	600[f]	770	10d (3"x0.148" common)	310	460	600[f]	770
		1	1-1/2 16 Gage	128	191	251	323	1-1/2 16 Gage	170	255	335	430
	19/32	1-1/2	10d (3"x0.148" common)	340	510	665[f]	870	10d (3"x0.148" common)	340	510	665[f]	870
		1	1-3/4 16 Gage	139	210	281	356	1-3/4 16 Gage	185	280	375	475
			Nail Size (galvanized casing)					Nail Size (galvanized casing)				
	3/8	1-3/8	8d (2½"x0.113")	160	200	200	200	8d (2½"x0.113")	160	240	310	410

Notes to Table 2306.4.1
For SI: 1 inch = 25.4 mm, *1 foot = 25.4 mm,* 1 pound per foot = 14.5939 N/m.

a. For framing of other species: (1) Find specific gravity for species of lumber in AF&PA NDS. (2) For staples find shear value from table above for Structural I panels (regardless of actual grade) and multiply value by 0.82 for species with specific gravity of 0.42 or greater, or 0.65 for all other species. (3) For nails find shear value from table above for nail size for actual grade and multiply value by the following adjustment factor: Specific Gravity Adjustment Factor = [1-(0.5-SG)], where SG = Specific Gravity of the framing lumber. This adjustment factor shall not be greater than 1.
b. Panel edges backed with 2-inch nominal or ~~wider~~ *thicker* framing. Install panels either horizontally or vertically. Space fasteners maximum 6 inches on center along intermediate framing members for 3/8-inch and 7/16-inch panels installed on studs spaced 24 inches on center. For other conditions and panel thickness, space fasteners maximum 12 inches on center on intermediate supports.
c. 3/8-inch panel thickness or siding with a span rating of 16 inches on center is the minimum recommended where applied direct to framing as exterior siding.
d. Allowable shear values are permitted to be increased to values shown for 15/32-inch sheathing with same nailing provided (a) studs are spaced a maximum of 16 inches on center, or (b) panels are applied with long dimension across studs.
e. Framing at adjoining panel edges shall be 3 inches nominal or ~~wider~~ *thicker*, and nails shall be staggered where nails are spaced 2 inches on center.
f. Framing at adjoining panel edges shall be 3 inches nominal or ~~wider~~ *thicker*, and nails shall be staggered where both of the following conditions are met: (1) 10d (3"x0.148") nails having penetration into framing of more than 1-1/2 inches and (2) nails are spaced 3 inches on center.
g. Values apply to all-veneer plywood. Thickness at point of fastening on panel edges governs shear values.
h. Where panels applied on both faces of a wall and nail spacing is less than 6 inches o.c. on either side, panel joints shall be offset to fall on different framing members, or framing shall be 3-inch nominal or thicker at adjoining panel edges and nails on each side shall be staggered.
i. In Seismic Design Category D, E or F, where shear design values exceed 350 pounds per linear foot, all framing members receiving edge nailing from abutting panels shall not be less than a single 3-inch nominal member, or two 2-inch nominal members fastened together in accordance with Section 2306.1 to transfer the design shear value between framing members. Wood structural panel joint and sill plate nailing shall be staggered in all cases. See Section 2305.3.11 for sill plate size and anchorage requirements.
j. Galvanized nails shall be hot dipped or tumbled.
k. Staples shall have a minimum crown width of 7/16 inch and shall be installed with their crowns parallel to the long dimension of the framing members.
l. For shear loads of normal or permanent load duration as defined by the AF&PA NDS, the values in the table above shall be multiplied by 0.63 or 0.56, respectively.
m. *[DSA-SS & OSHPD 1, 2 and 4] Refer to Section 2305.2.4.2, which requires any wood structural panel sheathing used for diaphragms and shear walls that are part of the seismic-force-resisting system to be applied directly to framing members.*
n. The maximum allowable shear value for three-ply plywood resisting seismic forces is 200 pounds per foot (2.92 kn/m).

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

This local amendment puts additional restrictions on the design of wood structural panel diaphragms and shear walls. The amendment continues the application of the previous 1999 and 2002 LARUCP 23-3 amendment by allowing shear value capacities based on testing only and not calculations alone. By deleting the words that allow calculation of shear wall values, it will no longer be possible to circumvent the reductions in allowable shear capacities established in the Table.

This local amendment carries forward the previous LARUCP amendment to limit the maximum shear capacity for 3-ply plywood along with requiring greater edge distance for nails in shear walls resisting

high loads, thereby addressing the problem of nails pulling out of the edges of the plywood under seismic loading. This amendment reflects the recommendations by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Task Force that investigated the poor performance observed in 1994 Northridge Earthquake.

Furthermore, the cities and county of the Los Angeles region has taken extra measures to maintain the structural integrity of the framing of the shear walls when designed for high levels of seismic loads by requiring wood sheathing be applied directly over framing members, thereby prohibiting the use of the second portion of Table 2306.4.1, which provides allowable values for panels placed over gypsum sheathing. This amendment is intended to prevent the undesirable performance of nails when gypsum board softens due to cyclic earthquake displacements and the nail ultimately does not have any engagement in a solid material within the thickness of the gypsum board.

The allowable shear values for wood structural panel shear walls with stapled nails are based on monotonic testing. Earthquakes load shear walls in a repeating fully reversible manner. The Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Task Force previously investigated, documented damages, and reviewed existing test reports. The proposed amendment to reduce the allowable shear capacity of shear wall with stapled nail by 25% is consistent with the Task Force previous recommendations made after the 1994 Northridge Earthquake. At that time, the report to the Governor from the Seismic Safety Commission of the State of California recommended that code requirements be "more thoroughly substantiated with testing."

FINDINGS:

Local Geological Conditions – The greater Los Angeles/Long Beach region is a densely populated area having buildings constructed over and near a vast array of fault systems capable of producing major earthquakes, including but not limited to the recent 1994 Northridge Earthquake. The proposed modification to place certain design and construction limits on structural wood panel shear walls thus resulting in improved quality of construction and performance of structures need to be incorporated into the code to assure that new buildings and additions to existing buildings are designed and constructed in accordance with the scope and objectives of the International Building Code.

Section 2306.4.5 of the 2007 California Building Code is amended to read as follows:

2306.4.5 Shear walls sheathed with other materials. Shear wall capacities for walls sheathed with lath, plaster or gypsum board shall be in accordance with Table 2306.4.5. Shear walls sheathed with lath, plaster or gypsum board shall be constructed in accordance with Chapter 25 and Section 2306.4.5.1. Walls resisting seismic loads shall be subject to the limitations in Section 12.2.1 of ASCE 7. *The allowable shear values shown in Table 2306.4.5 for material in Category 1 is limited to 90 pound per foot (1.31 kN/m); materials in Category 2 thru 4 are limited to 30 pound per foot (438 N/m). Shear walls sheathed with lath, plaster or gypsum board shall not be used below the top level in a multi-level building.*

Table 2306.4.5 of the 2007 California Building Code is hereby deleted in its entirely.

Table 2306.4.5 is added to read as follows:

TABLE 2306.4.5
ALLOWABLE SHEAR FOR WIND OR SEISMIC FORCES FOR SHEAR WALLS OF LATH AND PLASTER OR GYPSUM BOARD WOOD FRAMED WALL ASSEMBLIES

TYPE OF MATERIAL	THICKNESS OF MATERIAL	WALL CONSTRUCTION	FASTENER SPACING[b] MAXIMUM (inches)	SHEAR VALUE[a,e] (plf)		MINIMUM FASTENER SIZE[c,d,j,k,l]
				Seismic[j]	Wind	
1. Expanded metal, or woven wire lath and portland cement plaster	7/8"	Unblocked	6	90	180	No. 11 gage, 1-1/2" long, 7/16" head 16 Ga. Galv. Staple, 7/8" legs
2. Gypsum lath, plain or perforated	3/8" lath and 1/2" plaster	Unblocked	5	30	100	No. 13 gage, 1-1/8" long, 19/64" head, plasterboard nail 16 Ga. Galv. Staple, 1-1/8" long 0.120" Nail, min. 3/8" head, 1-1/4" long
3. Gypsum sheathing	1/2" x 2' x 8'	Unblocked	4	30	75	No. 11 gage, 1-3/4" long, 7/16" head, diamond-point, galvanized 16 Ga. Galv. Staple, 1-3/4" long
	1/2" x 4'	Blocked[f]	4	30	175	
		Unblocked	7	30	100	
	5/8" x 4'	Blocked	4" edge/ 7" field	30	200	6d galvanized 0.120" Nail, min. 3/8" head, 1-3/4" long
4. Gypsum board, gypsum veneer base or water-resistant gypsum backing board	1/2"	Unblocked[f]	7	30	75	5d cooler (1-5/8" lx 0.086") or wallboard 0.120" Nail, min. 3/8" head, 1-1/2" long 16 Gage Staple, 1-1/2" long
		Unblocked[f]	4	30	110	
		Unblocked	7	30	100	
		Unblocked	4	30	125	
		Blocked[g]	7	30	125	
		Blocked[g]	4	30	150	

		Unblocked	8/12[h]	30	60	No. 6- 1-1/4" screws[i]
		Blocked[g]	4/16[h]	30	160	
		Blocked[g]	4/12[h]	30	155	
		Blocked[f, g]	8/12[h]	30	70	
		Blocked[g]	6/12[h]	30	90	
	5/8"	Unblocked[f]	7	30	115	6d cooler (1-7/8" x 0.092") or wallboard 0.120" Nail, min. 3/8" head, 1-3/4" long 16 Gage Staple, 1-1/2" legs, 1-5/8" long
			4	30	145	
		Blocked[g]	7	30	145	
			4	30	175	
		Blocked[g] Two ply	Base ply: 9 Face ply: 7	30	250	Base ply-6d cooler (1-7/8" x 0.092") or wallboard 1-3/4" x 0.120" Nail, min. 3/8" head 1-5/8" 16 Ga. Galv. Staple Face ply-8d cooler (2-3/8" x 0.113") or wallboard 0.120" Nail, min. 3/8" head, 2-3/8" long 15 Ga. Galv. Staple, 2-1/4" long
		Unblocked	8/12[h]	30	70	No. 6- 1-1/4" screws[i]
		Blocked[g]	8/12[h]	30	90	

Notes to Table 2306.4.5

For SI: 1 inch = 25.4 mm, 1 foot = 25.4 mm, 1 pound per foot = 14.5939 N/m.

a. These shear walls shall not be used to resist loads imposed by masonry or concrete construction (see Section 2305.1.5). Values shown are for short-term loading due to wind or seismic loading. Walls resisting seismic loads shall be subject to the limitations in Section 12.2.1 of ASCE 7. Values shown shall be reduced 25 percent for normal loading.
b. Applies to fastening at studs, top and bottom plates and blocking.
c. Alternate fasteners are permitted to be used if their dimensions are not less than the specified dimensions. Drywall screws are permitted to substitute for the 5d (1-5/8" x 0.086"), and 6d (1-7/8" x 0.092")(cooler) nails listed above, and No. 6 1-1/4 inch Type S or W screws for 6d (1-7/8" x 0.092")(cooler) nails.
d. For properties of cooler nails, see ASTM C 514.
e. Except as noted, shear values are based on maximum framing spacing of 16 inches on center.
f. Maximum framing spacing of 24 inches on center.
g. All edges are blocked, and edge fastening is provided at all supports and all panel edges.
h. First number denotes fastener spacing at the edges; second number denotes fastener spacing at intermediate framing members.
i. Screws are Type W or S.
j. Staples shall have a minimum crown width of 7/16 inch, measure outside the legs, and shall be installed with their crowns parallel to the long dimension of the framing members.
k. Staples for the attachment of gypsum loath and woven-wire lath shall have a minimum crown width of ¾ inch, measured outside the legs.
l. This construction shall not be used below the top level of wood construction in a multi-level building.

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

This amendment is consistent with the previous 1999 and 2002 LARUCP 25-2 amendment adopted by the cities and county of the Los Angeles region that reduced allowable shear values. Due to the high geologic activities in the Southern California area and the expected higher level of performance on buildings and structures, this local amendment continues to reduce the allowable shear values for shear walls sheathed with lath, plaster or gypsum board. The poor performance of such shear walls sheathed with other materials in the 1994 Northridge Earthquake was investigated by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Task Force. The cities and county of the Los Angeles region has taken extra measures to maintain the structural integrity of the framing of the shear walls when designed for high levels of seismic loads.

FINDINGS:

Local Geological Conditions – The greater Los Angeles/Long Beach region is a densely populated area having buildings constructed over and near a vast array of fault systems capable of producing major earthquakes, including but not limited to the recent 1994 Northridge Earthquake. The proposed modification need to be incorporated into the code to assure that new buildings and additions to existing buildings are designed and constructed in accordance with the scope and objectives of the International Building Code.

Section 2308 of the 2007 California Building Code is amended to read as follows:

2308.3.4 Braced wall line support. Braced wall lines shall be supported by continuous foundations.

~~***Exception:*** *For structures with a maximum plan dimension not over 50 feet (15240 mm), continuous foundations are required at exterior walls only.*~~

2308.12.1 Number of stories. Structures of conventional light-frame construction shall not exceed one story in height in Seismic Design Category D or E.

~~***Exception:*** *[HCD 1] Detached one- and two-family dwellings are permitted to be two stories high in Seismic Design Category D or E.*~~

2308.12.2 Concrete or masonry. Concrete or masonry walls or masonry veneer shall not extend above the basement.

Exception: Masonry veneer is permitted to be used in the first story above grade plane in Seismic Design Category D, provided the following criteria are met:

1. Type of brace in accordance with Section 2308.9.3 shall be Method 3 and the allowable shear capacity in accordance with Table 2306.4.1 shall be a minimum of 350 plf (5108 N/m).

2. The bracing of the first story shall be located at each end and at least every 25 feet (7620 mm) o.c. but not less than 45 percent of the braced wall line.

3. Hold-down connectors shall be provided at the ends of braced walls for the first floor to foundation with an allowable design of 2,100 pounds (9341 N).

4. Cripple walls shall not be permitted.

5. *Anchored masonry and stone wall veneer shall not exceed 5 inches (127 mm) in thickness, shall conform to the requirements of Division 14 and shall not extend more than 5 feet (1524 mm) above the first story finished floor.*

2308.12.4 Braced wall line sheathing. Braced wall lines shall be braced by one of the types of sheathing prescribed by Table 2308.12.4 as shown in Figure 2308.9.3. The sum of lengths of braced wall panels at each braced wall line shall conform to Table 2308.12.4. Braced wall panels shall be distributed along the length of the braced wall line and start at not more than 8 feet (2438 mm) from each end of the braced wall line. Panel sheathing joints shall occur over studs or blocking. Sheathing shall be fastened to studs, top and bottom plates and at panel edges occurring over blocking. Wall framing to which sheathing used for bracing is applied shall be nominal 2 inch wide [actual $1^1/_2$ inch (38 mm)] or larger members, *spaced a maximum of 16 inches on center. Nailing shall be minimum 8d common placed 3/8 inches from panel edges and spaced not more than 6 inches on center, and 12 inches on center along intermediate framing members.*

~~Cripple walls having a stud height exceeding 14 inches (356 mm) shall be considered a story for the purpose of this section and shall be braced as required for braced wall lines in accordance with Table 2309.12.4. Where interior braced wall lines occur without a continuous foundation below, the length of parallel exterior cripple wall bracing shall be one and one-half times the lengths required by Table 2308.12.4. Where the cripple wall sheathing type used is Type S-W and this additional length of bracing cannot be provided, the capacity of Type S-W sheathing shall be increased by reducing the spacing of fasteners along the perimeter of each piece of sheathing to 4 inches (102 mm) o.c.~~

Braced wall panel construction types shall not be mixed within a braced wall line.

Braced wall panels required by Section 2308.12.4 may be eliminated when all of the following requirements are met:

1. *One story detached Group U occupancies not more than 25 feet in depth or length.*

2. *The roof and three enclosing walls are solid sheathed with ½-inch nominal thickness wood structural panels with 8d common nails placed 3/8 inches from panel edges and spaced not more than 6 inches on center along all panel edges and 12 inches on center along intermediate framing members. Wall openings for doors or windows are permitted provided a minimum 4 foot wide wood structural braced panel with minimum height to length ratio of 2 to 1 is provided at each end of the wall line and that the wall line be sheathed for 50% of its length.*

2308.12.5 Attachment of sheathing. Fastening of braced wall panel sheathing shall not be less than that prescribed in Table 2308.12.4 or Table 2304.9.1. Wall sheathing shall not be attached to framing members by adhesives.

All braced wall panels shall extend to the roof sheathing and shall be attached to parallel roof rafters or blocking above with framing clips (18 gauge minimum) spaced at maximum 24 inches (6096 mm) on center with four 8d nails per leg (total eight 8d nails per clip). Braced wall panels shall be laterally braced at each top corner and at maximum 24 inch (6096 mm) intervals along the top plate of discontinuous vertical framing.

TABLE 2308.12.4
WALL BRACING IN SEISMIC DESIGN CATEGORIES D AND E
(Minimum Length of Wall Bracing per each 25 Linear Feet of Braced Wall Line [a])

CONDITION	SHEATHING TYPE[b]	S_{DS} < 0.50	0.50 ≤ S_{DS} < 0.75	0.75 ≤ S_{DS} ≤ 1.00	S_{DS} > 1.00
One Story	G-P[c]	10 feet 8 inches	14 feet 8 inches	18 feet 8 inches	25 feet 0 inches
	S-W	5 feet 4 inches	8 feet 0 inches	9 feet 4 inches	12 feet 0 inches
~~Story Below top story [HCD 1]~~	~~G-P[c,d]~~	~~18 feet 8 inches[d]~~	~~NP~~	~~NP~~	~~Np~~
	~~S-W[d]~~	~~10 feet 8 inches[d]~~	~~13 feet 4 inches[d]~~	~~17 feet 4 inches[d]~~	~~21 feet 4 inches[d]~~
~~Bottom story of three stories [HCD 1]~~	~~G-P~~	~~Conventional construction not permited; conformance with Section 2301.2, Item 1 or 2 is required.~~			
	~~S-W~~				

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. Minimum length of panel bracing of one face of the wall for S-W sheathing *shall be at least 4'-0" long* or both faces of the wall for G-P sheathing *shall be at least 8'-0" long;* h/w ratio shall not exceed 2:1. For S-W panel bracing of the same material on two faces of the wall, the minimum length is permitted to be one-half the tabulated value but the h/w ratio shall not exceed 2:1 and design for uplift is required.

b. G-P = gypsum board, ~~fiberboard, particleboard, lath and~~ *portland cement* plaster or gypsum sheathing boards; S-W = wood structural panels ~~and diagonal wood sheathing~~. ~~*NP=not permitted*~~.

c. Nailing as specified below shall occur at all panel edges at studs, at top and bottom plates and, where occurring, at blocking:
For 1/2-inch gypsum board, 5d (0.113 inch diameter) cooler nails at 7 inches on center;
For 5/8-inch gypsum board, No 11 gage (0.120 inch diameter) cooler nails at 7 inches on center;
For gypsum sheathing board, 1-3/4 inches long by 7/16-inch head, diamond point galvanized nails at 4 inches on center;

For gypsum lath, No. 13 gage (0.092 inch) by 1-1/8 inches long, 19/64-inch head, plasterboard at 5 inches on center;
For Portland cement plaster, No. 11 gage (0.120 inch) by $1^1/_2$ inches long, $^7/_{16}$- inch head at 6 inches on center;
~~For fiberboard and particleboard, No. 11 gage (0.120 inch) by $1^1/_2$ inches long, $^7/_{16}$- inch head, galvanized nails at 3 inches on center.~~

~~*d. [HCD 1] Applies to detached one- and two-family dwellings only.*~~

~~e.~~*d. S-W sheathing shall be 15/32" thick nailed with 8d nails, at 6:6:12.*

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

The propose amendment continues the previous 1999 and 2002 LARUCP amendment to limit the use of conventional wood frame construction to simple one story residential buildings, limit the use of conventional framing braced wall panels to 25 feet maximum spacing, require that interior braced walls be supported by continuous foundations and limits the use of stone and masonry anchored veneer when using conventional framing design.

Larger or more complex buildings must be designed by a registered design professional. Near source earthquake conditions subject most local buildings and structures to loads in excess of base code lateral forces. Large number of multilevel wood frame buildings, especially those with split level, cantilevered floors and complex shaped wind attachments, suffered extensive damages in the Northridge Earthquake.

Additional weight attributed to the use of heavy veneer substantially increases loads to conventionally braced walls in an earthquake. Moreover, normal to wall loads that occur in an earthquake can seriously overstress wood bearing walls in combined seismic/gravity load combinations. Numerous conventionally framed veneer covered structures sustained serious damages in the Northridge Earthquake as a result of the heavy weight of the veneer.

Interior walls can easily be called upon to resist over half of the seismic loading imposed on simple structure. Without a continuous foundation, earthquake loads would be transferred through a non-structural concrete slab floor or by a wood floor. Raised wood floor diaphragms and bolting of the perimeter walls can become inadequate to resist the imposed horizontal shear.

FINDINGS:

Local Geological Conditions – The greater Los Angeles/Long Beach region is a densely populated area having buildings constructed over and near a vast array of fault systems capable of producing major earthquakes, including but not limited to the recent 1994 Northridge Earthquake. Conventional framing does not address the need for a continuous load path, critical shear transfer mechanisms, connection ties, irregular and flexible portions of complex shaped structures. Unless designed by a registered design professional, such buildings built by conventional framing requirements will be prone to serious damage in future large earthquakes. The proposed modification need to be incorporated into the code to assure that new buildings and additions to existing buildings are designed and constructed in accordance with the scope and objectives of the International Building Code.

Chapter 36 is hereby added to the California Building Code as follows:

CHAPTER 36 HILLSIDE BUILDING DISTRICT

Sec. 3601 Hillside Building District established.

There is hereby established a Hillside Building District in the area designated in the "Hillside Building District Map" as set forth in this Code. The specific regulations in this Chapter shall apply to the Hillside Building District.

Sec. 3602 Geological and foundation investigations required.

3602.1 Investigations required. Prior to issuing a building permit for any new building, structure, or addition to an existing building or structure on a site in the Hillside Building District where slopes exceed three (3) horizontal to one vertical or where unstable geological or soil conditions are known or suspected to exist, a geological and foundation investigation shall be conducted, and a report shall be submitted to the City Building Official by a geologist and a civil engineer registered in the State; provided, however, the City Building Official may issue a building permit for an addition to an existing building or structure without a geological and foundation inspection if such addition is located so as not to be affected by slopes exceeding three (3) horizontal to one vertical.

3602.2 Prerequisites to permit issuance. Where a geological and foundation investigation required by this Section indicates the presence of a geological hazard, and evidence indicates mitigating measures can offset or eliminate the hazard, the City Building Official shall issue a building permit provided all recommended mitigating measures are designed and incorporated into the proposed project and all other requirements of this Code and the Municipal Code are met.

3602.3 Denial of permits. Where a geological and foundation investigation indicates the presence of a geological hazard, and evidence indicates no mitigating measures can offset or eliminate the hazard, the City Building Official shall deny the issuance of a building permit for the proposed project.

Sec. 3603 Foundation embedment. Where foundations are placed on natural slopes or uncompacted fill, the foundation shall extend through the natural overburdened or uncompacted fill and rest in undisturbed, unweathered, firm natural base materials. Foundations shall be designed to resist any vertical or lateral movement or overburden or fill.

Sec. 3604 Yard Drainage. Surface runoff flowing or collecting on building pads and yards shall be directed to catch basins and non-erosive devices to reduce the hazard of erosion, subsidence, or

slippage of the surrounding property. Such devices shall conduct any surface runoff to a street or alley and shall be designed to accommodate a three (3") inch per hour rainfall.

Sec. 3605 Gutters. Eave gutters and downspouts on structures located in the Hillside Building District shall be provided to collect all roof water and deposit it in non-erosive devices to a street or alley. Gutters, downspouts, and non-erosive devices shall be sized to accommodate a three (3") inch per hour rainfall.

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

No change from previous code. This amendment requires hillside projects to investigate geological and drainage conditions prior to permit issuance.

FINDINGS:

Beverly Hills is located in a seismically active area and is in close proximity to earthquake fault zones, and it is reasonably foreseeable that an earthquake would render the City particularly vulnerable to devastation. In addition, the city's topographic conditions make it vulnerable to mud slides.

Chapter 37 is hereby added to the California Building Code as follows:

CHAPTER 37 ADDITIONAL REQUIREMENTS IN CERTAIN AREAS

Sec. 3701 Construction requirements in commercial and industrial zones.

3701.1 Except as provided in Section 3702.2, all buildings and structures hereafter erected, constructed, or moved within any commercial or industrial zone shall be of Type I, II-A, or III A, and shall comply with other provisions of this Code.

3701.2 Occupancies with a floor area of fifteen hundred (1500) square feet or less, and open parking garages shall comply with either Section 3701.1 or shall be of type II-B construction.

Sec. 3702 Walls and fences in commercial and industrial zones. Any wall or fence built, constructed, or erected within a commercial or industrial zone shall be of noncombustible material.

EXCEPTIONS:

(1) Protective walls or fences erected for the duration of a construction, demolition or alteration operation may be constructed of combustible material.

(2) A temporary wall or fence erected to close the front or rear portion of a business building pending occupancy may be constructed of combustible material provided such opening is filled entirely. Such enclosure shall be permitted to be used for a period not exceeding one year.

Sec. 3703 Special regulations in Very High Fire Hazard Severity Zone. The following special regulations shall be applicable to all building and structures used for human occupancy in the Very High Fire Hazard Severity Zone as defined in the City's Fire Code.

3703.1 Exterior walls and eaves shall be of one-hour fire-resistive construction.

3703.2 Buildings or structures constructed over slopes shall have all under-floor and deck areas enclosed, and such enclosures shall be of one-hour fire resistive construction.

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

No change from previous code. These amendments require all commercial buildings to be constructed with fire resistive construction and homes in hillsides to have additional fire protection to minimize the spread of fire.

FINDINGS:

Beverly Hills is located in an area climatically classified as "semi-arid" and prone to winds of high velocity. Moreover, due to the arid nature of the area, the weather during the windy period tends to be very warm and dry. The dry weather conditions, combined with the relatively hilly topography of the City is very hazardous to the surrounding highly populated areas in as far as flame spread is concerned.

Because of the above-described climatic and topographic conditions, the City and the surrounding cities have historically suffered from occasional structural fires. These have often been difficult to control due to the dry winds carrying sparks and cinders to surrounding structures.

Appendix G114 is hereby added to the California Building Code as follows:

G114.1 Purpose: The provisions of this division are intended to promote public safety and welfare by reducing the risk of flood damages in areas prone to flooding.

G114.2 Scope: Buildings and structures erected in areas prone to flooding shall be constructed as required by the provisions of this division. The base flood elevation shown on the approved flood hazard map is the minimum elevation used to define areas prone to flooding, unless records indicate a higher elevation is to be used. The flood-prone areas are defined in the jurisdiction's floodplain management ordinance.

G114.3 Definitions: For the purpose of this division, certain terms are defined as follows:

BASE FLOOD ELEVATION is the depth or peak elevation of flooding, including wave height, having 1 percent chance of being equaled or exceeded in any given year. BASE FLOOD ELEVATION is the elevation 22.5 inches above adjacent grade in area 1 and 16 inches above adjacent grade in area 2 as determined by the 100 year storm map on file in the Department of Building and Safety.

FLOOD HAZARD MAP is a map published by an approved agency that defines the flood boundaries, elevations and insurance risk zones as determined by a detailed flood insurance study.

HAZARD ZONES are areas that have been determined to be prone to flooding and are classified as either flood hazard zones, A zones, or coastal high-hazard zones, V zones, in accordance with Section 3107.1 and 3108.1. HAZARD ZONES are areas which have been determined by the City to be prone to flooding and are classified as flood hazard zones.

SECTION G114.4 –PROTECTION OF MECHANICAL AND ELECTRICAL SYSTEMS

New or replacement electrical equipment and heating, ventilating, air conditioning and other service facilities shall be either placed above the base flood elevation or protected to prevent water from entering or accumulating within the system components during floods up to the base flood elevation. Installation of electrical wiring and outlets, switches, junction boxes and panels below the base flood elevation shall conform to the provisions of the Electrical Code for such items in wet locations.

SECTION G114.5 – FLOOD HAZARD ZONES – A ZONES

G114.5.1 General: Areas that have been determined as prone to flooding by not subject to wave heights of more than 3 feet (914 mm) are designated as flood hazard zones. Building or structures erected within a flood hazard zone shall have the lowest floor, including basement floors, located at or above the base flood elevation.

EXCEPTIONS: 1. Except for Group R Occupancies, any occupancy may have floors below the base flood elevation in accordance with this Section.

2. Except for Group R occupancies, floors of buildings or structures which are used only for building access, exits, foyers, storage and parking garages may be below the base flood elevation.

G114.5.2 Enclosures below Base Flood Elevation. Enclosed spaces below the base flood elevation shall not be used with the exception of building access, means of egress, foyers, storage and parking garages. Enclosed spaces shall be provided with vents, valves or other openings that will automatically equalize the lateral pressure of waters acting on the exterior wall surfaces. The bottom of the openings shall not be higher than 12 inches (305 mm) above finish grade. A minimum of two

openings per building or one opening for each enclosure below the base flood elevation, whichever is greater, shall be provided. The total net area of such openings shall not be less than 4 square feet (0.37 m2) or 1 square inch for every square foot (0.007 m2 for every 1 m2) of enclosed area, whichever is greater.

G114.5.3 Flood-resistant Construction. Buildings or structures of any occupancy other than Group R may, in lieu of meeting the elevation provisions, be erected with floors usable for human occupancy below the base flood elevation, provided the following conditions are met:

1. Space below the base flood elevation shall be constructed with exterior walls and floors that are impermeable to the passage of water.
2. Structural components subject to hydrostatic and hydrodynamic loads during the occurrence of flooding to the base flood elevation shall be capable of resisting such forces, including the effect of buoyancy.
3. Openings below the base flood elevation shall be provided with watertight closures and shall have adequate structural capacity to support flood loads acting upon closure surfaces.
4. Floor and wall penetrations for plumbing, mechanical and electrical systems shall be made watertight to prevent flood water seepage through spaces between penetration and wall construction materials. Sanitary sewer and storm drainage systems that have openings below the base flood elevation shall be provided with closure devices to prevent backwater flow during conditions of flooding.

G114.5.4 Plan Requirements for Flood-resistant Construction. When buildings or structures are to be constructed in accordance with this Section, an architect or engineer licensed by the state to practice as such shall prepare plans showing details of the floor wall and foundation support components. Calculations and approved technical data used to comply with the conditions of this Section shall also be provided.

SECTION G114.5.5 – ELEVATION CERTIFICATION

A land surveyor, architect or engineer licensed by the state to practice as such shall certify that the actual elevation in relations to mean sea level of the lowest floor, if in a flood hazard zone, or the bottom of the lowest horizontal structural member if in a coastal high-hazard zone, are at or above the minimum elevation when required by the provisions of this Section.

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

No change from previous code. These amendments require all new buildings constructed in the city's flood hazard areas to be built with flood resistant construction.

FINDINGS:

Due to seasonal climatic heavy rains and run off from the hills (topographical), portions of the city are prone to flooding.

Appendix J104.3 is hereby amended by adding a sentence at the end of section J104.3 as follows:

Section J104.3 *** In addition, the soils report shall specify whether methane hazard exists on site. If methane hazard exists, a licensed Architect, registered Engineer or Geologist shall submit a report to the satisfaction of the City Building Official which includes, but is not limited to, the results of the testing procedure and the proposed mitigation measures.

Section J104.5 is hereby added to the California Building Code as follows:

J104.5 Slope failure reports. In addition to any other requirements set forth in this chapter, for Class I slope failures, the permit applicant shall submit to the building official a combined soils engineering and engineering geology report to address its cause and provide recommended repair methods. For Class II slope failures, the permit applicant shall submit to the building official an engineering geology report to address its cause and provide recommended repair methods. For Class III slope failure, unless there exist other conditions which, in the opinion of the building official, require the submission of soils engineering or engineering geology reports, the permit applicant shall not be required to submit such reports.

Appendix J112 is hereby added to the California Building Code as follows:

Sec. J112 Hazardous Conditions.

J112.1 Notices. Whenever the City Building Official determines by inspection that any existing excavation or fill or other condition of the soil from any cause has become a menace to life or limb, or endangers property, or affects the safety, usability, or stability of a public way, the owner of the property upon which such excavation, fill, or other condition of
the soil is located, or other person or agent in control of such property, upon receipt of a notice in writing from the City Building Official so to do, within ninety (90) days after the date of such written notice, shall repair and reconstruct such excavation, fill, or other condition of the soil so that it conforms to the requirements of this Chapter, or otherwise repair, strengthen, or eliminate such excavation, fill, or other condition of the soil in a manner satisfactory to the City Building Official to eliminate the danger. The City Building Official may designate a shorter period of time for elimination of the condition if an imminent and immediate hazard is found to exist.

J112.2 Reports. In the event the owner or other person or agent in control of such property fails to comply with the notice to repair or reconstruct such excavation, fill, or other condition of the soil, the City Building Official may submit a written report to Council requesting authorization to proceed in performing the work specified in such written notice,
and assess the costs of such work as a special assessment against the property.

J112.3 Hearings. Upon the receipt of such a report, the Council may fix a time, date, and place for a hearing on such report and any protests or objections thereto. At least ten (10) days prior to the hearing a notice of the hearing shall be served by certified mail, postage prepaid, addressed to the owner of the property at his last known address, and to each holder of any security interest in the real property.

J112.4 Authorizing work. On conclusion of the hearing, the Council may by resolution confirm the report of the City Building Official and order the repair or reconstruction of such excavation, fill, or other condition of the soil by the City.

J112.5 Levy and assessment. Upon the completion of the repair or reconstruction of such excavation, fill, or other condition of the soil by the City, the City Building Official will transmit a final statement of the total direct and indirect costs of such work to the Council, which will by resolution fix the time, date, and place for hearing such statement in accordance with the provisions of this code. Upon the date fixed for the hearing, the Council will hear the report of the City Building Official, together with any objections or protests thereto, and may then by resolution order the costs of the work to be paid and levied as a special assessment against the property. The City Clerk will then transmit a copy of the resolution to the County Auditor-Collector directing that the amount designated to be collected concurrently with the next installment of real property taxes on the property involved.

Appendix Section J113 is hereby added to the California Building Code as follows:
Sec. J113 Bonds.

J113.1 Bonds required. The City Building Official may require the posting of a bond prior to issuance of a permit where the nature of the work, if commenced and allowed to remain in an uncompleted state, would create a hazard to human life or endanger adjoining or other property, any street or street improvement, or any other public property. The bond shall be in an amount sufficient to cover the cost of eliminating any dangerous condition or geological hazard if the project is not properly performed or is not completed in a timely manner. The bond shall comply with the provisions of Title 3, Chapter 4 of the Beverly Hills Municipal Code.

J113.2 Right of entry. In the event of any default in any performance of any term or condition of the permit for the work, the surety, or any person employed or engaged on its behalf, or the City Building Official, or any person employed or engaged on his behalf, shall have the right to go upon the premises to complete the required work or make it safe.

J113.3 Interference prohibited. No person shall interfere with or obstruct the ingress or egress to or from any such premises by any authorized representative or agent of any surety or of the City

engaged in completing the work required to be performed under the permit or in complying with the terms or conditions thereof.

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

These amendments are necessary to require owners to include methane hazards, slope failure analysis, and other administrative requirements for mitigating hazards soil conditions.

FINDINGS:

Beverly Hills is located in a seismically active area and is in close proximity to earthquake fault zones, and it is reasonably foreseeable that an earthquake would render the City particularly vulnerable to devastation. In addition, the city's topographic conditions make it vulnerable to mud slides.

Section 760-19 is hereby added to the California Electrical Code as follows:

Sec. 760-19 Residential Sprinkler Flow Alarms.

Residential sprinkler flow alarm wiring shall meet one of the following requirements:

(1) Wiring shall originate at a panelboard and shall be kept separate from all other wiring except at the panelboard; or

(1) The alarm shall obtain power from a circuit supplying kitchen and/or bathroom lights.

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

No change from previous code. This provision integrates fire sprinkler alarm wiring with building wiring. This amendment prevents fire alarms from being disconnected.

FINDINGS:

Beverly Hills is located in an area climatically classified as "semi-arid" and prone to winds of high velocity. Moreover, due to the arid nature of the area, the weather during the windy period tends to be very warm and dry. The dry weather conditions, combined with the relatively hilly topography of the City is very hazardous to the surrounding highly populated areas in as far as flame spread is concerned.

Because of the above-described climatic and topographic conditions, the City and the surrounding cities have historically suffered from occasional structural fires. These have often been difficult to control due to the dry winds carrying sparks and cinders to surrounding structures

Section 903.2 is hereby amended to read as follows:

Section 903.2 Where required. Approved automatic sprinkler systems in new building and structures shall be required for all occupancies, except U occupancies which are sheds that are less than five hundred (500) square feet.

Approved automatic sprinkler systems shall be required in all existing buildings if: (i) additions, alterations or repairs are made within any twelve (12) month period which exceed fifty percent (50%) of the value of such existing building, (ii) an addition is constructed which exceeds fifty percent (50%) of the square footage of the existing building, or (iii) an addition of more than five thousand (5,000) square feet is constructed.

Areas occupied by the following existing occupancies shall have installed an automatic fire-extinguishing system in compliance with this code:

(1) Throughout all existing eating establishments having a floor area in excess of three thousand (3,000) square feet.

(2) Throughout bowling alleys,

(3) Throughout public assembly occupancies having an occupant load of three hundred (300) or more persons. If such occupancies are located above the first floor, the floors below shall be provided with an automatic sprinkler system; provided further, public assembly occupancies of three hundred (300) or more persons placed in buildings existing prior to August 19, 1976, shall not be required to provide an automatic fire-extinguishing system in floors below such occupancy.

(4) Throughout hotels except those areas used exclusively for lodging.

(5) Throughout retail sales rooms classified as Group M and S occupancies if the floor area of all floors exceeds twelve thousand (12,000) square feet, and in Group M and S retail sales and storage occupancies more than three (3) stories in height, and in Group M and S Occupancies, if such occupancies are located within the same building or structure as Group R-l occupancies. The area of mezzanines shall be included in determining the areas where sprinklers are required.

(6) Nightclubs and discos in rooms primarily used for entertaining occupants who are drinking or dining and unseparated accessory uses where the total area of such unseparated rooms and assembly uses exceeds three thousand (3,000) square feet. For uses to be considered "Separated," the separation shall be not less than is required for a one-hour occupancy separation.

(7) In every story or basement of all buildings if the floor area exceeds fifteen hundred (1500) square feet and there is not provided at least twenty (20) square feet of opening entirely above the adjoining ground level in each 50 lineal feet or fraction thereof of exterior wall in the story or basement on at least one side of the building. Openings shall have a minimum dimension of not less than thirty (30) inches. Such openings shall be accessible to the fire department from the exterior and shall not be obstructed in a manner that fire fighting or rescue cannot be accomplished from the exterior.

When openings in a story are provided on only one side and the opposite wall of such story is more than seventy-five (75) feet from such openings, the story shall be provided with an approved

automatic sprinkler system, or openings as specified above shall be provided on at least two sides of an exterior wall of the story.

(8) In elevator pits.

(9) In rooms where nitrate film is stored and handled.

(10) In protected combustible fiber storage vaults as defined in the Fire Code.

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

No change from previous code. These provisions are intended to require existing buildings with high use intensity or hazardous occupancy to be sprinklered and require all buildings be sprinklered when it is substantially added to or remodeled.

FINDINGS:

Beverly Hills is located in an area climatically classified as "semi-arid" and prone to winds of high velocity. Moreover, due to the arid nature of the area, the weather during the windy period tends to be very warm and dry. The dry weather conditions, combined with the relatively hilly topography of the City is very hazardous to the surrounding highly populated areas in as far as flame spread is concerned.

Because of the above-described climatic and topographic conditions, the City and the surrounding cities have historically suffered from occasional structural fires. These have often been difficult to control due to the dry winds carrying sparks and cinders to surrounding structures.

Section 903.3.1.1.1 is hereby amended by deleting item number 3 as follows:

3. Delete item number 3.

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

No change from previous code. This provision removes the exception in the code that allows deletion of sprinklers in generators and transformer rooms.

FINDINGS:

Beverly Hills is located in an area climatically classified as "semi-arid" and prone to winds of high velocity. Moreover, due to the arid nature of the area, the weather during the windy period tends to be very warm and dry. The dry weather conditions, combined with the relatively hilly topography of the City is very hazardous to the surrounding highly populated areas in as far as flame spread is concerned.

Because of the above-described climatic and topographic conditions, the City and the surrounding cities have historically suffered from occasional structural fires. These have often been difficult to control due to the dry winds carrying sparks and cinders to surrounding structures.

Section 903.3.1.2 is hereby deleted:

Section 903.3.1.2 NFPA 13R Sprinkler Systems

Delete

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

No change from previous code. This provision removes the option of using the residential sprinkler code standards.

FINDINGS:

Beverly Hills is located in an area climatically classified as "semi-arid" and prone to winds of high velocity. Moreover, due to the arid nature of the area, the weather during the windy period tends to be very warm and dry. The dry weather conditions, combined with the relatively hilly topography of the City is very hazardous to the surrounding highly populated areas in as far as flame spread is concerned.

Because of the above-described climatic and topographic conditions, the City and the surrounding cities have historically suffered from occasional structural fires. These have often been difficult to control due to the dry winds carrying sparks and cinders to surrounding structures.

Section 903.3.1.3.1 is hereby added as follows:

Section 903.3.1.3.1 Balconies and Decks.

Sprinkler protection shall be provided for exterior overhangs, balconies, decks, and ground floor patios of dwelling units exceeding four (4) feet in width.

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

No change from previous code. This provision requires sprinklers in exterior decks and overhangs.

FINDINGS:

Beverly Hills is located in an area climatically classified as "semi-arid" and prone to winds of high velocity. Moreover, due to the arid nature of the area, the weather during the windy period tends to be very warm and dry. The dry weather conditions, combined with the relatively hilly topography of the City is very hazardous to the surrounding highly populated areas in as far as flame spread is concerned.

Because of the above-described climatic and topographic conditions, the City and the surrounding cities have historically suffered from occasional structural fires. These have often been difficult to control due to the dry winds carrying sparks and cinders to surrounding structures.

Section 903.4 is hereby amended as follows:

Section 903.4 Sprinkler system monitoring and alarms. All valves controlling the water supply for automatic sprinkler systems, pumps, tanks, water levels and temperatures, critical air pressures, and water-flow switches on all sprinkler systems shall be electrically supervised. Existing sprinkler systems totaling 20 sprinkler heads or more on one property being modified or altered shall be electrically supervised.

Section 903.4.2 is hereby amended:

Section 903.4.2 Alarms

Approved audible devices shall be connected to every automatic sprinkler system. Such sprinkler water-flow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Alarm devices shall be provided on the exterior **and interior** of the building in an approved location **to notify all occupants**. Where a fire alarm system is installed, actuation of the automatic sprinkler system shall actuate the building fire alarm system

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

No change from previous code. This provision requires sprinkler flow alarms to be located inside, as well as outside of buildings. It is intended to notify all occupants upon actuation of the sprinkler system.

FINDINGS:

Beverly Hills is located in an area climatically classified as "semi-arid" and prone to winds of high velocity. Moreover, due to the arid nature of the area, the weather during the windy period tends to be very warm and dry. The dry weather conditions, combined with the relatively hilly topography of the City is very hazardous to the surrounding highly populated areas in as far as flame spread is concerned.

Because of the above-described climatic and topographic conditions, the City and the surrounding cities have historically suffered from occasional structural fires. These have often been difficult to control due to the dry winds carrying sparks and cinders to surrounding structures.

Section 905.11 is hereby amended as follows:

Section 905.11 Standpipes.

Existing Buildings. Existing structures with occupied **floors located 3 or more** stories above or below the lowest level of fire department access shall be equipped with standpipes installed in accordance with Section 905. The standpipes shall have an approved fire department connection with hose connections at each floor level above or below the lowest level of fire department access. The fire code official is authorized to approve the installation of manual standpipe systems to achieve compliance with this section where the responding fire department is capable of providing the required hose flow at the highest standpipe outlet.

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

No change from previous code. This provision requires existing buildings that are 3 or more stories (in lieu of 50 ft) above or below fire access to provide standpipes.

FINDINGS:

Beverly Hills is located in an area climatically classified as "semi-arid" and prone to winds of high velocity. Moreover, due to the arid nature of the area, the weather during the windy period tends to be very warm and dry. The dry weather conditions, combined with the relatively hilly topography of the City is very hazardous to the surrounding highly populated areas in as far as flame spread is concerned.

Because of the above-described climatic and topographic conditions, the City and the surrounding cities have historically suffered from occasional structural fires. These have often been difficult to control due to the dry winds carrying sparks and cinders to surrounding structures.

Section 907.10.1.1.1 is hereby added:

Section 907.10.1.1.1 All Use Areas

Visible alarm notification appliances shall be provided in all occupied rooms where ambient noise impairs hearing of the fire alarm including but not limited to residential home theaters.

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

No change from previous code. This provision requires a visible alarm to all areas of the building.

FINDINGS:

Beverly Hills is located in an area climatically classified as "semi-arid" and prone to winds of high velocity. Moreover, due to the arid nature of the area, the weather during the windy period tends to be very warm and dry. The dry weather conditions, combined with the relatively hilly topography of the City is very hazardous to the surrounding highly populated areas in as far as flame spread is concerned.

Because of the above-described climatic and topographic conditions, the City and the surrounding cities have historically suffered from occasional structural fires. These have often been difficult to control due to the dry winds carrying sparks and cinders to surrounding structures.

Section 3301.2 is hereby added as follows:

Section 3301.2 Fireworks Prohibited.

No person shall manufacture, store, offer for sale or discharge any fireworks in the City; provided further, fireworks may be discharged in conjunction with a city sponsored event. "Fireworks

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

No change from previous code. This provision prevents use and sale of fire works.

FINDINGS:

Beverly Hills is located in an area climatically classified as "semi-arid" and prone to winds of high velocity. Moreover, due to the arid nature of the area, the weather during the windy period tends to be very warm and dry. The dry weather conditions, combined with the relatively hilly topography of the City is very hazardous to the surrounding highly populated areas in as far as flame spread is concerned.

Because of the above-described climatic and topographic conditions, the City and the surrounding cities have historically suffered from occasional structural fires. These have often been difficult to control due to the dry winds carrying sparks and cinders to surrounding structures.

Section 4706 is hereby amended as follows:

Section 4706 Vegetation Management

4706.1 General.

A. Definitions. For purposes of this section, the following definitions shall apply:

1. Vegetative Growth. Any native brush, or weeds, or grass, or specimen native shrub, or any live, or dead organic material as designated by the fire chief.

2. Very High Fire Hazard Severity Zone. That area included within the boundaries described and set forth in a map maintained by the fire chief on file in the office of the fire prevention bureau.

3. Native Brush. All varieties of vegetative growth other than trees, that are indigenous to and found within the very high fire hazard severity zone except those plants that are identified as 'fire resistive plants' in a list established and maintained by the fire chief.

4. Specimen Native Shrub. An individual shrub that is within the definition of 'native brush' and that is trimmed up one-third of its height or six (6') feet above the ground, whichever is less, and from the vicinity of which has been removed all dead wood, duff, and combustible litter; and that is not among those plants identified as 'extremely hazardous native brush' in a list established and maintained by the fire chief.

5. Structure. That which is built or constructed, including an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

6. Fuel Modification Zone. The area existing between one hundred (100') feet and two hundred (200') feet, in any direction from any structure, unless otherwise specified by the chief.

B. Required Maintenance. Persons owning, leasing, controlling, operating or maintaining buildings or structures in, upon or adjoining very high fire hazard severity zone fire areas, and persons owning, leasing or controlling land adjacent (within 200 feet) to such buildings or structures, shall at all times comply with the following requirements:

1. Maintain all native brush, weeds, grass, and hazardous vegetation situated within one hundred feet (100') of ANY structure, regardless of whether said structure is located upon such land or upon adjacent land shall be maintained at a height of not more than three inches (3") above the ground.

2. Reduce the fuel load within the fuel modification zone (100' to 200') around any structure regardless of whether said structure is located upon such land or upon adjacent land.

Exception: Specimen native shrubs may be retained throughout the first 100 feet provided they are: spaced at a distance not less than eighteen feet (18') from other native shrubs, brush or structures; maintained free of dead wood and litter; and trimmed up at least six feet (6') from the ground or 1/3 of their height, whichever is less.

3. Maintain all native brush, weeds, grass and hazardous vegetation within ten feet (10') of any combustible fence shall be maintained at a height of not more than three inches (3") above the ground.

4. Remove all trees, shrubs, bushes, and other growing vegetation or portions thereof, adjacent to or overhanging any structure shall be kept free of dead limbs, branches, and other combustible matter.

5. Maintain all trees shall be trimmed up five feet (5') from the ground and maintained so that no portion is closer than ten feet (10') from the outlet of any chimney.

6. Maintain five feet (5') of vertical clearance between roof surfaces and portions of trees overhanging any building or structure.

7. Maintain all roof structures shall be kept free of substantial accumulations of leaves, needles, twigs, and other combustible matter.

8. Remove all cut vegetation and debris and legally disposed of. All vegetation, native or otherwise, shall be maintained so as not to constitute a fire hazard or public nuisance.

9. Clear all hazardous vegetation and other combustible growth within the first 100 feet surrounding all structures. Reduce the amount and/or modify the arrangement of hazardous vegetation within the fuel modification zone.

10. Prune the branches from the lower third of any native plants kept in this area. If the plant is over 18 feet in height, only the lower six feet (6') must be pruned. Heavy brush must be 'trimmed up' so that all foliage in the lower third of the plant is removed. Remove any dead plants (leave the lowest 3" and root structure to help prevent erosion.)

11. Remove dead material from live plants.

12. Remove or process all cut vegetation as follows: may be machine processed and left on the property to a maximum depth of three inches (3"), so long as none of the material is left within one hundred feet (100') of any structure. Machine processed material shall not be placed within ten feet (10') of usable road surfaces or driveways.

13. Maintain all landscape vegetation, including, but not limited to, conifers (e.g., cedar, cypress, fir, juniper, and pine), eucalyptus, acacia, palm and pampas grass in such a condition as not to provide an available fuel supply to augment the spread or intensity of a fire.

C. Authority Of The Fire Chief To Modify Brush Clearing Requirements. If the fire chief determines in any specific case that difficult terrain, danger of erosion, or other unusual circumstances make strict compliance with the clearance of vegetation provisions of this section undesirable or impractical, he may suspend the enforcement thereof and require reasonable alternative measures. Nothing contained in this subsection shall be deemed to preclude the chief from requiring more than the minimum specific requirements set forth above when the chief determines that conditions exist which necessitate greater fire protection measures.

D. Issuance Of Brush Clearance Notice. In addition to any other remedies for violations provided by law, including those remedies set forth **in this code**, the fire department may issue a "vegetation clearance notice" to the record owner and any tenant, lessee or other possessor of the affected properties, specifying the condition(s) required to be corrected, and setting forth a date by which corrective action must be taken. The fire department may take corrective action *at the owner's expense* in the event the required correction is not completed. If the owner fails to pay the cost incurred by the fire department to correct such condition(s) following notice of the cost and an opportunity to be heard, the city council may make the expense a lien upon the property where such condition exists.

4706.2. Clearance of Brush or Vegetative Growth from Roadways.

All native brush, weeds, grass and hazardous vegetation situated within ten (10') feet of the outer edge or edges of the usable road surface of any highway, street, alley or driveway serving more than one residence shall be maintained at a height of not more than three (3") inches above the ground.

REASONS FOR AMENDMENT/INTERPRETATION/CLARIFICATION:

No change from previous code. This provision requires hillside brush clearance.

FINDINGS:

Beverly Hills is located in an area climatically classified as "semi-arid" and prone to winds of high velocity. Moreover, due to the arid nature of the area, the weather during the windy period tends to be very warm and dry. The dry weather conditions, combined with the relatively hilly topography of the City is very hazardous to the surrounding highly populated areas in as far as flame spread is concerned.

Because of the above-described climatic and topographic conditions, the City and the surrounding cities have historically suffered from occasional structural fires. These have often been difficult to control due to the dry winds carrying sparks and cinders to surrounding structures.