**BUILDING STANDARDS COMMISSION**
2525 Natomas Park Drive, Suite 130
Sacramento, California 95833-2936
(916) 263-0916 FAX (916) 263-0959

March 29, 2012

Gwen Pierce, CMC, City Clerk
City of Calabasas
100 Civic Center Way
Calabasas, CA 91302

Dear Ms. Pierce:

This letter is to acknowledge receipt on February 21, 2012 of the City of Calabasas submittal pertaining to Ordinance No. 2012-294. Your filing attests to your understanding that according to Health and Safety Code Section 17958.7 no modification or change to the California Building Standards Code shall become effective or operative for any purpose until the findings and the modifications or changes have been filed with the California Building Standards Commission (the Commission).

This letter attests only to the filing of these local modifications with the Commission, which is not authorized by law to determine the merit of the filing.

As a reminder, local modifications are specific to a particular edition of the Code. They must be readopted and filed with the Commission in order to remain in effect when the next triennial edition of the Code is published. In addition, should you receive Fire Protection District ordinances for ratification, it is required to submit the ratified ordinances to the Department of Housing and Community Development [H&SC Section 13869.7(c)], attention State Housing Law Program Manager, rather than the Commission.

If you have any questions or need any further information, you may contact me at (916) 263-0916.

Sincerely,

Enrique M. Rodriguez
Associate Construction Analyst

cc: Chron
Local Filings

CITY of CALABASAS

RECEIVED
2012 FEB 21 P 12:41
CALIFORNIA BUILDING
STANDARDS COMMISSION

February 13, 2012

California Building Standards Commission
2525 Natomas Park Drive, Suite 130
Sacramento, CA 95833-2936

Re: Calabasas City Council Ordinance No. 2012-294

To Whom It May Concern:

Enclosed please find a certified copy of Calabasas City Council Ordinance No. 2012-294, adopted by the Calabasas City Council on February 8, 2012, for filing with the California Building Standards Commission.

Sincerely,

Gwen Peirce, CMC
City Clerk

Enclosure

100 Civic Center Way
Calabasas, CA 91302
(818) 224-1600
Fax (818) 225-7324

**ORDINANCE NO. 2012-294**

**AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF CALABASAS REPEALING THE LOCAL AMENDMENTS TO THE UNIFORM PLUMBING CODE ESTABLISHING THE CITY'S ON-SITE WASTEWATER TREATMENTS SYSTEMS (OWTS) INSPECTION PROGRAM AND AMENDING THE CALABASAS MUNICIPAL CODE**

**THE CITY COUNCIL OF THE CITY OF CALABASAS DOES ORDAIN AS FOLLOWS:**

**SECTION 1. MUNICIPAL CODE AMENDMENT.** The following subsections of Calabasas Municipal Code Chapter 15.04.610 Appendix K are hereby repealed:

| | |
|---|---|
| K1 (A)(1) | Definitions |
| K1 (A)(2) | Permitting Provisions |
| K1 (A)(3) | Use or Modification of an Existing System |
| K1 (A)(4) | Repair of a Failing System |
| K13 | Onsite Wastewater Treatment System Operating Permits |
| K16 | Unlawful Systems |

**SECTION 2. SEVERABILITY.** If any provision, section, paragraph, sentence or word of this Ordinance, or the application thereof to any person or circumstance, is rendered or declared invalid by any court of competent jurisdiction, the remaining provisions, sections, paragraphs, sentences or words of this ordinance, and their application to other persons or circumstances, shall not be affected thereby and shall remain in full force and effect and, to that end, the provisions of this ordinance are severable.

**SECTION 3. NO EFFECT ON ENFORCEABILITY.** The amendments to the Municipal Code adopted by this Ordinance shall not affect or impair any act done, or right vested or approved, or any proceeding, suit or prosecution commenced in any cause before such amendment shall take effect; but every such act, vested right, proceeding, suit, or prosecution shall remain in full force and effect for all purposes.

**SECTION 4. CEQA.** This Ordinance is exempt from the California Environmental Quality Act ("CEQA") because it is not a "project" as defined in 14 Cal. Code Regs. § 15378: it will have no direct, or reasonably foreseeable indirect, effect on the environment. Furthermore, this Ordinance is exempt pursuant to 14 Cal. Code Regs. §§ 15309 (inspections and changes to inspection procedures), and 15321 (enforcement action by regulatory agency). This ordinance does not disturb the Plumbing Code of the City, as promulgated by the California Building Standards Commission and local amendments to that Code other than those this Ordinance specifically repeals. Accordingly, the legal requirement to design, construct and operate OWTS so as to protect health, safety and the environment in unimpaired by this Ordinance, which merely eliminates one means to enforce those requirements, preserving others.

**SECTION 5. EFFECTIVE DATE.** This ordinance shall take effect thirty days after its passage and adoption pursuant to California Government Code section 36937.

**SECTION 6. CERTIFICATION.** The City Clerk shall certify to the passage and adoption of this ordinance and shall cause the same to be published or posted according to law.

**PASSED, APPROVED AND ADOPTED**, this 8th day of February, 2012.

James R. Bozajian, Mayor

ATTEST:

Gwen Peirce, CMC, City Clerk

APPROVED AS TO FORM:

2/8/12

Michael G. Colantuono, City Attorney

**STATE OF CALIFORNIA )**
**COUNTY OF LOS ANGELES ) SS**
**CITY OF CALABASAS )**

**I, GWEN PEIRCE,** City Clerk of the City of Calabasas, California, **DO HEREBY CERTIFY** that the foregoing ordinance, being **Ordinance No. 2012-294** was duly introduced and approved by the City Council of the City of Calabasas at a regular meeting held on the 22nd day of January, 2012 and adopted and passed by said Council at a regular meeting held on the 8th day of February, 2012 by the following vote:

AYES: Mayor Bozajian, Mayor pro Tem Maurer and Councilmembers Gaines, Martin and Shapiro.

NOES: None.

ABSTAIN: None.

ABSENT: None.

Gwen Peirce, CMC
City Clerk
City of Calabasas, California

**Declaration of Posting**

I, **ANNIE KRDILYAN**, declare that I am an employee of the City of Calabasas, California; that on February 9, 2012, I posted copies of the attached passed and approved **ORDINANCE NO. 2012-294 AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF CALABASAS REPEALING THE LOCAL AMENDMENTS TO THE UNIFORM PLUMBING CODE ESTABLISHING THE CITY'S ON-SITE WASTEWATER TREATMENTS SYSTEMS (OWTS) INSPECTION PROGRAM AND AMENDING THE CALABASAS MUNICIPAL CODE** and declaring the vote of the Calabasas City Council at City Hall, Calabasas Tennis and Swim Center, Juan Bautista de Anza Park and Gelson's Market in the City of Calabasas.

I declare under penalty of perjury that the foregoing is true and correct. Executed in the City of Calabasas, County of Los Angeles, State of California this 9th day of February, 2012.

**ANNIE KRDILYAN**
**OFFICE ASSISTANT**

STATE OF CALIFORNIA – STATE AND CONSUMER SERVICES AGENCY GOVERNOR EDMUND G. BROWN JR.

**BUILDING STANDARDS COMMISSION**
2525 Natomas Park Drive, Suite 130
Sacramento, California 95833-2936
(916) 263-0916 FAX (916) 263-0959

June 14, 2011

Gwen Pierce, CMC, City Clerk
City of Calabasas
100 Civic Center Way
Calabasas, CA 91302

Dear Ms. Pierce:

This letter is to acknowledge receipt on June 13, 2011 of the City of Calabasas submittal pertaining to Ordinance No. 2011-284 with findings and is acceptable for filing. Your filing attests to your understanding that according to Health and Safety Code Section 17958.7 no modification or change to the California Building Standards Code shall become effective or operative for any purpose until the finding and the modification or change have been filed with the California Building Standards Commission (the Commission).

This letter attests only to the filing of these local modifications with the Commission, which is not authorized by law to determine the merit of the filing.

As a reminder, local modifications are specific to a particular edition of the Code. They must be readopted and filed with the Commission in order to remain in effect when the next triennial edition of the Code is published. In addition, should you receive Fire Protection District ordinances for ratification, it is required to submit the ratified ordinances to the Department of Housing and Community Development [H&SC Section 13869.7(c)], attention State Housing Law Program Manager, rather than the Commission.

If you have any questions or need any further information, you may contact me at (916) 263-0916.

Sincerely,

Enrique M. Rodriguez
Associate Construction Analyst

cc: Chron
Local Filings

CITY *of* CALABASAS

June 10, 2011

California Building Standards Commission
2525 Natomas Park Drive, Suite 130
Sacramento, CA 95833-2936

Re: Calabasas City Council Ordinance No. 2011-284

To Whom It May Concern:

Enclosed please find a certified copy of Calabasas City Council Ordinance No. 2011-284, adopted by the Calabasas City Council on June 8, 2011, for filing with the California Building Standards Commission.

Sincerely,

Gwen Peirce

Gwen Peirce, CMC
City Clerk

Enclosure

RECEIVED
2011 JUN 13 A 11: 12
CALIFORNIA BUILDING
STANDARDS COMMISSION

100 Civic Center Way
Calabasas, CA 91302
(818) 224-1600
Fax (818) 225-7324

# ORDINANCE NO. 2011-284

**AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF CALABASAS, CALIFORNIA, AMENDING THE CALABASAS PLUMBING CODE WITH RESPECT TO ONSITE WASTEWATER TREATMENT SYSTEMS (OWTS)**

**THE CITY COUNCIL OF THE CITY OF CALABASAS DOES ORDAIN AS FOLLOWS:**

**SECTION 1. Code Amendment.** Calabasas Plumbing Code section K 13.0(B)(3), which is incorporated by reference into Calabasas Muni cipal Code section 15.04.560, is hereby amended to read as follows:

(3) All owners of real property served by an existing OWTS shall be required to apply for and obtain an OWTS operating permit on or before July 26, 2011.

**SECTION 2. Code Amendment.** Calabasas Plumbing Code section K 13.0(C), which is incorporated by reference into Calabasas Municipal Code section 15.04.560, is hereby amended to read as follows:

(C) Validity and renewal of OWTS operating permits.

(1) Absent a determination by the administrative authority that an illicit discharge has occurred, or that failing or failed system does or may exist, or that a major repair is, or may be, required, an unconditional OWTS operating permit shall be valid until the date of a voluntary conveyance (including but not limited to, assignment, gift, sale, or transfer) of a legal interest in or title to real property served by the OWTS which occurs at least 10 years after the operating permit was issued and each conveyance thereafter. A conditional OWTS operating permit shall be valid for this same time unless otherwise provided by the permit.

(i) Such a voluntary conveyance does not include:

a. involuntary transfers (*e.g.,* foreclosure proceedings or actions, as well as transfers to an heir upon an owner's death);

Certified to be a true and correct copy of original document on file with the City of Calabasas
Gwen Peirce
Gwen Peirce, CMC, City Clerk

b. creation of an equitable interest in the real property to secure a loan against it; and,

c. a "change in ownership" described in Section 62 of the California Revenue & Taxation Code as it now exists or may hereafter be amended. "Completion of a voluntary conveyance" may be evidenced, without limitation, by the execution of any deed or instrument, or its recordation with the Los Angeles County Recorder's Office.

(ii) If the administrative authority determines that an illicit discharge has occurred, or that failing or failed system does exist, or that a major repair is, required, in such instances, the OWTS permit shall be suspended without further action or notice on the date the administrative authority gives notice of that determination to the owner of record of the property served by the OWTS or to the permittee until the system is brought into compliance.

(iii) The administrative authority is authorized to condition an OWTS operating permit as necessary to protect public health, safety and welfare, including setting a shorter permit period for reinspection of the OWTS or reissuance of a permit.

**SECTION 3. Code Amendment.** Calabasas Plumbing Code section K 13.0(E), which is incorporated by reference into Calabasas Municipal Code section 15.04.560, is hereby amended to read as follows:

(E) OWTS inspection and operating permit criteria.

(1) The administrative authority shall not issue an operating permit until the OWTS has been inspected by an OWTS inspector, who shall not be accompanied by City staff during his or her inspection of the OWTS unle ss the property owner so requests in writing, and found to be operating in compliance with the OWTS inspection guidelines and with any applicable conditions previously

established or imposed for the OWTS. When such an inspection cannot be accomplished due to unique conditions, alternate inspection methods may be proposed to the administrative authority and implemented upon its prior written approval. Any alternate method of inspection request shall be submitted in writing and subject to approval of the administrative authority, with the appropriate alternate methods and materials request form completed and the required fee paid. All alternate method of inspection requests shall be prepared by a professional identified in Section K13 (F)(1)(a) above. Nothing in this paragraph shall alter the responsibility of the administrative authority to inspect work done pursuant to a permit issued under any other provision of chapter 15.04 of the Calabasas Municipal Code.

**SECTION 4. Code Amendment.** Calabasas Plumbing Code section K 13.0(E)(7) is hereby added to Calabasas Municipal Code section 15.04.560 to read as follows:

(7) A property owner may appeal (i) a decision of the administrative authority that an OWTS is not operating in compliance with this Code, the OWTS inspection guidelines, or with any applicable conditions previously established or imposed for that OWTS (collectively, the "standards") or (ii) a decision regarding repairs necessary to bring an OWTS into compliance with the standards within ten (10) days from that decision. The City Council shall appoint, upon nomination of the City Manager, a Board of Appeals with appropriate technical qualifications to hear and decide such appeals. Such nominees shall not include City employees. Notwithstanding any other provisions of this Chapter 15.04, this Section K13.0(E)(7) provides the sole administrative appeal with respect to the decisions identified in this section; further review shall be pursuant to California Code of Civil Procedure section 1094.5. Appeal hearings shall be conducted pursuant to chapter 17.74 of the Calabasas Municipal Code except that references to the "director" shall mean the building official, "appeal body" shall mean the Board of Appeals established by this paragraph, and no appeal to the City Council shall be permitted.

**SECTION 5. Findings.** The City Council finds that each provision of this Ordinance is an administrative regulation for which no findings of local conditions are required by the California Health& Safety Code rather than a change in a substantive building standard specifying materials and means of construction. The City Council nevertheless finds that the amendments provided in this Ordinance are needed due to local climatic, geological, and topographical conditions as follows:

**A. Climatic Conditions**

1. The greater Los Angeles region is within a climate capable of producing major rain related disasters, including but not limited to those caused by El Nino (or La Nina) subtropical weather, which also requires well-maintained onsite wastewater treatment systems to protect health and safety.

**B. Geologic Conditions**

1. Los Angeles County and the City of Calabasas are located in a highly active seismic area. There are earthquake faults that run along boundaries of Los Angeles and in the vicinity of Calabasas. The Chatsworth Fault runs through Simi Valley and Chatsworth, both of which are close to Calabasas. The epicenter of the 1994 Northridge earthquake was less than 10 miles from Calabasas, and produced the strongest ground swells ever recorded in an urban setting in North America. Damage was widespread: sections of major freeways collapsed, parking structures and office buildings collapsed, and numerous apartment buildings suffered irreparable damage. Many homes in Calabasas suffered significant damage. Damage to onsite wastewater treatment systems existing in the City at the time of that earthquake, as well as other during earthquakes in the area, is therefore very likely.

2. The high likelihood of future earthquakes also creates a need for frequent re-inspection of the onsite wastewater treatment systems to ensure that they are in working order.

3. Improperly installed and malfunctioning onsite wastewater treatment systems are a known source of waterway contamination in the City of Calabasas. The groundwater absorption and filtration rates are largely dependent on geologic conditions, and the hilly and rocky terrain contributes to a lessening of the absorption and percolation of contaminated water.

**C. Topographical Conditions**

1. The City of Calabasas is in a mountainous area with much of its development on hills, or bounded by hills. This pattern of development exacerbates pollution and water runoff problems because water runoff is

forced to more quickly run down hill than it would otherwise, decreasing the natural capacity of the land to absorb, disperse and remediate the effects of pollution. Further, because of the topography, runoff is channelized, and all pollution is concentrated in channels and streambeds rather than dispersed in the environment and mitigated by dilution. This has caused the need to adopt health and safety precautions to combat the negative effects of such results.

2. Many of the OWTS existing in the City serve properties in mountainous canyons drained by blue line streams. The topography and geology of those canyons places residences, and the OWTS that serve them, in close proximity to creeks and other surface waters and to groundwater. OWTS near such water resources are of particular environmental concern, requiring meaningful programs to implement the existing standards of Appendix K to the Plumbing Code to ensure OWTS are functioning as designed to protect the health and safety of residents of the sites served by OWTS, and of neighbors and visitors, to protect the environment and to comply with environmental laws.

**SECTION 6. References in Documents and Continuing Legal Effect.** References to prior versions of any portion of the Plumbing Code, or of the Calabasas Municipal Code that are amended or renumbered in this Municipal Code, that are cited on notices issued by the City or other documents of ongoing or continuing legal effect, including resolutions adopting or imposing fees or charges, until converted, are deemed to be references to the new counterpart part of the Plumbing Code or amended Municipal Code sections for the purposes of notice and enforcement. The provisions adopted hereby shall not in any manner affect deposits, established fees or other matters of record which refer to, or are otherwise connected with, ordinances which are specifically designated by number, code section or otherwise, but such references shall be deemed to apply to the corresponding provisions set forth in the code sections adopted or amended hereby. Provided, however, that the extension of time effected by Section 1 of this Ordinance is intended to apply to the benefit of owners of properties in the City served by OWTS who did not comply with earlier deadlines to obtain OWTS permits.

**SECTION 7. Continuity.** To the extent the provisions of this Ordinance are substantially the same as previous provisions of the Calabasas Municipal Code, these provisions shall be construed as continuations of those provisions and not as new enactments.

**SECTION 8. No Effect on Enforceability.** Except as expressly stated in Section 6 of this Ordinance above, the repeal or amendment of any sections of the Municipal Code by this Ordinance shall not affect or impair any act done, or right

vested or approved, or any proceeding, suit or prosecution commenced in any cause before such repeal or amendment shall take effect; but every such act, vested right, proceeding, suit, or prosecution shall remain in full force and effect for all purposes unless such act, vested right, proceeding, suit or prosecution is specifically based on the particular provision repealed or amended by this ordinance. No offense committed and no liability, penalty, or forfeiture, either civil or criminal, incurred prior to the repeal or alteration of any applicable provision of the Code as amended, shall be discharged or affected by such repeal or alteration but prosecutions and suits for such offenses, liabilities, penalties or forfeitures shall be instituted and proceed in all respects unless they are specifically based on the particular provision repealed or amended by this ordinance.

**SECTION 9. CEQA.** This Ordinance is exempt from the California Environmental Quality Act ("CEQA") pursuant to CEQA Guidelines § 15061(b)(3) as a project that has no potential to cause a significant effect on the environment; CEQA Guidelines §§ 15307, 15308 as an action taken by a regulatory agency to protect the environment and natural resources; CEQA Guidelines § 15301 as the operation, repair, maintenance, permitting or minor alteration of existing structures, facilities and mechanical equipment; CEQA Guidelines § 15302 as the replacement or reconstruction of existing structures or facilities; CEQA Guidelines § 15303 as the construction or installation of small structures, facilities or equipment; CEQA Guidelines § 15332 for infill development projects, CEQA Guidelines § 15321 for regulatory enforcement actions; and CEQA Guidelines § 15309 for regulatory inspections.

**SECTION 10. Certification.** The City Clerk shall certify to the adoption of this ordinance and shall cause the same to be processed in the manner required by law.

**SECTION 11. Building Standards Commission.** The City Council finds that each provision of this Ordinance is an administrative regulation for which no filing with the California Buildings Standards Commission is required. The City Clerk shall nevertheless file a certified copy of this Ordinance with the California Building Standards Commission.

**SECTION 12. Severability.** Should any section, subsection, clause, or provision of this Ordinance for any reason be held to be invalid or unconstitutional, such invalidity or unconstitutionality shall not affect the validity or constitutionality of the remaining portions of this Ordinance; it being hereby expressly declared that this Ordinance, and each section, subsection, sentence, clause, and phrase hereof would have been adopted irrespective of the fact that any one or more sections, subsections, sentences, clauses, or phrases be declared invalid or unconstitutional.

**SECTION 13. Effective Date.** This ordinance shall take effect thirty days after its passage and adoption pursuant to California Government Code section 36937.

**SECTION 14. Publication.** The City Clerk shall cause this Ordinance to be published in accordance with California Government Code Section 36933, shall certify to the adoption of this Ordinance, and shall cause this Ordinance and its certification, together with proof of publication, to be entered in the Book of Ordinances of the City Council.

**PASSED, APPROVED AND ADOPTED** this 8th day of June 2011.

James R. Bozajian, Mayor

ATTEST:

Gwen Peirce, CMC, City Clerk

APPROVED AS TO FORM:

6/8/11

Michael G. Colantuono, City Attorney

**STATE OF CALIFORNIA )**
**COUNTY OF LOS ANGELES ) SS**
**CITY OF CALABASAS )**

**I, GWEN PEIRCE,** City Clerk of the City of Calabasas, California, **DO HEREBY CERTIFY** that the foregoing ordinance, being **Ordinance No. 2011-284** was duly adopted by the City Council of the City of Calabasas, at a regular meeting of the City Council held June 8, 2011 and that it was adopted by the following vote, to wit:

AYES: Mayor Bozajian, Mayor pro Tem Maurer, Councilmembers Gaines and Wolfson.

NOES: Councilmember Martin.

ABSTAIN: None.

ABSENT: None.

Gwen Peirce, CMC
City Clerk
City of Calabasas, California

STATE OF CALIFORNIA – STATE AND CONSUMER SERVICES AGENCY GOVERNOR EDMUND G. BROWN JR.

**BUILDING STANDARDS COMMISSION**
2525 Natomas Park Drive, Suite 130
Sacramento, California 95833-2936
(916) 263-0916 FAX (916) 263-0959

June 6, 2011

Gwen Peirce, City Clerk
City of Calabasas
100 Civic Center Way
Calabasas, CA 91302

Dear Ms. Peirce:

This letter is to acknowledge receipt on May 31, 2011 of the City of Calabasas submittal pertaining to Ordinance No. 2011-278 with findings and is acceptable for filing. Your filing attests to your understanding that according to Health and Safety Code Section 17958.7 no modification or change to the California Building Standards Code shall become effective or operative for any purpose until the finding and the modification or change have been filed with the California Building Standards Commission (the Commission).

This letter attests only to the filing of these local modifications with the Commission, which is not authorized by law to determine the merit of the filing.

As a reminder, local modifications are specific to a particular edition of the Code. They must be readopted and filed with the Commission in order to remain in effect when the next triennial edition of the Code is published. In addition, should you receive Fire Protection District ordinances for ratification, it is required to submit the ratified ordinances to the Department of Housing and Community Development [H&SC Section 13869.7(c)], attention State Housing Law Program Manager, rather than the Commission.

If you have any questions or need any further information, you may contact me at (916) 263-0916.

Sincerely,

Enrique M. Rodriguez
Associate Construction Analyst

cc: Chron
Local Filings

CITY of CALABASAS

May 25, 2011

California Building Standards Commission
2525 Natomas Park Drive, Suite 130
Sacramento, CA 95833-2936

Re: Calabasas City Council Ordinance No. 2011-278

To Whom It May Concern:

Enclosed please find a certified copy of Calabasas City Council Ordinance No. 2011-278, adopted by the Calabasas City Council on February 9, 2011, for filing with the California Building Standards Commission. The previous version that your office received on February 16, 2011 contained clerical errors that have been corrected in the enclosed document.

Sincerely,

Gwen Peirce, CMC
City Clerk

Enclosure

RECEIVED
2011 MAY 31 P 4:30
CALIFORNIA BUILDING
STANDARDS COMMISSION

100 Civic Center Way
Calabasas, CA 91302
(818) 224-1600
Fax (818) 225-7324

# ORDINANCE NO. 2011-278

**AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF CALABASAS, CALIFORNIA, ADOPTING BY REFERENCE, PURSUANT TO GOVERNMENT CODE SECTION 50022.2, THE 2010 CALIFORNIA CODE OF REGULATIONS, TITLE 24 - THE 2010 CALIFORNIA BUILDING STANDARDS CODE WITH ADMINISTRATIVE AMENDMENTS, AND WHERE APPROPRIATE, EXPRESS FINDINGS AND DETERMINATIONS RELATING TO THE ENACTMENT OF MORE RESTRICTIVE CODE STANDARDS THAN THOSE OF THE CALIFORNIA BUILDING CODE, CALIFORNIA RESIDENTIAL CODE, CALIFORNIA GREEN BUILDING STANDARDS CODE, CALIFORNIA FIRE CODE IN ACCORDANCE WITH CALIFORNIA HEALTH AND SAFETY CODE SECTIONS 17922, 17958 AND 18941.5**

WHEREAS, the City Council of the City of Calabasas does hereby find that there is a need to enforce the most current editions of the California Building Standards Code, with local amendments thereof, as recited herein for regulating and controlling the design, erection, construction, enlargement, installation, alteration, repair, relocation, removal, use and occupancy, demolition, conversion, height and area, location and maintenance, and quality of materials of all buildings and structures and plumbing, mechanical, electrical and fire suppression systems and certain equipments within the City;

WHEREAS, local regulations necessary to carry out the application of the CBSC that do not establish building standards, may be enacted without meeting the requirements of California Health & Safety Code sections 18941.5, 17958, 17598.5 and 17958.7;

WHEREAS, pursuant to sections 17922, 17958, 17958.5 and 17958.7 of the California Health & Safety Code, the City may adopt the provisions of the Uniform Building, Plumbing, Mechanical, Electric and Fire Codes, with certain amendments to the provisions of the codes which are reasonably necessary to protect the health [1]and welfare of citizens of Calabasas because of local climatic, geological and topographical conditions;

WHEREAS, the City Council does hereby further find that Calabasas is within a very active seismic area,

WHEREAS, soil conditions in the City can be highly expansive;

WHEREAS, construction occurring in or near hillside areas within the City is prone to erosion;

[1] Revised November 8, 2010

Certified to be a true and correct copy of original document on file with the City of Calabasas

Gwen Peirce, CMC, City Clerk

WHEREAS, the City of Calabasas is immediately adjacent to the Chatsworth and Malibu Coastal Fault Zones, is near the San Andreas Fault and is surrounded by other earthquake faults; and

WHEREAS, the City is located by the International Building Code in Seismic Design Category D, E or F, and the International Residential Code in Seismic Design Category D2 or E, which is considered by experts to be one of the most active seismic regions in the world; and

WHEREAS, the Northridge Earthquake that occurred on January 17, 1994, was only a moderate Richter Magnitude 6.8 earthquake, yet caused damage in the Los Angeles Basin area to more than 115,000 buildings and the vacation of 21,000 residential units including 2,000[2]single-family homes; and

WHEREAS, there were 57 persons who lost their lives in this earthquake, but there could have been several thousand more casualties, if the earthquake had occurred at midday during the workweek when most buildings would be occupied instead of at 4:31 a.m. on a holiday; and

WHEREAS, seismic experts report a significantly high probability for a larger earthquake occurring in or near the greater Los Angeles Basin area within the next 30 years; and

WHEREAS, unusually large earthquakes cause extraordinary stresses on buildings and structures and Fire Department resources which require more stringent building regulations than would otherwise be required; and

WHEREAS, the City requires the extra margin of safety due to the necessity of providing onsite[1] fire protection in a seismic emergency when Fire Department resources could be greatly delayed or overwhelmed; and

WHEREAS, the Northridge Earthquake provided valuable insight into the vulnerabilities of some building systems, designs and materials [3]due to the unanticipated level of damage; and

WHEREAS, the City, in cooperation with other major jurisdictions within the region, are continuing efforts to protect the community from the hazards of future earthquakes through the Los Angeles Regional Uniform Code Program (LARUCP) which creates uniformity of building regulations adopted by the cities and county of the Los Angeles region; and

WHEREAS, the California Building Code, California Residential Code and California Fire Code have not yet fully addressed the lessons learned from the Northridge Earthquake; and

---

[2] Revised November 8, 2010

[3] Revised November 8, 2010

WHEREAS, parts of the City are located immediately adjacent the Los Angeles Basin, one of the most polluted metropolitan areas and one of the most heavily modified watersheds in the nation, with a climate system capable of producing major winds, fire-and-rain related disasters and is a densely populated area having residential and nonresidential buildings constructed within a region where environmental resources are scarce; and

WHEREAS, the California Regional Water Quality Control Board Los Angeles Region 4 has determined the waterways within the City of Calabasas are impaired;

WHEREAS, the impairment of the waterways is due, in significant part, to the existing topography, geology and climate of the area surrounding and including Calabasas;

WHEREAS, on October 1, 2004, the City of Calabasas and the California Regional Water Quality Control Board Los Angeles Region 4 entered into a memorandum of understanding wherein the City is obligated to monitor every onsite wastewater treatment system within the [4]City; and

WHEREAS, the City Council does hereby further find that in accordance with section 15061(b)(3) of the California Code of Regulations, the adoption of these local amendments to the California Building Standards Code, and amendments to the Calabasas Municipal Code are exempt from the provisions of the California Environmental Quality Act because such actions are largely administrative in nature, are designed to improve and not degrade environmental quality, and the impacts of these local amendments to the building standards code will not adversely affect the environment in any manner that could be significant.

NOW, THEREFORE, to provide adequate protection under the local, climatic, geologic and topographical conditions set forth above, and as more fully set forth in Exhibit 1 to this ordinance, the City of Calabasas makes the following findings and determinations relative to the adoption of administrative amendments, and where appropriate, the adoption of more restrictive Building Standards Code provisions than those of the California Administrative Code, California Building Code, California Residential Code, California Green Building Standards Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Historical Building Code, California Fire Code, California Existing Building Code, [5]and the 2010 California Referenced Standards Code.

**THE CITY COUNCIL OF THE CITY OF CALABASAS DOES ORDAIN AS FOLLOWS:**

**SECTION 1.** The following sections of Article I of Chapter 15.04 of the Calabasas Municipal Code are hereby amended to read as follows:

[4] Revised November 8, 2010
[5] Revised November 8, 2010

## Article I California Building Code

### 15.04.010 2010 California Building Code adopted.

A. The 2010 California Building Code, together with the appendices, which regulate the erection, construction, enlargements, alteration, repair, moving, removal, conversion, demolition, occupancy, use, equipment, height, area, security, abatement, and maintenance of buildings or structures within the city, provide for the issuance of permits and collection of fees therefore, and provide for penalties for violation thereto, are hereby adopted by reference, and conflicting ordinances are hereby repealed.

B. All of the regulations, provisions, conditions, and terms of said codes, together with their appendices, one copy of which will be on file and accessible to the public for inspection at the City Clerk's office, are hereby referred to, adopted and made part of this chapter as if fully set forth in this chapter with the exceptions, deletions, additions, and amendments thereto as set forth in this subchapter.

**SECTION 2.** **15.04.020** of the Calabasas Municipal Code is hereby amended to read as follows:

### 15.04.020 Penalty.

Every person violating any provision of the 2010 California Building Code and appendices, adopted by reference by 15.04.010, or of any permit or license granted thereunder, or any rules or regulations promulgated pursuant thereto, is guilty of a misdemeanor. Upon conviction thereof, he or she shall be punishable by a fine not-to-exceed one thousand dollars ($1,000.00) or imprisonment not-to-exceed six months, or by both such fine and imprisonment. The imposition of such penalty for any violation shall not excuse the violation or permit it to continue. Each day that a violation occurs shall constitute a separate offense.

**SECTION 3.** Existing **15.04.030** Appendix Chapter 1 of the Calabasas Municipal Code is hereby deleted in its entirety, and replaced with a **new section 15.04.030** to be entitled **"Administrative Amendments."** The new section 15.04.030 shall read as follows:

The following sections of the California Building Code are amended, deleted or added to read as follows:

## SCOPE AND ADMINISTRATION

### SECTION 101
### GENERAL

**101 1 (a) Administrative Provisions**

The Administrative provisions delineated by Calabasas Municipal Code Section 15.04.30 are applicable to the Residential Building Code, Green Building Standards Code, Electrical Code, Mechanical Code, Plumbing Code, Energy Historic Code and Existing Building Code.

**101 (b) 1 Title.** These regulations shall be known as the *California Building Code of the State of California,* hereinafter referred to as "this code."

**101 (b) 2 Scope.** The provisions of this code shall apply to the construction, *alteration,* movement, enlargement, replacement, repair, equipment, used and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures.

**Exception:** Detached one-and two-family *dwellings* and multiple single-family *dwellings (townhouses)* not more than three *stories* above *grade plane* in height with a separate *means of egress* and their accessory structures shall comply with the *California Building Code.*

**101 (b) 2. 1 Appendices.** Provisions in the appendices shall not apply unless specifically adopted.

**101 (b) 3 Intent.** The purpose of this code is to establish the minimum requirements to safeguard the public health, safety and general welfare through structural strength, *means of egress* facilities, stability, sanitation, adequate light and ventilation, energy conservation, and safety to life and property from fire and other hazards attributed to the built environment and to provide safety to firefighters and emergency responders during emergency operations.

**101.4 Referenced codes.** The other codes listed in Sections 101.4.1 through 101.4.6 and referenced elsewhere in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference.

**101. 4.1 Gas.** The provisions of the *International Fuel Gas Code* shall apply to the installation of gas piping from the point of delivery, gas appliances and related accessories as covered in this code. These requirements apply to gas piping systems extending from the point of delivery to the inlet connections of appliances and the installation and operation of residential and commercial gas appliances and related accessories.

**101.4.2 Mechanical.** The provisions of the *International Mechanical Code* shall apply to the installation, alterations, repairs and replacement of mechanical systems, including equipment, appliances, fixtures, fittings and/or appurtenances, including ventilating, heating, cooling, air-conditioning and refrigeration systems, incinerators and other energy-related systems.

**101.4.3 Plumbing.** The provisions of the *International Plumbing Code* shall apply to the installation, *alteration,* repair and replacement of plumbing systems, including equipment, appliances, fixtures, fittings and appurtenances, and where connected to a water or sewage system and all aspects of a medical gas system. The provisions of the *International Private Sewage*

*Disposal Code* shall apply to private sewage disposal systems.

**101.4.4 Property maintenance.** The provisions of the *International Property Maintenance Code* shall apply to existing structures and premises; equipment and facilities; light, ventilation, space heating, sanitation, life and fire safety hazards; responsibilities of owners, operators and occupants; and occupancy of existing premises and structures.

**101.4.5 Fire prevention.** The provisions of the *International Fire Code* shall apply to matters affecting or relating to structures, processes and premises from the hazard of fire and explosion arising from the storage, handling or use of structures, materials or devices; from conditions hazardous to life, property or public welfare in the occupancy of structures or premises; and from the construction, extension, repair, *alteration* or removal of fire suppression and alarm systems or fire hazards in the structure or on the premises from occupancy or operation.

**101.4.6 Energy.** The provisions of the *California Energy Code, Title* 24, *Part* 6 shall apply to all matters governing the design and construction of buildings for energy efficiency.

***Exception:*** *[OSHPD* **1**,**2** & *4] Not required by OSHPD.*

## SECTION 102
## APPLICABILITY

**102.1 General.** Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable. Where, in any specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern.

***102.1.1 Additional requirements.*** *[OSHPD* **1**, **2**, **3**, & **4**, *DSA-SS* & *DSA-SS/CC] See Chapter I, Division I, Section 1.1.7.*

**102.2 Other laws.** The provisions of this code shall not be deemed to nullify any provisions of local, state or federal law.

**102.3 Application of references.** References to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

**102.4 Referenced codes and standards.** The codes and standards referenced in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.

***102.4.1 Code References.*** *[OSHPD* **1**, **2**, **3** & **4**, *DSA-SS* & *DSA-SS/CC] All reference to International Codes or other similar codes in referenced standards shall be replaced by equivalent provisions in the California Building Standard Codes.*

***102.4.2 Reference in Standards.*** *[OSHPD* **1**, **2**, **3** & **4**, *DSA-SS* & *DSA-SS/CC]*

*All references listed in reference standards shall be replaced by referenced standards listed in Chapter* 35 *of this code, where applicable, and shall include all amendments to the reference standards in this code.*

**102.5 Partial invalidity.** In the event that any part or provision of this code is held to be illegal or void, this shall not have the effect of making void or illegal any of the other parts or provisions.

**102.6 Existing structures.** The legal occupancy of any structure existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the *California Building Code* or the *California Fire Code,* or as is deemed necessary by the *building official* for the general safety and welfare of the occupants and the public.

## SECTION 103
## DEPARTMENT OF BUILDING SAFETY

**103.1 Creation of enforcement agency.** The Division of Building, Safety is hereby created and the official in charge thereof shall be known as the *building official.*

**103.2 Appointment.** The *building official* shall be appointed by the Community Development Director.

**103.3 Deputies.** In accordance with the prescribed procedures of this jurisdiction and with the concurrence of the appointing authority, the *building official* shall have the authority to appoint a deputy building official, the related technical officers, inspectors, plan examiners and other employees. Such employees shall have powers as delegated by the *building official.* For the maintenance of existing properties, see the *California Building Code.*

## SECTION 104
## DUTIES AND POWERS OF BUILDING OFFICIAL

**104.1 General.** The *building official* is hereby authorized and directed to enforce the provisions of this code. The *building official* shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures shall be in compliance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

**104.2 Applications and permits.** The *building official* shall receive applications, review *construction documents* and issue *permits* for the erection, and *alteration,* demolition and moving of buildings and structures, inspect the premises for which such *permits* have been issued and enforce compliance with the provisions of this code.

**104.3 Notices and orders.** The *building official* shall issue all necessary notices or orders to ensure compliance with this code.

**104.4 Inspections.** The *building official* shall make all of the required

inspections, or the *building official* shall have the authority to accept reports of inspection by *approved agencies* or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such *approved agency* or by the responsible individual. The *building official* is authorized to engage such expert opinion as deemed necessary to report upon unusual technical issues that arise, subject to the approval of the appointing authority.

**104.5 Identification.** The *building official* shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

**104.6 Right of entry.** Where it is necessary to make an inspection to enforce the provisions of this code, or where the *building official* has reasonable cause to believe that there exists in a structure or upon a premises a condition which is contrary to or in violation of this code which makes the structure or premises unsafe, dangerous or hazardous, the *building official* is authorized to enter the structure or premises at reasonable times to inspect or to perform the duties imposed by this code, provided that if such structure or premises be occupied that credentials be presented to the occupant and entry requested. If such structure or premises is unoccupied, the *building official* shall first make a reasonable effort to locate the owner or other person having charge or control of the structure or premises and request entry. If entry is refused, the *building official* shall have recourse to the remedies provided by law to secure entry.

**104.7 Department records.** The *building official* shall keep official records of applications received, *permits* and certificates issued, fees collected, reports of inspections, and notices and orders issued. Such records shall be retained in the official records for the period required for retention of public records.

**104.8 Liability.** The *building official,* member of the board of appeals or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered liable personally and is hereby relieved from personal liability for any damage accruing to persons or property as a result of any act or by reason of an act or omission in the discharge of official duties. Any suit instituted against an officer or employee because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by legal representative of the jurisdiction until the final termination of the proceedings. The *building official* or any subordinate shall not be liable for cost in any action, suit or proceeding that is instituted in pursuance of the provisions of this code

**104.9 Approved materials and equipment.** Materials, equipment and devices *approved* by the *building official* shall be constructed and installed in accordance with such approval.

**104.9.1 Used materials and equipment.** The use of used materials which meet the requirements of this code for new materials is permitted. Used equipment and devices shall not be reused unless *approved* by the *building official.*

**104.10 Modifications.** Wherever there are practical difficulties involved in carrying out the provisions of this code, the *building official* shall have the

authority to grant modifications for individual cases, upon application of the owner or owner's representative, provided the *building official* shall first find that special individual reason makes the strict letter of this code impractical and the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, accessibility, life and fire safety, or structural requirements. The details of action granting modifications shall be recorded and entered in the files of the department of building safety.

**104.11 Alternative materials, design and methods of construction and equipment.** The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved.* An alternative material, design or method of construction shall be *approved* where the *building official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire *resistance,* durability and safety.

**104.11.1 Research reports.** Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

**104.11.2 Tests.** Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the *building official* shall have the authority to require tests as evidence of compliance to be made at no expense to the jurisdiction. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the *building official* shall approve the testing procedures. Tests shall be performed by an *approved agency.* Reports of such tests shall be retained by the *building official* for the period required for retention of public records.

***104.11.3 Peer review. [OSHPD 1 & 4]*** *When peer review is required, it shall be performed pursuant to Section 3414A.*

***104.11.4 Earthquake monitoring instruments. [OSHPD 1 & 4]*** *The enforcement agency may require earthquake monitoring instruments for any building that receives approval of an alternative system for the Lateral Force Resisting System (LFRS). There shall be a sufficient number of instruments to characterize the response of the building during an earthquake and shall include at least one tri-axial free field instrument or equivalent. A proposal for instrumentation and equipment specifications shall be forwarded to the enforcement agency for review and approval. The Owner of the building shall be responsible for the implementation of the instrumentation program. Maintenance of the instrumentation and removal/processing of the records shall be the responsibility of the enforcement agency or its designated agent.*

**105.1 Permits Required.** All persons who intends to construct, enlarge, alter, move, demolish or change the occupancy of a building or structure, or to erect, install, enlarge, alter, repair, remove, convert or replace any electrical, gas, mechanical or plumbing system, component or device, the installation of which is regulated by the Technical Codes in Title 15 of the Calabasas Municipal Code, shall first make written application to the *building official* and obtain each required *permit.*

Whenever any work or installation has been commenced without a permit in violation of this section, a special investigation to identify the nature and extent of the unpermitted work or installation shall be made prior to the issuance of the permit. An investigation fee shall be paid in addition to customary fees for each permit prior to, or at the time of, the issuance of a permit or permits. Failure to pay a special investigation fee in full constitutes cause to deny the issuance of a permit or permits. The investigation fee shall be as specified by resolution of the City Council.

The payment of the investigation fee shall not exempt any person from compliance with all other provisions of the Calabasas Municipal Code, or from any penalty prescribed by law for failing to obtain each required permit.

Property bordering a parcel zoned Open-Space or Open-Space Development-Restricted. An application for a permit under this title for the construction or alteration of any structure to be located within ten (10) feet of a property zoned Open-Space or Open-Space Development-Restricted, as identified in the City's zoning map, shall not be complete unless accompanied by a survey prepared by a licensed land surveyor or another person authorized by law to conduct and prepare a survey. This survey shall be required to depict (i) the boundaries of the property, (ii) the work to be constructed, and (iii) the boundary of the property nearest the site of the work which is zoned Open-Space or Open-Space Development-Restricted, as identified in the City's zoning map. A survey is a construction document subject to all of the requirements and exceptions of Section 106 of the California Building Code. In addition to the foregoing, prior to the issuance of a building permit for any structure located within ten (10) feet of a property which is zoned Open Space or Open Space - Development Restricted, as identified in the City's zoning map, an applicant or property owner shall be required to perform a stake survey in the manner required by the Director. Any stakes installed to fulfill the foregoing requirement shall not be moved or removed and shall remain in place consistent with the stake survey until the completion of the work for which the permit issues."

**105.1.1 Annual permit.** In lieu of an individual *permit* for each *alteration* to an already *approved* electrical, gas, mechanical or plumbing installation, the *building official* is authorized to issue an annual *permit* upon application therefor to any person, firm or corporation regularly employing one or more qualified trade persons in the building, structure or on the premises owned or operated by the applicant for the *permit.*

**105.1.2 Annual permit records.** The person to whom an annual *permit* is issued shall keep a detailed record of *alterations* made under such annual *permit.* The *building official* shall have access to such records at all times or such records shall be filed with the *building official* as designated.

**105.2 Work exempt from permit.** A building permit shall not be required for the following:

**Building:**

1. One-story detached accessory buildings used as tool and storage sheds, playhouses and similar uses, provided that:

   A. The building is accessory to a dwelling unit.

   B. The building neither exceeds one hundred twenty (120) square feet (11.15 $m^2$) in roof area nor exceeds seven feet (2133 mm) in overall height.

   C. The building has no plumbing or electrical installations or fixtures.

   D. The building is separated from the dwelling or garage structure by a minimum of ten (10) feet (3048) and any other building or structure by a minimum of six feet (1829 mm).

2. Fences not over six feet (1829 mm) high.

   **Exception** 1: Solid walls or fences more than three feet (914 mm) above grade, within the required front yard setback.

   **Exception** 2: Non-retaining masonry fences or walls more than three feet (914 mm) above finished grade.

3. Oil derricks.

4. Retaining walls that are not over 4 feet (1219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge or impounding Class I, II or IIIA liquids.

5. Water tanks supported directly on grade if the capacity does not exceed 5,000 gallons (18 925 L) and the ratio of height to diameter or width does not exceed 2:1.

6. Sidewalks and driveways not more than 30 inches (762 mm) above adjacent grade, and not over any basement or *story* below and are not part of an *accessible route.*

7. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work.

8. Temporary motion picture, television and theater stage sets and scenery.

9. Prefabricated swimming pools accessory to a Group R-3 occupancy that are less than 24 inches (610 mm) deep, do not exceed 5,000 gallons (18 925 L) and are installed entirely above ground.

10. Shade cloth structures constructed for nursery or agricultural purposes,

not including service systems.

11. Swings and other playground equipment accessory to detached one-and two-family *dwellings.*

12. Window *awnings* supported by an *exterior wall* that do not project more than 54 inches (1372 mm) from the exterior wall and do not require additional support of Groups R-3 and U occupancies.

13. Nonfixed and movable fixtures, cases, racks, counters and partitions not over 5 feet 9 inches (1753 mm) in height.

**Electrical:**

**Repairs and maintenance:** Minor repair work, including the replacement of lamps or the connection of *approved* portable electrical equipment to *approved* permanently installed receptacles.

**Radio and television transmitting stations:** The provisions of this code shall not apply to electrical equipment used for radio and television transmissions, but do apply to equipment and wiring for a power supply and the installations of towers and antennas.

**Temporary testing systems:** A *permit* shall not be required for the installation of any temporary system required for the testing or servicing of electrical equipment or apparatus.

**R 1** *Listed* cord-and-plug connected temporary decorative lighting.

**R 2** Reinstallation of attachment plug receptacles but not the outlets therefor.

**R 3** Replacement of branch circuit overcurrent devices of the required capacity in the same location.

**Gas:**

1. Portable heating appliance.

2. Replacemen t of any minor part that does not alter approval of equipment or make such equipment unsafe.

**R 1** Portable heating, cooking or clothes drying *appliances.*

**R 2** Portable-fuel-cell *appliances* that are not connected to a fixed piping system and are not interconnected to a power grid

**Mechanical:**

1. Portable heating appliance.

2. Portable ventilation equipment.

3. Portable cooling unit.

4. Steam, hot or chilled water piping within any heating or cooling equipment regulated by this code.

5. Replacement of any part that does not alter its approval or make it unsafe.

6. Portable evaporative cooler.
7. Self-contained refrigeration system containing 10 pounds (5 kg) or less of refrigerant and actuated by motors of 1 horsepower (746 W) or less.

R 1 Portable heating, cooking or clothes drying *appliances.*

R 2 Portable-fuel-cell *appliances* that are not connected to a fixed piping system and are not interconnected to a power grid.

**Plumbing:**

1. The stopping of leaks in drains, water, soil, waste or vent pipe, provided, however, that if any concealed trap, drain pipe, water, soil, waste or vent pipe becomes defective and it becomes necessary to remove and replace the same with the new material, such work shall be considered as new work and a permit shall be obtained and inspection made as provided in this code.
2. The clearing of stoppages or the repairing of leaks in pipes, valves or fixtures and the removal and reinstallation of water closets, provided such repairs do not involve or require the replacement or rearrangement of valves, pipes or fixtures.

**105.2.1 Emergency repairs.** Where equipment replacements and repairs must be performed in an emergency situation, the *permit* application shall be submitted within the next working business day to the *building official.*

**105.2.2 Repairs.** Application or notice to the *building official* is not required for ordinary repairs to structures, replacement of lamps or the connection of *approved* portable electrical equipment to *approved* permanently installed receptacles. Such repairs shall not include the cutting away of any wall, partition or portion thereof, the removal or cutting of any structural beam or load-bearing support, or the removal or change of any required *means of egress,* or rearrangement of parts of a structure affecting the egress requirements; nor shall ordinary repairs include *addition to, alteration* of, replacement or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent or similar piping, electric wiring or mechanical or other work affecting public health or general safety.

**105.2.3 Public service agencies.** A *permit* shall not be required for the installation, *alteration* or repair of generation, transmission, distribution or metering or other related equipment that is under the ownership and control of public service agencies by established right.

**105.3 Application for permit.** To obtain a *permit,* the applicant shall first file an application therefor in writing on a form furnished by the department of building safety for that purpose. Such application shall:

1. Identify and describe the work to be covered by the *permit* for which application is made.
2. Describe the land on which the proposed work is to be done by legal description, street address or similar description that will readily identify

and definitely locate the proposed building or work.

3. Indicate the use and occupancy for which the proposed work is intended.
4. Be accompanied by *construction documents* and other information as required in Section 107.
5. State the valuation of the proposed work
6. Be signed by the applicant, or the applicant's authorized agent.
7. Give such other data and information as required by the building official.

**105.3.1 Action on application.** The *building official* shall examine or cause to be examined applications for *permits* and amendments thereto within a reasonable time after filing. If the application or the *construction documents* do not conform to the requirements of pertinent laws, the *building official* shall reject such application in writing, stating the reasons therefor. If the *building official* is satisfied that the proposed work conforms to the requirements of this code and laws and ordinances applicable thereto, the *building official* shall issue a *permit* therefor as soon as practicable.

**105.3.2 Time limitation of application.** An application for a permit for any proposed work shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been pursued in good faith or a permit has been issued; except that the building official may grant up to two extensions not exceeding 180 days per extension, beyond the initial 180-day limit upon written request by the applicant showing that circumstances beyond the control of the applicant have prevented action from being taken and upon the payment of an extension fee equal to 25 percent of the plan check fee.

Once an application and any extension(s) thereof have expired, the applicant shall resubmit plans and specifications and pay a new plan checking or review fee.

*[OSHPD* 1, 2, & 4] *Time limitation shall be in accordance with Title* 24, *Part* 1, *Chapter* 7, *Section 7-129.*

**105.4 Validity of permit.** The issuance or granting of a *permit* shall not be construed to be a *permit* for, or an approval of, any violation of any of the provisions of this code or of any other ordinance of the jurisdiction. Permits presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid. The issuance of a *permit* based on *construction documents* and other data shall not prevent the *building official* from requiring the correction of errors in the *construction documents* and other data. The *building official* is also authorized to prevent occupancy or use of a structure where in violation of this code or of any other ordinances of this jurisdiction.

**105.5 Expiration of a Permit –General** Except as set forth in Sections 105.5.1 and 105.5.2, every permit issued for property *within the city* shall expire by limitation and become null and void as follows:

(i) If work authorized by such permit is not commenced within 180 days from the issuance date of such permit.

(ii) If work authorized by such permit is commenced within 180 days from the issuance date of such permit, such permit shall expire by limitation and become null-and-void 180 days after the date of the last successful inspection by the Building and Safety Division. For purposes of this subsection, "successful inspection" shall mean a required inspection (as identified in Section 110 of this code, or otherwise determined to be necessary by the Building Official) in which work inspected was determined by the Building Official or a designee thereof, to meet all applicable minimum code requirements and the inspection was documented as successful.

(iii) Notwithstanding any provision in Subparts 105.5.1 and 105.5.2, no permit shall be extended, and therefore, no permit shall be valid, for any period exceeding two (2) years from the original date of issuance.

In the event of permit expiration, before work authorized pursuant by the expired permit can be commenced or recommenced, a new permit shall first be obtained (hereinafter, a "renewal permit). To obtain a renewal permit, the applicant may be required to resubmit plans and specifications, if deemed necessary by the Building Official and/or City Planner. The applicant must pay all applicable fees, including but not limited to, a plan check fee and building permit fees, in the amount then established by resolution of the City Council. If renewal permits are applied for, a mandatory site inspection shall be performed by the Building and Safety Division and an inspection fee paid by the applicant to determine compliance of existing conditions and materials with this Code. All work to be performed under a renewal permit must be performed in accordance with all applicable technical codes, regulations, laws, and ordinances in effect on the date of issuance of the renewal permit.

Permits for portable amusement devices and for temporary Group A-4 or Group A-5 structures shall be valid for a period not exceeding 30 days. Permits for amusement devices erected under a building permit shall be valid for a period of 90 days.

**105.5.1 Expiration of Demolition Permit.** Notwithstanding any provision of Section 105.5, a demolition permit shall expire by limitation and become null and void 60 days after the date on which the permit was issued. The Building Official may extend the validity of the permit for a period not exceeding 180 days beyond the initial 60-day limit upon written request by the applicant filed with the Building Official prior to the expiration date of the original permit.

**105.5.2 Expiration of permit for unpermitted structures.** Notwithstanding any provision of Section 105.5, if a building permit is issued in order to bring an unpermitted building or structure or other unlawful, substandard, or prohibited condition therein into compliance with any applicable law, ordinance, rule or regulation, such permit shall expire by limitation and become null and void 60 days after the date on which the permit was issued. The building official may

extend the validity of the permit in writing for a period not exceeding 180 days beyond the initial 60-day limit upon written request by the applicant filed with the Building Official prior to the expiration date of the original permit. The time limitations herein shall also apply to permits issued for plumbing, mechanical or electrical work and installations that were initially undertaken without each required permit.

**105.6 Suspension or revocation.** The *building official* may, in writing, suspend or revoke a permit issued under the provisions of this code, or other relevant laws, ordinances, rules, or regulations, whenever the permit is issued in error or on the basis of incorrect information supplied, or in violation of any ordinance or regulation of any of the provisions of this Code.

The building official may also, in writing, withhold inspections or approvals, or suspend or revoke a permit, where work is being performed in violation of approved plans, conditions of any permit, or applicable laws, and/or where work is being concealed without approval from the Building Official, and/or where work is not in accordance with the direction of the Building Official.

**105.7 Placement of permit.** The building *permit* or copy shall be kept on the site of the work until the completion of the project.

## SECTION 106
## FLOOR AND ROOF DESIGN LOADS

**106.1 Live loads posted.** Where the live loads for which each floor or portion thereof of a commercial or industrial building is or has been designed to exceed 50 psf (2.40 *kN/m2),* such design live loads shall be conspicuously posted by the owner in that part of each *st01Y* in which they apply, using durable signs. It shall be unlawful to remove or deface such notices.

***106.1.1 Snow Load Posting.*** *[OSHPD* 1,2,3 & 4, II
***DSA-SS & DSA-SS/CC]*** *Snow loads used in design shall be posted as for live loads.*

***106.1.2 Load Posting Responsibility.*** *[OSHPD* 1, 2 & 4] II
*The owner or governing board shall be responsible for keeping the actual load below the allowable limits.*

**106.2 Issuance of certificate of occupancy.** A certificate of occupancy required by Section 111 shall not be issued until the floor load signs, required by Section 106.1, have been installed.

**106.3 Restrictions on loading.** It shall be unlawful to place, or cause or permit to be placed, on any floor or roof of a building, structure or portion thereof, a load greater than is permitted by this code.

## SECTION 107
## SUBMITTAL DOCUMENTS

**107.1 General.** Submittal documents consisting of *construction documents,* statement of *special inspections,* geotechnical report and other data shall be submitted in two or more sets with each *permit* application. The *construction documents* shall be prepared by a *registered design professional* where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the *building official* is authorized to require additional *construction documents* to be prepared by a *registered design professional.*

Exception: The *building official* is authorized to waive the submission of *construction documents* and other data not required to be prepared by a *registered design professional* if it is found that the nature of the work applied for is such that review of *construction documents* is not necessary to obtain compliance with this code.

**107.2 Construction documents.** *Construction documents* shall be in accordance with Sections 107.2.1 through 107.2.5.

**107.2.1 Information on construction documents.** *Construction documents* shall be dimensioned and drawn upon suitable material. Electronic media documents are permitted to be submitted when *approved* by the *building official. Construction documents* shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the *building official.*

**107.2.2 Fire protection system shop drawings.** Shop drawings for the *fire protection system(s)* shall be submitted to indicate conformance to this code and the *construction documents* and shall be *approved* prior to the start of system installation. Shop drawings shall contain all information as required by the referenced installation standards in Chapter 9.

**107.2.3 Means of egress.** The *construction documents* shall show in sufficient detail the location, construction, size and character of all portions of the *means of egress* in compliance with the provisions of this code. In other than occupancies in Groups R-2, R-3, and I-I, the *construction documents* shall designate the number of occupants to be accommodated on every floor, and in all rooms and spaces.

**107.2.4 Exterior wall envelope.** *Construction documents* for all buildings shall describe the *exterior wall envelope* in sufficient detail to determine compliance with this code. The *construction documents* shall provide details of the *exterior wall envelope* as required, including flashing, intersections with dissimilar materials, corners, end details, control joints, intersections at roof, eaves or parapets, means of drainage, water-resistive membrane and details around openings.

The *construction documents* shall include manufacturer's installation instructions that provide supporting documentation that the proposed penetration and opening details described in the *construction documents* maintain the weather resistance of the *exterior wall envelope.* The supporting documentation shall fully describe the *exterior wall* system which was tested,

where applicable, as well as the test procedure used.

**107.2.5 Site plan.** The *construction documents* submitted with the application for *permit* shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from *lot lines,* the established street grades and the proposed finished grades and, as applicable, flood hazard areas, floodways, and *design flood* elevations; and it shall be drawn in accordance with an accurate boundary line survey. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot. The *building official* is authorized to waive or modify the requirement for a site plan when the application for *permit* is for *alteration* or repair or when otherwise warranted.

**107.2.5.1 Design flood elevations.** Where *design flood* elevations are not specified, they shall be established in accordance with Section 1612.3.1.

**107.3 Examination of documents.** The *building official* shall examine or cause to be examined the accompanying submittal documents and shall ascertain by such examinations whether the construction indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

**107.3.1 Approval of construction documents.** When the *building official* issues a *permit,* the *construction documents* shall be *approved,* in writing or by stamp, as "Reviewed for Code Compliance." One set of *construction documents* so reviewed shall be retained by the *building official.* The other set shall be returned to the applicant, shall be kept at the site of work and shall be open to inspection by the *building official* or a duly authorized representative.

**107.3.2 Previous approvals.** This code shall not require changes in the *construction documents,* construction or designated occupancy of a structure for which a lawful *permit* has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

**107.3.3 Phased approval.** The *building official* is authorized to issue a *permit* for the construction of foundations or any other part of a building or structure before the *construction documents* for the whole building or structure have been submitted, provided that adequate information and detailed statements have been filed complying with pertinent requirements of this code. The holder of such *permit* for the foundation or other parts of a building or structure shall proceed at the holder's own risk with the building operation and without assurance that a *permit* for the entire structure will be granted.

**107.3.4 Design professional in responsible charge.**

**107.3.4.1 General.** When it is required that documents be prepared by a *registered design professional,* the *building official* shall be authorized to require the owner to engage and designate on the building *permit* application a *registered design professional* who shall act as the *registered design professional in responsible charge.* If the circumstances require, the owner shall designate a substitute *registered design professional in responsible*

*charge* who shall perform the duties required of the original *registered design professional in responsible charge.* The *building official* shall be notified in writing by the owner if the *registered design professional in responsible charge* is changed or is unable to continue to perform the duties.

The *registered design professional in responsible charge* shall be responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building.

**107.3.4.2 Deferred submittals.** For the purposes of this section, deferred submittals are defined as those portions of the design that are not submitted at the time of the application and that are to be submitted to the *building official* within a specified period.

Deferral of any submittal items shall have the prior approval of the *building official.* The *registered design professional in responsible charge* shall list the deferred submittals on the *construction documents* for review by the *building official.* Documents for deferred submittal items shall be submitted to the *registered design professional in responsible charge* who shall review them and forward them to the *building official* with a notation indicating that the deferred submittal documents have been reviewed and been found to be in general conformance to the design of the building. The deferred submittal items shall not be installed until the deferred submittal documents have been *approved by the building official. [OSHPD 1, 2, & 4] Deferred submittals shall be in accordance with Title* 24, *Part* 1, *Chapter* 7, *Section* 7-126.

**107.4 Amended construction documents.** Work shall be installed in accordance with the *approved construction documents,* and any changes made during construction that are not in compliance with the *approved construction documents* shall be resubmitted for approval as an amended set of *construction* documents. *[OSHPD 1,2 & 4] Change in the work shall be in accordance with Title* 24, *Part* 1, *Chapter* 7, *Section 7-153.*

**107.5 Retention of construction documents.** One set of *approved construction documents* shall be retained by the *building official* for a period of not less than 180 days from date of completion of the permitted work, or as required by state or local laws.

## SECTION 108
## TEMPORARY STRUCTURES AND USES

**108.1 General.** The *building official* is authorized to issue a *permit* for temporary structures and temporary uses. Such *permits* shall be limited as to time of service, but shall not be permitted for more than 180 days. The *building official* is authorized to grant extensions for demonstrated cause.

**108.2 Conformance.** Temporary structures and uses shall conform to the structural strength, fire safety, *means of egress,* accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure public health, safety and general welfare.

**108.3 Temporary power.** The *building official* is authorized to give permission to temporarily supply and use power in part of an electric installation before such installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in NFPA 70.

**108.4 Termination of approval.** The *building official* is authorized to terminate such *permit* for a temporary structure or use and to order the temporary structure or use to be discontinued.

## SECTION 109 FEES

**109.1 Payment of** fees. A *permit* shall not be valid until the fees prescribed by law have been paid, nor shall an amendment to a *permit* be released until the additional fee, if any, has been paid.

**109.2 Schedule of permit** fees. The fee for each permit shall be as set forth in the City of Calabasas Building Permit Fee Schedule. Such fees shall be established, and may be amended from time to time, by resolution of the City Council. The determination of value or valuation under any of the provisions of this chapter shall be made by the building official whose determination shall be final. The value is to be utilized in computing the permit and plan review fees established pursuant to this chapter and shall be the total value of all construction work for which the permit is issued including, by way of illustration and not by limitation, finish work, painting, roofing, electrical, plumbing, heating, air conditioning, elevators, fire-extinguishing systems and any other permanent equipment.

**109.3 Building permit valuations.** The applicant for a *permit* shall provide an estimated *permit* value at time of application. *Permit* valuations shall include total value of work, including materials and labor, for which the *permit* is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. If, in the opinion of the *building official,* the valuation is underestimated on the application, the *permit* shall be denied, unless the applicant can show detailed estimates to meet the approval of the *building official.* Final building *permit* valuation shall be set by the *building official.*

**109.4 Work commencing before permit issuance.** Special investigation fees, as required by Subsection 105.1 shall be due for any unpermitted work or installations that occurred, whether to buildings, structures, land, or in connection with electrical, mechanical or plumbing systems or installations. Special investigation fees shall be due in addition to permit fees

**109.5 Related** fees. The payment of the fee for the construction, *alteration,* removal or demolition for work done in connection to or concurrently with the work authorized by a building *permit* shall not relieve the applicant or holder of the *permit* from the payment of other fees that are prescribed by law.

**109.6 Refunds.** In the event that any person shall have obtained a permit and no portion of the work or construction covered by such permit shall have been commenced, and such permit shall have been canceled *or expired,* the

permittee, upon presentation to said building official of a request therefore, in writing on a special form, may be entitled to a refund in an amount equal to 80 percent of the fee actually paid for such permit.

Upon verification of eligibility, the building official may refund the applicable amount, provided the request has been submitted no later than one year after the cancellation or expiration of the permit and that the permittee was the payor of said permit fees.

No portion of the plan checking fee shall be refunded, unless no checking has been performed on a set of plans, in which case 80 percent of the plan checking fee may be refunded.

**109.7 Noncompliance Fee.** If the building official or duly authorized board, in the course of enforcing the provisions of this code or any state law, issued an order to a person and that person fails to comply with the order within 15 days following the due date for compliance stated in the order, including any extensions thereof, then the building official shall have the authority to collect a noncompliance fee.

The noncompliance fee shall not be imposed unless the order states that a failure to comply within 15 days after the compliance date specified in the order will result in the fee being imposed. No more than one such fee shall be collected for failure to comply with an order. The amount of the noncompliance fee shall be paid as required, in accordance with the schedule as established by the applicable governing authority.

**109.8 Plan Checking or Review Fees for Building or Structures.** The building official may require additional charges for review required by complexity of plans or changes, additions or revisions of approved plans or reports, and for services beyond the first and second check due to changes, omissions or errors on the part of the applicant. The payment of said fees shall not exempt any person from compliance with other provisions of this code.

## SECTION 110
## INSPECTIONS

**110.1 General.** Construction or work for which a *permit* is required shall be subject to inspection by the *building official* and such construction or work shall remain accessible and exposed for inspection purposes until *approved.* Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the *permit* applicant to cause the work to remain accessible and exposed for inspection purposes. Neither the *building official* nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

**110.2 Preliminary inspection.** Before issuing a *permit,* the *building official* is

authorized to examine or cause to be examined buildings, structures and sites for which an application has been filed.

**110.3 Required inspections.** The *building official,* upon notification, shall make the inspections set forth in Sections 110.3.1 through 110.3.10.

**110.3.1 Footing and foundation inspection.** Footing and foundation inspections shall be made after excavations for footings are complete and any required reinforcing steel is in place. For concrete foundations, any required forms shall be in place prior to inspection. Materials for the foundation shall be on the job, except where concrete is ready mixed in accordance with ASTM C 94, the concrete need not be on the job.

**110.3.2 Concrete slab and under-floor inspection.** Concrete slab and under-floor inspections shall be made after in-slab or under-floor reinforcing steel and building service equipment, conduit, piping accessories and other ancillary equipment items are in place, but before any concrete is placed or floor sheathing installed, including the subfloor.

**110.3.3 Lowest floor elevation.** In flood hazard areas, upon placement of the lowest floor, including the basement, and prior to further vertical construction, the elevation certification required in Section 1612.5 shall be submitted to the *building official.*

**110.3.4 Frame inspection.** Framing inspections shall be made after the roof deck or sheathing, all framing, *fireblocking* and bracing are in place and pipes, chimneys and vents to be concealed are complete and the rough electrical, plumbing, heating wires, pipes and ducts are *approved.*

**110.3.5 Lath and gypsum board inspection.** Lath and gypsum board inspections shall be made after lathing and gypsum board, interior and exterior, is in place, but before any plastering is applied or gypsum board joints and fasteners are taped and finished.

**Exception:** Gypsum board that is not part of a fire-resistance-rated assembly or a shear assembly.

**110.3.6 Fire-and smoke-resistant penetrations.** Protection of joints and penetrations in fire-resistance-rated assemblies, *smoke barriers* and smoke partitions shall not be concealed from view until inspected and *approved.*

**110.3.7 Energy efficiency inspections.** Inspections shall be made to determine compliance with Chapter 13 and shall include, but not be limited to, inspections for: envelope insulation *R*-and U-values, fenestration U-value, duct system R-value, and HVAC and water-heating equipment efficiency.

**110.3.8 Other inspections.** In addition to the inspections specified above, the *building official* is authorized to make or require other inspections of any construction work to ascertain compliance with the provisions of this code and other laws that are enforced by the department of building safety.

**110.3.9 Special inspections.** For *special inspections,* see Section 1704.

**110.3.10 Final inspection.** The final inspection shall be made after all work required by the building *permit* is completed.

**110.4 Inspection agencies.** The *building official* is authorized to accept reports of *approved* inspection agencies, provided such agencies satisfy the requirements as to qualifications and reliability.

**110.5 Inspection requests.** It shall be the duty of the holder of the building *permit* or their duly authorized agent to notify the *building official* when work is ready for inspection. It shall be the duty of the *permit* holder to provide access to and means for inspections of such work that are required by this code.

**110.6 Approval required.** Work shall not be done beyond the point indicated in each successive inspection without first obtaining the approval of the *building official.* The *building official,* upon notification, shall make the requested inspections and shall either indicate the portion of the construction that is satisfactory as completed, or notify the *permit* holder or his or her agent wherein the same fails to comply with this code. Any portions that do not comply shall be corrected and such portion shall not be covered or concealed until authorized by the *building official.*

## SECTION R110
## INSPECTIONS

**R110.1 Types of inspections.** For onsite construction, from time to time the *building official,* upon notification from the *permit holder* or his agent, shall make or cause to be made any necessary inspections and shall either approve that portion of the construction as completed or shall notify the *permit holder* or his or her agent wherein the same fails to comply with this code. *The enforcing agency upon notification of the permit holder or their agent shall within a reasonable time make the inspections set forth in Sections R109.1.1, R109.1.1.1, R109.1.3, R109.1.4, R109.1.4.1, R109.1.5, R109.1.5.1, R109.1.5.2 and R109.1.6.*

***Note:*** *Reinforcing steel or structural framework of any part of any building or structure shall not be covered or concealed without first obtaining the approval of the enforcing agency.*

**R110.1.1 Foundation inspection.** Inspection of the foundation *and footings* shall be made after poles or piers are set I I or trenches or *basement* areas are excavated and any required forms erected and any required reinforcing steel is in place and supported prior to the placing of concrete. The foundation *or footing* inspection shall include excavations I I for thickened slabs intended for the support of bearing walls, partitions, structural supports, or *equipment* and special requirements for wood foundations. *Materials for the foundation shall be on the job site except where concrete is ready-mixed in accordance with ASTM* C 94. *Under this circumstance concrete is not required to be at the job site.*

***R110.1.1.1 Concrete slab and under-floor inspection.*** *Concrete slab and under-floor inspections shall be made after in-slab or under-floor reinforcing steel and building service equipment, conduits, piping or other ancillary*

*building trade products or equipment are installed, but before any concrete is placed or floor sheathing is installed, including the sub floor.*

**R110.1.2 Plumbing, mechanical, gas and electrical systems inspection.** Rough inspection of plumbing, mechanical, gas and electrical systems shall be made prior to covering or concealment, before fixtures or *appliances* are set or installed, and prior to framing inspection.

Exception: Back-filling of ground-source heat pump loop systems tested in accordance with Section M2105. 1 prior to inspection shall be permitted.

**R110.1.3 Floodplain inspections.** For construction in areas prone to flooding as established by Table R301.2(1), upon placement of the lowest floor, including *basement,* and prior to further vertical construction, the *building official* shall require submission of documentation, prepared and sealed by a registered *design professional,* of the elevation of the lowest floor, including *basement,* required in Section R322.

**R110.1.4 Frame and masonry inspection.** Inspection of framing and masonry construction shall be made after the roof, masonry, all framing, firestopping, draftstopping and bracing are in place and after *chimneys and vents to be concealed are completed and the rough electrical, plumbing, heating wires, pipes and ducts are approved.*

*R110.1.4.1 Lath and gypsum board inspection. Lath and gypsum board inspections shall be made after lathing and gypsum board, interior and exterior;* is in *place, but before any plastering is applied or gypsum board joints and fasteners are taped and finished.*

**R110.1.5** Other inspections. In addition to the called inspections above, the *building official* may make or require any other inspections to ascertain compliance with this code and other laws enforced by the *building official.*

## SECTION 111
## CERTIFICATE OF OCCUPANCY

**111.1 Use and occupancy.** No building or structure shall be used or occupied, and no change in the existing occupancy classification of a building or structure or portion thereof shall be made, until the *building official* has issued a certificate of occupancy therefor as provided herein. Issuance of a certificate of occupancy shall not be construed as an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction.

**Exception:** Certificates of occupancy are not required for work exempt from *permits* under Section 105.2.

**111.1.1 Unpermitted Structures** No person shall own, use, occupy, or maintain an unpermitted structure. For purposes of this subsection, "unpermitted structure" shall be defined as any building or structure, or portion thereof, that was erected, constructed, enlarged, altered, repaired, moved, improved, removed, connected, converted, demolished, or equipped with regulated devices, fixtures or installations, at any point in time by any person, without the required permit(s) having first been obtained from the Building

Official, or with a valid permit as issued by the Building Official which subsequently expired and became null and void. An unpermitted structure also includes one for which a building permit has been suspended or revoked.

**111.2 Certificate issued.** After the *building official* inspects the building or structure and finds no violations of the provisions of this code or other laws that are enforced by the department of building safety, the *building official* shall issue a certificate of occupancy that contains the following:

1. The building *permit* number.
2. The address of the structure.
3. The name and address of the owner.
4. A description of that portion of the structure for which the certificate is issued.
5. A statement that the described portion of the structure has been inspected for compliance with the requirements of this code for the occupancy and division of occupancy and the use for which the proposed occupancy is classified.
6. The name of the *building official.*
7. The edition of the code under which the *permit* was issued.
8. The use and occupancy, in accordance with the provisions of Chapter 3.
9. The type of construction as defined in Chapter 6.
10. The design *occupant load.*
11. If an *automatic sprinkler system* is provided, whether the sprinkler system is required.
12. Any special stipulations and conditions of the building *permit.*

**111.3 Temporary occupancy. Issuance of Temporary Certificate of Occupancy.** The Building Official may, in writing, authorize a temporary certificate of occupancy of any building or structure, or portion thereof, that lacks a permanent certificate of occupancy for any reason, provided patent conditions in open and accessible portions of the building or structure do not reveal a substantial hazard to an occupant or occupants.

Applications for a temporary certificate of occupancy shall be on a city-approved form. Such applications shall be accompanied by a fee to process the application and for the inspection of the building or structure to determine its suitability for a temporary certificate of occupancy. Such fees shall be established by the City Council by resolution.

A temporary certificate of occupancy is valid for a period of time to be specified by the Building Official in the certificate. The city attorney may require applicants for a temporary certificate of occupancy to execute an indemnification, as approved by the city attorney, in favor of the city and its employees as a prerequisite to receiving a temporary certificate of occupancy.

The Building Official may extend the period of a temporary certificate of occupancy in writing, as well as impose conditions thereto. Property owners

shall acknowledge and agree to said conditions in writing. The breach of any condition thereof shall render a temporary certificate of occupancy null and void without further action by the city. In such event, the owners shall cause all use and occupancy of the building or structure to be terminated by a date required by the Building Official. Use or occupancy of a building or structure, or allowing the use or occupancy of a building or structure, with an expired a temporary certificate of occupancy is a violation of this code and unlawful. Failing to cause the termination of all uses and occupancy in a structure after a termination date is a violation of this code and unlawful. The boards established by Section 1.8.7 do not have jurisdiction to consider, decide or rule pertaining to the issuance, expiration or nullification of a temporary certificate of occupancy, or with regard to any other matter relating thereto.

**111.4 Revocation.** The Building Official may, in writing, suspend or revoke a certificate of occupancy whenever the Building Official determines that the certificate was issued in error, or on the basis of incorrect information supplied, or when it is determined that the building, structure or premises, or portion thereof, is in violation of any provision of this code, or other relevant laws, ordinances, rules and/or regulations. Use or occupancy of a building or structure, or allowing the use or occupancy of a building or structure, with a suspended or revoked certificate of occupancy is a violation of this code and unlawful. The boards established by Section 1.8.7 do not have jurisdiction to consider, decide or rule pertaining to the issuance, suspension or revocation of a certificate of occupancy, or with regard to any other matter relating thereto.

## SECTION 112
## SERVICE UTILITIES

**112.1 Connection of service utilities.** No person shall make connections from a utility, source of energy, f uel or power to any building or system that is regulated by this code for which a *permit* is required, until released by the *building official.*

**112.2 Temporary connection.** The *building official* shall have the authority to authorize the temporary connection of the building or system to the utility source of energy, fuel or power.

**112.3 Authority to disconnect service utilities.** The powers granted the Building Official pursuant to this subsection extend to all buildings, structures or systems (including electrical, plumbing and mechanical) that are regulated by this code. This subsection supersedes all similar provisions in other codes that are part of Title 15 of the Calabasas Municipal Code.

**112.3.1 Authority to Disconnect Electric Utility.** The Building Official is hereby empowered to disconnect or to require in writing the discontinuance of electric utility service to buildings, structures or premises, or portions thereof, or to wiring, devices or materials where such buildings, structures or premises, or portions thereof, are determined to be a hazard to life, health and/or property, or where they lack permits and required inspection approvals.

The Building Official is hereby empowered to disconnect or to require in writing the discontinuance of electric utility service as a means of preventing, restraining, correcting or abating any violation of this code, or other relevant laws, ordinances, rules or regulations.

The electrical service shall remain disconnected or electrical utility service shall remain discontinued until the code violation has been abated to the satisfaction of the Building Official, or until the installation of such wiring, devices or materials have been made safe as directed by the Building Official; or until a permit has been issued and the work has been inspected and approved by the Building Official.

**112.3.2 Authority to Disconnect Gas Utility**
The Building Official is hereby empowered to disconnect or to require in writing the discontinuance of gas utility service to buildings, structures or premises, or portions thereof, or to appliances, devices or materials where such buildings, structures or premises, or portions thereof, are determined to be a hazard to life, health and/or property, or where they lack permits and required inspection approvals.

The Building Official is hereby empowered to disconnect or to require in writing the discontinuance of gas utility service as a means of preventing, restraining, correcting or abating any violation of this code, or other relevant laws, ordinances, rules or regulations.

The gas service shall remain disconnected or gas utility service shall remain discontinued until the code violation has been abated to the satisfaction of the Building Official, or until the installation of such appliances, devices or materials have been made safe as directed by the Building Official; or until a permit has been issued and the work has been inspected and approved by the Building Official.

**112.3.3 Authority to Disconnect Water Utility.** The Building Official is hereby empowered to disconnect or to require in writing the discontinuance of water utility service to buildings, structures or premises, or portions thereof, or to fixtures, devices or materials where such buildings, structures or premises, or portions thereof, are determined to be a hazard to life, health, property or to the environment, or where they lack permits and required inspection approvals.

The Building Official is hereby empowered to disconnect or to require in writing the discontinuance of water utility service as a means of preventing, restraining, correcting or abating any violation of this code, or other relevant laws, ordinances, rules or regulations.

The water service shall remain disconnected or water utility service shall remain discontinued until the code violation has been abated to the satisfaction of the Building Official, or until the installation of such appliances, devices or materials have been made safe as directed by the Building Official; or until a permit has been issued and the work has been inspected and

approved by the Building Official.

**Section 112.3.4** The powers granted the Building Official pursuant to this section 112.3 may be exercised only when the utility service or services to be disconnected create a dangerous condition by virtue of any violation of Chapter 15.04 of the Calabasas Municipal Code. The Building Official shall notify the serving utility, and whenever possible the owner and occupant of the building, structure or service system of the decision to disconnect prior to taking such actions.

## SECTION 113
## BOARD OF APPEALS.

**113.1 General.** In order to hear and decide appeals of orders, decisions, or determinations of the *building official* regarding materials or methods of construction, the City Council shall appoint upon nomination of the City Manager a Board of Appeals under this code with appropriate technical qualifications. Notwithstanding any other provisions of this Chapter 15.04, this Section 113 and Section K13(F)(6) of Appendix K of the 2010 California Plumbing Code provide the sole administrative appeals authorized by this chapter.

**113.2. Limitations on Authority.**

(a) An application for appeal shall be based on a claim that a decision of the building official to prohibit the use of materials or methods of construction reflects one of the following errors: (i) the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, (ii) the provisions of this code do not fully apply according to their terms, or (iii) the materials or methods of constructions proposed are equally well or better suited to accomplish the purposes of this code than those otherwise required by this code.

(b) The Board of Appeals shall have no authority to: (i) waive the requirements of this code, (ii) to consider, decide or rule on the existence or nonexistence of any activity, condition, or use involving real property and/or any structure and other improvements on real property that the building official or another authorized agent of the city has determined to violate Title 15 or any other provision of the Calabasas Municipal Code, or (iii) consider, decide or rule whether persons are or are not responsible for violations of the Calabasas Municipal Code or public nuisances or what actions are required by responsible persons to correct or abate violations of the Calabasas Code or public nuisances.

(c) The limitations of this section 113.2 shall apply equally to any appellate body established by the Electrical, Mechanical or Plumbing Codes of the City.

**113.3 Procedures.** A person seeking an appeal under this Section 113 shall file an appeal on a form furnished by the building official and pay an appeal fee in an amount established from time to time by resolution of the City Council. That fee shall be sufficient to cover the cost of the building official's obtaining a written interpretation of relevant provisions of this Title 15 by the International Code Council or any successor thereto. The Board of Appeals may, after hearing, adopt that written interpretation as the decision of the Board. If the Board of Appeals does not adopt that written interpretation, it shall state its reasoning in writing. The Board may establish, by a regulation published in the manner required of ordinances of the City Council, procedures for the conduct of appeals under this Section 113 and until it shall do so, the appeal provisions of Section 116.2 of this code shall apply. Judicial review of a decision of the Board of Appeal under this Section 113 may be had pursuant to Code of Civil Procedure Section 1094.5. Judicial review of any decision of the building official not subject to appeal under this Section 113 may be had pursuant to Code of Civil Procedure Section 1085.

## SECTION 114
## VIOLATIONS

**114.1 Unlawful acts.** It is unlawful for any property owner and/or other responsible person to erect, construct, alter, extend, repair, move, remove, demolish, or occupy any building or structure, ~~or~~ as well as any regulated equipment, system or installation, or cause or allow the same to be done, in conflict with this code. It is unlawful for any for any property owner and/or other responsible person to maintain, whether due to action or inaction, any building or structure, as well as any regulated equipment, system or installation in violation of this code

**114.2 Notice of violation.** The *building official* is authorized to serve a notice of violation or order on the person responsible for the erection, construction, *alteration,* extension, repair, moving, removal, demolition or occupancy of a building or structure in violation of the provisions of this code, or in violation of a *permit* or certificate issued under the provisions of this code. Such order shall direct the discontinuance of the illegal action or condition and the abatement of the violation.

**114.3 Prosecution of violation.** If the notice of violation is not complied with promptly, the *building official* is authorized to request the legal counsel of the jurisdiction to institute the appropriate proceeding at law or in equity to restrain, correct or abate such violation, or to require the removal or termination of the unlawful occupancy of the building or structure in violation of the provisions of this code or of the order or direction made pursuant thereto.

**114.4 Violation penalties.** Any person who violates a provision of this, code or fails to comply with any of the requirements thereof or who erects, constructs, alters or repairs a building or structure in violation of the *approved construction documents* or directive of the *building official,* or of a *permit* or certificate issued under the provisions of this code, shall be subject to penalties as prescribed by law.

## SECTION 115
## STOP WORK ORDER

**115.1 Authority.** Whenever the *building official* finds any work regulated by this code being performed in a manner either contrary to the provisions of this code or dangerous or unsafe, the *building official* is authorized to issue a stop work order.

**115.2 Issuance.** The stop work order shall be in writing and shall be given to the owner of the property involved, or to the owner's agent, or to the person doing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order, and the conditions under which the cited work will be permitted to resume.

**115.3 Unlawful continuance.** Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to penalties as prescribed by law.

## SECTION 116
## UNSAFE STRUCTURES OR INSTALLATIONS THEREIN

**116.1 Unsafe Structures or Installations Therein** Any building or structure that has any or all of the conditions hereinafter described shall constitute an unsafe or dangerous building or structure:

(a) Structural inadequacies, damage, deficiencies, defects or deterioration, as well as nearby hazardous embankments or excavations, that could cause a building or structure to partially or completely collapse or fail.

(b) Electrical, plumbing or mechanical work or installations, which because of a defect in materials or installation, or due to some other faulty operating or other condition, pose a risk of explosion or fire.

(c) Unsanitary or unhealthful conditions that are present in a building or structure.

(d) All forms of construction, as well as electrical, plumbing or mechanical work, systems, fixtures, appliances or other installations for which all required permits and inspection approvals have not been obtained from the Building Official.

(e) Occupancy or use for which a building or structure was not designed or intended, or that results in a change in the occupancy classification thereof.

(f) Inadequate egress from a building or structure.

(g) A vacant building or structure that is not secured against unauthorized entry.

(h) Any condition that violates any regulation in Title 15 of the Calabasas Municipal Code.

Any or all of the foregoing conditions endanger the health, safety or welfare of occupants, persons who may enter the premises, or the public.

**116.2 Orders to Vacate.** Notwithstanding any other provision of this code, if the building official or a designee thereof, determines a condition is present in a building or structure or on premises that constitutes an immediate danger or hazard to the health, safety or welfare of occupants or to the public, the Building Official may order persons to vacate buildings, structures, premises, or portions thereof. Such orders may include orders to not re-enter, as well authorize limited entry subject to written conditions. Conditions may include, but not be limited to, requiring buildings, structures and premises to be secured from entry or access by means that are acceptable to the Building Official. Orders shall advise persons of their appeal rights as discussed in this subsection.

Orders may be personally served on an occupant, or served by first class mail and posted on the premises containing the immediate danger or hazard. If an owner does not occupy said premises, a copy of the order shall be also sent by first class mail to the owner as identified by Los Angeles County Assessor records. For owner-occupied properties, the issuance date of an order is the date of its personal service. For non-owner occupied properties, the issuance date of an order is the date an order to the owner and any occupant(s), or a copy thereof, are deposited in a U.S. Postal Service mail container and posted on the premises. Failure of any person to receive an order shall not affect its validity, or the appeal period. When identifying a mailing address for an owner, the Building Official shall consider such information as shown in Los Angeles County Assessor records.

Orders issued pursuant to this subsection, and any conditions thereof, are appealable by a property owner or occupant on a City-approved form that must be received by the City Clerk's Office within ten days of an order's issuance. Appellants shall state all grounds for their appeal in said form. A fee is not charged for such appeals. Failure to tender an appeal in a timely manner constitutes a waiver of the right to appeal, in which case an order is final.
If a timely appeal is made, the Building & Safety Division shall provide ten days advance written notice to the appealing party or parties of the date, time and place of the hearing. A timely appeal does not stay an order, or any conditions thereof. Failure of any person to receive a notice of hearing shall not affect its validity.

Timely appeals shall be heard by the City Manager, or a designee thereof. The boards established by this code do not have jurisdiction to consider, decide or rule on orders that are authorized by this subsection. Appeal hearings are informal and rules of evidence do not apply. Failure of an appellant or appellants to appear at a hearing constitutes a waiver of the right to appeal, in which case the order is final. The hearing officer shall, within ten days following the hearing, issue a written decision upholding, modifying, or reversing the order or conditions thereof, notice of which shall be sent to the appellant(s) by first class mail. Such decisions are not appealable. The notice of decision shall contain the following statement: "The Hearing Officer's decision is final, and judicial review of this decision is subject to the provisions and time limits set forth in Cal. Code of Civil Procedure §§ 1094.5 and 1094.6."

Orders may be accompanied by, or combined with, Notices of Violations (which are not appealable). Orders shall be rescinded in writing when the Building Official determines that the immediate danger or hazard has been fully corrected or abated with all permits, approvals and inspections as required by the Calabasas Municipal Code.

**116.3 Violations.** It is unlawful and a public nuisance for any person to maintain an unsafe or dangerous building or structure. Each and every day that a building or structure is maintained in an unsafe or dangerous condition is a new violation of this code. It is a violation of this code and unlawful for any person to fail to comply with an order to vacate, as well as all conditions thereof.

**116.4 Deleted in its entirety**
**116.5 Deleted in its entirety**

**SECTION 4.** Municipal Code section **15.04.200, entitled, "Structural amendments"** is hereby amended and the following subsections shall read as follows:

Chapter 16 of the 2010 California Building Code is amended to read as follows:

**Section 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 un-topped steel decking shall also be permitted to be idealized as flexible, provided all of the following conditions are met:

1. 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.

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

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

4. Portions of wood structural panel diaphragms that cantilever beyond the vertical elements of the seismic-force-resisting system are designed in accordance with section 4.2.5.2 of AF&PASDPWS.

Exception: For buildings two stories or less in height with diaphragms constructed of wood structural panels, the cantilevered portion may be analyzed using flexible diaphragm assumption, provided the length of the overhang does not exceed fifteen (15) percent of the distance between the

lateral force resisting system adjacent to the cantilevered portion in the same direction nor one-fourth the width of the diaphragm, where the width is the dimension of the diaphragm perpendicular to the overhang.

**Section 1613.6.7** of the 2010 California Building Code is amended to read as follows:

**Equation 16-44.**

$$\delta M = Cd\,\delta max \div I$$

where:

Cd = Deflection amplification factor in Table 12.2-1 of ASCE 7.

δmax = Maximum displacement defined in Section 12.8.4.3 of ASCE 7.

I = Importance factor in accordance with Section 11.5.1 of ASCE 7.

**Section 1613.8** is added to Chapter 16 of the 2010 California Building Code to read as follows:

**Section 1613.8 ASCE 7, Table 12.8-2. Modify ASCE 7 Table 12.8-2 by adding the following:**

| Structure Type | C1 | X |
|---|---|---|
| Eccentrically braced steel frames and buckling-restrained braced frames | **0.03 (0.0731) 3** | **0.75** |

**Section 1613.9** is added to the California Building Code as follows:

1613.9 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.

**Section 1613.10** is added to the California Building Code as follows:

1613.10 ASCE 7, Section 12.8.7 Modify ASCE 7 Section 12.8.7 by amending Equation 12.8-16 as follows:

$$\theta = \frac{P_x \Delta I}{V_x\, h_{sx}\, C_d} \qquad \textbf{(12.8-16)}$$

**Section 1613.11** is added to the California Building Code as follows:

**1613.11 ASCE7, Section 12.11.2.2.3** Modify ASCE 7, Section 12.2.4 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 structures assigned to Seismic Design Category D, E or F, wood diaphragms supporting concrete or masonry walls 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 sub-diaphragms to transmit the anchorage forces to the main continuous crossties.

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

**Section 1613.12** is added to the California Building Code as follows:

**1613.12 Seismic Design Provisions for Hillside Buildings.**

**1613.12.1 Purpose.** The purpose of this section is to establish minimum regulations for the design and construction of new buildings and additions to existing buildings when constructing such buildings on or into slopes steeper than one unit vertical in three units horizontal (33.3%). These regulations establish minimum standards for seismic force resistance to reduce the risk of injury or loss of life in the event of earthquakes.

**1613.12.2 Scope.** The provisions of this section shall apply to the design of the lateral-force-resisting system for hillside buildings at and below the base level diaphragm. The design of the lateral-force-resisting system above the base level diaphragm shall be in accordance with the provisions for seismic and wind design as required elsewhere in this division.

EXCEPTION: Non-habitable accessory buildings and decks not supporting or supported from the main building are exempt from these regulations.

**1613.12.3 Definitions.** For the purposes of this section certain terms are defined as follows:

BASE LEVEL DIAPHRAGM is the floor at, or closest to, the top of the highest level of the foundation.

DIAPHRAGM ANCHORS are assemblies that connect a diaphragm to the adjacent foundation at the uphill diaphragm edge.

DOWNHILL DIRECTION is the descending direction of the slope approximately perpendicular to the slope contours.

FOUNDATION is concrete or masonry which supports a building, including footings, stem walls, retaining walls, and grade beams.

FOUNDATION EXTENDING IN THE DOWNHILL DIRECTION is a foundation running downhill and approximately perpendicular to the uphill foundation.

HILLSIDE BUILDING is any building or portion thereof constructed on or into a slope steeper than one unit vertical in three units horizontal (33.3%). If only a portion of the building is supported on or into the slope, these regulations apply to the entire building.

PRIMARY ANCHORS are diaphragm anchors designed for and providing a direct connection as described in Sections 1613.12.5 and 1613.12.7.3 between the diaphragm and the uphill foundation.

SECONDARY ANCHORS are diaphragm anchors designed for and providing a redundant diaphragm to foundation connection, as described in Sections 1613.12.6 and 1613.12.7.4.

UPHILL DIAPHRAGM EDGE is the edge of the diaphragm adjacent and closest to the highest ground level at the perimeter of the diaphragm.

UPHILL FOUNDATION is the foundation parallel and closest to the uphill diaphragm edge.

**1613.12.4 Analysis and Design.**

**1613.12.4.1 General.** Every hillside building within the scope of this section shall be analyzed, designed, and constructed in accordance with the provisions of this division. When the code-prescribed wind design produces greater effects, the wind design shall govern, but detailing requirements and limitations prescribed in this and referenced sections shall be followed.

**1613.12.4.2 Base Level Diaphragm-Downhill Direction.** The following provisions shall apply to the seismic analysis and design of the connections for the base level diaphragm in the downhill direction.

**1613.12.4.2.1 Base for Lateral Force Design Defined.** For seismic forces acting in the downhill direction, the base of the building shall be the floor at or closest to the top of the highest level of the foundation.

**1613.12.4.2.2 Base Shear.** In developing the base shear for seismic design, the response modification coefficient (R) shall not exceed 4.5 for bearing wall and building frame systems. The total base shear shall include the forces tributary to the base level diaphragm including forces from the base level diaphragm.

**1613.12.5 Base Shear Resistance-Primary Anchors.**

**1613.12.5.1 General.** The base shear in the downhill direction shall be resisted through primary anchors from diaphragm struts provided in the base level diaphragm to the foundation.

**1613.12.5.2 Location of Primary Anchors.** A primary anchor and diaphragm strut shall be provided in line with each foundation extending in the downhill direction. Primary anchors and diaphragm struts shall also be provided where interior vertical lateral-force-resisting elements occur above and in contact with the base level diaphragm. The spacing of primary anchors and diaphragm struts or collectors shall in no case exceed 30 feet (9144 mm).

**1613.12.5.3 Design of Primary Anchors and Diaphragm Struts.** Primary anchors and diaphragm struts shall be designed in accordance with the requirements of Section 1613.12.8.

**1613.12.5.4 Limitations.** The following lateral-force-resisting elements shall not be designed to resist seismic forces below the base level diaphragm in the downhill direction:

1. Wood structural panel wall sheathing,

2. Cement plaster and lath,

3. Gypsum wallboard, and

4. Tension only braced frames.

Braced frames designed in accordance with the requirements of Section 2205.2.2 may be used to transfer forces from the primary anchors and diaphragm struts to the foundation provided lateral forces do not induce flexural stresses in any member of the frame or in the diaphragm struts. Deflections of frames shall account for the variation in slope of diagonal members when the frame is not rectangular.

**1613.12.6. Base Shear Resistance-Secondary Anchors.**

**161312.6.1 General.** In addition to the primary anchors required by Section 1613.12.5, the base shear in the downhill direction shall be

resisted through secondary anchors in the uphill foundation connected to diaphragm struts in the base level diaphragm.

EXCEPTION: Secondary anchors are not required where foundations extending in the downhill direction spaced at not more than 30 feet (9144 mm) on center extend up to and are directly connected to the base level diaphragm for at least 70% of the diaphragm depth.

**1613.12.6.2 Secondary Anchor Capacity and Spacing.** Secondary anchors at the base level diaphragm shall be designed for a minimum force equal to the base shear, including forces tributary to the base level diaphragm, but not less than 600 pounds per lineal foot (8.76 kN/m). The secondary anchors shall be uniformly distributed along the uphill diaphragm edge and shall be spaced a maximum of four feet (1219 mm) on center.

**1613.12.6.3 Design.** Secondary anchors and diaphragm struts shall be designed in accordance with Section 1613.12.8.

**1613.12.7 Diaphragms Below the Base Level-Downhill Direction.** The following provisions shall apply to the lateral analysis and design of the connections for all diaphragms below the base level diaphragm in the downhill direction.

**1613.12.7.1 Diaphragm Defined.** Every floor level below the base level diaphragm shall be designed as a diaphragm.

**1613.12.7.2 Design Force.** Each diaphragm below the base level diaphragm shall be designed for all tributary loads at that level using a minimum seismic force factor not less than the base shear coefficient.

**1613.12.7.3 Design Force Resistance-Primary Anchors.** The design force described in Section 1613.8.7.2 shall be resisted through primary anchors from diaphragm struts provided in each diaphragm to the foundation. Primary anchors shall be provided and designed in accordance with the requirements and limitations of Section 1613.12.5.

**1613.12.7.4 Design Force Resistance-Secondary Anchors.**

**1613.12.7.4.1 General.** In addition to the primary anchors required in Section 1613.12.7.3, the design force in the downhill direction shall be resisted through secondary anchors in the uphill foundation connected to diaphragm struts in each diaphragm below the base level.

EXCEPTION: Secondary anchors are not required where foundations extending in the downhill direction, spaced at not more than

30 feet (9144 mm) on center, extend up to and are directly connected to each diaphragm below the base level for at least 70% of the diaphragm depth.

**1613.12.7.4.2 Secondary Anchor Capacity.** Secondary anchors at each diaphragm below the base level diaphragm shall be designed for a minimum force equal to the design force but not less than 300 pounds per lineal foot (4.38 kN/m). The secondary anchors shall be uniformly distributed along the uphill diaphragm edge and shall be spaced a maximum of four feet (1219 mm) on center.

**1613.12.7.4.3 Design.** Secondary anchors and diaphragm struts shall be designed in accordance with Section 1613.12.8.

**1613.12.8 Primary and Secondary Anchorage and Diaphragm Strut Design.** Primary and secondary anchors and diaphragm struts shall be designed in accordance with the following provisions:

1. Fasteners. All bolted fasteners used to develop connections to wood members shall be provided with square plate washers at all bolt heads and nuts. Washers shall be minimum 3/16 inch (4.8 mm) thick and two inch (51 mm) square for 1/2-inch (12.7 mm) diameter bolts, and 1/4-inch (6.4 mm) thick and 2-1/2-inch (64 mm) square for 5/8-inch (15.9 mm) diameter or larger bolts. Nuts shall be wrench tightened prior to covering.

2. Fasteni ng. The diaphragm to foundation anchorage shall not be accomplished by the use of toe-nailing, nails subject to withdrawal, or wood in cross-grain bending or cross-grain tension.

3. Size of Wood Members. Wood diaphragm struts collectors, and other wood members connected to primary anchors shall not be less than three-inch (76 mm) nominal width. The effects of eccentricity on wood members shall be evaluated as required per Item 9.

4. Desig n. Primary and secondary anchorage, including diaphragm struts, splices, and collectors shall be designed for 125% of the tributary force.

5. Allo wable Stress Increase. The one-third allowable stress increase permitted under Section 1605.3.2 shall not be taken when the working (allowable) stress design method is used.

6. Seis mic Load Factor. The seismic load factor shall be 1.7 for steel and concrete anchorage when the strength design method is used.

7. Primary Anchors. The load path for primary anchors and diaphragm struts shall be fully developed into the diaphragm and into the foundation. The foundation must be shown to be adequate to resist the concentrated loads from the primary anchors.

8. Secon dary Anchors. The load path for secondary anchors and diaphragm struts shall be fully developed in the diaphragm but need not be developed beyond the connection to the foundation.

9. Symmetr y. All lateral force foundation anchorage and diaphragm strut connections shall be symmetrical. Eccentric connections may be permitted when demonstrated by calculation or tests that all components of force have been provided for in the structural analysis or tests.

10. Wood Ledgers. Wood ledgers shall not be used to resist cross-grain bending or cross-grain tension.

**1613.12.9 Lateral-Force-Resisting Elements Normal to the Downhill Direction.**

**1613.12.9.1 General.** In the direction normal to the downhill direction, lateral-force-resisting elements shall be designed in accordance with the requirements of this section.

**1613.12.9.2 Base Shear.** In developing the base shear for seismic design, the response modification coefficient (R) shall not exceed 4.5 for bearing wall and building frame systems.

**1613.12.9.3 Vertical Distribution of Seismic Forces.** For seismic forces acting normal to the downhill direction the distribution of seismic forces over the height of the building using Section 12.8.3 of ASCE 7 shall be determined using the height measured from the top of the lowest level of the building foundation.

**1613.12.9.4 Drift Limitations.** The story drift below the base level diaphragm shall not exceed 0.005 times the story height. The total drift from the base level diaphragm to the top of the foundation shall not exceed 3/4 inch (19 mm). Where the story height or the height from the base level diaphragm to the top of the foundation varies because of a stepped footing or story offset, the height shall be measured from the average height of the top of the foundation. The story drift shall not be reduced by the effect of horizontal diaphragm stiffness.

Where code-prescribed wind forces govern the design of the lateral force resisting system normal to the downhill direction, the drift limitation shall be 0.0025 for the story drift and the total drift from the base level

diaphragm to the top of the foundation may exceed 3/4 inch (19 mm) when approved by the Department. In no case, however, shall the drift limitations for seismic forces be exceeded.

**1613.12.9.5 Distribution of Lateral Forces.**

**1613.12.9.5.1 General.** The design lateral force shall be distributed to lateral-force-resisting elements of varying heights in accordance with the stiffness of each individual element.

**1613.12.9.5.2 Wood Structural Panel Sheathed Walls.** The stiffness of a stepped wood structural panel shear wall may be determined by dividing the wall into adjacent rectangular elements, subject to the same top of wall deflection. Deflections of shear walls may be estimated by Section 2305.3.2. Sheathing and fastening requirements for the stiffest section shall be used for the entire wall. Each section of wall shall be anchored for shear and uplift at each step. The minimum horizontal length of a step shall be eight feet (2438 mm) and the maximum vertical height of a step shall be two feet, eight inches (813 mm).

**1613.12.9.5.3 Reinforced Concrete or Masonry Shear Walls.** Reinforced concrete or masonry shear walls shall have forces distributed in proportion to the rigidity of each section of the wall.

**1613.12.9.6 Limitations.** The following lateral force-resisting-elements shall not be designed to resist lateral forces below the base level diaphragm in the direction normal to the downhill direction:

1. Cement plaster and lath,

2. Gypsum wallboard, and

3. Tension-only braced frames.

Braced frames designed in accordance with the requirements of Chapter 22 of this Code may be designed as lateral-force-resisting elements in the direction normal to the downhill direction, provided lateral forces do not induce flexural stresses in any member of the frame. Deflections of frames shall account for the variation in slope of diagonal members when the frame is not rectangular.

**1613.12.10 Specific Design Provisions.**

**1613.12.10.1 Footings and Grade Beams.** All footings and grade beams shall comply with the following:

1. Grade beams shall extend at least 12 inches (305 mm) below the lowest adjacent grade and provide a minimum 24-inch (610 mm) distance horizontally from the bottom outside face of the grade beam to the face of the descending slope.
2. C ontinuous footings shall be reinforced with at least two No. 4 reinforcing bars at the top and two No. 4 reinforcing bars at the bottom.
3. All main footing and grade beam reinforcement steel shall be bent into the intersecting footing and fully developed around each corner and intersection.
4. All concrete stem walls shall extend from the foundation and reinforced as required for concrete or masonry walls.

**1613.12.10.2 Protection Against Decay and Termites.** All wood to earth separation shall comply with the following:

1. Where a footing or grade beam extends across a descending slope, the stem wall, grade beam, or footing shall extend up to a minimum 18 inches (457 mm) above the highest adjacent grade.

   EXCEPTION: At paved garage and doorway entrances to the building, the stem wall need only extend to the finished concrete slab, provided the wood framing is protected with a moisture proof barrier.
2. Wood ledgers supporting a vertical load of more than 100 pounds per lineal foot (1.46 kN/m) and located within 48 inches (1219 mm) of adjacent grade are prohibited. Galvanized steel ledgers and anchor bolts, with or without wood nailers, or treated or decay resistant sill plates supported on a concrete or masonry seat, may be used.

**1613.12.10.3 Sill Plates.** All sill plates and anchorage shall comply with the following:

1. All wood framed walls, including nonbearing walls, when resting on a footing, foundation, or grade beam stem wall, shall be supported on wood sill plates bearing on a level surface.
2. Power-driven fasteners shall not be used to anchor sill plates except at interior nonbearing walls not designed as shear walls.

**1613.12.10.4 Column Base Plate Anchorage.** T he base of isolated wood posts (not framed into a stud wall) supporting a vertical load of 4000 pounds (17.8 kN) or more and the base plate for a steel column shall comply with the following:

1. When the post or column is supported on a pedestal extending above the top of a footing or grade beam, the pedestal shall be designed and reinforced as required for concrete or masonry columns. The pedestal shall be reinforced with a minimum of four No. 4 bars extending to the bottom of the footing or grade beam. The top of exterior pedestals shall be sloped for positive drainage.
2. The base plate anchor bolts or the embedded portion of the post base, and the vertical reinforcing bars for the pedestal, shall be confined with two No. 4 or three No. 3 ties within the top five inches (127 mm) of the concrete or masonry pedestal. The base plate anchor bolts shall be embedded a minimum of 20 bolt diameters into the concrete or masonry pedestal. The base plate anchor bolts and post bases shall be galvanized and each anchor bolt shall have at least two galvanized nuts above the base plate.

**1613.12.10.5 Steel Beam to Column Supports.** All steel beam to column supports shall be positively braced in each direction. Steel beams shall have stiffener plates installed on each side of the beam web at the column. The stiffener plates shall be welded to each beam flange and the beam web. Each brace connection or structural member shall consist of at least two 5/8 inch (15.9 mm) diameter machine bolts.

**Section** **1613.13** is added to Chapter 16 of the 2010 California Building Code to read as follows:

**1613.13 Suspended Ceilings.** Minimum design and installation standards for suspended ceilings shall be determined in accordance with the requirements of Section 2506.2.1 of this Code and this subsection.

**1613.13.1 Scope.** This part contains special requirements for suspended ceilings and lighting system. Provisions of Section 13.5.6 of ASCE 7 shall apply except as modified herein.

**1613.13.2 General.** The suspended ceilings and lighting systems shall be limited to 6 feet (1828 mm) below the structural deck unless the lateral bracing is designed by a licensed engineer or architect.

**1613.13.3 Design and Installation Requirements**

**1613.13.3.1 Bracing at Discontinuity.** Positive bracing to the structure shall be provided at changes in the ceiling plane elevation or at discontinuities in the ceiling grid system.

**1613.13.3.2 Support for Appendages.** Cable trays, electrical conduits and piping shall be independently supported and independently braced from the structure.

**1613.13.3.3 Sprinkler Heads.** All sprinkler heads (drops) except fire-resistance-rated floor/ceiling or roof/ceiling assemblies, shall be designed to allow for free movement of the sprinkler pipes with oversize rings, sleeves or adaptors through the ceiling tile, in accordance with Section 13.5.6.2.2 (e) of ASCE7. Sprinkler heads penetrating fire-resistance-rated floor/ceiling or roof/ceiling assemblies shall comply with Section 713 of this Code.

**1613.13.3.4 Perimeter Members.** A minimum wall angle size of at least a two-inch (51 mm) horizontal leg shall be used at perimeter walls and interior full height partitions. The first ceiling tile shall maintain ¾ inch (19mm) clear from the finish wall surface. An equivalent alternative detail that will provide sufficient movement due to anticipated lateral building displacement may be used in lieu of the long leg angle subject to the approval of the Superintendent of Building.

**1613.13.4 Special Requirements for Means of Egress.** Suspended ceiling assemblies located along means of egress serving an occupant load of 30 or more shall comply with the following provisions.

**1613.13.4.1General.** Ceiling suspension systems shall be connected and braced with vertical hangers attached directly to the structural deck along the means of egress serving an occupant load of 30 or more and a lobbies accessory to Group A Occupancies. Spacing of vertical hangers shall not exceed 2 feet (610mm) on center along the entire length of the suspended ceiling assembly located along the means of egress or at the lobby.

**1613.13.4.2 Assembly Device.** All lay in panels shall be secured to the suspension ceiling assembly with two hold-down clips minimum for each tile within a 4-foot (1219mm) radius of the exit lights and exit signs.

**1613.13.4.3 Emergency Systems.** Independent supports and braces shall be provided for light fixtures required for exit illumination. Power supply for exit illumination shall comply with the requirements of Section 1006.3 of this Code.

**1613.4.4 Supports for Appendage.** Separate support from the structural deck shall be provided for all appendages such as light fixtures, air diffusers, exit signs, and similar elements.

**Chapter 17 of the 2010 California Building Code is amended and the following subsections shall read 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. C oncrete patios, driveways and sidewalks, on grade.

**1704.8 Driven deep foundations and connection grade beams.** Special inspections shall be performed during installation and testing of driven deep foundation elements as required by Table 1704.8. Special inspection shall be performed for connection grade beams in accordance with section 1704.4 for structures assigned to seismic design category DE or F. The approved geotechnical report, and the construction documents prepared by the registered design professional shall be used to determine compliance.

**1704.9 Cast in Place deep foundations and connection grade beams.** Special inspections shall be performed during installation and testing of driven deep foundation elements as required by Table 1704.8. Special inspection shall be performed for connection grade beams in accordance with section 1704.4 for structures assigned to seismic design category DE or F. The approved geotechnical report, and the construction documents prepared by the registered design professional shall be used to determine compliance.

**1705.3 Seismic resistance.** The statement of specia l inspections shall include seismic requirements for cases covered in Sections 1705.3.1 through 1705.3.5.

Exception: Seismic requirements are permitted to be excluded from the statement of special inspections for structures designed and constructed in accordance with the following:

1. The structure consists of light-frame construction; the design spectral response acceleration at short periods Sds, as determined in Section 1613.5.4 does not exceed 0.5g; and the height of the structure does not exceed 35 feet (10 668 mm) above grade plane; or

2. The structure is constructed using a reinforced masonry structural system or reinforced concrete structural system; the design spectral response acceleration at short periods, Sds, as determined in Section 1613.5.4, does not exceed 0.5 g, and the height of the structure does not exceed 25 feet (8620 mm) above grade plane; or

3. Detached one-or two-family dwellings not exceeding two stories above grade plane, provided the structure is not assigned to Seismic Design Category D, E or F and does not have any of the following plan or vertical irregularities in accordance with Section 12.3.2 of ASCE 7:

   3.1 Torsional irregularity.

   3.2 Nonparallel systems.

   3.3 Stiffness irregularity – extreme soft story and soft story.

   3.4 Discontinuity in capacity – weak story.

**1710.1 General.** Where required by the provisions of Section 1710.2 or 1710.3 the owner shall employ a professional structural observer to perform structural observations as defined in Section 1702. The structural observer shall be one of the following individuals:

1. The registered design professional responsible for the structural design, or

2. A registered design professional designated by the registered design professional responsible for the structural design.

Prior to the commencement of observations, the structural observer shall submit to the building official a written statement identifying the frequency and extent of structural observations.

The owner or owner's representative shall coordinate and call a preconstruction meeting between the structural observer, contractors, affected subcontractors and special inspectors. The structural observer shall preside over the meeting. The purpose of the meeting shall be to identify the major structural elements and connections that affect the vertical and lateral load resisting systems of the structure and to review scheduling of the required observations. A record of the meeting shall be included in the report submitted to the building official.

Observed deficiencies shall be reported in writing to the owner's representative, special inspector, contractor and the building official. Upon the form prescribed by the building official, the structural observer shall submit to the building official a written statement at each significant construction stage stating that the site visits have been made and identifying any reported deficiencies which, to the best of the structural observer's knowledge, have not been resolved. A final report by the structural observer which states that all observed deficiencies have been resolved is required before acceptance of the work by the building official.

**1710.2 Structural observations for seismic resistance.** Structural observations shall be provided for those structures included in Seismic Design Category D, E or F, as determined in Section 1613, where one or more of the following conditions exist:

1. The structure is classified as Occupancy Category III or IV in accordance with Section 1604.5.

2. The height of the structure is greater than 75 feet (22860 mm) above the base.

3. The structure is classified as Occupancy Category I or II in accordance with Section 1604.5 and is greater than two stories on stories above grade plans a lateral design is required for the structure or portion thereof.

   **Exception:** One-story wood framed Group R-3 and Group U Occupancies less than 2000 square feet in area, provided the adjacent grade is not steeper than one unit vertical in 10 units horizontal (10% sloped), assigned to Seismic Design Category D.

4. When so designated by the registered design professional responsible for the structural design.

5. Whe n such observation is specifically required by the building official.

Chapter 18 of the 2010 California Building Code is amended to read as follows:

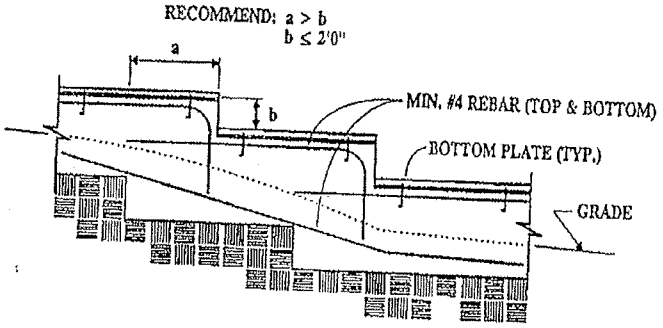
**1807.1.4 Permanent wood foundation systems.** Permanent wood foundation systems shall be designed and installed in accordance with AF&PA PWF. Lumber and plywood shall be treated in accordance with AWPA U1 (Commodity Specification A, Use Category 4B and Section 5.2) and shall be identified in accordance with Section 2303.1.8.1. Permanent wood foundation systems shall not be used for structures assigned to Seismic Design Category D, E or F.

**1807.1.6** Prescriptive design of concrete and masonry foundation walls. Concrete and masonry foundation walls that are laterally supported at the top and bottom shall be permitted to be designed and constructed in accordance with this section. Prescriptive design of foundation walls shall not be used for structures assigned to Seismic Design Category D, E or F.

**1809.3** of the 2010 California Building Code is amended to read as follows:

**1809.3 Stepped footings.** The top surface of footings shall be level. The bottom surface of footings shall be 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).

For structures assigned to Seismic Design Category D, E or F, the stepping requirement shall also apply to the top surface of grade beams supporting walls. Footings shall be reinforced with four ½-inch diameter (12.7 mm) deformed reinforcing bars. Two bars shall be placed at the top and bottom of the footings as shown in Figure 1809.3




STEPPED FOUNDATIONS

Figure 1805.1

**Section 1809.7 and Table 1809.7** of the 2010 California Building Code are amended to read, in words and figures, as follows:

**1809.7 Prescriptive footings for light-frame construction.** Where a specific design is not provided, concrete or masonry-unit footings supporting walls of light-

frame construction shall be permitted to be designed in accordance with Table 1809.7. Prescriptive footings in Table 1809.7 shall not exceed one story above grade plane for structures assigned to Seismic Design Category D, E or F.

**TABLE 1809.7**
**PRESCRIPTIVE FOOTINGS SUPPORTING WALLS OF LIGHT-FRAME CONSTRUCTION** [a, b, c, d, e]

| 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 1809.4.
b. The ground under the floor is permitted to be excavated to the elevation of the top of the footing.
c. 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 1807.1.6.
f. Footings shall be 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.

**Section 1809.12** of the 2010 California Building Code is amended to read, in words and figures, as follows:

**1809.12 Timber footings.** Timber footings shall be permitted for buildings of Type V construction and as otherwise approved by the building official. Such footings shall be treated in accordance with AWPA U1 (Commodity Specification A, Use Category 4B). Treated timbers are not required where placed entirely below permanent water level, or where used as capping for wood piles that project above the water level over submerged or marsh lands. The compressive stresses perpendicular to grain in untreated timber footing supported upon treated piles shall not exceed 70 percent of the allowable stresses for the species and grade of timber as specified in the AF&PA NDS. Timber footings shall not be used in structures assigned to Seismic Design Category D, E or F.

**Section 1810.3.2.4** of the 2010 California Building Code is amended to read, in words and figures, as follows:

**1810.3.2.4 Timber.** Timber deep foundation elements shall be designed as piles or poles in accordance with AF&PA NDS. Round timber elements shall conform to ASTM D 25. Sawn timber elements shall conform to DOC PS-20.

Timber shall not be used in structures assigned to Seismic Design Category D, E or F.

**Chapter 19 of the 2010 California Building Code is hereby amended and the following subsections shall read as follows:**

**1908.1 General.** The text of ACI 318 shall be modified as indicated in Sections 1908.1.1 through 1908.1.14.

**1908.1.11 ACI 318, Section 21.6.4.1.** Modify ACI 317, Section 21.6.4.1, to read 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 21.6.4.1, Items (a) through (c), over the full height of the member.

**1908.1.12 ACI 318, Section 21.6.4** Modify ACI 318, Section 21.6.4, by adding Section 21.6.4.8 to read as follows:

21.6.4.8 – At any section where the design strength P of the column is less than the sum of the shears Ve computed in accordance with ACI 318 Sections 21.5.4.1 and 21.6.5.1 for all the beams framing into the column above the level under consideration, transverse reinforcement as specified in ACI 318 Sections 21.6.4.1 through 21.6.4.3 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 P of the column, these moments may be assumed to result from the deformation of the frame in any one principal axis.

**1908.1.13 ACI 318, Section 21.9.4.** Modify ACI 318, Section 21.9.4 by adding Section 21.9.4.6 to read as follows:

21.9.4.6 – Walls and portions of walls with Pu> 0.35Po 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 ACI 318 Section 21.13.

**1908.1.14 ACI 318, Section 21.11.6.** Modify ACI 318, Section 21.11.6, by adding the following:

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

**1908.1.2 ACI 318, Section 21.1.1.** Modify ACI 318, Sections 21.1.1.3 and 21.1.1.7 as follows:

21.1.1.3 – Structures assigned to Seismic Design Category A shall satisfy requirements of Chapters 1 to 19 and 22; Chapter 21 does not apply. Structures assigned to Seismic Design Category B, C, D, E or F also shall satisfy 21.1.1.4 through 21.1.1.8 as applicable. Except for structural elements of plain concrete complying with Section 1908.1.8 of the International Building Code, structural elements of plain concrete are prohibited in structures assigned to Seismic Design Category C, D, E, or F.

21.1.1.7 Structural systems designated as part of the seismic-force-resisting system shall be restricted to those permitted by ASCE 7. Except for Seismic Design Category A, for which Chapter 21 does not apply, the following provisions shall be satisfied for each structural system designated as part of the seismic-force-resisting system, regardless of the Seismic Design Category:

(a) Ordinary moment frames shall satisfy 21.2.
(b) Ordinary reinforced concrete structural walls and ordinary precast structural walls need not satisfy any provisions in Chapter 21.
(c) Intermediate moment frames shall satisfy 21.3.
(d) Intermediate precast structural walls shall satisfy 21.4.
(e) Special moment frames shall satisfy 21.5 through 21.8.
(f) Special structural walls shall satisfy 21.9.
(g) Special structural walls constructed using precast concrete shall satisfy 21.10.

All special moment frames and special structural walls shall be also satisfy 21.1.3 through 21.1.7. Concrete tilt-up wall panels classified as intermediate precast structural wall system shall satisfy 21.9 in addition to 21.4.2 and 21.4.3 for structures assigned to Seismic Design Category D, E or F.

**1908.1.3. ACI, Section 21.4.** Modify ACI 318, Section 21.4, by renumbering Section 21.4.3 to become 21.4.4 and adding new Sections 21.4.3, 21.4.5,~~and~~ 21.4.6 and 21.4.7 to read as follows:

21.4.3 – Connections that are designed to yield shall be capable of maintaining 80 percent of their design strength at the deformation induced by the design displacement or shall use Type 2 mechanical splices.

21.4.4 – Elements of the connection that are not designed to yield shall develop at least 1.5 Sy.

21.4.5- Wall piers in Seismic Design Category D, E, or F shall comply with Section 1908.1.4 of this Code.

21.4.6 – Wall piers not designed as part of a moment frame in buildings assigned to Seismic Design Category C shall have transverse reinforcement designed to resist the shear forces determined from 21.3.3. Spacing of transverse reinforcement shall not exceed 8 inches (203mm). Transverse

reinforcement shall be extended beyond the pier clear height for at least 12 inches (305 mm).

**Exceptions:**

1. Wall piers that satisfy 21.13.
2. Wall piers along a wall line within a story where other shear wall segments provide lateral support to the wall piers and such segment have a total stiffness of at least six times the sum of the stiffness of all the wall piers.

21.4.7 – Wall segment with a horizontal length-to-thickness ratio less than 2.5 shall be designed as columns.

**1908.1.8 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) 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.

(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. 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:

In detached one-and two-family dwellings three stories or less in height and constructed with stud-bearing walls, plain concrete footings 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.

**Section 1909.4 Design.** Structural plain concrete walls, footings and pedestals shall be designed for adequate strength in accordance with ACI 318, Section 22.4 through 22.8.

**Exception:** For Group R-3 occupancies and buildings or other occupancies less than two stories above plane of light-frame construction, the required edge

thickness of ACI 318 is permitted to be reduced to 6 inches (152mm), provided that the footing does not extend more than 4 inches (102mm) on either side of the supported wall. This exception shall not apply to structural elements designed to resist seismic lateral forces for structures assigned to Seismic Design Category D, E or F.

**Chapter 22 of the 2010 California Building Code is amended to read as follows:**

**2204.1.1 Consumables for welding**

**2204.1.1.1 Seismic Force Resisting System (SFRS) welds.** All welds used in members and connections in the SFRS shall be made with filler metals meeting the requirements specified in AWS D1.8 Clause 6.3 AWS D1.8 Clauses 6.3.5, 6.3.6, 6.3.7 and 6.3.8 shall apply only to demand critical welds.

**2204.1.1.2 Demand critical welds.** Where welds are designated as demand critical, they shall be made with filler metals meeting the requirements specified in AWS D1.8 Clause 6.3.

**2205.4 AISC 341, Part I, Section 13.2 Members.** Add Section 13.2f to read as follows:

> 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.

Chapter 23 of the 2010 California Building Code is amended to read as follows:

**2304.9.1 Fastener requirements.** Connections for wood members shall be designed in accordance with the appropriate methodology in Section 2301.2. The number and size of fasteners connecting wood members shall not be less than that set forth in Table 2304.9.1. Staple fasteners in Table 2304.9.1 shall not be used to resist or transfer seismic forces in structures assigned to Seismic Design Category D, E or F.

**Exception:** Staples may be used to resist or transfer seismic forces when the allowable shear values are substantiated by cyclic testing and approved by the building official.

Add new footnote q to Table 2304.9.1.

q. Staples shall not be sued to resist or transfer seismic forces in structures assigned to Seismic Design Category D, E or F.

**2304.11.7 Wood used in retaining walls and cribs.** Wood installed in retaining or crib walls shall be preservative treated in accordance with AWPA U1 (Commodity Specifications A or F) for soil and fresh water use. Wood shall not be sued in retaining or crib walls for structures assigned to Seismic Design Category D, E or F.

**2305.4 Quality of Nails.** In Seismic Design Category D, E or F, 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. Clipped head or box nails are not 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.

**2305.5 Hold-down connectors.** In Seismic Design Category D, E or F, hold-down connectors shall be designed to resist shear wall overturning moments using approved cyclic load values of 75 percent of the allowable seismic load values that do not consider cyclic loading of the product. Connector bolts into wood framing shall 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-down connectors shall be tightened to finger tight plus one half (1/2) wrench turn just prior to covering the wall framing.

**Tables 2306.2.1(3) and 2306.2.1(4)** are added to Chapter 23 of the 2010 California Building Code and Section 2306.2.1.

**2306.2.1 Wood structural panel diaphragms.** Wood structural panel diaphragms shall be designed and constructed in accordance with AF&PA SDPWS. Wood structural panel diaphragms are permitted to resist horizontal forces using the allowable shear capacities set forth in Table 2306.2.1(1) or 2306.2.1(2). For structures assigned to Seismic Design Category D, E or F, the allowable shear capacities shall be set forth in Table 2306.2.1(3) or 2306.2.1(4). The allowable shear capacities in Table 2306.2.1(1) or 2306.2.1(2) are permitted to be increased 40 percent for wind design.

Wood structural panel diaphragms fastened with staples shall not be used to resist seismic forces in structures assigned to Seismic Design Category D, E or F.

**Exception:** Staples may be used for wood structural panel diaphragms when the allowable shear values are substantiated by cyclic testing and approved by the building official.

Wood structural panel diaphragms used to resist seismic forces in structures assigned to Seismic Design Category D, E or F shall be applied directly to the framing members.

**Exception:** Wood structural panel 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.

**Section 2306.2.1(3), 2306.2.1(4) and Table 2306.3(2)** of the 2010 California Building Code are added to read as follows:

**2306.2.1(3) Wood structural panel diaphragms.** Wood structural panel diaphragms are permitted to resist horizontal forces using the allowable shear capacities set forth in Table 2306.2.1(3).

TABLE 2306.2.1(3)
ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL DIAPHRAGMS WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE FOR SEISMIC LOADING FOR STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY D, E OR F

| 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 galvanized box) or staple size[k] | Fastener spacing at panel edges (inches) | | | | NAIL (common or galvanized box) or staple size[k] | Fastener spacing at panel edges (inches) | | | |
| | | | | 6 | 4 | 3 | 2[e] | | 6 | 4 | 3 | 2[e] |
| Structural I Sheathing | 5/16 | 1-1/4 | 6d (2"x0.113" common, 2"x0.099" galvanized box) | 150 | 200 | 200 | 200 | 6d (2"x0.113" common, 2"x0.099" galvanized box) | 200 | 300 | 390 | 510 |
| | | 1 | 1-1/2 16 Gage | 124 | 184 | 200 | 200 | 1-1/2 16 Gage | 165 | 245 | 325 | 415 |
| | 3/8 | 1-3/8 | 8d (2½"x0.131" common, 2½"x0.113" galvanized box) | 200 | 200 | 200 | 200 | 8d (2½"x0.131" common, 2½"x0.113" galvanized box) | 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, 2½"x0.113" galvanized box) | 255[d] | 395[d] | 505[d] | 670[d] | 8d (2½"x0.131" common, 2½"x0.113" galvanized box) | 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, 2½"x0.113" galvanized box) | 280 | 430 | 550 | 730 | 8d (2½"x0.131" common, 2½"x0.113" galvanized box) | 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, 3"x0.128" galvanized box) | 340 | 510 | 665[f] | 870 | 10d (3"x0.148" common, 3"x0.128" galvanized box) | 340 | 510 | 665[f] | 870 |
| Sheathing, plywood siding[g] except Group 5 Species | 5/16 or 1/4[c] | 1-1/4 | 6d (2"x0.113" common, 2"x0.099" galvanized box) | 180 | 200 | 200 | 200 | 6d (2"x0.113" common, 2"x0.099" galvanized box) | 180 | 270 | 350 | 450 |
| | | 1 | 1-1/2 16 Gage | 109 | 165 | 200 | 200 | 1-1/2 16 Gage | 145 | 220 | 295 | 375 |
| | 3/8 | 1-1/4 | 6d (2"x0.113" common, 2"x0.099" galvanized box) | 200 | 200 | 200 | 200 | 6d (2"x0.113" common, 2"x0.099" galvanized box) | 200 | 300 | 390 | 510 |
| | | 1-3/8 | 8d (2½"x0.131" common, 2½"x0.113" galvanized box) | 200 | 200 | 200 | 200 | 8d (2½"x0.131" common, 2½"x0.113" galvanized box) | 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, 2½"x0.113" galvanized box) | 240[d] | 350[d] | 450[d] | 585[d] | 8d (2½"x0.131" common, 2½"x0.113" galvanized box) | 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, 2½"x0.113" galvanized box) | 260 | 380 | 490 | 640 | 8d (2½"x0.131" common, 2½"x0.113" galvanized box) | 260 | 380 | 490 | 640 |
| | | 1-1/2 | 10d (3"x0.148" common, 3"x0.128" galvanized box) | 310 | 460 | 600[f] | 770 | 10d (3"x0.148" common, 3"x0.128" galvanized box) | 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, 3"x0.128" galvanized box) | 340 | 510 | 665[f] | 870 | 10d (3"x0.148" common, 3"x0.128" galvanized box) | 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) | | | | |
| | 5/16[c] | 1-1/4 | 6d (2"x0.099") | 140 | 200 | 200 | 200 | 6d (2"x0.099") | 140 | 210 | 275 | 360 |
| | 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 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. Except for wood structural panel sheathing used for shear walls that are part of the seismic-force-resisting system, 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, 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, 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).

**Table 2306.3(2)** is added to Chapter 23 of the 2010 California Building Code, Section 2306.3 and Table 2306.3 are amended to read, in words and figures, as follows:

**2306.3 Wood structural panel shear walls.** Wood structural panel shear walls shall be designed and constructed in accordance with AF&PA SDPWS. Wood structural panel shear walls are permitted to resist horizontal forces using the allowable shear capacities set forth in Table 2306.3(1). For structures assigned to Seismic Design Category D, E or F, the allowable shear capacities shall be set forth in Table 2306.3(2). The allowable shear capacities in Table 2306.3(1) are permitted to be increased 40 percent for wind design.

Wood structural panel shear walls used to resist seismic forces in structures assigned to Seismic Design Category D, E or F shall not be less than 4 feet by 8 feet (1219 mm by 2438 mm), except at boundaries 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 in structures assigned to Seismic Design Category D, E or F is 200 pounds per foot (2.92 kn/m). Nails shall be placed not less than ½ 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 ¼ inch (6.4 mm) from the edge of the connecting members for shears of 350 pounds per foot (5.11kN/m) or less.

Wood structural panel shear walls fastened with staples shall not be used to resist seismic forces in structures assigned to Seismic Design Category D, E or F.

Exception: Staples may be used for wood structural panel shear walls when the allowable shear values are substantiated by cyclic testing and approved by the building official.

Wood structures panel shear walls used to resist seismic forces in structures assigned to Seismic Design Category D, E or F shall be applied directly to the framing members.

TABLE 2306.3(1)
ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL SHEAR WALLS WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE FOR WIND OR SEISMIC LOADING b,h,I,j,l,m,n

TABLE 2306.3(2)
ALLOWABLE SHEAR (POUNDS OER FOOR) FOR WOOD STRUCTURAL PANEL SHEAR WALLS WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE FOR SEISMIC LOADING FOR STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY D, 3 OR F

| | | | ALLOWABLE SHEAR VALUE FOR SEISMIC FORCES PANELS APPLIED DIRECTLY TO FRAMING | | | | |
|---|---|---|---|---|---|---|---|
| PANEL GRADE | MINIMUM FASTENER PENETRATION IN FRAMING (INCH) | COMMON NAIL SIZE | | | | Fastener spacing at panel edges (inches) | |
| | | | | 6 | 4 | 3 | 2e |
| Structural sheathing | 3/8 | 1 3/8 | 8d (2 ½" x0.131" common) | 200 | 200 | 200 | 200 |
| | 7/16 | 1 3/8 | 8d(2 ½" x0.131" common) | 255 | 395 | 505 | 670 |
| | 15/32 | 1 3/8 | 8d(2 ½"x0.131" common | 280 | 430 | 550 | 730 |
| | | 1 ½ | 10d(3"x0.148" common | 340 | 510 | 665 | 870 |
| Sheathing, plywood siding except Group 5 Species | 3/8 | 1 3/8 | 8d (2 ½ x0.113") | 160 | 200 | 200 | 200 |

For SI: 1 inch = 25.4 mm, 1 foot= 25.4mm, 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. (2) 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-incyh nominal or 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. For grooved panel siding. The normal panel thickness is the thickness of the panel measured at the point of nailing.

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 thicker, and nails shall be staggered where nails are spaced 2 inches on center or less.

f. Framing at adjoining panel edges shall be 3 inches nominal or thicker, and nails shall be staggered where both of the following conditions are met: (1) (3"x0.148") nails having penetration into framing of more than 1-1/2 inches and (2) nails are spaced 3 inches on center or less.

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 at all panel edges shall be staggered.

i. 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 at all panel edges. See Section 4.3.6.1 and 4.3.6.4.3 of AF&PA SDPWS for sill plate size and anchorage requirements.

j. Galvanized nails shall be hot dipped or tumbled.

k. 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.

l. The maximum allowable shear value for three-ply plywood resisting seismic forces is 200 pounds per foot (2.92 kn/m).

**Section** **Table 2306.4.5** is added to Chapter 23 of the 2010 California Building Code and reads, in words and figures, 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,g] (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<br>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<br>16 Ga. Galv. Staple, 1-1/8" long<br>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<br>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<br>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<br>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<br>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<br>Face ply-8d ciiker (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] |

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.

**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 for structures not assigned to Seismic Design Category D, E or F.

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

**Exception:** Stone and 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. Anc hored 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 and spaced a maximum of 16 inches on center.

Exception: Braced wall panels req uired 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 15/32 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.

Wood structural panel sheathing shall be a minimum of 15/32 inch thick nailed with 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.

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

**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] | $S_{DS} < 0.50$ | $0.50 \leq S_{DS} < 0.75$ | $0.75 \leq S_{DS} \leq 1.00$ | $S_{DS} > 1.00$ |
|---|---|---|---|---|---|
| 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 |

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, Portland cement plaster or gypsum sheathing boards; S-W = wood structural panels.
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;
d. S-W sheathing shall be a minimum of 15/32" thick nailed with 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.

**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 2304.9.1. Wall sheathing shall not be attached to framing members by adhesives. Staple fasteners in Table 2304.9.1 shall not be used to resist or transfer seismic forces in structures assigned to Seismic Design Category D, E or F.

Exception: Staples may be used to resist or transfer seismic forces when the allowable shear values are substantiated by cyclic testing and approved by the building official.

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 inches (6096 mm) intervals along the top plate of discontinuous vertical framing.

**SECTION 5.** **15.04.250 Restrictions in fire zones,** of the Calabasas Municipal Code is hereby deleted in its entirety.

**SECTION 6.** **15.04.300** of the Calabasas Municipal Code is hereby amended to read as follows:

**15.04.300 Existing Structures.** The following sections and subsections of Chapter 34 of the 2010 California Building Code and are amended or added to read, in words and figures, as follows:

**3402.1 Definitions.** For the purposes of this chapter, the following definition applies and is hereby added to Section 3402.1, Definitions of the 2010 California Building Code (CBC):

**3403.5 Repairs.** For the purposes of this chapter, the following repair requirements are hereby added as a new Subsection 3403.5 to Section 3403 Additions, Alterations or Repair in the 2010 California Building Code (CBC):

**SECTION 7.** **15.04.350** of the Calabasas Municipal Code shall be readopted without amendment.

**15.04.350 Safety assessment placards.**

**SECTION 8.** **15.04.355** of the Calabasas Municipal Code shall be readopted without amendment:

**15.04.355 Barriers for swimming pools, spas, and hot tubs.**

**SECTION 9.** **15.04.360** of the Calabasas Municipal Code is amended to read as follows:

**15.04.360 Appendix A** of the 2010 California Building Code is hereby adopted.

**SECTION10. 15.04.370** of the Calabasas Municipal Code is amended to read as follows:

**15.04.370 Appendix C** of the 2010 California Building Code is hereby adopted.

**SECTION 11. 15.04.375** is hereby added to the Calabasas Municipal to read as follows:

**15.04.375 Appendix F** of the 2010 California Building Code is hereby adopted.

**SECTION 12. 15.04.380** of the Calabasas Municipal Code is amended to read as follows:

**15.04.380 Appendix G** of the 2010 California Building Code is hereby adopted

**SECTION 13. 15.04.385** of the Calabasas Municipal Code is amended to read as follows:

**15.04.385 Appendix H** of the 2010 California Building Code is hereby adopted.

**SECTION 14. 15.04.390** of the Calabasas Municipal Code is amended to read as follows:

**15.04.390 Appendix I** of the 2010 California Building Code is hereby adopted.

**SECTION 15. 15.04.395** of the Calabasas Municipal Code is amended to read as follows:

**15.04.395 Appendix J** of the 2010 California Building Code is hereby adopted and the following sections are amended to read as follows:

**Section J103.1 Permits required.** Except as exempted in Section J103.2, no grading shall be performed without first having obtained a permit therefor from the City Engineer. A grading permit does not include the construction of retaining walls or other structures.

**Section J105.2 Special Inspections.** The special inspection requirements of Section 1704.7 shall apply to work performed under a grading permit where required by the City Engineer.

**SECTION 16.** Article II of Chapter 15.04 of the Municipal Code, shall be renamed "California Residential Code" and shall provide as follows:

**15.04.410 2010 California Residential Code adopted.**

A. The 2010 California Residential Code, together with the appendices, which regulate the erection, construction, enlargements, alteration, repair, moving, removal, conversion, demolition, occupancy, use, equipment, height, area, security, abatement, and maintenance of buildings or structures of detached one-and-two-family dwelling, townhouse not more than three stories above grade plane in height, provide for the issuance of permits and collection of fees therefore, and provide for penalties for violation thereto, are hereby adopted by reference, and conflicting ordinances are hereby repealed.

B. All of the regulations, provisions, conditions, and terms of said codes, together with their appendices, one copy of which will be on file and accessible to the public for inspection at the City Clerk's office, are hereby referred to, adopted and made part of this chapter as if fully set forth in this chapter with the exceptions, deletions, additions, and amendments thereto as set forth in this subchapter.

**15.04.420 Penalty**

Every person violating any provision of the 2010 California Residential Code and appendices, adopted by reference by 15.04.410, or of any permit or license granted thereunder, or any rules or regulations promulgated pursuant thereto, is guilty of a misdemeanor. Upon conviction thereof, he or she shall be punishable by a fine not-to-exceed one thousand dollars ($1,000.00) or imprisonment not-to-exceed six months, or by both such fine and imprisonment. The imposition of such penalty for any violation shall not excuse the violation or permit it to continue. Each day that a violation occurs shall constitute a separate offense.

**15.04.430 Definitions.**

Notwithstanding the provisions of Section 15.04.010, whenever the names or terms defined in this section are used in this code, each such name or term shall be deemed or construed to have in the meaning ascribed to it in this section.

"Board of supervisors" means the city of Calabasas city council.

"Building official and engineer" or "County engineer" means the building official of the city of Calabasas.

"County" or "County of Los Angeles" or "Unincorporated Territory of the County of Los Angeles" means the city of Calabasas.

"Grading code" means Title 15.10, 15.11, 15.12 grading and site development standards of the Calabasas Municipal Code.

### 15.04.440 Structural Amendments

The following subsections within Chapter 3 of the 2010 California Residential Code shall be revised to read as follows:

**R301.1.3.2 Woodframe structures.**

The building official shall require construction documents to be approved and stamped by a California licensed architect or engineer for all dwellings of wood frame construction more than two stories and basement in height located in Seismic Design Category A, B or C. Notwithstanding other sections of the law, the law establishing these provisions is found in Business and Professions Code Section 5537 and 6737.1.

The building official shall require construction documents to be approved and stamped by a California licensed architect or engineer for all dwellings of wood frame construction more than one story in height or with a basement located in Seismic Design Category $D_0$, $D_1$, or $D_2$.

**R301.1.4 Seismic design provisions for buildings constructed on or into slopes steeper than one unit vertical in three units horizontal (33.3 percent slope).** The design and construction of new buildings and additions to existing buildings when constructed on or into slopes steeper than one unit vertical in three units horizontal (33.3 percent slope) shall comply with Section 1613.12 of the California Building Code.

**R301.2.2.2.5 Irregular buildings.** Prescriptive construction as regulated by this code shall not be used for irregular structures located in Seismic Design Categories C, Do, D1 and D2. Irregular portions of structures shall be designed in accordance with accepted engineering practice to the extent the irregular features affect the performance of the remaining structural system. When the forces associated with the irregularity are resisted by a structural system designed in accordance with accepted engineering practice, design of the remainder of the building shall be permitted using the provisions of this code. A building or portion of a building shall be considered to be irregular when one or more of the following conditions occur:

1. When exterior shear wall lines or braced wall panels are not in one plane vertically from the foundation to the uppermost story in which they are required.
3. When the end of a braced wall panel occurs over an opening in the wall below.
5. When portions of a floor level are vertically offset.

**Section R301.2.2.3.5.1 is added to Section 301.2.2.3.5 of the 2010 Edition of the California Residential Code as follows:**

**Section R301.2.2.3.5.1 AISI S230, Section B1.** Modify AISI S230, Section B1 to read as follows:

Where No. 8 screws are specified, the required number of screws in a steel-to-steel connection shall be permitted to reduce in accordance with the reduction factors in Table B1-1 when larger screws are used or when the sheets of steel being connected are thicker than 33 mils (0.84mm). When applying the reduction factor, the resulting number of screws shall be rounded up.

**R322.1.4.1 Determination of design flood elevations.** If design flood elevations are not specified, the building official is authorized to require the applicant to:

1. Obtain and reasonably use data available from federal, state, or other source; or
2. Determine the design flood elevation in accordance with accepted hydrologic and hydraulic undertaken by a registered civil engineer who shall determine that the technical methods used reflect currently accepted engineering practice. Studies, analyses and computations shall be submitted insufficient detail to allow thorough review and approval.

**Chapter 4 of the 2010 California Residential Code is amended and the following subsections shall read as follows:**

**R401.1 Application.** The provisions of this chapter shall control the design and construction of the foundation and foundation spaces for all buildings. In addition to the provisions of this chapter, the design and construction of foundations in areas prone to flooding as established by Table R301.2(1) shall meet the provisions of Section R322. Wood foundations shall be designed and installed in accordance with AF&PA PWF.

**Exception:** The provisions of this chapter shall be permitted to be used for wood foundations only in the following situations:

1. In buildings that have no more than two floors and a rood.
2. When Interior basement and foundation walls are constructed at intervals not exceeding 50 feet (15 240mm).
3. Wood foundations in Seismic Design Category $D_0$, $D_1$, or $D_2$ shall not be permitted.

**Exception:** In non-occupied, single-story, detached storage sheds and similar uses other than carport or garage, provided the gross floor area does not exceed 200 square feet, the plate height does not exceed 12 feet in height above the grade plane at any point, and the maximum rood projection does not exceed 24 inches.

**R403.1.2 Continuous footing in Seismic Design Categories D0, D1, and D2.** The braced wall panels at exterior walls of buildings located in Seismic Design Categories $D_0$, $D_1$, and $D_2$ shall be supported by continuous footings. All required interior braced wall panels in buildings be supported by continuous footings.

**R403.1.3 Seismic reinforcing.** Concrete footings located in Seismic Design Categories $D_0$, $D_1$, and $D_2$, as established in Table R301.2(1), shall have minimum reinforcement. Bottom reinforcement shall be located a minimum of 3 inches (76 mm) clear from the bottom of the footing

In Seismic Design Categories $D_0$, $D_1$, and $D_2$ where construction joint is created between a concrete footing and a stem wall, a minimum of one No. 4 bar shall be installed at not more than 4 feet (1219 mm) on center. The vertical bar shall extend 3 inches (76 mm) clear of the bottom of the footing, have a standard hook and extend a minimum of 14 inches (357 mm) into the stem wall.

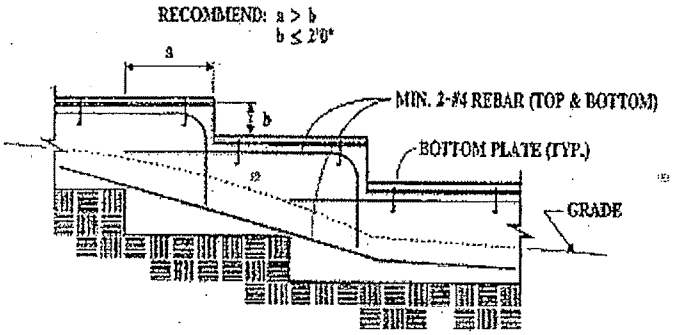
In Seismic Design Categories $D_0$, $D_1$, and $D_2$ where a grouted masonry stem wall is supported on a concrete footing and stem wall, a minimum of one No. 4 bar shall be installed at not more than 4 feet (1219 mm) on center. The vertical bar shall extend 3 inches (76 mm) clear of the bottom of the footing and have a standard hook.

In Seismic Design Categories $D_0$, $D_1$, or $D_2$ masonry stem walls without solid grout and vertical reinforcing are not permitted.

> **Exception:** in detached one- and two-family dwellings located in Seismic Design Category A, B or C which are three stories or less in height and constructed with stud bearing walls, plain concrete footings without longitudinal reinforcement supporting walls and isolated plain concrete footings supporting columns or pedestals are permitted.

**R403.1.5 Slope.** The top surface of footings shall be level. The bottom surface of footings shall be 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).

For structures located in Seismic Design Categories $D_0$, $D_1$, or $D_2$, stepped footings shall be reinforced with four 1/2-inch diameter (12.7 mm) deformed reinforcing bars. Two bars shall be placed at the top and bottom of the footings as shown in Figure R403.1.5.




STEPPED FOUNDATIONS

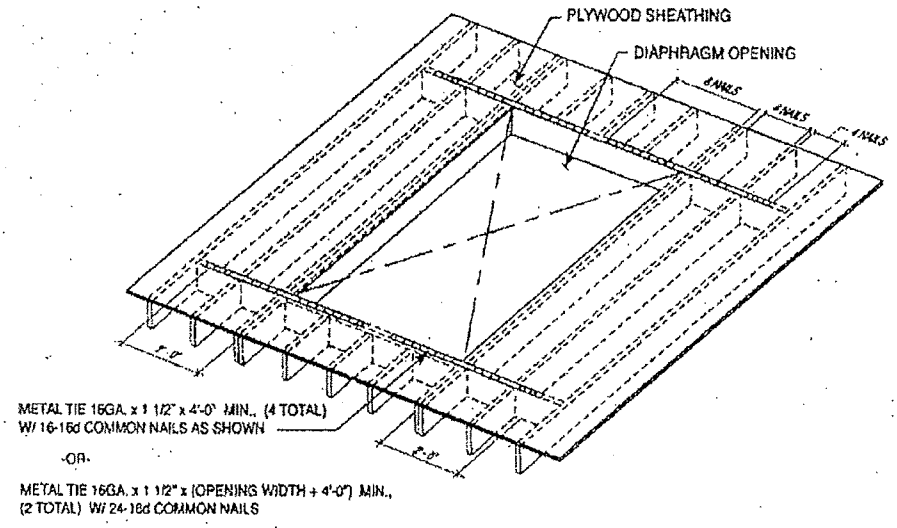
**R404.2 Wood foundation walls.** Wood foundation walls shall be constructed in accordance with the provisions of Sections R404.2.1 through R404.2.6 and with the details shown in figures R403.1 (2) and R403.2 (3). Wood foundation walls shall not be used for structures located in Seismic Design Category $D_0$, $D_1$, or $D_2$.

**Section Chapter 5 of the 2010 California Residential Code is amended and the following subsections shall read as follows:**

**R501.1 Application.** The provision of this chapter shall control the design and construction of the floors for all buildings including the floors of attic spaces used to house mechanical or plumbing fixtures and equipment weighing less than 400 lbs and a maximum height of 4 feet above the floor or attic level.

**Section R503.2.4** is added to Chapter 5 of the 2010 Edition of the California Residential Code to read as follows:

**R503.2.4 Openings in horizontal diaphragms.** Openings in horizontal diaphragms with a dimension perpendicular to the joist that is greater than 4 feet (1.2 m) shall be constructed in accordance with Figure R503.2.4.




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

a. Blockings shall be provided beyond headers.
b. Metal ties not less than 0.058 inch [1.47 mm (16 galvanized gage)] by 1.5 inches (38 mm) wide with eight 16d common nails on each side of the header-joist intersection. The metal ties shall have a minimum yield of 33,000 psi (227 MPa).
c. Openings in diaphragms shall be further limited in accordance with Section R301.2.2.2.5.

Chapter 6 of the 2010 California Residential Code is amended and the following subsections shall read as follows:

**Lines 34 thru 37 of Table R602.3(1)**
**Other Wall Sheathing[h]**

| | | | | |
|---|---|---|---|---|
| 34 | ½"structural cellulosic fiberboard sheathing | ½" galvanized roofing nail | 3 | 6 |
| 35 | 25/32" structural cellulosic fiberboard sheathing | 1 ¾ " galvanized roofing nail | 3 | 6 |
| 36 | ½ " gypsum sheathing[d] | 1 ½ " galvanized roofing nail, 1 ¼ screws, Type W or S | 7 | 7 |
| 37 | 5/8" gypsum sheathing[d] | 1 ¾ " galvanized roofing nail, 1 5/8" screws, Type W or S | 7 | 7 |

**Table R602.3(2)**
**Wood structural panels subfloor, roof and wall sheathing to framing and particleboard wall sheathing to framing[f]**

| | | | |
|---|---|---|---|
| up to 1/2 | 0.097 - 0.099 Nail 2 1/4 | 3 | 6 |
| 19/32 and 5/8 | 0.113 Nail 2 | 3 | 6 |
| | 0.097 - 0.099 Nail 2 1/4 | 4 | 8 |
| 23/32 and 3/4 | 0.097 - 0.099 Nail 2 1/4 | 4 | 8 |
| 1 | 0.113 Nail 2 1/4 | 3 | 6 |

**Floor underlayment: plywood hardboard-particleboard[f]**

**Plywood**

| | | | |
|---|---|---|---|
| 1/4 and 5/16 | 1 1/4 ring or screw shank nail-minimum 12 1/2 ga (0.099") shank diameter | 3 | 6 |
| 11/32 , 3/8 , 15/32 , and 1/2 | 1 1/4 ring or screw shank nail-minimum 12 1/2 ga (0.099") shank diameter | 6 | 8[e] |
| 19/32 , 5/8 , 23/32 , and 3/4 | 1 1/4 ring or screw shank nail-minimum 12 1/2 ga (0.099") shank diameter | 6 | 8 |

## Table R602.10.1.2(2)

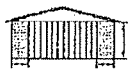
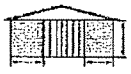
TABLE R602.10.1.2(2)[a, b, c]
BRACING REQUIREMENTS BASED ON SEISMIC DESIGN CATEGORY
(AS A FUNCTION OF BRACED WALL LINE LENGTH)

| SOIL CLASS D[a]<br>WALL HEIGHT = 10 FT<br>10 PSF FLOOR DEAD LOAD<br>15 PSF ROOF/CEILING DEAD LOAD<br>BRACED WALL LINE SPACING ≤ 25 FT | | | MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE | | | |
|---|---|---|---|---|---|---|
| Seismic Design Category (SDC) | Story Location | Braced Wall Line Length | Method LIB | Methods[d] DWB, SFB, GB, PBS, PCP, HPS | Method WSP | Continuous Sheathing |
| SDC $D_0$ or $D_1$ | | 10 | NP | ~~3.0~~ 6.0 | 2.0 | 1.7 |
| | | 20 | NP | ~~6.0~~ 12.0 | 4.0 | 3.4 |
| | | 30 | NP | ~~9.0~~ 18.0 | 6.0 | 5.1 |
| | | 40 | NP | ~~12.0~~ 24.0 | 8.0 | 6.8 |
| | | 50 | NP | ~~15.0~~ 30.0 | 10.0 | 8.5 |
| | | 10 | NP | ~~6.0~~ NP | 4.5 | 3.8 |
| | | 20 | NP | ~~12.0~~ NP | 9.0 | 7.7 |
| | | 30 | NP | ~~18.0~~ NP | 13.5 | 11.5 |
| | | 40 | NP | ~~24.0~~ NP | 18.0 | 15.3 |
| | | 50 | NP | ~~30.0~~ NP | 22.5 | 19.1 |
| | | 10 | NP | ~~8.5~~ NP | 6.0 | 5.1 |
| | | 20 | NP | ~~17.0~~ NP | 12.0 | 10.2 |
| | | 30 | NP | ~~25.5~~ NP | 18.0 | 15.3 |
| | | 40 | NP | ~~34.0~~ NP | 24.0 | 20.4 |
| | | 50 | NP | ~~42.5~~ NP | 30.0 | 25.5 |
| SDC $D_2$ | | 10 | NP | ~~4.0~~ 8.0 | 2.5 | |
| | | 20 | NP | ~~8.0~~ 16.0 | 5.0 | |
| | | 30 | NP | ~~12.0~~ 24.0 | 7.5 | |
| | | 40 | NP | ~~16.0~~ 32.0 | 10.0 | |
| | | 50 | NP | ~~20.0~~ 40.0 | 12.5 | |
| | | 10 | NP | ~~7.5~~ NP | 5.5 | |
| | | 20 | NP | ~~15.0~~ NP | 11.0 | |
| | | 30 | NP | ~~22.5~~ NP | 16.5 | |
| | | 40 | NP | ~~30.0~~ NP | 22.0 | |
| | | 50 | NP | ~~37.5~~ NP | 27.5 | |
| | | 10 | NP | NP | NP | |
| | | 20 | NP | NP | NP | |
| | | 30 | NP | NP | NP | |
| | | 40 | NP | NP | NP | |
| | | 50 | NP | NP | NP | |

d. Methods GB and PCP braced wall panel h/w ratio shall not exceed 1:1 in SDC $D_0$, $D_1$, and $D_2$. Methods DWB, SFB, PBS, and HPS are not permitted in SDC $D_0$, $D_1$, and $D_2$.

## Table R602.10.2

TABLE R602.10.2
INTERMITTENT BRACING METHODS[a]

| | | | | 8d common (2 ½" x 0.131) nails at 6" spacing (panel edge) at 12" spacing (intermediate supports), 3/8" edge distance to panel edge |
|---|---|---|---|---|
| WSP | Wood structural panel (see Section R604) | ~~3/8" 15/32"~~ | | ~~For exterior/interior sheathing see Table R602.3(3) For interior sheathing see Table R602.3(1)~~ |
| SFB | Structural fiberboard sheathing | ½" or 25/32" for maximum 16" stud spacing |  | 1½" galvanized roofing nails or 8d common (2½" x 0.131) nails at 3" spacing (panel edges) at 6" spacing (intermediate supports) |
| GB | Gypsum board | ½" |  | Nails or screws at 7" spacing at panel edges including top and bottom plates; for all braced wall panel locations for exterior sheathing nail or screw size, see Table R602.3(1); for interior gypsum board nail or screw size, see Table R702.3.5 |
| PBS | Particleboard sheathing (see Section R605) | 3/8" or ½" for maximum 16" stud spacing | | 1½", 11 gage, 7/16" head nails at 6" spacing ~~or 7/8", 16 gage staples at 6" spacing~~ |
| PCP | Portland cement plaster | See Section R703.6 For maximum 16" stud spacing | | |

a. Methods GB and PCP braced wall panel h/w ratio shall not exceed 1:1 in SDC $D_0$, $D_1$, and $D_2$. Methods LIB, DWB, SFB, PBS, HPS, and PFG are not permitted in SDC $D_0$, $D_1$, and $D_2$.

## Figure R602.10.3.

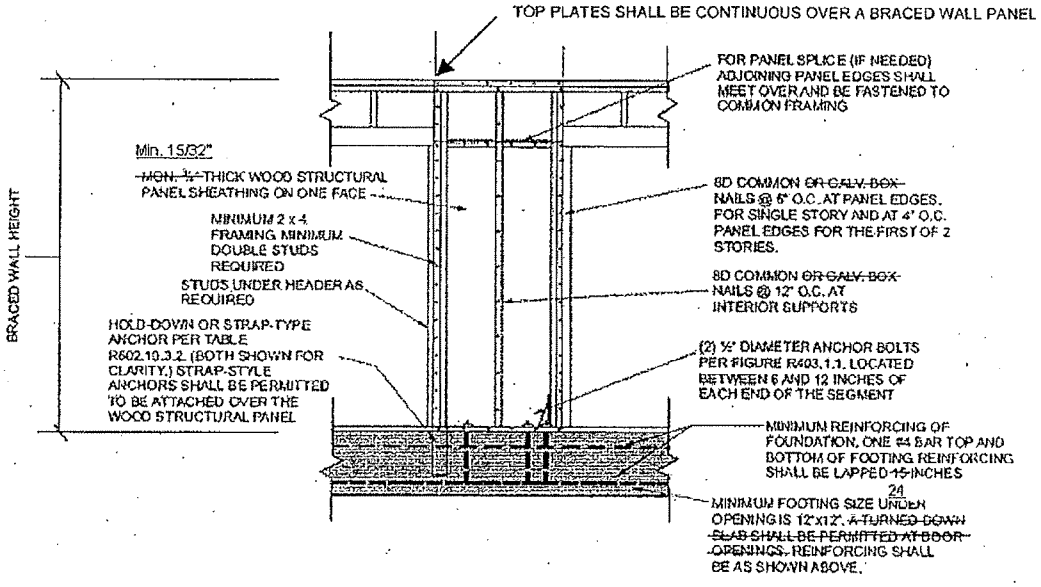



FIGURE R602.10.3.2
ALTERNATE BRACED WALL PANEL

**Figure R602.10.3**

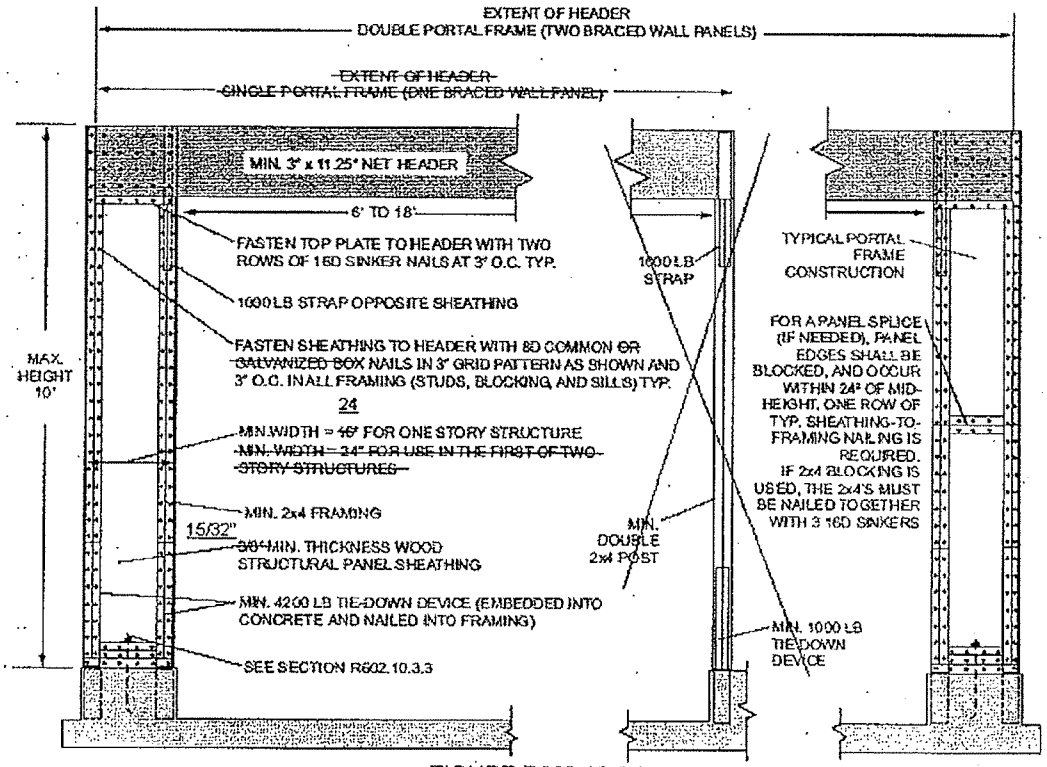



FIGURE R602.10.3.3
METHOD PFH: PORTAL FRAME WITH HOLD-DOWNS AT DETACHED GARAGE DOOR OPENINGS

**Section R602.10.3.**

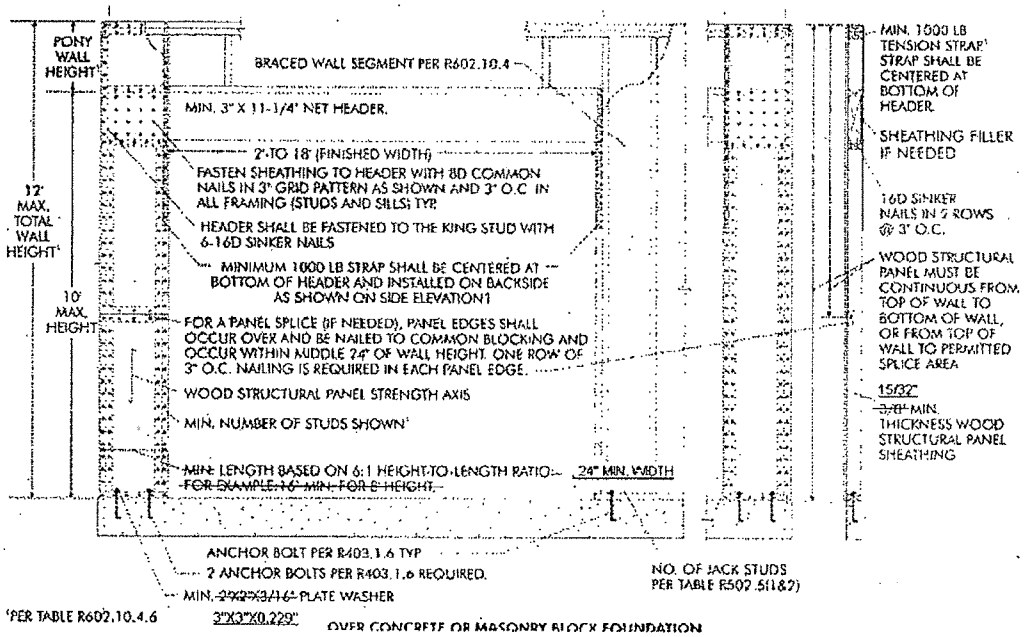
1. Each panel shall be fabricated in accordance with Figure R602.10.3.3. The wood structural panel sheathing shall extend up over the solid sawn or glued-laminated header and shall be nailed in the side of the built-up beam opposite the wood structural panel sheathing. The header shall extend between the inside faces of the first full-length outer studs of each panel. One anchor bolt not less than $^{5}/_{8}$- inch-diameter (16 mm) and installed in accordance with Section R403.1.6 shall be provided in the center of each sill Oplate. The hold-down devices shall be an embedded-strap type, installed in accordance with the manufacturer's recommendations. The panels shall be supported directly on a foundation that is continuous across the entire length of the braced wall line. The foundation shall be reinforced as shown on Figure R602.10.3.2. This reinforcement shall be lapped not less than 24 inches (610 mm) with the reinforcement required in the continuous foundation located directly under the braced wall line.

## Table R602.10.4.

TABLE R602.10.4.1
CONTINUOUS SHEATHING METHODS

| METHOD | MATERIAL | MINIMUM THICKNESS | FIGURE | CONNECTION CRITERIA |
|---|---|---|---|---|
| CS-WSP | Wood structural panel | 15/32" <br> 3/8 | 6d | 6d common (2" × 0.113") nails at 6" spacing (panel edges) and at 12" spacing (intermediate supports) ~~or 16 ga. × 1 3/4 staples at 3" spacing (panel edges) and 6" spacing (intermediate supports)~~ |
| CS-G | Wood structural panel adjacent to garage openings and supporting roof load only[a,b] | 15/32" <br> 3/8 | | See Method CS-WSP |
| CS-PF | Continuous portal frame | See Section R602.10.4.1 | | See Section R602.10.4.1 |

## Figure R602.10.4.1.




**Section** **R602.10.7.1** of the 2010 California Residential Code is deleted in its entirety.

**Section** **R606.2.4** of the 2010 California Residential Code is amended to read as follows:

**R606.2.4 Parapet walls.** Unreinforced solid masonry parapet walls shall not be less than 8 inches (203 mm) thick and their height shall not exceed four times their thickness. Unreinforced hollow unit masonry parapet wall shall not be less than 8 inches (203 mm)

thick, and their height shall not exceed three times their thickness. Masonry parapet walls in areas subject to wind loads of 30 pounds per square foot (1.44 kPa) or located in Seismic Design Category $D_0$, $D_1$, or $D_2$, or on townhouses in Seismic Design Category C shall be reinforced in accordance with Section R606.12.

**R606.12.2.2.3 Reinforcement of requirements for masonry elements.** Masonry elements listed in Section R606.12.2.2.2 shall be reinforced in either the horizontal or vertical direction as shown in Figure R606.11(3) and in accordance with the following:

1. Horizontal reinforcement. Horizontal joint reinforcement shall consist of at least one No. 4 bar spaced not more than 48 inches (1219 mm). Horizontal reinforcement shall be provided within 16 inches (406 mm) of the top and bottom of these masonry elements.

2. Vertical reinforcement. Vertical reinforcement shall consist of at least one No. 4 bar spaced not more than 48 inches (1219 mm). Vertical reinforcement shall be within 8 inches (406 mm) of the ends of masonry walls.

**Exception of Section 602.3.2**

Exception: In other than Seismic Design Category $D_0$, $D_1$, or $D_2$, a single top plate maybe installed in stud walls, provided the plate is adequately tied at joints, corners and interesting walls by a minimum of 3-inch-by-6-inch by a 0.036 inch-thick (76 mm by 152 mm by 0.914 mm) galvanized steel plate that is nailed to each wall or segment of wall by six 8d nails on each side, provided the rafters or joists are centered over the studs with a tolerance of no more than 1 inch (25 mm). The top plate may be omitted over lintels that are adequately tied to adjacent wall sections with steel plates or equivalent as previously described.

**Chapter 8 of the 2010 California Residential Code is amended and the following subsections shall read as follows:**

**Footnote "l" is added to Table R802.5.1(9)**

Edge distances, end distances and spacings for nails shall be sufficient to prevent splitting of the wood.

**R802.8 Lateral support.** Roof framing members and ceiling joists having a depth-to-thickness ratio exceeding 2 to 1 based on nominal dimensions shall be provided with lateral support at points of bearing to prevent rotation. For roof rafters with ceiling joists attached per Table R602.3(1), the depth-thickness ratio for the total assembly shall be determined using the combined thickness of the rafter plus the attached ceiling joist.

**R802.10.2 Design.** Wood trusses shall be designed in accordance with accepted engineering practice. The design and manufacture of metal-plate-connected wood

trusses shall comply with ANSI/TPI 1. The truss design drawings shall be prepared by a registered professional.

**R803.2.4 Openings in horizontal diaphragms.** Openings in horizontal diaphragms shall conform with Section R503.2.4.

**Chapter 10 of the 2010 California Residential Code is amended and the following subsections shall read as follows:**

**R1001.3.1 Vertical reinforcing.** For chimneys up to 40 inches (1016 mm) wide, four No. 4 continuous vertical bars adequately anchored into the concrete foundation shall be placed between wythes of solid masonry or within the cells of hollow unit masonry and grouted in accordance with Section R609. Grout shall be prevented from bonding with the flue liner so that the flue liner is free to move with thermal expansion. For chimneys more than 40 inches (1016 mm) wide, two additional No. 4 vertical bars adequately anchored into the concrete foundation shall be provided for each additional flue incorporated into the chimney or for each additional 40 inches (1016 mm) in width or fraction thereof.

**SECTION 17. Section 15.04.450** of the Calabasas Municipal Code is hereby added to read as follows.

**15.04.450 Existing Structures.**

The following sections of the Residential Code are added to provide as follows:

**R1101 Compliance with other codes.** Alterations, repairs, additions, changes of occupancy and maintenance of all structures shall comply with the provisions for alterations, repairs, additions, changes of occupancy and maintenance of all structures in the California Fire Code, California Plumbing Code, California Mechanical Code, California Electrical Code, Title 25, California Code of Regulations, Division 1, Chapter 1, Subchapter 1, Article 1 (a) and (b) and California Health and Safety Code Sections 17920-17927.

*(HCD 1) See Chapter 34, Section 3403.1, Exception 2 and Title 25, Division 1, Chapter 1, Subchapter 1, Article 1, commencing with Section 1 for existing buildings or structures.*

**R1102 Substandard Buildings.** Any building or portion thereof including any dwelling unit, guestroom or suite of rooms, or the premises on which the same is located, in which there exists any of the following listed conditions to an extent that endangers the life, limb, health, property, safety, or welfare of the public or the occupants thereof shall be deemed and hereby is declared to be a substandard building:

(a) Inadequate sanitation shall include, but not be limited to, the following:

(1) Lack of, or improper water closet, lavatory, or bathtub or shower in a dwelling unit.

(2) Lack of, or improper water closets, lavatories, and bathtubs or showers per number of guests in a hotel.

(3) Lack of, or improper kitchen sink.

(4) Lack of hot and cold running water to plumbing fixtures in a hotel.

(5) Lack of hot and cold running water to plumbing fixtures in a dwelling unit.

(6) Lack of adequate heating.

(7) Lack of, or improper operation of required ventilating equipment.

(8) Lack of minimum amounts of natural light and ventilation required by this code.

(9) Room and space dimensions less than required by this code.

(10) Lack of required electrical lighting.

(11) Dampness of habitable rooms.

(12) Infestation of insects, vermin, or rodents as determined by the health officer.

(13) General dilapidation or improper maintenance.

(14) Lack of connection to required sewage disposal system.

(15) Lack of adequate garbage and rubbish storage and removal facilities as determined by the health officer.

(b) Structural hazards shall include, but not be limited to, the following:

(1) Deteriorated or inadequate foundations.

(2) Defective or deteriorated flooring or floor supports.

(3) Flooring or floor supports of insufficient size to carry imposed loads with safety.

(4) Members of walls, partitions, or other vertical supports that split, lean, list, or buckle due to defective material or deterioration.

(5) Members of walls, partitions, or other vertical supports that are of insufficient size to carry imposed loads with safety.

(6) Members of ceilings, roofs, ceilings and roof supports, or other horizontal members which sag, split, or buckle due to defective material or deterioration.

(7) Members of ceiling, roofs, ceiling and roof supports, or other horizontal members that are of insufficient size to carry imposed loads with safety.

(8) Fireplaces or chimneys which list, bulge, or settle due to defective material or deterioration.

(9) Fireplaces or chimneys which are of insufficient size or strength to carry imposed loads with safety.

(c) Any nuisance.

(d) All wiring, except that which conformed with all applicable laws in effect at the time of installation if it is currently in good and safe condition and working properly.

(e) All plumbing, except plumbing that conformed with all applicable laws in effect at the time of installation and has been maintained in good condition, or that may not have conformed with all applicable laws in effect at the time of installation but is currently in good and safe condition and working properly, and that is free of cross connections and siphonage between fixtures.

(f) All mechanical equipment, including vents, except equipment that conformed with all applicable laws in effect at the time of installation and that has been maintained in good and safe condition, or that may not have conformed with all applicable laws in effect at the time of installation but is currently in good and safe condition and working properly.

(g) Faulty weather protection, which shall include, but not be limited to, the following:

(1) Deteriorated, crumbling, or loose plaster.

(2) Deteriorated or ineffective waterproofing of exterior walls, roof, foundations, or floors, including broken windows or doors.

(3) Defective or lack of weather protection for exterior wall coverings, including lack of paint, or weathering due to lack of paint or other approved protective covering.

(4) Broken, rotted, split, or buckled exterior wall coverings or roof coverings.

(h) Any building or portion thereof, device, apparatus, equipment, combustible waste, or vegetation that, in the opinion of the chief of the fire department or his deputy, is in such a condition as to cause a fire or explosion or provide a ready fuel to augment the spread and intensity of fire or explosion arising from any cause.

(i) All materials of construction, except those which are s pecifically allowed or approved by this code, and which have been adequately maintained in good and safe condition.

(j) Those premises on which an accumulation of weeds, vegetation, junk, dead organic matter, debris, garbage, offal, rodent harborages, stagnant water, combustible materials, and similar materials or conditions constitute fire, health, or safety hazards.

(k) Any building or portion thereof that is determined to be an unsafe building due to inadequate maintenance, in accordance with the latest edition of the Uniform Building Code.

(l) All buildings or portions thereof not provided with adequate exit facilities as required by this code, except those buildings or portions thereof whose exit facilities conformed with all applicable laws at the time of their construction and that have been adequately maintained and increased in relation to any increase in occupant load, alteration or addition, or any change in occupancy.

When an unsafe condition exists through lack of, or improper location of, exits, additional exits may be required to be installed.

(m) All buildings or portions thereof that are not provided with the fire-resistive construction or fire-extinguishing systems or equipment required by this code, except those buildings or portions thereof that conformed with all applicable laws at the time of their construction and whose fire-resistive integrity and fire-extinguishing systems or equipment have been adequately maintained and improved in relation to any increase in occupant load, alteration or addition, or any change in occupancy.

(n) All buildings or portions thereof occupied for living, sleeping, cooking, or dining purposes that were not designed or intended to be used for those occupancies.

(o) Inadequate structural resistance to horizontal forces.

"Substandard building" includes a building not in compliance with Section 13143.2. of the California Health and Safety Code. However, a condition that would require displacement of sound walls or ceilings to meet height, length, or width requirements for ceilings, rooms, and dwelling units shall not by itself be considered sufficient existence of dangerous conditions making a building a substandard building, unless the building was constructed, altered, or converted in violation of those requirements in effect at the time of construction, alteration, or conversion.

**R1103 Definitions.** For the purposes of this chapter, the following definition applies and is hereby added to Section R 202 Definitions of the 2010 California Residential Code (CRC):

**Substantial Structural Damage** – A condition where:

1. In any story, the vertical elements of the lateral-force-resisting system, have suffered damage such that the lateral load-carrying capacity of the structure in any direction has been reduced by more than 20 percent from its pre-damaged condition, or
2. The capacity of any vertical gravity load-carrying component, or any group of such components, that supports more than 30 percent of the total area of the structure's floor(s) and roof(s) has been reduced more than 20 percent from its pre-damaged condition, and the remaining capacity of such affected elements with respect to all dead and live loads is less than 75 percent of that required by the building code for new buildings of similar structure, purpose and location.

**R1104 Repairs.** For the purposes of this chapter, the following repair requirements are hereby added as Additions, Alterations or Repair in the 2010 California Residential Code (CRC):

**R1104.1 Repairs.** Repairs of structural elements shall comply with this section.

**R1104.1.1 Seismic evaluation and design.** Seismic evaluation and design of an existing building and its components shall be based on the following criteria.

**R1104.1.1.1 Evaluation and design procedures.** The seismic evaluation and design shall be based on the procedures specified in the building code, ASCE 31 *Seismic Evaluation of Existing Buildings (for evaluation only) or ASCE 41* Seismic

rehabilitation of Existing Buildings. The procedures contained in Appendix A of the International Existing Building Code shall be permitted to be used as specified in Section R1104.1.1.3.

**R1104.1.1.2 CRC level seismic forces.** When seismic forces are required to meet the building code level, they shall be one of the following:

1. 100 percent of the values in the building code. The R factor used for analysis in accordance with Chapter 16 of the building code shall be the R factor specified for structural systems classified as "Ordinary" unless it can be demonstrated that the structural system satisfies the proportioning and detailing requirements for systems classified as "Intermediate" or "Special".

2. Forces corresponding to BSE-1 and BSE-2 Earthquake Hazard Levels defined in ASCE 41. Where ASCE 41 is used, the corresponding performance levels shall be those shown in Table R1104.1.1.2.

**TABLE R1104.1.1.2**
**ASCE 41 and ASCE 31 PERFORMANCE LEVELS**

| OCCUPANCY CATEGORY (BASED ON IBC TABLE 1604.5) | PERFORMANCE LEVEL FOR USE WITH ASCE 31 AND WITH ASCE 41 BSE-1 EARTHQUAKE HAZARD LEVEL | PERFORMANCE LEVEL FOR USE WITH ASCE 41 BSE-2 EARTHQUAKE HAZARD LEVEL |
|---|---|---|
| I | Life Safety (LS) | Collapse Prevention (CP) |
| II | Life Safety (LS) | Collapse Prevention (CP) |
| III | Note (a) | Note (a) |
| IV | Immediate Occupancy (IO) | Life Safety (LS) |

a. Performance Levels for Occupancy Category III shall be taken as halfway between the performance levels specified for Occupancy Category II and Occupancy Category IV.

**R1104.1.1.3 Reduced CBC level seismic forces.** When seismic forces are permitted to meet reduced building code levels, they shall be one of the following:

1. 75 percent of the forces prescribed in the building code. The R factor used analysis in accordance with Chapter 16 of the California Building Code shall be the R factor as specified in Section R1104.1.1.2.

2. In accordance with the applicable chapters in Appendix A of the International Existing Building Code as specified in Items 2.1 through 2.5 below. Structures or portions of structures that comply with the requirements of the applicable chapter in Appendix A shall be deemed to comply with the requirements for reduced building code force levels.

2.1 The seismic evaluation and design of un-reinforced masonry bearing wall buildings in Occupancy Category 1 or II are permitted to be based on the procedures specified in Appendix Chapter A1.

2.2 Seismic evaluation and design of the wall anchorage system in reinforced concrete and reinforced masonry wall buildings with flexible diaphragms in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A2.

2.3 Seismic evaluation and design of cripple walls and sill plate anchorage in residential buildings or light-frame wood construction in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A3.

2.4 Seismic evaluation and design of soft, weak, or open-front wall conditions in multiunit residential buildings of wood construction in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A4.

2.5 Seismic evaluation and design of concrete buildings and concrete with masonry infill buildings in all Occupancy Categories are permitted to be based on the procedures specified in Appendix Chapter A5.

3. In accordance with ASCE 31 based on the applicable performance level as shown in Table R1104.1.1.2.

4. Those associated with the BSE-1 Earthquake Hazard Level defined in ASCE 41 and the performance level as shown in Table R1104.1.1.2. Where ASCE 41 is used, the design spectral response acceleration parameters Sxs and Sx1 shall not be taken less than 75 percent of the respective design spectral response acceleration parameters SDS and SD1 defined by the International Building Code and its reference standards.

**R1104.1.2 Wind Design.** Wind design of existing buildings shall be based on the procedures specified in the building code.

**R1105 Repairs to damaged buildings.** Repairs to damaged buildings shall comply with this section.

**R1105.2.1 Unsafe conditions.** Regardless of the extent of structural damage, unsafe conditions shall be eliminated.

**R1105.2.2 Substantial structural damage to vertical elements of the lateral-force-resisting system.** A building that has sustained substantial structural damage to the vertical elements of its lateral-force-resisting system shall be evaluated and repaired in accordance with the applicable provisions of Section R1104.2.1 through R1104.2.3.

**R1105.2.2.1 Evaluation.** The building shall be evaluated by a registered design professional, and the evaluation findings shall be submitted to the code official.

The evaluation shall establish whether the damaged building, if repaired to its pre-damage state, would comply with the provisions of the building code. Wind forces for this evaluation shall be those prescribed in the building code. Seismic forces for this evaluation are permitted to be the reduced level seismic forces specified in Code Section R1104.2.1.

**R1105.2.2.2 Extent of repair for compliant buildings.** If the evaluation establishes compliance of the pre-damage building in accordance with Section R1104.2.1, then repairs shall be permitted that restore the building to its pre-damage state, using materials and strengths that existed prior to the damage.

**R1105.2.2.3 Extent of repair for non-compliant buildings.** If the evaluation does not establish compliance of the pre-damage building in accordance with Section R1105.2.2.1, then the building shall be rehabilitated to comply with applicable provisions of the building code for load combinations including wind of seismic forces. The wind design level for the repair shall be as required by the building code in effect at the tie of original construction unless the damage was caused by wind, in which case the design level shall be as required by the code in effect at the time of original construction or as required by the building code, whichever is greater. Seismic forces for this rehabilitation design shall be those required for the design of the pre-damaged building, but not less than the reduced level seismic forces specified in Section R1101.1.3. New structural members and connections required by this rehabilitation design shall comply with the detailing provisions of the building code for new buildings or similar structure, purpose, and location.

**R1105.2.3 Substantial structural damage to vertical load-carrying components.** Vertical load-carrying components that have sustained substantial structural damage shall be rehabilitated to comply with the applicable provisions for dead and live loads in the building code. Undamaged vertical load-carrying components that receive dead or live loads from rehabilitated components shall also be rehabilitated to carry the design loads of the rehabilitation design. New structural members and connections required by this rehabilitation design shall comply with the detailing provisions of the building code for new buildings of similar structure, purpose, and location.

**R1105.2.3.1 Lateral force-resisting elements.** Regardless of the level of damage to vertical elements of the lateral force-resisting system, if substantial structural damage to vertical load-carrying components was caused primarily by wind or seismic effects, then the building shall be evaluated in accordance with Section R1103.5.2.2.1 and, if non-compliant, rehabilitated in accordance with Section R1103.5.2.2.3.

**R1105.2.4 Less than substantial structural damage.** For damage less than substantial structural damage, repairs shall be allowed that restore the building to its pre-damage state, using materials and strengths that existed prior to the damage. New structural members and connections used for this repair shall comply with the detailing provisions of the building code for new buildings of similar structure, purpose, and location.

**SECTION 18.** **15.04.460** of the Calabasas Municipal Code is hereby added to read as follows:

**15.04.460 Safety Assessment Placards**

A. Intent. This section established standard placards to be used to indicate the condition of a structure for continued occupancy. The section further authorizes the Building Official and his or her authorized representatives to post the appropriate placard at each entry point to a building or structure upon completion of a safety assessment.

B Application of Provisions
The provisions of this chapter are applicable to all buildings and structures of all occupancies regulated by the City of Calabasas. The City Council may extend the provisions as necessary.

C. Definitions
Safety assessment is a visual, non-destructive examination of a building or structure for purpose of determining the condition for continued occupancy.

D Placards
The following are verbal descriptions of the official placards to be used to designate the condition for continued occupancy of buildings or structures.

1. INSPECTED – Lawful Occupancy Permitted is to be posted on any building or structure wherein no apparent structural hazard has been found. This placard is not intended to mean that there is no damage to the building or structure.
2. RESTRICTED USE is to be posted on each building or structure that has been damaged wherein the damage has resulted in some form of restriction to the continued occupancy. The individual who posts this placard will note in general terms the type of damage encountered and will clearly and concisely note the restrictions on continued occupancy.
3. UNSAFE – Do Not Enter or Occupy is to be posted on each building or structure that has been damaged such that continued occupancy poses a threat to life safety. Buildings or structures posted with this placard shall not be entered under any circumstance except as authorized in writing by the Building Official, or his or her authorized representative. Safety assessment teams shall be authorized to enter these buildings at any time. This placard is not to be used or considered as a demolition order. The individual who posts this placard will note in general terms the type of damage encountered.

i. This ordinance number, the name of the jurisdiction, its address, and phone number shall be permanently affixed to each placard.

ii. Once it has been attached to a building or structure, a placard is not to be removed, altered or covered until done so by an authorized representative of the Building Official. It shall be unlawful for any person, firm or corporation to alter, remove, cover or deface a placard unless authorized pursuant to this section.

**SECTION 19.** **15.04.470** of the Calabasas Municipal Code is amended to read in words and figures, as follows:

**15.04.470 Barriers for Swimming pools, spas, and hot tubs.**

Section 3109.3 of the 2010 California Building Code is amended to read as follows:

3109.3 Outdoor Swimming Pool. An outdoor swimming pool shall be provided with a barrier that shall be installed, inspected and approved prior to plastering or filling with water. The barrier shall comply with the following:

1. The top of the barrier shall be at least 60 inches (1524 mm) above grade measured on the side of the barrier which faces away from the swimming pool. The maximum vertical clearance between grade and the bottom of the barrier shall be 2 inches (51 mm) measured on the side of the barrier which faces away from the swimming pool. The maximum vertical clearance at the bottom of the barrier may be increased to 4 inches (102 mm) when grade is a solid surface such as a concrete deck, or when the barrier is mounted on top of the aboveground pool structure. When barriers have horizontal members spaced less than 45 inches (1143 mm) apart, the horizontal members shall be placed on the pool side of the barrier. Any decorative design work on the side away from the swimming pool, such as protrusions, indentations or cutouts, which render the barrier climbable, is prohibited.
2. Openings in the barrier shall not allow passage of a 1 3/4-inch-diameter (44 mm) sphere.

EXCEPTIONS:

1. When vertical spacing between such openings is 48 inches (1143 mm) or more, the opening size may be increased such that the passage of a 4-inch-diameter (102 mm) sphere is not allowed.
2. For fencing composed of vertical and horizontal members, the spacing between vertical members may be increased up to 4 inches (102 mm) when the distance between the tops of horizontal members is 48 inches (1143 mm) or more.
3. Chain link fences used as the barrier shall not be of less than 11 gage and shall be provided with slats of wood or UV resistant plastic interwoven with the chain link.

3A. Existing chain link fences may be used as the swimming pools, spas, and hot tub barriers and shall

be screened as provided for in the City of Calabasas Land Use and Development Code.

3B. Replacement fencing for swimming pools, spas, and hot tub barriers and barriers for new swimming pools, spas, and hot tub barriers shall not be constructed of chain link fencing of any type.

**SECTION 20.** **15.04.480** of the Calabasas Municipal Code is amended to read as follows:

**15.04.480 Appendix H** of the 2010 California Residential Code is hereby adopted.

**SECTION 21.** The title of **Article III** of Chapter 15.04 of the Calabasas Municipal Code is hereby amended to read, "California Mechanical Code." The new Article III shall include the following sections which shall read as follows:

**15.04.510 2010 California Mechanical Code adopted.**

A. The 2010 California Mechanical Code, which regulate and control the design, construction, quality of materials, erection, installation, alteration, repair, location, relocation, replacement, addition to, use or maintenance of heating, venting, cooling, refrigeration systems, or other miscellaneous heat-producing appliances in the city, provides for the issuance of permits and collection of fees therefore and provides for penalties for the violation thereof, with certain changes and amendments thereto, is hereby adopted by reference, and all conflicting ordinances are hereby repealed.

B. All of the regulations, provisions, conditions, and terms of said codes, together with their appendices, one copy of which will be on file and accessible to the public for inspection at the City Clerk's office, are hereby referred to, adopted, and made part of this chapter as if fully set forth in this chapter with the exceptions, deletions, additions, and amendments thereto as set forth in this subchapter.

**15.040.520 Penalty**

Every person violating any provision of the 2010 California Mechanical Code, adopted by reference by 15.04.510, or of any permit or license granted thereunder, or any rules or regulations promulgated pursuant thereto, is guilty of a misdemeanor. Upon conviction thereof, he or she shall be punishable by a fine not-to-exceed one thousand dollars or imprisonment not-to-exceed six months, or by both such fine and imprisonment. The imposition of such penalty for any violation shall not excuse the violation or permit it to continue. Each day that a violation occurs shall constitute a separate offense.

**15.04.530 Definitions**

Not withstanding the provisions of Section 15.04.510, whenever the names or terms defined in this section are used in this code, each such name or term shall be deemed or construed to have in the meaning ascribed to it in this section.

A. "Board of Supervisors" shall mean the City of Calabasas City Council.

B. "County" or "County of Los Angeles" or Unincorporated Territory of the County of Los Angeles" shall mean the City of Calabasas.

C. "Building Official and Engineer" or "County Engineer" shall mean the Building Official of the City of Calabasas.

**15.04.540 Fees**

Not withstanding the provisions of Section 15.04.510 the amount of every fee set forth in the code shall be the fee set forth in the most current resolution of the City Council establishing fees.

**SECTION 22.** The title of Article IV of Chapter 15.04 of the Calabasas Municipal Code is hereby amended to be "California Plumbing Code." Article IV shall now include of the following sections, which shall be revised to read as follows:

**15.04.560 2010 California Plumbing Code adopted.**

(A) The 2010 California Plumbing Code inclusive of 2010 California Plumbing Code Appendix A, Appendix B, Appendix D, Appendix F, Appendix G, Appendix I, Appendix L Appendix M and Appendix S which provide minimum requirements and standards for the protection of the public health, safety and welfare by regulating the installation or alteration of plumbing and drainage, materials, venting, wastes, traps, interceptors, water systems, sewers, gas piping, water heaters and other related products, and workmanship in the city, provide for the issuance of permits and collection of fees therefor, and provide for penalties for the violations thereof, with certain changes and amendments thereto, are hereby adopted by reference, and conflicting ordinances are hereby repealed.

(B) All of the regulations, provisions, conditions, and terms of said codes, together with their appendices, one copy of which will be on file and accessible to the public for inspection at the City Clerk's office, are hereby referred to, adopted, and made part of this chapter as if fully set forth in this chapter with the exceptions, deletions, additions, and amendments thereto as set forth in this subchapter.

**15.04.570 Penalty.**

Every person violating any provision of the 2010 California Plumbing Code, adopted by reference by 15.04.560, or of any permit or license granted thereunder, or any rules or regulations promulgated pursuant thereto, is guilty of a misdemeanor. Upon conviction thereof, he or she shall be punishable by a fine not-to-exceed one thousand dollars or imprisonment not-to-exceed six months, or by both such fine and imprisonment. The imposition of such penalty for any violation shall not excuse the violation or permit it to continue. Each day that a violation occurs shall constitute a separate offense.

**15.04.580 Definitions.**

Not withstanding the provisions of Section 15.04.560, whenever the names or terms defined in this section are used in this code, each such name or term shall be deemed or construed to have in the meaning ascribed to it in this section.

A. "Board of Supervisors" shall mean the City of Calabasas City Council.

B. "County" or "County of Los Angeles" or Unincorporated Territory of the County of Los Angeles" shall mean the City of Calabasas.

C. "Building Official and Engineer" or "County Engineer" shall mean the Building Official of the City of Calabasas.

**15.04.590 Fees.**

Notwithstanding the provisions of Section 15.04.560 the amount of every fee set forth in the code shall be the fee set forth in the most current resolution of the City Council establishing fees.

**SECTION 23.** **15.04.610 Appendix K of the 2010 California Plumbing Code** is hereby revised:

**APPENDIX K PRIVATE SEWAGE DISPOSAL SYSTEMS**
**ONSITE WASTEWATER TREATMENT SYSTEMS (OWTS)**

**Introduction.**

A primary function of an onsite wastewater treatment system ("OWTS" or "Treatment System") is to reduce or eliminate the pathogenic organisms that are found in wastewater. Defective and/or substandard treatment systems that fail to adequately treat wastewater can contaminate groundwater, affect water quality, and create significant health hazards for the public and environment. Inappropriately designed or inadequately maintained onsite wastewater treatment systems have been proven to be the third most common source of groundwater contamination in the nation.

Appendix K and amendments thereto (hereafter collectively "Appendix K") are intended to address these growing and proven environmental issues by ensuring that existing onsite wastewater treatment systems are property operated and maintained and new treatment systems are properly constructed or installed and thereafter properly operated and maintained. Appendix K and the amendments thereto are designed to meet these objectives and ensure that all new and existing OWTS in the City of Calabasas are environmentally safe and free of health hazards.

**K 1.0 Private Sewage Disposal - General.**

(A) Where permitted by Section 713.0, the building sewer shall be permitted to be connected to a private sewage disposal system complying with the provisions of this appendix. The type of system shall be determined on the basis of location, soil porosity, and groundwater level, and shall be designed to receive all sewage from the property. The system, except as otherwise approved, shall consist of a septic tank with effluent discharging into a subsurface disposal field, into one (1) or more seepage pits,

or into a combination of subsurface disposal field and seepage pits. The Authority Having Jurisdiction shall be permitted to grant exceptions to the provisions of this appendix for permitted structures that have been destroyed due to fire or natural disaster and that cannot be reconstructed in compliance with these provisions provided that such exceptions are the minimum necessary.

**(1) Definitions.**

The words and terms in Appendix K and the amendments thereto shall have the meanings hereafter stated. These shall supersede and control over any conflicting provision in the 2010 California Plumbing Code and its appendices, or in any other portion of the Calabasas Municipal Code. If regulations or standards exist in state or federal law that are more restrictive than those in Appendix K, those shall control.

"**Administrative authority**" means the city building official and/or his duly authorized representative(s).

"**Alternative onsite wastewater treatment system**" or "AOWTS" means an OWTS designed to provide enhanced wastewater treatment that meets or exceeds secondary treatment.

"**Basin Plan**" means the same as "Water Quality Control Plan" as defined in Division 7 (commencing with Section 13000) of the Water Code. The Basin Plan is adopted by the Los Angeles Regional Water Quality Control Board, approved by the SWRCB and the Office of Administrative Law, and identify surface water and groundwater bodies within the region's boundaries and establish its beneficial uses and water quality objectives. Copies are available from the Los Angeles Regional Water Quality Control Boards.

"**Bedroom:**" A term often utilized for the load capacity calculation of an OWTS. A bedroom means a room or space of sufficient size that has been or may be regularly used for sleeping purposes. For existing legal nonconforming dwellings with benefit of building permits and inspection approvals, rooms or spaces that have clearly established uses due to the lawful installation of permanent cooking facilities, plumbing fixtures or other appliances, or rooms or spaces that are not of sufficient size to constitute a bedroom are not "bedrooms" as that term is used in this Appendix K.

"**Biochemical oxygen demand (BOD):**" An indirect measure of the concentration of biologically degradable material existing in organic wastes. It usually reflects the amount of oxygen consumed in five days by biological processes breaking down organic waste.

"**Building renovations:**" Actions to any residential or nonresidential structure including, but not limited to, alterations, additions, construction, enlargements, expansions, improvements, relocations, repairs, rehabilitation or remodel work, that result, or may result, in an increase in the volume of sewage or wastewater into an existing OWTS over the level present before those renovations are made.

"**Certified report:**" A test report by an approved OWTS inspector of an existing or new OWTS certifying that an inspection and test thereof pursuant to Appendix K was done in the required and proper manner and that certifying the information and findings in the report to be accurate and truthful. A certified report shall also contain all recommended major repairs. The required elements of a certified report shall be established by the administrative authority.

"**Cesspool:**" An excavation in the ground receiving wastewater, designed to retain organic matter and solids, while allowing the liquids to seep into the soil. Cesspools differ from seepage pits because cesspool systems do not have septic tanks.

"**Clay:**" A soil particle; the term also refers to a type of soil texture. As a soil particle, clay consists of individual rock or mineral particles in soils having diameters <0.002 mm in diameter. As a soil texture, clay is a soil material comprised as forty (40) percent or more clay particles and not more than forty-five (45) percent sand and not more than forty (40) percent silt particles.

"**Contaminants of concern:**" Substances of any kind and in any form that have been identified by federal and/or state laws and regulations as posing an actual or potential hazard, detriment or threat to public health, safety or welfare, or to the environment, if present in water or able to infiltrate surface or subsurface water bodies or resources.

"**Development:**" Any grading or construction on unimproved land, or any new construction or alteration or repair of an existing structure. Development also includes building renovations and changes or intensification in the use or uses of land.

"**Dispersal system:**" A leachfield, seepage pit, subsurface drip system, evapotranspiration and adsorption bed, evapotranspiration and absorption bed, adsorption trench, or other types of systems for final wastewater treatment and subsurface discharge.

"**Dosing tank:**" A watertight receptacle located between an OWTS treatment unit (i.e., septic tank or supplemental treatment unit) and a dispersal area equipped with an automatic siphon device or pump designed to discharge wastewater intermittently in the distribution lines in amounts proportioned to the capacity of such lines and to provide adequate rest periods between such discharges.

"**Effluent:**" Initially treated sewage from a septic tank and discharged from an OWTS, or any portion thereof.

"**Evapotranspiration and infiltration (ETI) bed:**" A subsurface dispersal bed in which soil capillarity and root uptake help to dispense the effluent from a septic tank or supplemental treatment system through surface evaporation, soil absorption and plant transpiration.

"**Evapotranspiration and adsorption bed:**" A subsurface dispersal system that relies on soil capillarity and root uptake to disperse the effluent from a septic tank or supplemental treatment system through surface evaporation, soil adsorption, and plant transpiration.

"**Existing OWTS:**" A private sewage disposal or treatment system on private real property that was installed before the effective date of Ordinance No. 2009-262. Any system that is thereafter installed, whether in whole or part, is referred to by this Appendix as a new OWTS.

"**Failing or failed system:**" Any temporary or permanent defect or malfunction, regardless of cause, in an existing or new OWTS, including, but not limited to, those that result from a complete or partial impairment or inoperability, or improper function, of any component or design feature of an OWTS. A private sewage disposal or treatment system can reflect a partial, moderate or complete failure.

"**Fines:**" Soil particles with a diameter less than 0.05 millimeters. Fines consist of silt-or clay-sized particles.

"**Groundwater recharge areas:**" Areas where water infiltrates into the earth and either increases the total amount of water stored underground or replenishes the groundwater supply depleted through pumping or natural discharge.

"**Guidelines**" or "OWTS inspection guidelines" means the guidelines specified in Section K13 (E)(1).

"**Hazardous material:**" An agent, item or substance (biological, chemical, physical) that has been identified by federal and/or state laws and regulations as having the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. The term "hazardous material" includes contaminants of concern.

"**Illicit discharge:**" The subsurface or surface release for any reason or cause of sewage, wastewater, effluent or any other material or substance from an existing or new OWTS that would not occur if the OWTS were in good condition and all of its components were working properly. The manner in which an illicit discharge can occur includes, but is not limited to, dumping, leaking, overflowing, pumping or spilling.

"**Leachfield:**" One or a group of chambers or trenches designed to disperse effluent from a septic tank or supplemental treatment system.

"**Legal non-conforming OWTS:**" An existing OWTS installed in accordance with an approved design and location pursuant to a plumbing permit that was issued under then applicable law and which received an inspection approval from the public agency issuing the permit.

"**Load" or "loading:**" The actual discharge or volume level of sewage or wastewater that flows from plumbing fixtures into an existing or new OWTS. An "Approved Load" pertains to the discharge or volume level of sewage or wastewater that an existing or new OWTS was designed or intended to accommodate when a plumbing permit was issued for that OWTS and an inspection approval from an issuing public agency was given.

"**Major repair or repairs:**" Any action or actions that involve the alteration, correction, cure, prevention, repair, rehabilitation, resolution, restoration or revival of a failing or failed system (of any degree). In the absence of, or in conjunction with, a failed or failing system, a major repair further includes all actions to fully resolve all causes of an illicit discharge and to prevent its recurrence. These actions also include, but are not limited to, replacement or substitution of one or more components of an existing or new OWTS, or the introduction or use of devices or technologies in connection with existing components of an OWTS, or the demolition of a structure, or portion thereof, or grading or excavation work to establish necessary or improved access to, or improved functionality of, an OWTS. In the absence of a failed or failing system or an illicit discharge, actions limited to periodic pumping or servicing of an OWTS (as these terms are commonly used by California licensed plumbing contractors and other licensed or certified professionals) do not constitute a major repair.

"**Minor repair:**" Clearing of building drain piping with a hand or electronically driven flexible auger, refitting into place inlet or outlet tees, installing access risers or other minor alterations to an OWTS approved by the administrative authority.

"**Monitoring program:**" The program required by section K(1) (A)(4) (c) below.

"**OWTS**" means, regardless of the date of its installation, a private onsite wastewater disposal or treatment system, and each of its components, as defined under California law and regulations, and future amendments thereto, whether or not a particular OWTS complies with such laws and regulations.

"**OWTS plumbing permit:**" A written authorization issued by the administrative authority that must be obtained before: (i) starting a major repair; (ii) demolishing or removing all or a portion of a failed or failing system; (iii) starting building renovations; (iv) constructing or installing a new OWTS; or (v) performing other actions that require such a permit under Appendix K.

"**OWTS operating permit:**" A written authorization issued by the administrative authority to reflect that owners of an existing or new OWTS have complied with the regulations of Section K13 of Appendix K.

"**OWTS inspector:**" Persons having the qualifications stated in Section K13 (F)(1) of Appendix K and certified by the administrative authority to inspect and test an OWTS.

"**OWTS owner or owner**" means and includes every person having legal title to, or who leases, rents, occupies or has charge, control or possession of, any private real property in the city on which an existing or new OWTS is present, including all persons shown as owners on the last equalized assessment roll of the Los Angeles County Assessor's Office. Owners also include persons with powers of attorney, executors of estates, trustees, or who are court-appointed administrators, conservators, guardians or receivers of persons or property served by an OWTS.

"**Percolation test:**" A method of testing water absorption of the soil. The test is conducted with clean water and test results can be used to establish whether or not the soil is suitable for a dispersal system, as well as in the design and location of such a system.

"**Permeability:**" The capacity of soil, sediment, or porous rock to transmit water; the property of soil or rock that allows passage of water through it.

"**Pollutant:**" Any substance that alters water quality of the waters of the state to a degree that may potentially affect the beneficial uses of water, as listed in a basin plan.

"**Pretreatment:**" The conversion and/or reduction of certain water pollutants in wastewater by any technology or combination of technologies that precedes discharge to a subsurface wastewater infiltration system or other final treatment unit or process before final dissemination into the receiving environment.

"**Responsible person:**" has the meaning stated in section 1.17.020 of this code.

"**Rock:**" Any naturally formed aggregate of one or more minerals (e.g., granite, shale, marble); or a body of undifferentiated mineral matter (e.g., obsidian), or of solid organic matter (e.g. coal) that is greater than 0.08 inches (2mm) in size.

"**Sand:**" A soil particle; this term also refers to a type of soil texture. As a soil particle, sand consists of individual rock or mineral particles in soils having diameters ranging from 0.05 to 2.0 millimeters in diameter. As a soil texture, sand is soil that is comprised of eighty-five (85) percent or more sand particles, with the percentage of silt plus 1.5 times the percentage of clay particles comprising less than fifteen (15) percent.

"Secondary treatment" means the processing of sewage effluent by means of a treatment device which renders a sewage effluent of thirty (30) mg/L biochemical oxygen demand or less, thirty (30) mg/L total suspended solids or less, and fifteen (15) mg/L oil and grease or less.

"**Seepage pit:**" A drilled or dug excavation, three to six feet in diameter, either lined or gravel filled, that receives the effluent discharge from a septic tank or other OWTS treatment unit for dispersal.

"**Septic constraint areas:**" Those areas with noted high groundwater conditions, poor soil conditions for septic systems or noted septic tank system problems, and lands identified as primary groundwater recharge areas.
"**Septic tank:**" A watertight (except as to designed inflow and outflow points), covered receptacle designed for primary treatment of wastewater and constructed to:

(i) Receive wastewater discharged from a building;
(ii) Separate settleable and floating solids from the liquid;
(iii) Digest organic matter by anaerobic bacterial action;
(iv) Store digested solids; and
(v) Clarify wastewater for further treatment before final subsurface discharge.

"**Setback:**" A minimum horizontal distance maintained between and an OWTS and a potential point of impact or other physical point of reference.
"**Sewage**" means and includes any and all waste substance, liquid or solid, associated with human habitation, or which contains or may be contaminated with human or animal excreta, offal or any feculent matter. The term "wastewater" is synonymous with "sewage."
"**Silt:**" A soil particle; this term also refers to a type of soil texture. As a soil particle, silt consists of individual rock or mineral particles in soils having diameters ranging from between 0.05 and 0.002 mm in diameter. As a soil texture, silt is soil that is comprised as approximately eighty (80) percent or more silt particles and not more than twelve (12) percent clay particles.
"**Site:**" The location of a proposed OWTS and, as deemed appropriate by the administrative authority, a reserve dispersal area capable of disposing two hundred (200) percent of the design flow from all sources an OWTS it is intended to serve.
"**Site evaluation:**" An assessment of the characteristics of a site sufficient to determine its suitability for an OWTS. The regulations pertaining to this evaluation are set forth in Section K1 (A)(2) (2) - (5) of this Appendix K.
"**Site evaluation plan:**" A plan, in a form acceptable to the administrative authority, for the design and construction or rehabilitation of an OWTS in compliance with this code and other applicable law.
"**Site evaluation report:**" A report, in a form acceptable to the administrative authority, reporting the results of a site evaluation.
"**Soil:**" The naturally occurring body of porous mineral and organic materials on the land surface. It is composed of unconsolidated materials above bedrock; sand-sized, silt-sized, and clay-sized particles mixed with varying amounts of larger fragments and organic material. The various combinations of particles differentiate specific soil textures identified in the U.S. Department of Agriculture's Soil Classification Chart.
"**Soil texture:**" The soil class that describes the relative amount of sand, clay, silt and combinations thereof as defined by the classes of the soil textural triangle developed by the U.S. Department of Agriculture's and expressed in its Soil Classification Chart.
"**Supplemental treatment systems:**" Pretreatment devices added to an OWTS or to a component of an OWTS other than a septic tank or dosing tank, to achieve higher levels of wastewater treatment relative to a conventional septic tank in order to address septic constraint areas. These systems treat the wastewater before it is discharged to a dispersal system.

**"Surface water:"** All waters whose surface is naturally exposed to the atmosphere, such as rivers, lakes, reservoirs, ponds, streams, impoundments, seas, estuaries, and all springs, wells, or other collectors directly influenced by surface water.

**(2) Permitting provisions.**

(a) The regulations in this section are intended to supplement the 2010 California Plumbing Code as adopted by the city. If a conflict exists between the regulations, the more restrictive regulation shall apply.

The permitting provisions for a new OWTS are as follows:

A complete application must be submitted to administrative authority and an OWTS plumbing permit must be obtained before:

(i) starting a major repair; or

(ii) demolishing or removing all or a portion of a failed or failing system; or

(iii) starting building renovations;

(iv) constructing or installing a new OWTS; or

(v) performing other actions that require this permit under Appendix K. An OWTS plumbing permit shall also be obtained before the repair or installation of any mechanical or electrical device added or connected to any OWTS, with the exception of the installation of septic tank risers.

No person shall allow, cause or maintain any condition or activity that results in flow to an OWTS in excess of the approved load for any reason without first obtaining an OWTS plumbing permit and an OWTS operating permit.

No building permit shall be issued for building renovations unless an OWTS plumbing permit issues concurrently.

Permit applications will be made on forms provided by the administrative authority and shall be completed in full, signed by the owner or the owner's legally authorized representative and accompanied by all required reports, submittals and fees.

A permit shall be issued only to a licensed contractor as delineated in K1(A)(2)(f) below or to an OWTS owner. When a permit is issued to an OWTS owner, all work that the permit authorizes shall nevertheless be performed by or under the supervision of a licensed contractor as delineated in K1(A)(2)(f) below.

(b) **Site evaluation: Pre-permit requirements for a new OWTS.** Owners shall cause a site evaluation to be conducted and submit to the administrative authority a complete Site Evaluation Plan and Site Evaluation Report on forms approved by the administrative authority for that purpose and obtain written approval of that plan and report prior to:

(i) submitting an application and related materials for an OWTS plumbing permit; or (ii) installing or allowing the installation of a new OWTS.

1. Site evaluations shall be conducted and Site Evaluation Plans and Reports shall be prepared by one of the following California professionals:

a. Registered civil engineer.
b. Certified professional soil scientist.
c. Certified engineering geologist or registered geologist.

2. Sub mittals of Site Evaluation Plans and Reports shall be accompanied by a fee as established by city council resolution.

3. Inspecti ons by the administrative authority of a site and adjoining areas may be requested in connection with review of a Site Evaluation Plan and Report. An owner's failure to consent to any inspection request or to provide complete access to the areas to be inspected shall be cause to deny approval of a Site Plan Evaluation Plan and/or Report.

4. Site Evaluation Plans and Reports shall not be reviewed unless deemed complete by the administrative authority, accompanied by the required fee, and prepared by the required professional.

5. An a pproved site evaluation plan and report may be transferred with title to a site provided that: (i) amendments to Appendix K and to pertinent provisions of this code have not taken effect that change the regulations pertaining to site evaluation, Site Evaluation Plans and Site Evaluation Reports or the requirements for a new OWTS after the approval of the Site Evaluation Plan and Report and before the transfer of title; and (ii) conditions and uses of the subject property as described in the Site Evaluation Report have not changed.

6. If new amendments to Appendix K and to pertinent provisions of this code take effect after a Site Evaluation Plan and Report is approved and before an OWTS plumbing permit is, or will be, issued, the administrative authority may require a change the requirements for a new OWTS, as well as a revised site evaluation report or additional submittals and fees.

(c) **Site Evaluation Report: Required information**. A Site Evaluation Report shall be accompanied by a Site Evaluation Plan, drawn to scale, including:

1. Assessor's parcel number and map.
2. Property lines.
3. Parcel size: The map must include dimensions of parcel and any easements on the parcel.
4. Topography: Topographic map of the parcel at an appropriate engineering scale to portray the property and relevant portions of adjacent property and their respective boundaries at two-foot max contour intervals.

5. All existing and proposed structures, walls and fences on the parcel.

6. A description of all components of the proposed new OWTS and their locations on the parcel.

7. Soil evaluation: A site specific soil investigation and report of the subject property with specific attention to the proposed or existing disposal area and its suitability for proper septic effluent disposal. Soil evaluation shall include a physical investigation of the disposal area to a sufficient depth to determine the character of the soil profile and its percolation characteristics, historic and actual groundwater levels, and characterization of other geologic features within or around the disposal area which could affect, or be affected by, the operation of the OWTS.

8. Water sources and surface water courses or drainage ways.

9. Utilities, including water mains, gas lines and power lines.

10. Encumbrances including easements, roads and rock outcrops.

11. The location of each Oak Tree.

12. Any other information that the building official deems necessary to implement Appendix K.

(d) Upon receipt of a completed Site Evaluation Plan and Report and the required fee, the administrative authority shall approve the Site Evaluation Report unless either of the following determinations are made:

1. The proposed new OWTS would not comply with Appendix K and title 17 of this code.

2. The report contains inaccurate information, or an omission of information that is material for compliance with Appendix K and title 17 of this code.

(e) Approved Site Evaluation Plan and Report: Additional required Information. Upon receiving approval of a Site Evaluation Plan and Report, an owner shall submit the development plans and specifications required for a new OWTS. These shall be prepared by a professional as delineated in Section K1 (A)(2)(b)(1.) above. In addition to the information required for a complete Site Evaluation Plan and Report, the development plans and specifications shall also include:

1. Prop osed locations of all new buildings, roads, driveways and other forms of development. "Development" is defined in Section K1 (A)(1) above.

2. Prop osed easements.

3. Exact location of proposed septic tank, distribution box or drop boxes and all other components.

4. Exact location of absorption field area and replacement area, drawn to scale. Each lot must have sufficient usable area available to accommodate an initial OWTS and replacement OWTS with twice the capacity of the initial OWTS.

5. Prop osed elevations of the building sewer, the location of the building drain cleanouts, the inlet and outlet of the septic tank, distribution boxes or drop boxes,

number and length of the dispersal systems and specifications for the installation of any other OWTS components.

6. Required setbacks must be identified on the site development plan.

7. Desig n and location specifications, as well as maintenance requirements for any alternative onsite wastewater treatment system.

8. Any other information that the administrative authority deems necessary in order to properly implement Appendix K.

(f) An OWTS plumbing permit for a new OWTS shall only be issued to a professional specified in Section K1 (A)(2)(b)(1.) above or to a California-licensed contractor with a Class A, C-42 or C-36 license.

(g) An OWTS plumbing permit for the installation of a new OWTS shall be effective for one year from issuance unless a determination has been previously made that a failing or failed system exists, or that an illicit discharge has occurred, or that a major repair is needed for any reason. In such instances the administrative authority may set a shorter expiration date for the permit. An OWTS plumbing permit is not transferable to any subsequent owner of the subject real property. It is unlawful for an owner or responsible person to allow or undertake actions that are regulated by Appendix K with an expired OWTS plumbing permit. The administrative authority may suspend or revoke an OWTS plumbing permit upon determining that work not authorized by the permit is occurring. The administrative authority may impose written conditions to an OWTS plumbing permit in order to protect public health, safety and welfare.

An owner shall complete all requirements for and obtain an OWTS operating permit within thirty (30) calendar days of the administrative authority's issuance of a final inspection approval of work pursuant to an OWTS plumbing permit. Regulations of OWTS operating permits are stated in Section K13 below.

(h) The administrative authority may renew an OWTS plumbing permit once for the original permitee if a permit extension request on a city form is filed before the original permit expiration date. The administrative authority may impose written conditions on such a renewal to protect public health, safety and welfare.

An on-site waste water treatment system that has been determined to be failing is subject to the provisions of Section K1 (A) (4).

**(3) Continued use and/or modifications of an existing or new OWTS.**

(a) The regulations in this section are intended to supplement Appendix Chapter 1 of the 2010 California Plumbing Code as adopted by the city. If a conflict between the provisions of this section and that Appendix Chapter exists, the more restrictive regulation shall apply.

(b) The provisions for the continued use and/or modifications to an existing or new OWTS are as follows:

1. Every existing or new OWTS shall be maintained in a safe and sanitary condition and in good working order at all times.

2. No person shall alter, expand or modify an existing or new OWTS or maintain an alteration, expansion or modification to an existing or new OWTS without first obtaining an OWTS plumbing permit. Further, no person shall allow, cause or maintain any other condition or activity that results in an increase in the approved load of an existing or new OWTS for any reason without first obtaining an OWTS plumbing permit and an OWTS operating permit. "Load" is defined above in Section K1(A)(1).

3. A complete application must first be submitted to the administrative authority and an OWTS plumbing permit must be obtained before any person starts a major repair to an existing or new OWTS. An OWTS plumbing permit shall also first be obtained for the repair or installation of any mechanical or electrical device connected to any existing or new OWTS, with the exception of the installation of septic tank risers.

4. Permit applications will be made on forms provided by the administrative authority and will be accepted only when complete, signed by the owner or the owner's legally authorized representative and accompanied by all required reports, submittals and fees.

5. A permit shall be issued only to a licensed contractor as delineated in K1(A)(2)(f) above or to an owner. When a permit is issued to an owner, all work that the permit authorizes shall be performed by a licensed contractor as delineated in K1(A)(2)(f) above unless the administrative authority determines that the owner has the experience and skill necessary to perform the work consistently with all applicable law and with the public health, safety and welfare.

6. The administrative authority may, if cause exists to conclude that an illicit discharge has occurred or may occur, or that a failing or failed system is or may be present, require an owner to: (i) have an existing or new OWTS inspected and tested in an approved manner by an OWTS inspector whether or not an OWTS operating permit was previously issued; and (ii) file a Certified Report with the administrative authority by a stated date. The administrative authority shall consider the existence and degree of possible hazards to public health, safety or welfare in setting that deadline. If a Certified Report confirms the presence of a failed or failing system, or the need for a major repair, an owner shall comply with the regulations in Appendix K and obtain an OWTS plumbing permit and obtain and implement an OWTS operation permit consistently with section K13 below.

7. A building permit for building renovations will not be issued until an owner demonstrates in the manner required by Appendix K that he or she will not increase the approved load of an existing or new OWTS. Alternatively, an owner shall comply with the regulations in Appendix K for an OWTS plumbing permit concurrently with the issuance of a building permit for building renovations.

8. An OWTS plumbing permit for an alteration, expansion or modification to an existing OWTS shall be governed by Section K1 A (2) (g) above except that a permit shall remain effective for six months rather than a year.

9. A septic tank, dispersal system or component of an existing OWTS that is determined to not be legal non-conforming may be granted that status by the administrative authority in writing pursuant to an OWTS plumbing permit if the owner

provides a Certified Report and other information and records to support the administrative authority's determinations that:

(a) The septic tank, dispersal system or other component of an existing OWTS conforms to the plumbing code in effect at the time of its installation.

(b) The OWTS is in good working order and conforms to all of the criteria stated in Section K13 (E) below. As used herein, "good working order" includes the absence of conditions indicating an illicit discharge or a failing or failed system.

In order to assist in determining whether or not legal non-conforming status should be granted to an existing OWTS, the administrative authority may also require the owner to comply with all or some of the regulations in Section K1 (A)(2) (1.) through (8.) above.

10. Operation of a septic tank, dispersal system or component of an existing OWTS that the administrative authority determines not to be legal non-conforming after written notice of that determination is a violation of this code.

**(4) Repair of a failing or failed system.**

(a) This section is intended to supplement Appendix Chapter 1 of the 201007 California Plumbing Code as adopted by the city. If a conflict between this section and that Appendix chapter exists, the more restrictive regulation shall apply.

(b) Owners of a failing or failed system (shall comply with sections K1 (A)(3) [Continued Use and/or modifications of an existing or new OWTS] and K13 [OWTS operating permit].

(c) If cause exists to conclude that a failing or failed system is or may be present, the administrative authority may require an owner, at that owner's sole expense, to undertake, adhere to and maintain a monitoring program in effect until authorized in writing to terminate it. The obligations imposed by this paragraph may be among the conditions of an OWTS plumbing permit. A monitoring plan may include, but not be limited to, the following actions:

1. Pum ping of an OWTS as often as the administrative authority deems necessary to prevent, or reduce the possibility of, an illicit discharge, as well as to allow persons to continue to safely occupy a structure. The provider of this service shall be an OWTS inspector, or other qualified person as determined and approved by the administrative authority.

2. Sub mittal of pumping records to the city as often as the administrative authority deems necessary to verify that the objectives of pumping are being achieved. These records shall contain sufficient information to enable the administrative authority to make the necessary determinations concerning those objectives.

3. Site inspections by an OWTS inspector, the scope and frequency of which shall be determined by the administrative authority, along with the submittal frequency of a Certified Report or reports to the city with sufficient detail to enable the administrative authority to make the necessary determinations concerning the

preservation of public health, safety and welfare during the period of the monitoring program.

(d) The installation of an AOWTS, whether established or not included in Appendix K, may be proposed to correct a failing or failed system. Owners proposing to install an AOWTS shall comply with Section K1 (A)(2) through (8) above. Compliance with a monitoring program as discussed above shall continue until an installed AOWTS has received a final inspection approval under an OWTS plumbing permit from the city, unless, the building official determines in writing that the program can be terminated at an earlier time without jeopardizing public health, safety and welfare.

**(B)** Where the quantity or quality of the sewage is such that the above system cannot be expected to function satisfactorily for commercial, agricultural, and industrial plumbing systems; for installations where appreciable amounts of industrial or indigestible wastes are produced; for occupancies producing abnormal quantities of sewage or liquid waste; or when grease interceptors are required by other parts of this code, the method of sewage treatment and disposal shall be first approved by the Authority Having Jurisdiction. Special sewage disposal systems for minor, limited, or temporary uses shall be first approved by the Authority Having Jurisdiction.

**(C)** Disposal systems shall be designed to utilize the most porous or absorptive portions of the soil formation. Where the groundwater level extends to within twelve (12) feet (3,658 mm) or less of the ground surface or where the upper soil is porous and the underlying stratum is rock or impervious soil, a septic tank and disposal field system shall be installed.

**(D)** Disposal systems shall be located outside of flood hazard areas. Exception: Where suitable sites outside of flood hazard areas are not available, disposal systems shall be permitted to be located in flood hazard areas on sites where the effects of inundation under conditions of the design flood are minimized.

**(E)** All private sewage disposal systems shall be so designed that additional seepage pits or subsurface drain fields, equivalent to not less than one-hundred (100) percent of the required original system, shall be permitted to be installed where the original system cannot absorb all the sewage. No division of the lot or erection of structures on the lot shall be made if such division or structure impairs the usefulness of the one-hundred (100) percent expansion area.

**(F)** No property shall be improved in excess of its capacity to properly absorb sewage effluent by the means provided in this code.
**Exception:** The Authority Having Jurisdiction shall be permitted to, at its discretion, approve an alternate system.

**(G)** No private sewage disposal system, or pmt thereof, shall be located in any lot other than the lot that is the site of the building or structure served by such private sewage disposal system, nor shall any private sewage disposal system or part thereof be located at any point having less than the minimum distances indicated in Table K-I.

Nothing contained in this code shall be construed to prohibit the use of all or part of

an abutting lot to provide additional space for a private sewage disposal system or part thereof when proper cause, transfer of ownership, or change of boundary not in violation of other requirements has been first established to the satisfaction of the Authority Having Jurisdiction. The instrument recording such action shall constitute an agreement with the Authority Having Jurisdiction, which shall clearly state and show that the areas so joined or used shall be maintained as a unit during the time they are so used. Such agreement shall be recorded in the office of the County Recorder as part of the conditions of ownership of said properties and shall be binding on all heirs, successors, and assigns to such properties. A copy of the instrument recording such proceedings shall be filed with the Authority Having Jurisdiction.

**(H)** When there is insufficient lot area or improper soil conditions for adequate sewage disposal for the building or land use proposed, and the Authority Having Jurisdiction so finds, no building permit shall be issued and no private sewage disposal shall be permitted. Where space or soil conditions are critical, no building permit shall be issued until engineering data and test reports satisfactory to the Authority Having Jurisdiction have been submitted and approved.

**(I)** Nothing contained in this appendix shall be construed to prevent the Authority Having Jurisdiction from requiring compliance with additional requirements than those contained herein, where such additional requirements are essential to maintain a safe and sanitary condition.

**(J)** Alternate systems shall be permitted to be used only by special permission of the Authority Having Jurisdiction after being satisfied of their adequacy. This authorization is based on extensive field and test data from conditions similar to those at the proposed site, or require such additional data as necessary to provide assurance that the alternate system will produce continuous and long-range results at the proposed site, not less than equivalent to systems which are specifically authorized.

If demonstration systems are to be considered for installation, conditions for installation, maintenance, and monitoring at each such site shall first be established by the Authority Having Jurisdiction.

Approved aerobic systems shall be permitted to be substituted for conventional septic tanks provided the Authority Having Jurisdiction is satisfied that such systems will produce results not less than equivalent to septic tanks, whether their aeration systems are operating or not.

### K 2.0 Capacity of Septic Tanks.

The liquid capacity of all septic tanks shall conform to Tables K-2 and K-3 as determined by the number of bedrooms or apartment units in dwelling occupancies and the estimated waste/sewage design flow rate or the number of plumbing fixture units as determined from Table 7-3 of this Code, whichever is greater in other building occupancies. The capacity of anyone (1) septic tank and its drainage system shall be limited by the soil structure classification, as specified in Table K-4.

## K 3.0 Area of Disposal Fields and Seepage Pits.

The minimum effective absorption area in disposal fields in square feet ($m^2$), and in seepage pits in square feet ($m^2$) of side wall, shall be predicated on the required septic tank capacity in gallons (liters) and/or estimated waste/sewage flow rate, whichever is greater, and shall conform to Table K-4 as determined for the type of soil found in the excavation, and shall be as follows:

**(A)** When disposal fields are installed, a minimum of one hundred and fifty (150) square feet ($14m^2$) of trench bottom shall be provided for each system exclusive of any hard pan, rock, clay, or other impervious formations. Side wall area in excess of the required twelve (12) inches (305mm) and not to exceed thirty-six (36) inches (914 mm) below t he leach line may be added to the trench bottom area when computing absorption areas.

**(B)** Where leaching beds are permitted in lieu of trenches, the area of each such bed shall be at least fifty (50) percent greater than the tabular requirements for trenches. Perimeter side wall area in excess of the required twelve (12) inches (305 mm) and not to exceed thirty-six (36) inches (914 mm) below the leach line may be added to the trench bottom area when computing absorption areas.

**(C)** No excavation for a leach line or leach bed shall extend within ten (10) feet (3048mm) of ground water table nor to a depth where sewage may contaminate the underground water stratum.

**(D)** The minimum effective absorption area in any seepage pit shall be calculated as the excavated side wall area below the inlet exclusive of any hardpan, rock, clay, or other impervious formations.

The minimum required area of porous formation shall be provided in one or more seepage pits. No excavation shall extend within ten (10) feet (3048 mm) of ground water table nor to a depth where sewage may contaminate underground water stratum.

**(E)** Leaching chambers shall be sized on the bottom absorption area (nominal unit width) in square feet. The required area shall be calculated using Table K4 with a 0.70 multiplier.

## K 4.0 Percolation Test.

**(A)** Wherever practicable, disposal field and seepage (a) pit sizes shall be computed from Table K-4. Seepage pit sizes shall be computed by percolation tests unless use of Table K-4 is approved by the administrative authority.

**(B)** In order to determine the absorption qualities of (b) seepage pits and of questionable soils other than those listed in Table K-4, the proposed site shall be subjected to percolation tests acceptable to the administrative authority.

**(C)** When a percolation test is required, the proposed system shall have the capacity to absorb a quantity of clear water in a twenty-four-hour period equal to at least five times the liquid capacity of the proposed septic tank. No private disposal system shall be permitted to serve a building if that test shows the absorption capacity of the soil is less than 0.83 gallons per square foot (33.8L/m2) or more than 5.12 gallons per square foot (208 L/m2) of leaching area per twenty-four (24) hours. If the percolation test shows an absorption rate greater than 5.12 gallons per square foot (208 L/m2) per 24

hours, a private disposal system may be permitted if the site does not overlie ground waters protected for drinking water supplies, a minimum thickness of two (2) feet (610mm) of the native soil below the entire proposed system design is replaced by loamy sand, and the system design is based on percolation tests made in the loamy sand.

## K 5.0 Septic Tank Construction.

**(A)** Plans for all septic tanks shall be submitted to the Authority Having Jurisdiction for approval. Such plans shall show all dimensions, reinforcing, structural calculations, and such other pertinent data as required.

**(B)** Septic tank design shall be such as to produce a clarified effluent consistent with accepted standards and shall provide adequate space for sludge and scum accumulations.

**(C)** Septic tanks shall be constructed of solid durable materials not subject to excessive corrosion or decay and shall be watertight.

**(D)** Septic tanks shall have a minimum of two (2) compartments. The inlet compartment of any septic tank shall be not less than two-thirds (2/3) of the total capacity of the tank, nor less than five-hundred (500) gallons (1.9 m3) liquid capacity, and shall be not less than three (3) feet (914 mm) in width and five (5) feet (1,524 mm) in length. Liquid depth shall be not less than two (2) feet (610 mm) and six (6) inches (152 mm) nor more than six (6) feet (1 ,829 mm). The secondary compartment of any septic tank shall have a minimum capacity of two-hundred fifty (250) gallons (I.0 m3) and a maximum capacity of one-third (1/3) of the total capacity of such tank. In septic tanks having over a fifteen-hundred (1,500) gallon (5.7 m3) capacity, the secondary compartment shall be not less than five (5) feet (1,524 mm) in length.

**(E)** Access to each septic tank shall be provided by not less than two (2) manholes twenty (20) inches (508 mm) in minimum dimension or by an equivalent removable cover slab. One (1) access manhole shall be located over the inlet and one (1) access manhole shall be located over the outlet. Wherever a first compartment exceeds twelve (12) feet (3,658 mm) in length, an additional manhole shall be provided over the baffle wall.

**(F)** The inlet and outlet pipe openings shall not be larger in size than the connecting sewer pipe. The vertical leg of round inlet and outlet fittings shall not be less in size than the connecting sewer pipe nor less than four (4) inches (102 mm). A baffle-type fitting shall have the equivalent cross-sectional area of the connecting sewer pipe and not less than a four (4) inch (102 mm) horizontal dimension when measured at the inlet and outlet pipe inverts.

**(G)** The inlet and outlet pipe or baffle shall extend four (4) inches (102 mm) above and not less than twelve (12) inches (305 mm) below the water surface. The invert of the inlet pipe shall be at a level not less than two (2) inches (51 mm) above the invert of the outlet pipe.

**(H)** Inlet and outlet pipe fittings or baffles and compartment partitions shall have a free vent area equal to the required cross-sectional area of the house sewer or private sewer discharging therein to provide free ventilation above the water surface from the disposal field or seepage pit through the septic tank, house sewer, and stack to the outer air.

(I) The sidewalls shall extend not less than nine (9) inches (229 mm) above the liquid depth. The cover of the septic tank shall be not less than two (2) inches (51 mm) above the back vent openings.

(J) Partitions or baffles between compartments shall be of solid, durable material and shall extend not less than four (4) inches (102 mm) above the liquid level. An inverted fitting equivalent in size to the tank inlet, but in no case less than four (4) inches (102 mm) in size, shall be in-stalled in the inlet compartment side of the baffle with the bottom of the fitting placed midway in the depth of the liquid. Wooden baffles are prohibited.

**(K) Structural Design.**

(1) **General.** Each such tank shall be structurally designed to withstand all anticipated earth or other loads. Septic tank covers shall be capable of supporting an earth load of not less than five-hundred (500) pounds per square foot (23.9 kPa) when the maximum coverage does not exceed three (3) feet (914 mm).

(2) Flood Loads. In flood hazard areas, tanks shall be anchored to counter buoyant forces during conditions of the design flood. The vent termination and service manhole of the tank shall be a minimum of 2 feet (610 mm) above the design flood elevation or fitted with covers designed to prevent the inflow of floodwater or the outflow of the contents of the tanks during conditions of the design flood.

(L) Septic tanks installed under concrete or blacktop paving shall have the required manholes accessible by extending the manhole openings to grade in a manner acceptable to the Authority Having Jurisdiction.

**(M) Materials.**

(1) Concrete Septic Tanks. All materials used in constructing a septic tank shall be in accordance with applicable standards in Chapter 14, Table 14-1.

(2) Steel Septic Tanks. The minimum wall thickness of any steel septic tank shall be number twelve (12) U.S. gauge (0.109) (2.8 mm), and each such tank shall be protected from corrosion both externally and internally by an approved bituminous coating or by other acceptable means.

(3) Alternate Materials. Septic tanks constructed of alternate materials shall be permitted to be approved by the Authority Having Jurisdiction when complying with approved applicable standards.

Wooden septic tanks shall be prohibited.

**(N) Prefabricated Septic Tanks.**

(1) Manufactured or prefabricated septic tanks shall comply with all approved applicable standards and be approved by the Authority Having Jurisdiction.

(2) Independent laboratory tests and engineering calculations certifying the tank capacity and structural stability shall be provided as required by the Authority Having Jurisdiction.

**K 6.0 Disposal Fields.**

(A) Distribution lines shall be constructed of clay tile laid with open joints, perforated

clay pipe, perforated bituminous fiber pipe, perforated high-density polyethylene pipe, perforated ABS pipe, perforated PVC pipe, or other approved materials, provided that sufficient openings are available for distribution of the effluent into the trench area.

**(B)** Before placing filter material or drain lines in a prepared excavation, all smeared or compacted surfaces shall be removed from trenches by raking to a depth of one (1) inch (25.4 mm) and the loose material removed. Clean stone, gravel, slag, or similar filter material acceptable to the Authority Having Jurisdiction, varying in size from three fourths (3/4) inch to two and one-half (2-112) inches (19.1 mm to 64 mm), shall be placed in the trench to the depth and grade required by this section. Drain pipe shall be placed on filter material in an approved manner. The drain lines shall then be covered with filter material to the minimum depth required by this section, and this material covered with untreated building paper, straw, or similar porous material to prevent closure of voids with earth backfill. No earth backfill shall be placed over the filter material cover until after inspection and acceptance.

**Exception:** Listed or approved plastic leaching chambers shall be permitted to be used in lieu of pipe and filter material. Chamber installations shall follow the rules for disposal fields, where applicable, and shall conform to manufacturer's installation instructions.

| | MINIMUM | MAXIMUM |
|---|---|---|
| Number of drain lines per field | 1 | - |
| Length of each line | - | 100 feet (30,480 mm) |
| Bottom width of trench | 18 inches (457 mm) | 36 inches (914 mm) |
| Spacing of lines, center-to-center | 6 feet (1,829 mm) | - |
| Depth of earth cover of lines [preferred – 18 inches (457 mm)] | 12 inches (305 mm) | |
| Grade of lines | level | - |
| Filter material under drain lines | 12 inches (305 mm) | 3 in./100 ft. (25 mm/m) |
| Filter material over drain lines | 2 inches (51 mm) | - |
| | | - |

**(C)** A grade board staked in the trench to the depth of filter material shall be utilized when the distribution line is constructed with drain tile or a flexible pipe material that will not maintain alignment without continuous support.

**(D)** When seepage pits are used in combination with disposal fields, the filter material in the trenches shall terminate not less than five (5) feet (1,524 mm) from the pit excavation, and the line extending from such points to the seepage pit shall be approved pipe with watertight joints.

**(E)** Where two (2) or more drain lines are installed, an approved distribution box of sufficient size to receive lateral lines shall be installed at the head of each disposal field. The inverts of all outlets shall be level, and the invert of the inlet shall be not less than one (1) inch (25.4 mm) above the outlets. Distribution boxes shall be designed to ensure equal flow and shall be installed on a level concrete slab in natural or compacted soil.

**(F)** Laterals from a distribution box to the disposal field shall be approved pipe with watertight joints. Multiple disposal field laterals, wherever practicable, shall be of uniform length.

**(G)** Connections between a septic tank and a distribution box shall be laid with approved pipe with watertight joints on natural ground or compacted fill.

**(H)** When the quantity of sewage exceeds the amount that can be disposed in five-hundred (500) lineal feet (152.4 m) of leach line, a dosing tank shall be used. Dosing tanks shall be equipped with an automatic siphon or pump that discharges the tank once every three (3) or four (4) hours. The tank shall have a capacity equal to sixty (60) to seventy-five (75) percent of the interior capacity of the pipe to be dosed at one time. Where the total length of pipe exceeds one thousand (1,000) lineal feet (304.8 m), the dosing tank shall be provided with two (2) siphons or pumps dosing alternately and each serving one-half (1/2) of the leach field.

**(I)** Disposal fields shall be constructed as follows:
*(See chart above.)*
Minimum spacing between trenches or leaching beds shall be four (4) feet (1,219 mm) plus two (2) feet (610 mm) for each additional foot (305 mm) of depth in excess of one (1) foot (305 mm) below the bottom of the drain line. Distribution drain lines in leaching beds shall be a maximum of six (6) feet (1,829 mm)

apart on centers, and no part of the perimeter of the leaching bed shall be more than three (3) feet (914 mm) from a distribution drain line. Disposal fields, trenches, and leaching beds shall not be paved over or covered by concrete or any material that can reduce or inhibit any possible evaporation of sewer effluent.

**(J)** When necessary on sloping ground to prevent excessive line slope, leach lines or leach beds shall be stepped. The lines between each horizontal section shall be made with watertight joints and shall be designed so each horizontal leaching trench or bed shall be utilized to the maximum capacity before the effluent shall pass to the next lower leach line or bed. The lines between each horizontal leaching section shall be made with approved watertight joints and installed on natural or unfilled ground.

## K 7.0 Seepage Pits.

**(A)** The capacity of seepage pits shall be based on the quantity of liquid waste discharging there into and on the character and porosity of the surrounding soil, and shall conform to Section K 3.0 of this appendix.

**(B)** Multiple seepage pit installations shall be served through an approved distribution box or be connected in series by means of a watertight connection laid on undistributed or compacted soil; the outlet from the pit shall have an approved vented leg fitting extending not less than twelve (12) inches (305 mm) below the inlet fitting.

**(C)** Each seepage pit shall be circular in shape and shall have an excavated diameter of not less than four (4) feet (1,219 mm). Each such pit shall be lined with approved-type whole new hard-burned clay brick, concrete brick, concrete circular-type cesspool blocks, or other approved materials. Approval shall be obtained prior to construction for any pit having an excavated diameter greater than six (6) feet (1,829 mm).

**(D)** The lining in every seepage pit shall be laid on a firm foundation. Lining materials shall be placed tight together and laid with joints staggered. Except in the case of approved-type precast concrete circular sections, no brick or block shall be greater in height than its width, and shall be laid flat to form not less than a four (4) inch (102 mm) wall. Brick or block greater than twelve (12) inches (305 mm) in length shall have chamfered matching ends and be scored to provide for seepage. Excavation voids behind the brick, block, or concrete liner shall have a minimum of six (6) inches (152 mm) of clean three-fourths (3/4) inch (19.1 mm) gravel or rock.

**(E)** All brick or block used in seepage pit construction shall have a minimum compressive strength of twenty-five-hundred (2,500) pounds per square inch (17,237 kPa).

**(F)** Each seepage pit shall have a minimum sidewall (not including the arch) of ten (10) feet (3,048 mm) below the inlet.

**(G)** The arch or dome of any seepage pit shall be permitted to be constructed in one of three ways:

(1) Approved-type hard-burned clay brick or solid concrete brick or block laid in cement mortar.

(2) Approved brick or block laid dry. In both of the above methods, an approved cement mortar covering of not less than two (2) inches (51 mm) in thickness shall be applied, said covering to extend not less than six (6) inches (152 mm) beyond the sidewalls of the pit.

(3) Approved-type one or two-piece reinforced concrete slab of twenty-five-hundred (2,500) pounds per square inch (17,237 kPa) minimum compressive strength, not less than five (5) inches (127 mm) thick and designed to support an earth load of not less than four-hundred (400) pounds per square foot (19.2 kPa). Each such cover shall be provided with a nine (9) inch (229 mm) minimum inspection hole with plug or cover and shall be coated on the underside with an approved bituminous or other non-permeable protective compound.

**(H)** The top of the arch or cover must be not less than eighteen (18) inches (457 mm) but not more than four (4) feet (1219 mm) below the surface of the ground.

**(I)** An approved vented inlet fitting shall be provided in every seepage pit so arranged as to prevent the inflow from damaging the sidewall.

**Exception:** When using a one-or two-piece concrete slab cover inlet, fitting shall be permitted to be a one-fourth (1/4) bend fitting discharging through an opening in the top of the slab cover. On multiple seepage pit installations, the outlet fittings shall be per Section K 7.0 (B) of this appendix.

### K 8.0 Deleted in its entirety

### K 9.0 Commercial or Industrial Special Liquid-Waste Disposal.

**(A)** When liquid wastes contain excessive amounts of grease, garbage, flammable wastes, sand, or other ingredients that affect the operation of a private sewage disposal system, an interceptor for such wastes shall be installed.

**(B)** Installation of such interceptors shall comply with Section 1009.0 of this code, and their location shall be in ac-accordance with Table K-I of this appendix.

**(C)** A sampling box shall be installed when required by the Authority Having Jurisdiction.

**(D)** Interceptors shall be of approved design and be not less than two (2) compartments. Structural requirements shall be in compliance with the applicable subparts of Section K 5.0 of this appendix.

**(E)** Interceptors shall be located as close to the source as possible and be accessible for servicing. All necessary man-holes for servicing shall be at grade level and be gastight.

**(F)** Waste discharge from interceptors shall be permitted to be connected to a septic tank or other primary system or be disposed into a separate disposal system.

**(G)** Recommended Design Criteria. A formula may be adapted to other types of occupancies with similar wastes. (See Recommended Design Criteria on next page).

## K 10.0 Inspection and Testing.

### (A) Inspection.

(1) Applicable provisions of Section 103.5 of this code and this appendix shall be complied with. Plans shall be required per Section 101.3 of this code.

(2) System components shall be properly identified as to manufacturer. Septic tanks or other primary systems shall have the rated capacity permanently marked on the unit.

(3) Septic tanks or other primary systems shall be in-stalled on dry, level, well-compacted soil.

(4) If design is predicated on soil tests, the system shall be installed at the same location and depth as the tested area.

### (B) Testing.

(1) Septic tanks or other primary components shall be filled with water to flow line prior to requesting inspection. Seams or joints shall be left exposed (except the bottom), and the tank shall remain water-tight.

(2) A flow test shall be performed through the system to the point of effluent disposal. All lines and components shall be watertight. Capacities, required air space, and fittings shall be in accordance with the provisions set forth in this appendix.

## K 11.0 Abandoned Sewers and Sewage Disposal Facilities.

**(A)** Every abandoned building (house) sewer, or part thereof, shall be plugged or capped in an approved manner within five (5) feet (1,524 mm) of the property line.

**(B)** Every cesspool, septic tank, and seepage pit that has been abandoned or has been discontinued otherwise from further use, or to which no waste or soil pipe from a plumbing fixture is connected, shall have the sewage removed therefrom and be completely filled with the earth, sand, gravel, concrete, or other approved material.

**(C)** The top cover or arch over the cesspool, septic tank, or seepage pit shall be removed before filling, and the filling shall not extend above the top of the vertical portions of the sidewalls or above the level of any outlet pipe until inspection has been called and the cesspool, septic tank, or seepage pit has been inspected. After such inspection, the cesspool, septic tank, or seepage pit shall be filled to the level of the top of the ground.

**(D)** No person owning or controlling any cesspool, septic tank, or seepage pit on the premises of such person or in that portion of any public street, alley, or other public property abutting such premises shall fail, refuse, or neglect to comply with the provisions of this section or upon receipt of notice so to comply with the Authority Having Jurisdiction.

**(E)** Where disposal facilities are abandoned consequent to connecting any premises with the public sewer, the permitee making the connection shall fill all abandoned

facilities as required by the Authority Having Jurisdiction within thirty (30) days from the time of connecting to the public sewer.

**K 12.0 Drawings and Specifications.**

The Authority Having Jurisdiction, Health Officer, or other department having jurisdiction shall be permitted to require any or all of the following information before a permit is issued for a private sewage disposal system or at any time during the construction thereof.

**(A)** Plot plan drawn to scale, completely dimensioned, showing direction and approximate slope of surface, location of all present or proposed retaining walls, drainage channels, water supply lines or wells, paved areas and structures on the plot, number of bedrooms or plumbing fixtures in each structure, and location of the private sewage disposal system with relation to lot lines and structures.

**RECOMMENDED DESIGN CRITERIA**
**GREASE AND GARBAGE, COMMERCIAL KITCHENS**

| Number of meals per peak hour | x | Waste flow rate | x | Retention time | x | Storage factor | = | Interceptor size (liquid capacity) |
|---|---|---|---|---|---|---|---|---|

**SAND-SILT OIL, AUTO WASHERS**

| Number of meals per peak hour | x | Waste flow rate | x | Retention time | x | Storage factor | = | Interceptor size (liquid capacity) |
|---|---|---|---|---|---|---|---|---|

**SILT-LINT GREASE, LAUNDRIES, LAUNDROMATS**

| Number of machines | x | 2 cycles per hour | x | Waste flow rate | x | Retention time | x | Storage Factor | = | Interceptor size (liquid capacity) |
|---|---|---|---|---|---|---|---|---|---|---|

**Waste Flow Rate**
See Table K-3 of this appendix for estimated flow rates.

**Retention Times**
Commercial kitchen waste:
Dishwasher and/or disposal.....2.5 hours
Single service kitchen:
Single serving with disposal.....1.5 hours
Sand-silt oil..... 2.0 hours
Lint-silt (laundry)..... 2.0 hours

**Storage Factors**
Fully equipped commercial kitchen..... 8 hours operation: 1
16 hours operation: 2
24 hours operation: 3
Single service kitchen..... 1.5
Auto washers..... self-serve: 1.5
..... employee operated: 2
Laundries, Laundromats.....1.5 (allows for rock filter)

**(B)** Details of construction necessary to ensure compliance with the requirements of this appendix together with a full description of the complete installation including quality, kind, and grade of all materials, equipment, construction, workmanship, and methods of assembly and installation.

**(C)** A log of soil formations and groundwater levels as determined by test holes dug in close proximity to any proposed seepage pit or disposal field, together with a statement of water absorption characteristics of the soil at the proposed site, as determined by approved percolation tests.

**K 13.0 Onsite wastewater treatment system operating permits.**

This section is intended to supplement Chapter One of the 2010~~07~~ California Plumbing Code as adopted by the city. If a conflict between this section and that chapter exists, the more restrictive regulation shall apply.

**(A) Purpose.** The purpose of this Section K13 is to protect public health, safety and welfare, including the environment and water quality, by establishing requirements for the operation and maintenance of every OWTS in the city.

**(B) OWTS operating permit requirement.**

(1) All Owners of real property in the city served by an OWTS shall be responsible for all of the following:

(a) Obtaining all inspections and permits required by this section;

(b) Ensuring the continued maintenance and proper functioning of the OWTS at all times; and,

(c) Making any necessary repairs, modifications or upgrades to the OWTS to prevent an illicit discharge or the development of a failing of failed system. All of the foregoing responsibilities shall be performed in accordance with the requirements of this section. The issuance of an OWTS operating permit does not excuse owners or responsible persons from their obligations under Appendix K or relieve them from liability for their failure to fulfill those obligations.

(2) Any applicant for a permit under Title 15 and 17 of this Code for development that includes the construction of a new OWTS on real property not currently served by an OWTS shall apply for and obtain an operating permit for the OWTS. A certificate of occupancy for a development shall not be issued until an operating permit is issued under this section.

(3) All owners of real property served by an existing OWTS shall be required to apply for and obtain an OWTS operating permit upon the earliest of the as follows:

(a) Within six months of the effective date of this section. The building official may grant a one-time extension of five months upon receipt of a written request by the property owner. No additional extensions shall be granted.

(b) In conjunction with the obligation to apply for an OWTS plumbing permit as required by any regulation in Appendix K. An application for an OWTS operating permit shall be concurrent with any application permit or approval required by Titles 15 and 17 of this Code and, if no such permit is required, then prior to undertaking any major repair or other action that requires an OWTS plumbing permit, or thereafter as required in writing by the administrative authority.

(c) Prior to completing a voluntary conveyance (including but not limited to, assignment, gift, sale, or transfer) of a legal interest in or title to real property served by an OWTS, unless the grantors, sellers, transferors, donors or assignors (collectively the "Grantors") first comply with the regulations in Section (G) below. Excluded from such conveyances are:

(i) involuntary transfers (e.g., foreclosure proceedings or actions, as well as transfers to an heir on an owner's death);

(ii) creation of an equitable interest in the real property to secure a loan against it; and,

(iii) a "change in ownership" that is described in Section 62 of the California Revenue and Taxation Code, and any future amendments thereto. "Completion of a voluntary conveyance" may be evidenced, without limitation, by the

execution of any deed or instrument, or its recordation with the Los Angeles County Recorder's Office.

(4) All purchasers, transferees, assignees, donees and other persons who become an owner of real property (collectively the "Grantees") for which a valid OWTS operating permit is in effect, shall tender a completed "Notice of Change in Ownership Re: OWTS Operating Permit" an a city approved form to the administrative authority within thirty (30) calendar days of the voluntary conveyance. The grantors of the subject property shall inform the grantees in writing of this obligation before the voluntary conveyance. Failure of grantors to give notice of this obligation shall not excuse grantees' obligation to timely file this form.

(5) For purposes of this section, an OWTS operating permit for property included in a common interest development shall be issued in the name of a homeowners' association or any other entity representing all the owners of property in the common interest development or, if no such association or entity exists, then an OWTS operating permit shall issue in the name of all owners of property in the common interest development unless the OWTS serves a single residential or commercial unit in that development and is entirely located within land held separately by the owner of that single unit, in which case the permit shall issue in the name of the owner of that unit.

(6) Any person who becomes an OWTS owner by reason of a judicial or non-judicial foreclosure action or proceeding, shall complete either of the following actions within thirty (30) days of obtaining title to a property served by an OWTS:

(a) Complete all requirements for and obtain an OWTS operating permit if one is not in effect for the property on the date the owner took title to the property. It shall be unlawful and a violation of Appendix K for such an owner to complete a voluntary conveyance of the subject property before obtaining this permit unless he or she first complies with Section (G) below.

(b) Tender a completed "Notice of Change in Ownership Re: OWTS Operating Permit" on a city approved form to the administrative authority if OWTS operating permit is in effect on the date the owner took title to the property.

**(C) Validity and renewal of OWTS operating permits.**

(1) An OWTS operating permit shall be valid for five years absent a determination by the administrative authority that an illicit discharge has occurred, or that failing or failed system does or may exist, or that a major repair is, or may be, required. In such instances, the OWTS permit shall be null and void without further action or notice on the date the administrative authority made its determination. The administrative authority is authorized to condition an OWTS operating permit as necessary to protect public health, safety and welfare, including setting a shorter permit period.

(2) The regulations in Subsection (1) above shall apply to AOWTS operating permits.

(3) An Owner shall renew an OWTS Operating Permit by tendering a completed City application form to the Administrative Authority at least forty-five (45) days before its expiration date. If an OWTS Operating Permit becomes null and void pursuant to Subsection (1) above, the Owner shall complete all requirements for and obtain a new OWTS Operating Permit in a period established by the Administrative, who shall

consider the obligations of as Owner or other Responsible Persons to address an Illicit Discharge or a Failing or Failed System as required by Appendix K, as well as the public health, safety and welfare.

**(D) Fees.** Fees for applications for an inspection of an OWTS, issuance of an operating permit, issuance of a certificate of inspection, preparation of a compliance agreement, a notice of change in ownership Re: OWTS operating permit, an application for certification as an OWTS inspector or an application for renewal of such certification shall be established from time to time by resolution of the city council.

**(E) OWTS inspection and operating permit criteria.**

(1) The administrative authority shall not issue an operating permit until the OWTS has been inspected by an OWTS inspector and found to be operating in compliance with the OWTS inspection guidelines and with any applicable conditions previously established or imposed for the OWTS. When such an inspection cannot be accomplished due to unique conditions, alternate inspection methods may be proposed to the administrative authority and subject to its prior written approval. Any alternate method of inspection request shall be submitted in writing, with the appropriate alternate methods and materials request form completed and the required fee paid. All alternate method of inspection requests shall be prepared by a professional identified in Section K13 (F)(1)(a).

(2)The results of any inspection required by this section shall be contained and submitted as a Certified Report to the administrative authority by the OWTS inspector on a form or with elements required by the administrative authority for that purpose. Certified Reports are subject to written approval of the administrative authority.

(3) The administrative authority shall establish and approve OWTS inspection guidelines and any amendments thereto. Such guidelines shall be consistent with this section and serve its objective to require the periodic inspection and ongoing maintenance of OWTS and AWOTS systems to ensure that they function as designed and consistently with water quality and other environmental regulations and do not constitute a nuisance. Such guidelines shall have the force of law when notice of those guidelines is given in the manner required for ordinances of the city council.

(4) (a) The design of a new onsite wastewater treatment systems is dictated by the size of the structure it is to serve. The required design capacity is usually related to the number of bedrooms in a residence and is further quantified in gallons per day (gpd). The sizing of the disposal area, usually a leach field or seepage pit, is related to the design capacity requirements and the infiltration permeability of the soil surrounding the disposal area.

(b) When required by the administrative authority, an investigation of the adequacy of an OWTS includes an examination of system capacity. This examination is referred to as a hydraulic loading test and characterizes the ability of the system to dispose of effluent. This test may be performed under an artificial environment by one or a combination of either adherence to the National Association of Wastewater Transporters (NAWT) Inspection Manual for Onsite Wastewater Treatment Systems, or simultaneous activation of all plumbing fixtures in the residence for a length of time determined by the Administrative Authority, or by the use of a 3/4" garden hose turned on with flow meter attached, or by determining the design average daily flow by (a) multiplying the number of bedrooms by 150 and (b) Calculating peak one hour flow as 50% of the design flow and (c) dividing peak one hour flow by 60 to establish flow

rate in gpm then applying the amount of water to the system and monitoring the liquid levels in the septic tank disposal area components.

The disposal area and components are ~~is~~ examined while the system is under hydraulic load, and the current percolation rate is verified.

(c) For installation of a new OWTS or for planned major repairs to a failing or failed system, or for an OWTS inspection and the issuance of an OWTS operating permit, the hydraulic load calculation shall be based upon this section unless an alternate means of inspection is proposed and approved under paragraph (1) of this section (E).

(d) When required by the administrative authority, an investigation of seepage pits shall be performed in accordance with section K 4. The liquid levels established shall be monitored in a matter acceptable to the administrative authority.

(5) When a Certified Report reveals that repairs to an OWTS that do not constitute major repairs are necessary, with the written approval of the administrative authority, a conditional pass inspection may be documented by an OWTS inspector and re-inspected by the administrative authority. An OWTS operating permit may be issued upon approval of an inspection.

(6) An owner or other responsible person, as well as an OWTS inspector who knowingly prepares, offers, or submits an inaccurate, incomplete, false or altered Certified Report to the city, or to a prospective grantee, is guilty of a misdemeanor punishable as provided in chapter 1.16 of this code.

**(F) Approval of OWTS inspectors.**

(1) The administrative authority may certify as an OWTS inspector any person who:

(a) Is a person specified in Section K1 (A)(2) (f); and

(b) Has attended OWTS inspection training as required by the administrative authority; and

(c) Has passed an examination recognized by the administrative authority.

(2) Any OWTS inspector examination to be recognized by the administrative authority shall establish the fitness of an applicant to assess the condition and function of any onsite wastewater treatment systems and to determine whether maintenance, repair, or replacement of system components is necessary to bring the system into compliance with the guidelines.

(3) OWTS inspectors shall maintain certification in accordance with the requirements of this section and any other requirements established by the administrative authority to accomplish the goals of this section. Certification must be renewed every two years.

(4)The administrative authority shall maintain a current list of all certified OWTS inspectors. The list shall be available for inspection by any person upon request.

(5) The administrative authority may revoke or suspend the certification of an OWTS inspector. Grounds for revocation and/or suspension include, but not limited to:

(a) Falsification or fraudulent alteration of a Certified Report;

(b) Material misrepresentation in connection with a Certified Report;

(c) Failure to timely provide the building official with a copy of any Certified Report performed for the purpose of compliance with this section;

(d) Failure to comply with Section K-13 (F) (1) above; or

(e) Failure to secure recertification as mandated by Section K-13 (F) (3): or

(f) In the reasonable judgment of the administrative authority for other cause renders the inspector unfit to protect the public interest in professional and objective inspections of OWTS in the city.

(6) An OWTS inspector may appeal a decision of the administrative authority to revoke or suspend his or her certification by a written request, accompanied by the required appeal fee, to the administrative authority for a hearing within ten (10) days from the date the notice of revocation or suspension was mailed. If a timely request for an administrative hearing is received, the city manager shall conduct a hearing on the notice. Written notice of the date, time and location of the hearing shall be provided to the appellant at least five days before the hearing date. The appellant may present oral and written evidence at the hearing which the city manager shall consider in making his or her decision whether or not revocation or suspension of the OWTS inspector certification is consistent with the evidence and the standards of this paragraph K13 (F). The city manager shall issue a written decision within ten (10) days of the close of the hearing which shall be final as to the city and subject thereafter to judicial review pursuant to California Code of Civil Procedure 1094.5.

**(G)** Transfer of obligations to comply with Appendix K. The administrative authority may excuse a grantor in writing from the obligation to obtain an OWTS operating permit prior to a voluntary conveyance provided the grantor first complies with all of the following:

(1) The OWTS was inspected and tested in a manner satisfactory to the administrative authority no more than thirty (30) days prior to the voluntary conveyance.

(2) A certified report of the foregoing inspection and test results, as well as other required information including, but not limited to, disclosures of the actual or possible existence of a failing or failed system, or actual or possible need for major repairs, has been approved by the administrative authority prior to the voluntary conveyance.

(3) The grantees' execution of an Appendix K Compliance Agreement on terms satisfactory to the administrative authority at least at least thirty (30) calendar days prior to completion of the voluntary conveyance. This agreement shall include, but not be limited to, provisions that set forth a timeline that is satisfactory to the building official for the procurement of all permits and any major repairs indicated by the Certified Report or required by Appendix K, as well as the grantees' acceptance of any

orders and conditions that the building official may impose to protect public health, safety and welfare. This document shall also include an acknowledgement that grantees are not relying on the administrative authority's approval of the Certified Report. A performance bond or security may be required to assure the administrative authority that grantee's' obligations under the Compliance Agreement will be faithfully and timely performed. A grantee shall further agree to the recordation of an instrument on a city approved form with the Los Angeles Recorder's office that provides the public and interested persons with constructive notice of the grantee's obligations under the agreement. The document shall also provide for the recordation of an appropriate notice when the city has determined that grantors have satisfied these obligations.

(4) The grantors' and grantees' execution of indemnifications, waivers and releases in favor of the administrative authority are provided in a form acceptable to the city attorney.

(5) Any other documents the administrative authority deems necessary to ensure compliance with Appendix K.

**(H)** Revocation of operating permit. The administrative authority may revoke or suspend an operating permit if a responsible person is found to be in violation of any condition(s) of the permit or of any applicable requirements of this code, any Los Angeles Regional Water Quality Control Board standard, or other federal, state, county or other law or statue.

**K14 RESERVED**

**K15 RESERVED**

**K16.0 Unlawful systems.**

This section is intended to supplement Appendix Chapter 1 of the 2010~~07~~ California Plumbing Code as adopted by the city. If a conflict between this section and that Appendix chapter exists, the more restrictive regulation shall apply.

**(A)** As used in this section, "Unlawful System" includes any OWTS, or portion thereof, that is altered, installed, operated, maintained, repaired, or replaced in violation of Appendix K. Unlawful systems constitute a public nuisance and may be abated pursuant to chapter 8.20 of this code or in any other manner authorized by law.

(1) Unlawful Systems demonstrating Illicit Discharge are an immediate threat to public health, safety and welfare. Such systems shall be required to comply with a Monitoring Program as described in Section K1(A)(4) above. If an Owner refuses to accept and/or to follow a monitoring program, or if an Illicit Discharge nevertheless recurs, the Administrative Authority is authorized to issue an Order to Vacate requiring all persons to vacate a structure or structures in order to prevent the continued generation of sewage that could result in an Illicit Discharge. It is unlawful for any person to enter, occupy, re-enter, re-occupy or use a structure that is the subject to an

Order to Vacate except as authorized in writing by the Administrative Authority; such entry, occupancy or use of the structure may be subject to conditions established by the Administrative Authority and violation of any imposed condition is unlawful. An Order to Vacate shall not be rescinded unless the Building Official first determines in writing that the immediate threat to public health, safety and welfare has been abated in accordance with the regulations in Appendix K and other applicable law.

(2) An Unlawful System not demonstrating an immediate threat to public health, safety and welfare, as determined by the Administrative Authority in writing, shall be brought into full compliance with Appendix K and other applicable law within thirty days unless the Administrative Authority grants a written extension upon determining that the Owner has made substantial progress in completing this project during the initial compliance period and there is no apparent detriment or hazard to public health, safety and welfare in granting the extension. Notwithstanding an initial determination that an immediate threat or hazard does not exist in connection with an Unlawful System, the Administrative Authority may, upon receiving additional or new information that supports a contrary conclusion, set a shorter compliance completion deadline (regardless of any extension), and (i) require an Owner to adopt and adhere to a monitoring program as delineated by Section K 1 (A) (4); and/or, (ii) issue an Order to Vacate. The Administrative Authority is also authorized to issue any other orders and take any other actions that are necessary to protect public health, safety and welfare, including the environment and water bodies.

(3) Unlawful systems include maintaining an OWTS or portions thereof in a structurally defective condition or otherwise contrary to Sections K1 (A)(2) through (A)(4) or K13, or any of the other provisions of this code, or any other applicable law.

(4) Unlawful systems include any OWTS in connection with which an owner or other responsible person engaged in an act prohibited by Appendix K, as well as any inaction relating to any obligation or requirements that Appendix K imposes on them.

(5) Unlawful systems include any OWTS from which sewage or effluent empties, flows, seeps or drains into any stream, spring, or other waters within the city;

(6) Unlawful systems include any OWTS which exposes rodents, insects or humans to any sewage or effluent.

(7) Unlawful systems include any OWTS into which any person has discharged, or allowed or caused the discharge contaminants of concern or hazardous material, or which contains contaminants of concern or hazardous material.

(8) Unlawful systems include any OWTS maintained in any instance contrary to any correction notice or notice of violation issued by any local, state or federal agency, or contrary to any applicable law.

**(B) Correction of unlawful systems—Procedures.**

(1) Responsibility for repair. Every owner and responsible party with respect to an unlawful system shall bring that unlawful system into compliance with the regulations in Appendix K, other provisions of this code, as well as with any other applicable law.

(2) Manner of repair regardless of whether an owner holds an OWTS plumbing permit, all major repairs and other work upon an OWTS shall, be performed by a person specified in Section K1 (A)(2) (f) above.

(3) Notice of violation. If the administrative authority determines that an unlawful system exists, or that an OWTS is otherwise in violation of Appendix K or other applicable law, a written notice of violation may be sent by first class mail to the owner at the address shown on an application for an OWTS plumbing permit or an OWTS operating permit, or as reflected in the other records in the administrative authority's possession, if any. The notice of violation shall describe the violation, the corrective and other compliance actions or measures required, their commencement and completion dates, and whether or not a previously issued OWTS operating permit is null and void pursuant to Section K 13(C)(1). Any omission from such a notice shall not excuse owners and other responsible persons from maintaining an OWTS in compliance with the regulations in Appendix K and other applicable law at all times. Appendix K may be enforced, in the discretion of the city prosecutor or city attorney, as a misdemeanor or infraction pursuant to chapter 1.16 or pursuant to an administrative citation under 1.17 of this code or in any other administrative or judicial proceeding authorized by law.

**(C) Notice of violation correction time periods.** Time periods prescribed in the notice of violation to complete repairs of an OWTS shall be established by the administrative authority so as to protect the public health, safety and general welfare and may, without limitation, be based on conditions of failure as follows:

(1) Unlawful Systems demonstrating Illicit Discharge are an immediate threat to public health, safety and welfare. Such systems shall be required to comply with a Monitoring Program as described in Section K1(A)(4) above. If an Owner refuses to accept and/or to follow a monitoring program, or if an Illicit Discharge nevertheless recurs, the Administrative Authority is authorized to issue an Order to Vacate requiring all persons to vacate a structure or structures in order to prevent the continued generation of sewage that could result in an Illicit Discharge. It is unlawful for any person to enter, occupy, re-enter, re-occupy or use a structure that is the subject to an Order to Vacate except as authorized in writing by the Administrative Authority; such entry, occupancy or use of the structure may be subject to conditions established by the Administrative Authority and violation of any imposed condition is unlawful. An Order to Vacate shall not be rescinded unless the Building Official first determines in writing that the immediate threat to public health, safety and welfare has been abated in accordance with the regulations in Appendix K and other applicable law.

(2) An Unlawful System not demonstrating an immediate threat to public health, safety and welfare, as determined by the Administrative Authority in writing, shall be

brought into full compliance with Appendix K and other applicable law within thirty days unless the Administrative Authority grants a written extension upon determining that the Owner has made substantial progress in completing this project during the initial compliance period and there is no apparent detriment or hazard to public health, safety and welfare in granting the extension. Notwithstanding an initial determination that an immediate threat or hazard does not exist in connection with an Unlawful System, the Administrative Authority may, upon receiving additional or new information that supports a contrary conclusion, set a shorter compliance completion deadline (regardless of any extension), and (i) require an Owner to adopt and adhere to a monitoring program as delineated by Section K 1 (A) (4); and/or, (ii) issue an Order to Vacate. The Administrative Authority is also authorized to issue any other orders and take any other actions that are necessary to protect public health, safety and welfare, including the environment and water bodies.

**(D) Penalty.**

(1)All owners and responsible persons who maintain an unlawful system or who, by action or inaction, fail to comply with any regulation or obligation in Appendix K, as well as any condition or order of the administrative authority issued or imposed pursuant to Appendix K, are guilty of a misdemeanor punishable under chapter 1.16 or 1.17 of this code.

(2) Upon a determination by the administrative authority that an OWTS is failing or a failed system, or an unlawful system, an owner shall, if a public sewer is available to service the subject property, obtain a OWTS plumbing permit to remove the existing OWTS and connect the subject property to the public sewer system as required by article III of chapter 15.04 of this code. The administrative authority shall establish a deadline for the owner to obtain an OWTS plumbing permit, to commence work, and to complete work. The determination shall be stated in a notice of obligation to connect to public sewer system, which may be sent by first class mail to the owner at the address shown in Los Angeles County Assessor's records. Owners and other responsible persons who fail to comply with that notice are in violation of this code. The administrative authority shall determine that a public sewer system is available to serve the subject property based on Section 713 of the California Plumbing Code "Sewers required" and title 17 of this code.

(3) If the building official determines that a public sewer system is not available to serve the subject property, the owner may install a new OWTS to replace a failing or failed system, or to replace an unlawful system. That system shall comply with provisions of Appendix K, title 17 of this code, and all other applicable law at the time of the proposed installation. The administrative authority shall establish a deadline for the owner to obtain an OWTS plumbing permit, as well to start and complete work. These determinations shall be stated in a notice of authorization to install a new OWTS, which may be sent by first class mail to the owner at the address shown in Los Angeles County Assessor's records. Owners and other responsible persons who fail to comply with requirements and the deadlines in that notice are in violation of this Code.

## TABLE K-1
## LOCATION OF SEWAGE DISPOSAL SYSTEM

| MINIMUM HORIZONTAL DISTANCE IN CLEAR REQUIRED FROM | BUILDING SEWER | SEPTIC TANK | DISPOSAL FIELD | SEEPAGE PIT OR CESSPOOL |
|---|---|---|---|---|
| Building or structures[1] | 2 feet (610 mm) | 5 feet (1,524 mm) | 8 feet (2,438 mm) | 8 feet (2,438 mm) |
| Property line adjoining private property | Clear[2] | 5 feet (1,524 mm) | 5 feet (1,524 mm) | 8 feet (2,438 mm) |
| Water supply wells | 50 feet[3] (15,240 mm) | 50 feet (15,240 mm) | 100 feet (30.5 m) | 150 feet (45.7 m) |
| Streams and other bodies of water | 50 feet (15,240 mm) | 50 feet (15,240 mm) | 100[7] feet (30.5 m) | 150 feet[7] (45.7 m) |
| Trees | - | 10 feet (3,048 mm) | - | 10 feet (3,048 mm) |
| Seepage pits or cesspools | - | 5 feet (1,524 mm) | 5 feet (1,524 mm) | 12 feet (3,658 mm) |
| Disposal field | - | 5 feet (1,524 mm) | 4 feet[4] (1,219 mm) | 5 feet (1,524 mm) |
| On-site domestic water service line | 1 foot[5] (305 mm) | 5 feet (1,524 mm) | 5 feet (1,524 mm) | 5 feet (1,524 mm) |
| Distribution box | - | - | 5 feet (1,524 mm) | 5 feet (1,524 mm) |
| Pressure public water main | 10 feet[6] (3,048 mm) | 10 feet (3,048 mm) | 10 feet (3,048 mm) | 10 feet (3,048 mm) |

**Note:**
When disposal fields and/or seepage pits are installed in sloping ground, the minimum horizontal distances between any part of the leaching system and ground surface shall be fifteen (15) feet (4,572 mm).

[1] Including porches and steps, whether covered or uncovered, breezeways, roofed porte cocheres, roofed patios, carports, covered walks, covered driveways, and similar structures or appurtenances.

[2] See also Section 313.3 of the California Plumbing Code.

[3] All drainage piping shall clear domestic water supply wells by not less than fifty (50) feet (15,240 mm). This distance may be reduced to not less than twenty-five (25) feet (7,620 mm) when the drainage piping is constructed of materials approved for use within a building.

[4] Plus two (2) feet (610 mm) for each additional one (1) foot (305 mm) of depth in excess of one (1) foot (305 mm) below the button of the drain line. (See also Section K 6.0)

[5] See Section 720,0 of the California Plumbing Code.

[6] For parallel construction – For crossings, approval by the Health Department shall be required.

[7] These minimum clear horizontal distances shall also apply between disposal fields, seepage pits, and the man high -tide line.

## TABLE K-2
## CAPACITY OF SEPTIC TANKS*

| SINGLE FAMILY DWELLINGS – NUMBER OF BEDROOMS | MULTIPLE DWELLINGS UNITS OR APARTMENTS – ONE BEDROOM EACH | OTHER USES: MAXIMUM FIXTURE UNITS SERVED PER TABLE 7-3 | MINIMUM SEPTIC TANK CAPACITY IN GALLONS | (LITERS) |
|---|---|---|---|---|
| 1 or 2 | - | 15 | 750 | (2,839) |
| 3 | - | 20 | 1,000 | (3,785) |
| 4 | 2 units | 25 | 1,200 | (4,542) |
| 5 or 6 | 3 | 33 | 1,500 | (5,678) |
| - | 4 | 5 | 2,000 | (7,571) |
| - | 5 | 55 | 2,250 | (8,517) |
| - | 6 | 60 | 2,500 | (9,464) |
| - | 7 | 70 | 2,750 | (10,410) |
| - | 8 | 80 | 3,000 | (11,356) |
| - | 9 | 90 | 3,250 | (12,303) |
| - | 10 | 100 | 3,500 | (13,249) |

***Note:**
Extra bedroom, 150 gallons (568 liters) each.
Extra dwelling units over 10:250 gallons (946 liters) each.
Extra fixture units over 100:25 gallons (95 liters) per fixture unit.
Septic tank sizes in this table include sludge storage capacity and the connection of domestic food waste disposal units without further volume increase.

## TABLE K-3
## ESTIMATED WASTE/SEWAGE FLOW RATES

Because of the many variables encountered, it is not possible to set absolute values for waste/sewage flow rates for all situations. The designer should evaluate each situation and, if figures in this table need modification, they should be made with the concurrence of the Authority Having Jurisdiction.

| TYPE OF OCCUPANCY | GALLONS (LITERS) PER DAY |
|---|---|
| 1. Airports | 15 (56.8) per employee |
| | 5 (18.0) per passenger |
| 2. Auto washers | Check with equipment manufacturer |
| 3. Bowling alleys (snack bar only) | 75 (283.9) per lane |
| 4. Camps: | |
| Campground with central comfort station | 35 (132.5) per person |
| Campground with flush toilets, no showers | 25 (94.6) per person |
| Day camps (no meals served) | 15 (56.8) per person |
| Summer and seasonal | 50 (189.3) per person |
| 5. Churches (Sanctuary) | 5 (18.9) per seat |
| With kitchen waste | 7 (26.5) per seat |
| 6. Dance halls | 5 (18.9) per person |
| 7. Factories | |
| No showers | 25 (94.6) per employee |
| With showers | 35 (132.5) per employee |
| Cafeteria, add | 5 (18.9) per employee |
| 8. Hospitals | 250 (946.4) per bed |
| Kitchen waste only | 25 (94.6) per bed |
| Laundry waste only | 40 (151.4) per bed |
| 9. Hotels (no kitchen waste) | 60 (227.1) per bed (2 person) |
| 10. Institutions (Resident) | 75 (283.9) per person |
| Nursing home | 125 (473.2) per person |
| Rest home | 125 (473.2) per person |
| 11. Laundries, self-service (minimum 10 hours per day) | 50 (189.3) per wash cycle |
| Commercial | Per manufacturer's specifications |
| 12. Motel | 50 (189.3) per bed space |
| With kitchen | 60 (227.1) per bed space |
| 13. Offices | 20 (75.7) per employee |
| 14. Parks, mobile homes | 250 (946.4) per space |
| Picnic parks (toilets only) | 20 (75.7) per parking space |
| Recreational vehicles - without water hook up | 75 (283.9) per space |
| with water and sewer hook-up | 100 (378.5) per space |
| 15. Restaurants - cafeterias | 20 (75.7) per employee |
| toilet | 7 (26.5) per customer |
| kitchen waste | 6 (22.7) per meal |
| add for garbage disposal | 1 (3.8) per meal |
| add for cocktail lounge | 2 (7.6) per customer |
| kitchen waste - Disposable service | 2 (7.6) per meal |
| 16. Schools -Staff and office | 20 (75.7) per person |
| Elementary students | 15 (56.8) per person |
| Intermediate and high | 20 (75.7) per student |
| with gym and showers, add | 5 (18.9) per student |
| with cafeteria, add | 3 (11.4) per student |
| Boarding, total waste | 100 (378.5) per person |
| 17. Service station, toilets | 1000 (3785) for 1st bay |
| | 500 (1892.7) for each additional bay |
| 18. Stores | 20 (75.7) per employee |

public restrooms, add ..... 1 per 10 sq. ft. (4.1/m2) of floor space
19. Swimming pools, public ..... 10 (37.9) per person
20. Theaters, auditoriums ..... 5 (18.9) per seat drive-in
..... 10 (37.9) per space

**(A) Recom mended Design Criteria.** Sewage disposal systems sized using the estimated waste/sewage flow rates should be calculated as follows:

(1) Waste/sewage flow, up to 1,500 gallons/day (5,678 L/day)
Flow x 1.5 = septic tank size.

(2) Waste/sewage flow, over 1,500 gallons/day (5,678 L/day)
Flow x 0.75 + 1,125 = septic tank size.

(3) Secondary system shall be sized for total flow per 24 hours.

**(B)** Also see Section K 2.0 of this appendix.

**TABLE K-4**
**DESIGN CRITERIA OF FIVE TYPICAL SOILS**

| TYPE OF SOIL | REQUIRED sq. ft. OF LEACHING AREA/100 gal. ($m^2$/L) | | MAXIMUM ABSORPTION CAPACITY IN gals./sq. ft. OF LEACHING AREA FOR A 24 HR. PERIOD (L/$m^2$) | |
|---|---|---|---|---|
| Coarse sand or gravel | 20 | (0.005) | 5.0 | (203.7) |
| Fine sand | 25 | (0.006) | 4.0 | (162.9) |
| Sandy loam or sandy clay | 40 | (0.010) | 2.5 | (101.8) |
| Clay with considerable sand or gravel | 90 | (0.022) | 1.1 | (44.8) |
| Clay with small amount of sand or gravel | 120 | (0.030) | 0.8 | (32.6) |

**TABLE K-5**

| REQUIRED SQUARE FEET OF LEACHING AREA/100 gal. SEPTIC TANK CAPACITY | | MAXIMUM SEPTIC TANK SIZE ALLOWABLE | |
|---|---|---|---|
| | ($m^2$/L) | (gallons) | (liters) |
| 20-25 | (0.005-0.006) | 7,500 | (28,390) |
| 40 | (0.010) | 5,000 | (18,927) |
| 90 | (0.022) | 3,500 | (13,249) |
| 120 | (0.030) | 3,000 | (11,356) |

**SECTION 24.** The text of **Section 15.04.620** of the municipal code, relating to Appendix M, Swimming Pools, is readopted and unchanged, except that the first sentence of that section is revised to read: "Appendix M is created and added to the 2010 California Plumbing Code to read, in words and figures, as follows:"

**SECTION 25.** Section **15.04.640** Appendix S Solar Potable Water Heating Systems
Remains unchanged

The text of **Section 15.04.640** of the municipal code, relating to Appendix S, Portable Water Heating Systems, is readopted and unchanged.

**SECTION 26.** The title of Article V of Chapter 15.04 of the Calabasas Municipal Code is hereby amended to be, "2010 California Electrical Code." The following sections shall be amended to provide as follows, and each shall be in the new Article V.

### 15.04.720 2010 California Electrical Code adopted.

A. The 2010 California Electrical Code, which provides minimum requirements and standards for the protection of the public health, safety, and welfare by regulating the installation or alteration of electrical wiring, equipment, materials, and workmanship in the city, provides for the issuance of permits and collection of fees therefor and provides penalties for the violations thereof, with all changes and amendments thereto, is hereby adopted by reference, and all conflicting ordinances are hereby repealed.

B. All of the regulations, provisions, conditions, and terms of said codes, together with their appendices, one copy of which will be on file and accessible to the public for inspection at the City Clerk's office, are hereby referred to, adopted, and made part of this chapter as if fully set Forth in this chapter with the exceptions, deletions, additions, and amendments thereto as set forth in this subchapter.

### 15.04.730 Penalty.

Every person violating any provision of the 2010 California Electrical Code and appendices, adopted by reference by 15.04.720, or of any permit or license granted thereunder, or any rules or regulations promulgated pursuant thereto, is guilty of a misdemeanor. Upon conviction thereof, he or she shall be punishable by a fine not-to-exceed one thousand dollars or imprisonment not-to-exceed six months, or by both such fine and imprisonment. The imposition of such penalty for any violation shall not excuse the violation or permit it to continue. Each day that a violation occurs shall constitute a separate offense.

### 15.04.740 Definitions.

Wenever the names or terms defined in this section are used in this code, each such name or term shall be deemed or construed to have in the meaning ascribed to it in this section.

A. "Board of Supervisors" shall mean the City of Calabasas City Council.

B. "County" or "County of Los Angeles" or Unincorporated Territory of the County of Los Angeles" shall mean the City of Calabasas.

C. "Building Official and Engineer" or "County Engineer" shall mean the Building Official of the City of Calabasas.

### 15.04.750 Fees

The amount of every fee set forth in the code shall be the fee set forth in the most current resolution of the City Council establishing fees.

**SECTION 27.** The title of **Article VI** of Chapter 15.04 of the Calabasas Municipal Code is shall be revised to "California Energy Code." Article VI is hereby amended to include the following sections which shall read as follows:

**15.04.800 2010 California Energy Code adopted.**

A. The 2010 California Energy Code, together with the appendices, which regulate the building envelope, space-conditioning systems, water-heating systems, outdoor lighting systems and signs located either indoors or outdoors within the city, are hereby adopted by reference, and conflicting ordinances are hereby repealed.

B. All of the regulations, provisions, conditions, and terms of said codes, together with their appendices, one copy of which will be on file and accessible to the public for inspection at the City Clerk's office, are hereby referred to, adopted and made part of this chapter as if fully set forth in this chapter with the exceptions, deletions, additions, and amendments thereto as set forth in this subchapter.

**15.04.810 Penalty**

Every person violating any provision of the 2010 C alifornia Energy Code and appendices, adopted by reference by 15.04.800, or of any permit or license granted thereunder, or any rules or regulations promulgated pursuant thereto, is guilty of a misdemeanor. Upon conviction thereof, he or she shall be punishable by a fine not-to-exceed one thousand dollars ($1,000.00) or imprisonment not-to-exceed six months, or by both such fine and imprisonment. The imposition of such penalty for any violation shall not excuse the violation or permit it to continue. Each day that a violation occurs shall constitute a separate offense.

**SECTION 28.** The title of **Article VII** of Chapter 15.04 of the Calabasas Municipal Code is shall be revised to "California Historical Building Code." Article VII is hereby amended to include the following sections which shall read as follows:

**15.04.820 2010 California Historical Building Code adopted.**

(A) The 2010 California Historical Building Code, which provides regulations, minimum requirements and standards for the preservation, restoration, rehabilitation, relocation of buildings or properties designated as historical building or properties, with all changes and amendments thereto, is hereby adopted by reference, and all conflicting ordinances are hereby repealed.

(B) All of the regulations, provisions, conditions, and terms of said codes, together with their appendices, one copy of which will be on file and accessible to the public for inspection at the City Clerk's office, are hereby referred to, adopted, and made part of this chapter as if fully set forth in this chapter with the exceptions, deletions, additions, and amendments thereto as set forth in this subchapter.

**15.04.830 Penalty**

Every person violating any provision of the 2010 California Historical Building Code and appendices, adopted by reference by 15.04.840, or of any permit or license granted thereunder, or any rules or regulations promulgated pursuant thereto, is guilty of a misdemeanor. Upon conviction thereof, he or she shall be punishable by a fine not-to-exceed one thousand dollars ($1,000.00) or imprisonment not-to-exceed six months, or by both such fine and imprisonment. The imposition of such penalty for any violation shall not excuse the violation or permit it to continue. Each day that a violation occurs shall constitute a separate offense.

**SECTION 29.** The title of **Article VIII** of Chapter 15.04 of the Calabasas Municipal Code is shall be revised to "California Historical Building Code." Article VIII is hereby amended to include the following sections which shall read as follows:

**15.04.840 2010 California Existing Building Code adopted.**

(A) The 2010 California Existing Building Code, which provides minimum requirements and standards for the protection of the public health, safety, and welfare by providing minimum standards for structural seismic resistance for structures with one or more unreinforced masonry walls, with all changes and amendments thereto, is hereby adopted by reference, and all conflicting ordinances are hereby repealed.

(B) All of the regulations, provisions, conditions, and terms of said codes, together with their appendices, one copy of which will be on file and accessible to the public for inspection at the City Clerk's office, are hereby referred to, adopted, and made part of this chapter as if fully set forth in this chapter with the exceptions, deletions, additions, and amendments thereto as set forth in this subchapter.

**15.04.850 Penalty**

Every person violating any provision of the 2010 California Existing Building Code and appendices, adopted by reference by 15.04.840, or of any permit or license granted thereunder, or any rules or regulations promulgated pursuant thereto, is guilty of a misdemeanor. Upon conviction thereof, he or she shall be punishable by a fine not-to-exceed one thousand dollars ($1,000.00) or imprisonment not-to-exceed six months, or by both such fine and imprisonment. The imposition of such penalty for any violation shall not excuse the violation or permit it to continue. Each day that a violation occurs shall constitute a separate offense.

**SECTION 30.** The title of **Article IX** of Chapter 15.04 of the Calabasas Municipal Code shall be revised to "California Referenced Standards Code." Article IX is hereby amended to include the following sections which shall read as follows:

**15.04.860 2010 California Referenced Standards Codes adopted.**

The 2010 California Referenced Standards Codes, which provides cross references to applicable standards referenced throughout the California Building Standards Codes, are hereby adopted by reference, and all conflicting ordinances are hereby repealed.

**SECTION 31.** The title of **Article X** of Chapter 15.04 of the Calabasas Municipal Code shall be revised to "California Administrative Code." Article X is hereby amended to include the following section which shall read as follows:

**15.04.870 2010 California Administrative Code adopted.**

The 2010 California Administrative Code, which provides, provisions for the duties and responsibilities of the California Building Standards Commission, are hereby adopted by reference, and all conflicting ordinances are hereby repealed.

**SECTION 32.** The new title of **Article XI** of Chapter 15.04 of the Calabasas Municipal Code shall be "2008 Consolidated Fire Protection District Code of Los Angeles." Article XI is hereby amended to include the following sections which shall be readopted without amendment:

**15.04.900 2008 Consolidated Fire Protection District Code of Los Angeles.**

**15.04.910 Designation of the City of Calabasas.**

**15.04.920 Findings in support of adoption of more restrictive building standards.**

**15.04.930 Penalty.**

**SECTION 33.** The new title of **Article XII** of Chapter 15.04 of the Calabasas Municipal Code shall be "2010 California Green Building Standards Code." Article XII is hereby amended to include the following sections which shall be revised or added to provide as follows:

**15.04.950 2010 California Green Building Standards Code adopted.**

A. The 2010 California Green Building Standards Code, together with its appendices, which regulate the planning, design, construction, operation, replacement, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenance connected or attached to such building structures throughout the State of California, are hereby adopted by reference, and ordinances of the city which conflict with that Code are hereby repealed to the extent of the conflict.

B. All of the regulations, provisions, conditions, and terms of the 2010 California Green Building Standards Code, together with its appendices, one copy of which will be on file and accessible to the public for inspection at the city clerk's office, are hereby referred to, adopted and made part of this chapter as if fully set forth in this chapter with the exceptions, deletions, additions, and amendments thereto as set forth in this chapter.

**15.04.960 101.10 Mandatory requirements.**

This code contains both voluntary and mandatory green building measures. The Building Official shall have the authority to develop checklists identifying appropriate mandatory and voluntary measures for different types of construction projects but, in so doing, shall implement and not amend the requirements of this code and the codes it adopts by reference.

**15.04.965 Penalty**

Every person violating any provision of the 2010 Green Building Standards Code and appendices, adopted by reference by 15.04.950, or of any permit or license granted thereunder, or any rules or regulations promulgated pursuant thereto, is guilty of a misdemeanor. Upon conviction thereof, he or she shall be punishable by a fine not-to-exceed one thousand dollars ($1,000.00) or imprisonment not-to-exceed six months, or by both such fine and imprisonment. The imposition of such penalty for any violation shall not excuse the violation or permit it to continue. Each day that a violation occurs shall constitute a separate offense.

**SECTION 34.** A new **Article XIII** shall be added to Chapter 15.04 of the Calabasas Municipal Code, and shall be entitled, "Violations Abatement and Penalties." The existing Municipal Code section 15.04.970 shall move into this new [6]Article XIII but otherwise remain unchanged.

**SECTION 35.** Findings. The City Council hereby adopts the findings set forth in **Exhibit 1** as if fully set forth herein. The City Council finds that each amendment to the Building Standards Code was an administrative change for which no findings need be legally made and/or was made due to local climatic, geological, and/or topographical conditions such as the hot, dry summers, the hilly terrain and the high potential for seismic activity which make structures particularly vulnerable to rapidly spreading fires and structural damage.

**SECTION 36.** References in Documents and Continuing Legal Effect. References to prior versions of any portion of the Building Standards Code, or of the Calabasas Municipal Code that are amended or renumbered in this Municipal Code, that are cited on notices issued by the City or other documents of ongoing or continuing legal

[6] Revised November 8, 2010

effect, including resolutions adopting or imposing fees or charges, until converted, are deemed to be references to the new counterpart part of the Building Standards Code or amended Municipal Code sections for the purposes of notice and enforcement. The provisions adopted hereby shall not in any manner affect deposits, established fees or other matters of record which refer to, or are otherwise connected with, ordinances which are specifically designated by number, code section or otherwise, but such references shall be deemed to apply to the corresponding provisions set forth in the code sections adopted or amended hereby.

**SECTION 37.** Continuity. To the extent the provisions of this Ordinance are substantially the same as previous provisions of the Calabasas Municipal Code, these provisions shall be construed as continuations of those provisions and not as [7]new enactments.

**SECTION 38.** No Effect on Enforceability. The repeal of any sections of the Municipal Code, shall not affect or impair any act done, or right vested or approved, or any proceeding, suit or prosecution had or commenced in any cause before such repeal shall take effect; but every such act, vested right, proceeding, suit, or prosecution shall remain in full force and effect for all purposes as if the applicable provisions of the Municipal Code, or part thereof, had remained in force and effect. No offense committed and no liability, penalty, or forfeiture, either civil or criminal, incurred prior to the repeal or alteration of any applicable provision of the 2007 Code as amended, shall be discharged or affected by such repeal or alteration but prosecutions and suits for such offenses, liabilities, penalties or forfeitures shall be instituted and proceed in all respects as if the applicable provisions of the 2007 Code, as amended, had not been repealed or altered.

**SECTION 39.** CEQA. This Ordinance is exempt from the California Environmental Quality Act pursuant to State Guidelines §15061 (b) (3) as a project that has no potential for causing a significant effect on the environment.

**SECTION 40.** [8]Certification. The City Clerk shall certify to the adoption of this ordinance and shall cause the same to be processed in the manner required by law.

**SECTION 41.** Building Standards Commission. The City Clerk shall file a certified copy of this Ordinance with the California Building Standards Commission.

**SECTION 42.** Severability. Should any section, subsection, clause, or provision of this Ordinance for any reason be held to be invalid or unconstitutional, such invalidity or unconstitutionality shall not affect the validity or constitutionality of the remaining portions of this Ordinance; it being hereby expressly declared that this Ordinance, and each section, subsection, sentence, clause, and phrase hereof would have been [9]adopted irrespective of the fact that any one or more sections, subsections, sentences, clauses, or phrases be declared invalid or unconstitutional.

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[7] Revised November 8, 2010
[8] Revised November 8, 2010
[9] Revised November 8, 2010

**SECTION 43.** Effective Date. This ordinance shall take effect thirty days after its passage and adoption pursuant to California Government Code section 36937.

**SECTION 44.** Publication. The City Clerk shall cause this Ordinance to be published in accordance with California Government Code Section 36933, shall certify to the adoption of this Ordinance, and shall cause this Ordinance and its certification, together with proof of publication, to be entered in the Book of Ordinances of the City Council.

**PASSED, APPROVED AND ADOPTED** this 9th day of February, 2011.

Barry Groveman, Mayor

ATTEST:

Gwen Peirce, CMC, City Clerk

APPROVED AS TO FORM:

2/9/11

Michael G. Colantuono, City Attorney

**STATE OF CALIFORNIA )**
**COUNTY OF LOS ANGELES ) SS**
**CITY OF CALABASAS )**

**I, GWEN PEIRCE,** City Clerk of the City of Calabasas, California, **DO HEREBY CERTIFY** that the foregoing ordinance, being **Ordinance No. 2011-278** was duly adopted by the City Council of the City of Calabasas, at a regular meeting of the City Council held February 9, 2011 and that it was adopted by the following vote, to wit:

AYES: Mayor Groveman, Mayor pro Tem Washburn and Councilmember Wolfson.

NOES: Councilmembers Bozajian and Maurer.

ABSTAIN: None.

ABSENT: None.

Gwen Peirce, CMC
City Clerk
City of Calabasas, California

## EXHIBIT 1

## 2010 California Building Standards Code

## FACTUAL FINDINGS ESTABLISHING THE REASONABLE NEED FOR LOCAL AMENDMENTS TO PORTIONS OF THE BUILDING STANDARDS CODE BASED UPON CLIMATIC, GEOLOGICAL AND/OR TOPOGRAPHICAL CONDITIONS or ADMINISTRATIVE PROVISION

Section 1 of this Exhibit sets forth various findings that apply in Calabasas, explaining the administrative provisions, various local climatic, geological and/or topographical conditions that necessitate the various changes.

Section 2 of this Exhibit explains which findings apply to which amendments.

In numerous instances herein, the City has opted to make findings even though it is not legally required to do so. For example, if a change to a building standard is administrative in nature, then no finding is legally required. Likewise, if a proposal does not contradict a building standard, but merely supplements the standard, then the city need not make a finding. The city nevertheless has opted to make findings in many such circumstances.

### Section 1. General Findings

The following findings apply in the City of Calabasas, and explain why the changes to the Building Standards Code are necessary because of climatic, geological, topographical or local administrative regulations in the city.

### A. Climatic Conditions

1. Hot, dry Santa Ana winds are common to all areas within the City of Calabasas and Los Angeles County in general. These winds, which can cause small fires to spread quickly, are a contributing factor to the high fire danger in the area, and create the need for an increased level of fire protection. This added protection will supplement normal fire department response available and provide immediate protection for life and safety of multiple occupants during fire occurrences.

2. Los Angeles County and the City of Calabasas are located in a semi-arid Mediterranean type climate which predisposes all fuels, including wood shingles, to rapid ignition and spread of fire. Therefore, there exists a need for additional fire protection measures.

3. The greater Los Angeles region is within a climate capable of producing major rain related disasters, including but not limited to those caused by el Nino (or La Nina) subtropical –like weather.

### B. Geologic Conditions

1. Los Angeles County and the City of Calabasas are located in a highly active seismic area. There are earthquake faults that run along boundaries of Los Angeles and in the vicinity of Calabasas. The Chatsworth Fault runs through Simi Valley and Chatsworth, both of which are close to Calabasas. The epicenter of the 1994

Northridge earthquake was less than 10 miles from Calabasas, and produced the strongest ground swells ever instrumentally recorded in an urban setting in North America. Damage was wide-spread, sections of major freeways collapsed, parking structures and office buildings collapsed, and numerous apartment buildings suffered irreparable damage. Damage to wood-frame apartment houses was very widespread in the San Fernando Valley and Santa Monica areas.

The Newport-Inglewood Fault Zone (NIFZ) which runs through Los Angeles and Orange County was the source of the destructive 1933 Long Beach earthquake (6.3 magnitude, hypocenter off Newport Beach coast), which took 120 lives, with areas damaged from Laguna Beach to Marina del Rey and inland to Whittier, and poses one of the greatest hazards to lives and property in the nation. Regional planning for reoccurrence is recommended by the State of California, Department of Conservation.

The October 17, 1989, Santa Cruz earthquake resulted in only one major San Francisco fire in the Marina district, but when combined with the 34 other fires and over 500 responses, the department was taxed to its full capabilities. The Marina fire was difficult to contain because mains supplying water to the district burst during the earthquake. If more fires had been ignited by the earthquake, it would have been difficult for the fire department to contain them. Experts predict a major earthquake in our area within the next 50 years. This situation creates the need for both additional fire protection measures and automatic on-site fire protection for building occupants since a multitude of fires may result from breakage of gas and electric lines as a result of an earthquake. As noted by "Planning Scenario on a Major Earthquake on the Newport-Inglewood Fault Zone, 1988, State Department of Conservation," page 59, "unfortunately, barely meeting the minimum earthquake standards of building codes places a building on the verge of being legally unsafe";

2. Traffic and circulation congestion presently existing in the City of Calabasas often places fire department response time to fire occurrences at risk. This condition will be exacerbated by any major disaster, including any earthquake wherein damage to the highway system will occur. This condition makes the need for additional on-site protection for property occupants necessary.

3. The City of Calabasas is located in an area subject to a climatic condition of high winds and low humidity. This combination of events creates an environment, which is conducive to rapidly spreading fires. Control of such fires requires rapid response. Obstacles generated by a strong wind, such as fallen trees, street lights and utility poles. Additionally, Section 6, Figure 6-2 of ASCE 7 identifies a significant increase in the amount of wind force at 60 feet above the ground. Use of aerial type fire fighting apparatus above this height would place rescue personnel at increased risk of injury.

   The City of Calabasas is located in the middle of the seismically active area. The viability of the public water system would be questionable at best after a major seismic event. A severe seismic event has the potential to negatively impact any rescue or fire suppression activities because it is likely to create obstacles similar to

those indicated under the high wind section above. With the probability of strong aftershocks there exists a need to provide increased protection for anyone on upper floors.

4. Untreated wood roofs cause or contribute to serious fire hazard and to the rapid spread of fires when such fires are accompanied by high winds. Pieces of burning wooden roofs become flying brands and are carried by the wind to other locations and thereby spread fire quickly. Recent Grand Jury Report findings support this concern.

5. Improperly sitting and malfunctioning onsite wastewater treatment systems are a known source of water way contamination in the City of Calabasas. The groundwater absorption and filtration rates are largely dependent on geologic conditions, and the hilly and rocky terrain contributes to a lessening of the absorption and percolation of contaminated water.

**C. Administrative Regulations**

Local regulations necessary to carry out the application of the CBSC that do not establish building standards may be enacted without meeting the requirements of the HSC sections 18941.5, 17958, 17958.5 and 17958.7. Additional amendments have been made to Codes. Through recommendation of the City Attorney, City Prosecutor, or the Community Development Department, such amendments are hereby found to be either administrative or procedural in nature which do not impact the technical standards within the California Building Standards Codes or concern themselves with subjects which are not covered in such Codes. The changes made include provisions making each of said Codes compatible with other Codes and Ordinances enforced by the City.

**D. Not Applicable (N/A).** No findings need to be made, because the code section that is at issue does not amend any building standard.

**E. Topographical Conditions**

1. Calabasas is in a mountainous area with a high percentage development on hills, or bounded by hills. This pattern of development exacerbates pollution and water runoff problems because water runoff is forced to more quickly run down hill than it would otherwise, decreasing the ability of the land to naturally absorb and disperse and remediate the effects of pollution. Further, because of the topography, runoff is channelized, and all pollution congregates in a more limited number of areas than would otherwise occur. This has caused the need to adopt health and safety precautions to combat the negative effects of such results.

2. Because Calabasas is in a mountainous area with a high percentage of development on hills or bounded by hills, and most roads are windy as a result, emergency response is more difficult, and it becomes necessary to implement additional fire and life safety precautions

## Section 2 – Which Findings Apply to Which Amendments

Amendments to the 2010 Edition of the California Codes are found reasonably necessary based on the climatic and/or geologic conditions cited in Section 1 of this ordinance.

| Calabasas Municipal Code Section | Applicable Finding |
|---|---|
| 15.04 | A-1, A-2, B-1, B-2, B-3, B-4, B-5, C, E-1 and E-2 |
| 15.04.010 | N/A |
| 15.04.020 | C |
| 15.04.030 | N/A |
| 15.04.035 | C |
| 15.04.040 | N/A |
| 15.04.200 | See California Building Code Sections (CBC) below |
| 15.04.250 | C |
| 15.04.300 | N/A |
| 15.04.360 | N/A |
| 15.04.370 | N/A |
| 15.04.375 | N/A |
| 15.04.380 | N/A |
| 15.04.385 | N/A |
| 15.04.390 | N/A |
| 15.04.395 | N/A |
| 15.04.410 | N/A |
| 15.04.460 | C |
| 15.04.470 | C |
| 15.04.480 | C |
| 15.04.490 | N/A |
| 15.04.510 | N/A |
| 15.04.520 | C |
| 15.04.530 | C |
| 15.04.540 | C |
| 15.04.560 | N/A |
| 15.04.590 | C |
| 15.04.610* | C and E-1 |
| 15.04.720 | N/A |
| 15.04.750 | C |
| 15.04.800 | N/A |
| 15.04.820 | C |
| 15.04.840 | N/A |
| 15.04.860 | C |
| 15.04.870 | N/A |
| 15.04.900 | C |
| 15.04.950 | C |
| 15.04.960 | C |
| 15.04.970 | C |

* Revised November 8, 2010

| California Building Code Section | Applicable Finding |
|---|---|
| 103.1 | C |
| 103.2 | C |
| 105.1, 105.2, 105.3.2, | C |
| 105.5, 105.5.1, 105.5.2, | C |
| 105.6 | C |
| 109.4, 109.6 | C |
| 111.1.1, 111.3, 111.4 | C |
| 112.3, 112.3.1, 112.3.2, | C |
| 112.3.3 | C |
| 114.1 | C |
| 116.1, 116.2, 116.3 | C |
| 116.4 | C |
| 116.5 | C and see exhibit 2 |
| 1613.6.1 | B-1, B-3 and see exhibit 2 |
| 1613.6.7 | B-1, B-3 and see exhibit 2 |
| 1613.8 | B-1, B-3 and see exhibit 2 |
| 1613.9 | B-1, B-3 and see exhibit 2 |
| 1613.10 | B-1, B-3 and see exhibit 2 |
| 1613.11 | B-1, B-3 and see exhibit 2 |
| 1613.12 | B-1, B-3 and see exhibit 2 |
| 1613.12.1, 1613.12.2, 1613.12.3, | B-1, B-3 and see exhibit 2 |
| 1613.12.4, 1613.12.4.1, 1613.12.4.2, | B-1, B-3 and see exhibit 2 |
| 1613.12.4.2.1, 1613.12.4.2.2 | B-1, B-3 and see exhibit 2 |
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|---|---|
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| **California Green Building Standards Code** | **Applicable Finding** |
|---|---|
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* Revised November 8, 2010

# LOS ANGELES REGION
# UNIFORM CODE PROGRAM

# RECOMMENDED TECHNICAL AMENDMENTS TO THE 2010 CALIFORNIA BUILDING CODE, 2010 CALIFORNIA RESIDENTIAL CODE, AND 2010 CALIFORNIA GREEN BUILDING STANDARDS CODE

**Final Draft: August 26, 2010**

PREPARED BY:

ICC LOS ANGELES BASIN CHAPTER'S
**STRUCTURAL CODE COMMITTEE,**
**CRC CODE COMMITTEE, AND**
**GREEN BUILDING STANDARDS CODE COMMITTEE.**

## PREFACE

In 1957 our founding members established one of the earliest chapters of the International Conference of Building Officials and now the International Code Council. Today the Chapter has grown to over eighty-nine Southern California jurisdictions, plus consulting firms and members of the construction industry. When ICBO merged with two other building official organizations to create the International Code Council, the Los Angeles Basin Chapter officially became an ICC Chapter in December 2002.

With the recent change of the model codes from the Uniform Codes to the International Codes, the ICC Los Angeles Basin Chapter has been very active throughout the years in leading the effort to create uniformity of building codes and regulations in the greater Los Angeles region as well as addressing policy issues of interest to building officials and the construction industry.

One such effort to promote uniformity of building regulations is through the Los Angeles Regional Uniform Code Program (LARUCP). The LARUCP program began in July 1999 with the purpose of developing uniform interpretations and handouts to serve as guidelines for building officials, contractors, engineers and architects in the consistent application of the codes. The mission of this program was to minimize the number of and to develop uniformity in local technical amendments to model codes for adoption by jurisdictions in the greater Los Angeles region.

Leading the efforts to creating uniformity of building codes and regulations within the region are the dedicated members of the Los Angeles County Building and Safety Division, City of Los Angeles Department of Building and Safety, City of Long Beach Building and Safety Bureau, and other jurisdictional members in the greater Los Angeles region. Through the coordination of the ICC Los Angeles Basin Chapter's CRC Committee, Structural Code Committee, and Green Building Standards Committee, the following regulatory streamlining tasks to be completed are:

1. Create uniformity of building, plumbing, mechanical, electrical, energy efficiency and green codes that can be adopted in most of the jurisdictions in the greater Los Angeles region.

2. Reduces the total number of local technical amendments to the model code in the greater Los Angeles region.

3. Received support from most, if not all, of the 89 jurisdictions in the greater Los Angeles region.

4. Obtain active participation from a majority of the jurisdictions in the greater Los Angeles region in formulating and implementing this program.

5. With construction valuation of over $5 billion in the region, conservatively assuming that this program produces a 1% construction cost savings, achieve an estimated cost saving of $50 million per year in the greater Los Angeles region.

## DISCUSSION

Section 17958 of the California Health and Safety Code requires that the latest California Building Standards Codes apply to local construction 180 days after they become effective at the State level. The California Building Standards Commission has adopted the 2010 Edition of the California Building Code, California Residential Code, and California Green Building Standards Code. State Law requires that these Codes become effective at the local level on January 1, 2011.

State Law requires that local amendments to the California Building Standards Codes be enacted only when an express finding is made that such modifications or changes are reasonably necessary because of local climatic, geological or topographical conditions.

The ICC Los Angeles Basin Chapter's CRC Committee, Structural Committee, and Green Building Standards Committee are recommending that the FY 2010 LARUCP Recommended Technical

Amendments contained in this document, some of which continues amendments enacted during the previous code adoption cycle, be considered for local adoption for the following reasons:

1. To protect the community within the greater Los Angeles region from a vast array of fault systems capable of producing major earthquakes and/or climate systems capable of producing major winds, fire and rain related disaster.

2. To ensure and encourage energy efficiency and sustainable practices are incorporated into building designs and constructions.

The FY 2010 LARUCP Recommended Technical Amendments have been widely circulated and/or discussed over the past several months with various local jurisdictional members, structural engineering associations or committees such as, but not limited to, Seismology, Steel, Light Frame Construction, Quality Assurance and Building Code Committee, design professionals in the construction/engineering industry, and other interested groups or individuals. The proposed languages, reasons and findings as to climatic, topographic or geologic conditions are detailed in this document for each of the recommended technical amendments to the model code.

## STATEMENT ON USE OF DOCUMENT

The primary purpose of the ICC Los Angeles Basin Chapter's Committees is to serve and benefit its members. To this end, the Committees provides a forum for the exchange, consideration, and discussion of ideas and proposals that are relevant to the construction industry and the consensus of which forms the basis for the proposed amendments contained in this document.

By making available the recommendations in this document, the ICC Los Angeles Basin Chapter's Committees does not insure any jurisdiction using the information it contains against any liability arising from that use. The Committees disclaims liability for any injury to persons or to property, or other damages of any nature whatsoever, whether special, indirect, consequential or compensatory, directly or indirectly resulting from the publication, use of, or reliance on this document. The Committees makes no guaranty or warranty as to the accuracy or completeness of any information provided herein. Any jurisdiction using this document should rely on their own independent judgment and exercise reasonable care in any given circumstances. Each jurisdiction adopting the proposed amendments contained in this document should make an independent, substantiating investigation of the validity of that information for their particular use.

## ACKNOWLEDGEMENT

The ICC Los Angeles Basin Chapter would like to express its gratitude and appreciation to all the participating committee members and correspondents that spent countless hours over the past several months assisting in the review, discussion, evaluation and drafting of the proposed recommended technical amendments to the 2010 Edition of the California Building Code, 2010 Edition of the California Residential Code and 2010 Edition of the California Green Building Standards Code. Special thanks go out to the following individuals without whose support and effort the recommendations presented herein would not be possible.

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# PART I

## RECOMMENDED LARUCP AMENDMENTS TO THE

## 2010 EDITION OF THE CALIFORNIA BUILDING CODE

## SUMMARY OF RECOMMENDED LARUCP AMENDMENTS TO THE 2010 CBC

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|---|---|---|---|---|
| 16-01 | 16-01 | Amend CBC Section 1613.6.1 Assumption of Flexible Diaphragm | AM | 5/25/10 |
| 16-02 | 16-10 | Amend CBC Section 1613.6.7 Building Separation | AM | 4/27/10 |
| 16-03 | 16-07 | Add CBC Section 1613.8 BRBF Period Parameter | AS | 4/27/10 |
| 16-04 | 16-04 | Add CBC Section 1613.9 Values for Vertical Combinations | AS | 4/27/10 |
| 16-05 | 16-08 | Add CBC Section 1613.10 Stability Coefficient | AS | 4/27/10 |
| 16-06 | 16-02 | Add CBC Section 1613.11 Subdiaphragm | AM | 4/27/10 |
| 16-07 | 16-03 | Add CBC Section 1613.12 Hillside Building | AM | 6/14/10 |
| 16-08 | 16-09 | Add CBC Section 1613.13 Suspended Ceiling | AM | 5/25/10 |
| 17-01 | 17-02 | Amend CBC Section 1704.4 SI for Concrete Construction | AM | 4/27/10 |
| 17-02 | 17-03 | Amend CBC Section 1704.8 Driven Deep Foundations | AS | 5/25/10 |
| 17-03 | 17-03 | Amend CBC Section 1704.9 Cast-in-Place Deep Foundations | AS | 5/25/10 |
| 17-04 | 17-01 | Amend CBC Section 1705.3 Seismic Resistance Inspection | AM | 4/27/10 |
| 17-05 | 17-04 | Amend CBC Section 1710.1 Structural Observations General | AM | 4/27/10 |
| 17-06 | 17-04 | Amend CBC Section 1710.2 Structural Observations Seismic | AM | 4/27/10 |
| 18-01 | 18-01 | Amend CBC Section 1807.1.4 Permanent Wood Foundation System | AS | 4/27/10 |
| 18-02 | 18-01 | Amend CBC Section 1807.1.6 Prescriptive Design of Foundation Walls | AS | 4/27/10 |
| 18-03 | 18-01 | Amend CBC Section 1809.3 Stepped Footings | AS | 4/27/10 |
| 18-04 | 18-01 | Amend CBC Table 1809.7 Prescriptive Footings | AS | 4/27/10 |
| 18-05 | 18-01 | Amend CBC Section 1809.12 Timber Footings | AS | 4/27/10 |
| 18-06 | 18-01 | Amend CBC Section 1810.3.2.4 Timber | AS | 4/27/10 |
| 19-01 | 19-02 | Add CBC Sections 1908.1.11 thru 14 Reinforcement | AS | 4/27/10 |
| 19-02 | N/A | Amend CBC Section 1908.1.2 Intermediate Structural Wall | AS | 4/27/10 |
| 19-03 | N/A | Amend CBC Section 1908.1.3 Wall Pier | AS | 4/27/10 |
| 19-04 | 19-03 | Amend CBC Section 1908.1.8 Minimum Reinforcement | AS | 4/27/10 |
| 19-05 | N/A | Amend CBC Section 1909.4 Structural Plain Concrete Design | AM | 6/14/10 |
| 22-01 | N/A | Add CBC Section 2204.1.1 Consumables for Welding | AS | 4/27/10 |
| 22-02 | 22-01 | Add CBC Section 2205.4 SCBF Member Type | AS | 4/27/10 |
| 23-01 | N/A | Amend CBC Section 2304.11.7 Wood Used in Retaining Wall | AM | 5/11/10 |
| 23-02 | 23-03 | Add CBC Section 2305.4 Quality of Nails | AS | 5/11/10 |
| 23-03 | 23-02 | Add CBC Section 2305.5 Hold-down Connectors | AM | 5/11/10 |
| 23-04 | 23-04 | Amend CBC Section 2306.2.1 Wood Diaphragm | AM | 5/11/10 |
| 23-05 | 23-04 | Amend CBC Section 2306.3 Wood Shear Walls | AM | 6/24/10 |
| 23-06 | 23-05 | Amend CBC Section 2306.7 Other Shear Walls | AM | 6/24/10 |
| 23-07 | N/A | Amend CBC Section 2308.3.4 Brace Wall Line Support | AM | 5/11/10 |
| 23-08 | 23-06 | Amend CBC Section 2308.12.2 Concrete or Masonry | AM | 5/11/10 |
| 23-09 | 23-06 | Amend CBC Section 2308.12.4 Braced Wall Sheathing | AM | 6/14/10 |
| 23-10 | N/A | Amend CBC Section 2304.9.1 Fastener Requirement | AM | 6/14/10 |
| 23-11 | 23-06 | Amend CBC Section 2308.12.5 Attachment of Sheathing | AM | 5/11/10 |

FOOTNOTE:
1. AS = Approved as submitted. AM = Approved as modified. N/A = Not Applicable.

**2010 LARUCP 16-01.** Section 1613.6.1 of the 2010 Edition of the California Building Code is amended to read 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:

1. 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.

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

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

4. Portions of wood structural panel diaphragms that cantilever beyond the vertical elements of the ~~lateral~~seismic-force-resisting system are designed in accordance with Section 4.2.5.2 of AF&PA SDPWS.

**RATIONALE:**

This proposed amendment changes "lateral" to "seismic" to reflect consistency of the application of this provision.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 emphasize that the design concern is for seismic-force-resisting elements and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 16-02.** Equation 16-44 of Section 1613.6.7 of the 2010 Edition of the California Building Code is amended to read as follows:

$$\delta_M = \frac{C_d \delta_{max}}{I} \qquad \textbf{(Equation 16-44)}$$

where:
$C_d$ = Deflection amplification factor in Table 12.2-1 of ASCE 7.
$\delta_{max}$ = Maximum displacement defined in Section 12.8.4.3 of ASCE 7.
~~$I$ = Importance factor in accordance with Section 11.5.1 of ASCE 7.~~

**RATIONALE:**

The inclusion of the importance factor in this equation has the unintended consequence of reducing the minimum seismic separation distance for important facilities such as hospital, school, police and fire station, etc. from adjoining structures. The proposal to omit the importance factor from Equation 16-44 will ensure that a safe seismic separation distance is provided. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 omit the importance factor in the equation ensures that a safe seismic separation distance is maintained for important facilities from adjoining structures and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 16-03.** Section 1613.8 is added to Chapter 16 of the 2010 Edition of the California Building Code to read as follows:

**1613.8 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 |

**RATIONALE:**

The steel Buckling Restrained Braced Frame (BRBF) system was first approved for use in 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 was an oversight that these parameters were not carried forward into the 2005 Edition of the ASCE 7. 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. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 amendment provides clarification on the design parameters for BRBF members and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code and ASCE 7-05.

**2010 LARUCP 16-04.** Section 1613.9 is added to Chapter 16 of the 2010 Edition of the California Building Code to read as follows:

**1613.9 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.

**RATIONALE:**

Observed damages to one and two family dwellings of light frame construction after the Northridge Earthquake may have been partially attributed to vertical irregularities common to this type of occupancy and construction. In an effort to improve quality of construction and incorporate lesson learned from studies after the Northridge Earthquake, the proposed modification to ASCE 7-05 Section 12.2.3.1 by limiting the number of stories and height of the structure to two stories will significantly minimize the impact of vertical irregularities and concentration of inelastic behavior from mixed structural systems. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 mixed structural system to two stories is intended to improve quality of construction by reducing potential damages that may result from vertical irregularities of the structural system in buildings subject to high seismic load and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 16-05.** Section 1613.10 is added to Chapter 16 of the 2010 Edition of the California Building Code to read as follows:

**1613.10 ASCE 7, Section 12.8.7.** Modify ASCE 7 Section 12.8.7 by amending Equation 12.8-16 as follows:

$$\theta = \frac{P_x \Delta I}{V_x h_{sx} C_d} \qquad (12.8\text{-}16)$$

**RATIONALE:**

The importance factor, I, was 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 consistent with the provisions adopted by OSPHD and DSA-SS as reflected in Section 1615.10.5 of the 2010 California Building Code. SEAOSC Steel Committee had supported the proposed modification during the 2007 code adoption process. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 is intended to improve the likelihood that important and critical buildings and structures remain operational in the event of an emergency resulting from seismic activities and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 16-06.** Section 1613.11 is added to Chapter 16 of the 2010 Edition of the California Building Code to read as follows:

**1613.11 ASCE 7, Section 12.11.2.2.3.** Modify ASCE 7, Section 12.12.4 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 structures assigned to Seismic Design Category D, E or F, wood diaphragms supporting concrete or masonry walls 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.

**RATIONALE:**

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, there was a need to limit subdiaphragm allowable shear loads to control combined orthogonal stresses within the diaphragm. Recognizing the importance and need to continue the recommendation made by the task force while taking into consideration the improve performances and standards for diaphragm construction today, this proposal increases 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 and is deemed appropriate and acceptable. Due to the frequency of this type of failure during the past significant earthquakes, various jurisdictions within the Los Angeles region have taken this additional step to prevent roof or floor diaphragms from pulling away from concrete or masonry walls. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 special anchorage of the diaphragm to the wall and limit the allowable shear will address special needs for concrete and masonry construction with flexible wood diaphragm and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 16-07.** Section 1613.12 is added to Chapter 16 of the 2010 Edition of the California Building Code to read as follows:

**1613.12 Seismic Design Provisions for Hillside Buildings.**

**1613.12.1 Purpose.** The purpose of this section is to establish minimum regulations for the design and construction of new buildings and additions to existing buildings when constructing such buildings on or into slopes steeper than one unit vertical in three units horizontal (33.3%). These regulations establish minimum standards for seismic force resistance to reduce the risk of injury or loss of life in the event of earthquakes.

**1613.12.2 Scope.** The provisions of this section shall apply to the design of the lateral-force-resisting system for hillside buildings at and below the base level diaphragm. The design of the lateral-force-resisting system above the base level diaphragm shall be in accordance with the provisions for seismic and wind design as required elsewhere in this division.

**Exception:** Non-habitable accessory buildings and decks not supporting or supported from the main building are exempt from these regulations.

**1613.12.3 Definitions.** For the purposes of this section certain terms are defined as follows:

BASE LEVEL DIAPHRAGM is the floor at, or closest to, the top of the highest level of the foundation.

DIAPHRAGM ANCHORS are assemblies that connect a diaphragm to the adjacent foundation at the uphill diaphragm edge.

DOWNHILL DIRECTION is the descending direction of the slope approximately perpendicular to the slope contours.

FOUNDATION is concrete or masonry which supports a building, including footings, stem walls, retaining walls, and grade beams.

FOUNDATION EXTENDING IN THE DOWNHILL DIRECTION is a foundation running downhill and approximately perpendicular to the uphill foundation.

HILLSIDE BUILDING is any building or portion thereof constructed on or into a slope steeper than one unit vertical in three units horizontal (33.3%). If only a portion of the building is supported on or into the slope, these regulations apply to the entire building.

PRIMARY ANCHORS are diaphragm anchors designed for and providing a direct connection as described in Sections 1613.12.5 and 1613.12.7.3 between the diaphragm and the uphill foundation.

SECONDARY ANCHORS are diaphragm anchors designed for and providing a redundant diaphragm to foundation connection, as described in Sections 1613.12.6 and 1613.12.7.4.

UPHILL DIAPHRAGM EDGE is the edge of the diaphragm adjacent and closest to the highest ground level at the perimeter of the diaphragm.

UPHILL FOUNDATION is the foundation parallel and closest to the uphill diaphragm edge.

**1613.12.4 Analysis and Design.**

**1613.12.4.1 General.** Every hillside building within the scope of this section shall be analyzed, designed, and constructed in accordance with the provisions of this division. When the code-

prescribed wind design produces greater effects, the wind design shall govern, but detailing requirements and limitations prescribed in this and referenced sections shall be followed.

**1613.12.4.2 Base Level Diaphragm-Downhill Direction.** The following provisions shall apply to the seismic analysis and design of the connections for the base level diaphragm in the downhill direction.

**1613.12.4.2.1 Base for Lateral Force Design Defined.** For seismic forces acting in the downhill direction, the base of the building shall be the floor at or closest to the top of the highest level of the foundation.

**1613.12.4.2.2 Base Shear.** In developing the base shear for seismic design, the response modification coefficient (R) shall not exceed 5 for bearing wall and building frame systems. The total base shear shall include the forces tributary to the base level diaphragm including forces from the base level diaphragm.

**1613.12.5 Base Shear Resistance-Primary Anchors.**

**1613.12.5.1 General.** The base shear in the downhill direction shall be resisted through primary anchors from diaphragm struts provided in the base level diaphragm to the foundation.

**1613.12.5.2 Location of Primary Anchors.** A primary anchor and diaphragm strut shall be provided in line with each foundation extending in the downhill direction. Primary anchors and diaphragm struts shall also be provided where interior vertical lateral-force-resisting elements occur above and in contact with the base level diaphragm. The spacing of primary anchors and diaphragm struts or collectors shall in no case exceed 30 feet (9144 mm).

**1613.12.5.3 Design of Primary Anchors and Diaphragm Struts.** Primary anchors and diaphragm struts shall be designed in accordance with the requirements of Section 1613.12.8.

**1613.12.5.4 Limitations.** The following lateral-force-resisting elements shall not be designed to resist seismic forces below the base level diaphragm in the downhill direction:

1. Wood structural panel wall sheathing,
2. Cement plaster and lath,
3. Gypsum wallboard, and
4. Tension only braced frames.

Braced frames designed in accordance with the requirements of Section 2205.2.2 may be used to transfer forces from the primary anchors and diaphragm struts to the foundation provided lateral forces do not induce flexural stresses in any member of the frame or in the diaphragm struts. Deflections of frames shall account for the variation in slope of diagonal members when the frame is not rectangular.

**1613.12.6. Base Shear Resistance-Secondary Anchors.**

**1613.12.6.1 General.** In addition to the primary anchors required by Section 1613.12.5, the base shear in the downhill direction shall be resisted through secondary anchors in the uphill foundation connected to diaphragm struts in the base level diaphragm.

**Exception:** Secondary anchors are not required where foundations extending in the downhill direction spaced at not more than 30 feet (9144 mm) on center extend up to and are directly connected to the base level diaphragm for at least 70% of the diaphragm depth.

**1613.12.6.2 Secondary Anchor Capacity and Spacing.** Secondary anchors at the base level diaphragm shall be designed for a minimum force equal to the base shear, including forces tributary to the base level diaphragm, but not less than 600 pounds per lineal foot (8.76 kN/m). The secondary anchors shall be uniformly distributed along the uphill diaphragm edge and shall be spaced a maximum of four feet (1219 mm) on center.

**1613.12.6.3 Design.** Secondary anchors and diaphragm struts shall be designed in accordance with Section 1613.12.8.

**1613.12.7 Diaphragms Below the Base Level-Downhill Direction.** The following provisions shall apply to the lateral analysis and design of the connections for all diaphragms below the base level diaphragm in the downhill direction.

**1613.12.7.1 Diaphragm Defined.** Every floor level below the base level diaphragm shall be designed as a diaphragm.

**1613.12.7.2 Design Force.** Each diaphragm below the base level diaphragm shall be designed for all tributary loads at that level using a minimum seismic force factor not less than the base shear coefficient.

**1613.12.7.3 Design Force Resistance-Primary Anchors.** The design force described in Section 1613.12.7.2 shall be resisted through primary anchors from diaphragm struts provided in each diaphragm to the foundation. Primary anchors shall be provided and designed in accordance with the requirements and limitations of Section 1613.12.5.

**1613.12.7.4 Design Force Resistance-Secondary Anchors.**

**1613.12.7.4.1 General.** In addition to the primary anchors required in Section 1613.12.7.3, the design force in the downhill direction shall be resisted through secondary anchors in the uphill foundation connected to diaphragm struts in each diaphragm below the base level.

**Exception:** Secondary anchors are not required where foundations extending in the downhill direction, spaced at not more than 30 feet (9144 mm) on center, extend up to and are directly connected to each diaphragm below the base level for at least 70% of the diaphragm depth.

**1613.12.7.4.2 Secondary Anchor Capacity.** Secondary anchors at each diaphragm below the base level diaphragm shall be designed for a minimum force equal to the design force but not less than 300 pounds per lineal foot (4.38 kN/m). The secondary anchors shall be uniformly distributed along the uphill diaphragm edge and shall be spaced a maximum of four feet (1219 mm) on center.

**1613.12.7.4.3 Design.** Secondary anchors and diaphragm struts shall be designed in accordance with Section 1613.12.8.

**1613.12.8 Primary and Secondary Anchorage and Diaphragm Strut Design.** Primary and secondary anchors and diaphragm struts shall be designed in accordance with the following provisions:

1. Fasteners. All bolted fasteners used to develop connections to wood members shall be provided with square plate washers at all bolt heads and nuts. Washers shall be minimum 0.229 inch by 3 inches by 3 inches (5.82 mm by 76 mm by 76 mm) in size. Nuts shall be tightened to finger tight plus one half (1/2) wrench turn prior to covering the framing.

2. Fastening. The diaphragm to foundation anchorage shall not be accomplished by the use of toenailing, nails subject to withdrawal, or wood in cross-grain bending or cross-grain tension.

3. Size of Wood Members. Wood diaphragm struts collectors, and other wood members connected to primary anchors shall not be less than three-inch (76 mm) nominal width. The effects of eccentricity on wood members shall be evaluated as required per Item 9.

4. Design. Primary and secondary anchorage, including diaphragm struts, splices, and collectors shall be designed for 125% of the tributary force.

5. Allowable Stress Increase. The one-third allowable stress increase permitted under Section 1605.3.2 shall not be taken when the working (allowable) stress design method is used.

6. Steel Element of Structural Wall anchorage System. The strength design forces for steel elements of the structural wall anchorage system, with the exception of anchor bolts and reinforcing steel, shall be increased by 1.4 times the forces otherwise required.

7. Primary Anchors. The load path for primary anchors and diaphragm struts shall be fully developed into the diaphragm and into the foundation. The foundation must be shown to be adequate to resist the concentrated loads from the primary anchors.

8. Secondary Anchors. The load path for secondary anchors and diaphragm struts shall be fully developed in the diaphragm but need not be developed beyond the connection to the foundation.

9. Symmetry. All lateral force foundation anchorage and diaphragm strut connections shall be symmetrical. Eccentric connections may be permitted when demonstrated by calculation or tests that all components of force have been provided for in the structural analysis or tests.

10. Wood Ledgers. Wood ledgers shall not be used to resist cross-grain bending or cross-grain tension.

**1613.12.9 Lateral-Force-Resisting Elements Normal to the Downhill Direction.**

**1613.12.9.1 General.** In the direction normal to the downhill direction, lateral-force-resisting elements shall be designed in accordance with the requirements of this section.

**1613.12.9.2 Base Shear.** In developing the base shear for seismic design, the response modification coefficient (R) shall not exceed 5 for bearing wall and building frame systems.

**1613.12.9.3 Vertical Distribution of Seismic Forces.** For seismic forces acting normal to the downhill direction the distribution of seismic forces over the height of the building using Section 12.8.3 of ASCE 7 shall be determined using the height measured from the top of the lowest level of the building foundation.

**1613.12.9.4 Drift Limitations.** The story drift below the base level diaphragm shall not exceed 0.007 times the story height at strength design force level. The total drift from the base level diaphragm to the top of the foundation shall not exceed 3/4 inch (19 mm). Where the story height or the height from the base level diaphragm to the top of the foundation varies because of a stepped footing or story offset, the height shall be measured from the average height of the top of the foundation. The story drift shall not be reduced by the effect of horizontal diaphragm stiffness.

**1613.12.9.5 Distribution of Lateral Forces.**

**1613.12.9.5.1 General.** The design lateral force shall be distributed to lateral-force-resisting elements of varying heights in accordance with the stiffness of each individual element.

**1613.12.9.5.2 Wood Structural Panel Sheathed Walls.** The stiffness of a stepped wood structural panel shear wall may be determined by dividing the wall into adjacent rectangular elements, subject to the same top of wall deflection. Deflections of shear walls may be estimated by AF&PA SDPWS Section 4.3.2. Sheathing and fastening requirements for the stiffest section shall be used for the entire wall. Each section of wall shall be anchored for shear and uplift at each step. The minimum horizontal length of a step shall be eight feet (2438 mm) and the maximum vertical height of a step shall be two feet, eight inches (813 mm).

**1613.12.9.5.3 Reinforced Concrete or Masonry Shear Walls.** Reinforced concrete or masonry shear walls shall have forces distributed in proportion to the rigidity of each section of the wall.

**1613.12.9.6 Limitations.** The following lateral force-resisting-elements shall not be designed to resist lateral forces below the base level diaphragm in the direction normal to the downhill direction:

1. Cement plaster and lath,
2. Gypsum wallboard, and
3. Tension-only braced frames.

Braced frames designed in accordance with the requirements of Section 2205.2.2 of this Code may be designed as lateral-force-resisting elements in the direction normal to the downhill direction, provided lateral forces do not induce flexural stresses in any member of the frame. Deflections of frames shall account for the variation in slope of diagonal members when the frame is not rectangular.

**1613.12.10 Specific Design Provisions.**

**1613.12.10.1 Footings and Grade Beams.** All footings and grade beams shall comply with the following:

1. Grade beams shall extend at least 12 inches (305 mm) below the lowest adjacent grade and provide a minimum 24-inch (610 mm) distance horizontally from the bottom outside face of the grade beam to the face of the descending slope.
2. Continuous footings shall be reinforced with at least two No. 4 reinforcing bars at the top and two No. 4 reinforcing bars at the bottom.
3. All main footing and grade beam reinforcement steel shall be bent into the intersecting footing and fully developed around each corner and intersection.
4. All concrete stem walls shall extend from the foundation and reinforced as required for concrete or masonry walls.

**1613.12.10.2 Protection Against Decay and Termites.** All wood to earth separation shall comply with the following:

1. Where a footing or grade beam extends across a descending slope, the stem wall, grade beam, or footing shall extend up to a minimum 18 inches (457 mm) above the highest adjacent grade.

**Exception:** At paved garage and doorway entrances to the building, the stem wall need only extend to the finished concrete slab, provided the wood framing is protected with a moisture proof barrier.

2. Wood ledgers supporting a vertical load of more than 100 pounds per lineal foot (1.46 kN/m) and located within 48 inches (1219 mm) of adjacent grade are prohibited. Galvanized steel ledgers and anchor bolts, with or without wood nailers, or treated or decay resistant sill plates supported on a concrete or masonry seat, may be used.

**1613.12.10.3 Sill Plates.** All sill plates and anchorage shall comply with the following:

1. All wood framed walls, including nonbearing walls, when resting on a footing, foundation, or grade beam stem wall, shall be supported on wood sill plates bearing on a level surface.

2. Power-driven fasteners shall not be used to anchor sill plates except at interior nonbearing walls not designed as shear walls.

**1613.12.10.4 Column Base Plate Anchorage.** The base of isolated wood posts (not framed into a stud wall) supporting a vertical load of 4,000 pounds (17.8 kN) or more and the base plate for a steel column shall comply with the following:

1. When the post or column is supported on a pedestal extending above the top of a footing or grade beam, the pedestal shall be designed and reinforced as required for concrete or masonry columns. The pedestal shall be reinforced with a minimum of four No. 4 bars extending to the bottom of the footing or grade beam. The top of exterior pedestals shall be sloped for positive drainage.

2. The base plate anchor bolts or the embedded portion of the post base, and the vertical reinforcing bars for the pedestal, shall be confined with two No. 4 or three No. 3 ties within the top five inches (127 mm) of the concrete or masonry pedestal. The base plate anchor bolts shall be embedded a minimum of 20 bolt diameters into the concrete or masonry pedestal. The base plate anchor bolts and post bases shall be galvanized and each anchor bolt shall have at least two galvanized nuts above the base plate.

**1613.12.10.5 Steel Beam to Column Supports.** All steel beam to column supports shall be positively braced in each direction. Steel beams shall have stiffener plates installed on each side of the beam web at the column. The stiffener plates shall be welded to each beam flange and the beam web. Each brace connection or structural member shall consist of at least two 5/8 inch (15.9 mm) diameter machine bolts.

**RATIONALE:**

Due to the difficulty of fire suppression vehicles accessing winding and narrow hillside properties and the probabilities for future earthquakes in the Los Angeles region, this technical amendment is required to address the special needs for buildings constructed on hillside locations. A joint Structural Engineers Association of Southern California (SEAOSC) and both the Los Angeles County and Los Angeles City Task Force investigated the performance of hillside building failures after the Northridge earthquake. Numerous hillside failures resulted in loss of life and millions of dollars in damage. These criteria were developed to minimize the damage to these structures and have been in use by both the City and County of Los Angeles for several years with much success. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Topographical and Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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. Additionally, the topography within the Los Angeles region includes significant hillsides with narrow and winding access that makes timely response by fire suppression vehicles challenging and difficult. The proposed modification establishes design parameters to better mitigate and limit property damage that are the results of increased seismic forces which are imparted upon hillside buildings and structures and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 16-8.** Section 1613.13 is added to Chapter 16 of the 2010 Edition of the California Building Code to read as follows:

**1613.13 Suspended Ceilings.** Minimum design and installation standards for suspended ceilings shall be determined in accordance with the requirements of Section 2506.2.1 of this Code and this subsection.

**1613.13.1 Scope.** This part contains special requirements for suspended ceilings and lighting systems. Provisions of Section 13.5.6 of ASCE 7 shall apply except as modified herein.

**1613.13.2 General.** The suspended ceilings and lighting systems shall be limited to 6 feet (1828 mm) below the structural deck unless the lateral bracing is designed by a licensed engineer or architect.

**1613.13.3 Design and Installation Requirements.**

**1613.13.3.1 Bracing at Discontinuity.** Positive bracing to the structure shall be provided at changes in the ceiling plane elevation or at discontinuities in the ceiling grid system.

**1613.13.3.2 Support for Appendages.** Cable trays, electrical conduits and piping shall be independently supported and independently braced from the structure.

**1613.13.3.3 Sprinkler Heads.** All sprinkler heads (drops) except fire-resistance-rated floor/ceiling or roof/ceiling assemblies, shall be designed to allow for free movement of the sprinkler pipes with oversize rings, sleeves or adaptors through the ceiling tile, in accordance with Section 13.5.6.2.2 (e) of ASCE 7.

Sprinkler heads penetrating fire-resistance-rated floor/ceiling or roof/ceiling assemblies shall comply with Section 713 of this Code.

**1613.13.3.4 Perimeter Members.** A minimum wall angle size of at least a two-inch (51 mm) horizontal leg shall be used at perimeter walls and interior full height partitions. The first ceiling tile shall maintain 3/4 inch (19 mm) clear from the finish wall surface. An equivalent alternative detail that will provide sufficient movement due to anticipated lateral building displacement may be used in lieu of the long leg angle subject to the approval of the Superintendent of Building.

**1613.13.4 Special Requirements for Means of Egress.** Suspended ceiling assemblies located along means of egress serving an occupant load of 30 or more shall comply with the following provisions.

**1613.13.4.1 General.** Ceiling suspension systems shall be connected and braced with vertical hangers attached directly to the structural deck along the means of egress serving an occupant load of 30 or more and at lobbies accessory to Group A Occupancies. Spacing of vertical hangers shall not exceed 2 feet (610 mm) on center along the entire length of the suspended ceiling assembly located along the means of egress or at the lobby.

**1613.13.4.2 Assembly Device.** All lay-in panels shall be secured to the suspension ceiling assembly with two hold-down clips minimum for each tile within a 4-foot (1219 mm) radius of the exit lights and exit signs.

**1613.13.4.3 Emergency Systems.** Independent supports and braces shall be provided for light fixtures required for exit illumination. Power supply for exit illumination shall comply with the requirements of Section 1006.3 of this Code.

**1613.13.4.4 Supports for Appendage.** Separate support from the structural deck shall be provided for all appendages such as light fixtures, air diffusers, exit signs, and similar elements.

**RATIONALE:**

The California Building Code has little to no information regarding the safe design and construction requirements for ceiling suspension systems subject to seismic loads. It is through the experience of prior earthquakes, such as the Northridge Earthquake, that this amendment is proposed so as to minimize the amount of bodily and building damage within the spaces in which this type of ceiling will be installed. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**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 requiring safe design and construction requirements for ceiling suspension systems to resist seismic loads is intended to minimize the amount of damage within a building and therefore 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.

**2010 LARUCP 17-01.** Section 1704.4 of the 2010 Edition of the California Building Code is amended to read 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 above grade plane 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. Concrete foundation walls constructed in accordance with Table 1807.1.6.2.~~

~~5~~4. Concrete patios, driveways and sidewalks, on grade.

**RATIONALE:**

Results from studies after the 1994 Northridge Earthquake indicated that a lot of the damages were attributed to lack of quality control during construction resulting in poor performance of the building or structure. Therefore, the proposed amendment requires special inspection for concrete with a compressive strength greater than 2,500 pounds per square inch. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 special inspection for concrete with a compressive strength greater than 2,500 psi to improve quality of control during construction and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 17-02.** Section 1704.8 of the 2010 Edition of the California Building Code is amended to read as follows:

**1704.8 Driven deep foundations and connection grade beams.** Special inspections shall be performed during installation and testing of driven deep foundation elements as required by Table 1704.8. Special inspections shall be performed for connection grade beams in accordance with Section 1704.4 for structures assigned to Seismic Design Category D, E or F. The approved geotechnical report, and the construction documents prepared by the registered design professionals, shall be used to determine compliance.

**RATIONALE:**

Studies after the Northridge Earthquake revealed that great confusion exist in the field over what is required by the code in the way of special inspection beyond just piles and caissons. Connecting grade beams used in driven deep foundations will generally act like concrete beams and should not be treated like typical footings. Section 1704.4 requires concrete beams to have special inspection, but exempts the footings of buildings three stories or less in height. This amendment clarifies that the grade beams that connect driven deep foundations are not exempt from special inspection even if they are used as part of the foundation system. They are an essential part of the driven deep foundation system and should receive the same level of inspection, particularly since this type of system must resist the higher seismic demand loads in this region.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 special inspection of connecting grade beams to ensure adequate performance of the foundation system and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 17-03.** Section 1704.9 of the 2010 Edition of the California Building Code is amended to read as follows:

**1704.9 Cast-in-place deep foundations and connection grade beams.** Special inspections shall be performed during installation and testing of cast-in-place deep foundation elements as required by Table 1704.9. Special inspections shall be performed for connection grade beams in accordance with Section 1704.4 for structures assigned to Seismic Design Category D, E or F. The approved geotechnical report, and the construction documents prepared by the registered design professionals, shall be used to determine compliance.

**RATIONALE:**

Studies after the Northridge Earthquake revealed that great confusion exist in the field over what is required by the code in the way of special inspection beyond just piles and caissons. Connecting grade beams used in cast-in-place deep foundations will generally act like concrete beams and should not be treated like typical footings. Section 1704.4 requires concrete beams to have special inspection, but exempts the footings of buildings three stories or less in height. This amendment clarifies that the grade beams that connect cast-in-place deep foundations are not exempt from special inspection even if they are used as part of the foundation system. They are an essential part of the cast-in-place deep foundation system and should receive the same level of inspection, particularly since this type of system must resist the higher seismic demand loads in this region.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 special inspection of connecting grade beams to ensure adequate performance of the foundation system and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 17-04.** Section 1705.3 of the 2010 Edition of the California Building Code is amended to read as follows:

**1705.3 Seismic resistance.** The statement of special inspections shall include seismic requirements for cases covered in Sections 1705.3.1 through 1705.3.5.

**Exception:** Seismic requirements are permitted to be excluded from the statement of special inspections for structures designed and constructed in accordance with the following:

1. The structure consists of light-frame construction; the design spectral response acceleration at short periods, $S_{DS}$, as determined in Section 1613.5.4, does not exceed 0.5g; and the height of the structure does not exceed 35 feet (10 668 mm) above grade plane; or

2. The structure is constructed using a reinforced masonry structural system or reinforced concrete structural system; the design spectral response acceleration at short periods, $S_{DS}$, as determined in Section 1613.5.4, does not exceed 0.5g, and the height of the structure does not exceed 25 feet (7620 mm) above grade plane; or

3. Detached one- or two-family dwellings not exceeding two stories above grade plane, provided the structure is not assigned to Seismic Design Category D, E or F and does not have any of the following plan or vertical irregularities in accordance with Section 12.3.2 of ASCE 7:

   3.1 Torsional irregularity.

   3.2 Nonparallel systems.

   3.3 Stiffness irregularity—extreme soft story and soft story.

   3.4 Discontinuity in capacity—weak story.

**RATIONALE:**

In southern California, very few detached one- or two-family dwellings not exceeding two stories above grade plane are built as "box-type" structures, specially for those in hillside areas and near the oceanfront. Many steel moment frames or braced frames and/or cantilevered columns within buildings can still be shown as "regular" structures by calculations. With the higher seismic demand placed on buildings and structures in this region, the language in Sections 1705.3 Item 3 of the California Building Code would permit many detached one- or two-family dwellings not exceeding two stories above grade plane with complex structural elements to be constructed without the benefit of special inspections. By requiring special inspections, the quality of major structural elements and connections that affect the vertical and lateral load resisting systems of the structure will greatly be increased. The exception should only be allowed for detached one- or two-family dwellings not exceeding two stories above grade plane assigned to Seismic Design category A, B and C.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 special inspections for detached one- or two-family dwellings not exceeding two stories above grade plane assigned to Seismic Design Category D, E and F will help ensure that acceptable standards of workmanship and quality of construction are provided and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 17-05.** Section 1710.1 of the 2010 Edition of the California Building Code is amended to read as follows:

**1710.1 General.** Where required by the provisions of Section 1710.2 or 1710.3, the owner shall employ a ~~registered design professional~~ structural observer to perform structural observations as defined in Section 1702. The structural observer shall be one of the following individuals:

1. The registered design professional responsible for the structural design, or

2. A registered design professional designated by the registered design professional responsible for the structural design.

Prior to the commencement of observations, the structural observer shall submit to the building official a written statement identifying the frequency and extent of structural observations.

~~At the conclusion of the work included in the permit, the structural observer shall submit to the building official a written statement that the site visits have been made and identify any reported deficiencies that, to the best of the structural observer's knowledge, have not been resolved.~~

The owner or owner's representative shall coordinate and call a preconstruction meeting between the structural observer, contractors, affected subcontractors and special inspectors. The structural observer shall preside over the meeting. The purpose of the meeting shall be to identify the major structural elements and connections that affect the vertical and lateral load resisting systems of the structure and to review scheduling of the required observations. A record of the meeting shall be included in the report submitted to the building official.

Observed deficiencies shall be reported in writing to the owner or owner's representative, special inspector, contractor and the building official. Upon the form prescribed by the building official, the structural observer shall submit to the building official a written statement at each significant construction stage stating that the site visits have been made and identifying any reported deficiencies which, to the best of the structural observer's knowledge, have not been resolved. A final report by the structural observer which states that all observed deficiencies have been resolved is required before acceptance of the work by the building official.

**RATIONALE:**

The language in Section 1710.1 of the California Building Code permits the owner to employ any registered design professional to perform structural observations with minimum guideline. However, it is important to recognize that the registered design professional responsible for the structural design has thorough knowledge of the building he/she designed. By requiring the registered design professional responsible for the structural design or their designee who were involved with the design to observe the construction, the quality of the observation for major structural elements and connections that affect the vertical and lateral load resisting systems of the structure will greatly be increased. Additional requirements are provided to help clarify the role and duties of the structural observer and the method of reporting and correcting observed deficiencies to the building official. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 the registered design professional in responsible charge for the structural design to observe the construction will help ensure acceptable standards of workmanship is provided and to

improve the quality of the observation and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 17-06.** Section 1710.2 of the 2010 Edition of the California Building Code is amended to read as follows:

**1710.2 Structural observations for seismic resistance.** Structural observations shall be provided for those structures assigned to Seismic Design Category D, E or F, as determined in Section 1613, where one or more of the following conditions exist:

1. The structure is classified as Occupancy Category III or IV in accordance with Table 1604.5.
2. The height of the structure is greater than 75 feet (22860 mm) above the base.
3. The structure ~~is assigned to Seismic Design Category E,~~ is classified as Occupancy Category I or II in accordance with Table 1604.5, and ~~is greater than two stories one stories above grade plane~~ a lateral design is required for the structure or portion thereof.

   **Exception:** One-story wood framed Group R-3 and Group U Occupancies less than 2,000 square feet in area, provided the adjacent grade is not steeper than 1 unit vertical in 10 units horizontal (10% sloped), assigned to Seismic Design Category D.

4. When so designated by the registered design professional responsible for the structural design.
5. When such observation is specifically required by the building official.

**RATIONALE:**

With the higher seismic demand placed on buildings and structures in this region, the language in Section 1710.2 Item 3 of the California Building Code would permit many low-rise buildings and structures with complex structural elements to be constructed without the benefit of a structural observation. By requiring a registered design professional to observe the construction, the quality of the observation for major structural elements and connections that affect the vertical and lateral load resisting systems of the structure will greatly be increased. An exception is provided to permit simple structures and buildings to be excluded. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 the registered design professional in responsible charge for the structural design to observe the construction will help ensure acceptable standards of workmanship is provided and to improve the quality of the observation and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 18-01.** Section 1807.1.4 of the 2010 Edition of the California Building Code is amended to read as follows:

**1807.1.4 Permanent wood foundation systems.** Permanent wood foundation systems shall be designed and installed in accordance with AF&PA PWF. Lumber and plywood shall be treated in accordance with AWPA U1 (Commodity Specification A, Use Category 4B and Section 5.2) and shall be identified in accordance with Section 2303.1.8.1. Permanent wood foundation systems shall not be used for structures assigned to Seismic Design Category D, E or F.

**RATIONALE:**

No substantiating data has been provided to show that wood foundation is effective in supporting buildings and structures during a seismic event while being subject to deterioration caused by the combined detrimental effect of constant moisture in the soil and wood-destroying organisms. Wood foundation systems, 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 and temperate weather in the Southern California region and are not generally familiar with the necessary precautions and treatment of wood that makes it suitable for both seismic event and wet applications. The proposed amendment takes the precautionary steps to reduce or eliminate potential problems that may result in using wood foundation systems that experience relatively rapid decay due to the fact that the region does not experience temperatures cold enough to destroy or retard the growth and proliferation of wood-destroying organisms. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Climatic and Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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. In addition, the region is within a climate system capable of producing major winds, fire and rain related disasters, including but not limited to those caused by the Santa Ana winds and El Nino (or La Nina) subtropical-like weather. This region is especially susceptible to more active termite and wood attacking insects and microorganisms. The proposed modification to prohibit the use of wood foundation systems as well as limit prescriptive design provisions in an effort to mitigate potential problems or deficiencies due to the proliferation of wood-destroying organisms and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 18-02.** Section 1807.1.6 of the 2010 Edition of the California Building Code is amended to read as follows:

**1807.1.6 Prescriptive design of concrete and masonry foundation walls.** Concrete and masonry foundation walls that are laterally supported at the top and bottom shall be permitted to be designed and constructed in accordance with this section. Prescriptive design of foundation walls shall not be used for structures assigned to Seismic Design Category D, E or F.

**RATIONALE:**

With the higher seismic demand placed on buildings and structures in this region, it is deemed necessary to take precautionary steps to reduce or eliminate potential problems that may result by following prescriptive design provisions that does not take into consideration the surrounding environment. Plain concrete performs poorly in withstanding the cyclic forces resulting from seismic events. In addition, no substantiating data has been provided to show that under-reinforced foundation walls are effective in resisting seismic loads and may potentially lead to a higher risk of failure. It is important that the benefit and expertise of a registered design professional be obtained to properly analyze the structure and take these issues into consideration. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

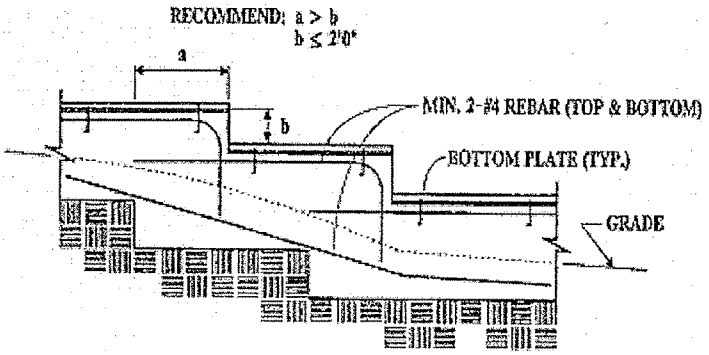
**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 prohibit prescriptive design provisions for foundation walls as plain concrete have performed poorly in withstanding the cyclic forces resulting from seismic events and to require the walls to be designed by a registered design professional to ensure that the proper analysis of the structure takes into account the surrounding condition and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 18-03.** Section 1809.3 of the 2010 Edition of the California Building Code is amended to read as follows:

**1809.3 Stepped footings.** The top surface of footings shall be level. The bottom surface of footings shall be 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).

For structures assigned to Seismic Design Category D, E or F, the 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 1809.3.




STEPPED FOUNDATIONS

FIGURE 1809.3
STEPPED FOOTING

**RATIONALE:**

With the higher seismic demand placed on buildings and structures in this region, precautionary steps are proposed to reduce or eliminate potential problems that may result for under reinforced footings located on sloped surfaces. Requiring minimum reinforcement for stepped footings is intended to address the problem of poor performance of plain or under-reinforced footings during a seismic event. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 minimum reinforcement in stepped footings is intended to improve performance of buildings and structures and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 18-04.** Section 1809.7 and Table 1809.7 of the 2010 Edition of the California Building Code are amended to read as follows:

**1809.7 Prescriptive footings for light-frame construction.** Where a specific design is not provided, concrete or masonry-unit footings supporting walls of light-frame construction shall be permitted to be designed in accordance with Table 1809.7. Prescriptive footings in Table 1809.7 shall not exceed one story above grade plane for structures assigned to Seismic Design Category D, E or F.

**TABLE 1809.7**
**PRESCRIPTIVE FOOTINGS SUPPORTING WALLS OF LIGHT-FRAME CONSTRUCTION** [a, b, c, d, e]

| 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 1809.4.
b. The ground under the floor shall be permitted to be excavated to the elevation of the top of the footing.
c. ~~Interior stud-bearing walls shall be permitted to be supported by isolated footings. The footing width and length shall be twice the width shown in this table, and footings shall be spaced not more than 6 feet on center.~~ Not Adopted.
d. See Section 1908 for additional requirements for concrete footings of structures assigned to Seismic Design Category C, D, E or F.
e. For thickness of foundation walls, see Section 1807.1.6.
f. Footings shall be permitted to support a roof 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 shall be permitted to be 6 inches thick.~~

**RATIONALE:**

No substantiating data has been provided to show that under-reinforced footings are effective in resisting seismic loads and may potentially lead to a higher risk of failure. Therefore, this proposed amendment requires minimum reinforcement in continuous footings to address the problem of poor performance of plain or under-reinforced footings during a seismic event. With the higher seismic demand placed on buildings and structures in this region, precautionary steps are proposed to reduce or eliminate potential problems that may result by following prescriptive design provisions for footing that does not take into consideration the surrounding environment. It was important that the benefit and expertise of a registered design professional be obtained to properly analysis the structure and takes these issues into consideration. 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. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 use of the prescriptive design provisions and under-reinforced or plain concrete is to ensure that the proper analysis of the structure takes into account the surrounding condition and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 18-05.** Section 1809.12 of the 2010 Edition of the California Building Code is amended to read as follows:

**1809.12 Timber footings.** Timber footings shall be permitted for buildings of Type V construction and as otherwise approved by the building official. Such footings shall be treated in accordance with AWPA U1 (Commodity Specification A, Use Category 4B). Treated timbers are not required where placed entirely below permanent water level, or where used as capping for wood piles that project above the water level over submerged or marsh lands. The compressive stresses perpendicular to grain in untreated timber footing supported upon treated piles shall not exceed 70 percent of the allowable stresses for the species and grade of timber as specified in the AF&PA NDS. Timber footings shall not be used in structures assigned to Seismic Design Category D, E or F.

**RATIONALE:**

No substantiating data has been provided to show that timber footings is effective in supporting buildings and structures during a seismic event while being subject to deterioration caused by the combined detrimental effect of constant moisture in the soil and wood-destroying organisms. Timber footings, when they are not properly treated and protected against deterioration, have performed very poorly. Most contractors are typically accustomed to construction in dry and temperate weather in the Southern California region and are not generally familiar with the necessary precautions and treatment of wood that makes it suitable for both seismic event and wet applications. The proposed amendment takes the precautionary steps to reduce or eliminate potential problems that may result by using timber footings that experience relatively rapid decay due to the face that the region does not experience temperatures cold enough to destroy or retard the growth and proliferation of wood-destroying organisms. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Climatic and Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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. In addition, the region is within a climate system capable of producing major winds, fire and rain related disasters, including but not limited to those caused by the Santa Ana winds and El Nino (or La Nina) subtropical-like weather. This region is especially susceptible to more active termite and wood attacking insects and microorganisms. The proposed modification to prohibit the use of timber footings in an effort to mitigate potential problems or deficiencies due to the proliferation of wood-destroying organisms and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 18-06.** Section 1810.3.2.4 of the 2010 Edition of the California Building Code is amended to read as follows:

**1810.3.2.4 Timber.** Timber deep foundation elements shall be designed as piles or poles in accordance with AF&PA NDS. Round timber elements shall conform to ASTM D 25. Sawn timber elements shall conform to DOC PS-20. Timber shall not be used in structures assigned to Seismic Design Category D, E or F.

**RATIONALE:**

No substantiating data has been provided to show that timber deep foundation is effective in supporting buildings and structures during a seismic event while being subject to deterioration caused by the combined detrimental effect of constant moisture in the soil and wood-destroying organisms. Timber deep foundation, when they are not properly treated and protected against deterioration, has performed very poorly. Most contractors are typically accustomed to construction in dry and temperate weather in the Southern California region and are not generally familiar with the necessary precautions and treatment of wood that makes it suitable for both seismic event and wet applications. The proposed amendment takes the precautionary steps to reduce or eliminate potential problems that may result by using timber deep foundation that experience relatively rapid decay due to the face that the region does not experience temperatures cold enough to destroy or retard the growth and proliferation of wood-destroying organisms. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Climatic and Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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. In addition, the region is within a climate system capable of producing major winds, fire and rain related disasters, including but not limited to those caused by the Santa Ana winds and El Nino (or La Nina) subtropical-like weather. This region is especially susceptible to more active termite and wood attacking insects and microorganisms. The proposed modification to prohibit the use of timber deep foundation in an effort to mitigate potential problems or deficiencies due to the proliferation of wood-destroying organisms and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 19-01.** Section 1908.1 is amended to read as shown below and Sections 1908.1.11 thru 1908.1.14 is added to Chapter 19 of the 2010 Edition of the 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 ~~1908.1.10~~1908.1.14.

**1908.1.11 ACI 318, Section 21.6.4.1.** Modify ACI 318, Section 21.6.4.1, to read 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 21.6.4.1, Items (a) through (c), over the full height of the member.

**1908.1.12 ACI 318, Section 21.6.4.** Modify ACI 318, Section 21.6.4, by adding Section 21.6.4.8 to read as follows:

21.6.4.8 – At any section where the design strength, $\varphi P_n$, of the column is less than the sum of the shears $V_e$ computed in accordance with ACI 318 Sections 21.5.4.1 and 21.6.5.1 for all the beams framing into the column above the level under consideration, transverse reinforcement as specified in ACI 318 Sections 21.6.4.1 through 21.6.4.3 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, $\varphi P_n$, of the column, these moments may be assumed to result from the deformation of the frame in any one principal axis.

**1908.1.13 ACI 318, Section 21.9.4.** Modify ACI 318, Section 21.9.4, by adding Section 21.9.4.6 to read as follows:

21.9.4.6 – 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 ACI 318 Section 21.13.

**1908.1.14 ACI 318, Section 21.11.6.** Modify ACI 318, Section 21.11.6, 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.

**RATIONALE:**

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 it is provided 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 the 1994 Northridge Earthquake. Rebar placed in very thin concrete topping slabs have been observed in some instances to have popped out of the slab due to insufficient concrete coverage. This modification ensures that critical boundary and collector rebars are placed in sufficiently thick slab to prevent buckling of such reinforcements.

This proposed amendment is a continuation of amendment 19-02 (2007) adopted during previous code adoption cycle with editorial revisions of ACI section numbering.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 increase confinement in critical columns, limiting the use of highly gravity loaded walls, and increase concrete coverage in thin slabs will have to prevent failure of the structure and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 19-02.** Section 1908.1.2 of the 2010 Edition of the California Building Code is amended to read as follows:

**1908.1.2 ACI 318, Section 21.1.1.** Modify ACI 318, Sections 21.1.1.3 and 21.1.1.7 as follows:

21.1.1.3 – Structures assigned to Seismic Design Category A shall satisfy requirements of Chapters 1 to 19 and 22; Chapter 21 does not apply. Structures assigned to Seismic Design Category B, C, D, E or F also shall satisfy 21.1.1.4 through 21.1.1.8, as applicable. Except for structural elements of plain concrete complying with Section 1908.1.8 of the International Building Code, structural elements of plain concrete are prohibited in structures assigned to Seismic Design Category C, D, E or F.

21.1.1.7 – Structural systems designated as part of the seismic-force-resisting system shall be restricted to those permitted by ASCE 7. Except for Seismic Design Category A, for which Chapter 21 does not apply, the following provisions shall be satisfied for each structural system designated as part of the seismic-force-resisting system, regardless of the Seismic Design Category:

(a) Ordinary moment frames shall satisfy 21.2.
(b) Ordinary reinforced concrete structural walls and ordinary precast structural walls need not satisfy any provisions in Chapter 21.
(c) Intermediate moment frames shall satisfy 21.3.
(d) Intermediate precast structural walls shall satisfy 21.4.
(e) Special moment frames shall satisfy 21.5 through 21.8.
(f) Special structural walls shall satisfy 21.9.
(g) Special structural walls constructed using precast concrete shall satisfy 21.10.

All special moment frames and special structural walls shall also satisfy 21.1.3 through 21.1.7. Concrete tilt-up wall panels classified as intermediate precast structural wall system shall satisfy 21.9 in addition to 21.4.2 and 21.4.3 for structures assigned to Seismic Design Category D, E or F.

**RATIONALE:**

By virtue of ACI 318 Section 21.1.1.7(d), intermediate precast structural walls designed under Section 21.4, material requirements intended under provisions 21.1.4, 21.1.5, 21.1.6, and 21.1.7 would be excluded for structures assigned to Seismic Design Category D, E or F. Clarification of ACI 318 Chapter 21 is needed to ensure that structural walls designed under ASCE 7 Table 12.2-1 using the intermediate wall panel category would conform to ductility requirements comparable to special structural wall; and conformance to the long standing practice of ACI 318 to impose special requirements for high seismic design regions. This amendment gives explicit requirement under which design and detailing need to conform to special structural wall system provision in ACI-318 Section 21.9, which covers both cast-in-place as well as precast. This amendment further gives building officials the tools to enforce minimum life safety building performance under earthquake forces in Seismic Design Category D, E or F.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 intermediate structural wall system is intended to assure that ductility requirements for high seismic region is provided and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code and ACI 318.

**2010 LARUCP 19-03.** Section 1908.1.3 of the 2010 Edition of the California Building Code is amended to read as follows:

**1908.1.3 ACI 318, Section 21.4.** Modify ACI 318, Section 21.4, by renumbering Section 21.4.3 to become 21.4.4 and adding new Sections 21.4.3, 21.4.5, ~~and~~ 21.4.6 and 21.4.7 to read as follows:

21.4.3 – Connections that are designed to yield shall be capable of maintaining 80 percent of their design strength at the deformation induced by the design displacement or shall use Type 2 mechanical splices.

21.4.4 – Elements of the connection that are not designed to yield shall develop at least 1.5 $S_y$.

21.4.5 – Wall piers in Seismic Design Category D, E or F shall comply with Section 1908.1.4 of this Code.

~~21.4.5~~21.4.6 – Wall piers not designed as part of a moment frame in buildings assigned to Seismic Design Category C shall have transverse reinforcement designed to resist the shear forces determined from 21.3.3. Spacing of transverse reinforcement shall not exceed 8 inches (203 mm). Transverse reinforcement shall be extended beyond the pier clear height for at least 12 inches (305 mm).

**Exceptions:**
1. Wall piers that satisfy 21.13.
2. Wall piers along a wall line within a story where other shear wall segments provide lateral support to the wall piers and such segments have a total stiffness of at least six times the sum of the stiffnesses of all the wall piers.

~~21.4.6~~21.4.7 – Wall segments with a horizontal length-to-thickness ratio less than 2.5 shall be designed as columns.

**RATIONALE:**

The design provision for wall pier detailing was originally introduced by SEAOC in 1987 to legacy Uniform Building Code (UBC) and was included in the 1988 UBC through the 1997 UBC (2002 CBC). The wall pier detailing provision prescribed under Section 1908.1.4 was intended for high seismic zones equivalent to current Seismic Design Category D, E or F. Section 1908.1.3 was added as a complement of wall pier detailing in Seismic Design Category C (formerly seismic zones 2A and 2B under the legacy model code). ACI 318 Commentary R 21.1.1 emphasized "it is essential that structures assigned to higher Seismic Design Categories possess a higher degree of toughness", and further encourages practitioners to use special structural wall system in regions of high seismic risk. ASCE 7 Table 12.2-1 permits intermediate precast structural wall system in Seismic Design Category D, E or F. Current Section 1908.1.3 does not limit to just structures assigned to Seismic Design Category C. The required shear strength under 21.3.3, referenced in current Section 21.4.5, is based on $V_u$ under either nominal moment strength or two times the code prescribed earthquake force. The required shear strength in 21.6.5.1, referenced in Section 21.9.10.2 (IBC 1908.1.4), is based on the probable shear strength, $V_e$ under the probable moment strength, $M_{pr}$. In addition, the spacing of required shear reinforcement is 8 inches on center under current Section 21.4.5 instead of 6 inches on center with seismic hooks at both ends under Section 21.9.10.2. Requirement of wall pier under Section 21.9.10.2 would enhance better ductility.

Current practice in commercial buildings constructed using precast panels wall system have large window and door openings and/or narrow wall piers. Wall panels varying up to three stories high with openings resembles wall frame which is not currently recognized under any of the defined seismic-force resisting systems other than consideration of structural wall system. Conformance to special structural wall system design and detailing of wall piers ensures minimum life safety performance in resisting earthquake forces for structures in Seismic Design Category D, E or F. Proposed modification separates wall piers designed for structures assigned to Seismic Design Category C from those assigned to Seismic Design Category D, E or F.

This modification is consistent with the amendment adopted by DSA-SS as reflected in Section 1916.4.4 of the 2010 Edition of the California Building Code; and reflects code change proposal approved for 2012 IBC during the 2009/2010 code development hearing.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 wall pier detailing is intended to assure that ductility requirements for high seismic region is provided and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code and ACI 318.

**2010 LARUCP 19-04.** Section 1908.1.8 of the 2010 Edition of the California Building Code is amended to read as follows:

**1908.1.8 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.~~

**RATIONALE:**

This proposed amendment requires minimum reinforcement in continuous footings to address 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 Joint Task Force that investigated the poor performance observed in 1994 Northridge Earthquake. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 minimum reinforcement to address the problem of poor performance of plain or under-reinforced footings during a seismic event and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 19-05.** Section 1909.4 of the 2010 Edition of the California Building Code is amended to read as follows:

**1909.4 Design.** Structural plain concrete walls, footings and pedestals shall be designed for adequate strength in accordance with ACI 318, Section 22.4 through 22.8.

> **Exception:** For Group R-3 occupancies and buildings or other occupancies less than two stories above grade plane of light-frame construction, the required edge thickness of ACI 318 is permitted to be reduced to 6 inches (152 mm), provided that the footing does not extend more than 4 inches (102 mm) on either side of the supported wall. This exception shall not apply to structural elements designed to resist seismic lateral forces for structures assigned to Seismic Design Category D, E or F.

**RATIONALE:**

With the higher seismic demand placed on buildings and structures in this region, the proposed amendment takes the precautionary steps to reduce or eliminate potential problems that may result permitting a reduced edge thickness of the footing that support walls without taking into consideration the surrounding environment. In addition, no substantiating data has been provided to show that the reduced edge thickness is effective in resisting seismic loads and may potentially lead to a higher risk of failure. It is important that the benefit and expertise of a registered design professional be obtained to properly analyze the structure and take these issues into consideration.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 prohibit the reduced edge thickness of footings supporting walls is intended to ensure that the proper analysis of the structure takes into account the surrounding condition and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 22-01.** Section 2204.1.1 is added to Chapter 22 of the 2010 Edition of the California Building Code to read as follows:

**2204.1.1 Consumables for welding.**

**2204.1.1.1 Seismic Force Resisting System (SFRS) welds.** All welds used in members and connections in the SFRS shall be made with filler metals meeting the requirements specified in AWS D1.8 Clause 6.3. AWS D1.8 Clauses 6.3.5, 6.3.6, 6.3.7 and 6.3.8 shall apply only to demand critical welds.

**2204.1.1.2 Demand critical welds.** Where welds are designated as demand critical, they shall be made with filler metals meeting the requirements specified in AWS D1.8 Clause 6.3.

RATIONALE:

A number of significant technical modifications have been made since the adoption of AISC 341-05. One such change incorporates AWS D1.8/D1.8M by reference for welding related issues. This change will be included in AISC 341-10 that is to be incorporated by reference into the 2012 Edition of the International Building Code. This proposed amendment is consistent with actions taken by both DSA-SS and OSHPD to incorporate such language in the 2010 Edition of the California Building Code.

AWS D1.8/D1.8M requires that all seismic force resisting system welds be made with filler metals classified using AWS A5 standards that achieve the following mechanical properties:

| Filler Metal Classification Properties for Seismic Force Resisting System Welds | | |
|---|---|---|
| Property | Classification | |
| | 70 ksi (480 MPa) | 80 ksi (550 MPa) |
| Yield Strength, ksi (MPa) | 58 (400) min. | 68 (470) min. |
| Tensile Strength, ksi (MPa) | 70 (480) min. | 80 (550) min. |
| Elongation, % | 22 min. | 19 min. |
| CVN Toughness, ft-lbf (J) | 20 (27) min. @ 0 °F (–18 °C) [a] | |
| [a] Filler metals classified as meeting 20 ft-lbf (27 J) min. at a temperature lower than 0 °F (–18 °C) also meet this requirement. | | |

In addition to the above requirements, AWS D1.8/D1.8M requires, unless otherwise exempted from testing, that all demand critical welds are to be made with filler metals receiving Heat Input Envelope Testing that achieve the following mechanical properties in the weld metal:

| Mechanical Properties for Demand Critical Welds | | |
|---|---|---|
| Property | Classification | |
| | 70 ksi (480 MPa) | 80 ksi (550 MPa) |
| Yield Strength, ksi (MPa) | 58 (400) min. | 68 (470) min. |
| Tensile Strength, ksi (MPa) | 70 (480) min. | 80 (550) min. |
| Elongation (%) | 22 min. | 19 min. |
| CVN Toughness, ft-lbf (J) | 40 (54) min. @ 70 °F (20 °C) [b, c] | |
| [b] For LAST of +50 °F (+10 °C). For LAST less than + 50 °F (+10 °C), see AWS D1.8/D1.8M Clause 6.3.6.<br>[c] Tests conducted in accordance to AWS D1.8/D1.8M Annex A meeting 40 ft-lbf (54 J) min. at a temperature lower than +70 °F (20 °C) also meet this requirement. | | |

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 amendment is consistent with requirements in AISC 341-10 for improving quality of critical welds and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code and ASCE 7-05.

**2010 LARUCP 22-02.** Section 2205.4 is added to Chapter 22 of the 2010 Edition of the California Building Code to read as follows:

**2205.4 AISC 341, Part I, Section 13.2 Members.** Add Section 13.2f to read as follows:

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 3,000 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.

**RATIONALE:**

Past test results on braces used in steel concentrically braced frames (SCBF) indicated 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 recommended this modification during the 2007 code amendment process. This recommendation is a continuation of the proposal adopted in 2007. Furthermore, OSPHD has taken the same position and is continuing this recommendation as reflected in Section 2205A.4.1.5.1 to Chapter 22 of the 2010 Edition of the California Building Code. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

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 region is a densely populated area having buildings and structures 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 amendment is intended to reduce and minimize fracture of rectangular and square brace frame members due to local buckling behavior of the cross section and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code and ASCE 7-05.

**2010 LARUCP 23-01.** Section 2304.11.7 of the 2010 Edition of the California Building Code is amended to read as follows:

**2304.11.7 Wood used in retaining walls and cribs.** Wood installed in retaining or crib walls shall be preservative treated in accordance with AWPA U1 (Commodity Specifications A or F) for soil and fresh water use. Wood shall not be used in retaining or crib walls for structures assigned to Seismic Design Category D, E or F.

**RATIONALE:**

No substantiating data has been provided to show that wood used in retaining or crib walls are effective in supporting buildings and structures during a seismic event while being subject to deterioration caused by the combined detrimental effect of constant moisture in the soil and wood-destroying organisms. Wood used in retaining or crib walls, when they are not properly treated and protected against deterioration, have performed very poorly. Most contractors are typically accustomed to construction in dry and temperate weather in the Southern California region and are not generally familiar with the necessary precautions and treatment of wood that makes it suitable for both seismic event and wet applications. The proposed amendment takes the precautionary steps to reduce or eliminate potential problems that may result by using wood in retaining or crib walls that experience relatively rapid decay due to the face that the region does not experience temperatures cold enough to destroy or retard the growth and proliferation of wood-destroying organisms. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Climatic and Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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. In addition, the region is within a climate system capable of producing major winds, fire and rain related disasters, including but not limited to those caused by the Santa Ana winds and El Nino (or La Nina) subtropical-like weather. This region is especially susceptible to more active termite and wood attacking insects and microorganisms. The proposed modification to prohibit the use of wood in retaining or crib walls in an effort to mitigate potential problems or deficiencies due to the proliferation of wood-destroying organisms and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 23-02.** Section 2305.4 is added to Chapter 23 of the 2010 Edition of the California Building Code to read as follows:

**2305.4 Quality of Nails.** In Seismic Design Category D, E or F, 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. Clipped head or box nails are not 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.

**RATIONALE:**

The overdriving of nails into the structural wood panel still remains a concern when pneumatic nail guns are used for wood structural panel shear wall nailing. Box nails were observed to cause massive and multiple failures of the typical 3/8-inch thick plywood during the 1994 Northridge Earthquake. The use of clipped head nails continues to be restricted from being used in wood structural panel shear walls 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 wood structural panel shear wall construction were found to perform much less in previous wood structural panel shear wall testing done at the University of California Irvine. The existing test results indicated that, under cyclic loading, the wood structural panel shear walls 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. This amendment reflects the recommendations by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the poor performance observed in 1994 Northridge Earthquake. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 dimensions as hand-driven nail will result in improved quality of construction and performance of wood structural panel shear walls and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 23-03.** Section 2305.5 is added to Chapter 23 of the 2010 Edition of the California Building Code to read as follows:

**2305.5 Hold-down connectors.** In Seismic Design Category D, E or F, hold-down connectors shall be designed to resist shear wall overturning moments using approved cyclic load values or 75 percent of the allowable seismic load values that do not consider cyclic loading of the product. Connector bolts into wood framing shall 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-down connectors shall be tightened to finger tight plus one half (1/2) wrench turn just prior to covering the wall framing.

RATIONALE:

Many of the hold-down connectors currently in use do not have any acceptance report based on dynamic testing protocol. This proposed amendment continues to limit the allowable capacity to 75% of the acceptance report value to provide an additional factor of safety for statically tested anchorage devices. Cyclic forces imparted on buildings and structures by seismic activity cause more damage than equivalent forces that are applied in a static manner. Steel plate washers will reduce the additional damage that can result when hold-down connectors are fastened to wood framing members. This amendment reflects the recommendations by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the poor performance observed in 1994 Northridge Earthquake. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

FINDINGS:

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 minimum performance requirements for hold-down connectors will reduce failure of wood structural panel shear walls due to excessive deflection and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 23-04.** Tables 2306.2.1(3) and 2306.2.1(4) are added to Chapter 23 of the 2010 Edition of the California Building Code and Section 2306.2.1 of the 2010 Edition of the California Building Code is amended to read as follows:

**2306.2.1 Wood structural panel diaphragms.** Wood structural panel diaphragms shall be designed and constructed in accordance with AF&PA SDPWS. Wood structural panel diaphragms are permitted to resist horizontal forces using the allowable shear capacities set forth in Table 2306.2.1(1) or 2306.2.1(2). For structures assigned to Seismic Design Category D, E or F, the allowable shear capacities shall be set forth in Table 2306.2.1(3) or 2306.2.1(4). The allowable shear capacities in Table 2306.2.1(1) or 2306.2.1(2) are permitted to be increased 40 percent for wind design.

Wood structural panel diaphragms fastened with staples shall not used to resist seismic forces in structures assigned to Seismic Design Category D, E or F.

**Exception:** Staples may be used for wood structural panel diaphragms when the allowable shear values are substantiated by cyclic testing and approved by the building official.

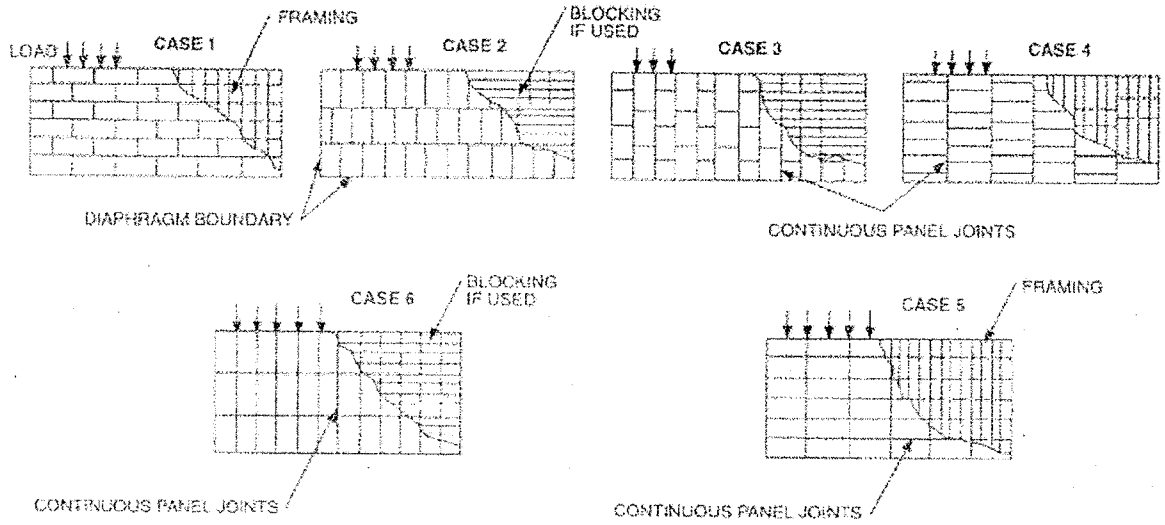
Wood structural panel diaphragms used to resist seismic forces in structures assigned to Seismic Design Category D, E or F shall be applied directly to the framing members.

**Exception:** Wood structural panel 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 2306.2.1(3)
ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL DIAPHRAGMS WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE[a] FOR SEISMIC LOADING[f] FOR STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY D, E OR F

| PANEL GRADE | COMMON NAIL SIZE | MINIMUM FASTENER PENETRATION IN FRAMING (inches) | MINIMUM NOMINAL PANEL THICKNESS (inch) | MINIMUM NOMINAL WIDTH OF FRAMING MEMBERS AT ADJOINING PANEL EDGES AND BOUNDARIES[e] (inches) | BLOCKED DIAPHRAGMS | | | | UNBLOCKED DIAPHRAGMS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Fastener spacing (inches) at diaphragm boundaries (all cases) at continuous panel edges parallel to load (Cases 3,4), and at all panel edges (Cases 5, 6)[b] | | | | Fastener spaced 6" max. at supported edges[b] | |
| | | | | | 6 | 4 | 2 ½[c] | 2[c] | Case 1 (No unblocked edges or continuous joints parallel to load) | All other configurations (Cases 2, 3, 4, 5 and 6) |
| | | | | | Fastener spacing (inches) at other panel edges (Cases 1,2,3 and 4)[b] | | | | | |
| | | | | | 6 | 6 | 4 | 3 | | |
| Structural I Grades | 8d (2 ½" x 0.131") | 1 3/8 | 3/8 | 2 | 270 | 360 | 530 | 600 | 240 | 180 |
| | | | | 3 | 300 | 400 | 600 | 675 | 265 | 200 |
| | 10d[d] (3" x 0.148") | 1 1/2 | 15/32 | 2 | 320 | 425 | 640 | 730 | 285 | 215 |
| | | | | 3 | 360 | 480 | 720 | 820 | 320 | 240 |
| Sheathing, single floor and other grades covered in DOC PS1 and PS2 | 6d[e] (2" x 0.113") | 1 1/4 | 3/8 | 2 | 185 | 250 | 375 | 420 | 165 | 125 |
| | | | | 3 | 210 | 280 | 420 | 475 | 185 | 140 |
| | 8d (2 ½" x 0.131") | 1 3/8 | | 2 | 240 | 320 | 480 | 545 | 215 | 160 |
| | | | | 3 | 270 | 360 | 540 | 610 | 240 | 180 |
| | 8d (2 ½" x 0.131") | 1 3/8 | 7/16 | 2 | 255 | 340 | 505 | 575 | 230 | 170 |
| | | | | 3 | 285 | 380 | 570 | 645 | 255 | 190 |
| | 8d (2 ½" x 0.131") | 1 3/8 | 15/32 | 2 | 270 | 360 | 530 | 600 | 240 | 180 |
| | | | | 3 | 300 | 400 | 600 | 675 | 265 | 200 |
| | 10d[d] (3" x 0.148") | 1 1/2 | | 2 | 290 | 385 | 575 | 655 | 255 | 190 |
| | | | | 3 | 324 | 430 | 650 | 735 | 290 | 215 |
| | 10d[d] (3" x 0.148") | 1 1/2 | 19/32 | 2 | 320 | 425 | 640 | 730 | 285 | 215 |
| | | | | 3 | 360 | 480 | 720 | 820 | 320 | 240 |

**TABLE 2306.2.1(3)–continued**
**ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL DIAPHRAGMS WITH FRAMING OF DOUGLAS FIR-LARCH, OR SOUTHERN PINE[a] FOR SEISMIC LOADING[f]**
**FOR STRUCTURES ASSIGNED TO SEISMIC DESIGN CATERGORY D, E OR F**




For SI: 1 inch = 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 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. Space fasteners maximum 12 inches o.c. along intermediate framing members (6 inches o.c. where supports are spaced 48 inches o.c.).
c. Framing at adjoining panel edges shall be 3 inches nominal or thicker, and nails at all panel edges shall be staggered where panel edge nailing is specified at 2 ½ inches o.c. or less.
d. Framing at adjoining panel edges shall be 3 inches nominal or thicker, and nails at all panel edges shall be staggered where both of the following conditions are met: (1) 10d nails having penetration into framing of more than 1 ½ inches and (2) panel edge nailing is specified at 3 inches o.c. or less.
e. The minimum nominal width of framing members not located at boundaries or adjoining panel edges shall be 2 inches.
f. 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.

## TABLE 2306.2.1(4)
## ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL BLOCKED DIAPHRAGMS UTILIZING MULTIPLE ROWS OF FASTENERS (HIGH LOAD DIAPHRAGMS) WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE[a] FOR SEISMIC LOADING[b,f,g]
## FOR STRUCTURES ASSIGNED TO SEISMIC DESIGN CATERGORY D, E OR F

| PANEL GRADE[c] | COMMON NAIL SIZE | MINIMUM FASTENER PENETRATION IN FRAMING (inches) | MINIMUM NOMINAL PANEL THICKNESS (inch) | MINIMUM NOMINAL WIDTH OF FRAMING MEMBERS AT ADJOINING PANEL EDGES AND BOUNDARIES[e] (inches) | LINES OF FASTENERS | BLOCKED DIAPHRAGMS | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Cases 1 and 2[d] | | | |
| | | | | | | Fastener Spacing Per Line at Boundaries (inches) | | | |
| | | | | | | 4 | | 2 1/2 | |
| | | | | | | Fastener Spacing Per Line at Other Panel Edges (inches) | | | |
| | | | | | | 6 | 4 | 4 | 3 |
| Structural I grades | 10d common nails | 1 1/2 | 15/32 | 3 | 2 | 605 | 815 | 875 | 1,150 |
| | | | | 4 | 2 | 700 | 915 | 1,005 | 1,290 |
| | | | | 4 | 3 | 875 | 1,220 | 1,285 | 1,395 |
| | | | 19/32 | 3 | 2 | 670 | 880 | 965 | 1,255 |
| | | | | 4 | 2 | 780 | 990 | 1,110 | 1,440 |
| | | | | 4 | 3 | 965 | 1,320 | 1,405 | 1,790 |
| | | | 23/32 | 3 | 2 | 730 | 955 | 1,050 | 1,365 |
| | | | | 4 | 2 | 855 | 1,070 | 1,210 | 1,565 |
| | | | | 4 | 3 | 1,050 | 1,430 | 1,525 | 1,800 |
| Sheathing, single floor and other grades covered in DOC PS1 and PS2 | 10d common nails | 1 1/2 | 15/32 | 3 | 2 | 525 | 725 | 765 | 1,010 |
| | | | | 4 | 2 | 605 | 815 | 875 | 1,105 |
| | | | | 4 | 3 | 765 | 1,085 | 1,130 | 1,195 |
| | | | 19/32 | 3 | 2 | 650 | 860 | 935 | 1,225 |
| | | | | 4 | 2 | 755 | 965 | 1,080 | 1,370 |
| | | | | 4 | 3 | 935 | 1,290 | 1,365 | 1,485 |
| | | | 23/32 | 3 | 2 | 710 | 935 | 1,020 | 1,335 |
| | | | | 4 | 2 | 825 | 1,050 | 1,175 | 1,445 |
| | | | | 4 | 3 | 1,020 | 1,400 | 1,480 | 1,565 |

For SI: 1 inch = 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 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. Fastening along intermediate framing members: Space fasteners a maximum of 12 inches on center, except 6 inches on center for spans greater than 32 inches.

c. Panels conforming to PS1 or PS 2.

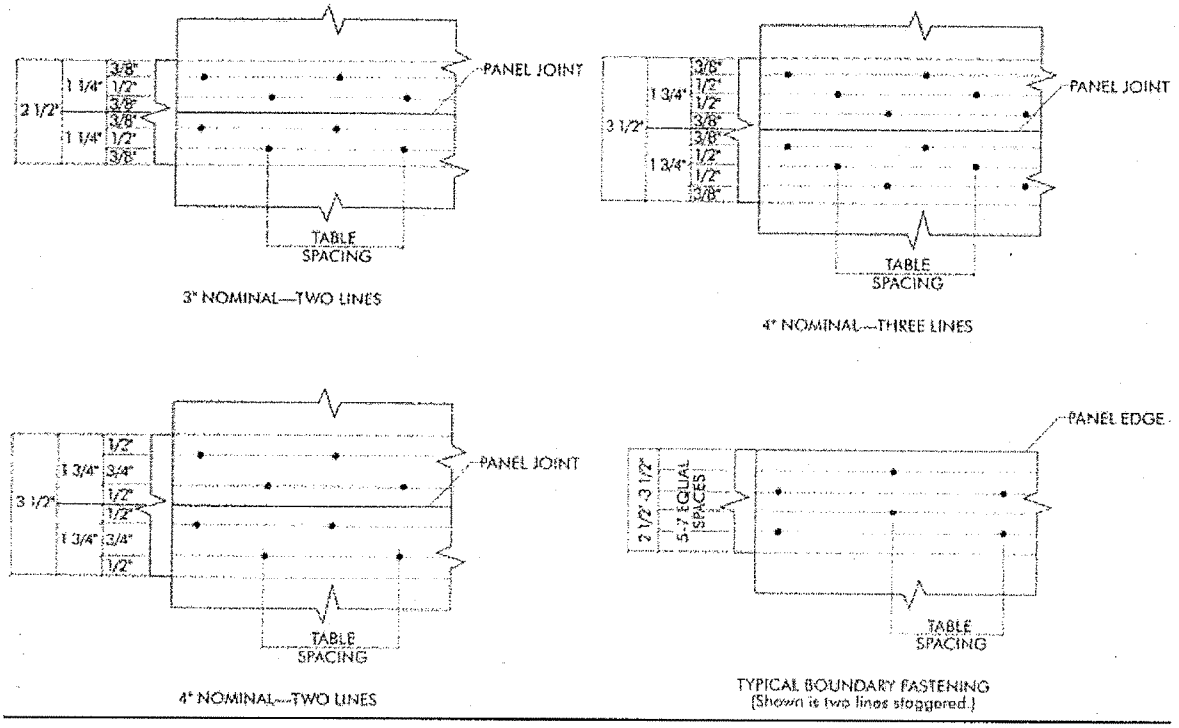
d. This table gives shear values for Cases 1 and 2 as shown in Table 2306.2.1(3). The values shown are applicable to Cases 3, 4, 5 and 6 as shown in Table 2306.2.1(3), providing fasteners at all continuous panels edges are spaced in accordance with the boundary fastener spacing.

e. The minimum nominal depth of framing members shall be 3 inches nominal. The minimum nominal width of framing members not located at boundaries or adjoining panel edges shall be 2 inches.

f. High load diaphragms shall be subject to special inspection in accordance with Section 1704.6.1.

g. 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.

**TABLE 2306.2.1(4)–continued**
**ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL BLOCKED DIAPHRAGMS UTILIZING MULTIPLE ROWS OF FASTENERS (HIGH LOAD DIAPHRAGMS) WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE[a] FOR SEISMIC LOADING[b,f,g]**
**FOR STRUCTURES ASSIGNED TO SEISMIC DESIGN CATERGORY D, E OR F**




NOTE: SPACE PANEL END AND EDGE JOINT 1/8-INCH. REDUCE SPACING BETWEEN LINES OF NAILS AS NECESSARY TO MAINTAIN MINIMUM 3/8-INCH FASTENER EDGE MARGINS. MINIMUM SPACING BETWEEN LINES IS 3/8-INCH

## RATIONALE:

The Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the damages to buildings and structures during the 1994 Northridge Earthquake recommended reducing allowable shear values in wood structural panel shear walls or diaphragms that were not substantiated by cyclic testing. That recommendation was consistent with a report to the Governor from the Seismic Safety Commission of the State of California recommending that code requirements be "more thoroughly substantiated with testing." The allowable shear values for wood structural panel shear walls or diaphragms fastened with staples are based on monotonic testing and does not take into consideration that earthquake forces load shear wall or diaphragm in a repeating and fully reversible manner.

In. September 2007, limited cyclic testing was conducted by a private engineering firm to determine if wood structural panels fastened with staples would exhibit the same behavior as the wood structural panels fastened with common nails. The test result revealed that wood structural panel fastened with staples appeared to be much lower in strength and stiffness than wood structural panels fastened with common nails. It was recommended that the use of staples as fasteners for wood structural panel shear walls or diaphragms not be permitted to resist seismic forces in structures assigned to Seismic Design Category D, E and F unless it can be substantiated by cyclic testing.

Furthermore, the cities and county within the Los Angeles region has taken extra measures to maintain the structural integrity of the framing of shear walls and diaphragms designed for high levels of seismic forces by requiring wood sheathing be applied directly over the framing members and prohibiting the use of panels placed over gypsum sheathing. This proposed 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.

This proposed amendment continues the previous amendment adopted during the 2007 code adoption cycle.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 design and construction limits on staples as fasteners used in wood structural panel or diaphragms not substantiated with cyclic testing will help to maintain minimum quality of construction and performance standards of structures and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 23-05.** Table 2306.3(2) is added to Chapter 23 of the 2010 Edition of the California Building Code and Section 2306.3 and Table 2306.3 of the 2010 Edition of the California Building Code are amended to read as follows:

**2306.3 Wood structural panel shear walls.** Wood structural panel shear walls shall be designed and constructed in accordance with AF&PA SDPWS. Wood structural panel shear walls are permitted to resist horizontal forces using the allowable shear capacities set forth in Table 2306.3(1). For structures assigned to Seismic Design Category D, E or F, the allowable shear capacities shall be set forth in Table 2306.3(2). The allowable shear capacities in Table 2306.3(1) are permitted to be increased 40 percent for wind design.

Wood structural panel shear walls used to resist seismic forces in structures assigned to Seismic Design Category D, E or F shall not be 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 in structures assigned to Seismic Design Category D, E or F 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.

Wood structural panel shear walls fastened with staples shall not used to resist seismic forces in structures assigned to Seismic Design Category D, E or F.

**Exception:** Staples may be used for wood structural panel shear walls when the allowable shear values are substantiated by cyclic testing and approved by the building official.

Wood structural panel shear walls used to resist seismic forces in structures assigned to Seismic Design Category D, E or F shall be applied directly to the framing members.

TABLE 2306.3(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]

## TABLE 2306.3(2)
## ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL SHEAR WALLS WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE[a] FOR SEISMIC LOADING[b, h, j, k, l] FOR STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY D, E OR F

| PANEL GRADE | MINIMUM NOMINAL PANEL THICKNESS (inch) | MINIMUM FASTENER PENETRATION IN FRAMING (inches) | ALLOWABLE SHEAR VALUE FOR SEISMIC FORCES PANELS APPLIED DIRECTLY TO FRAMING | | | | |
|---|---|---|---|---|---|---|---|
| | | | COMMON NAIL SIZE | Fastener spacing at panel edges (inches) | | | |
| | | | | 6 | 4 | 3 | 2[e] |
| Structural I sheathing | 3/8 | 1 3/8 | 8d (2½"x0.131" common) | 200 | 200 | 200 | 200 |
| | 7/16 | 1 3/8 | 8d (2½"x0.131" common) | 255 | 395 | 505 | 670 |
| | 15/32 | 1 3/8 | 8d (2½"x0.131" common) | 280 | 430 | 550 | 730 |
| | | 1 1/2 | 10d (3"x0.148" common) | 340 | 510 | 665[f] | 870 |
| Sheathing, plywood siding[g] except Group 5 Species | 3/8[c] | 1 3/8 | 8d (2½"x0.113") | 160 | 200 | 200 | 200 |

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 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 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. For grooved panel siding, the nominal panel thickness is the thickness of the panel measured at the point of nailing.

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 thicker, and nails shall be staggered where nails are spaced 2 inches on center or less.

f. Framing at adjoining panel edges shall be 3 inches nominal or 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 or less.

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 at all panel edges shall be staggered.

i. 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 at all panel edges. See Section 4.3.6.1 and 4.3.6.4.3 of AF&PA SDPWS for sill plate size and anchorage requirements.

j. Galvanized nails shall be hot dipped or tumbled.

k. 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.

l. The maximum allowable shear value for three-ply plywood resisting seismic forces is 200 pounds per foot (2.92 kn/m).

**RATIONALE:**

The Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the damages to buildings and structures during the 1994 Northridge Earthquake recommended reducing allowable shear values in wood structural panel shear walls or diaphragms that were not substantiated by cyclic testing. That recommendation was consistent with a report to the Governor from the Seismic Safety Commission of the State of California recommending that code requirements be "more thoroughly substantiated with testing." The allowable shear values for wood structural panel shear walls or diaphragms fastened with stapled nails are based on monotonic testing and does not take into consideration that earthquake forces load shear wall or diaphragm in a repeating and fully reversible manner.

In September 2007, limited cyclic testing was conducted by a private engineering firm to determine if wood structural panels fastened with stapled nails would exhibit the same behavior as the wood structural panels fastened with common nails. The test result revealed that wood structural panel fastened with stapled nails appeared to be much lower in strength and stiffness than wood structural panels fastened with common nails. It was recommended that the use of stapled nail as fasteners for wood structural panel shear walls or diaphragms not be permitted to resist seismic forces in structures assigned to Seismic Design Category D, E and F unless it can be substantiated by cyclic testing.

Furthermore, the cities and county within the Los Angeles region has taken extra measures to maintain the structural integrity of the framing of shear walls and diaphragms designed for high levels of seismic forces by requiring wood sheathing be applied directly over the framing members and prohibiting the use of panels placed over gypsum sheathing. This proposed 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.

This proposed amendment continues the previous amendment adopted during the 2007 code adoption cycle.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 design and construction limits on stapled nail fasteners used in wood structural panel shear walls or diaphragms not substantiated with cyclic testing will help to maintain minimum quality of construction and performance standards of structures and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 23-06.** Section 2306.7 of the 2010 Edition of the California Building Code are amended to read as follows:

**2306.7 Shear walls sheathed with other materials.** Shear walls sheathed with portland cement plaster, gypsum lath, gypsum sheathing or gypsum board shall be designed and constructed in accordance with AF&PA SDPWS. Shear walls sheathed with these materials are permitted to resist horizontal forces using the allowable shear capacities set forth in Table 2306.7. Shear walls sheathed with portland cement plaster, gypsum lath, gypsum sheathing or gypsum board shall not be used to resist seismic forces in structures assigned to Seismic Design Category E or F.

Shear walls sheathed with lath, plaster or gypsum board shall not be used below the top level in a multi-level building for structures assigned to Seismic Design Category D.

**RATIONALE:**

Due to the high geologic activities in the Southern California area and the expected higher level of performance on buildings and structures, this proposed local amendment limits the location where shear walls sheathed with lath, plaster or gypsum board are used in multi-level buildings. 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 and formed the basis for this proposed amendment. Considering that shear walls sheathed with lath, plaster or gypsum board are less ductile than steel moment frames or wood structural panel shear walls, the cities and county of the Los Angeles region has taken the necessary measures to limit the potential structural damage that may be caused by the use of such walls at the lower level of multi-level building that are subject to higher levels of seismic loads. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 location where shear walls sheathed with lath, plaster or gypsum board are used will help to ensure that multi-level building will reach it's performance objective in resisting higher levels of seismic loads and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 23-07.** Section 2308.3.4 of Chapter 23 of the 2010 Edition of the 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 for structures not assigned to Seismic Design Category D, E or F.

**RATIONALE:**

With the higher seismic demand placed on buildings and structures in this region, interior walls can easily be called upon to resist over half of the seismic loading imposed on simple buildings or structures. Without a continuous foundation to support the braced wall line, seismic loads would be transferred through other elements such as non-structural concrete slab floors, wood floors, etc. The proposed change is to limit the use of the exception to structures assigned to Seismic Design Category A, B or C where lower seismic demands are expected. Requiring interior braced walls be supported by continuous foundations is intended to reduce or eliminate the poor performance of buildings or structures. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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. The proposed modification to require continuous footings under braced wall lines will improve performance of buildings or structure during a seismic event and therefore 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.

**2010 LARUCP 23-08.** Section 2308.12.2 of Chapter 23 of the 2010 Edition of the California Building Code is amended to read as follows:

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

**Exception:** Stone and 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 Chapter 14 and shall not extend more than 5 feet (1524 mm) above the first story finished floor.

**RATIONALE:**

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. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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.

**2010 LARUCP 23-09.** Section 2308.12.4 and Table 2308.12.4 of the 2010 Edition of the California Building Code are amended to read as follows:

**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 and spaced a maximum of 16 inches on center.

**Exception:** 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 15/32 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.

Wood structural panel sheathing shall be a minimum of 15/32 inch thick nailed with 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.

**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] | $S_{DS} < 0.50$ | $0.50 \leq S_{DS} < 0.75$ | $0.75 \leq S_{DS} \leq 1.00$ | $S_{DS} > 1.00$ |
|---|---|---|---|---|---|
| One Story | G-P[c] | 10 feet 8 inches | 14 feet 8 inches | 18 feet 8 inches | 25 feet 0 inches |
| | S-W[d] | 5 feet 4 inches | 8 feet 0 inches | 9 feet 4 inches | 12 feet 0 inches |

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~~.

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. S-W sheathing shall be a minimum of 15/32" thick nailed with 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.

## RATIONALE:

This proposed amendment specifies minimum sheathing thickness and nail size and spacing so as to provide a uniform standard of construction for designers and buildings to follow. This is intended to improve the performance level of buildings and structures that are subject to the higher seismic demands placed on buildings or structure in this region. This proposed amendment reflects the recommendations by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the poor performance observed in 1994 Northridge Earthquake. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

## FINDINGS:

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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. The proposed modification to provide specific detailing requirements will improve the performance of buildings and structures and therefore needs 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.

**2010 LARUCP 23-10.** Section 2304.9.1 and Table 2304.9.1 of the 2010 Edition of the California Building Code are amended to read as follows:

**2304.9.1 Fastener requirements.** Connections for wood members shall be designed in accordance with the appropriate methodology in Section 2301.2. The number and size of fasteners connecting wood members shall not be less than that set forth in Table 2304.9.1. Staple fasteners in Table 2304.9.1 shall not be used to resist or transfer seismic forces in structures assigned to Seismic Design Category D, E or F.

**Exception:** Staples may be used to resist or transfer seismic forces when the allowable shear values are substantiated by cyclic testing and approved by the building official.

Add new footnote q to Table 2304.9.1.

q. Staples shall not be used to resist or transfer seismic forces in structures assigned to Seismic Design Category D, E or F.

**RATIONALE:**

Due to the high geologic activities in the Southern California area and the expected higher level of performance on buildings and structures, this proposed local amendment limit the use of staple fasteners in resisting or transferring seismic forces. In September 2007, limited cyclic testing data was provided to the ICC Los Angeles Chapter Structural Code Committee showing that stapled wood structural shear panels do not exhibit the same behavior as the nailed wood structural shear panels. The test results of the stapled wood structural shear panels appeared much lower in strength and drift than the nailed wood structural shear panel test results. Therefore, the use of staples as fasteners to resist or transfer seismic forces shall not be permitted without being substantiated by cyclic testing. This proposed amendment is a continuation of a similar amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 use of staple fasteners to resist or transfer seismic load improve the performance of buildings and structures during a seismic event and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 23-11.** Section 2308.12.5 of the 2010 Edition of the California Building Code are amended to read as follows:

**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 2304.9.1. Wall sheathing shall not be attached to framing members by adhesives. Staple fasteners in Table 2304.9.1 shall not be used to resist or transfer seismic forces in structures assigned to Seismic Design Category D, E or F.

**Exception:** Staples may be used to resist or transfer seismic forces when the allowable shear values are substantiated by cyclic testing and approved by the building official.

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 inches (6096 mm) intervals along the top plate of discontinuous vertical framing.

**RATIONALE:**

Due to the high geologic activities in the Southern California area and the expected higher level of performance on buildings and structures, this proposed local amendment limit the use of staple fasteners in resisting or transferring seismic forces. In September 2007, limited cyclic testing data was provided to the ICC Los Angeles Chapter Structural Code Committee showing that stapled wood structural shear panels do not exhibit the same behavior as the nailed wood structural shear panels. The test results of the stapled wood structural shear panels appeared much lower in strength and drift than the nailed wood structural shear panel test results. Therefore, the use of staples as fasteners to resist or transfer seismic forces shall not be permitted without being substantiated by cyclic testing. This proposed amendment is a continuation of a similar amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 use of staple fasteners to resist or transfer seismic load improve the performance of buildings and structures during a seismic event and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

# PART II

## RECOMMENDED LARUCP AMENDMENTS TO THE

## 2010 EDITION OF THE CALIFORNIA RESIDENTIAL CODE

## SUMMARY OF RECOMMENDED LARUCP AMENDMENTS TO THE 2010 CRC

| 2010 LARUCP NO. | TITLE/DESCRIPTION | STATUS[1] | DATE |
|---|---|---|---|
| R3-01 | Amend CRC Section R301.1.3.2 Woodframe Structures | AS | 6/24/10 |
| R3-02 | Amend CRC Section R301.1.4 Slopes Steeper Than 33% | AS | 6/24/10 |
| R3-03 | Amend CRC Section R301.2.2.2.5 Irregular Buildings | AS | 6/24/10 |
| R3-04 | Amend CRC Section R301.2.2.3.5.1 Modify AISI S230 Section B1 | AS | 6/24/10 |
| R3-05 | Amend CRC Section R322.1.4.1 Design Flood Elevations | AS | 6/24/10 |
| R4-01 | Amend CRC Section R401.1 Foundation Application | AS | 6/24/10 |
| R4-02 | Amend CRC Section R403.1 General Footings | AS | 6/24/10 |
| R4-03 | Amend CRC Section R404.2 Wood Foundation Walls | AS | 6/24/10 |
| R5-01 | Amend CRC Section R501.1 Application | AS | 6/24/10 |
| R5-02 | Amend CRC Section R503.2.4 Openings In Horizontal Diaphragms | AM | 6/24/10 |
| R6-01 | Amend CRC Table R602.3(1) Fastener Schedule | AS | 5/25/10 |
| R6-02 | Amend CRC Table R602.3(2) Alternate Attachment | AM | 5/25/10 |
| R6-03 | Amend CRC Table R602.10.1.2(2) Bracing Requirement | AS | 5/25/10 |
| R6-04 | Amend CRC Table R602.10.2 Intermittent Bracing Method | AM | 5/25/10 |
| R6-05 | Amend CRC Figure R602.10.3.2 Alternate Braced Wall Panel | AM | 6/8/10 |
| R6-06 | Amend CRC Figure R602.10.3.3 Portal Frame | AM | 6/8/10 |
| R6-07 | Amend CRC Section R602.10.3.3 Method PFH | AS | 6/8/10 |
| R6-08 | Amend CRC Table R602.10.4.1 Continuous Sheathing | AM | 6/8/10 |
| R6-09 | Amend CRC Figure R602.10.4.1.1 Method CS-PF | AS | 6/24/10 |
| R6-10 | Delete CRC Section R602.10.7.1 Braced Wall Panel | AS | 6/8/10 |
| R6-11 | Amend CRC Section R606.2.4 Parapet Walls | AS | 6/8/10 |
| R6-12 | Amend CRC Section R606.12.2.2.3 Reinforcement for Masonry | AS | 6/8/10 |
| R6-13 | Amend CRC Section R602.3.2 Single Top Plate | AS | 6/24/10 |
| R8-01 | Amend CRC Table R802.5.1(9) Joist Heel Joint Connection | AM | 6/24/10 |
| R8-02 | Amend CRC Section R802.8 Lateral Support | AS | 6/24/10 |
| R8-03 | Amend CRC Section R802.10.2 Design of Wood Trusses | AS | 6/24/10 |
| R8-04 | Add CRC Section R803.2.4 Openings in Horizontal Diaphragms | AS | 6/24/10 |
| R10-01 | Amend CRC Section R1001.3.1 Vertical Reinforcing | AS | 6/24/10 |
| | | | |

FOOTNOTE:
1. AS = Approved as submitted. AM = Approved as modified.

**2010 LARUCP R3-01.** Section R301.1.3.2 of the 2010 Edition of the California Residential Code is amended to read as follows:

**R301.1.3.2 Woodframe structures ~~greater than two stories~~.** The building official shall require construction documents to be approved and stamped by a California licensed architect or engineer for all dwellings of woodframe construction more than two stories and basement in height located in Seismic Design Category A, B or C. Notwithstanding other sections the law, the law establishing these provisions is found in Business and Professions Code Section 5537 and 6737.1.

The building official shall require construction documents to be approved and stamped by a California licensed architect or engineer for all dwellings of woodframe construction more than one story in height or with a basement located in Seismic Design Category $D_0$, $D_1$, $D_2$ or E.

**RATIONALE:**

After the 1994 Northridge Earthquake, the Wood Frame Construction Joint Task Force recommended that the quality of wood frame construction need to be greatly improved. One such recommendation identified by the Task Force is to improve the quality and organization of structural plans prepared by the engineer or architect so that plan examiners, building inspectors, contractors and special inspectors may logically follow and construct the presentation of the seismic force-resisting systems in the construction documents. For buildings or structures located in Seismic Design Category $D_0$, $D_1$, $D_2$ or E that are subject to a greater level of seismic forces, the requirement to have a California licensed architect or engineer prepare the construction documents is intended to minimize or reduce structural deficiencies that may cause excessive damage or injuries in wood frame buildings. Structural deficiencies such as plan and vertical irregularities, improper shear transfer of the seismic force-resisting system, missed details or connections important to the structural system, and the improper application of the prescriptive requirements of the California Residential Code can be readily addressed by a registered design professional.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 construction documents for wood frame construction greater than one story in height or with a basement to be approved and stamped by a California licensed architect or engineer is intended to assure that the both the structural design and prescriptive requirement of the code are properly utilized and presented and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R3-02.** Section R301.1.4 is added to Chapter 3 of the 2010 Edition of the California Residential Code to read as follows:

**R301.1.4 Seismic design provisions for buildings constructed on or into slopes steeper than one unit vertical in three units horizontal (33.3 percent slope).** The design and construction of new buildings and additions to existing buildings when constructed on or into slopes steeper than one unit vertical in three units horizontal (33.3 percent slope) shall comply with Section 1613.12 of the California Building Code.

**RATIONALE:**

Due to the difficulty of fire suppression vehicles accessing winding and narrow hillside properties and the probabilities for future earthquakes in the Los Angeles region, this technical amendment is required to address the special needs for buildings constructed on hillside locations. A joint Structural Engineers Association of Southern California (SEAOSC) and both the Los Angeles County and Los Angeles City Task Force investigated the performance of hillside building failures after the Northridge earthquake. Numerous hillside failures resulted in loss of life and millions of dollars in damage. These criteria were developed to minimize the damage to these structures and have been in use by both the City and County of Los Angeles for several years with much success. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Topographical and Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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. Additionally, the topography within the Los Angeles region includes significant hillsides with narrow and winding access that makes timely response by fire suppression vehicles challenging and difficult. The proposed modification establishes design parameters to better mitigate and limit property damage that are the results of increased seismic forces which are imparted upon hillside buildings and structures and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R3-03.** Section R301.2.2.2.5 of the 2010 Edition of the California Residential Code is amended to read as follows:

1. When exterior shear wall lines or braced wall panels are not in one plane vertically from the foundation to the uppermost story in which they are required.

   ~~**Exception:** For wood light-frame construction, floors with cantilevers or setbacks not exceeding four times the nominal depth of the wood floor joists are permitted to support braced wall panels that are out of plane with braced wall panels below provided that:~~
   ~~1. Floor joists are nominal 2 inches by 10 inches (51 mm by 254 mm) or larger and spaced not more than 16 inches (406 mm) on center.~~
   ~~2. The ratio of the back span to the cantilever is at least 2 to 1.~~
   ~~3. Floor joists at ends of braced wall panels are doubled.~~
   ~~4. For wood-frame construction, a continuous rim joist is connected at ends to all cantilever joists. When spliced, the rim joists shall be spliced using a galvanized metal tie not less than 0.058 inch (1.5 mm) (16 gage) and 1½ inches (38 mm) wide fastened with six 16d nails on each side of the splice or a block of the same size as the rim joist of sufficient length to fit securely between the joist space at which the splice occurs fastened with eight 16d nails on each side of the splice; and~~
   ~~5. Gravity loads carried at the end of cantilevered joists are limited to uniform wall and roof loads and the reactions from headers having a span of 18 feet (2438 mm) or less.~~

3. When the end of a braced wall panel occurs over an opening in the wall below ~~and ends at a horizontal distance greater than 1 foot (305 mm) from the edge of the opening. This provision is applicable to shear walls and braced wall panels offset in plane and to braced wall panels offset out of plane as permitted by the exception to item 1 above.~~

   ~~**Exception:** For wood light-frame wall construction, one end of a braced wall panel shall be permitted to extend more than one foot (305 mm) over an opening not more than 8 feet (2438 mm) wide in the wall below provided that the opening includes a header in accordance with the following:~~
   ~~1. The building width, loading condition and framing member species limitations of Table R502.5(1) shall apply; and~~
   ~~2. Not less than one 2x12 or two 2x10 for an opening not more than 4 feet (1219 mm) wide; or~~
   ~~3. Not less than two 2x12 or three 2x10 for an opening not more than 6 feet (1829 mm) wide; or~~
   ~~4. Not less than three 2x12 or four 2x10 for an opening not more than 8 feet (2438 mm) wide; and~~
   ~~5. The entire length of the braced wall panel does not occur over an opening in the wall below.~~

5. When portions of a floor level are vertically offset.

   ~~**Exceptions:**~~
   ~~1. Framing supported directly by continuous foundations at the perimeter of the building.~~
   ~~2. For wood light-frame construction, floors shall be permitted to be vertically offset when the floor framing is lapped or tied together as required by section R502.6.1.~~

**RATIONALE:**

With the higher seismic demand placed on buildings and structures in this region, precautionary steps are proposed to reduce or eliminate potential problems that may result by limiting the type of irregular conditions specified in the International Residential Code. Such limitations are intended to reduce the potential structural damage expected in the event of an earthquake. 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 and all associated elements when designed for high levels of seismic loads.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 amendment limits the type of irregular conditions within buildings that may lead to higher structural damage during a seismic event and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code and consistent with the requirements in the ASCE 7-05.

**2010 LARUCP R3-04.** Section R301.2.2.3.5.1 is added to Section 301.2.2.3.5 of the 2010 Edition of the California Residential Code as follows:

**R301.2.2.3.5.1 AISI S230, Section B1.** Modify AISI S230, Section B1 to read as follows:

Where No. 8 screws are specified, the required number of screws in a steel-to-steel connection shall be permitted to be reduced in accordance with the reduction factors in Table B1-1 when larger screws are used or when ~~one of~~ the sheets of steel being connected is thicker than 33 mils (0.84mm). When applying the reduction factor, the resulting number of screws shall be rounded up.

**RATIONALE:**

The term "one" conflicts with Table B1-1, whereas in the table it states the "thinnest connected steel sheet". The term "one" in the code language can misleadingly be interpreted as though one of the sheets can be 33 mils and the other sheet thicker, but that one would still qualify for a reduction factor; this is not the intent of the tables. For example, in a steel-to-steel connection consisting of a 33 mils and 44 mils, and if in any part of the code it is required to provide (4) No. 8 screws; according to Table B1-1 the factor 1.0 would apply to the required number of screws and thus a reduction of screws would not be allowed.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 clarify that the thinnest connected steel sheets need to be thicker than 33 mils to qualify for the reduction factors and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R3-05.** Section R322.1.4.1 of the 2010 Edition of the California Residential Code is amended to read as follows:

**R322.1.4.1 Determination of design flood elevations.** If design flood elevations are not specified, the building official is authorized to require the applicant to:

1. Obtain and reasonably use data available from a federal, state or other source; or
2. Determine the design flood elevation in accordance with accepted hydrologic and hydraulic undertaken by a registered ~~design professional~~ civil engineer who shall determine that the technical methods used reflect currently accepted engineering practice. Studies, analyses and computations shall be submitted insufficient detail to allow thorough review and approval.

RATIONALE:

This amendment is intended to clarify the appropriate design professional who should perform studies and analysis for design flood elevations. Registered civil engineers are highly trained and equipped to perform such design and analysis.

FINDINGS:

Local Topographical and Geological Conditions – The greater Los Angeles region is affected by both natural and man-made topographic conditions, such as, steep hillsides conditions where dry brush may cause brush fires and are fanned by strong concentrated winds caused by steep ravines and valley areas of the hillsides, or when it rains, mudflow or landslides caused by steep bare (no vegetation) slopes. Man-made topography may include very densely populated areas or areas of many high-rise buildings, including but not limited to, Century City, Wilshire Corridor, Westwood or Downtown Los Angeles, where street access for local fire department may be challenging and difficult to navigate or impeded during times of high traffic activity. The proposed modification to require a registered civil engineer to perform design and analysis ensures that a more reliable and better performance is achieved and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alternations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R4-01.** Section R401.1 of the 2010 Edition of the California Residential Code is amended to read as follows:

**R401.1 Application.** The provisions of this chapter shall control the design and construction of the foundation and foundation spaces for all buildings. In addition to the provisions of this chapter, the design and construction of foundations in areas prone to flooding as established by Table R301.2(1) shall meet the provisions of Section R322. Wood foundations shall be designed and installed in accordance with AF&PA PWF.

**Exception**: The provisions of this chapter shall be permitted to be used for wood foundations only in the following situations:
1. In buildings that have no more than two floors and a roof.
2. When interior basement and foundation walls are constructed at intervals not exceeding 50 feet (15 240 mm).

Wood foundations in Seismic Design Category $D_0$, $D_1$ or $D_2$ shall ~~be designed in accordance with accepted engineering practice~~ not be permitted.

**Exception:** In non-occupied, single-story, detached storage sheds and similar uses other than carport or garage, provided the gross floor area does not exceed 200 square feet, the plate height does not exceed 12 feet in height above the grade plane at any point, and the maximum roof projection does not exceed 24 inches.

**RATIONALE:**

No substantiating data has been provided to show that wood foundation is effective in supporting buildings and structures during a seismic event while being subject to deterioration caused by the combined detrimental effect of constant moisture in the soil and wood-destroying organisms. Wood foundation, 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 and temperate weather in the Southern California region and are not generally familiar with the necessary precautions and treatment of wood that makes it suitable for both seismic event and wet applications. The proposed amendment takes the precautionary steps to reduce or eliminate potential problems that may result in using wood foundation that experience relatively rapid decay due to the fact that the region does not experience temperatures cold enough to destroy or retard the growth and proliferation of wood-destroying organisms. However, an exception is made for non-occupied, single-story storage structures that pose significantly less risk to human safety and may utilize the wood foundation guidelines specified in this Chapter. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles for the California Building Code.

**FINDINGS:**

Local Climatic and Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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. In addition, the region is within a climate system capable of producing major winds, fire and rain related disasters, including but not limited to those caused by the Santa Ana winds and El Nino (or La Nina) subtropical-like weather. This region is especially susceptible to more active termite and wood attacking insects and microorganisms. The proposed modification to prohibit the use of wood foundation systems as well as limit prescriptive design provisions in an effort to mitigate potential problems or deficiencies due to the proliferation of wood-destroying organisms and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R4-02.** Sections R403.1.2, R403.1.3, R403.1.5 of the 2010 Edition of the California Residential Code are amended to read as follows:

**R403.1.2 Continuous footing in Seismic Design Categories $D_0$, $D_1$ and $D_2$.** The braced wall panels at exterior walls of buildings located in Seismic Design Categories $D_0$, $D_1$ and $D_2$ shall be supported by continuous footings. All required interior braced wall panels in buildings ~~with plan dimensions greater than 50 feet (15240 mm)~~ shall ~~also~~ be supported by continuous footings.

**R403.1.3 Seismic reinforcing.** Concrete footings located in Seismic Design Categories $D_0$, $D_1$ and $D_2$, as established in Table R301.2(1), shall have minimum reinforcement. Bottom reinforcement shall be located a minimum of 3 inches (76 mm) clear from the bottom of the footing.

In Seismic Design Categories $D_0$, $D_1$ and $D_2$ where construction joint is created between a concrete footing and a stem wall, a minimum of one No. 4 bar shall be installed at not more than 4 feet (1219 mm) on center. The vertical bar shall extend to 3 inches (76 mm) clear of the bottom of the footing, have a standard hook and extend a minimum of 14 inches (357 mm) into the stem wall.

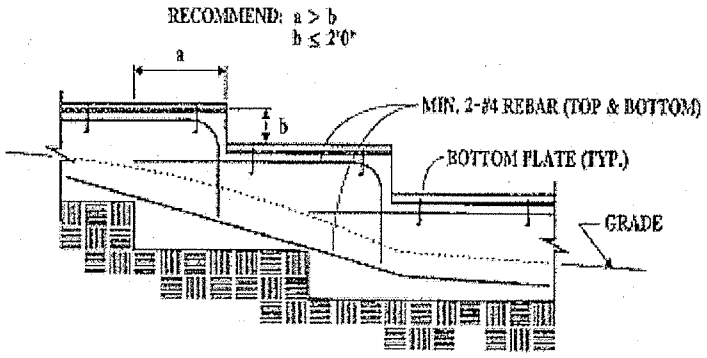
In Seismic Design Categories $D_0$, $D_1$ and $D_2$ where a grouted masonry stem wall is supported on a concrete footing and stem wall, a minimum of one No. 4 bar shall be installed at not more than 4 feet (1219 mm) on center. The vertical bar shall extend to 3 inches (76 mm) clear of the bottom of the footing and have a standard hook.

In Seismic Design Categories $D_0$, $D_1$ and $D_2$ masonry stem walls without solid grout and vertical reinforcing are not permitted.

**Exception:** In detached one- and two-family dwellings <u>located in Seismic Design Category A, B or C</u> which are three stories or less in height and constructed with stud bearing walls, plain concrete footings without longitudinal reinforcement supporting walls and isolated plain concrete footings supporting columns or pedestals are permitted.

**R403.1.5 Slope.** The top surface of footings shall be level. The bottom surface of footings shall be 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).

<u>For structures located in Seismic Design Categories $D_0$, $D_1$ or $D_2$, stepped 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 R403.1.5.</u>




STEPPED FOUNDATIONS

**FIGURE R403.1.5**
**STEPPED FOOTING**

**RATIONALE:**

With the higher seismic demand placed on buildings and structures in this region, precautionary steps are proposed to reduce or eliminate potential problems that may result for under-reinforced footings located on sloped surfaces. Requiring minimum reinforcement for stepped footings is intended to address the problem of poor performance of plain or under-reinforced footings during a seismic event. Furthermore, interior walls can easily be called upon to resist over half of the seismic loading imposed on simple buildings or structures. Without a continuous foundation to support the braced wall line, seismic loads would be transferred through other elements such as non-structural concrete slab floors, wood floors, etc. The proposed change is to limit the use of the exception to structures assigned to Seismic Design Category A, B or C where lower seismic demands are expected. Requiring interior braced walls be supported by continuous foundations is intended to reduce or eliminate the poor performance of buildings or structures. This proposed amendment is consistent with an amendment adopted during previous code adoption cycles for the California Building Code.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 continuous footings under braced wall lines, require reinforcement in one- and two-family dwelling, and minimum reinforcement in stepped footings will improve performance of buildings or structure during a seismic event and minimize potential problems or deficiencies and therefore 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 Residential Code.

**2010 LARUCP R4-03.** Section R404.2 of the 2010 Edition of the California Residential Code is amended to read as follows:

**R404.2 Wood foundation walls.** Wood foundation walls shall be constructed in accordance with the provisions of Sections R404.2.1 through R404.2.6 and with the details shown in Figures R403.1(2) and R403.2(3). Wood foundation walls shall not be used for structures located in Seismic Design Category $D_0$, $D_1$ or $D_2$.

**RATIONALE:**

No substantiating data has been provided to show that wood foundation wall is effective in supporting buildings and structures during a seismic event while being subject to deterioration caused by the combined detrimental effect of constant moisture in the soil and wood-destroying organisms. Wood foundation 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 and temperate weather in the Southern California region and are not generally familiar with the necessary precautions and treatment of wood that makes it suitable for both seismic event and wet applications. The proposed amendment takes the precautionary steps to reduce or eliminate potential problems that may result in using wood foundation walls that experience relatively rapid decay due to the fact that the region does not experience temperatures cold enough to destroy or retard the growth and proliferation of wood-destroying organisms. This proposed amendment is consistent with an amendment adopted during previous code adoption cycles for the California Building Code.

**FINDINGS:**

Local Climatic and Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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. In addition, the region is within a climate system capable of producing major winds, fire and rain related disasters, including but not limited to those caused by the Santa Ana winds and El Nino (or La Nina) subtropical-like weather. This region is especially susceptible to more active termite and wood attacking insects and microorganisms. The proposed modification to prohibit the use of wood foundation wall in an effort to mitigate potential problems or deficiencies due to the proliferation of wood-destroying organisms and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R5-01.** Section R501.1 of the 2010 Edition of the California Residential Code is amended to read as follows:

**R501.1 Application.** The provision of this chapter shall control the design and construction of the floors for all buildings including the floors of attic spaces used to house mechanical or plumbing fixtures and equipment weighing less than 400 lbs and maximum height of 4 feet above the floor or attic level.

**RATIONALE:**

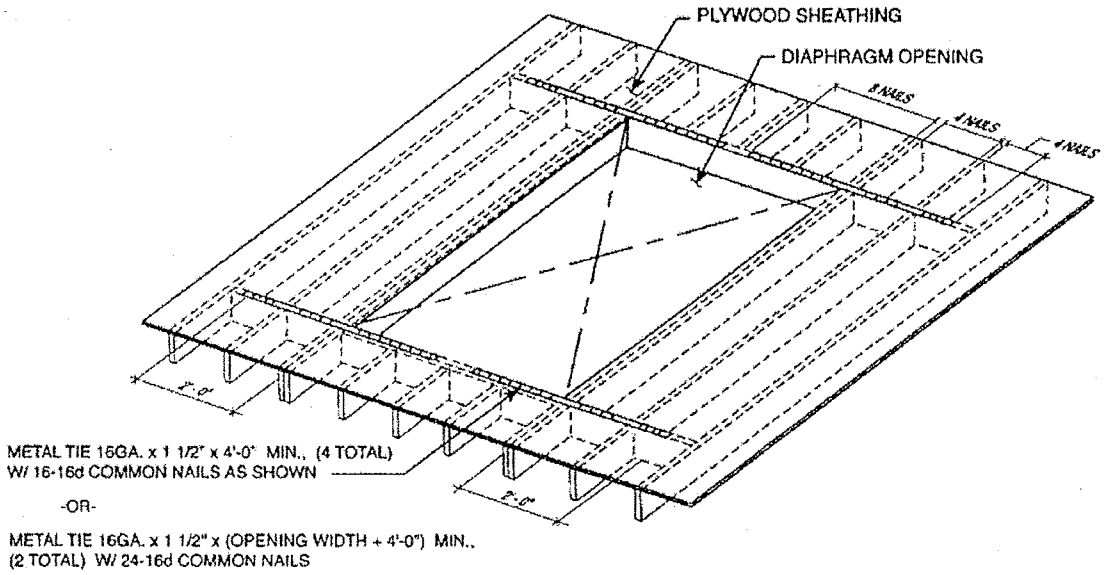
There is no limitation for weight of mechanical and plumbing fixtures and equipments in the International Residential Code. Requirements from ASCE 7-05 and the International Building Code would permit equipment weighing up to 400 lbs when mounted at 4 feet or less above the floor or attic level without engineering design. Where equipment exceeds this requirement, it is the intent of this proposed amendment that a registered design professional be required to analyze if the floor support is adequate and structurally sound.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 equipment weight is intended to reduce injuries, save lives, and minimize structural damages and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R5-02.** Section R503.2.4 is added to Chapter 5 of the 2010 Edition of the California Residential Code to read as follows:

**R503.2.4 Openings in horizontal diaphragms.** Openings in horizontal diaphragms with a dimension perpendicular to the joist that is greater than 4 feet (1.2 m) shall be constructed in accordance with Figure R503.2.4.




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

a. Blockings shall be provided beyond headers.
b. Metal ties not less than 0.058 inch [1.47 mm (16 galvanized gage)] by 1.5 inches (38 mm) wide with eight 16d common nails on each side of the header-joist intersection. The metal ties shall have a minimum yield of 33,000 psi (227 MPa).
c. Openings in diaphragms shall be further limited in accordance with Section R301.2.2.2.5.

**FIGURE R503.2.4**
**OPENINGS IN HORIZONTAL DIAPHRAGMS**

## RATIONALE:

Section R502.10 of the Code does not provide any prescriptive criteria to limit the maximum floor opening size nor does Section R503 provide any details to address the issue of shear transfer near larger floor openings. With the higher seismic demand placed on buildings and structures in this region, it is important to ensure that a complete load path is provided to reduce or eliminate potential damages caused by seismic forces. Requiring blocking with metal ties around larger floor openings and limiting opening size is consistent with the requirements of Section R301.2.2.2.5.

## FINDINGS:

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 specific detailing at large floor openings is intended to address the poor

performance of floor diaphragms with openings and limit or reduce property damages during a seismic event and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R6-01.** Lines 34 thru 37 of Table R602.3(1) of the 2010 Edition of the California Residential Code are amended to read as follows:

| | Other wall sheathing[h] | | | |
|---|---|---|---|---|
| 34 | 1/2" structural cellulosic fiberboard sheathing | 1/2" galvanized roofing nail; ~~7/16" crown or 1" crown staple 16 ga., 1 1/4" long~~ | 3 | 6 |
| 35 | 25/32" structural cellulosic fiberboard sheathing | 1 3/4" galvanized roofing nail; ~~7/16" crown or 1" crown staple 16 ga., 1 1/2" long~~ | 3 | 6 |
| 36 | 1/2" gypsum sheathing[d] | 1 1/2" galvanized roofing nail; ~~staple galvanized, 1 1/2" long;~~ 1 1/4" screws, Type W or S | 7 | 7 |
| 37 | 5/8" gypsum sheathing[d] | 1 3/4" galvanized roofing nail; ~~staple galvanized, 1 5/8" long;~~ 1 5/8" screws, Type W or S | 7 | 7 |

## RATIONALE:

The Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the damages to buildings and structures during the 1994 Northridge Earthquake recommended reducing allowable shear values in wood structural panel shear walls or diaphragms that were not substantiated by cyclic testing. That recommendation was consistent with a report to the Governor from the Seismic Safety Commission of the State of California recommending that code requirements be "more thoroughly substantiated with testing." The allowable shear values for wood structural panel shear walls or diaphragms fastened with staples are based on monotonic testing and does not take into consideration that earthquake forces load shear wall or diaphragm in a repeating and fully reversible manner.

In September 2007, limited cyclic testing was conducted by a private engineering firm to determine if wood structural panels fastened with staples would exhibit the same behavior as the wood structural panels fastened with common nails. The test result revealed that wood structural panel fastened with staples appeared to be much lower in strength and stiffness than wood structural panels fastened with common nails. It was recommended that the use of staples as fasteners for wood structural panel shear walls or diaphragms not be permitted to resist seismic forces in structures assigned to Seismic Design Category $D_0$, $D_1$ and $D_2$ unless it can be substantiated by cyclic testing.

This proposed amendment is consistent with an amendment adopted during previous code adoption cycles for the California Building Code.

## FINDINGS:

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 design and construction limits on staples as fasteners used in wood structural panel or diaphragms not substantiated with cyclic testing will help to maintain minimum quality of construction and performance standards of structures and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R6-02.** Table R602.3(2) of the 2010 Edition of the California Residential Code is amended to read as follows:

| Wood structural panels subfloor, roof and wall sheathing to framing and particleboard wall sheathing to framing[f] | | | |
|---|---|---|---|
| up to 1/2 | ~~Staple 15 ga. 1 3/4~~ | ~~4~~ | ~~8~~ |
| | 0.097 - 0.099 Nail 2 1/4 | 3 | 6 |
| | ~~Staple 16 ga. 1 3/4~~ | ~~3~~ | ~~6~~ |
| 19/32 and 5/8 | 0.113 Nail 2 | 3 | 6 |
| | ~~Staple 15 and 16 ga. 2~~ | ~~4~~ | ~~8~~ |
| | 0.097 - 0.099 Nail 2 1/4 | 4 | 8 |
| 23/32 and 3/4 | ~~Staple 14 ga. 2~~ | ~~4~~ | ~~8~~ |
| | ~~Staple 15 ga. 1 3/4~~ | ~~3~~ | ~~6~~ |
| | 0.097 - 0.099 Nail 2 1/4 | 4 | 8 |
| | ~~Staple 15 ga. 2~~ | ~~4~~ | ~~8~~ |
| 1 | ~~Staple 14 ga. 2 1/4~~ | ~~4~~ | ~~8~~ |
| | 0.113 Nail 2 1/4 | 3 | 6 |
| | ~~Staple 15 ga. 2 1/4~~ | ~~4~~ | ~~8~~ |

| Floor underlayment; plywood-hardboard-particleboard[f] | | | |
|---|---|---|---|
| Plywood | | | |
| 1/4 and 5/16 | 1 1/4 ring or screw shank nail-minimum 12 1/2 ga. (0.099") shank diameter | 3 | 6 |
| | ~~Staple 18 ga., 7/8, 3/16 crown width~~ | ~~2~~ | ~~5~~ |
| 11/32, 3/8, 15/32, and 1/2 | 1 1/4 ring or screw shank nail-minimum 12 1/2 ga. (0.099") shank diameter | 6 | 8[e] |
| 19/32, 5/8, 23/32 and 3/4 | 1 1/2 ring or screw shank nail-minimum 12 1/2 ga. (0.099") shank diameter | 6 | 8 |
| | ~~Staple 16 ga. 1 1/2~~ | ~~6~~ | ~~8~~ |

## RATIONALE:

The Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the damages to buildings and structures during the 1994 Northridge Earthquake recommended reducing allowable shear values in wood structural panel shear walls or diaphragms that were not substantiated by cyclic testing. That recommendation was consistent with a report to the Governor from the Seismic Safety Commission of the State of California recommending that code requirements be "more thoroughly substantiated with testing." The allowable shear values for wood structural panel shear walls or diaphragms fastened with staples are based on monotonic testing and does not take into consideration that earthquake forces load shear wall or diaphragm in a repeating and fully reversible manner.

In September 2007, limited cyclic testing was conducted by a private engineering firm to determine if wood structural panels fastened with staples would exhibit the same behavior as the wood structural panels fastened with common nails. The test result revealed that wood structural panel fastened with staples appeared to be much lower in strength and stiffness than wood structural panels fastened with common nails. It was recommended that the use of staples as fasteners for wood structural panel shear walls or diaphragms not be permitted to resist seismic forces in structures assigned to Seismic Design Category $D_0$, $D_1$ and $D_2$ unless it can be substantiated by cyclic testing.

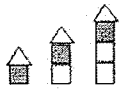
This proposed amendment is consistent with an amendment adopted during previous code adoption cycles for the California Building Code.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 design and construction limits on staples as fasteners used in wood structural panel or diaphragms not substantiated with cyclic testing will help to maintain minimum quality of construction and performance standards of structures and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R6-03.** Table R602.10.1.2(2) of the 2010 Edition of the California Residential Code is amended to read as follows:

**TABLE R602.10.1.2(2)[a, b, c]**
**BRACING REQUIREMENTS BASED ON SEISMIC DESIGN CATEGORY**
**(AS A FUNCTION OF BRACED WALL LINE LENGTH)**

| SOIL CLASS D[a]<br>WALL HEIGHT = 10 FT<br>10 PSF FLOOR DEAD LOAD<br>15 PSF ROOF/CEILING DEAD LOAD<br>BRACED WALL LINE SPACING ≤ 25 FT | | | MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE | | | |
|---|---|---|---|---|---|---|
| Seismic Design Category (SDC) | Story Location | Braced Wall Line Length | Method LIB | Methods[d] DWB, SFB, GB, PBS, PCP, HPS | Method WSP | Continuous Sheathing |
| SDC $D_0$ or $D_1$ |  | 10 | NP | ~~3.0~~ 6.0 | 2.0 | 1.7 |
| | | 20 | NP | ~~6.0~~ 12.0 | 4.0 | 3.4 |
| | | 30 | NP | ~~9.0~~ 18.0 | 6.0 | 5.1 |
| | | 40 | NP | ~~12.0~~ 24.0 | 8.0 | 6.8 |
| | | 50 | NP | ~~15.0~~ 30.0 | 10.0 | 8.5 |
| | | 10 | NP | ~~6.0~~ NP | 4.5 | 3.8 |
| | | 20 | NP | ~~12.0~~ NP | 9.0 | 7.7 |
| | | 30 | NP | ~~18.0~~ NP | 13.5 | 11.5 |
| | | 40 | NP | ~~24.0~~ NP | 18.0 | 15.3 |
| | | 50 | NP | ~~30.0~~ NP | 22.5 | 19.1 |
| | | 10 | NP | ~~8.5~~ NP | 6.0 | 5.1 |
| | | 20 | NP | ~~17.0~~ NP | 12.0 | 10.2 |
| | | 30 | NP | ~~25.5~~ NP | 18.0 | 15.3 |
| | | 40 | NP | ~~34.0~~ NP | 24.0 | 20.4 |
| | | 50 | NP | ~~42.5~~ NP | 30.0 | 25.5 |
| SDC $D_2$ | | 10 | NP | ~~4.0~~ 8.0 | 2.5 | |
| | | 20 | NP | ~~8.0~~ 16.0 | 5.0 | |
| | | 30 | NP | ~~12.0~~ 24.0 | 7.5 | |
| | | 40 | NP | ~~16.0~~ 32.0 | 10.0 | |
| | | 50 | NP | ~~20.0~~ 40.0 | 12.5 | |
| | | 10 | NP | ~~7.5~~ NP | 5.5 | |
| | | 20 | NP | ~~15.0~~ NP | 11.0 | |
| | | 30 | NP | ~~22.5~~ NP | 16.5 | |
| | | 40 | NP | ~~30.0~~ NP | 22.0 | |
| | | 50 | NP | ~~37.5~~ NP | 27.5 | |
| | | 10 | NP | NP | NP | |
| | | 20 | NP | NP | NP | |
| | | 30 | NP | NP | NP | |
| | | 40 | NP | NP | NP | |
| | | 50 | NP | NP | NP | |

d. Methods GB and PCP braced wall panel h/w ratio shall not exceed 1:1 in SDC $D_0$, $D_1$, and $D_2$. Methods DWB, SFB, PBS, and HPS are not permitted in SDC $D_0$, $D_1$, and $D_2$.

**RATIONALE:**

Due to the high geologic activities in the Southern California area and the expected higher level of performance on buildings and structures, this proposed local amendment increase the length and limits the location where shear walls sheathed with lath, plaster or gypsum board are used in multi-level

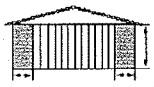
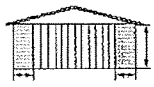
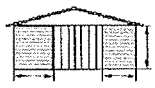
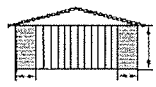
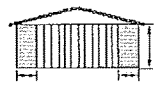
buildings. In addition, shear walls sheathed with other materials are prohibited in Seismic Design Category $D_0$, $D_1$ and $D_2$ to be consistent with the design limitation for similar shear walls found in the California Building Code. The poor performance of such shear walls in the 1994 Northridge Earthquake was investigated by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Task Force and formed the basis for this proposed amendment. Considering that shear walls sheathed with lath, plaster or gypsum board are less ductile than steel moment frames or wood structural panel shear walls, the cities and county of the Los Angeles region has taken the necessary measures to limit the potential structural damage that may be caused by the use of such walls at the lower level of multi-level building that are subject to higher levels of seismic loads. This proposed amendment is consistent with an amendment adopted during previous code adoption cycles for the California Building Code.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 increase the length and limit the location where shear walls sheathed with lath, plaster or gypsum board are used will help to ensure that multi-level building will reach it's performance objective in resisting higher levels of seismic loads and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R6-04.** Table R602.10.2 of the 2010 Edition of the California Residential Code is amended to read as follows:

TABLE R602.10.2
INTERMITTENT BRACING METHODS[a]

| | | | | 8d common (2 ½" x 0.131) nails at 6" spacing (panel edge) at 12" spacing (intermediate supports), 3/8" edge distance to panel edge |
|---|---|---|---|---|
| WSP | Wood structural panel (see Section R604) | ~~3/8"~~ 15/32" |  | ~~For exterior/interior sheathing see Table R602.3(3) For interior sheathing see Table R602.3(1)~~ |
| SFB | Structural fiberboard sheathing | 1/2" or 25/32" for maximum 16" stud spacing |  | 1 1/2" galvanized roofing nails or 8d common (2 1/2" x 0.131) nails at 3" spacing (panel edges) at 6" spacing (intermediate supports) |
| GB | Gypsum board | 1/2" |  | Nails or screws at 7" spacing at panel edges including top and bottom plates; for all braced wall panel locations for exterior sheathing nail or screw size, see Table R602.3(1); for interior gypsum board nail or screw size, see Table R702.3.5 |
| PBS | Particleboard sheathing (see Section R605) | 3/8" or 1/2" for maximum 16" stud spacing |  | 1 1/2" galvanized roofing nails or 8d common (2 1/2" x 0.131) nails at 3" spacing (panel edges) at 6 spacing (intermediate supports) |
| PCP | Portland cement plaster | See Section R703.6 For maximum 16" stud spacing |  | 1 1/2", 11 gage, 7/16" head nails at 6" spacing ~~or 7/8", 16 gage staples at 6" spacing~~ |

a. Methods GB and PCP braced wall panel h/w ratio shall not exceed 1:1 in SDC $D_0$, $D_1$, and $D_2$. Methods LIB, DWB, SFB, PBS, HPS, and PFG are not permitted in SDC $D_0$, $D_1$, and $D_2$.

**RATIONALE:**

3/8" thick 3 ply-plywood shear walls experienced many failures during the Northridge Earthquake. Box nails were observed to cause massive and multiple failures of the typical 3/8" thick 3-ply plywood during the Northridge Earthquake. This proposed amendment specifies minimum sheathing thickness, nail size and spacing so as to provide a uniform standard of construction for designers and buildings to follow. This is intended to improve the performance level of buildings and structures that are subject to the higher seismic demands and reduce and limit potential damages to property. This proposed amendment reflects the recommendations by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the poor performance observed in 1994 Northridge Earthquake.

In September 2007, limited cyclic testing was conducted by a private engineering firm to determine if wood structural panels fastened with staples would exhibit the same behavior as the wood structural panels fastened with common nails. The test result revealed that wood structural panel fastened with staples appeared to be much lower in strength and stiffness than wood structural panels fastened with common nails. It was recommended that the use of staples as fasteners for wood structural panel shear walls or diaphragms not be permitted to resist seismic forces in structures assigned to Seismic Design Category $D_0$, $D_1$ and $D_2$ unless it can be substantiated by cyclic testing.

This proposed amendment is consistent with an amendment adopted during previous code adoption cycles for the California Building Code.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 design and construction limits on stapled nail fasteners used in wood structural panel shear walls not substantiated with cyclic testing and requiring minimum sheathing thickness and nailing type and size will help to maintain minimum quality of construction and performance standards of structures and therefore 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 Residential Code.

**2010 LARUCP R6-05.** Figure R602.10.3.2 of the 2010 Edition of the California Residential Code is amended to read as follows:

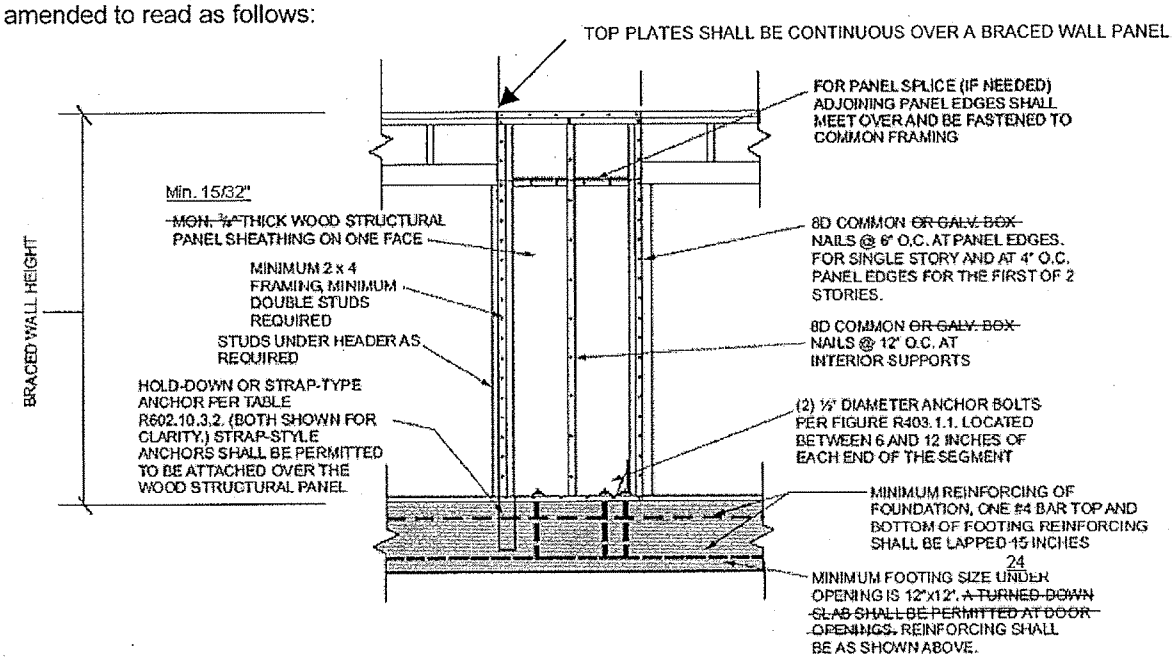



FIGURE R602.10.3.2
ALTERNATE BRACED WALL PANEL

**RATIONALE:**

3/8" thick 3 ply-plywood shear walls experienced many failures during the Northridge Earthquake. Box nails were observed to cause massive and multiple failures of the typical 3/8" thick 3-ply plywood during the Northridge Earthquake. This proposed amendment specifies minimum sheathing thickness, nail size and spacing so as to provide a uniform standard of construction for designers and buildings to follow. This is intended to improve the performance level of buildings and structures that are subject to the higher seismic demands and reduce and limit potential damages to property. This proposed amendment reflects the recommendations by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the poor performance observed in 1994 Northridge Earthquake. This proposed amendment is consistent with an amendment adopted during previous code adoption cycles for the California Building Code.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 requiring minimum sheathing thickness and nailing type and size will help to maintain minimum quality of construction and performance standards of structures and therefore 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 Residential Code.

**2010 LARUCP R6-06.** Figure R602.10.3.3 of the 2010 Edition of the California Residential Code is amended to read as follows:

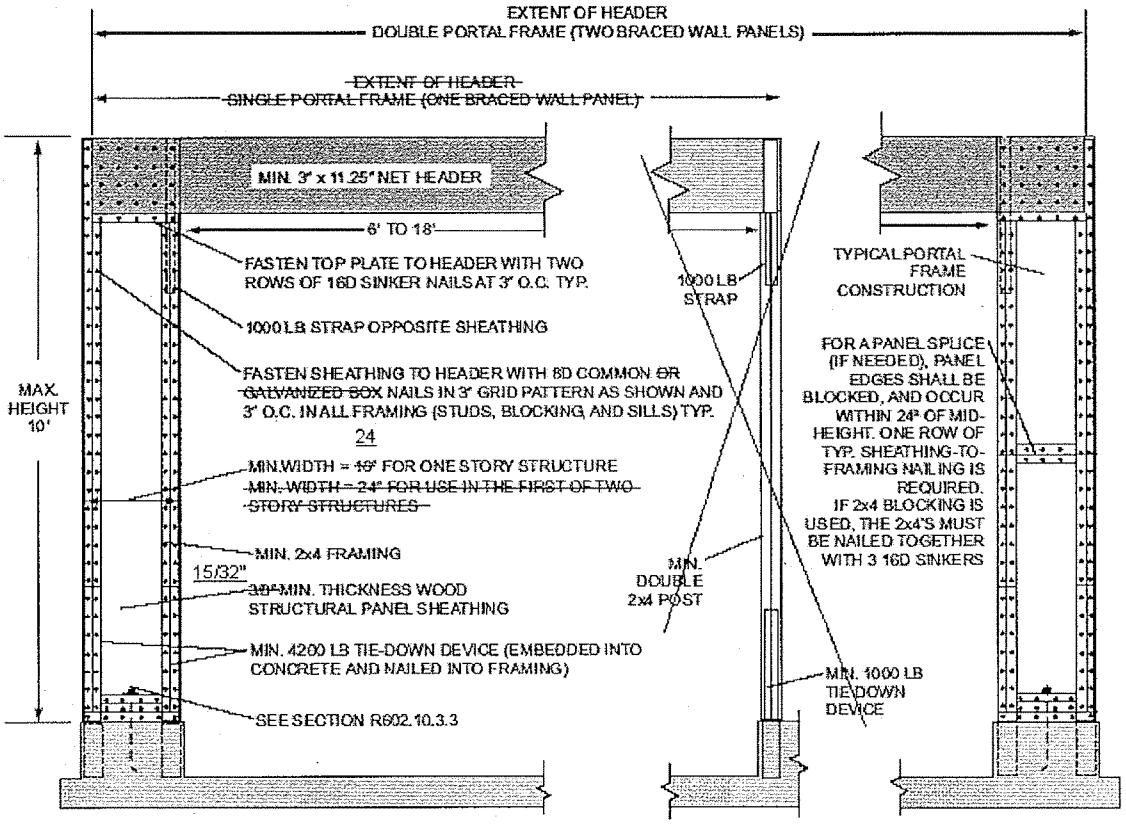



FIGURE R602.10.3.3
METHOD PFH: PORTAL FRAME WITH HOLD-DOWNS AT DETACHED GARAGE DOOR OPENINGS

**RATIONALE:**

3/8" thick 3 ply-plywood shear walls experienced many failures during the Northridge Earthquake. Box nails were observed to cause massive and multiple failures of the typical 3/8" thick 3-ply plywood during the Northridge Earthquake. This proposed amendment specifies minimum sheathing thickness, nail size and spacing so as to provide a uniform standard of construction for designers and buildings to follow. This is intended to improve the performance level of buildings and structures that are subject to the higher seismic demands and reduce and limit potential damages to property. This proposed amendment reflects the recommendations by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the poor performance observed in 1994 Northridge Earthquake. This proposed amendment is consistent with an amendment adopted during previous code adoption cycles for the California Building Code.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 requiring minimum sheathing thickness and nailing type and size will help to maintain

minimum quality of construction and performance standards of structures and therefore 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 Residential Code.

**2010 LARUCP R6-07.** Item 1 of Section R602.10.3.3 of the 2010 Edition of the California Residential Code is amended to read as follows:

1. Each panel shall be fabricated in accordance with Figure R602.10.3.3. The wood structural panel sheathing shall extend up over the solid sawn or glued-laminated header and shall be nailed in accordance with Figure R602.10.3.3. A spacer, if used with a built-up header, shall be placed on the side of the built-up beam opposite the wood structural panel sheathing. The header shall extend between the inside faces of the first full-length outer studs of each panel. One anchor bolt not less than 5/8-inch-diameter (16 mm) and installed in accordance with Section R403.1.6 shall be provided in the center of each sill plate. The hold-down devices shall be an embedded-strap type, installed in accordance with the manufacturer's recommendations. The panels shall be supported directly on a foundation that is continuous across the entire length of the braced wall line. The foundation shall be reinforced as shown on Figure R602.10.3.2. This reinforcement shall be lapped not less than ~~15~~24 inches (~~381~~ 610 mm) with the reinforcement required in the continuous foundation located directly under the braced wall line.

**RATIONALE:**

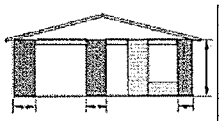
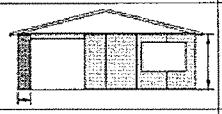
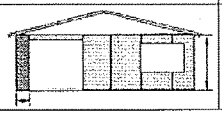
The proposal change to the minimum lap splice requirement ensures design and construction consistency with Section 12.16.1 of ACI 318-05.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 increase the lap splice requirement will improve performance of buildings and structures and is consistent with ACI 318 and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code and ACI 318.

**2010 LARUCP R6-08.** Table R602.10.4.1 of the 2010 Edition of the California Residential Code is amended to read as follows:

**TABLE R602.10.4.1**
**CONTINUOUS SHEATHING METHODS**

| METHOD | MATERIAL | MINIMUM THICKNESS | FIGURE | CONNECTION CRITERIA |
|---|---|---|---|---|
| CS-WSP | Wood structural panel | 15/32" ~~3/8"~~ |  8d | ~~6d~~ common (2" × 0.113") nails at 6" spacing (panel edges) and at 12" spacing (intermediate supports) ~~or 16 ga. x 1 3/4" staples at 3" spacing (panel edges) and 6" spacing (intermediate supports)~~ |
| CS-G | Wood structural panel adjacent to garage openings and supporting roof load only[a,b] | 15/32" ~~3/8"~~ |  | See Method CS-WSP |
| CS-PF | Continuous portal frame | See Section R602.10.4.1.1 |  | See Section R602.10.4.1.1 |

## RATIONALE:

3/8" thick 3 ply-plywood shear walls experienced many failures during the Northridge Earthquake. Box nails were observed to cause massive and multiple failures of the typical 3/8" thick 3-ply plywood during the Northridge Earthquake. This proposed amendment specifies minimum sheathing thickness, nail size and spacing so as to provide a uniform standard of construction for designers and buildings to follow. This is intended to improve the performance level of buildings and structures that are subject to the higher seismic demands and reduce and limit potential damages to property. This proposed amendment reflects the recommendations by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the poor performance observed in 1994 Northridge Earthquake.

In September 2007, limited cyclic testing was conducted by a private engineering firm to determine if wood structural panels fastened with staples would exhibit the same behavior as the wood structural panels fastened with common nails. The test result revealed that wood structural panel fastened with staples appeared to be much lower in strength and stiffness than wood structural panels fastened with common nails. It was recommended that the use of staples as fasteners for wood structural panel shear walls or diaphragms not be permitted to resist seismic forces in structures assigned to Seismic Design Category $D_0$, $D_1$ and $D_2$ unless it can be substantiated by cyclic testing.

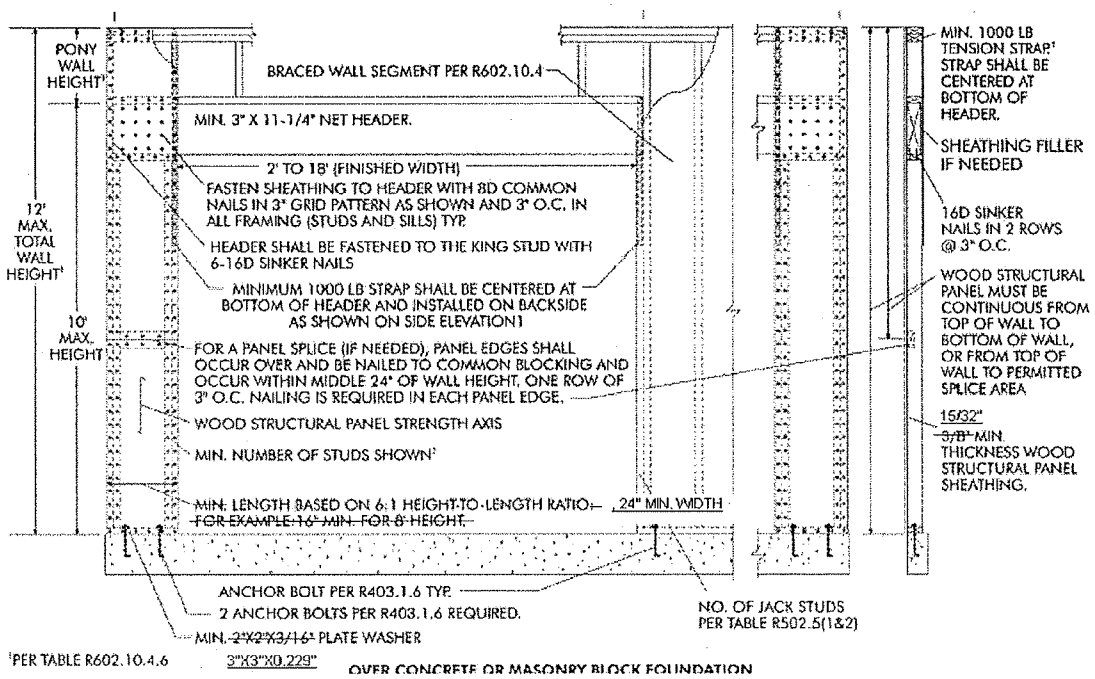
This proposed amendment is consistent with an amendment adopted during previous code adoption cycles for the California Building Code.

## FINDINGS:

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 design and construction limits on stapled nail fasteners used in wood structural panel shear walls not substantiated with cyclic testing and requiring minimum sheathing thickness and nailing type and size will help to maintain minimum quality of construction and performance standards of structures and therefore 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 Residential Code.

**2010 LARUCP R6-09.** Figure R602.10.4.1.1 of the 2010 Edition of the California Residential Code is amended to read as follows:




## RATIONALE:

3/8" thick 3 ply-plywood shear walls experienced many failures during the Northridge Earthquake. Box nails were observed to cause massive and multiple failures of the typical 3/8" thick 3-ply plywood during the Northridge Earthquake. This proposed amendment specifies minimum sheathing thickness, nail size and spacing so as to provide a uniform standard of construction for designers and buildings to follow. This is intended to improve the performance level of buildings and structures that are subject to the higher seismic demands and reduce and limit potential damages to property. This proposed amendment reflects the recommendations by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the poor performance observed in 1994 Northridge Earthquake. This proposed amendment is consistent with an amendment adopted during previous code adoption cycles for the California Building Code.

## FINDINGS:

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 requiring minimum sheathing thickness and nailing type and size will help to maintain minimum quality of construction and performance standards of structures and therefore 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 Residential Code.

**2010 LARUCP R6-10.** Section R602.10.7.1 of the 2010 Edition of the California Residential Code is deleted in its entirety:

~~**R602.10.7.1 Braced wall panel support for Seismic Design Category $D_2$.** In one-story buildings located in Seismic Design Category $D_2$, braced wall panels shall be supported on continuous foundations at intervals not exceeding 50 feet (15 240 mm). In two-story buildings located in Seismic Design Category $D_2$, all braced wall panels shall be supported on continuous foundations.~~

~~**Exception:** Two-story buildings shall be permitted to have interior braced wall panels supported on continuous foundations at intervals not exceeding 50 feet (15 240 mm) provided that:~~

~~1. The height of cripple walls does not exceed 4 feet (1219 mm).~~
~~2. First-floor braced wall panels are supported on doubled floor joists, continuous blocking or floor beams.~~
~~3. The distance between bracing lines does not exceed twice the building width measured parallel to the braced wall line.~~

**RATIONALE:**

With the higher seismic demand placed on buildings and structures in this region, interior walls can easily be called upon to resist over half of the seismic loading imposed on simple buildings or structures. Without a continuous foundation to support the braced wall line, seismic loads would be transferred through other elements such as non-structural concrete slab floors, wood floors, etc. Requiring interior braced walls be supported by continuous foundations is intended to reduce or eliminate the poor performance of buildings or structures. This proposed amendment is consistent with an amendment adopted during previous code adoption cycles for the California Building Code.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 all exterior walls and interior braced wall panels in buildings be supported on continuous footings for a complete load path will improve performance of buildings or structure during a seismic event and therefore, need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R6-11.** Section R606.2.4 of the 2010 Edition of the California Residential Code is amended to read as follows:

**R606.2.4 Parapet walls.** Unreinforced solid masonry parapet walls shall not be less than 8 inches (203 mm) thick and their height shall not exceed four times their thickness. Unreinforced hollow unit masonry parapet walls shall be not less than 8 inches (203 mm) thick, and their height shall not exceed three times their thickness. Masonry parapet walls in areas subject to wind loads of 30 pounds per square foot (1.44 kPa) or located in Seismic Design Category $D_0$, $D_1$ or $D_2$, or on townhouses in Seismic Design Category C shall be reinforced in accordance with Section R606.12.

**RATIONALE:**

The addition of the word "or" will prevent the use of unreinforced parapets in Seismic Design Category $D_0$, $D_1$ or $D_2$, or on townhouses in Seismic Design Category C.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 not allow the use of unreinforced masonry is intended to prevent non-ductile failures and sudden structural collapses and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R6-12.** Section R606.12.2.2.3 of the 2010 Edition of the California Residential Code is amended to read as follows:

**R606.12.2.2.3 Reinforcement of requirements for masonry elements.** Masonry elements listed in Section R606.12.2.2.2 shall be reinforced in either the horizontal or vertical direction as shown in Figure ~~R606.11(2)~~R606.11(3) and in accordance with the following:

1. Horizontal reinforcement. Horizontal joint reinforcement shall consist of ~~at least two longitudinal W1.7 wires spaced not more than 16 inches (406 mm) for walls greater than 4 inches (102 mm) in width and at least one longitudinal W1.7 wire spaced not more than 16 inches (406 mm) for walls not exceeding 4 inches (102 mm) in width; or~~ at least one No. 4 bar spaced not more than 48 inches (1219 mm). ~~Where two longitudinal wires of joint reinforcement are used, the space between these wires shall be the widest that the mortar joint will accommodate.~~ Horizontal reinforcement shall be provided within 16 inches (406 mm) of the top and bottom of these masonry elements.

2. Vertical reinforcement. Vertical reinforcement shall consist of at least one No. 4 bar spaced not more than 48 inches (1219 mm). Vertical reinforcement shall be within ~~16~~ 8 inches (406mm) of the ends of masonry walls.

**RATIONALE:**

Reinforcement using longitudinal wires for buildings and structures located in high seismic areas are deficient and not as ductile as deformed rebar. Having vertical reinforcement closer to the ends of masonry walls helps to improve the seismic performance of masonry buildings and structures.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 increase reinforcements will ensure that the ductility requirements for buildings in high seismic region meet the intent of the code and limit potential property damages and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R6-13.** Exception of Section 602.3.2 of the 2010 Edition of the California Residential Code is amended to read as follows:

Exception: In other than Seismic Design Category $D_0$, $D_1$ or $D_2$, ~~a~~ A single top plate may be installed in stud walls, provided the plate is adequately tied at joints, corners and interesting walls by a minimum 3-inch-by-6-inch by a 0.036-inch-thick (76 mm by 152 mm by 0.914 mm) galvanized steel plate that is nailed to each wall or segment of wall by six 8d nails on each side, provided the rafters or joists are centered over the studs with a tolerance of no more than 1 inch (25 mm). The top plate may be omitted over lintels that are adequately tied to adjacent wall sections with steel plates or equivalent as previously described.

**RATIONALE:**

The cities and county of the Los Angeles region have taken extra measures to maintain the structural integrity of the framing of the shear wall system for buildings and structures subject to high seismic loads by eliminating single top plate construction. The performance of modern day braced wall panel construction is directly related to an adequate load path extending from the roof diaphragm to the foundation system. A single top plate is likely to be over nailed due to the nailing requirements at a rafter, stud, top plate splice, and braced wall panel edge in a single location. In addition, notching on a single top plate for plumbing, ventilation and electrical wiring may reduce the load transfer capacity of the plate without proper detailing. Majority of buildings and structures designed and built per the California Residential Code with a single top plate may not need structural observation and special inspections. The potential construction mistakes mentioned above could not be caught and corrected by knowledgeable engineers and inspectors, and could jeopardize structural performance of buildings and structures located in high seismic areas.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 eliminate the usage of a single top plate will help to maintain minimum quality of construction and performance standards of structures and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R8-01.** Footnote "i" is added to Table R802.5.1(9) of the 2010 Edition of the California Residential Code to read as follows:

i. Edge distances, end distances and spacings for nails shall be sufficient to prevent splitting of the wood.

**RATIONALE:**

The number of nails required for the heel joint connection per Table R802.5.1(9) can be excessive depending on the rafter slope, spacing, and roof span. This footnote is intended to help prevent the splitting of connecting wood members when large numbers of nail are required as stated in the National Design Specification for Wood Construction (NDS).

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 connecting members to be of sufficient size will help to prevent splitting of connecting wood members and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R8-02.** Section R802.8 of the 2010 Edition of the California Residential Code is amended to read as follows:

**R802.8 Lateral support.** Roof framing members and ceiling joists having a depth-to-thickness ratio exceeding ~~5~~2 to 1 based on nominal dimensions shall be provided with lateral support at points of bearing to prevent rotation. For roof rafters with ceiling joists attached per Table R602.3(1), the depth-thickness ratio for the total assembly shall be determined using the combined thickness of the rafter plus the attached ceiling joist.

**RATIONALE:**

This proposed amendment provides provisions to ensure that the ends of wood members and the points of bearing have adequate lateral support to prevent rotation and to help stabilized the members during construction. This proposed amendment is consistent with and similar to requirements contained in the National Design Specification for Wood Construction (NDS).

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 provide lateral bracing at the ends of members will prevent rotation and stabilize the members during construction and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R8-03.** Section R802.10.2 of the 2010 Edition of the California Residential Code is amended to read as follows:

**R802.10.2 Design.** Wood trusses shall be designed in accordance with accepted engineering practice. The design and manufacture of metal-plate-connected wood trusses shall comply with ANSI/TPI 1. The truss design drawings shall be prepared by a registered professional ~~where required by the statutes of the jurisdiction in which the project is to be constructed in accordance with Section R106.1~~.

**RATIONALE:**

Wood trusses are engineered structural elements that require engineered design and calculations. This amendment provides clarifications that all wood truss design drawings are to be prepared by a registered professional.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 a registered design professional will help ensure the proper design of wood trusses and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R8-04.** Section R803.2.4 is added to Chapter 8 of the 2010 Edition of the California Residential Code to read as follows:

**R803.2.4 Openings in horizontal diaphragms.** Openings in horizontal diaphragms shall conform with Section R503.2.4.

**RATIONALE:**

Section R802 of the Code does not provide any prescriptive criteria to limit the maximum roof opening size nor does Section R803 provide any details to address the issue of shear transfer near larger roof openings. With the higher seismic demand placed on buildings and structures in this region, it is important to ensure that a complete load path is provided to reduce or eliminate potential damages caused by seismic forces. Requiring blocking with metal ties around larger roof openings and limiting opening size is consistent with the requirements of Section R301.2.2.2.5.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 specific detailing at large roof openings is intended to address the poor performance of roof diaphragms with openings and limit or reduce property damages during a seismic event and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R10-01.** Section R1001.3.1 of the 2010 Edition of the California Residential Code is amended to read as follows:

**R1001.3.1 Vertical reinforcing.** For chimneys up to 40 inches (1016 mm) wide, four No. 4 continuous vertical bars adequately anchored into the concrete foundation shall be placed between wythes of solid masonry or within the cells of hollow unit masonry and grouted in accordance with Section R609. Grout shall be prevented from bonding with the flue liner so that the flue liner is free to move with thermal expansion. For chimneys more than 40 inches (1016 mm) wide, two additional No. 4 vertical bars adequately anchored into the concrete foundation shall be provided for each additional flue incorporated into the chimney or for each additional 40 inches (1016 mm) in width or fraction thereof.

**RATIONALE:**

The performance of fireplace/chimney without anchorage to the foundation has been observed to be inadequate during major earthquakes. The lack of anchorage to the foundation can result in the overturning or displacement of the fireplace/chimney.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 anchor masonry chimneys into concrete foundation will reduce injuries, save lives, and minimize structural damages and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

# PART III

## RECOMMENDED LARUCP AMENDMENTS TO THE

## 2010 EDITION OF THE CALIFORNIA GREEN BUILDING STANDARDS CODE

## SUMMARY OF RECOMMENDED LARUCP AMENDMENTS TO THE 2010 CGBSC

| 2010 LARUCP NO. | TITLE/DESCRIPTION | STATUS[1] | DATE |
|---|---|---|---|
| G1-01 | Amend CGBSC Section 101.10 Mandatory and Voluntary Requirements | AM | 6/24/10 |
| G1-02 | Add CGBSC Section 101.12 Fee for Mandatory Measures | AS | 6/24/10 |
| G1-03 | Add CGBSC Section 101.12.1 Fee for Tier Measures | AS | 6/24/10 |
| G2-01 | Amend CGBSC Section 202 Sustainability Definition | AS | 6/24/10 |
| G2-02 | Amend CGBSC Section 202 Low-Rise Residential Building Definition | AM | 6/24/10 |
| G4-01 | Amend CGBSC Section 4.304.1 Irrigation Controller | AM | 6/24/10 |
| G4-02 | Amend CGBSC Section 4.408 Construction Waste Reduction | AS | 6/24/10 |
| | | | |

FOOTNOTE:
1. AS = Approved as submitted. AM = Approved as modified.

**2010 LARUCP G1-01.** Section 101.10 of the 2010 Edition of the California Green Building Standards Code is amended to read as follows:

**101.10 Mandatory and voluntary requirements.** This code contains both mandatory and voluntary green building measures. Mandatory and voluntary measures are identified in the appropriate application checklist contained in this code. The mandatory measures of Chapter 4 and voluntary measures of Appendix A4 shall apply to new low-rise residential buildings. The mandatory measures of Chapter 5 and voluntary measures of Appendix A5 shall apply to all buildings which are not low-rise residential buildings.

**RATIONALE:**

Under the existing definition of Low-Rise Residential Building, measures in the California Green Building Standards Code would not be applicable to new residential buildings and structures four stories and greater. With the proposed amendment for Low-Rise Residential Building, this proposed amendment would allow application of the measures in Chapter 5 and Appendix Chapter A5 for new residential buildings greater than six stories. This proposed amendment would also allow applicability Chapter 5 and Appendix Chapter A5 to OSHPD 3 occupancies.

**FINDINGS:**

Local Environmental/Climatic Conditions – The greater Los Angeles region is a densely populated area having residential buildings constructed within a region where environmental resources are scarce due to varying and occasional immoderate temperatures and weather conditions. The proposed modification to require higher efficiencies of energy usage and greater beneficial use of environmental material will be achieved with the proposed expansion of the Mandatory and Voluntary requirements and therefore need to be incorporated into the code to assure that new residential buildings are designed and constructed in accordance with the scope and objectives of the California Green Building Standards Code.

**2010 LARUCP G1-02.** Section 101.12 is added to the 2010 California Green Building Standards Code to read as follows:

**101.12 Fee for Mandatory Measures.** A fee of ten percent (10%) of the plan check/permit fee shall be assessed to verify compliance with the mandatory measure of the California Green Building Standards Code.

OR ALTERNATIVELY

**2010 LARUCP G1-02.** Section [INSERT NUMBER] is added to the [INSERT NAME OF CITY] Municipal Code to read as follows:

**[INSERT SECTION NUMBER] Fee for Mandatory Measures.** A fee of ten percent (10%) of the plan check/permit fee shall be assessed to verify compliance with the mandatory measure of the California Green Building Standards Code.

**RATIONALE:**

Due to the extra work it will take staff to review and verify compliance with the measures in the new code, a recommended fee of 10% of either the permit and plan check is proposed. While it is understood that each jurisdiction must determine what fee is appropriate for their jurisdiction, the recommended 10% is a starting point. This amount is based upon similar fees assessed for other supplemental reviews or inspection such as accessibility or energy compliance. It may be used as a basis for justifying the proposed fees based upon comparison to other similar fees as indicated above.

**FINDINGS:**

Local Administrative Finding – This amendment is necessary for administrative clarification and does not modify a Building Standards pursuant to Sections 17958, 17958.5 and 17958.7 of the California Health and Safety Code. This amendment establishes administrative standards for the effective enforcement of building standards and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the California Green Building Standards Code.

**2010 LARUCP G1-03.** Section 101.12.1 is added to the 2010 California Green Building Standards Code to read as follows:

**101.12.1 Fee for Tier Measures.** When Tier 1 or Tier 2 measures need to be verified by the enforcing agency, an additional ten percent (10%) of the plan check/permit fee may be assessed.

OR ALTERNATIVELY

**2010 LARUCP G1-02.** Section [INSERT NUMBER] is added to the [INSERT NAME OF CITY] Municipal Code to read as follows:

**[INSERT SECTION NUMBER] Fee for Tier Measures.** When Tier 1 or Tier 2 measures need to be verified by the enforcing agency, an additional ten percent (10%) of the plan check/permit fee may be assessed.

**RATIONALE:**

Due to the extra work it will take staff to review and verify compliance with the tier 1 or 2 measures in the new code, a recommended fee of 10% of either the permit and plan check is proposed. While it is understood that each jurisdiction must determine what fee is appropriate for their jurisdiction, the recommended 10% is a starting point. This amount is based upon similar fees assessed for other supplemental reviews or inspection such as accessibility or energy compliance. It may be used as a basis for justifying the proposed fees based upon comparison to other similar fees as indicated above.

**FINDINGS:**

Local Administrative Finding – This amendment is necessary for administrative clarification and does not modify a Building Standards pursuant to Sections 17958, 17958.5 and 17958.7 of the California Health and Safety Code. This amendment establishes administrative standards for the effective enforcement of building standards and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the California Green Building Standards Code.

**2010 LARUCP G2-01.** Section 202 of the 2010 Edition of the California Green Building Standards Code is amended to read as follows:

**LOW-RISE RESIDENTIAL BUILDING.** A building that is of Occupancy Group R and is ~~three~~six stories or less, or that is a one- or two-family dwelling or townhouse.

**RATIONALE:**

Under the existing definition of Low-Rise Residential Building, measures in the California Green Building Standards Code would not be applicable to new residential buildings and structures four stories and greater. This proposed amendment would allow application of the measures in Chapter 4 and Appendix Chapter A4 for new residential buildings and structures six stories and less.

**FINDINGS:**

Local Environmental/Climatic Conditions – The greater Los Angeles region is a densely populated area having residential buildings constructed within a region where environmental resources are scarce due to varying and occasional immoderate temperatures and weather conditions. The proposed modification to require higher efficiencies of energy usage and greater beneficial use of environmental material will be achieved with the proposed expansion of Low Rise Residential Building and therefore need to be incorporated into the code to assure that new residential buildings are designed and constructed in accordance with the scope and objectives of the California Green Building Standards Code.

**2010 LARUCP G2-02.** Section 202 of the 2010 Edition of the California Green Building Standards Code is amended to read as follows:

**SUSTAINABILITY.** Consideration of present development and construction impacts on the community, the economy, and the environment without compromising the needs of the future.

**RATIONALE:**

The 2010 California Green Building Standards Code contains the word "sustainable" but does not define it. Although it is a term used in association with green building, the word "sustainability" is often confused to mean the same as green building. The proposed amendment allows clarity and distinguishing understanding while providing for a general definition.

**FINDINGS:**

Local Administrative Finding – This amendment is necessary for administrative clarification and does not modify a Building Standards pursuant to Sections 17958, 17958.5 and 17958.7 of the California Health and Safety Code. This amendment establishes administrative standards for the effective enforcement of building standards and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the California Green Building Standards Code.

**2010 LARUCP G4-01.** Section 4.304.1 of the 2010 Edition of the California Green Building Standards Code is amended to read as follows:

**4.403.1 Irrigation controllers.** Automatic irrigation system controllers for landscaping provided ~~by the builder~~ and installed at the time of final inspection and shall comply with the following:

1. Controllers shall be weather- or soil moisture-based controllers that automatically adjust irrigation in response to changes in plants' needs as weather conditions change.
2. Weather-based controllers without integral rain sensors or communication systems that account for local rainfall shall have a separate wired or wireless rain sensor which connects or communicates with the controller(s). Soil moisture-based controllers are not required to have rain sensor input.

**RATIONALE:**

The proposed amendment requires that weather-based or soil moisture-based irrigation controllers shall be provided regardless of which entity provides and installs landscaping. The proposed amendment will then capture a larger number of landscaping projects with greater flexibility for water savings. The existing code requirement that conditions a smart controller when landscaping is provided and installed at the time of final inspection will remain as it appears in the California Green Building Standards Code.

**FINDINGS:**

Local Environmental/Climatic Conditions – The greater Los Angeles region is a densely populated area having residential buildings constructed within a region where water resource is scarce. The proposed modification to install weather-based or soil moisture-based irrigation controllers for any new residential building subject to Chapter 4, regardless of which entity provides landscaping, will allow greater efficiencies of outdoor water-use and therefore need to be incorporated into the code to assure that new residential buildings are designed and constructed in accordance with the scope and objectives of the California Green Building Standards Code.

**2010 LARUCP G4-02.** Section 4.408 of the 2010 Edition of the California Green Building Standards Code is amended to read as follows:

No recommended language provided.
[INSERT YOUR OWN LANGUAGE]

**RATIONALE:**

Each jurisdiction is recommended to evaluate and compare their existing Construction and Debris Recycling Ordinance, if applicable, against the requirements in this Section for applicability, duplication, or recommend change to their local ordinance. Since each jurisdiction may contain different requirement based upon their locally adopted ordinance, no recommended language is provided.

**FINDINGS:**

Local Environmental/Climatic Conditions – The greater Los Angeles region [OR NAME OF CITY OR REGION] is a densely populated area having buildings and structures constructed within [SPECIFY ENVIRONMENTAL CONDITIONS AND WHAT IMPACT IT HAS ON THE ENVIRONMENT]. The proposed modification to [SPECIFY PROPOSED REQUIREMENT AND WHAT IT HOPES TO ACCOMPLISH] and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the California Green Building Standards Code.

STATE OF CALIFORNIA - STATE AND CONSUMER SERVICES AGENCY ARNOLD SCHWARZENEGGER, Governor
CALIFORNIA BUILDING STANDARDS COMMISSION
2525 Natomas Park Drive, Suite 130
Sacramento, CA 95833
(916) 263-0916 FAX (916) 263-0959

December 9, 2010

Gwen Pierce, City Clerk
City of Calabasas
100 Civic Center Way
Calabasas, CA 91302

Dear Ms. Pierce,

This is to acknowledge receipt of the City of Calabasas submittal pertaining to Ordinance No. 2010-278-U with findings on December 1, 2010. As the law states, no local modification or change to the California Building Standards Code (Code) shall become effective or operative for any purpose until the finding and the modification or change have been filed with the California Building Standards Commission (the Commission).

As a reminder, local modifications are specific to a particular edition of the Code. They must be readopted and filed with the Commission in order to remain in effect when the next triennial edition of the Code is published. In addition, should you receive Fire Protection District ordinances for ratification, it is required to submit the ratified ordinances to the Department of Housing and Community Development [H&SC Section 13869.7(c)], attention State Housing Law Program Manager, rather than the Commission.

This letter attests only to the filing of these local modifications with the Commission, which is not authorized by law to determine the merit of the filing. If you have any questions or need any further information, you may contact me at (916) 263-0916.

Sincerely,

Jane G. Taylor
Senior Architect

cc: Chron
Local Filings

CITY *of* CALABASAS

November 29, 2010

California Building Standards Commission
2525 Natomas Park Drive, Suite 130
Sacramento, CA 95833-2936

Re: Calabasas City Council Ordinance No. 2010-278U

To Whom It May Concern:

Enclosed please find a certified copy of Calabasas City Council Ordinance No. 2010-278U, adopted by the Calabasas City Council on November 24, 2010, for filing with the California Building Standards Commission.

Please contact Maureen Tamuri, Community Development Director, at (818) 224-1600 with any questions.

Sincerely,

Gwen Peirce, CMC
City Clerk

Enclosure

CALIFORNIA BUILDING STANDARDS COMMISSION
2010 NOV 31 A 11:05

100 Civic Center Way
Calabasas, CA 91302
(818) 224-1600
Fax (818) 225-7324

# ORDINANCE NO. 2010-278-U

**AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF CALABASAS, CALIFORNIA, ADOPTING BY REFERENCE, PURSUANT TO GOVERNMENT CODE SECTION 50022.2, THE 2010 CALIFORNIA CODE OF REGULATIONS, TITLE 24 - THE 2010 CALIFORNIA BUILDING STANDARDS CODE WITH ADMINISTRATIVE AMENDMENTS, AND WHERE APPROPRIATE, EXPRESS FINDINGS AND DETERMINATIONS RELATING TO THE ENACTMENT OF MORE RESTRICTIVE CODE STANDARDS THAN THOSE OF THE CALIFORNIA BUILDING CODE, CALIFORNIA RESIDENTIAL CODE, CALIFORNIA GREEN BUILDING STANDARDS CODE, CALIFORNIA FIRE CODE IN ACCORDANCE WITH CALIFORNIA HEALTH AND SAFETY CODE SECTIONS 17922, 17958 AND 18941.5**

WHEREAS, the City Council of the City of Calabasas does hereby find that there is a need to enforce the most current editions of the California Building Standards Code, with local amendments thereof, as recited herein for regulating and controlling the design, erection, construction, enlargement, installation, alteration, repair, relocation, removal, use and occupancy, demolition, conversion, height and area, location and maintenance, and quality of materials of all buildings and structures and plumbing, mechanical, electrical and fire suppression systems and certain equipments within the City;

WHEREAS, pursuant to section 17951 (e) of the Health and Safety Code, local regulations necessary to carry out the application of the CBSC that do not establish building standards, may be enacted without meeting the requirements of California Health & Safety Code sections 18941.5, 17958, 17598.5 and 17958.7;

WHEREAS, pursuant to sections 17922, 17958, 17958.5 and 17958.7 of the California Health & Safety Code, the City may adopt the provisions of the Uniform Building, Plumbing, Mechanical, Electric and Fire Codes, with certain amendments to the provisions of the codes which are reasonably necessary to protect the health [1]and welfare of citizens of Calabasas because of local climatic, geological and topographical conditions;

WHEREAS, the City Council does hereby further find that Calabasas is within a very active seismic area,

WHEREAS, soil conditions in the City can be highly expansive;

WHEREAS, construction occurring in or near hillside areas within the City is prone to erosion;

[1] Revised November 8, 2010

Certified to be a true and correct copy
of original document on file with the
City of Calabasas
Gwen Peirce, CMC, City Clerk

WHEREAS, the City of Calabasas is immediately adjacent to the Chatsworth and Malibu Coastal Fault Zones, is near the San Andreas Fault and is surrounded by other earthquake faults; and

WHEREAS, the City is located by the International Building Code in Seismic Design Category D, E or F, and the International Residential Code in Seismic Design Category D2 or E, which is considered by experts to be one of the most active seismic regions in the world; and

WHEREAS, the Northridge Earthquake that occurred on January 17, 1994, was only a moderate Richter Magnitude 6.8 earthquake, yet caused damage in the Los Angeles Basin area to more than 115,000 buildings and the vacation of 21,000 residential units including 2,000[2]single-family homes; and

WHEREAS, there were 57 persons who lost their lives in this earthquake, but there could have been several thousand more casualties, if the earthquake had occurred at midday during the workweek when most buildings would be occupied instead of at 4:31 a.m. on a holiday; and

WHEREAS, seismic experts report a significantly high probability for a larger earthquake occurring in or near the greater Los Angeles Basin area within the next 30 years; and

WHEREAS, unusually large earthquakes cause extraordinary stresses on buildings and structures and Fire Department resources which require more stringent building regulations than would otherwise be required; and

WHEREAS, the City requires the extra margin of safety due to the necessity of providing onsite[1] fire protection in a seismic emergency when Fire Department resources could be greatly delayed or overwhelmed; and

WHEREAS, the Northridge Earthquake provided valuable insight into the vulnerabilities of some building systems, designs and materials [3]due to the unanticipated level of damage; and

WHEREAS, the City, in cooperation with other major jurisdictions within the region, are continuing efforts to protect the community from the hazards of future earthquakes through the Los Angeles Regional Uniform Code Program (LARUCP) which creates uniformity of building regulations adopted by the cities and county of the Los Angeles region; and

WHEREAS, the California Building Code, California Residential Code and California Fire Code have not yet fully addressed the lessons learned from the Northridge Earthquake; and

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[2] Revised November 8, 2010

[3] Revised November 8, 2010

WHEREAS, parts of the City are located immediately adjacent the Los Angeles Basin, one of the most polluted metropolitan areas and one of the most heavily modified watersheds in the nation, with a climate system capable of producing major winds, fire-and-rain related disasters and is a densely populated area having residential and nonresidential buildings constructed within a region where environmental resources are scarce; and

WHEREAS, the California Regional Water Quality Control Board Los Angeles Region 4 has determined the waterways within the City of Calabasas are impaired;

WHEREAS, the impairment of the waterways is due, in significant part, to the existing topography, geology and climate of the area surrounding and including Calabasas;

WHEREAS, on October 1, 2004, the City of Calabasas and the California Regional Water Quality Control Board Los Angeles Region 4 entered into a memorandum of understanding wherein the City is obligated to monitor every onsite wastewater treatment system within the [4]City; and

WHEREAS, the City Council does hereby further find that in accordance with section 15061(b)(3) of the California Code of Regulations, the adoption of these local amendments to the California Building Standards Code, and amendments to the Calabasas Municipal Code are exempt from the provisions of the California Environmental Quality Act because such actions are largely administrative in nature, are designed to improve and not degrade environmental quality, and the impacts of these local amendments to the building standards code will not adversely affect the environment in any manner that could be significant.

NOW, THEREFORE, to provide adequate protection under the local, climatic, geologic and topographical conditions set forth above, and as more fully set forth in Exhibit 1 to this ordinance, the City of Calabasas makes the following findings and determinations relative to the adoption of administrative amendments, and where appropriate, the adoption of more restrictive Building Standards Code provisions than those of the California Administrative Code, California Building Code, California Residential Code, California Green Building Standards Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Historical Building Code, California Fire Code, California Existing Building Code, [5]and the 2010 California Referenced Standards Code.

[4] Revised November 8, 2010
[5] Revised November 8, 2010

**THE CITY COUNCIL OF THE CITY OF CALABASAS DOES ORDAIN AS FOLLOWS:**

**SECTION 1.** The following sections of Article I of Chapter 15.04 of the Calabasas Municipal Code are hereby amended to read as follows:

**Article I California Building Code**

**15.04.010 2010 California Building Code adopted.**

A. The ~~2007~~ 2010 California Building Code, together with the appendices, which regulate the erection, construction, enlargements, alteration, repair, moving, removal, conversion, demolition, occupancy, use, equipment, height, area, security, abatement, and maintenance of buildings or structures within the city, provide for the issuance of permits and collection of fees therefore, and provide for penalties for violation thereto, are hereby adopted by reference, and conflicting ordinances are hereby repealed.

B. All of the regulations, provisions, conditions, and terms of said codes, together with their appendices, one copy of which will be on file and accessible to the public for inspection at the City Clerk's office, are hereby referred to, adopted and made part of this chapter as if fully set forth in this chapter with the exceptions, deletions, additions, and amendments thereto as set forth in this subchapter.

**SECTION 2.** **15.04.020** of the Calabasas Municipal Code is hereby amended to read as follows:

**15.04.020 Penalty.**

Every person violating any provision of the ~~2007~~ 2010 California Building Code and appendices, adopted by reference by 15.04.010, or of any permit or license granted thereunder, or any rules or regulations promulgated pursuant thereto, is guilty of a misdemeanor. Upon conviction thereof, he or she shall be punishable by a fine not-to-exceed one thousand dollars ($1,000.00) or imprisonment not-to-exceed six months, or by both such fine and imprisonment. The imposition of such penalty for any violation shall not excuse the violation or permit it to continue. Each day that a violation occurs shall constitute a separate offense.

**SECTION 3.** Existing **15.04.030** Appendix Chapter 1 of the Calabasas Municipal Code is hereby deleted in its entirety, and replaced with a **new section 15.04.030** to be entitled "**Administrative Amendments.**" The new section 15.04.030 shall read as follows:

The following sections of the California Building Code are amended, deletedor added to read as follows:

## Scope and Administration

**Section 101.2.1.1 Administrative Provisions**

The Administrative provisions delineated by Calabasas Municipal Code Section 15.04.30 are applicable to the Residential Building Code, Green Building Standards Code, Electrical Code, Mechanical Code, Plumbing Code, Energy Historic Code and Existing Building Code.

**Section 103.1 Creation of enforcement agency.**

The ~~Department~~ Division of Building and Safety is hereby created and the official in charge thereof shall be known as the building official.

**Section 103.2 Appointment.**

The Building Official shall be appointed by the ~~chief appointing authority of the jurisdiction~~ Community Development Director.

**Section 105.1 Permits Required.**

~~Any owner or authorized agent~~ All persons who intend to construct, enlarge, alter, move, demolish or change the occupancy of a building or structure, or to erect, install, enlarge, alter, repair, remove, convert or replace any electrical, gas, mechanical or plumbing system, component or device, the installation of which is regulated by ~~this code, or to cause any such work to be done~~ the Technical Codes in Title 15 of the Calabasas Municipal Code, shall first make written application to the building official and obtain each required permit.

Whenever any work or installation has been commenced without a permit in violation of this section, a special investigation to identify the nature and extent of the unpermitted work or installation shall be made prior to the issuance of the permit. An investigation fee shall be paid in addition to customary fees for each permit prior to, or at the time of, the issuance of a permit or permits. Failure to pay a special investigation fee in full constitutes cause to deny the issuance of a permit or permits. The investigation fee shall be as specified by resolution of the City Council.

The payment of the investigation fee shall not exempt any person from compliance with all other provisions of the Calabasas Municipal Code, or from any penalty prescribed by law for failing to obtain each required permit.

**Section 105.2 Work exempt from permit.**

~~Exemptions from permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the~~

~~provisions of this code or any other laws or ordinances of this jurisdiction. Permits shall not be required for the following~~:

A building permit shall not be required for the following:

1. One-story detached accessory buildings, used as tool and storage sheds, playhouses, and similar uses, provided ~~the floor area does not exceed 120 square feet (11m2)~~ that:

   A. The building is accessory to a dwelling unit.

   B. The building neither exceeds 120 square feet (11.15 $m^2$) in roof area nor exceeds 7 feet (2133 mm) in overall height.

   C. The building has no plumbing or electrical installations or fixtures.

   D. The building is separated from the dwelling or garage structure by a minimum of 10 feet (3048 mm) and any other building or structure by a minimum of 6 feet (1829 mm).

2. Fences not over 6 feet (1829 mm) high.

   EXCEPTION 1: Solid walls or fences more than 3 feet (914 mm) above grade, within the required front yard setback.

   EXCEPTION 2: Non-retaining masonry fences or walls more than 3 feet (914 mm) above finished grade.

**Section 105.3.2 Time Limitation of Application**

An application for a permit for any proposed work shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been pursued in good faith or a permit has been issued; except that the building official may grant ~~one or more~~ up to two extensions not exceeding ~~90~~ 180 days ~~each~~ per extension, beyond the initial 180-day limit upon written request by the applicant showing that circumstances beyond the control of the applicant have prevented action from being taken and upon the payment of an extension fee equal to 25 percent of the plan check fee.

Once an application and any extension(s) thereof have expired, the applicant shall resubmit plans and specifications and pay a new plan checking or review fee.

**Section 105.5 Expiration of Permit -- General**

~~Every permit issued shall become invalid unless the work on the site authorized by such permit is commenced within 180 days after its issuance, or the work authorized on the site by such permit is suspended or abandoned for a period~~

~~of 180 days after the time the work is commenced. The building official is authorized to grant, in writing, one or more extensions of time, for periods not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.~~

Except as set forth in Sections 105.5.1 and 105.5.2, every permit issued for property within the city shall expire by limitation and become null and void as follows:

(i) If work authorized by such permit is not commenced within 180 days from the issuance date of such permit.

(ii) If work authorized by such permit is commenced within 180 days from the issuance date of such permit, such permit shall expire by limitation and become null-and-void 180 days after the date of the last successful inspection by the Building and Safety Division. For purposes of this subsection, "successful inspection" shall mean a required inspection (as identified in Section 110 of this code, or otherwise determined to be necessary by the Building Official) in which work inspected was determined by the Building Official or a designee thereof, to meet all applicable minimum code requirements and the inspection was documented as successful.

(iii) Notwithstanding any provision in Subparts 105.5.1 and 105.5.2, no permit shall be extended, and therefore, on permit shall be valid, for any period exceeding two (2) years from the original date of issuance.

In the event of permit expiration, before work authorized pursuant by the expired permit can be commenced or recommenced, a new permit shall first be obtained (hereinafter, a "renewal permit). To obtain a renewal permit, the applicant may be required to resubmit plans and specifications, if deemed necessary by the Building Official and/or City Planner. The applicant must pay all applicable fees, including but not limited to, a plan check fee and building permit fees, in the amount then established by resolution of the City Council. If renewal permits are applied for, a mandatory site inspection shall be performed by the Building and Safety Division and an inspection fee paid by the applicant to determine compliance of existing conditions and materials with this Code. All work to be performed under a renewal permit must be performed in accordance with all applicable technical codes, regulations, laws, and ordinances in effect on the date of issuance of the renewal permit.

Permits for portable amusement devices and for temporary Group A-4 or Group A-5 structures shall be valid for a period not exceeding 30 days. Permits for amusement devices erected under a building permit shall be valid for a period of 90 days.

**Section 105.5.1 Expiration of Demolition Permit.**

Notwithstanding any provision of Section 105.5, a demolition permit shall expire by limitation and become null and void 60 days after the date on which the permit was issued. The Building Official may extend the validity of the permit for a period not exceeding 180 days beyond the initial 60-day limit upon written request by the applicant filed with the Building Official prior to the expiration date of the original permit.

**Section 105.5.2 Expiration of permit for unpermitted structures.**

Notwithstanding any provision of Section 105.5, if a building permit is issued in order to bring an unpermitted building or structure or other unlawful, substandard, or prohibited condition therein into compliance with any applicable law, ordinance, rule or regulation, such permit shall expire by limitation and become null and void 60 days after the date on which the permit was issued. The building official may extend the validity of the permit in writing for a period not exceeding 180 days beyond the initial 60-day limit upon written request by the applicant filed with the Building Official prior to the expiration date of the original permit. The time limitations herein shall also apply to permits issued plumbing, mechanical or electrical work and installation that were initially undertaken without each required permit.

**Section 105.6 – Suspension or Revocation of Permit.**

~~The building official is authorized to suspend or revoke a permit issued under the provision s of this code wherever the permit is issued in error or on the basis of incorrect, inaccurate or incomplete information, or in violation of any ordinance or regulation or any of the provisions of this code.~~

The building official may, in writing, suspend or revoke a permit issued under the provisions of this code, or other relevant laws, ordinances, rules, or regulations, whenever the permit is issued in error or on the basis of incorrect information supplied, or in violation of any ordinance or regulation of any of the provisions of this Code.

The building official may also, in writing, withhold inspections or approvals, or suspend or revoke a permit, where work is being performed in violation of approved plans, conditions of any permit, or applicable laws, and/or where work is being concealed without approval from the Building Official, and/or where work is not in accordance with the direction of the Building Official.

**Section 109.2. Schedule of Permit Fees.**

~~On buildings, structures, electrical, gas, mechanica, and plumbing systems or alterations requiring a permit, a fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority~~.

The fee for each permit shall be as set forth in the City of Calabasas Building Permit Fee Schedule. Such fees shall be established, and may be amended from time to time, by resolution of the City Council. The determination of value or valuation under any of the provisions of this chapter shall be made by the building official whose determination shall be final. The value is to be utilized in computing the permit and plan review fees established pursuant to this chapter and shall be the total value of all construction work for which the permit is issued including, by way of illustration and not by limitation, finish work, painting, roofing, electrical, plumbing, heating, air conditioning, elevators, fire-extinguishing systems and any other permanent equipment.

**Section 109.4 – Work commencing before permit issuance.**

~~Any person who commences any work on a building, structure, electrical gas, mechanical or plumbing system before obtaining the necessary permits shall be subject to a fee established by the building official that shall be in addition to the required permit fees.~~

Special investigation fees, as required by Subsection 105.1 shall be due for any unpermitted work or installations that occurred, whether to buildings, structures, land, or in connection with electrical, mechanical or plumbing systems or installations. Special investigation fees shall be due in addition to permit fees.

**Section 109.6 Refunds**

~~The building official is authorized to establish a refund policy~~.

In the event that any person shall have obtained a permit and no portion of the work or construction covered by such permit shall have been commenced, and such permit shall have been canceled or expired, the permittee, upon presentation to said building official of a request therefore, in writing on a special form, may be entitled to a refund in an amount equal to 80 percent of the fee actually paid for such permit.

Upon verification of eligibility, the building official may refund the applicable amount, provided the request has been submitted no later than one year after the cancellation or expiration of the permit and that the permittee was the payor of said permit fees.

No portion of the plan checking fee shall be refunded, unless no checking has been performed on a set of plans, in which case 80 percent of the plan checking fee may be refunded.

**Section 109.7 Noncompliance Fee**

If the building official or duly authorized board, in the course of enforcing the provisions of this code or any state law, issued an order to a person and that person fails to comply with the order within 15 days following the due date for

compliance stated in the order, including any extensions thereof, then the building official shall have the authority to collect a noncompliance fee.

The noncompliance fee shall not be imposed unless the order states that a failure to comply within 15 days after the compliance date specified in the order will result in the fee being imposed. No more than one such fee shall be collected for failure to comply with an order. The amount of the noncompliance fee shall be paid as required, in accordance with the schedule as established by the applicable governing authority.

**Section 109.9 Plan Checking or Review Fees for Building or Structures**

The building official may require additional charges for review required by complexity of plans or changes, additions or revisions of approved plans or reports, and for services beyond the first and second check due to changes, omissions or errors on the part of the applicant. The payment of said fees shall not exempt any person from compliance with other provisions of this code.

**Section 111.1.1 Unpermitted Structures**

No person shall own, use, occupy, or maintain an unpermitted structure. For purposes of this subsection, "unpermitted structure" shall be defined as any building or structure, or portion thereof, that was erected, constructed, enlarged, altered, repaired, moved, improved, removed, connected, converted, demolished, or equipped with regulated devices, fixtures or installations, at any point in time by any person, without the required permit(s) having first been obtained from the Building Official, or with a valid permit as issued by the Building Official which subsequently expired and became null and void. An unpermitted structure also includes one for which a building permit has been suspended or revoked.

**Section 111.3 Temporary Occupancy; Issuance of Temporary Certificate of Occupancy**

The Building Official ~~is~~ may, in writing, authorized ~~to issue~~ a temporary certificate of occupancy ~~before the completion of the entire work coverd by the permit, provided that such protion or portions shall be occupied safely. The building official shall set a time period during which the temporary cerfificate of occupancy is valid.~~ of any building or structure, or portion thereof, that lacks a permanent certificate of occupancy for any reason, provided patent conditions in open and accessible portions of the building or structure do not reveal a substantial hazard to an occupant or occupants.

Applications for a temporary certificate of occupancy shall be on a city-approved form. Such applications shall be accompanied by a fee to process the application and for the inspection of the building or structure to determine its

suitability for a temporary certificate of occupancy. Such fees shall be established by the City Council by resolution.

A temporary certificate of occupancy is valid for a period of time to be specified by the Building Official in the certificate. The city attorney may require applicants for a temporary certificate of occupancy to execute an indemnification, as approved by the city attorney, in favor of the city and its employees as a prerequisite to receiving a temporary certificate of occupancy.

The Building Official may extend the period of a temporary certificate of occupancy in writing, as well as impose conditions thereto. Property owners shall acknowledge and agree to said conditions in writing. The breach of any condition thereof shall render a temporary certificate of occupancy null and void without further action by the city. In such event, the owners shall cause all use and occupancy of the building or structure to be terminated by a date required by the Building Official. Use or occupancy of a building or structure, or allowing the use or occupancy of a building or structure, with an expired a temporary certificate of occupancy is a violation of this code and unlawful. Failing to cause the termination of all uses and occupancy in a structure after a termination date is a violation of this code and unlawful. The boards established by Section 1.8.7 do not have jurisdiction to consider, decide or rule pertaining to the issuance, expiration or nullification of a temporary certificate of occupancy, or with regard to any other matter relating thereto.

**Section 111.4 Revocation**

The Building Official ~~is authorized to~~ may, in writing, suspend or revoke a certificate of occupancy ~~or completion~~ whenever the Building Official determines that the certificate was issued in error, or on the basis of incorrect information supplied, or when it is determined that the building, structure or premises, or portion thereof, is in violation of any provision of this code, or other relevant laws, ordinances, rules and/or regulations. Use or occupancy of a building or structure, or allowing the use or occupancy of a building or structure, with a suspended or revoked certificate of occupancy is a violation of this code and unlawful. The boards established by Section 1.8.7 do not have jurisdiction to consider, decide or rule pertaining to the issuance, suspension or revocation of a certificate of occupancy, or with regard to any other matter relating thereto.

**Section 112.3 Authority to Disconnect Service Utilities**

~~The building official shall have the authouity to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards set forth in Section 101.4 in case of emergency where necessary to eliminate an immediate hazard to like or property or when such utility connection has been made without the approval required by Section 112.1 or 112.2. The building official shall notify the serving utility, and wherever possible the owner and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notifed prior to disconnecting, the~~

~~owner or occupant of the building, structure or service system shall be notified in writing, as soon as practical thereafter.~~

The powers granted the Building Official pursuant to this subsection extend to all buildings, structures or systems (including electrical, plumbing and mechanical) that are regulated by this code. This subsection supersedes all similar provisions in other codes that are part of Title 15 of the Calabasas Municipal Code.

**Section 112.3.1 Authority to Disconnect Electric Utility**

The Building Official is hereby empowered to disconnect or to require in writing the discontinuance of electric utility service to buildings, structures or premises, or portions thereof, or to wiring, devices or materials where such buildings, structures or premises, or portions thereof, are determined to be a hazard to life, health and/or property, or where they lack permits and required inspection approvals.

The Building Official is hereby empowered to disconnect or to require in writing the discontinuance of electric utility service as a means of preventing, restraining, correcting or abating any violation of this code, or other relevant laws, ordinances, rules or regulations.

The electrical service shall remain disconnected or electrical utility service shall remain discontinued until the code violation has been abated to the satisfaction of the Building Official, or until the installation of such wiring, devices or materials have been made safe as directed by the Building Official; or until a permit has been issued and the work has been inspected and approved by the Building Official.

**Section 112.3.2 Authority to Disconnect Gas Utility**

The Building Official is hereby empowered to disconnect or to require in writing the discontinuance of gas utility service to buildings, structures or premises, or portions thereof, or to appliances, devices or materials where such buildings, structures or premises, or portions thereof, are determined to be a hazard to life, health and/or property, or where they lack permits and required inspection approvals.

The Building Official is hereby empowered to disconnect or to require in writing the discontinuance of gas utility service as a means of preventing, restraining, correcting or abating any violation of this code, or other relevant laws, ordinances, rules or regulations.

The gas service shall remain disconnected or gas utility service shall remain discontinued until the code violation has been abated to the satisfaction of the Building Official, or until the installation of such appliances, devices or materials have been made safe as directed by the Building Official; or until a permit has been issued and the work has been inspected and approved by the Building Official.

**Section 112.3.3 Authority to Disconnect Water Utility**

The Building Official is hereby empowered to disconnect or to require in writing the discontinuance of water utility service to buildings, structures or premises, or portions thereof, or to fixtures, devices or materials where such buildings, structures or premises, or portions thereof, are determined to be a hazard to life, health, property or to the environment, or where they lack permits and required inspection approvals.

The Building Official is hereby empowered to disconnect or to require in writing the discontinuance of water utility service as a means of preventing, restraining, correcting or abating any violation of this code, or other relevant laws, ordinances, rules or regulations.

The water service shall remain disconnected or water utility service shall remain discontinued until the code violation has been abated to the satisfaction of the Building Official, or until the installation of such appliances, devices or materials have been made safe as directed by the Building Official; or until a permit has been issued and the work has been inspected and approved by the Building Official.

**Section 112.3.4** The powers granted the Building Official pursuant to this section 112.3 may be exercised only when the utility service or services to be disconnected create a dangerous condition by virtue of any violation of Chapter 15.04 of the Calabasas Municipal Code. The Building Official shall notify the serving utility, and whenever possible the owner and occupant of the building, structure or service system of the decision to disconnect prior to taking such actions.

[6]**Section 113 Board of Appeals**

**113.1 General.** In order to hear and decide appeals of orders, decisions, or determinations of the building official regarding materials or methods of construction, the City Council shall appoint upon nomination of the City Manager a Board of Appeals under this code with appropriate technical qualifications. Notwithstanding any other provisions of this Chapter 15.04, this Section 113 and Section K13(F)(6) of Appendix K of the 2010 California Plumbing Code provide the sole administrative appeals authorized by this chapter.

**113.2 Limitations on Authority.** (a) An application for appeal shall be based on a claim that a decision of the building official to prohibit the use of materials or methods of construction reflects one of the following errors: (i) the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, (ii) the provisions of this code do not fully apply according to their terms, or (iii) the materials or methods of constructions proposed are equally well or better suited to accomplish the purposes of this code than those otherwise required by this code.

[6] Revised November 8, 2010

(b) The Board of Appeals shall have no authority to: (i) waive the requirements of this code, (ii) to consider, decide or rule on the existence or nonexistence of any activity, condition, or use involving real property and/or any structure and other improvements on real property that the building official or another authorized agent of the city has determined to violate Title 15 or any other provision of the Calabasas Municipal Code, or (iii) consider, decide or rule whether persons are or are not responsible for violations of the Calabasas Municipal Code or public nuisances or what actions are required by responsible persons to correct or abate violations of the Calabasas Code or public nuisances.

(c) The limitations of this section 113.2 shall apply equally to any appellate body established by the Electrical, Mechanical or Plumbing Codes of the City.

**113.3 Procedures.** A person seeking an appeal under this Section 113 shall file an appeal on a form furnished by the building official and pay an appeal fee in an amount established from time to time by resolution of the City Council. That fee shall be sufficient to cover the cost of the building official's obtaining a written interpretation of relevant provisions of this Title 15 by the International Code Council or any successor thereto. The Board of Appeals may, after hearing, adopt that written interpretation as the decision of the Board. If the Board of Appeals does not adopt that written interpretation, it shall state its reasoning in writing. The Board may establish, by a regulation published in the manner required of ordinances of the City Council, procedures for the conduct of appeals under this Section 113 and until it shall do so, the appeal provisions of Section 116.2 of this code shall apply. Judicial review of a decision of the Board of Appeal under this Section 113 may be had pursuant to Code of Civil Procedure Section 1094.5. Judicial review of any decision of the building official not subject to appeal under this Section 113 may be had pursuant to Code of Civil Procedure Section 1085.

**Section** **114.1 Unlawful acts** It ~~shall be~~ is unlawful for any ~~person, firm or corporation~~ property owner and/or other responsible person to erect, construct, alter, extend, repair, move, remove, demolish, or occupy any building or structure, ~~or~~ as well as any regulated equipment, ~~regulated by this code, or cause same to be done, in conflict with or in violation of any of the provisions of this code.~~ system or installation, or cause or allow the same to be done, in conflict with this code. It is unlawful for any for any property owner and/or other responsible person to maintain, whether due to action or inaction, any building or structure, as well as any regulated equipment, system or installation in violation of this code.

**Section** **SECTION 116**
**~~UNSAFE STRUCTURES AND EQUIPMENT~~**
**UNSAFE STRUCTURES OR INSTALLATIONS THEREIN**

**116.1 Unsafe Structures or Installations Therein**

~~**Conditions.** Structures or existing eqripment that are or hereafter become unsafe, insanitary or deficient because of inadequate means of egress facilities, inadequate light and ventilation, or which constitute a fire hazard, or are otherwise dangerous to human life or the public welfare, or that involve illegal or improper occupancy or inadequate maintenance, shall be deemed an unsafe condition. Unsafe structures shall be taken down and removed or made safe, as the building official deems necessary and as provided for in this section. A vacant structure that is not secured against entry shall be deemed unsafe.~~

Any building or structure that has any or all of the conditions hereinafter described shall constitute an unsafe or dangerous building or structure:

(a) Structural inadequacies, damage, deficiencies, defects or deterioration, as well as nearby hazardous embankments or excavations, that could cause a building or structure to partially or completely collapse or fail.

(b) Electrical, plumbing or mechanical work or installations, which because of a defect in materials or installation, or due to some other faulty operating or other condition, pose a risk of explosion or fire.

(c) Unsanitary or unhealthful conditions that are present in a building or structure.

(d) All forms of construction, as well as electrical, plumbing or mechanical work, systems, fixtures, appliances or other installations for which all required permits and inspection approvals have not been obtained from the Building Official.

(e) Occupancy or use for which a building or structure was not designed or intended, or that results in a change in the occupancy classification thereof.

(f) Inadequate egress from a building or structure.

(g) A vacant building or structure that is not secured against unauthorized entry.

(h) Any condition that violates any regulation in Title 15 of the Calabasas Municipal Code.

Any or all of the foregoing conditions endanger the health, safety or welfare of occupants, persons who may enter the premises, or the public.

**Section 116.2 Orders to Vacate**

~~The building official shall cause a report to be filed on an unsafe condition. The report shall state the occupancy of the structure and the nature of the unsafe condition.~~

Notwithstanding any other provision of this code, if the building official or a designee thereof, determines a condition is present in a building or structure or on premises that constitutes an immediate danger or hazard to the health, safety or welfare of occupants or to the public, the Building Official may order persons to vacate buildings, structures, premises, or portions thereof. Such orders may include orders to not re-enter, as well authorize limited entry subject to written conditions. Conditions may include, but not be limited to, requiring buildings, structures and premises to be secured from entry or access by means that are acceptable to the Building Official. Orders shall advise persons of their appeal rights as discussed in this subsection.

Orders may be personally served on an occupant, or served by first class mail and posted on the premises containing the immediate danger or hazard. If an owner does not occupy said premises, a copy of the order shall be also sent by first class mail to the owner as identified by Los Angeles County Assessor records. For owner-occupied properties, the issuance date of an order is the date of its personal service. For non-owner occupied properties, the issuance date of an order is the date an order to the owner and any occupant(s), or a copy thereof, are deposited in a U.S. Postal Service mail container and posted on the premises. Failure of any person to receive an order shall not affect its validity, or the appeal period. When identifying a mailing address for an owner, the Building Official shall consider such information as shown in Los Angeles County Assessor records.

Orders issued pursuant to this subsection, and any conditions thereof, are appealable by a property owner or occupant on a City-approved form that must be received by the City Clerk's Office within ten days of an order's issuance. Appellants shall state all grounds for their appeal in said form. A fee is not charged for such appeals. Failure to tender an appeal in a timely manner constitutes a waiver of the right to appeal, in which case an order is final.

If a timely appeal is made, the Building & Safety Division shall provide ten days advance written notice to the appealing party or parties of the date, time and place of the hearing. A timely appeal does not stay an order, or any conditions thereof. Failure of any person to receive a notice of hearing shall not affect its validity.

Timely appeals shall be heard by the City Manager, or a designee thereof. The boards established by this code do not have jurisdiction to consider, decide or rule on orders that are authorized by this subsection. Appeal hearings are informal and rules of evidence do not apply. Failure of an appellant or appellants to appear at a hearing constitutes a waiver of the right to appeal, in which case the order is final. The hearing officer shall, within ten days following the hearing, issue a written decision upholding, modifying, or reversing the order or conditions thereof, notice of which shall be sent to the appellant(s) by first class mail. Such decisions are not appealable. The notice of decision shall contain the following statement: "The Hearing Officer's decision is final, and judicial review of this decision is subject to the provisions and time limits set forth in Cal. Code of Civil Procedure §§ 1094.5 and 1094.6."

Orders may be accompanied by, or combined with, Notices of Violations (which are not appealable). Orders shall be rescinded in writing when the Building Official determines that the immediate danger or hazard has been fully corrected or abated with all permits, approvals and inspections as required by the Calabasas Municipal Code.

**Section 116.3 Violations**

~~If an unsafe condition is found, the building official shall serve on the owner, agent or person in control of the structure, a written notice that describes the condition deemed unsafe and specifies the required repairs or improvemtns to be made to abate the unsafe condition, or that requires the unsafe structure to be demolished within a stipulated time. Such notice shall require the person thus notifed to declare immediately to the building official acceptance or rejection of the terms of the order.~~

It is unlawful and a public nuisance for any person to maintain an unsafe or dangerous building or structure. Each and every day that a building or structure is maintained in an unsafe or dangerous condition is a new violation of this code. It is a violation of this code and unlawful for any person to fail to comply with an order to vacate, as well as all conditions thereof.

**Section 116.4 Method of Service.**

This section is deleted in its entirety.

**Section 116.5 Restoration**

This section is deleted in its entirety.

**SECTION 4.** Municipal Code section **15.04.200, entitled, "Structural amendments"** is hereby amended and the following subsections shall read as follows:

Chapter 16 of the ~~2007~~ 2010 California Building Code is amended to read as follows:

**Section 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 un-topped steel decking shall also be permitted to be idealized as flexible, provided all of the following conditions are met:

1. 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.

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

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

4. Portions of wood structural panel diaphragms that cantilever beyond the vertical elements of the ~~lateral~~ seismic-force-resisting system are designed in accordance with section 4.2.5.2 of AF&PASDPWS.

Exception: For buildings two stories or less in height with diaphragms constructed of wood structural panels, the cantilevered portion may be analyzed using flexible diaphragm assumption, provided the length of the overhang does not exceed fifteen (15) percent of the distance between the lateral force resisting system adjacent to the cantilevered portion in the same direction nor one-fourth the width of the diaphragm, where the width is the dimension of the diaphragm perpendicular to the overhang.

**Section** 1613.6.7 of the 2010 California Building Code is amended to read as follows:

**Equation 16-44.**

$$\delta M = \frac{C_d \delta_{max}}{I}$$

where:

Cd = Deflection amplification factor in Table 12.2-1 of ASCE 7.

δmax = Maximum displacement defined in Section 12.8.4.3 of ASCE 7.

I = Importance factor in accordance with Section 11.5.1 of ASCE 7.

**Section** 1613.8 is added to Chapter 16 of the 2010 California Building Code to read as follows:

**Section 1613.8 ASCE 7, Table 12.8-2. Modify ASCE 7 Table 12.8-2 by adding the following:**

| Structure Type | C1 | X |
|---|---|---|
| Eccentrically braced steel frames and buckling-restrained braced frames | 0.03 (0.0731) 3 | 0.75 |

**Section** 1613.9 is added to the California Building Code as follows:

1613.9 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.

**Section 1613.10** is added to the California Building Code as follows:

1613.10 ASCE 7, Section 12.8.7 Modify ASCE 7 Section 12.8.7 by amending Equation 12.8-16 as follows:

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

**(12.8-16)**

**Section 1613.11** is added to the California Building Code as follows:

**1613.11 ASCE7, Section 12.11.2.2.3** Modify ASCE 7, Section 12.2.4 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 structures assigned to Seismic Design Category D, E or F, wood diaphragms supporting concrete or masonry walls 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 sub-diaphragms to transmit the anchorage forces to the main continuous crossties.

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

**Section 1613.12** is added to the California Building Code as follows:

**1613.12 Seismic Design Provisions for Hillside Buildings.**

**1613.12.1 Purpose.** The purpose of this section is to establish minimum regulations for the design and construction of new buildings and additions to existing buildings when constructing such buildings on or into slopes steeper than one unit vertical in three units horizontal (33.3%). These regulations establish minimum standards for seismic force resistance to reduce the risk of injury or loss of life in the event of earthquakes.

**1613.12.2 Scope.** The provisions of this section shall apply to the design of the lateral-force-resisting system for hillside buildings at and below the base level diaphragm. The design of the lateral-force-resisting system above the base level diaphragm shall be in accordance with the provisions for seismic and wind design as required elsewhere in this division.

EXCEPTION: Non-habitable accessory buildings and decks not supporting or supported from the main building are exempt from these regulations.

**1613.12.3 Definitions.** For the purposes of this section certain terms are defined as follows:

BASE LEVEL DIAPHRAGM is the floor at, or closest to, the top of the highest level of the foundation.

DIAPHRAGM ANCHORS are assemblies that connect a diaphragm to the adjacent foundation at the uphill diaphragm edge.

DOWNHILL DIRECTION is the descending direction of the slope approximately perpendicular to the slope contours.

FOUNDATION is concrete or masonry which supports a building, including footings, stem walls, retaining walls, and grade beams.

FOUNDATION EXTENDING IN THE DOWNHILL DIRECTION is a foundation running downhill and approximately perpendicular to the uphill foundation.

HILLSIDE BUILDING is any building or portion thereof constructed on or into a slope steeper than one unit vertical in three units horizontal (33.3%). If only a portion of the building is supported on or into the slope, these regulations apply to the entire building.

PRIMARY ANCHORS are diaphragm anchors designed for and providing a direct connection as described in Sections 1613.12.5 and 1613.12.7.3 between the diaphragm and the uphill foundation.

SECONDARY ANCHORS are diaphragm anchors designed for and providing a redundant diaphragm to foundation connection, as described in Sections 1613.12.6 and 1613.12.7.4.

UPHILL DIAPHRAGM EDGE is the edge of the diaphragm adjacent and closest to the highest ground level at the perimeter of the diaphragm.

UPHILL FOUNDATION is the foundation parallel and closest to the uphill diaphragm edge.

**1613.12.4 Analysis and Design.**

**1613.12.4.1 General.** Every hillside building within the scope of this section shall be analyzed, designed, and constructed in accordance with the provisions of this division. When the code-prescribed wind design produces greater effects, the wind design shall govern, but detailing requirements and limitations prescribed in this and referenced sections shall be followed.

**1613.12.4.2 Base Level Diaphragm-Downhill Direction.** The following provisions shall apply to the seismic analysis and design of the connections for the base level diaphragm in the downhill direction.

**1613.12.4.2.1 Base for Lateral Force Design Defined.** For seismic forces acting in the downhill direction, the base of the building shall be the floor at or closest to the top of the highest level of the foundation.

**1613.12.4.2.2 Base Shear.** In developing the base shear for seismic design, the response modification coefficient (R) shall not exceed 4.5 for bearing wall and building frame systems. The total base shear shall include the forces tributary to the base level diaphragm including forces from the base level diaphragm.

**1613.12.5 Base Shear Resistance-Primary Anchors.**

**1613.12.5.1 General.** The base shear in the downhill direction shall be resisted through primary anchors from diaphragm struts provided in the base level diaphragm to the foundation.

**1613.12.5.2 Location of Primary Anchors.** A primary anchor and diaphragm strut shall be provided in line with each foundation extending in the downhill direction. Primary anchors and diaphragm struts shall also be provided where interior vertical lateral-force-resisting elements occur above and in contact with the base level diaphragm. The spacing of primary anchors and diaphragm struts or collectors shall in no case exceed 30 feet (9144 mm).

**1613.12.5.3 Design of Primary Anchors and Diaphragm Struts.** Primary anchors and diaphragm struts shall be designed in accordance with the requirements of Section 1613.12.8.

**1613.12.5.4 Limitations.** The following lateral-force-resisting elements shall not be designed to resist seismic forces below the base level diaphragm in the downhill direction:

1. Wood structural panel wall sheathing,

2. Cement plaster and lath,

3. Gypsum wallboard, and

4. Tension only braced frames.

Braced frames designed in accordance with the requirements of Section 2205.2.2 may be used to transfer forces from the primary anchors and diaphragm struts to the foundation provided lateral forces do not induce flexural stresses in any member of the frame or in the diaphragm struts. Deflections of frames shall account for the variation in slope of diagonal members when the frame is not rectangular.

**1613.12.6. Base Shear Resistance-Secondary Anchors.**

**161312.6.1 General.** In addition to the primary anchors required by Section 1613.12.5, the base shear in the downhill direction shall be resisted through secondary anchors in the uphill foundation connected to diaphragm struts in the base level diaphragm.

EXCEPTION: Secondary anchors are not required where foundations extending in the downhill direction spaced at not more than 30 feet (9144 mm) on center extend up to and are directly connected to the base level diaphragm for at least 70% of the diaphragm depth.

**1613.12.6.2 Secondary Anchor Capacity and Spacing.** Secondary anchors at the base level diaphragm shall be designed for a minimum force equal to the base shear, including forces tributary to the base level diaphragm, but not less than 600 pounds per lineal foot (8.76 kN/m). The secondary anchors shall be uniformly distributed along the uphill diaphragm edge and shall be spaced a maximum of four feet (1219 mm) on center.

**1613.12.6.3 Design.** Secondary anchors and diaphragm struts shall be designed in accordance with Section 1613.12.8.

**1613.12.7 Diaphragms Below the Base Level-Downhill Direction.** The following provisions shall apply to the lateral analysis and design of the connections for all diaphragms below the base level diaphragm in the downhill direction.

**1613.12.7.1 Diaphragm Defined.** Every floor level below the base level diaphragm shall be designed as a diaphragm.

**1613.12.7.2 Design Force.** Each diaphragm below the base level diaphragm shall be designed for all tributary loads at that level using a minimum seismic force factor not less than the base shear coefficient.

**1613.12.7.3 Design Force Resistance-Primary Anchors.** The design force described in Section 1613.8.7.2 shall be resisted through primary anchors from diaphragm struts provided in each diaphragm to the foundation. Primary anchors shall be provided and designed in accordance with the requirements and limitations of Section 1613.12.5.

**1613.12.7.4 Design Force Resistance-Secondary Anchors.**

**1613.12.7.4.1 General.** In addition to the primary anchors required in Section 1613.12.7.3, the design force in the downhill direction shall be resisted through secondary anchors in the uphill foundation connected to diaphragm struts in each diaphragm below the base level.

EXCEPTION: Secondary anchors are not required where foundations extending in the downhill direction, spaced at not more than 30 feet (9144 mm) on center, extend up to and are directly connected to each diaphragm below the base level for at least 70% of the diaphragm depth.

**1613.12.7.4.2 Secondary Anchor Capacity.** Secondary anchors at each diaphragm below the base level diaphragm shall be designed for a minimum force equal to the design force but not less than 300 pounds per lineal foot (4.38 kN/m). The secondary anchors shall be uniformly distributed along the uphill diaphragm edge and shall be spaced a maximum of four feet (1219 mm) on center.

**1613.12.7.4.3 Design.** Secondary anchors and diaphragm struts shall be designed in accordance with Section 1613.12.8.

**1613.12.8 Primary and Secondary Anchorage and Diaphragm Strut Design.** Primary and secondary anchors and diaphragm struts shall be designed in accordance with the following provisions:

1. Fasteners. All bolted fasteners used to develop connections to wood members shall be provided with square plate washers at all bolt heads and nuts. Washers shall be minimum 3/16 inch (4.8 mm) thick and two inch (51 mm) square for 1/2-inch (12.7 mm) diameter bolts, and 1/4-inch (6.4 mm) thick and 2-1/2-inch (64 mm) square for 5/8-inch (15.9 mm) diameter or larger bolts. Nuts shall be wrench tightened prior to covering.

2. Fastening. The diaphragm to foundation anchorage shall not be accomplished by the use of toe-nailing, nails subject to withdrawal, or wood in cross-grain bending or cross-grain tension.

3. Size of Wood Members. Wood diaphragm struts collectors, and other wood members connected to primary anchors shall not be less than three-inch (76 mm) nominal width. The effects of eccentricity on wood members shall be evaluated as required per Item 9.

4. Design. Primary and secondary anchorage, including diaphragm struts, splices, and collectors shall be designed for 125% of the tributary force.

5. Allowable Stress Increase. The one-third allowable stress increase permitted under Section 1605.3.2 shall not be taken when the working (allowable) stress design method is used.

6. Seismic Load Factor. The seismic load factor shall be 1.7 for steel and concrete anchorage when the strength design method is used.

7. Primary Anchors. The load path for primary anchors and diaphragm struts shall be fully developed into the diaphragm and into the foundation. The foundation must be shown to be adequate to resist the concentrated loads from the primary anchors.

8. Secondary Anchors. The load path for secondary anchors and diaphragm struts shall be fully developed in the diaphragm but need not be developed beyond the connection to the foundation.

9. Symmetry. All lateral force foundation anchorage and diaphragm strut connections shall be symmetrical. Eccentric connections may be permitted when demonstrated by calculation or tests that all components of force have been provided for in the structural analysis or tests.

10. Wood Ledgers. Wood ledgers shall not be used to resist cross-grain bending or cross-grain tension.

**1613.12.9 Lateral-Force-Resisting Elements Normal to the Downhill Direction.**

**1613.12.9.1 General.** In the direction normal to the downhill direction, lateral-force-resisting elements shall be designed in accordance with the requirements of this section.

**1613.12.9.2 Base Shear.** In developing the base shear for seismic design, the response modification coefficient (R) shall not exceed 4.5 for bearing wall and building frame systems.

**1613.12.9.3 Vertical Distribution of Seismic Forces.** For seismic forces acting normal to the downhill direction the distribution of seismic forces over the height of the building using Section 12.8.3 of ASCE 7 shall be determined using the height measured from the top of the lowest level of the building foundation.

**1613.12.9.4 Drift Limitations.** The story drift below the base level diaphragm shall not exceed 0.005 times the story height. The total drift from the base level diaphragm to the top of the foundation shall not exceed 3/4 inch (19 mm). Where the story height or the height from the base level diaphragm to the top of the foundation varies because of a stepped footing or story offset, the height shall be measured from the average height of the top of the foundation. The story drift shall not be reduced by the effect of horizontal diaphragm stiffness.

Where code-prescribed wind forces govern the design of the lateral force resisting system normal to the downhill direction, the drift limitation shall be 0.0025 for the story drift and the total drift from the base level diaphragm to the top of the foundation may exceed 3/4 inch (19 mm) when approved by the Department. In no case, however, shall the drift limitations for seismic forces be exceeded.

**1613.12.9.5 Distribution of Lateral Forces.**

**1613.12.9.5.1 General.** The design lateral force shall be distributed to lateral-force-resisting elements of varying heights in accordance with the stiffness of each individual element.

**1613.12.9.5.2 Wood Structural Panel Sheathed Walls.** The stiffness of a stepped wood structural panel shear wall may be determined by dividing the wall into adjacent rectangular elements, subject to the same top of wall deflection. Deflections of shear walls may be estimated by Section 2305.3.2. Sheathing and fastening requirements for the stiffest section shall be used for the entire wall. Each section of wall shall be anchored for shear and uplift at each step. The minimum horizontal length of a step shall be eight feet (2438 mm) and the maximum vertical height of a step shall be two feet, eight inches (813 mm).

**1613.12.9.5.3 Reinforced Concrete or Masonry Shear Walls.** Reinforced concrete or masonry shear walls shall have forces distributed in proportion to the rigidity of each section of the wall.

**1613.12.9.6 Limitations.** The following lateral force-resisting-elements shall not be designed to resist lateral forces below the base level diaphragm in the direction normal to the downhill direction:

1. Cement plaster and lath,

2. Gypsum wallboard, and

3. Tension-only braced frames.

Braced frames designed in accordance with the requirements of Chapter 22 of this Code may be designed as lateral-force-resisting elements in the direction normal to the downhill direction, provided lateral forces do not induce flexural stresses in any member of the frame. Deflections of frames shall account for the variation in slope of diagonal members when the frame is not rectangular.

**1613.12.10 Specific Design Provisions.**

**1613.12.10.1 Footings and Grade Beams.** All footings and grade beams shall comply with the following:

1. Grade beams shall extend at least 12 inches (305 mm) below the lowest adjacent grade and provide a minimum 24-inch (610 mm) distance horizontally from the bottom outside face of the grade beam to the face of the descending slope.

2. Continuous footings shall be reinforced with at least two No. 4 reinforcing bars at the top and two No. 4 reinforcing bars at the bottom.

3. All main footing and grade beam reinforcement steel shall be bent into the intersecting footing and fully developed around each corner and intersection.

4. All concrete stem walls shall extend from the foundation and reinforced as required for concrete or masonry walls.

**1613.12.10.2 Protection Against Decay and Termites.** All wood to earth separation shall comply with the following:

1. Where a footing or grade beam extends across a descending slope, the stem wall, grade beam, or footing shall extend up to a minimum 18 inches (457 mm) above the highest adjacent grade.

EXCEPTION: At paved garage and doorway entrances to the building, the stem wall need only extend to the finished concrete slab, provided the wood framing is protected with a moisture proof barrier.

2. Wood ledgers supporting a vertical load of more than 100 pounds per lineal foot (1.46 kN/m) and located within 48 inches (1219 mm) of adjacent grade are prohibited. Galvanized steel ledgers and anchor bolts, with or without wood nailers, or treated or decay resistant sill plates supported on a concrete or masonry seat, may be used.

**1613.12.10.3 Sill Plates.** All sill plates and anchorage shall comply with the following:

1. All wood framed walls, including nonbearing walls, when resting on a footing, foundation, or grade beam stem wall, shall be supported on wood sill plates bearing on a level surface.

2. Power-driven fasteners shall not be used to anchor sill plates except at interior nonbearing walls not designed as shear walls.

**1613.12.10.4 Column Base Plate Anchorage.** The base of isolated wood posts (not framed into a stud wall) supporting a vertical load of 4000 pounds (17.8 kN) or more and the base plate for a steel column shall comply with the following:

1. When the post or column is supported on a pedestal extending above the top of a footing or grade beam, the pedestal shall be designed and reinforced as required for concrete or masonry columns. The pedestal shall be reinforced with a minimum of four No. 4 bars extending to the bottom of the footing or grade beam. The top of exterior pedestals shall be sloped for positive drainage.

2. The base plate anchor bolts or the embedded portion of the post base, and the vertical reinforcing bars for the pedestal, shall be confined with two No. 4 or three No. 3 ties within the top five inches (127 mm) of the concrete or masonry pedestal. The base plate anchor bolts shall be embedded a minimum of 20 bolt diameters into the concrete or masonry pedestal. The base plate anchor bolts and post bases shall be galvanized and each anchor bolt shall have at least two galvanized nuts above the base plate.

**1613.12.10.5 Steel Beam to Column Supports.** All steel beam to column supports shall be positively braced in each direction. Steel beams shall have stiffener plates installed on each side of the beam web at the column. The stiffener plates shall be welded to each beam flange and the beam web. Each brace connection or structural member shall consist of at least two 5/8 inch (15.9 mm) diameter machine bolts.

**Section** **1613.13** is added to Chapter 16 of the 2010 California Building Code to read as follows:

**1613.13 Suspended Ceilings.** Minimum design and installation standards for suspended ceilings shall be determined in accordance with the requirements of Section 2506.2.1 of this Code and this subsection.

**1613.13.1 Scope.** This part contains special requirements for suspended ceilings and lighting system. Provisions of Section 13.5.6 of ASCE 7 shall apply except as modified herein.

**1613.13.2 General.** The suspended ceilings and lighting systems shall be limited to 6 feet (1828 mm) below the structural deck unless the lateral bracing is designed by a licensed engineer or architect.

**1613.13.3 Design and Installation Requirements**

**1613.13.3.1 Bracing at Discontinuity.** Positive bracing to the structure shall be provided at changes in the ceiling plane elevation or at discontinuities in the ceiling grid system.

**1613.13.3.2 Support for Appendages.** Cable trays, electrical conduits and piping shall be independently supported and independently braced from the structure.

**1613.13.3.3 Sprinkler Heads.** All sprinkler heads (drops) except fire-resistance-rated floor/ceiling or roof/ceiling assemblies, shall be designed to allow for free movement of the sprinkler pipes with oversize rings, sleeves or adaptors through the ceiling tile, in accordance with Section 13.5.6.2.2 (e) of ASCE7. Sprinkler heads penetrating fire-resistance-rated floor/ceiling or roof/ceiling assemblies shall comply with Section 713 of this Code.

**1613.13.3.4 Perimeter Members.** A minimum wall angle size of at least a two-inch (51 mm) horizontal leg shall be used at perimeter walls and interior full height partitions. The first ceiling tile

shall maintain ¾ inch (19mm) clear from the finish wall surface. An equivalent alternative detail that will provide sufficient movement due to anticipated lateral building displacement may be used in lieu of the long leg angle subject to the approval of the Superintendent of Building.

**1613.13.4 Special Requirements for Means of Egress.** Suspended ceiling assemblies located along means of egress serving an occupant load of 30 or more shall comply with the following provisions.

**1613.13.4.1General.** Ceiling suspension systems shall be connected and braced with vertical hangers attached directly to the structural deck along the means of egress serving an occupant load of 30 or more and a lobbies accessory to Group A Occupancies. Spacing of vertical hangers shall not exceed 2 feet (610mm) on center along the entire length of the suspended ceiling assembly located along the means of egress or at the lobby.

**1613.13.4.2 Assembly Device.** All lay in panels shall be secured to the suspension ceiling assembly with two hold-down clips minimum for each tile within a 4-foot (1219mm) radius of the exit lights and exit signs.

**1613.13.4.3 Emergency Systems.** Independent supports and braces shall be provided for light fixtures required for exit illumination. Power supply for exit illumination shall comply with the requirements of Section 1006.3 of this Code.

**1613.4.4 Supports for Appendage.** Separate support from the structural deck shall be provided for all appendages such as light fixtures, air diffusers, exit signs, and similar elements.

**Chapter 17 of the 2010 California Building Code is amended and the following subsections shall read 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. Concrete foundation walls constructed in accordance with Table 1807.1.6.2~~

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

**1704.8 Driven deep foundations and connection grade beams.** Special inspections shall be performed during installation and testing of driven deep foundation elements as required by Table 1704.8. Special inspection shall be performed for connection grade beams in accordance with section 1704.4 for structures assigned to seismic design category DE or F. The approved geotechnical report, and the construction documents prepared by the registered design professional shall be used to determine compliance.

**1704.9 Cast in Place deep foundations and connection grade beams.** Special inspections shall be performed during installation and testing of driven deep foundation elements as required by Table 1704.8. Special inspection shall be performed for connection grade beams in accordance with section 1704.4 for structures assigned to seismic design category DE or F. The approved geotechnical report, and the construction documents prepared by the registered design professional shall be used to determine compliance.

**1705.3 Seismic resistance.** The statement of special inspections shall include seismic requirements for cases covered in Sections 1705.3.1 through 1705.3.5.

Exception: Seismic requirements are permitted to be excluded from the statement of special inspections for structures designed and constructed in accordance with the following:

1. The structure consists of light-frame construction; the design spectral response acceleration at short periods Sds, as determined in Section 1613.5.4 does not exceed 0.5g; and the height of the structure does not exceed 35 feet (10 668 mm) above grade plane; or

2. The structure is constructed using a reinforced masonry structural system or reinforced concrete structural system; the design spectral response acceleration at short periods, Sds, as determined in Section 1613.5.4, does not exceed 0.5 g, and the height of the structure does not exceed 25 feet (8620 mm) above grade plane; or

3. Detached one-or two-family dwellings not exceeding two stories above grade plane, provided the structure is not assigned to Seismic Design Category D, E or F and does not have any of the following plan or vertical irregularities in accordance with Section 12.3.2 of ASCE 7:

3.1 Torsional irregularity.

3.2 Nonparallel systems.

3.3 Stiffness irregularity – extreme soft story and soft story.

3.4 Discontinuity in capacity – weak story.

**1710.1 General.** Where required by the provisions of Section 1710.2 or 1710.3 the owner shall employ a ~~registered designed~~ professional structural observer to perform structural observations as defined in Section 1702. The structural observer shall be one of the following individuals:

1. The registered design professional responsible for the structural design, or

2. A registered design professional designated by the registered design professional responsible for the structural design.

Prior to the commencement of observations, the structural observer shall submit to the building official a written statement identifying the frequency and extent of structural observations.

~~At the conclusion of the work included in the permit, the structural observer shall submit to the building official a written statement that the site visits have been made and identify any reported deficiencies that, to the best of the structural observer's knowledge, have not been resolved.~~

The owner or owner's representative shall coordinate and call a preconstruction meeting between the structural observer, contractors, affected subcontractors and special inspectors. The structural observer shall preside over the meeting. The purpose of the meeting shall be to identify the major structural elements and connections that affect the vertical and lateral load resisting systems

of the structure and to review scheduling of the required observations. A record of the meeting shall be included in the report submitted to the building official.

Observed deficiencies shall be reported in writing to the owner's representative, special inspector, contractor and the building official. Upon the form prescribed by the building official, the structural observer shall submit to the building official a written statement at each significant construction stage stating that the site visits have been made and identifying any reported deficiencies which, to the best of the structural observer's knowledge, have not been resolved. A final report by the structural observer which states that all observed deficiencies have been resolved is required before acceptance of the work by the building official.

**1710.2 Structural observations for seismic resistance.** Structural observations shall be provided for those structures included in Seismic Design Category D, E or F, as determined in Section 1613, where one or more of the following conditions exist:

1. The structure is classified as Occupancy Category III or IV in accordance with Section 1604.5.

2. The height of the structure is greater than 75 feet (22860 mm) above the base.

3. The structure is ~~assigned to Seismic Design Category E~~ classified as Occupancy Category I or II in accordance with Section 1604.5 and is greater than two stories on stories above grade plans a lateral design is required for the structure or portion thereof.

   **Exception:** One-story wood framed Group R-3 and Group U Occupancies less than 2000 square feet in area, provided the adjacent grade is not steeper than one unit vertical in 10 units horizontal (10% sloped), assigned to Seismic Design Category D.

4. When so designated by the registered design professional responsible for the structural design.

5. When such observation is specifically required by the building official.

Chapter 18 of the 2010 California Building Code is amended to read as follows:

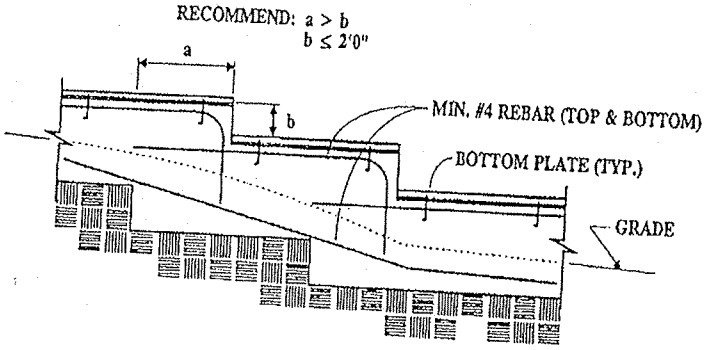
**1807.1.4 Permanent wood foundation systems.** Permanent wood foundation systems shall be designed and installed in accordance with AF&PA PWF. Lumber and plywood shall be treated in accordance with AWPA U1 (Commodity Specification A, Use Category 4B and Section 5.2) and shall be identified in accordance with Section 2303.1.8.1. Permanent wood foundation systems shall not be used for structures assigned to Seismic Design Category D, E or F.

**1807.1.6** Prescriptive design of concrete and masonry foundation walls. Concrete and masonry foundation walls that are laterally supported at the top and bottom shall be permitted to be designed and constructed in accordance with this section. Prescriptive design of foundation walls shall not be used for structures assigned to Seismic Design Category D, E or F.

**1809.3** of the 2010 California Building Code is amended to read as follows:

**1809.3 Stepped footings.** The top surface of footings shall be level. The bottom surface of footings shall be 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).

For structures assigned to Seismic Design Category D, E or F, the stepping requirement shall also apply to the top surface of grade beams supporting walls. Footings shall be reinforced with four ½-inch diameter (12.7 mm) deformed reinforcing bars. Two bars shall be placed at the top and bottom of the footings as shown in Figure 1809.3




STEPPED FOUNDATIONS

**Figure 1805.1**

**Section 1809.7 and Table 1809.7** of the 2010 California Building Code are amended to read, in words and figures, as follows:

**1809.7 Prescriptive footings for light-frame construction.** Where a specific design is not provided, concrete or masonry-unit footings supporting walls of light-frame construction shall be permitted to be designed in accordance with Table 1809.7. Prescriptive footings in Table 1809.7 shall not exceed one story above grade plane for structures assigned to Seismic Design Category D, E or F.

**TABLE 1809.7**
**PRESCRIPTIVE FOOTINGS SUPPORTING WALLS OF LIGHT-FRAME CONSTRUCTION** [a, b, c, d, e]

| 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 1809.4.
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 shall be permitted to be supported by isolated footings. The footing width and length shall be twice the width shown in this table, and 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 1807.1.6.
f. Footings shall be 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 footing for Group R-3 occupancies shall be permitted to be 6 inches thick.~~

**Section 1809.12** of the 2010 California Building Code is amended to read, in words and figures, as follows:

**1809.12 Timber footings.** Timber footings shall be permitted for buildings of Type V construction and as otherwise approved by the building official. Such footings shall be treated in accordance with AWPA U1 (Commodity Specification A, Use Category 4B). Treated timbers are not required where placed entirely below permanent water level, or where used as capping for wood piles that project above the water level over submerged or marsh lands. The compressive stresses perpendicular to grain in untreated timber footing supported upon treated piles shall not exceed 70 percent of the allowable stresses for the species and grade of timber as specified in the AF&PA NDS. Timber footings shall not be used in structures assigned to Seismic Design Category D, E or F.

**Section 1810.3.2.4** of the 2010 California Building Code is amended to read, in words and figures, as follows:

**1810.3.2.4 Timber.** Timber deep foundation elements shall be designed as piles or poles in accordance with AF&PA NDS. Round timber elements shall conform to ASTM D 25. Sawn timber elements shall conform to DOC PS-20. Timber shall not be used in structures assigned to Seismic Design Category D, E or F.

**Chapter 19 of the 2010 California Building Code is hereby amended and the following subsections shall read as follows:**

**1908.1 General.** The text of ACI 318 shall be modified as indicated in Sections 1908.1.1 through ~~1908.1.10~~ 1908.1.14.

**1908.1.11 ACI 318, Section 21.6.4.1.** Modify ACI 317, Section 21.6.4.1, to read 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 21.6.4.1, Items (a) through (c), over the full height of the member.

**1908.1.12 ACI 318, Section 21.6.4** Modify ACI 318, Section 21.6.4, by adding Section 21.6.4.8 to read as follows:

21.6.4.8 – At any section where the design strength P of the column is less than the sum of the shears Ve computed in accordance with ACI 318 Sections 21.5.4.1 and 21.6.5.1 for all the beams framing into the column above the level under consideration, transverse reinforcement as specified in ACI 318 Sections 21.6.4.1 through 21.6.4.3 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 P of the column, these moments may be assumed to result from the deformation of the frame in any one principal axis.

**1908.1.13 ACI 318, Section 21.9.4.** Modify ACI 318, Section 21.9.4 by adding Section 21.9.4.6 to read as follows:

21.9.4.6 – Walls and portions of walls with Pu > 0.35Po 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 ACI 318 Section 21.13.

**1908.1.14 ACI 318, Section 21.11.6.** Modify ACI 318, Section 21.11.6, by adding the following:

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

**1908.1.2 ACI 318, Section 21.1.1.** Modify ACI 318, Sections 21.1.1.3 and 21.1.1.7 as follows:

21.1.1.3 – Structures assigned to Seismic Design Category A shall satisfy requirements of Chapters 1 to 19 and 22; Chapter 21 does not apply.

Structures assigned to Seismic Design Category B, C, D, E or F also shall satisfy 21.1.1.4 through 21.1.1.8 as applicable. Except for structural elements of plain concrete complying with Section 1908.1.8 of the International Building Code, structural elements of plain concrete are prohibited in structures assigned to Seismic Design Category C, D, E, or F.

21.1.1.7 Structural systems designated as part of the seismic-force-resisting system shall be restricted to those permitted by ASCE 7. Except for Seismic Design Category A, for which Chapter 21 does not apply, the following provisions shall be satisfied for each structural system designated as part of the seismic-force-resisting system, regardless of the Seismic Design Category:

(a) Ordinary moment frames shall satisfy 21.2.
(b) Ordinary reinforced concrete structural walls and ordinary precast structural walls need not satisfy any provisions in Chapter 21.
(c) Intermediate moment frames shall satisfy 21.3.
(d) Intermediate precast structural walls shall satisfy 21.4.
(e) Special moment frames shall satisfy 21.5 through 21.8.
(f) Special structural walls shall satisfy 21.9.
(g) Special structural walls constructed using precast concrete shall satisfy 21.10.

All special moment frames and special structural walls shall be also satisfy 21.1.3 through 21.1.7. Concrete tilt-up wall panels classified as intermediate precast structural wall system shall satisfy 21.9 in addition to 21.4.2 and 21.4.3 for structures assigned to Seismic Design Category D, E or F.

**1908.1.3. ACI, Section 21.4.** Modify ACI 318, Section 21.4, by renumbering Section 21.4.3 to become 21.4.4 and adding new Sections 21.4.3, 21.4.5, ~~and~~ 21.4.6 and 21.4.7 to read as follows:

21.4.3 – Connections that are designed to yield shall be capable of maintaining 80 percent of their design strength at the deformation induced by the design displacement or shall use Type 2 mechanical splices.

21.4.4 – Elements of the connection that are not designed to yield shall develop at least 1.5 Sy.

21.4.5- Wall piers in Seismic Design Category D, E, or F shall comply with Section 1908.1.4 of this Code.

21.4.6 – Wall piers not designed as part of a moment frame in buildings assigned to Seismic Design Category C shall have transverse reinforcement designed to resist the shear forces determined from 21.3.3. Spacing of transverse reinforcement shall not exceed 8 inches (203mm). Transverse reinforcement shall be extended beyond the pier clear height for at least 12 inches (305 mm).

**Exceptions:**

1. Wall piers that satisfy 21.13.
2. Wall piers along a wall line within a story where other shear wall segments provide lateral support to the wall piers and such segment have a total stiffness of at least six times the sum of the stiffness of all the wall piers.

21.4.7 – Wall segment with a horizontal length-to-thickness ratio less than 2.5 shall be designed as columns.

**1908.1.8 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 of 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 dwelling assigned to Seismic Design Category D or E, the height of the wall shall not exceed 8 feet (2438mm), the thickness shall not be less than 7 ½ inches (190mm), and the wall shall retain no more than 4 feet (1219mm) 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 (203mm) 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:

In detached one-and two-family dwellings three stories or less in height and constructed with stud-bearing walls, plain concrete footings 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.

~~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.~~

~~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.~~

**Section** 1909.4 **Design.** Structural plain concrete walls, footings and pedestals shall be designed for adequate strength in accordance with ACI 318, Section 22.4 through 22.8.

**Exception:** For Group R-3 occupancies and buildings or other occupancies less than two stories above plane of light-frame construction, the required edge thickness of ACI 318 is permitted to be reduced to 6 inches (152mm), provided that the footing does not extend more than 4 inches (102mm) on either side of the supported wall. This exception shall not apply to structural elements designed to resist seismic lateral forces for structures assigned to Seismic Design Category D, E or F.

**Chapter 22 of the 2010 California Building Code is amended to read as follows:**

**2204.1.1 Consumables for welding**

**2204.1.1.1 Seismic Force Resisting System (SFRS) welds.** All welds used in members and connections in the SFRS shall be made with filler metals meeting the requirements specified in AWS D1.8 Clause 6.3 AWS D1.8 Clauses 6.3.5, 6.3.6, 6.3.7 and 6.3.8 shall apply only to demand critical welds.

**2204.1.1.2 Demand critical welds.** Where welds are designated as demand critical, they shall be made with filler metals meeting the requirements specified in AWS D1.8 Clause 6.3.

**2205.4 AISC 341, Part I, Section 13.2 Members.** Add Section 13.2f to read as follows:

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.

Chapter 23 of the 2010 California Building Code is amended to read as follows:

**2304.9.1 Fastener requirements.** Connections for wood members shall be designed in accordance with the appropriate methodology in Section 2301.2. The number and size of fasteners connecting wood members shall not be less than that set forth in Table 2304.9.1. Staple fasteners in Table 2304.9.1 shall not be used to resist or transfer seismic forces in structures assigned to Seismic Design Category D, E or F.

**Exception:** Staples may be used to resist or transfer seismic forces when the allowable shear values are substantiated by cyclic testing and approved by the building official.

Add new footnote q to Table 2304.9.1.

q. Staples shall not be sued to resist or transfer seismic forces in structures assigned to Seismic Design Category D, E or F.

**2304.11.7 Wood used in retaining walls and cribs.** Wood installed in retaining or crib walls shall be preservative treated in accordance with AWPA U1 (Commodity Specifications A or F) for soil and fresh water use. Wood shall not be sued in retaining or crib walls for structures assigned to Seismic Design Category D, E or F.

**2305.4 Quality of Nails.** In Seismic Design Category D, E or F, 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. Clipped head or box nails are not 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.

**2305.5 Hold-down connectors.** In Seismic Design Category D, E or F, hold-down connectors shall be designed to resist shear wall overturning moments using approved cyclic load values of 75 percent of the allowable seismic load values that do not consider cyclic loading of the product. Connector bolts into wood framing shall 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-down connectors shall be tightened to finger tight plus one half (1/2) wrench turn just prior to covering the wall framing.

**Tables 2306.2.1(3) and 2306.2.1(4)** are added to Chapter 23 of the 2010 California Building Code and Section 2306.2.1.

**2306.2.1 Wood structural panel diaphragms.** Wood structural panel diaphragms shall be designed and constructed in accordance with AF&PA SDPWS. Wood structural panel diaphragms are permitted to resist horizontal forces using the allowable shear capacities set forth in Table 2306.2.1(1) or 2306.2.1(2). For structures assigned to Seismic Design Category D, E or F, the allowable shear capacities shall be set forth in Table 2306.2.1(3) or 2306.2.1(4). The allowable shear capacities in Table 2306.2.1(1) or 2306.2.1(2) are permitted to be increased 40 percent for wind design.

Wood structural panel diaphragms fastened with staples shall not be used to resist seismic forces in structures assigned to Seismic Design Category D, E or F.

**Exception:** Staples may be used for wood structural panel diaphragms when the allowable shear values are substantiated by cyclic testing and approved by the building official.

Wood structural panel diaphragms used to resist seismic forces in structures assigned to Seismic Design Category D, E or F shall be applied directly to the framing members.

**Exception:** Wood structural panel 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.

**Section 2306.2.1(3), 2306.2.1(4) and Table 2306.3(2)** of the 2010 California Building Code are added to read as follows:

**2306.2.1(3) Wood structural panel diaphragms.** Wood structural panel diaphragms are permitted to resist horizontal forces using the allowable shear capacities set forth in Table 2306.2.1(3).

TABLE 2306.2.1(3)
ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL DIAPHRAGMS WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE FOR SEISMIC LOADING FOR STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY D, E OR F

| 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 galvanized box) or staple size[k] | Fastener spacing at panel edges (inches) | | | | NAIL (common or galvanized box) or staple size[k] | Fastener spacing at panel edges (inches) | | | |
| | | | | 6 | 4 | 3 | 2[e] | | 6 | 4 | 3 | 2[e] |
| Structural I Sheathing | 5/16 | 1-1/4 | 6d (2"x0.113" common, 2"x0.099" galvanized box) | 150 | 200 | 200 | 200 | 6d (2"x0.113" common, 2"x0.099" galvanized box) | 200 | 300 | 390 | 510 |
| | | 1 | 1-1/2 16 Gage | 124 | 184 | 200 | 200 | 1-1/2 16 Gage | 165 | 245 | 325 | 415 |
| | 3/8 | 1-3/8 | 8d (2½"x0.131" common, 2½"x0.113" galvanized box) | 200 | 200 | 200 | 200 | 8d (2½"x0.131" common, 2½"x0.113" galvanized box) | 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, 2½"x0.113" galvanized box) | 255[d] | 395[d] | 505[d] | 670[d] | 8d (2½"x0.131" common, 2½"x0.113" galvanized box) | 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, 2½"x0.113" galvanized box) | 280 | 430 | 550 | 730 | 8d (2½"x0.131" common, 2½"x0.113" galvanized box) | 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, 3"x0.128" galvanized box) | 340 | 510 | 665[f] | 870 | 10d (3"x0.148" common, 3"x0.128" galvanized box) | 340 | 510 | 665[f] | 870 |
| Sheathing, plywood siding[g] except Group 5 Species | 5/16 or 1/4[c] | 1-1/4 | 6d (2"x0.113" common, 2"x0.099" galvanized box) | 180 | 200 | 200 | 200 | 6d (2"x0.113" common, 2"x0.099" galvanized box) | 180 | 270 | 350 | 450 |
| | | 1 | 1-1/2 16 Gage | 109 | 165 | 200 | 200 | 1-1/2 16 Gage | 145 | 220 | 295 | 375 |
| | 3/8 | 1-1/4 | 6d (2"x0.113" common, 2"x0.099" galvanized box) | 200 | 200 | 200 | 200 | 6d (2"x0.113" common, 2"x0.099" galvanized box) | 200 | 300 | 390 | 510 |
| | | 1-3/8 | 8d (2½"x0.131" common, 2½"x0.113" galvanized box) | 200 | 200 | 200 | 200 | 8d (2½"x0.131" common, 2½"x0.113" galvanized box) | 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, 2½"x0.113" galvanized box) | 240[d] | 350[d] | 450[d] | 585[d] | 8d (2½"x0.131" common, 2½"x0.113" galvanized box) | 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, 2½"x0.113" galvanized box) | 260 | 380 | 490 | 640 | 8d (2½"x0.131" common, 2½"x0.113" galvanized box) | 260 | 380 | 490 | 640 |
| | | 1-1/2 | 10d (3"x0.148" common, 3"x0.128" galvanized box) | 310 | 460 | 600[f] | 770 | 10d (3"x0.148" common, 3"x0.128" galvanized box) | 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, 3"x0.128" galvanized box) | 340 | 510 | 665[f] | 870 | 10d (3"x0.148" common, 3"x0.128" galvanized box) | 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) | | | | |
| | 5/16[c] | 1-1/4 | 6d (2"x0.099") | 140 | 200 | 200 | 200 | 6d (2"x0.099") | 140 | 210 | 275 | 360 |
| | 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 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. Except for wood structural panel sheathing used for shear walls that are part of the seismic-force-resisting system, 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, 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, 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).

**Table 2306.3(2)** is added to Chapter 23 of the 2010 California Building Code, Section 2306.3 and Table 2306.3 are amended to read, in words and figures, as follows:

**2306.3 Wood structural panel shear walls.** Wood structural panel shear walls shall be designed and constructed in accordance with AF&PA SDPWS. Wood structural panel shear walls are permitted to resist horizontal forces using the allowable shear capacities set forth in Table 2306.3(1). For structures assigned to Seismic Design Category D, E or F, the allowable shear capacities shall be set forth in Table 2306.3(2). The allowable shear capacities in Table 2306.3(1) are permitted to be increased 40 percent for wind design.

Wood structural panel shear walls used to resist seismic forces in structures assigned to Seismic Design Category D, E or F shall not be less than 4 feet by 8 feet (1219 mm by 2438 mm), except at boundaries 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 in structures assigned to Seismic Design Category D, E or F is 200 pounds per foot (2.92 kn/m). Nails shall be placed not less than ½ 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 ¼ inch (6.4 mm) from the edge of the connecting members for shears of 350 pounds per foot (5.11kN/m) or less.

Wood structural panel shear walls fastened with staples shall not be used to resist seismic forces in structures assigned to Seismic Design Category D, E or F.

Exception: Staples may be used for wood structural panel shear walls when the allowable shear values are substantiated by cyclic testing and approved by the building official.

Wood structures panel shear walls used to resist seismic forces in structures assigned to Seismic Design Category D, E or F shall be applied directly to the framing members.

TABLE 2306.3(1)
ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL SHEAR WALLS WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE FOR WIND OR SEISMIC LOADING b,h,I,j,l,m,n

TABLE 2306.3(2)
ALLOWABLE SHEAR (POUNDS OER FOOR) FOR WOOD STRUCTURAL PANEL SHEAR WALLS WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE FOR SEISMIC LOADING FOR STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY D, 3 OR F

| | | | ALLOWABLE SHEAR VALUE FOR SEISMIC FORCES PANELS APPLIED DIRECTLY TO FRAMING | | | | |
|---|---|---|---|---|---|---|---|
| PANEL GRADE | MINIMUM FASTENER PENETRATION IN FRAMING (INCH) | COMMON NAIL SIZE | | Fastener spacing at panel edges (inches) | | | |
| | | | | 6 | 4 | 3 | 2e |
| Structural sheathing | 3/8 | 1 3/8 | 8d (2 ½" x0.131" common) | 200 | 200 | 200 | 200 |
| | 7/16 | 1 3/8 | 8d(2 ½" x0.131" common) | 255 | 395 | 505 | 670 |
| | 15/32 | 1 3/8 | 8d(2 ½"x0.131" common | 280 | 430 | 550 | 730 |
| | | 1 ½ | 10d(3"x0.148" common | 340 | 510 | 665 | 870 |
| Sheathing, plywood siding except Group 5 Species | 3/8 | 1 3/8 | 8d (2 ½ x0.113") | 160 | 200 | 200 | 200 |

For SI: 1 inch = 25.4 mm, 1 foot= 25.4mm, 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. (2) 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-incyh nominal or 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. For grooved panel siding. The normal panel thickness is the thickness of the panel measured at the point of nailing.

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 thicker, and nails shall be staggered where nails are spaced 2 inches on center or less.

f. Framing at adjoining panel edges shall be 3 inches nominal or thicker, and nails shall be staggered where both of the following conditions are met: (1) (3"x0.148") nails having penetration into framing of more than 1-1/2 inches and (2) nails are spaced 3 inches on center or less.

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 at all panel edges shall be staggered.

i. 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 at all panel edges. See Section 4.3.6.1 and 4.3.6.4.3 of AF&PA SDPWS for sill plate size and anchorage requirements.

j. Galvanized nails shall be hot dipped or tumbled.

k. 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.

l. The maximum allowable shear value for three-ply plywood resisting seismic forces is 200 pounds per foot (2.92 kn/m).

**Section** **Table 2306.4.5** is added to Chapter 23 of the 2010 California Building Code and reads, in words and figures, 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[l] | 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<br>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<br>16 Ga. Galv. Staple, 1-1/8" long<br>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<br>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<br>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<br>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<br>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<br>Face ply-8d ciiker (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] |

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.

**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 <u>for structures not assigned to Seismic Design Category D, E or F.</u>

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

**Exception:** Stone and 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 and spaced a maximum of 16 inches on center.

Exception: 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 15/32 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.

Wood structural panel sheathing shall be a minimum of 15/32 inch thick nailed with 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.

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

**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] | $S_{DS} < 0.50$ | $0.50 \leq S_{DS} < 0.75$ | $0.75 \leq S_{DS} \leq 1.00$ | $S_{DS} > 1.00$ |
|---|---|---|---|---|---|
| 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 |

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, Portland cement plaster or gypsum sheathing boards; S-W = wood structural panels.

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;

d. S-W sheathing shall be a minimum of 15/32" thick nailed with 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.

**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 2304.9.1. Wall sheathing shall not be attached to framing members by adhesives. Staple fasteners in Table 2304.9.1 shall

not be used to resist or transfer seismic forces in structures assigned to Seismic Design Category D, E or F.

Exception: Staples may be used to resist or transfer seismic forces when the allowable shear values are substantiated by cyclic testing and approved by the building official.

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 inches (6096 mm) intervals along the top plate of discontinuous vertical framing.

**SECTION 5.** **15.04.250 Restrictions in fire zones,** of the Calabasas Municipal Code is hereby deleted in its entirety.

**SECTION 6.** 15.04.300 of the Calabasas Municipal Code is hereby amended to read as follows:

**15.04.300 Existing Structures.** The following sections and subsections of Chapter 34 of the ~~2007~~ 2010 California Building Code and are amended or added to read, in words and figures, as follows:

**3402.1 Definitions.** For the purposes of this chapter, the following definition applies and is hereby added to Section 3402.1, Definitions of the ~~2007~~ 2010 California Building Code (CBC):

**3403.5 Repairs.** For the purposes of this chapter, the following repair requirements are hereby added as a new Subsection 3403.5 to Section 3403 Additions, Alterations or Repair in the ~~2007~~ 2010 California Building Code (CBC):

**SECTION 7.** 15.04.350 of the Calabasas Municipal Code shall be readopted without amendment.

**15.04.350 Safety assessment placards.**

**SECTION 8.** 15.04.355 of the Calabasas Municipal Code shall be readopted without amendment:

**15.04.355 Barriers for swimming pools, spas, and hot tubs.**

**SECTION 9.** 15.04.360 of the Calabasas Municipal Code is amended to read as follows:

**15.04.360 Appendix A** of the ~~2007~~ 2010 California Building Code is hereby adopted.

**SECTION10.** 15.04.370 of the Calabasas Municipal Code is amended to read as follows:

**15.04.370 Appendix C** of the ~~2007~~ 2010 California Building Code is hereby adopted.

**SECTION 11.** 15.04.375 is hereby added to the Calabasas Municipal to read as follows:

**15.04.375 Appendix F** of the ~~2007~~ 2010 California Building Code is hereby adopted.

**SECTION 12.** 15.04.380 of the Calabasas Municipal Code is amended to read as follows:

**15.04.380 Appendix G** of the ~~2007~~ 2010 California Building Code is hereby adopted

**SECTION 13.** 15.04.385 of the Calabasas Municipal Code is amended to read as follows:

**15.04.385 Appendix H** of the ~~2007~~ 2010 California Building Code is hereby adopted.

**SECTION 14.** 15.04.390 of the Calabasas Municipal Code is amended to read as follows:

**15.04.390 Appendix I** of the ~~2007~~ 2010 California Building Code is hereby adopted.

**SECTION 15.** 15.04.395 of the Calabasas Municipal Code is amended to read as follows:

**15.04.395 Appendix J** of the ~~2007~~ 2010 California Building Code is hereby adopted and the following sections are amended to read as follows:

**Section J103.1 Permits required.** Except as exempted in Section J103.2, no grading shall be performed without first having obtained a permit therefor from the ~~building official~~ City Engineer. A grading permit does not include the construction of retaining walls or other structures.

**Section J105.2 Special Inspections.** The special inspection requirements of Section 1704.7 shall apply to work performed under a grading permit where required by the ~~building official~~ City Engineer.

**SECTION 16.** Article II of Chapter 15.04 of the Municipal Code, shall be renamed "California Residential Code" and shall provide as follows:

**15.04.410 2010 California Residential Code adopted.**

A. The 2010 California Residential Code, together with the appendices, which regulate the erection, construction, enlargements, alteration, repair, moving, removal, conversion, demolition, occupancy, use, equipment, height, area, security, abatement, and maintenance of buildings or structures of detached one-and-two-family dwelling, townhouse not more than three stories above grade plane in height, provide for the issuance of permits and collection of fees therefore, and provide for penalties for violation thereto, are hereby adopted by reference, and conflicting ordinances are hereby repealed.

B. All of the regulations, provisions, conditions, and terms of said codes, together with their appendices, one copy of which will be on file and accessible to the public for inspection at the City Clerk's office, are hereby referred to, adopted and made part of this chapter as if fully set forth in this chapter with the exceptions, deletions, additions, and amendments thereto as set forth in this subchapter.

**15.04.420 Penalty**

Every person violating any provision of the 2010 California Residential Code and appendices, adopted by reference by 15.04.410, or of any permit or license granted thereunder, or any rules or regulations promulgated pursuant thereto, is guilty of a misdemeanor. Upon conviction thereof, he or she shall be punishable by a fine not-to-exceed one thousand dollars ($1,000.00) or imprisonment not-to-exceed six months, or by both such fine and imprisonment. The imposition of such penalty for any violation shall not excuse the violation or permit it to continue. Each day that a violation occurs shall constitute a separate offense.

**15.04.430 Definitions.**

Notwithstanding the provisions of Section 15.04.010, whenever the names or terms defined in this section are used in this code, each such name or term shall be deemed or construed to have in the meaning ascribed to it in this section.

"Board of supervisors" means the city of Calabasas city council.

"Building official and engineer" or "County engineer" means the building official of the city of Calabasas.

"County" or "County of Los Angeles" or "Unincorporated Territory of the County of Los Angeles" means the city of Calabasas.

"Grading code" means Title 15.10, 15.11, 15.12 grading and site development standards of the Calabasas Municipal Code.

### 15.04.440 Structural Amendments

The following subsections within Chapter 3 of the 2010 California Residential Code shall be revised to read as follows:

**R301.1.3.2 Woodframe structures.**

The building official shall require construction documents to be approved and stamped by a California licensed architect or engineer for all dwellings of wood frame construction more than two stories and basement in height located in Seismic Design Category A, B or C. Notwithstanding other sections of the law, the law establishing these provisions is found in Business and Professions Code Section 5537 and 6737.1.

The building official shall require construction documents to be approved and stamped by a California licensed architect or engineer for all dwellings of wood frame construction more than one story in height or with a basement located in Seismic Design Category $D_0$, $D_1$, or $D_2$.

**R301.1.4 Seismic design provisions for buildings constructed on or into slopes steeper than one unit vertical in three units horizontal (33.3 percent slope).** The design and construction of new buildings and additions to existing buildings when constructed on or into slopes steeper than one unit vertical in three units horizontal (33.3 percent slope) shall comply with Section 1613.12 of the California Building Code.

**R301.2.2.2.5 Irregular buildings.** Prescriptive construction as regulated by this code shall not be used for irregular structures located in Seismic Design Categories C, Do, D1 and D2. Irregular portions of structures shall be designed in accordance with accepted engineering practice to the extent the irregular features affect the performance of the remaining structural system. When the forces associated with the irregularity are resisted by a structural system designed in accordance with accepted engineering practice, design of the remainder of the building shall be permitted using the provisions of this code. A building or portion of a building shall be considered to be irregular when one or more of the following conditions occur:

1. When exterior shear wall lines or braced wall panels are not in one plane vertically from the foundation to the uppermost story in which they are required.

3. When the end of a braced wall panel occurs over an opening in the wall below.

5. When portions of a floor level are vertically offset.

**Section R301.2.2.3.5.1 is added to Section 301.2.2.3.5 of the 2010 Edition of the California Residential Code as follows:**

**Section R301.2.2.3.5.1 AISI S230, Section B1.** Modify AISI S230, Section B1 to read as follows:

Where No. 8 screws are specified, the required number of screws in a steel-to-steel connection shall be permitted to reduce in accordance with the reduction factors in Table B1-1 when larger screws are used or when the sheets of steel being connected are thicker than 33 mils (0.84mm). When applying the reduction factor, the resulting number of screws shall be rounded up.

**R322.1.4.1 Determination of design flood elevations.** If design flood elevations are not specified, the building official is authorized to require the applicant to:

1. Obtain and reasonably use data available from federal, state, or other source; or
2. Determine the design flood elevation in accordance with accepted hydrologic and hydraulic undertaken by a registered civil engineer who shall determine that the technical methods used reflect currently accepted engineering practice. Studies, analyses and computations shall be submitted insufficient detail to allow thorough review and approval.

**Chapter 4 of the 2010 California Residential Code is amended and the following subsections shall read as follows:**

**R401.1 Application.** The provisions of this chapter shall control the design and construction of the foundation and foundation spaces for all buildings. In addition to the provisions of this chapter, the design and construction of foundations in areas prone to flooding as established by Table R301.2(1) shall meet the provisions of Section R322. Wood foundations shall be designed and installed in accordance with AF&PA PWF.

**Exception:** The provisions of this chapter shall be permitted to be used for wood foundations only in the following situations:

1. In buildings that have no more than two floors and a rood.

2. When Interior basement and foundation walls are constructed at intervals not exceeding 50 feet (15 240mm).
Wood foundations in Seismic Design Category $D_0$, $D_1$, or $D_2$ shall not be permitted.

**Exception:** In non-occupied, single-story, detached storage sheds and similar uses other than carport or garage, provided the gross floor area does not exceed 200

square feet, the plate height does not exceed 12 feet in height above the grade plane at any point, and the maximum rood projection does not exceed 24 inches.

**R403.1.2 Continuous footing in Seismic Design Categories D0, D1, and D2.** The braced wall panels at exterior walls of buildings located in Seismic Design Categories $D_0$, $D_1$, and $D_2$ shall be supported by continuous footings. All required interior braced wall panels in buildings be supported by continuous footings.

**R403.1.3 Seismic reinforcing.** Concrete footings located in Seismic Design Categories $D_0$, $D_1$, and $D_2$, as established in Table R301.2(1), shall have minimum reinforcement. Bottom reinforcement shall be located a minimum of 3 inches (76 mm) clear from the bottom of the footing

In Seismic Design Categories $D_0$, $D_1$, and $D_2$ where construction joint is created between a concrete footing and a stem wall, a minimum of one No. 4 bar shall be installed at not more than 4 feet (1219 mm) on center. The vertical bar shall extend 3 inches (76 mm) clear of the bottom of the footing, have a standard hook and extend a minimum of 14 inches (357 mm) into the stem wall.

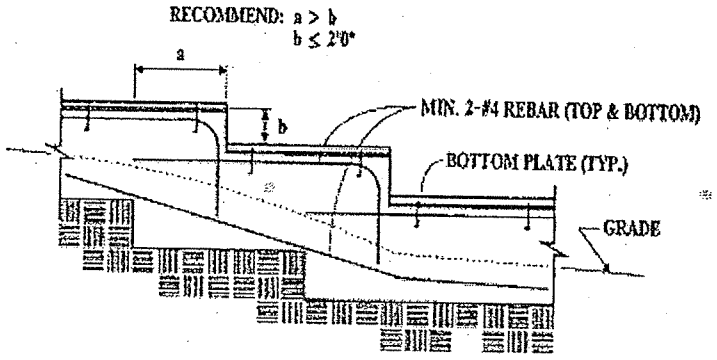
In Seismic Design Categories $D_0$, $D_1$, and $D_2$ where a grouted masonry stem wall is supported on a concrete footing and stem wall, a minimum of one No. 4 bar shall be installed at not more than 4 feet (1219 mm) on center. The vertical bar shall extend 3 inches (76 mm) clear of the bottom of the footing and have a standard hook.

In Seismic Design Categories $D_0$, $D_1$, or $D_2$ masonry stem walls without solid grout and vertical reinforcing are not permitted.

**Exception:** in detached one- and two-family dwellings located in Seismic Design Category A, B or C which are three stories or less in height and constructed with stud bearing walls, plain concrete footings without longitudinal reinforcement supporting walls and isolated plain concrete footings supporting columns or pedestals are permitted.

**R403.1.5 Slope.** The top surface of footings shall be level. The bottom surface of footings shall be 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).

For structures located in Seismic Design Categories $D_0$, $D_1$, or $D_2$, stepped footings shall be reinforced with four 1/2-inch diameter (12.7 mm) deformed reinforcing bars. Two bars shall be placed at the top and bottom of the footings as shown in Figure R403.1.5.




STEPPED FOUNDATIONS

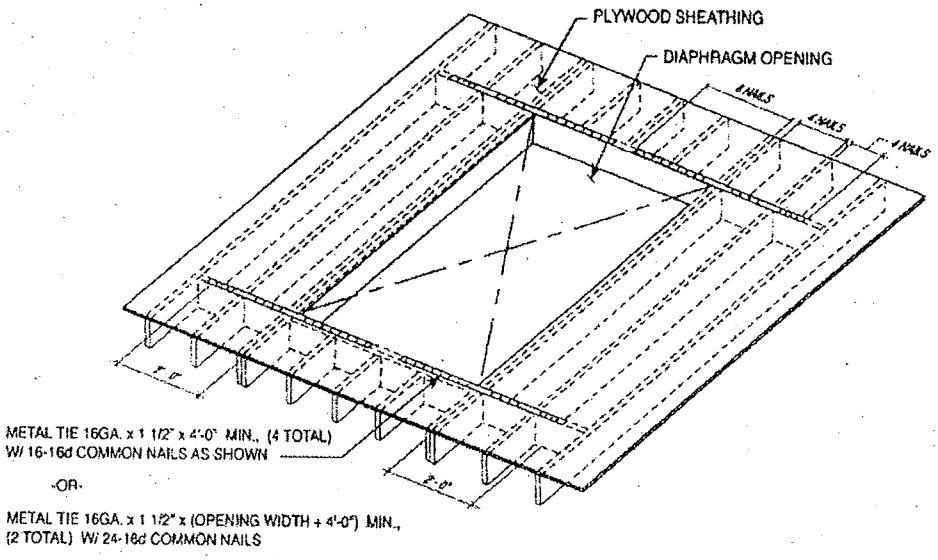
**R404.2 Wood foundation walls.** Wood foundation walls shall be constructed in accordance with the provisions of Sections R404.2.1 through R404.2.6 and with the details shown in figures R403.1 (2) and R403.2 (3). Wood foundation walls shall not be used for structures located in Seismic Design Category $D_0$, $D_1$, or $D_2$.

**Section Chapter 5 of the 2010 California Residential Code is amended and the following subsections shall read as follows:**

**R501.1 Application.** The provision of this chapter shall control the design and construction of the floors for all buildings including the floors of attic spaces used to house mechanical or plumbing fixtures and equipment weighing less than 400 lbs and a maximum height of 4 feet above the floor or attic level.

**Section R503.2.4** is added to Chapter 5 of the 2010 Edition of the California Residential Code to read as follows:

**R503.2.4 Openings in horizontal diaphragms.** Openings in horizontal diaphragms with a dimension perpendicular to the joist that is greater than 4 feet (1.2 m) shall be constructed in accordance with Figure R503.2.4.




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

a. Blockings shall be provided beyond headers.
b. Metal ties not less than 0.058 inch [1.47 mm (16 galvanized gage)] by 1.5 inches (38 mm) wide with eight 16d common nails on each side of the header-joist intersection. The metal ties shall have a minimum yield of 33,000 psi (227 MPa).
c. Openings in diaphragms shall be further limited in accordance with Section R301.2.2.2.5.

Chapter 6 of the 2010 California Residential Code is amended and the following subsections shall read as follows:

**Lines 34 thru 37 of Table R602.3(1)**
**Other Wall Sheathing[h]**

| | | | | |
|---|---|---|---|---|
| 34 | ½"structural cellulosic fiberboard sheathing | ½" galvanized roofing nail | 3 | 6 |
| 35 | 25/32" structural cellulosic fiberboard sheathing | 1 ¾ " galvanized roofing nail | 3 | 6 |
| 36 | ½ " gypsum sheathing[d] | 1 ½ " galvanized roofing nail, 1 ¼ screws, Type W or S | 7 | 7 |
| 37 | 5/8" gypsum sheathing[d] | 1 ¾ " galvanized roofing nail, 1 5/8" screws, Type W or S | 7 | 7 |

**Table R602.3(2)**

**Wood structural panels subfloor, roof and wall sheathing to framing and particleboard wall sheathing to framing[f]**

| | | | |
|---|---|---|---|
| up to 1/2 | 0.097 - 0.099 Nail 2 1/4 | 3 | 6 |
| 19/32 and 5/8 | 0.113 Nail 2 | 3 | 6 |
| | 0.097 - 0.099 Nail 2 1/4 | 4 | 8 |
| 23/32 and 3/4 | 0.097 - 0.099 Nail 2 1/4 | 4 | 8 |
| 1 | 0.113 Nail 2 1/4 | 3 | 6 |

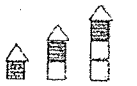
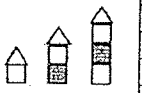
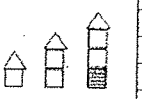
**Floor underlayment: plywood hardboard-particleboard[f]**

**Plywood**

| | | | |
|---|---|---|---|
| 1/4 and 5/16 | 1 1/4 ring or screw shank nail-minimum 12 1/2 ga (0.099") shank diameter | 3 | 6 |
| 11/32, 3/8, 15/32, and 1/2 | 1 1/4 ring or screw shank nail-minimum 12 1/2 ga (0.099") shank diameter | 6 | 8[e] |
| 19/32, 5/8, 23/32, and 3/4 | 1 1/4 ring or screw shank nail-minimum 12 1/2 ga (0.099") shank diameter | 6 | 8 |

# Table R602.10.1.2(2)

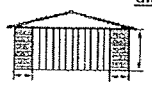
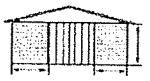
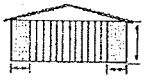
TABLE R602.10.1.2(2)[a, b, c]
BRACING REQUIREMENTS BASED ON SEISMIC DESIGN CATEGORY
(AS A FUNCTION OF BRACED WALL LINE LENGTH)

| SOIL CLASS D[a]<br>WALL HEIGHT = 10 FT<br>10 PSF FLOOR DEAD LOAD<br>15 PSF ROOF/CEILING DEAD LOAD<br>BRACED WALL LINE SPACING ≤ 25 FT | | | MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE | | | |
|---|---|---|---|---|---|---|
| Seismic Design Category (SDC) | Story Location | Braced Wall Line Length | Method LIB | Methods[d] DWB, SFB, GB, PBS, PCP, HPS | Method WSP | Continuous Sheathing |
| SDC $D_0$ or $D_1$ |  | 10 | NP | ~~3.0~~ 6.0 | 2.0 | 1.7 |
| | | 20 | NP | ~~6.0~~ 12.0 | 4.0 | 3.4 |
| | | 30 | NP | ~~9.0~~ 18.0 | 6.0 | 5.1 |
| | | 40 | NP | ~~12.0~~ 24.0 | 8.0 | 6.8 |
| | | 50 | NP | ~~15.0~~ 30.0 | 10.0 | 8.5 |
| |  | 10 | NP | ~~6.0~~ NP | 4.5 | 3.8 |
| | | 20 | NP | ~~12.0~~ NP | 9.0 | 7.7 |
| | | 30 | NP | ~~18.0~~ NP | 13.5 | 11.5 |
| | | 40 | NP | ~~24.0~~ NP | 18.0 | 15.3 |
| | | 50 | NP | ~~30.0~~ NP | 22.5 | 19.1 |
| |  | 10 | NP | ~~8.5~~ NP | 6.0 | 5.1 |
| | | 20 | NP | ~~17.0~~ NP | 12.0 | 10.2 |
| | | 30 | NP | ~~25.5~~ NP | 18.0 | 15.3 |
| | | 40 | NP | ~~34.0~~ NP | 24.0 | 20.4 |
| | | 50 | NP | ~~42.5~~ NP | 30.0 | 25.5 |
| SDC $D_2$ | | 10 | NP | ~~4.0~~ 8.0 | 2.5 | |
| | | 20 | NP | ~~8.0~~ 16.0 | 5.0 | |
| | | 30 | NP | ~~12.0~~ 24.0 | 7.5 | |
| | | 40 | NP | ~~16.0~~ 32.0 | 10.0 | |
| | | 50 | NP | ~~20.0~~ 40.0 | 12.5 | |
| | | 10 | NP | ~~7.5~~ NP | 5.5 | |
| | | 20 | NP | ~~15.0~~ NP | 11.0 | |
| | | 30 | NP | ~~22.5~~ NP | 16.5 | |
| | | 40 | NP | ~~30.0~~ NP | 22.0 | |
| | | 50 | NP | ~~37.5~~ NP | 27.5 | |
| | | 10 | NP | NP | NP | |
| | | 20 | NP | NP | NP | |
| | | 30 | NP | NP | NP | |
| | | 40 | NP | NP | NP | |
| | | 50 | NP | NP | NP | |

d. Methods GB and PCP braced wall panel h/w ratio shall not exceed 1:1 in SDC $D_0$, $D_1$, and $D_2$. Methods DWB, SFB, PBS, and HPS are not permitted in SDC $D_0$, $D_1$, and $D_2$.

## Table R602.10.2

TABLE R602.10.2
INTERMITTENT BRACING METHODS[a]

| | | | | |
|---|---|---|---|---|
| WSP | Wood structural panel (see Section R604) | ~~3/8"~~ 15/32" |  | 8d common (2 ½" x 0.131) nails at 6" spacing (panel edge) at 12" spacing (intermediate supports), 3/8" edge distance to panel edge ~~For exterior/interior sheathing see Table R602.3(3) For interior sheathing see Table R602.3(1)~~ |
| SFB | Structural fiberboard sheathing | 1/2" or 25/32" for maximum 16" stud spacing | | 1 1/2" galvanized roofing nails or 8d common (2 1/2" x 0.131) nails at 3" spacing (panel edges) at 6" spacing (intermediate supports) |
| GB | Gypsum board | 1/2" |  | Nails or screws at 7" spacing at panel edges including top and bottom plates; for all braced wall panel locations for exterior sheathing nail or screw size, see Table R602.3(1); for interior gypsum board nail or screw size, see Table R702.3.5 |
| PBS | Particleboard sheathing (see Section R605) | 3/8" or 1/2" for maximum 16" stud spacing | | 1 1/2" galvanized roofing nails or 8d common (2 1/2" x 0.131) nails at 3" spacing (panel edges) at 6 spacing (intermediate supports) |
| PCP | Portland cement plaster | See Section R703.6 For maximum 16" stud spacing |  | 1 1/2", 11 gage, 7/16" head nails at 6" spacing ~~or 7/8", 16 gage staples at 6" spacing~~ |

a. Methods GB and PCP braced wall panel h/w ratio shall not exceed 1:1 in SDC $D_0$, $D_1$, and $D_2$. Methods LIB, DWB, SFB, PBS, HPS, and PFG are not permitted in SDC $D_0$, $D_1$, and $D_2$.

## Figure R602.10.3.

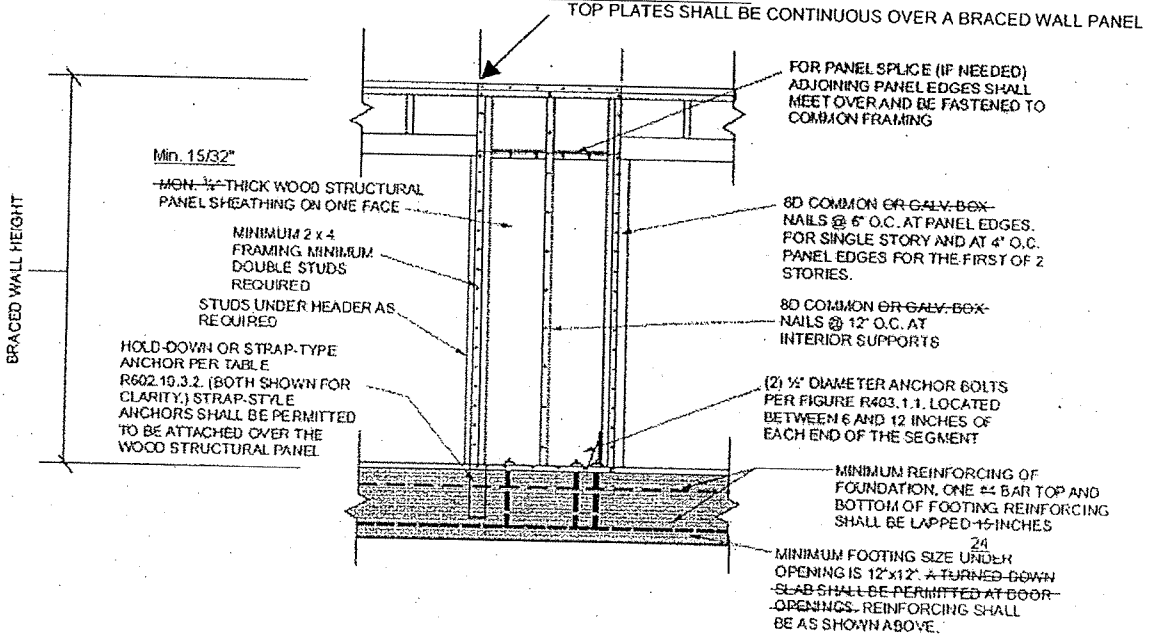



FIGURE R602.10.3.2
ALTERNATE BRACED WALL PANEL

## Figure R602.10.3

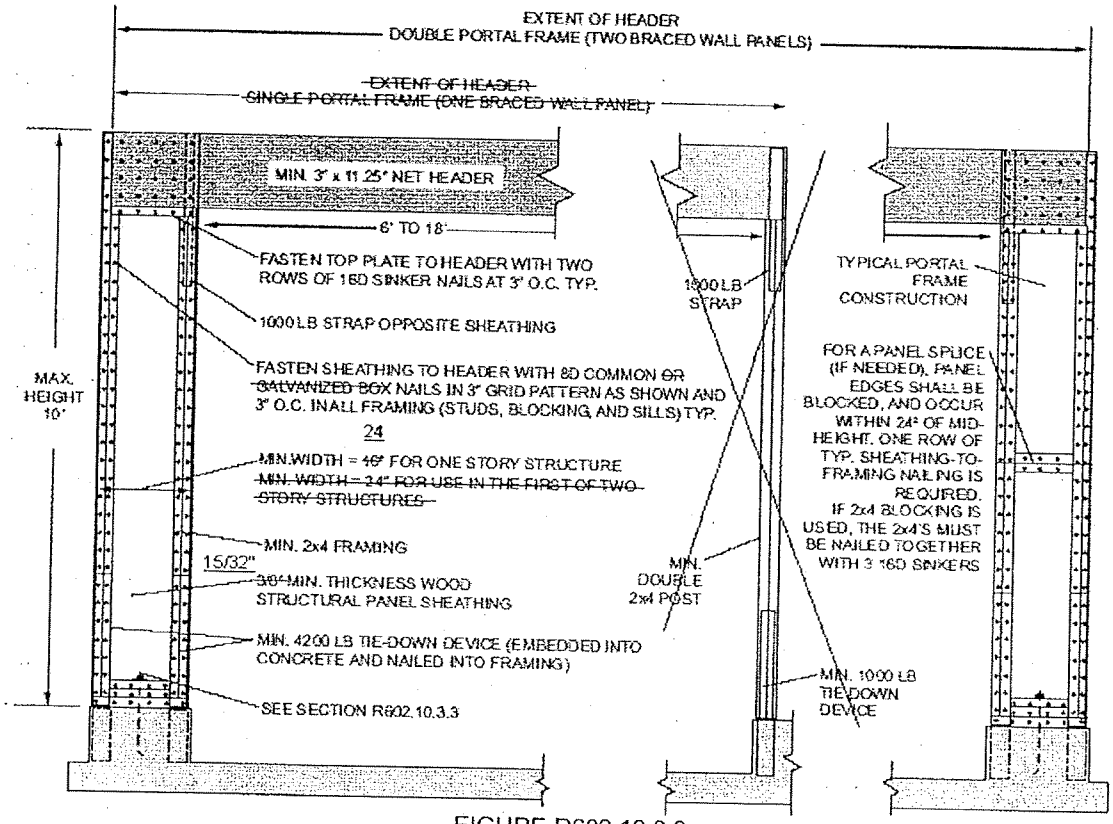


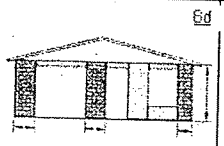
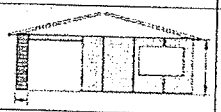
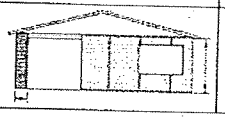

FIGURE R602.10.3.3
METHOD PFH: PORTAL FRAME WITH HOLD-DOWNS AT DETACHED GARAGE DOOR OPENINGS

**Section R602.10.3.**

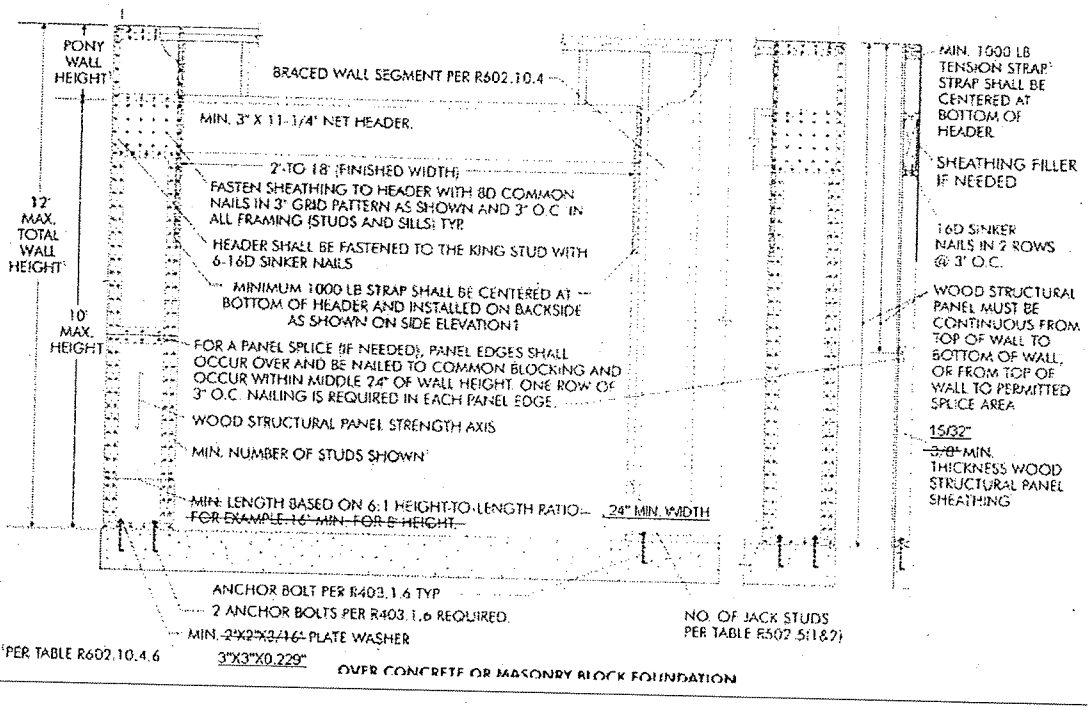
1. Each panel shall be fabricated in accordance with Figure R602.10.3.3. The wood structural panel sheathing shall extend up over the solid sawn or glued-laminated header and shall be nailed in the side of the built-up beam opposite the wood structural panel sheathing. The header shall extend between the inside faces of the first full-length outer studs of each panel. One anchor bolt not less than $^{5}/_{8}$- inch-diameter (16 mm) and installed in accordance with Section R403.1.6 shall be provided in the center of each sill Oplate. The hold-down devices shall be an embedded-strap type, installed in accordance with the manufacturer's recommendations. The panels shall be supported directly on a foundation that is continuous across the entire length of the braced wall line. The foundation shall be reinforced as shown on Figure R602.10.3.2. This reinforcement shall be lapped not less than 24 inches (610 mm) with the reinforcement required in the continuous foundation located directly under the braced wall line.

## Table R602.10.4.

TABLE R602.10.4.1
CONTINUOUS SHEATHING METHODS

| METHOD | MATERIAL | MINIMUM THICKNESS | FIGURE | CONNECTION CRITERIA |
|---|---|---|---|---|
| CS-WSP | Wood structural panel | 15/32" ~~3/8"~~ |  ~~6d~~ | ~~6d~~ common (2" × 0.113") nails at 6" spacing (panel edges) and at 12" spacing (intermediate supports) ~~or 16 ga. x 1 3/4 staples at 3" spacing (panel edges) and 6" spacing (intermediate supports)~~ |
| CS-G | Wood structural panel adjacent to garage openings and supporting roof load only[a,b] | 15/32" ~~3/8"~~ |  | See Method CS-WSP |
| CS-PF | Continuous portal frame | See Section R602.10.4.1.1 |  | See Section R602.10.4.1.1 |

## Figure R602.10.4.1.




**Section** **R602.10.7.1** of the 2010 California Residential Code is deleted in its entirety.

**Section** **R606.2.4** of the 2010 California Residential Code is amended to read as follows:

**R606.2.4 Parapet walls.** Unreinforced solid masonry parapet walls shall not be less than 8 inches (203 mm) thick and their height shall not exceed four times their thickness.

Unreinforced hollow unit masonry parapet wall shall not be less than 8 inches (203 mm) thick, and their height shall not exceed three times their thickness. Masonry parapet walls in areas subject to wind loads of 30 pounds per square foot (1.44 kPa) or located in Seismic Design Category $D_0$, $D_1$, or $D_2$, or on townhouses in Seismic Design Category C shall be reinforced in accordance with Section R606.12.

**R606.12.2.2.3 Reinforcement of requirements for masonry elements.** Masonry elements listed in Section R606.12.2.2.2 shall be reinforced in either the horizontal or vertical direction as shown in Figure R606.11(3) and in accordance with the following:

1. Horizontal reinforcement. Horizontal joint reinforcement shall consist of at least one No. 4 bar spaced not more than 48 inches (1219 mm). Horizontal reinforcement shall be provided within 16 inches (406 mm) of the top and bottom of these masonry elements.

2. Vertical reinforcement. Vertical reinforcement shall consist of at least one No. 4 bar spaced not more than 48 inches (1219 mm). Vertical reinforcement shall be within 8 inches (406 mm) of the ends of masonry walls.

**Exception of Section 602.3.2**

Exception: In other than Seismic Design Category $D_0$, $D_1$, or $D_2$, a single top plate maybe installed in stud walls, provided the plate is adequately tied at joints, corners and interesting walls by a minimum of 3-inch-by-6-inch by a 0.036 inch-thick (76 mm by 152 mm by 0.914 mm) galvanized steel plate that is nailed to each wall or segment of wall by six 8d nails on each side, provided the rafters or joists are centered over the studs with a tolerance of no more than 1 inch (25 mm). The top plate may be omitted over lintels that are adequately tied to adjacent wall sections with steel plates or equivalent as previously described.

**Chapter 8 of the 2010 California Residential Code is amended and the following subsections shall read as follows:**

**Footnote "I" is added to Table R802.5.1(9)**

Edge distances, end distances and spacings for nails shall be sufficient to prevent splitting of the wood.

**R802.8 Lateral support.** Roof framing members and ceiling joists having a depth-to-thickness ratio exceeding 2 to 1 based on nominal dimensions shall be provided with lateral support at points of bearing to prevent rotation. For roof rafters with ceiling joists attached per Table R602.3(1), the depth-thickness ratio for the total assembly

shall be determined using the combined thickness of the rafter plus the attached ceiling joist.

**R802.10.2 Design.** Wood trusses shall be designed in accordance with accepted engineering practice. The design and manufacture of metal-plate-connected wood trusses shall comply with ANSI/TPI 1. The truss design drawings shall be prepared by a registered professional.

**R803.2.4 Openings in horizontal diaphragms.** Openings in horizontal diaphragms shall conform with Section R503.2.4.

**Chapter 10 of the 2010 California Residential Code is amended and the following subsections shall read as follows:**

**R1001.3.1 Vertical reinforcing.** For chimneys up to 40 inches (1016 mm) wide, four No. 4 continuous vertical bars adequately anchored into the concrete foundation shall be placed between wythes of solid masonry or within the cells of hollow unit masonry and grouted in accordance with Section R609. Grout shall be prevented from bonding with the flue liner so that the flue liner is free to move with thermal expansion. For chimneys more than 40 inches (1016 mm) wide, two additional No. 4 vertical bars adequately anchored into the concrete foundation shall be provided for each additional flue incorporated into the chimney or for each additional 40 inches (1016 mm) in width or fraction thereof.

**SECTION 17.** **Section 15.04.450** of the Calabasas Municipal Code is hereby added to read as follows.

**15.04.450 Existing Structures.**

The following sections of the Residential Code are added to provide as follows:

**R1101 Compliance with other codes.** Alterations, repairs, additions, changes of occupancy and maintenance of all structures shall comply with the provisions for alterations, repairs, additions, changes of occupancy and maintenance of all structures in the California Fire Code, California Plumbing Code, California Mechanical Code, California Electrical Code, Title 25, California Code of Regulations, Division 1, Chapter 1, Subchapter 1, Article 1 (a) and (b) and California Health and Safety Code Sections 17920-17927.

*(HCD 1) See Chapter 34, Section 3403.1, Exception 2 and Title 25, Division 1, Chapter 1, Subchapter 1, Article 1, commencing with Section 1 for existing buildings or structures.*

**R1102 Substandard Buildings.** Any building or portion thereof including any dwelling unit, guestroom or suite of rooms, or the premises on which the same is located, in which there exists any of the following listed conditions to an extent that endangers the

life, limb, health, property, safety, or welfare of the public or the occupants thereof shall be deemed and hereby is declared to be a substandard building:

(a) Inadequate sanitation shall include, but not be limited to, the following:

(1) Lack of, or improper water closet, lavatory, or bathtub or shower in a dwelling unit.

(2) Lack of, or improper water closets, lavatories, and bathtubs or showers per number of guests in a hotel.

(3) Lack of, or improper kitchen sink.

(4) Lack of hot and cold running water to plumbing fixtures in a hotel.

(5) Lack of hot and cold running water to plumbing fixtures in a dwelling unit.

(6) Lack of adequate heating.

(7) Lack of, or improper operation of required ventilating equipment.

(8) Lack of minimum amounts of natural light and ventilation required by this code.

(9) Room and space dimensions less than required by this code.

(10) Lack of required electrical lighting.

(11) Dampness of habitable rooms.

(12) Infestation of insects, vermin, or rodents as determined by the health officer.

(13) General dilapidation or improper maintenance.

(14) Lack of connection to required sewage disposal system.

(15) Lack of adequate garbage and rubbish storage and removal facilities as determined by the health officer.

(b) Structural hazards shall include, but not be limited to, the following:

(1) Deteriorated or inadequate foundations.

(2) Defective or deteriorated flooring or floor supports.

(3) Flooring or floor supports of insufficient size to carry imposed loads with safety.

(4) Members of walls, partitions, or other vertical supports that split, lean, list, or buckle due to defective material or deterioration.

(5) Members of walls, partitions, or other vertical supports that are of insufficient size to carry imposed loads with safety.

(6) Members of ceilings, roofs, ceilings and roof supports, or other horizontal members which sag, split, or buckle due to defective material or deterioration.

(7) Members of ceiling, roofs, ceiling and roof supports, or other horizontal members that are of insufficient size to carry imposed loads with safety.

(8) Fireplaces or chimneys which list, bulge, or settle due to defective material or deterioration.

(9) Fireplaces or chimneys which are of insufficient size or strength to carry imposed loads with safety.

(c) Any nuisance.

(d) All wiring, except that which conformed with all applicable laws in effect at the time of installation if it is currently in good and safe condition and working properly.

(e) All plumbing, except plumbing that conformed with all applicable laws in effect at the time of installation and has been maintained in good condition, or that may not have conformed with all applicable laws in effect at the time of installation but is currently in good and safe condition and working properly, and that is free of cross connections and siphonage between fixtures.

(f) All mechanical equipment, including vents, except equipment that conformed with all applicable laws in effect at the time of installation and that has been maintained in good and safe condition, or that may not have conformed with all applicable laws in effect at the time of installation but is currently in good and safe condition and working properly.

(g) Faulty weather protection, which shall include, but not be limited to, the following:

(1) Deteriorated, crumbling, or loose plaster.

(2) Deteriorated or ineffective waterproofing of exterior walls, roof, foundations, or floors, including broken windows or doors.

(3) Defective or lack of weather protection for exterior wall coverings, including lack of paint, or weathering due to lack of paint or other approved protective covering.

(4) Broken, rotted, split, or buckled exterior wall coverings or roof coverings.

(h) Any building or portion thereof, device, apparatus, equipment, combustible waste, or vegetation that, in the opinion of the chief of the fire department or his deputy, is in such a condition as to cause a fire or explosion or provide a ready fuel to augment the spread and intensity of fire or explosion arising from any cause.

(i) All materials of construction, except those which are specifically allowed or approved by this code, and which have been adequately maintained in good and safe condition.

(j) Those premises on which an accumulation of weeds, vegetation, junk, dead organic matter, debris, garbage, offal, rodent harborages, stagnant water, combustible materials, and similar materials or conditions constitute fire, health, or safety hazards.

(k) Any building or portion thereof that is determined to be an unsafe building due to inadequate maintenance, in accordance with the latest edition of the Uniform Building Code.

(l) All buildings or portions thereof not provided with adequate exit facilities as required by this code, except those buildings or portions thereof whose exit facilities conformed with all applicable laws at the time of their construction and that have been adequately maintained and increased in relation to any increase in occupant load, alteration or addition, or any change in occupancy.

When an unsafe condition exists through lack of, or improper location of, exits, additional exits may be required to be installed.

(m) All buildings or portions thereof that are not provided with the fire-resistive construction or fire-extinguishing systems or equipment required by this code, except those buildings or portions thereof that conformed with all applicable laws at the time of their construction and whose fire-resistive integrity and fire-extinguishing systems or equipment have been adequately maintained and improved in relation to any increase in occupant load, alteration or addition, or any change in occupancy.

(n) All buildings or portions thereof occupied for living, sleeping, cooking, or dining purposes that were not designed or intended to be used for those occupancies.

(o) Inadequate structural resistance to horizontal forces.

"Substandard building" includes a building not in compliance with Section 13143.2. of the California Health and Safety Code. However, a condition that would require displacement of sound walls or ceilings to meet height, length, or width requirements for ceilings, rooms, and dwelling units shall not by itself be considered sufficient existence of dangerous conditions making a building a substandard building, unless the building was constructed, altered, or converted in violation of those requirements in effect at the time of construction, alteration, or conversion.

**R1103 Definitions.** For the purposes of this chapter, the following definition applies and is hereby added to Section R 202 Definitions of the 2010 California Residential Code (CRC):

**Substantial Structural Damage** – A condition where:

1. In any story, the vertical elements of the lateral-force-resisting system, have suffered damage such that the lateral load-carrying capacity of the structure in any direction has been reduced by more than 20 percent from its pre-damaged condition, or

2. The capacity of any vertical gravity load-carrying component, or any group of such components, that supports more than 30 percent of the total area of the structure's floor(s) and roof(s) has been reduced more than 20 percent from its pre-damaged condition, and the remaining capacity of such affected elements with respect to all dead and live loads is less than 75 percent of that required by the building code for new buildings of similar structure, purpose and location.

**R1104 Repairs.** For the purposes of this chapter, the following repair requirements are hereby added as Additions, Alterations or Repair in the 2010 California Residential Code (CRC):

**R1104.1 Repairs.** Repairs of structural elements shall comply with this section.

**R1104.1.1 Seismic evaluation and design.** Seismic evaluation and design of an existing building and its components shall be based on the following criteria.

**R1104.1.1.1 Evaluation and design procedures.** The seismic evaluation and design shall be based on the procedures specified in the building code, ASCE 31 *Seismic Evaluation of Existing Buildings (for evaluation only) or ASCE 41* Seismic rehabilitation of Existing Buildings. The procedures contained in Appendix A of the International Existing Building Code shall be permitted to be used as specified in Section R1104.1.1.3.

**R1104.1.1.2 CRC level seismic forces.** When seismic forces are required to meet the building code level, they shall be one of the following:

1. 100 percent of the values in the building code. The R factor used for analysis in accordance with Chapter 16 of the building code shall be the R factor specified for structural systems classified as "Ordinary" unless it can be demonstrated that the structural system satisfies the proportioning and detailing requirements for systems classified as "Intermediate" or "Special".

2. Forces corresponding to BSE-1 and BSE-2 Earthquake Hazard Levels defined in ASCE 41. Where ASCE 41 is used, the corresponding performance levels shall be those shown in Table R1104.1.1.2.

**TABLE R1104.1.1.2**
**ASCE 41 and ASCE 31 PERFORMANCE LEVELS**

| OCCUPANCY CATEGORY (BASED ON IBC TABLE 1604.5) | PERFORMANCE LEVEL FOR USE WITH ASCE 31 AND WITH ASCE 41 BSE-1 EARTHQUAKE HAZARD LEVEL | PERFORMANCE LEVEL FOR USE WITH ASCE 41 BSE-2 EARTHQUAKE HAZARD LEVEL |
|---|---|---|
| I | Life Safety (LS) | Collapse Prevention (CP) |
| II | Life Safety (LS) | Collapse Prevention (CP) |
| III | Note (a) | Note (a) |
| IV | Immediate Occupancy (IO) | Life Safety (LS) |

a. Performance Levels for Occupancy Category III shall be taken as halfway between the performance levels specified for Occupancy Category II and Occupancy Category IV.

**R1104.1.1.3 Reduced CBC level seismic forces.** When seismic forces are permitted to meet reduced building code levels, they shall be one of the following:

1. 75 percent of the forces prescribed in the building code. The R factor used analysis in accordance with Chapter 16 of the California Building Code shall be the R factor as specified in Section R1104.1.1.2.

2. In accordance with the applicable chapters in Appendix A of the International Existing Building Code as specified in Items 2.1 through 2.5 below. Structures or portions of structures that comply with the requirements of the applicable chapter in Appendix A shall be deemed to comply with the requirements for reduced building code force levels.

2.1 The seismic evaluation and design of un-reinforced masonry bearing wall buildings in Occupancy Category 1 or II are permitted to be based on the procedures specified in Appendix Chapter A1.

2.2 Seismic evaluation and design of the wall anchorage system in reinforced concrete and reinforced masonry wall buildings with flexible diaphragms in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A2.

2.3 Seismic evaluation and design of cripple walls and sill plate anchorage in residential buildings or light-frame wood construction in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A3.

2.4 Seismic evaluation and design of soft, weak, or open-front wall conditions in multiunit residential buildings of wood construction in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A4.

2.5 Seismic evaluation and design of concrete buildings and concrete with masonry infill buildings in all Occupancy Categories are permitted to be based on the procedures specified in Appendix Chapter A5.

3. In accordance with ASCE 31 based on the applicable performance level as shown in Table R1104.1.1.2.

4. Those associated with the BSE-1 Earthquake Hazard Level defined in ASCE 41 and the performance level as shown in Table R1104.1.1.2. Where ASCE 41 is used, the design spectral response acceleration parameters Sxs and Sx1 shall not be taken less than 75 percent of the respective design spectral response acceleration parameters SDS and SD1 defined by the International Building Code and its reference standards.

**R1104.1.2 Wind Design.** Wind design of existing buildings shall be based on the procedures specified in the building code.

**R1105 Repairs to damaged buildings.** Repairs to damaged buildings shall comply with this section.

**R1105.2.1 Unsafe conditions.** Regardless of the extent of structural damage, unsafe conditions shall be eliminated.

**R1105.2.2 Substantial structural damage to vertical elements of the lateral-force-resisting system.** A building that has sustained substantial structural damage to the vertical elements of its lateral-force-resisting system shall be evaluated and repaired in accordance with the applicable provisions of Section R1104.2.1 through R1104.2.3.

**R1105.2.2.1 Evaluation.** The building shall be evaluated by a registered design professional, and the evaluation findings shall be submitted to the code official. The evaluation shall establish whether the damaged building, if repaired to its pre-damage state, would comply with the provisions of the building code. Wind forces for this evaluation shall be those prescribed in the building code. Seismic forces for this evaluation are permitted to be the reduced level seismic forces specified in Code Section R1104.2.1.

**R1105.2.2.2 Extent of repair for compliant buildings.** If the evaluation establishes compliance of the pre-damage building in accordance with Section R1104.2.1, then repairs shall be permitted that restore the building to its pre-damage state, using materials and strengths that existed prior to the damage.

**R1105.2.2.3 Extent of repair for non-compliant buildings.** If the evaluation does not establish compliance of the pre-damage building in accordance with Section R1105.2.2.1, then the building shall be rehabilitated to comply with applicable provisions of the building code for load combinations including wind of seismic forces. The wind design level for the repair shall be as required by the building code in effect at the tie of original construction unless the damage was caused by wind, in which case the design level shall be as required by the code in effect at the time of original construction or as required by the building code, whichever is greater. Seismic forces for this rehabilitation design shall be those required for the design of the pre-damaged building, but not less than the reduced level seismic forces specified in Section R1101.1.3. New structural members and connections required by this rehabilitation design shall comply with the detailing provisions of the building code for new buildings or similar structure, purpose, and location.

**R1105.2.3 Substantial structural damage to vertical load-carrying components.** Vertical load-carrying components that have sustained substantial structural damage shall be rehabilitated to comply with the applicable provisions for dead and live loads in the building code. Undamaged vertical load-carrying components that receive dead or live loads from rehabilitated components shall also be rehabilitated to carry the design loads of the rehabilitation design. New structural members and connections required by this rehabilitation design shall comply with the detailing provisions of the building code for new buildings of similar structure, purpose, and location.

**R1105.2.3.1 Lateral force-resisting elements.** Regardless of the level of damage to vertical elements of the lateral force-resisting system, if substantial structural damage to vertical load-carrying components was caused primarily by wind or seismic effects, then the building shall be evaluated in accordance with Section R1103.5.2.2.1 and, if non-compliant, rehabilitated in accordance with Section R1103.5.2.2.3.

**R1105.2.4 Less than substantial structural damage.** For damage less than substantial structural damage, repairs shall be allowed that restore the building to its pre-damage state, using materials and strengths that existed prior to the damage. New

structural members and connections used for this repair shall comply with the detailing provisions of the building code for new buildings of similar structure, purpose, and location.

**SECTION 18.** **15.04.460** of the Calabasas Municipal Code is hereby added to read as follows:

### 15.04.460 Safety Assessment Placards

A. Intent. This section established standard placards to be used to indicate the condition of a structure for continued occupancy. The section further authorizes the Building Official and his or her authorized representatives to post the appropriate placard at each entry point to a building or structure upon completion of a safety assessment.

B Application of Provisions
The provisions of this chapter are applicable to all buildings and structures of all occupancies regulated by the City of Calabasas. The City Council may extend the provisions as necessary.

C. Definitions
Safety assessment is a visual, non-destructive examination of a building or structure for purpose of determining the condition for continued occupancy.

D Placards
The following are verbal descriptions of the official placards to be used to designate the condition for continued occupancy of buildings or structures.

1. INSPECTED – Lawful Occupancy Permitted is to be posted on any building or structure wherein no apparent structural hazard has been found. This placard is not intended to mean that there is no damage to the building or structure.

2. RESTRICTED USE is to be posted on each building or structure that has been damaged wherein the damage has resulted in some form of restriction to the continued occupancy. The individual who posts this placard will note in general terms the type of damage encountered and will clearly and concisely note the restrictions on continued occupancy.

3. UNSAFE – Do Not Enter or Occupy is to be posted on each building or structure that has been damaged such that continued occupancy poses a threat to life safety. Buildings or structures posted with this placard shall not be entered under any circumstance except as authorized in writing by the Building Official, or his or her authorized representative. Safety assessment teams shall be authorized to enter these buildings at any time. This placard is not to be used or

considered as a demolition order. The individual who posts this placard will note in general terms the type of damage encountered.

i. This ordinance number, the name of the jurisdiction, its address, and phone number shall be permanently affixed to each placard.

ii. Once it has been attached to a building or structure, a placard is not to be removed, altered or covered until done so by an authorized representative of the Building Official. It shall be unlawful for any person, firm or corporation to alter, remove, cover or deface a placard unless authorized pursuant to this section.

**SECTION 19.** 15.04.470 of the Calabasas Municipal Code is amended to read in words and figures, as follows:

**15.04.470 Barriers for Swimming pools, spas, and hot tubs.**

Section 3109.3 of the 2010 California Building Code is amended to read as follows:

3109.3 Outdoor Swimming Pool. An outdoor swimming pool shall be provided with a barrier that shall be installed, inspected and approved prior to plastering or filling with water. The barrier shall comply with the following:

1. The top of the barrier shall be at least 60 inches (1524 mm) above grade measured on the side of the barrier which faces away from the swimming pool. The maximum vertical clearance between grade and the bottom of the barrier shall be 2 inches (51 mm) measured on the side of the barrier which faces away from the swimming pool. The maximum vertical clearance at the bottom of the barrier may be increased to 4 inches (102 mm) when grade is a solid surface such as a concrete deck, or when the barrier is mounted on top of the aboveground pool structure. When barriers have horizontal members spaced less than 45 inches (1143 mm) apart, the horizontal members shall be placed on the pool side of the barrier. Any decorative design work on the side away from the swimming pool, such as protrusions, indentations or cutouts, which render the barrier climbable, is prohibited.

2. Openings in the barrier shall not allow passage of a 1 3/4-inch-diameter (44 mm) sphere.

EXCEPTIONS:

1. When vertical spacing between such openings is 48 inches (1143 mm) or more, the opening size may be increased such that the passage of a 4-inch-diameter (102 mm) sphere is not allowed.

2. For fencing composed of vertical and horizontal members, the spacing between vertical members may be increased up to 4 inches (102 mm) when the distance between the tops of horizontal members is 48 inches (1143 mm) or more.

3. Chain link fences used as the barrier shall not be of less than 11 gage and shall be provided with slats of wood or UV resistant plastic interwoven with the chain link.

3A. Existing chain link fences may be used as the swimming pools, spas, and hot tub barriers and shall be screened as provided for in the City of Calabasas Land Use and Development Code.

3B. Replacement fencing for swimming pools, spas, and hot tub barriers and barriers for new swimming pools, spas, and hot tub barriers shall not be constructed of chain link fencing of any type.

**SECTION 20.** 15.04.480 of the Calabasas Municipal Code is amended to read as follows:

**15.04.480 Appendix H** of the 2010 California Residential Code is hereby adopted.

**SECTION 21.** The title of **Article III** of Chapter 15.04 of the Calabasas Municipal Code is hereby amended to read, "California Mechanical Code." The new Article III shall include the following sections which shall read as follows:

**15.04.510 2010 California Mechanical Code adopted.**

A. The 2010 California Mechanical Code, which regulate and control the design, construction, quality of materials, erection, installation, alteration, repair, location, relocation, replacement, addition to, use or maintenance of heating, venting, cooling, refrigeration systems, or other miscellaneous heat-producing appliances in the city, provides for the issuance of permits and collection of fees therefore and provides for penalties for the violation thereof, with certain changes and amendments thereto, is hereby adopted by reference, and all conflicting ordinances are hereby repealed.

B. All of the regulations, provisions, conditions, and terms of said codes, together with their appendices, one copy of which will be on file and accessible to the public for inspection at the City Clerk's office, are hereby referred to, adopted, and made part of this chapter as if fully set forth in this chapter with the exceptions, deletions, additions, and amendments thereto as set forth in this subchapter.

**15.040.520 Penalty**

Every person violating any provision of the 2010 California Mechanical Code, adopted by reference by 15.04.510, or of any permit or license granted thereunder, or any rules or regulations promulgated pursuant thereto, is guilty of a misdemeanor. Upon conviction thereof, he or she shall be punishable by a fine not-to-exceed one thousand dollars or imprisonment not-to-exceed six months, or by both such fine and imprisonment. The imposition of such penalty for any violation shall not excuse the violation or permit it to continue. Each day that a violation occurs shall constitute a separate offense.

**15.04.530 Definitions**

Not withstanding the provisions of Section 15.04.510, whenever the names or terms defined in this section are used in this code, each such name or term shall be deemed or construed to have in the meaning ascribed to it in this section.

A. "Board of Supervisors" shall mean the City of Calabasas City Council.

B. "County" or "County of Los Angeles" or Unincorporated Territory of the County of Los Angeles" shall mean the City of Calabasas.

C. "Building Official and Engineer" or "County Engineer" shall mean the Building Official of the City of Calabasas.

**15.04.540 Fees**

Not withstanding the provisions of Section 15.04.510 the amount of every fee set forth in the code shall be the fee set forth in the most current resolution of the City Council establishing fees.

**SECTION 22.** The title of Article IV of Chapter 15.04 of the Calabasas Municipal Code is hereby amended to be "California Plumbing Code." Article IV shall now include of the following sections, which shall be revised to read as follows:

**15.04.560 2010 California Plumbing Code adopted.**

(A) The ~~2007~~ 2010 California Plumbing Code inclusive of ~~2007~~ 2010 California Plumbing Code Appendix A, Appendix B, Appendix D, Appendix F, Appendix G, Appendix I, Appendix L Appendix M and Appendix S which provide minimum requirements and standards for the protection of the public health, safety and welfare by regulating the installation or alteration of plumbing and drainage, materials, venting, wastes, traps, interceptors, water systems, sewers, gas piping, water heaters and other related products, and workmanship in the city, provide for the issuance of permits and collection of fees therefor, and provide for penalties for the violations thereof, with certain changes and amendments thereto, are hereby adopted by reference, and conflicting ordinances are hereby repealed.

(B) All of the regulations, provisions, conditions, and terms of said codes, together with their appendices, one copy of which will be on file and accessible to the public for inspection at the City Clerk's office, are hereby referred to, adopted, and made part of this chapter as if fully set forth in this chapter with the exceptions, deletions, additions, and amendments thereto as set forth in this subchapter.

**15.04.570 Penalty.**

Every person violating any provision of the ~~2007~~ 2010 California Plumbing Code, adopted by reference by 15.04.560, or of any permit or license granted thereunder, or any rules or regulations promulgated pursuant thereto, is guilty of a misdemeanor. Upon conviction thereof, he or she shall be punishable by a fine not-to-exceed one thousand dollars or imprisonment not-to-exceed six months, or by both such fine and imprisonment. The imposition of such penalty for any violation shall not excuse the violation or permit it to continue. Each day that a violation occurs shall constitute a separate offense.

**15.04.580 Definitions.**

Not withstanding the provisions of Section 15.04.560, whenever the names or terms defined in this section are used in this code, each such name or term shall be deemed or construed to have in the meaning ascribed to it in this section.

A. "Board of Supervisors" shall mean the City of Calabasas City Council.

B. "County" or "County of Los Angeles" or Unincorporated Territory of the County of Los Angeles" shall mean the City of Calabasas.

C. "Building Official and Engineer" or "County Engineer" shall mean the Building Official of the City of Calabasas.

**15.04.590 Fees.**

Notwithstanding the provisions of Section 15.04.560 the amount of every fee set forth in the code shall be the fee set forth in the most current resolution of the City Council establishing fees.

**SECTION 23.** **15.04.610 Appendix K of the 2010 California Plumbing Code** is hereby revised:

**APPENDIX K PRIVATE SEWAGE DISPOSAL SYSTEMS**
**ONSITE WASTEWATER TREATMENT SYSTEMS (OWTS)**

**Note** ** = Existing Amendment

Underline = New Amendment

~~Strikeout~~ = New Amendment

~~Strikeout~~ = Existing Amendment

**Introduction.** **

A primary function of an onsite wastewater treatment system ("OWTS" or "Treatment System") is to reduce or eliminate the pathogenic organisms that are found in wastewater. Defective and/or substandard treatment systems that fail to adequately treat wastewater can contaminate groundwater, affect water quality, and create significant health hazards for the public and environment. Inappropriately designed or inadequately maintained onsite wastewater treatment systems have been proven to be the third most common source of groundwater contamination in the nation.

Appendix K and amendments thereto (hereafter collectively "Appendix K") are intended to address these growing and proven environmental issues by ensuring that existing onsite wastewater treatment systems are property operated and maintained and new treatment systems are properly constructed or installed and thereafter properly operated and maintained. Appendix K and the amendments thereto are designed to meet these objectives and ensure that all new and existing OWTS in the City of Calabasas are environmentally safe and free of health hazards.

## K 1.0 Private Sewage Disposal - General.

**(A)** Where permitted by Section 713.0, the building sewer shall be permitted to be connected to a private sewage disposal system complying with the provisions of this appendix. The type of system shall be determined on the basis of location, soil porosity, and groundwater level, and shall be designed to receive all sewage from the property. The system, except as otherwise approved, shall consist of a septic tank with effluent discharging into a subsurface disposal field, into one (1) or more seepage pits, or into a combination of subsurface disposal field and seepage pits. The Authority Having Jurisdiction shall be permitted to grant exceptions to the provisions of this appendix for permitted structures that have been destroyed due to fire or natural disaster and that cannot be reconstructed in compliance with these provisions provided that such exceptions are the minimum necessary.

### (1) Definitions. **

The words and terms in Appendix K and the amendments thereto shall have the meanings hereafter stated. These shall supersede and control over any conflicting provision in the 2007 California Plumbing Code and its appendices, or in any other

portion of the Calabasas Municipal Code. If regulations or standards exist in state or federal law that are more restrictive than those in Appendix K, those shall control.

"Administrative authority" means the city building official and/or his duly authorized representative(s).

"Alternative onsite wastewater treatment system" or "AOWTS" means an OWTS designed to provide enhanced wastewater treatment that meets or exceeds secondary treatment.

"Basin Plan" means the same as "Water Quality Control Plan" as defined in Division 7 (commencing with Section 13000) of the Water Code. The Basin Plan is adopted by the Los Angeles Regional Water Quality Control Board, approved by the SWRCB and the Office of Administrative Law, and identify surface water and groundwater bodies within the region's boundaries and establish its beneficial uses and water quality objectives. Copies are available from the Los Angeles Regional Water Quality Control Boards.

"Bedroom:" A term often utilized for the load capacity calculation of an OWTS. A bedroom means a room or space of sufficient size that has been or may be regularly used for sleeping purposes. For existing legal nonconforming dwellings with benefit of building permits and inspection approvals, rooms or spaces that have clearly established uses due to the lawful installation of permanent cooking facilities, plumbing fixtures or other appliances, or rooms or spaces that are not of sufficient size to constitute a bedroom are not "bedrooms" as that term is used in this Appendix K.

"Biochemical oxygen demand (BOD):" An indirect measure of the concentration of biologically degradable material existing in organic wastes. It usually reflects the amount of oxygen consumed in five days by biological processes breaking down organic waste.

"Building renovations:" Actions to any residential or nonresidential structure including, but not limited to, alterations, additions, construction, enlargements, expansions, improvements, relocations, repairs, rehabilitation or remodel work, that result, or may result, in an increase in the volume of sewage or wastewater into an existing OWTS over the level present before those renovations are made.

"Certified report:" A test report by an approved OWTS inspector of an existing or new OWTS certifying that an inspection and test thereof pursuant to Appendix K was done in the required and proper manner and that certifying the information and findings in the report to be accurate and truthful. A certified report shall also contain all recommended major repairs. The required elements of a certified report shall be established by the administrative authority.

"Cesspool:" An excavation in the ground receiving wastewater, designed to retain organic matter and solids, while allowing the liquids to seep into the soil. Cesspools differ from seepage pits because cesspool systems do not have septic tanks.

"Clay:" A soil particle; the term also refers to a type of soil texture. As a soil particle, clay consists of individual rock or mineral particles in soils having diameters $<0.002$ mm in diameter. As a soil texture, clay is a soil material comprised as forty (40) percent or more clay particles and not more than forty-five (45) percent sand and not more than forty (40) percent silt particles.

"Contaminants of concern:" Substances of any kind and in any form that have been identified by federal and/or state laws and regulations as posing an actual or potential hazard, detriment or threat to public health, safety or welfare, or to the environment, if present in water or able to infiltrate surface or subsurface water bodies or resources.

"Development:" Any grading or construction on unimproved land, or any new construction or alteration or repair of an existing structure. Development also includes building renovations and changes or intensification in the use or uses of land.

"Dispersal system:" A leachfield, seepage pit, subsurface drip system, evapotranspiration and adsorption bed, evapotranspiration and absorption bed, adsorption trench, or other types of systems for final wastewater treatment and subsurface discharge.

"Dosing tank:" A watertight receptacle located between an OWTS treatment unit (i.e., septic tank or supplemental treatment unit) and a dispersal area equipped with an automatic siphon device or pump designed to discharge wastewater intermittently in the distribution lines in amounts proportioned to the capacity of such lines and to provide adequate rest periods between such discharges.

"Effluent:" Initially treated sewage from a septic tank and discharged from an OWTS, or any portion thereof.

"Evapotranspiration and infiltration (ETI) bed:" A subsurface dispersal bed in which soil capillarity and root uptake help to dispense the effluent from a septic tank or supplemental treatment system through surface evaporation, soil absorption and plant transpiration.

"Evapotranspiration and adsorption bed:" A subsurface dispersal system that relies on soil capillarity and root uptake to disperse the effluent from a septic tank or supplemental treatment system through surface evaporation, soil adsorption, and plant transpiration.

"Existing OWTS:" A private sewage disposal or treatment system on private real property that was installed before the effective date of Ordinance No. 2009-262. Any system that is thereafter installed, whether in whole or part, is referred to by this Appendix as a new OWTS.

"Failing or failed system:" Any temporary or permanent defect or malfunction, regardless of cause, in an existing or new OWTS, including, but not limited to, those that result from a complete or partial impairment or inoperability, or improper function, of any component or design feature of an OWTS. A private sewage disposal or treatment system can reflect a partial, moderate or complete failure.

"Fines:" Soil particles with a diameter less than 0.05 millimeters. Fines consist of silt-or clay-sized particles.

"Groundwater recharge areas:" Areas where water infiltrates into the earth and either increases the total amount of water stored underground or replenishes the groundwater supply depleted through pumping or natural discharge.

"Guidelines" or "OWTS inspection guidelines" means the guidelines specified in Section K13 (E)(1).

"Hazardous material:" An agent, item or substance (biological, chemical, physical) that has been identified by federal and/or state laws and regulations as having the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. The term "hazardous material" includes contaminants of concern.

"Illicit discharge:" The subsurface or surface release for any reason or cause of sewage, wastewater, effluent or any other material or substance from an existing or new OWTS that would not occur if the OWTS were in good condition and all of its components were working properly. The manner in which an illicit discharge can occur includes, but is not limited to, dumping, leaking, overflowing, pumping or spilling.

"Leachfield:" One or a group of chambers or trenches designed to disperse effluent from a septic tank or supplemental treatment system.

"Legal non-conforming OWTS:" An existing OWTS installed in accordance with an approved design and location pursuant to a plumbing permit that was issued under then applicable law and which received an inspection approval from the public agency issuing the permit.

"Load" or "loading:" The actual discharge or volume level of sewage or wastewater that flows from plumbing fixtures into an existing or new OWTS. An "Approved Load" pertains to the discharge or volume level of sewage or wastewater that an existing or new OWTS was designed or intended to

accommodate when a plumbing permit was issued for that OWTS and an inspection approval from an issuing public agency was given.

"Major repair or repairs:" Any action or actions that involve the alteration, correction, cure, prevention, repair, rehabilitation, resolution, restoration or revival of a failing or failed system (of any degree). In the absence of, or in conjunction with, a failed or failing system, a major repair further includes all actions to fully resolve all causes of an illicit discharge and to prevent its recurrence. These actions also include, but are not limited to, replacement or substitution of one or more components of an existing or new OWTS, or the introduction or use of devices or technologies in connection with existing components of an OWTS, or the demolition of a structure, or portion thereof, or grading or excavation work to establish necessary or improved access to, or improved functionality of, an OWTS. In the absence of a failed or failing system or an illicit discharge, actions limited to periodic pumping or servicing of an OWTS (as these terms are commonly used by California licensed plumbing contractors and other licensed or certified professionals) do not constitute a major repair.

"Minor repair:" Clearing of building drain piping with a hand or electronically driven flexible auger, refitting into place inlet or outlet tees, installing access risers or other minor alterations to an OWTS approved by the administrative authority.

"Monitoring program:" The program required by section K(1) (A)(4) (c) below.

"OWTS" means, regardless of the date of its installation, a private onsite wastewater disposal or treatment system, and each of its components, as defined under California law and regulations, and future amendments thereto, whether or not a particular OWTS complies with such laws and regulations.

"OWTS plumbing permit:" A written authorization issued by the administrative authority that must be obtained before: (i) starting a major repair; (ii) demolishing or removing all or a portion of a failed or failing system; (iii) starting building renovations; (iv) constructing or installing a new OWTS; or (v) performing other actions that require such a permit under Appendix K.

"OWTS operating permit:" A written authorization issued by the administrative authority to reflect that owners of an existing or new OWTS have complied with the regulations of Section K13 of Appendix K.

"OWTS inspector:" Persons having the qualifications stated in Section K13 (F)(1) of Appendix K and certified by the administrative authority to inspect and test an OWTS.

"OWTS owner or owner" means and includes every person having legal title to, or who leases, rents, occupies or has charge, control or possession of, any private real property in the city on which an existing or new OWTS is present, including all persons shown as owners on the last equalized assessment roll of the Los Angeles County Assessor's Office. Owners also include persons with powers of attorney, executors of estates, trustees, or who are court-appointed administrators, conservators, guardians or receivers of persons or property served by an OWTS.

"Percolation test:" A method of testing water absorption of the soil. The test is conducted with clean water and test results can be used to establish whether or not the soil is suitable for a dispersal system, as well as in the design and location of such a system.

"Permeability:" The capacity of soil, sediment, or porous rock to transmit water; the property of soil or rock that allows passage of water through it.

"Pollutant:" Any substance that alters water quality of the waters of the state to a degree that may potentially affect the beneficial uses of water, as listed in a basin plan.

"Pretreatment:" The conversion and/or reduction of certain water pollutants in wastewater by any technology or combination of technologies that precedes discharge to a subsurface wastewater infiltration system or other final treatment unit or process before final dissemination into the receiving environment.

"Responsible person:" has the meaning stated in section 1.17.020 of this code.

"Rock:" Any naturally formed aggregate of one or more minerals (e.g., granite, shale, marble); or a body of undifferentiated mineral matter (e.g., obsidian), or of solid organic matter (e.g. coal) that is greater than 0.08 inches (2mm) in size.

"Sand:" A soil particle; this term also refers to a type of soil texture. As a soil particle, sand consists of individual rock or mineral particles in soils having diameters ranging from 0.05 to 2.0 millimeters in diameter. As a soil texture, sand is soil that is comprised of eighty-five (85) percent or more sand particles, with the percentage of silt plus 1.5 times the percentage of clay particles comprising less than fifteen (15) percent.

"Secondary treatment" means the processing of sewage effluent by means of a treatment device which renders a sewage effluent of thirty (30) mg/L biochemical oxygen demand or less, thirty (30) mg/L total suspended solids or less, and fifteen (15) mg/L oil and grease or less.

"Seepage pit:" A drilled or dug excavation, three to six feet in diameter, either lined or gravel filled, that receives the effluent discharge from a septic tank or other OWTS treatment unit for dispersal.

"Septic constraint areas:" Those areas with noted high groundwater conditions, poor soil conditions for septic systems or noted septic tank system problems, and lands identified as primary groundwater recharge areas.

"Septic tank:" A watertight (except as to designed inflow and outflow points), covered receptacle designed for primary treatment of wastewater and constructed to:

(1) Receive wastewater discharged from a building;

(2) Separate settleable and floating solids from the liquid;

(3) Digest organic matter by anaerobic bacterial action;

(4) Store digested solids; and

(5) Clarify wastewater for further treatment before final subsurface discharge.

"Setback:" A minimum horizontal distance maintained between and an OWTS and a potential point of impact or other physical point of reference.

"Sewage" means and includes any and all waste substance, liquid or solid, associated with human habitation, or which contains or may be contaminated with human or animal excreta, offal or any feculent matter. The term "wastewater" is synonymous with "sewage."

"Silt:" A soil particle; this term also refers to a type of soil texture. As a soil particle, silt consists of individual rock or mineral particles in soils having diameters ranging from between 0.05 and 0.002 mm in diameter. As a soil texture, silt is soil that is comprised as approximately eighty (80) percent or more silt particles and not more than twelve (12) percent clay particles.

"Site:" The location of a proposed OWTS and, as deemed appropriate by the administrative authority, a reserve dispersal area capable of disposing two hundred (200) percent of the design flow from all sources an OWTS it is intended to serve.

"Site evaluation:" An assessment of the characteristics of a site sufficient to determine its suitability for an OWTS. The regulations pertaining to this evaluation are set forth in Section K1 (A)(2) (2) - (5) of this Appendix K.

"Site evaluation plan:" A plan, in a form acceptable to the administrative authority, for the design and construction or rehabilitation of an OWTS in compliance with this code and other applicable law.

"Site evaluation report:" A report, in a form acceptable to the administrative authority, reporting the results of a site evaluation.

"Soil:" The naturally occurring body of porous mineral and organic materials on the land surface. It is composed of unconsolidated materials above bedrock; sand-sized, silt-sized, and clay-sized particles mixed with varying amounts of larger fragments and organic material. The various combinations of particles differentiate specific soil textures identified in the U.S. Department of Agriculture's Soil Classification Chart.

"Soil texture:" The soil class that describes the relative amount of sand, clay, silt and combinations thereof as defined by the classes of the soil textural triangle developed by the U.S. Department of Agriculture's and expressed in its Soil Classification Chart.

"Supplemental treatment systems:" Pretreatment devices added to an OWTS or to a component of an OWTS other than a septic tank or dosing tank, to achieve higher levels of wastewater treatment relative to a conventional septic tank in order to address septic constraint areas. These systems treat the wastewater before it is discharged to a dispersal system.

"Surface water:" All waters whose surface is naturally exposed to the atmosphere, such as rivers, lakes, reservoirs, ponds, streams, impoundments, seas, estuaries, and all springs, wells, or other collectors directly influenced by surface water.

(2) **Permitting provisions.**

(1) The regulations in this section are intended to supplement Appendix Chapter 1 of the 2007 California Plumbing Code as adopted by the city. If a conflict exists between this section and that Appendix Chapter 1, the more restrictive regulation shall apply.

The permitting provisions for a new OWTS are as follows:

A complete application must be submitted to administrative authority and an OWTS plumbing permit must be obtained before:

(i) starting a major repair; or

(ii) demolishing or removing all or a portion of a failed or failing system; or

(iii) starting building renovations;

(iv) constructing or installing a new OWTS; or

(v) performing other actions that require this permit under Appendix K. An OWTS plumbing permit shall also be obtained before the repair or installation of any mechanical or electrical device added or connected to any OWTS, with the exception of the installation of septic tank risers.

No person shall allow, cause or maintain any condition or activity that results in flow to an OWTS in excess of the approved load for any reason without first obtaining an OWTS plumbing permit and an OWTS operating permit.

No building permit shall be issued for building renovations unless an OWTS plumbing permit issues concurrently.

Permit applications will be made on forms provided by the administrative authority and shall be completed in full, signed by the owner or the owner's legally authorized representative and accompanied by all required reports, submittals and fees.

A permit shall be issued only to a licensed contractor as delineated in K1(A)(2)(6) below or to an OWTS owner. When a permit is issued to an OWTS owner, all work that the permit authorizes shall nevertheless be performed by or under the supervision of a licensed contractor as delineated in K1(A)(2)(6) below.

(2) **Site evaluation: Pre-permit requirements for a new OWTS.** Owners shall cause a site evaluation to be conducted and submit to the administrative authority a complete Site Evaluation Plan and Site Evaluation Report on forms approved by the administrative authority for that purpose and obtain written approval of that plan and report prior to: (i) submitting an application and related materials for an OWTS plumbing permit; or (ii) installing or allowing the installation of a new OWTS.

(a) Site evaluations shall be conducted and Site Evaluation Plans and Reports shall be prepared by one of the following California professionals:

(1) Registered civil engineer.

(2) Certified professional soil scientist.

(3) Certified engineering geologist or registered geologist.

(b) Submittals of Site Evaluation Plans and Reports shall be accompanied by a fee as established by city council resolution.

(c) Inspections by the administrative authority of a site and adjoining areas may be requested in connection with review of a Site Evaluation Plan and Report. An owner's failure to consent to any inspection request or to provide complete access to the areas to be inspected shall be cause to deny approval of a Site Plan Evaluation Plan and/or Report.

(d) Site Evaluation Plans and Reports shall not be reviewed unless deemed complete by the administrative authority, accompanied by the required fee, and prepared by the required professional.

(e) An approved site evaluation plan and report may be transferred with title to a site provided that: (i) amendments to Appendix K and to pertinent provisions of this code have not taken effect that change the regulations pertaining to site evaluation, Site Evaluation Plans and Site Evaluation Reports or the requirements for a new OWTS after the approval of the Site Evaluation Plan and Report and before the transfer of title; and (ii) conditions and uses of the subject property as described in the Site Evaluation Report have not changed.

(f) If new amendments to Appendix K and to pertinent provisions of this code take effect after a Site Evaluation Plan and Report is approved and before an OWTS plumbing permit is, or will be, issued, the administrative authority may require a change the requirements for a new OWTS, as well as a revised site evaluation report or additional submittals and fees.

(3) **Site Evaluation Report: Required information.** A Site Evaluation Report shall be accompanied by a Site Evaluation Plan, drawn to scale, including:

(a) Assessor's parcel number and map.

(b) Property lines.

(c) Parcel size: The map must include dimensions of parcel and any easements on the parcel.

(d) Topography: Topographic map of the parcel at an appropriate engineering scale to portray the property and relevant portions of adjacent property and their respective boundaries at two-foot max contour intervals.

(e) All existing and proposed structures, walls and fences on the parcel.

(f) A description of all components of the proposed new OWTS and their locations on the parcel.

(g) Soil evaluation: A site specific soil investigation and report of the subject property with specific attention to the proposed or existing disposal area and its suitability for proper septic effluent disposal. Soil evaluation shall include a physical investigation of the disposal area to a sufficient depth to determine the character of the soil profile and its percolation characteristics, historic and actual groundwater levels, and characterization of other geologic features within or around the disposal area which could affect, or be affected by, the operation of the OWTS.

(h) Water sources and surface water courses or drainage ways.

(i) Utilities, including water mains, gas lines and power lines.

(j) Encumbrances including easements, roads and rock outcrops.

(k) The location of each Oak Tree.

(l) Any other information that the building official deems necessary to implement Appendix K.

(4) Upon receipt of a completed Site Evaluation Plan and Report and the required fee, the administrative authority shall approve the Site Evaluation Report unless either of the following determinations are made:

(a) The proposed new OWTS would not comply with Appendix K and title 17 of this code.

(b) The report contains inaccurate information, or an omission of information that is material for compliance with Appendix K and title 17 of this code.

(5) Approved Site Evaluation Plan and Report: Additional required Information. Upon receiving approval of a Site Evaluation Plan and Report, an owner shall submit the development plans and specifications required for a new OWTS. These shall be prepared by a professional as delineated in Section K1 (A)(2)(2)(a) above. In addition to the information required for a complete Site Evaluation Plan and Report, the development plans and specifications shall also include:

(a) Proposed locations of all new buildings, roads, driveways and other forms of development. "Development" is defined in Section K1 (A)(1) above.

(b) Proposed easements.

(c) Exact location of proposed septic tank, distribution box or drop boxes and all other components.

(d) Exact location of absorption field area and replacement area, drawn to scale. Each lot must have sufficient usable area available to accommodate an initial OWTS and replacement OWTS with twice the capacity of the initial OWTS.

(e) Proposed elevations of the building sewer, the location of the building drain cleanouts, the inlet and outlet of the septic tank, distribution boxes or drop boxes, number and length of the dispersal systems and specifications for the installation of any other OWTS components.

(f) Required setbacks must be identified on the site development plan.

(g) Design and location specifications, as well as maintenance requirements for any alternative onsite wastewater treatment system.

(h) Any other information that the administrative authority deems necessary in order to properly implement Appendix K.

(6) An OWTS plumbing permit for a new OWTS shall only be issued to a professional specified in Section K1 (A)(2) (2) (a) above or to a California-licensed contractor with a Class A, C-42 or C-36 license.

(7) An OWTS plumbing permit for the installation of a new OWTS shall be effective for one year from issuance unless a determination has been previously made that a failing or failed system exists, or that an illicit discharge has occurred, or that a major repair is needed for any reason. In such instances the administrative authority may set a shorter expiration date for the permit. An OWTS plumbing permit is not transferable to any subsequent owner of the subject real property. It is unlawful for an owner or responsible person to allow or undertake actions that are regulated by Appendix K with an expired OWTS plumbing permit. The administrative authority may suspend or revoke an OWTS plumbing permit upon determining that work not authorized by the permit is occurring. The administrative authority may impose written conditions to an OWTS plumbing permit in order to protect public health, safety and welfare.

An owner shall complete all requirements for and obtain an OWTS operating permit within thirty (30) calendar days of the administrative authority's issuance of a final inspection approval of work pursuant to an OWTS plumbing permit. Regulations of OWTS operating permits are stated in Section K13 below.

(8) The administrative authority may renew an OWTS plumbing permit once for the original permitee if a permit extension request on a city form is filed before the original permit expiration date. The administrative authority may impose written conditions on such a renewal to protect public health, safety and welfare.

**An on-site waste water treatment system that has been determined to be failing is subject to the provisions of Section (K 1) (A) (4).**

(3) **Continued use and/or modifications of an existing or new OWTS.**

(a) The regulations in this section are intended to supplement Appendix Chapter 1 of the 2007 California Plumbing Code as adopted by the city. If a conflict between the provisions of this section and that Appendix Chapter exists, the more restrictive regulation shall apply.

(b) The provisions for the continued use and/or modifications to an existing or new OWTS are as follows:

(1) Every existing or new OWTS shall be maintained in a safe and sanitary condition and in good working order at all times.

(2) No person shall alter, expand or modify an existing or new OWTS or maintain an alteration, expansion or modification to an existing or new OWTS without first obtaining an OWTS plumbing permit. Further, no person shall allow, cause or maintain any other condition or activity that results in an increase in the approved load of an existing or new OWTS for any reason without first obtaining an OWTS plumbing permit and an OWTS operating permit. "Load" is defined above in Section K1(A)(1).

(3) A complete application must first be submitted to the administrative authority and an OWTS plumbing permit must be obtained before any person starts a major repair to an existing or new OWTS. An OWTS plumbing permit shall also first be obtained for the repair or installation of any mechanical or electrical device connected to any existing or new OWST, with the exception of the installation of septic tank risers.

(4) Permit applications will be made on forms provided by the administrative authority and will be accepted only when complete, signed by the owner or the owner's legally authorized representative and accompanied by all required reports, submittals and fees.

(5) A permit shall be issued only to a licensed contractor as delineated in K1(A)(2)(6) above or to an owner. When a permit is issued to an owner, all work that the permit authorizes shall be performed by a licensed contractor as delineated in K1(A)(2)(6) above unless the administrative authority determines that the owner has the

experience and skill necessary to perform the work consistently with all applicable law and with the public health, safety and welfare.

(6) The administrative authority may, if cause exists to conclude that an illicit discharge has occurred or may occur, or that a failing or failed system is or may be present, require an owner to: (i) have an existing or new OWTS inspected and tested in an approved manner by an OWTS inspector whether or not an OWTS operating permit was previously issued; and (ii) file a Certified Report with the administrative authority by a stated date. The administrative authority shall consider the existence and degree of possible hazards to public health, safety or welfare in setting that deadline. If a Certified Report confirms the presence of a failed or failing system, or the need for a major repair, an owner shall comply with the regulations in Appendix K and obtain an OWTS plumbing permit and obtain and implement an OWTS operation permit consistently with section K13 below.

(7) A building permit for building renovations will not be issued until an owner demonstrates in the manner required by Appendix K that he or she will not increase the approved load of an existing or new OWTS. Alternatively, an owner shall comply with the regulations in Appendix K for an OWTS plumbing permit concurrently with the issuance of a building permit for building renovations.

(8) An OWTS plumbing permit for an alteration, expansion or modification to an existing OWTS shall be governed by Section K1 A (2) (7) above except that a permit shall remain effective for six months rather than a year.

(9) A septic tank, dispersal system or component of an existing OWTS that is determined to not be legal non-conforming may be granted that status by the administrative authority in writing pursuant to an OWTS plumbing permit if the owner provides a Certified Report and other information and records to support the administrative authority's determinations that:

(a) The septic tank, dispersal system or other component of an existing OWTS conforms to the plumbing code in effect at the time of its installation.

(b) The OWTS is in good working order and conforms to all of the criteria stated in Section K13 (E) below. As used herein, "good working order" includes the absence of conditions indicating an illicit discharge or a failing or failed system.

In order to assist in determining whether or not legal non-conforming status should be granted to an existing OWTS, the administrative authority may also require the owner to comply with all or some of the regulations in Section K1 (A)(2) (1) through (8) above.

(10) Operation of a septic tank, dispersal system or component of an existing OWTS that the administrative authority determines not to be legal non-conforming after written notice of that determination is a violation of this code.

(4) **Repair of a failing or failed system.**

(a) This section is intended to supplement Appendix Chapter 1 of the 2007 California Plumbing Code as adopted by the city. If a conflict between this section and that Appendix chapter exists, the more restrictive regulation shall apply.

(b) Owners of a failing or failed system (shall comply with sections K1 (A)(3) [Continued Use and/or modifications of an existing or new OWTS] and K13 [OWTS operating permit].

(c) If cause exists to conclude that a failing or failed system is or may be present, the administrative authority may require an owner, at that owner's sole expense, to undertake, adhere to and maintain a monitoring program in effect until authorized in writing to terminate it. The obligations imposed by this paragraph may be among the conditions of an OWTS plumbing permit. A monitoring plan may include, but not be limited to, the following actions:

(i) Pumping of an OWTS as often as the administrative authority deems necessary to prevent, or reduce the possibility of, an illicit discharge, as well as to allow persons to continue to safely occupy a structure. The provider of this service shall be an OWTS inspector, or other qualified person as determined and approved by the administrative authority.

(ii) Submittal of pumping records to the city as often as the administrative authority deems necessary to verify that the objectives of pumping are being achieved. These records shall contain sufficient information to enable the administrative authority to

make the necessary determinations concerning those objectives.

(iii) Site inspections by an OWTS inspector, the scope and frequency of which shall be determined by the administrative authority, along with the submittal frequency of a Certified Report or reports to the city with sufficient detail to enable the administrative authority to make the necessary determinations concerning the preservation of public health, safety and welfare during the period of the monitoring program.

(d) The installation of an AOWTS, whether established or not included in Appendix K, may be proposed to correct a failing or failed system. Owners proposing to install an AOWTS shall comply with Section K1 (A)(2) through (8) above. Compliance with a monitoring program as discussed above shall continue until an installed AOWTS has received a final inspection approval under an OWTS plumbing permit from the city, unless, the building official determines in writing that the program can be terminated at an earlier time without jeopardizing public health, safety and welfare.

**(B)** Where the quantity or quality of the sewage is such that the above system cannot be expected to function satisfactorily for commercial, agricultural, and industrial plumbing systems; for installations where appreciable amounts of industrial or indigestible wastes are produced; for occupancies producing abnormal quantities of sewage or liquid waste; or when grease interceptors are required by other parts of this code, the method of sewage treatment and disposal shall be first approved by the Authority Having Jurisdiction. Special sewage disposal systems for minor, limited, or temporary uses shall be first approved by the Authority Having Jurisdiction.

**(C)** Disposal systems shall be designed to utilize the most porous or absorptive portions of the soil formation. Where the groundwater level extends to within twelve (12) feet (3,658 mm) or less of the ground surface or where the upper soil is porous and the underlying stratum is rock or impervious soil, a septic tank and disposal field system shall be installed.

**(D)** Disposal systems shall be located outside of flood hazard areas. Exception: Where suitable sites outside of flood hazard areas are not available, disposal systems shall be permitted to be located in flood hazard areas on sites where the effects of inundation under conditions of the design flood are minimized.

**(E)** All private sewage disposal systems shall be so designed that additional seepage pits or subsurface drain fields, equivalent to not less than one-

hundred (100) percent of the required original system, shall be permitted to be installed where the original system cannot absorb all the sewage. No division of the lot or erection of structures on the lot shall be made if such division or structure impairs the usefulness of the one-hundred (100) percent expansion area.

**(F)** No property shall be improved in excess of its capacity to properly absorb sewage effluent by the means provided in this code.
**Exception:** The Authority Having Jurisdiction shall be permitted to, at its discretion, approve an alternate system.

**(G)** No private sewage disposal system, or pmt thereof, shall be located in any lot other than the lot that is the site of the building or structure served by such private sewage disposal system, nor shall any private sewage disposal system or part thereof be located at any point having less than the minimum distances indicated in Table K-I.

Nothing contained in this code shall be construed to prohibit the use of all or part of an abutting lot to provide additional space for a private sewage disposal system or part thereof when proper cause, transfer of ownership, or change of boundary not in violation of other requirements has been first established to the satisfaction of the Authority Having Jurisdiction. The instrument recording such action shall constitute an agreement with the Authority Having Jurisdiction, which shall clearly state and show that the areas so joined or used shall be maintained as a unit during the time they are so used. Such agreement shall be recorded in the office of the County Recorder as part of the conditions of ownership of said properties and shall be binding on all heirs, successors, and assigns to such properties. A copy of the instrument recording such proceedings shall be filed with the Authority Having Jurisdiction.

**(H)** When there is insufficient lot area or improper soil conditions for adequate sewage disposal for the building or land use proposed, and the Authority Having Jurisdiction so finds, no building permit shall be issued and no private sewage disposal shall be permitted. Where space or soil conditions are critical, no building permit shall be issued until engineering data and test reports satisfactory to the Authority Having Jurisdiction have been submitted and approved.

**(I)** Nothing contained in this appendix shall be construed to prevent the Authority Having Jurisdiction from requiring compliance with additional requirements than those contained herein, where such additional requirements are essential to maintain a safe and sanitary condition.

**(J)** Alternate systems shall be permitted to be used only by special permission of the Authority Having Jurisdiction after being satisfied of their adequacy. This authorization is based on extensive field and test data from conditions similar to those at the proposed site, or require such additional data as necessary to provide assurance that the alternate system will produce continuous and long-range results at the proposed site, not less than equivalent to systems

which are specifically authorized.

If demonstration systems are to be considered for installation, conditions for installation, maintenance, and monitoring at each such site shall first be established by the Authority Having Jurisdiction.

Approved aerobic systems shall be permitted to be substituted for conventional septic tanks provided the Authority Having Jurisdiction is satisfied that such systems will pro-duce results not less than equivalent to septic tanks, whether their aeration systems are operating or not.

## K 2.0 Capacity of Septic Tanks.

The liquid capacity of all septic tanks shall conform to Tables K-2 and K-3 as determined by the number of bedrooms or apartment units in dwelling occupancies and the estimated waste/sewage design flow rate or the number of plumbing fixture units as determined from Table 7-3 of this Code, whichever is greater in other building occupancies. The capacity of anyone (1) septic tank and its drainage system shall be limited by the soil structure classification, as specified in Table K-4.

## K 3.0 ~~Area of Disposal Fields.~~ ** Area of Disposal Fields and Seepage Pits.

The minimum effective absorption area in disposal fields in square feet ($m^2$), and in seepage pits in square feet ($m^2$) of side wall, shall be predicated on the required septic tank capacity in gallons (liters) and/or estimated waste/sewage flow rate, whichever is greater, and shall conform to Table K-4 as determined for the type of soil found in the excavation, and shall be as follows:

1. When disposal fields are installed, a minimum of one hundred and fifty (150) square feet ($14m^2$) of trench bottom shall be provided for each system exclusive of any hard pan, rock, clay, or other impervious formations. Side wall area in excess of the required twelve (12) inches (305mm) and not to exceed thirty-six (36) inches (914 mm) below the leach line may be added to the trench bottom area when computing absorption areas.

2. Where leaching beds are permitted in lieu of trenches, the area of each such bed shall be at least fifty (50) percent greater than the tabular requirements for trenches. Perimeter side wall area in excess of the required twelve (12) inches (305 mm) and not to exceed thirty-six (36) inches (914 mm) below the leach line may be added to the trench bottom area when computing absorption areas.

3. No excavation for a leach line or leach bed shall extend within ten (10) feet (3048mm) of ground water table nor to a depth where sewage may contaminate the underground water stratum.

4. The minimum effective absorption area in any seepage pit shall be calculated as the excavated side wall area below the inlet exclusive of any hardpan, rock, clay, or other impervious formations.

The minimum required area of porous formation shall be provided in one or more seepage pits. No excavation shall extend within ten (10) feet (3048 mm) of ground water table nor to a depth where sewage may contaminate underground water stratum.

5. Leaching chambers shall be sized on the bottom absorption area (nominal unit width) in square feet. The required area shall be calculated using Table K4 with a 0.70 multiplier.

**K 4.0 Percolation Test.****

(A) Wherever practicable, disposal field and seepage (a) pit sizes shall be computed from Table K-4. Seepage pit sizes shall be computed by percolation tests unless use of Table K-4 is approved by the administrative authority ~~and the health officer~~.

(B) In order to determine the absorption qualities of (b) seepage pits and of questionable soils other than those listed in Table K-4, the proposed site shall be subjected to percolation tests acceptable to the administrative authority ~~and the health officer~~.

(C) When a percolation test is required, the proposed system shall have the capacity to absorb a quantity of clear water in a twenty-four-hour period equal to at least five times the liquid capacity of the proposed septic tank. No private disposal system shall be permitted to serve a building if that test shows the absorption capacity of the soil is less than 0.83 gallons per square foot (33.8L/m2) or more than 5.12 gallons per square foot (208 L/m2) of leaching area per twenty-four (24) hours. If the percolation test shows an absorption rate greater than 5.12 gallons per square foot (208 L/m2) per 24 hours, a private disposal system may be permitted if the site does not overlie ground waters protected for drinking water supplies, a minimum thickness of two (2) feet (610mm) of the native soil below the entire proposed system design is replaced by loamy sand, and the system design is based on percolation tests made in the loamy sand.

**K 5.0 Septic Tank Construction.**

**(A)** Plans for all septic tanks shall be submitted to the Authority Having Jurisdiction for approval. Such plans shall show all dimensions, reinforcing, structural calculations, and such other pertinent data as required.

**(B)** Septic tank design shall be such as to produce a clarified effluent consistent with accepted standards and shall provide adequate space for sludge and scum accumulations.

**(C)** Septic tanks shall be constructed of solid durable materials not subject to excessive corrosion or decay and shall be watertight.

**(D)** Septic tanks shall have a minimum of two (2) compartments. The inlet compartment of any septic tank shall be not less than two-thirds (2/3) of the total capacity of the tank, nor less than five-hundred (500) gallons (1.9 m3) liquid capacity, and shall be not less than three (3) feet (914 mm) in width and five (5) feet (1,524 mm) in length. Liquid depth shall be not less than two (2) feet (610 mm) and six (6) inches (152 mm) nor more than six (6) feet (1 ,829 mm). The secondary compartment of any septic tank shall have a minimum capacity of two-hundred fifty (250) gallons (I.0 m3) and a maximum capacity of one-third (1/3) of the total capacity of such tank. In septic tanks having over a fifteen-hundred (1,500) gallon (5.7 m3) capacity, the secondary compartment shall be not less than five (5) feet (1,524 mm) in length.

**(E)** Access to each septic tank shall be provided by not less than two (2) manholes twenty (20) inches (508 mm) in minimum dimension or by an equivalent removable cover slab. One (1) access manhole shall be located over the inlet and one (1) access manhole shall be located over the outlet. Wherever a first compartment exceeds twelve (12) feet (3,658 mm) in length, an additional manhole shall be provided over the baffle wall.

**(F)** The inlet and outlet pipe openings shall not be larger in size than the connecting sewer pipe. The vertical leg of round inlet and outlet fittings shall not be less in size than the connecting sewer pipe nor less than four (4) inches (102 mm). A baffle-type fitting shall have the equivalent cross-sectional area of the connecting sewer pipe and not less than a four (4) inch (102 mm) horizontal dimension when measured at the inlet and outlet pipe inverts.

**(G)** The inlet and outlet pipe or baffle shall extend four (4) inches (102 mm) above and not less than twelve (12) inches (305 mm) below the water surface. The invert of the inlet pipe shall be at a level not less than two (2) inches (51 mm) above the invert of the outlet pipe.

** **(H)** Inlet and outlet pipe fittings or baffles and compartment partitions shall have a free vent area equal to the required cross-sectional area of the house sewer or private sewer discharging therein to provide free ventilation above the water surface from the disposal field ~~or seepage pit~~ or seepage pit through the septic tank, house sewer, and stack to the outer air.

**(I)** The sidewalls shall extend not less than nine (9) inches (229 mm) above the liquid depth. The cover of the septic tank shall be not less than two (2) inches (51 mm) above the back vent openings.

**(J)** Partitions or baffles between compartments shall be of solid, durable material and shall extend not less than four (4) inches (102 mm) above the liquid level. An inverted fitting equivalent in size to the tank inlet, but in no case less than four (4) inches (102 mm) in size, shall be in-stalled in the inlet compartment side of the baffle with the bottom of the fitting placed midway in the depth of the liquid. Wooden baffles are prohibited.

**(K) Structural Design.**

(1) **General.** Each such tank shall be structurally designed to withstand all anticipated earth or other loads. Septic tank covers shall be capable of supporting an earth load of not less than five-hundred (500) pounds per square foot (23.9 kPa) when the maximum coverage does not exceed three (3) feet (914 mm).

(2) Flood Loads. In flood hazard areas, tanks shall be anchored to counter buoyant forces during conditions of the design flood. The vent termination and service manhole of the tank shall be a minimum of 2 feet (610 mm) above the design flood elevation or fitted with covers designed to prevent the inflow of floodwater or the outflow of the contents of the tanks during conditions of the design flood.

**(L)** Septic tanks installed under concrete or blacktop paving shall have the required manholes accessible by extending the manhole openings to grade in a manner acceptable to the Authority Having Jurisdiction.

**(M) Materials.**

(1) Concrete Septic Tanks. All materials used in constructing a septic tank shall be in accordance with applicable standards in Chapter 14, Table 14-1.

(2) Steel Septic Tanks. The minimum wall thickness of any steel septic tank shall be number twelve (12) U.S. gauge (0.109) (2.8 mm), and each such tank shall be protected from corrosion both externally and internally by an approved bituminous coating or by other acceptable means.

(3) Alternate Materials. Septic tanks constructed of alternate materials shall be permitted to be approved by the Authority Having Jurisdiction when complying with approved applicable standards.

Wooden septic tanks shall be prohibited.

**(N) Prefabricated Septic Tanks.**

(1) Manufactured or prefabricated septic tanks shall comply with

all approved applicable standards and be approved by the Authority Having Jurisdiction.

(2) Independent laboratory tests and engineering calculations certifying the tank capacity and structural stability shall be provided as required by the Authority Having Jurisdiction.

## K 6.0 Disposal Fields.

**(A)** Distribution lines shall be constructed of clay tile laid with open joints, perforated clay pipe, perforated bituminous fiber pipe, perforated high-density polyethylene pipe, perforated ABS pipe, perforated PVC pipe, or other approved materials, provided that sufficient openings are available for distribution of the effluent into the trench area.

**(B)** Before placing filter material or drain lines in a prepared excavation, all smeared or compacted surfaces shall be removed from trenches by raking to a depth of one (1) inch (25.4 mm) and the loose material removed. Clean stone, gravel, slag, or similar filter material acceptable to the Authority Having Jurisdiction, varying in size from three fourths (3/4) inch to two and one-half (2-112) inches (19.1 mm to 64 mm), shall be placed in the trench to the depth and grade required by this section. Drain pipe shall be placed on filter material in an approved manner. The drain lines shall then be covered with filter material to the minimum depth required by this section, and this material covered with untreated building paper, straw, or similar porous material to prevent closure of voids with earth backfill. No earth backfill shall be placed over the filter material cover until after inspection and acceptance.

**Exception:** Listed or approved plastic leaching chambers shall be permitted to be used in lieu of pipe and filter material. Chamber installations shall follow the rules for disposal fields, where applicable, and shall conform to manufacturer's installation instructions.

| | MINIMUM | MAXIMUM |
|---|---|---|
| Number of drain lines per field | 1 | - |
| Length of each line | - | 100 feet (30,480 mm) |
| Bottom width of trench | 18 inches (457 mm) | 36 inches (914 mm) |
| Spacing of lines, center-to-center | 6 feet (1,829 mm) | - |
| Depth of earth cover of lines [preferred – 18 inches (457 mm)] | 12 inches (305 mm) | 3 in./100 ft. (25 mm/m) |
| Grade of lines | level | - |
| Filter material under drain lines | 12 inches (305 mm) | - |
| Filter material over drain lines | 2 inches (51 mm) | |

(C) A grade board staked in the trench to the depth of filter material shall be utilized when the distribution line is constructed with drain tile or a flexible pipe material that will not maintain alignment without continuous support.

(D) When seepage pits are used in combination with disposal fields, the filter material in the trenches shall terminate not less than five (5) feet (1,524 mm) from the pit excavation, and the line extending from such points to the seepage pit shall be approved pipe with watertight joints.

(E) Where two (2) or more drain lines are installed, an approved distribution box of sufficient size to receive lateral lines shall be installed at the head of each disposal field. The inverts of all outlets shall be level, and the invert of the inlet shall be not less than one (1) inch (25.4 mm) above the outlets. Distribution boxes shall be designed to ensure equal flow and shall be installed on a level concrete slab in natural or compacted soil.

(F) Laterals from a distribution box to the disposal field shall be approved pipe with watertight joints. Multiple disposal field laterals, wherever practicable, shall be of uniform length.

(G) Connections between a septic tank and a distribution box shall be laid with approved pipe with watertight joints on natural ground or compacted fill.

(H) When the quantity of sewage exceeds the amount that can be disposed in five-hundred (500) lineal feet (152.4 m) of leach line, a dosing tank shall be used. Dosing tanks shall be equipped with an automatic siphon or pump that discharges the tank once every three (3) or four (4) hours. The tank shall have a capacity equal to sixty (60) to seventy-five (75) percent of the interior capacity of the pipe to be dosed at one time. Where the total length of pipe exceeds one thousand (1,000) lineal feet (304.8 m), the dosing tank shall be provided with two (2) siphons or pumps dosing alternately and each serving one-half (1/2) of the leach field.

(I) Disposal fields shall be constructed as follows:

*(See chart above.)*

Minimum spacing between trenches or leaching beds shall be four (4) feet (1,219 mm) plus two (2) feet (610 mm) for each additional foot (305 mm) of depth in excess of one (1) foot (305 mm) below the bottom of the drain line. Distribution drain lines in leaching beds shall be a maximum of six (6) feet (1,829 mm) apart on centers, and no part of the perimeter of the leaching bed shall be more than three (3) feet (914 mm) from a distribution drain line. Disposal fields, trenches, and leaching beds shall not be paved over or covered by concrete or any material that can reduce or inhibit any possible evaporation of sewer effluent.

(J) When necessary on sloping ground to prevent excessive line slope, leach lines or leach beds shall be stepped. The lines between each horizontal section shall be made with watertight joints and shall be designed so each horizontal leaching trench or bed shall be utilized to the maximum capacity before the effluent shall pass to the next lower leach line or bed. The lines between each horizontal leaching section shall be made with approved watertight joints and installed on natural or unfilled ground.

## K 7.0 Seepage Pits.

(A) The capacity of seepage pits shall be based on the quantity of liquid waste discharging there into and on the character and porosity of the surrounding soil, and shall conform to Section K 3.0 of this appendix.

(B) Multiple seepage pit installations shall be served through an approved distribution box or be connected in series by means of a watertight connection laid on undistributed or compacted soil; the outlet from the pit shall have an approved vented leg fitting extending not less than twelve (12) inches (305 mm) below the inlet fitting.

(C) Each seepage pit shall be circular in shape and shall have an excavated diameter of not less than four (4) feet (1,219 mm). Each such pit shall be lined with approved-type whole new hard-burned clay brick, concrete brick, concrete circular-type cesspool blocks, or other approved materials. Approval shall be obtained prior to construction for any pit having an excavated diameter greater than six (6) feet (1,829 mm).

(D) The lining in every seepage pit shall be laid on a firm foundation. Lining materials shall be placed tight together and laid with joints staggered. Except in the case of approved-type precast concrete circular sections, no brick or block shall be greater in height than its width, and shall be laid flat to form not less than a four (4) inch (102 mm) wall. Brick or block greater than twelve (12) inches (305 mm) in length shall have chamfered matching ends and be scored to provide for seepage. Excavation voids behind the brick, block, or concrete liner shall have a minimum of six (6) inches (152 mm) of clean three-fourths (3/4) inch (19.1 mm) gravel or rock.

(E) All brick or block used in seepage pit construction shall have a minimum compressive strength of twenty-five-hundred (2,500) pounds per square inch (17,237 kPa).

(F) Each seepage pit shall have a minimum sidewall (not including the arch) of ten (10) feet (3,048 mm) below the inlet.

(G) The arch or dome of any seepage pit shall be permitted to be constructed in one of three ways:

(1) Approved-type hard-burned clay brick or solid concrete brick or block laid in cement mortar.

(2) Approved brick or block laid dry. In both of the above methods, an approved cement mortar covering of not less than two (2) inches (51 mm) in thickness shall be applied, said covering to extend not less than six (6) inches (152 mm) beyond the sidewalls of the pit.

(3) Approved-type one or two-piece reinforced concrete slab of twenty-five-hundred (2,500) pounds per square inch (17,237 kPa) minimum compressive strength, not less than five (5) inches (127 mm) thick and designed to support an earth load of not less than four-hundred (400) pounds per square foot (19.2 kPa). Each such cover shall be provided with a nine (9) inch (229 mm) minimum inspection hole with plug or cover and shall be coated on the underside with an approved bituminous or other non-permeable protective compound.

**(H)** The top of the arch or cover must be not less than eighteen (18) inches (457 mm) but not more than four (4) feet (1219 mm) below the surface of the ground.

**(I)** An approved vented inlet fitting shall be provided in every seepage pit so arranged as to prevent the inflow from damaging the sidewall.

**Exception:** When using a one-or two-piece concrete slab cover inlet, fitting shall be permitted to be a one-fourth (1/4) bend fitting discharging through an opening in the top of the slab cover. On multiple seepage pit installations, the outlet fittings shall be per Section K 7.0 (B) of this appendix.

~~**K 8.0 Cesspools.**~~ ****Deleted in its entirety**

~~(A) A cesspool shall be considered only as a temporary expedient pending the construction of a public sewer; as an overflow facility when installed in conjunction with an existing cesspool; or as a means of sewage disposal for limited, minor, or temporary uses, when first approved by the Authority Having Jurisdiction.~~

~~(B) Where it is established that a public sewer system will be available in less than two (2) years and soil and groundwater conditions are favorable to cesspool disposal, cesspools without septic tanks shall be permitted to be installed for single-family dwellings or for other limited uses when first approved by the Authority Having Jurisdiction.~~

~~(C) Each cesspool, when permitted, shall conform to the construction requirements set forth in Section K 7.0 of this appendix for seepage pits and shall have a minimum sidewall (not including arch) of twenty (20) feet (6,096 mm) below the inlet, provided, however, that when a strata of gravel or equally pervious material of four (4) feet (1,219 mm) in thickness is found, the depth of such sidewall shall be not more than ten (10) feet (3,048 mm) below the inlet.~~

~~(D) When overflow cesspools or seepage pits are added to existing installations, the effluent shall leave the existing pit through an approved vented leg extending not less than twelve (12) inches (305 mm) downward into such existing pit and having its outlet flow line not less than six (6) inches (152 mm) below the inlet. All pipe between pits shall be laid with approved watertight joints.~~

## K 9.0 Commercial or Industrial Special Liquid-Waste Disposal.

**(A)** When liquid wastes contain excessive amounts of grease, garbage, flammable wastes, sand, or other ingredients that affect the operation of a private sewage disposal system, an interceptor for such wastes shall be installed.

**(B)** Installation of such interceptors shall comply with Section 1009.0 of this code, and their location shall be in ac-accordance with Table K-I of this appendix.

**(C)** A sampling box shall be installed when required by the Authority Having Jurisdiction.

**(D)** Interceptors shall be of approved design and be not less than two (2) compartments. Structural requirements shall be in compliance with the applicable subparts of Section K 5.0 of this appendix.

**(E)** Interceptors shall be located as close to the source as possible and be accessible for servicing. All necessary man-holes for servicing shall be at grade level and be gastight.

**(F)** Waste discharge from interceptors shall be permitted to be connected to a septic tank or other primary system or be disposed into a separate disposal system.

**(G)** Recommended Design Criteria. A formula may be adapted to other types of occupancies with similar wastes. (See Recommended Design Criteria on next page).

| RECOMMENDED DESIGN CRITERIA<br>GREASE AND GARBAGE, COMMERCIAL KITCHENS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Number of meals per peak hour | x | Waste flow rate | x | Retention time | x | Storage factor | = | Interceptor size (liquid capacity) |
| **SAND-SILT OIL, AUTO WASHERS** | | | | | | | | |
| Number of meals per peak hour | x | Waste flow rate | x | Retention time | x | Storage factor | = | Interceptor size (liquid capacity) |
| **SILT-LINT GREASE, LAUNDRIES, LAUNDROMATS** | | | | | | | | |
| Number of machines | x | 2 cycles per hour | x | Waste flow rate | x | Retention time | x | Storage Factor = Interceptor size (liquid capacity) |

**Waste Flow Rate**

See Table K-3 of this appendix for estimated flow rates.

**Retention Times**

Commercial kitchen waste:

Dishwasher and/or disposal.....2.5 hours

Single service kitchen:

Single serving with disposal.....1.5 hours

Sand-silt oil.....2.0 hours

Lint-silt (laundry).....2.0 hours

**Storage Factors**

Fully equipped commercial kitchen.....8 hours operation: 1

16 hours operation: 2

24 hours operation: 3

Single service kitchen.....1.5

Auto washers.....self-serve: 1.5

employee operated: 2

Laundries, Laundromats.....1.5 (allows for rock filter)

## K 10.0 Inspection and Testing.

### (A) Inspection.

(1) Applicable provisions of Section 103.5 of this code and this appendix shall be complied with. Plans shall be required per Section 101.3 of this code.

(2) System components shall be properly identified as to manufacturer. Septic tanks or other primary systems shall have the rated capacity permanently marked on the unit.

(3) Septic tanks or other primary systems shall be in-stalled on dry, level, well-compacted soil.

(4) If design is predicated on soil tests, the system shall be installed at the same location and depth as the tested area.

**(B) Testing.**

(1) Septic tanks or other primary components shall be filled with water to flow line prior to requesting inspection. Seams or joints shall be left exposed (except the bottom), and the tank shall remain water-tight.

(2) A flow test shall be performed through the system to the point of effluent disposal. All lines and components shall be watertight. Capacities, required air space, and fittings shall be in accordance with the provisions set forth in this appendix.

**K 11.0 Abandoned Sewers and Sewage Disposal Facilities.**

**(A)** Every abandoned building (house) sewer, or part thereof, shall be plugged or capped in an approved manner within five (5) feet (1,524 mm) of the property line.

**(B)** Every cesspool, septic tank, and seepage pit that has been abandoned or has been discontinued otherwise from further use, or to which no waste or soil pipe from a plumbing fixture is connected, shall have the sewage removed therefrom and be completely filled with the earth, sand, gravel, concrete, or other approved material.

**(C)** The top cover or arch over the cesspool, septic tank, or seepage pit shall be removed before filling, and the filling shall not extend above the top of the vertical portions of the sidewalls or above the level of any outlet pipe until inspection has been called and the cesspool, septic tank, or seepage pit has been inspected. After such inspection, the cesspool, septic tank, or seepage pit shall be filled to the level of the top of the ground.

**(D)** No person owning or controlling any cesspool, septic tank, or seepage pit on the premises of such person or in that portion of any public street, alley, or other public property abutting such premises shall fail, refuse, or neglect to comply with the provisions of this section or upon receipt of notice so to comply with the Authority Having Jurisdiction.

**(E)** Where disposal facilities are abandoned consequent to connecting any premises with the public sewer, the permitee making the connection shall fill all abandoned facilities as required by the Authority Having Jurisdiction within thirty (30) days from the time of connecting to the public sewer.

## K 12.0 Drawings and Specifications.

The Authority Having Jurisdiction, Health Officer, or other department having jurisdiction shall be permitted to require any or all of the following information before a permit is issued for a private sewage disposal system or at any time during the construction thereof.

**(A)** Plot plan drawn to scale, completely dimensioned, showing direction and approximate slope of surface, location of all present or proposed retaining walls, drainage channels, water supply lines or wells, paved areas and structures on the plot, number of bedrooms or plumbing fixtures in each structure, and location of the private sewage disposal system with relation to lot lines and structures.

**(B)** Details of construction necessary to ensure compliance with the requirements of this appendix together with a full description of the complete installation including quality, kind, and grade of all materials, equipment, construction, workmanship, and methods of assembly and installation.

**(C)** A log of soil formations and groundwater levels as determined by test holes dug in close proximity to any proposed seepage pit or disposal field, together with a statement of water absorption characteristics of the soil at the proposed site, as determined by approved percolation tests.

## K 13.0 Onsite wastewater treatment system operating permits.

This section is intended to supplement Appendix Chapter 1 of the 2007 California Plumbing Code as adopted by the city. If a conflict between this section and that Appendix chapter exists, the more restrictive regulation shall apply.

(A) **Purpose.** The purpose of this Section K13 is to protect public health, safety and welfare, including the environment and water quality, by establishing requirements for the operation and maintenance of every OWTS in the city.

(B) **OWTS operating permit requirement.**

(1) All Owners of real property in the city served by an OWTS shall be responsible for all of the following:

(a) Obtaining all inspections and permits required by this section;

(b) Ensuring the continued maintenance and proper functioning of the OWTS at all times; and,

(c) Making any necessary repairs, modifications or upgrades to the OWTS to prevent an illicit discharge or the development of a failing of failed system. All of the foregoing responsibilities shall be performed in accordance with the requirements of this section. The issuance of an OWTS operating permit does not excuse owners or responsible persons from their obligations under Appendix K or relieve them from liability for their failure to fulfill those obligations.

(2) Any applicant for a permit under Title 15 and 17 of this Code for development that includes the construction of a new OWTS on real property not currently served by an OWTS shall apply for and obtain an operating permit for the OWTS. A certificate of occupancy for a development shall not be issued until an operating permit is issued under this section.

(3) All owners of real property served by an existing OWTS shall be required to apply for and obtain an OWTS operating permit upon the earliest of the following:

(a) Within six months of the effective date of this section. The building official may grant a one-time extension of five months upon receipt of a written request by the property owner. No additional extensions shall be granted.

(b) In conjunction with the obligation to apply for an OWTS plumbing permit as required by any regulation in Appendix K. An application for an OWTS operating permit shall be concurrent with any application permit or approval required by Titles 15 and 17 of this Code and, if no such permit is required, then prior to undertaking any major repair or other action that requires an OWTS plumbing permit, or thereafter as required in writing by the administrative authority.

(c) Prior to completing a voluntary conveyance (including but not limited to, assignment, gift, sale, or transfer) of a legal interest in or title to real property served by an OWTS, unless the grantors, sellers, transferors, donors or assignors (collectively the "Grantors") first comply with the regulations in Section (G) below. Excluded from such conveyances are:

(i) involuntary transfers (e.g., foreclosure proceedings or actions, as well as transfers to an heir on an owner's death);

(ii) creation of an equitable interest in the real property to secure a loan against it; and,

(iii) a "change in ownership" that is described in Section 62 of the California Revenue and Taxation Code, and any future amendments thereto. "Completion of a voluntary conveyance" may be evidenced, without limitation, by the execution of any deed or instrument, or its recordation with the Los Angeles County Recorder's Office.

(4) All purchasers, transferees, assignees, donees and other persons who become an owner of real property (collectively the "Grantees") for which a valid OWTS operating permit is in effect, shall tender a completed "Notice of Change in Ownership Re: OWTS Operating Permit" an a city approved form to the administrative authority within thirty (30) calendar days of the voluntary conveyance. The grantors of the subject property shall inform the grantees in writing of this obligation before the voluntary conveyance. Failure of grantors to give notice of this obligation shall not excuse grantees' obligation to timely file this form.

(5) For purposes of this section, an OWTS operating permit for property included in a common interest development shall be issued in the name of a homeowners' association or any other entity representing all the owners of property in the common interest development or, if no such association or entity exists, then an OWTS operating permit shall issue in the name of all owners of property in the common interest development unless the OWTS serves a single residential or commercial unit in that development and is entirely located within land held separately by the owner of that single unit, in which case the permit shall issue in the name of the owner of that unit.

(6) Any person who becomes an OWTS owner by reason of a judicial or non-judicial foreclosure action or proceeding, shall complete either of the following actions within thirty (30) days of obtaining title to a property served by an OWTS:

(a) Complete all requirements for and obtain an OWTS operating permit if one is not in effect for the property on the date the owner took title to the property. It shall be unlawful and a violation of Appendix K for such an owner to complete a voluntary conveyance of the subject property before obtaining this permit unless he or she first complies with Section (G) below.

(b) Tender a completed "Notice of Change in Ownership Re: OWTS Operating Permit" on a city approved form to the administrative authority if OWTS operating permit is in effect on the date the owner took title to the property.

(C) **Validity and renewal of OWTS operating permits.**

(1) An OWTS operating permit shall be valid for five years absent a determination by the administrative authority that an illicit discharge has occurred, or that failing or failed system does or may exist, or that a major repair is, or may be, required. In such instances, the OWTS permit shall be null and void without further action or notice on the date the administrative authority made its determination. The administrative authority is authorized to condition an OWTS operating permit as necessary to protect public health, safety and welfare, including setting a shorter permit period.

(2) The regulations in Subsection (1) above shall apply to AOWTS operating permits.

(3) An Owner shall renew an OWTS Operating Permit by tendering a completed City application form to the Administrative Authority at least forty-five (45) days before its expiration date. If an OWTS Operating Permit becomes null and void pursuant to Subsection (1) above, the Owner shall complete all requirements for and obtain a new OWTS Operating Permit in a period established by the Administrative, who shall consider the obligations of as Owner or other Responsible Persons to address an Illicit Discharge or a Failing or Failed System as required by Appendix K, as well as the public health, safety and welfare.

(D) **Fees.** Fees for applications for an inspection of an OWTS, issuance of an operating permit, issuance of a certificate of inspection, preparation of a compliance agreement, a notice of change in ownership Re: OWTS operating permit, an application for certification as an OWTS inspector or an application for renewal of such certification shall be established from time to time by resolution of the city council.

(E) **OWTS inspection and operating permit criteria.**

(1) The administrative authority shall not issue an operating permit until the OWTS has been inspected by an OWTS inspector and found to be operating in compliance with the OWTS inspection guidelines and with any applicable conditions previously established or imposed for the OWTS. When such an inspection cannot be accomplished due to unique conditions, alternate inspection methods may be proposed to the administrative authority and subject to its prior written approval. Any alternate method of inspection request shall be submitted in writing, with the appropriate alternate methods and materials request form completed and the required fee paid. All alternate method of inspection requests shall be prepared by a professional identified in Section K13 (F)(1)(a) above.

(2) The results of any inspection required by this section shall be contained and submitted as a Certified Report to the administrative authority by the OWTS inspector on a form or with elements required by the administrative authority for that purpose. Certified Reports are subject to written approval of the administrative authority.

(3) The administrative authority shall establish and approve OWTS inspection guidelines and any amendments thereto. Such guidelines shall be consistent with this section and serve its objective to require the periodic inspection and ongoing maintenance of OWTS and AWOTS systems to ensure that they function as designed and consistently with water quality and other environmental regulations and do not constitute a nuisance. Such guidelines shall have the force of law when notice of those guidelines is given in the manner required for ordinances of the city council.

(4) (i) The design of a new onsite wastewater treatment systems is dictated by the size of the structure it is to serve. Te required design capacity is usually related to the number of bedrooms in a residence and is further quantified in gallons per day (gpd). The sizing of the disposal area, usually a leach field or seepage pit, is related to the design capacity requirements and the infiltration permeability of the soil surrounding the disposal area.

(ii) When required by the administrative authority, an investigation of the adequacy of an OWTS includes an examination of system capacity. This examination is referred to as a hydraulic loading test and characterizes the ability of the system to dispose of effluent. This test may be performed under an artificial environment by one or a combination of either adherence to the National Association of Wastewater Transporters (NAWT) Inspection Manual for Onsite Wastewater Treatment Systems, or simultaneous activation of all plumbing fixtures in the residence for a length of time determined by the Administrative Authority, or by the use of a 3/4" garden hose turned on with flow meter attached, ~~fully~~ or by determining the design average daily flow by (a) multiplying the number of bedrooms by 150 and (b) Calculating peak one hour flow as 50% of the design flow and (c) dividing peak one hour flow by 60 to establish flow rate in gpm then applying the amount of water to the system and monitoring the liquid levels in the septic tank disposal area components.

The disposal area and components are ~~is~~ examined while the system is under hydraulic load, and the current percolation rate is verified.

(iii) For installation of a new OWTS or for planned major repairs to a failing or failed system, or for an OWTS inspection and the

issuance of an OWTS operating permit, the hydraulic load calculation shall be based upon this section unless an alternate means of inspection is proposed and approved under paragraph (1) of this section (E).

(iv) When required by the administrative authority, an investigation of seepage pits shall be performed in accordance with section K 4. The liquid levels established shall be monitored in a matter acceptable to the administrative authority.

(5) When a Certified Report reveals that repairs to an OWTS that do not constitute major repairs are necessary, with the written approval of the administrative authority, a conditional pass inspection may be documented by an OWTS inspector and re-inspected by the administrative authority. An OWTS operating permit may be issued upon approval of an inspection.

(6) An owner or other responsible person, as well as an OWTS inspector who knowingly prepares, offers, or submits an inaccurate, incomplete, false or altered Certified Report to the city, or to a prospective grantee, is guilty of a misdemeanor punishable as provided in chapter 1.16 of this code.

(F) **Approval of OWTS inspectors.**

(1) The administrative authority may certify as an OWTS inspector any person who:

(a) Is a person specified in Section K1 (A2) (6); and

(b) Has attended OWTS inspection training as required by the administrative authority; and

(c) Has passed an examination recognized by the administrative.

(2) Any OWTS inspector examination to be recognized by the administrative authority shall establish the fitness of an applicant to assess the condition and function of any onsite wastewater treatment systems and to determine whether maintenance, repair, or replacement of system components is necessary to bring the system into compliance with the guidelines.

(3) OWTS inspectors shall maintain certification in accordance with the requirements of this section and any other requirements established by the administrative authority to accomplish the goals of this section. Certification must be renewed every two years.

(4) The administrative authority shall maintain a current list of all certified OWTS inspectors. The list shall be available for inspection by any person upon request.

(5) The administrative authority may revoke or suspend the certification of an OWTS inspector. Grounds for revocation and/or suspension include, but not limited to:

(a) Falsification or fraudulent alteration of a Certified Report;

(b) Material misrepresentation in connection with a Certified Report;

(c) Failure to timely provide the building official with a copy of any Certified Report performed for the purpose of compliance with this section;

(d) Failure to comply with Section K-13 (F) (1) above; or

(e) Failure to secure recertification as mandated by Section K-13 (F) (3): or

(f) In the reasonable judgment of the administrative authority for other cause renders the inspector unfit to protect the public interest in professional and objective inspections of OWTS in the city.

(6) An OWTS inspector may appeal a decision of the administrative authority to revoke or suspend his or her certification by a written request, accompanied by the required appeal fee, to the administrative authority for a hearing within ten (10) days from the date the notice of revocation or suspension was mailed. If a timely request for an administrative hearing is received, the city manager shall conduct a hearing on the notice. Written notice of the date, time and location of the hearing shall be provided to the appellant at least five days before the hearing date. The appellant may present oral and written evidence at the hearing which the city manager shall consider in making his or her decision whether or not revocation or suspension of the OWTS inspector certification is consistent

with the evidence and the standards of this paragraph K13 (F). The city manager shall issue a written decision within ten (10) days of the close of the hearing which shall be final as to the city and subject thereafter to judicial review pursuant to California Code of Civil Procedure 1094.5.

(G) Transfer of obligations to comply with Appendix K. The administrative authority may excuse a grantor in writing from the obligation to obtain an OWTS operating permit prior to a voluntary conveyance provided the grantor first complies with all of the following:

(1) The OWTS was inspected and tested in a manner satisfactory to the administrative authority no more than thirty (30) days prior to the voluntary conveyance.

(2) A certified report of the foregoing inspection and test results, as well as other required information including, but not limited to, disclosures of the actual or possible existence of a failing or failed system, or actual or possible need for major repairs, has been approved by the administrative authority prior to the voluntary conveyance.

(3) The grantees' execution of an Appendix K Compliance Agreement on terms satisfactory to the administrative authority at least at least thirty (30) calendar days prior to completion of the voluntary conveyance. This agreement shall include, but not be limited to, provisions that set forth a timeline that is satisfactory to the building official for the procurement of all permits and any major repairs indicated by the Certified Report or required by Appendix K, as well as the grantees' acceptance of any orders and conditions that the building official may impose to protect public health, safety and welfare. This document shall also include an acknowledgement that grantees are not relying on the administrative authority's approval of the Certified Report. A performance bond or security may be required to assure the administrative authority that grantee's' obligations under the Compliance Agreement will be faithfully and timely performed. A grantee shall further agree to the recordation of an instrument on a city approved form with the Los Angeles Recorder's office that provides the public and interested persons with constructive notice of the grantee's obligations under the agreement. The document shall also provide for the recordation of an appropriate notice when the city has determined that grantors have satisfied these obligations.

(4) **RESERVED**

(5) The grantors' and grantees' 'execution of indemnifications, waivers and releases in favor of the administrative authority are provided in a form acceptable to the city attorney.

(6) Any other documents the administrative authority deems necessary to ensure compliance with Appendix K.

(H) Revocation of operating permit. The administrative authority may revoke or suspend an operating permit if a responsible person is found to be in violation of any condition(s) of the permit or of any applicable requirements of this code, any Los Angeles Regional Water Quality Control Board standard, or other federal, state, county or other law or statue.

**K16.0 Unlawful systems.**

This section is intended to supplement Appendix Chapter 1 of the 2007 California Plumbing Code as adopted by the city. If a conflict between this section and that Appendix chapter exists, the more restrictive regulation shall apply.

(A) As used in this section, "Unlawful System" includes any OWTS, or portion thereof, that is altered, installed, operated, maintained, repaired, or replaced in violation of Appendix K. Unlawful systems constitute a public nuisance and may be abated pursuant to chapter 8.20 of this code or in any other manner authorized by law.

(1) Unlawful Systems demonstrating ~~surfacing~~ Illicit Discharge are an immediate threat to public health, safety and welfare. Such systems shall be required to comply with a Monitoring Program as described in Section K1(A)(4) above. If an Owner refuses to accept and/or to follow a monitoring program, or if an Illicit Discharge nevertheless recurs, the Administrative Authority is authorized to issue an Order to Vacate requiring all persons to vacate a structure or structures in order to prevent the continued generation of sewage that could result in an Illicit Discharge. It is unlawful for any person to enter, occupy, re-enter, re-occupy or use a structure that is the subject to an Order to Vacate except as authorized in writing by the Administrative Authority; such entry, occupancy or use of the structure ~~The Administrative Authority~~ may be subject to conditions established by the Administrative Authority and ~~such an authorization~~ violation of any imposed ~~such a~~ condition is unlawful. An Order to Vacate shall not be rescinded unless the Building Official first determines in writing that the immediate threat to public health, safety and welfare has been abated in accordance with the regulations in Appendix K and other applicable law.

(2) An Unlawful System not demonstrating an immediate threat to public health, safety and welfare, as determined by the Administrative

Authority in writing, shall be brought into full compliance with Appendix K and other applicable law within thirty days unless the Administrative Authority grants a written extension upon determining that the Owner has made substantial progress in completing this project during the initial compliance period and there is no apparent detriment or hazard to public health, safety and welfare in granting the extension. Notwithstanding an initial determination that an immediate threat or hazard does not exist in connection with an Unlawful System, the Administrative Authority may, upon receiving additional or new information that supports a contrary conclusion, set a shorter compliance completion deadline (regardless of any extension), and (i) require an Owner to adopt and adhere to a monitoring program as ~~discussed above~~ delineated by Section K 1 (A) (4); and/or, (ii) issue an Order to Vacate. The Administrative Authority is also authorized to issue any other orders and take any other actions that are necessary to protect public health, safety and welfare, including the environment and water bodies.

(3) Unlawful systems include maintaining an OWTS or portions thereof in a structurally defective condition or otherwise contrary to Sections K1 (A)(2) through (A)(4) or K13, or any of the other provisions of this code, or any other applicable law.

(4) Unlawful systems include any OWTS in connection with which an owner or other responsible person engaged in an act prohibited by Appendix K, as well as any inaction relating to any obligation or requirements that Appendix K imposes on them.

(5) Unlawful systems include any OWTS from which sewage or effluent empties, flows, seeps or drains into any stream, spring, or other waters within the city;

(6) Unlawful systems include any OWTS which exposes rodents, insects or humans to any sewage or effluent.

(7) Unlawful systems include any OWTS into which any person has discharged, or allowed or caused the discharge contaminants of concern or hazardous material, or which contains contaminants of concern or hazardous material.

(8) Unlawful systems include any OWTS maintained in any instance contrary to any correction notice or notice of violation issued by any local, state or federal agency, or contrary to any applicable law.

(B) **Correction of unlawful systems—Procedures.**

(1) Responsibility for repair. Every owner and responsible party with respect to an unlawful system shall bring that unlawful system into compliance with the regulations in Appendix K, other provisions of this code, as well as with any other applicable law.

(2) Manner of repair regardless of whether an owner holds an OWTS plumbing permit, all major repairs and other work upon an OWTS shall, be performed by a person specified in Section K1 (A2) (6) above.

(3) Notice of violation. If the administrative authority determines that an unlawful system exists, or that an OWTS is otherwise in violation of Appendix K or other applicable law, a written notice of violation may be sent by first class mail to the owner at the address shown on an application for an OWTS plumbing permit or an OWTS operating permit, or as reflected in the other records in the administrative authority's possession, if any. The notice of violation shall describe the violation, the corrective and other compliance actions or measures required, their commencement and completion dates, and whether or not a previously issued OWTS operating permit is null and void pursuant to Section K 13(C)(1). Any omission from such a notice shall not excuse owners and other responsible persons from maintaining an OWTS in compliance with the regulations in Appendix K and other applicable law at all times. Appendix K may be enforced, in the discretion of the city prosecutor or city attorney, as a misdemeanor or infraction pursuant to chapter 1.16 or pursuant to an administrative citation under 1.17 of this code or in any other administrative or judicial proceeding authorized by law.

(C) **Notice of violation correction time periods.** Time periods prescribed in the notice of violation to complete repairs of an OWTS shall be established by the administrative authority so as to protect the public health, safety and general welfare and may, without limitation, be based on conditions of failure as follows:

(1) Unlawful Systems demonstrating ~~surfacing~~ Illicit Discharge are an immediate threat to public health, safety and welfare. Such systems shall be required to comply with a Monitoring Program as described in Section K1(A)(4) above. If an Owner refuses to accept and/or to follow a monitoring program, or if an Illicit Discharge nevertheless recurs, the Administrative Authority is authorized to issue an Order to Vacate requiring all persons to vacate a structure or structures in order to prevent the continued generation of sewage that could result in an Illicit Discharge. It is unlawful for any person to enter, occupy, re-enter, re-occupy or use a structure that is the subject to an Order to Vacate except as authorized in writing by the Administrative Authority; such entry, occupancy or use of the structure ~~The Administrative Authority~~ may be subject to conditions established by the

Administrative Authority and ~~such an authorization~~ violation of any imposed ~~such a~~ condition is unlawful. An Order to Vacate shall not be rescinded unless the Building Official first determines in writing that the immediate threat to public health, safety and welfare has been abated in accordance with the regulations in Appendix K and other applicable law.

(2) An Unlawful System not demonstrating an immediate threat to public health, safety and welfare, as determined by the Administrative Authority in writing, shall be brought into full compliance with Appendix K and other applicable law within thirty days unless the Administrative Authority grants a written extension upon determining that the Owner has made substantial progress in completing this project during the initial compliance period and there is no apparent detriment or hazard to public health, safety and welfare in granting the extension. Notwithstanding an initial determination that an immediate threat or hazard does not exist in connection with an Unlawful System, the Administrative Authority may, upon receiving additional or new information that supports a contrary conclusion, set a shorter compliance completion deadline (regardless of any extension), and (i) require an Owner to adopt and adhere to a monitoring program as ~~discussed above~~ delineated by Section K 1 (A) (4); and/or, (ii) issue an Order to Vacate. The Administrative Authority is also authorized to issue any other orders and take any other actions that are necessary to protect public health, safety and welfare, including the environment and water bodies.

(D) **Penalty.**

(1) All owners and responsible persons who maintain an unlawful system or who, by action or inaction, fail to comply with any regulation or obligation in Appendix K, as well as any condition or order of the administrative authority issued or imposed pursuant to Appendix K, are guilty of a misdemeanor punishable under chapter 1.16 or 1.17 of this code.

(2) Upon a determination by the administrative authority that an OWTS is failing or a failed system, or an unlawful system, an owner shall, if a public sewer is available to service the subject property, obtain a OWTS plumbing permit to remove the existing OWTS and connect the subject property to the public sewer system as required by article III of chapter 15.04 of this code. The administrative authority shall establish a deadline for the owner to obtain an OWTS plumbing permit, to commence work, and to complete work. The determination shall be stated in a notice of obligation to connect to public sewer system, which may be sent by first class mail to the owner at the address shown in Los Angeles County Assessor's records. Owners and other responsible persons who fail to comply with that notice are in violation of this code. The administrative authority shall determine that a public sewer system is available to serve the subject property based on

Section 713 of the California Plumbing Code "Sewers required" and title 17 of this code.

(3) If the building official determines that a public sewer system is not available to serve the subject property, the owner may install a new OWTS to replace a failing or failed system, or to replace an unlawful system. That system shall comply with provisions of Appendix K, title 17 of this code, and all other applicable law at the time of the proposed installation. The administrative authority shall establish a deadline for the owner to obtain an OWTS plumbing permit, as well to start and complete work. These determinations shall be stated in a notice of authorization to install a new OWTS, which may be sent by first class mail to the owner at the address shown in Los Angeles County Assessor's records. Owners and other responsible persons who fail to comply with requirements and the deadlines in that notice are in violation of this Code.

## TABLE K-1
## LOCATION OF SEWAGE DISPOSAL SYSTEM

| MINIMUM HORIZONTAL DISTANCE IN CLEAR REQUIRED FROM | BUILDING SEWER | SEPTIC TANK | DISPOSAL FIELD | SEEPAGE PIT OR CESSPOOL |
|---|---|---|---|---|
| Building or structures[1] | 2 feet (610 mm) | 5 feet (1,524 mm) | 8 feet (2,438 mm) | 8 feet (2,438 mm) |
| Property line adjoining private property | Clear[2] | 5 feet (1,524 mm) | 5 feet (1,524 mm) | 8 feet (2,438 mm) |
| Water supply wells | 50 feet[3](15,240 mm) | 50 feet (15,240 mm) | 100 feet (30.5 m) | 150 feet (45.7 m) |
| Streams and other bodies of water | 50 feet (15,240 mm) | 50 feet (15,240 mm) | 100[7] feet (30.5 m) | 150 feet[7] (45.7 m) |
| Trees | - | 10 feet (3,048 mm) | - | 10 feet (3,048 mm) |
| Seepage pits or cesspools | - | 5 feet (1,524 mm) | 5 feet (1,524 mm) | 12 feet (3,658 mm) |
| Disposal field | - | 5 feet (1,524 mm) | 4 feet[4] (1,219 mm) | 5 feet (1,524 mm) |
| On-site domestic water service line | 1 foot[5] (305 mm) | 5 feet (1,524 mm) | 5 feet (1,524 mm) | 5 feet (1,524 mm) |
| Distribution box | - | - | 5 feet (1,524 mm) | 5 feet (1,524 mm) |
| Pressure public water main | 10 feet[6] (3,048 mm) | 10 feet (3,048 mm) | 10 feet (3,048 mm) | 10 feet (3,048 mm) |

**Note:**

When disposal fields and/or seepage pits are installed in sloping ground, the minimum horizontal distances between any part of the leaching system and ground surface shall be fifteen (15) feet (4,572 mm).

[1] Including porches and steps, whether covered or uncovered, breezeways, roofed porte cocheres, roofed patios, carports, covered walks, covered driveways, and similar structures or appurtenances.

[2] See also Section 313.3 of the California Plumbing Code.

[3] All drainage piping shall clear domestic water supply wells by not less than fifty (50) feet (15,240 mm). This distance may be reduced to not less than twenty-five (25) feet (7,620 mm) when the drainage piping is constructed of materials approved for use within a building.

[4] Plus two (2) feet (610 mm) for each additional one (1) foot (305 mm) below the button of the drain line. (See also Section K 6.0)

[5] See Section 720,0 of the California Plumbing Code.

[6] For parallel construction – For crossings, approval by the Health Department shall be required.

[7] These minimum clear horizontal distances shall also apply between disposal fields, seepage pits, and the man high -tide line.

## TABLE K-2
## CAPACITY OF SEPTIC TANKS*

| SINGLE FAMILY DWELLINGS – NUMBER OF BEDROOMS | MULTIPLE DWELLINGS UNITS OR APARTMENTS – ONE BEDROOM EACH | OTHER USES: MAXIMUM FIXTURE UNITS SERVED PER TABLE 7-3 | MINIMUM SEPTIC TANK CAPACITY IN GALLONS | (LITERS) |
|---|---|---|---|---|
| 1 or 2 | - | 15 | 750 | (2,839) |
| 3 | - | 20 | 1,000 | (3,785) |
| 4 | 2 units | 25 | 1,200 | (4,542) |
| 5 or 6 | 3 | 33 | 1,500 | (5,678) |
| - | 4 | 5 | 2,000 | (7,571) |
| - | 5 | 55 | 2,250 | (8,517) |
| - | 6 | 60 | 2,500 | (9,464) |
| - | 7 | 70 | 2,750 | (10,410) |
| - | 8 | 80 | 3,000 | (11,356) |
| - | 9 | 90 | 3,250 | (12,303) |
| - | 10 | 100 | 3,500 | (13,249) |

***Note:**

Extra bedroom, 150 gallons (568 liters) each.

Extra dwelling units over 10:250 gallons (946 liters) each.

Extra fixture units over 100:25 gallons (95 liters) per fixture unit.

Septic tank sizes in this table include sludge storage capacity and the connection of domestic food waste disposal units without further volume increase.

## TABLE K-3
## ESTIMATED WASTE/SEWAGE FLOW RATES

Because of the many variables encountered, it is not possible to set absolute values for waste/sewage
flow rates for all situations. The designer should evaluate each situation and, if figures in this table need modification, they should be made with the concurrence of the Authority Having Jurisdiction.

| TYPE OF OCCUPANCY | GALLONS (LITERS) PER DAY |
|---|---|
| 1. Airports | 15 (56.8) per employee |
| | 5 (18.0) per passenger |
| 2. Auto washers | Check with equipment manufacturer |
| 3. Bowling alleys (snack bar only) | 75 (283.9) per lane |
| 4. Camps: | |
| Campground with central comfort station | 35 (132.5) per person |
| Campground with flush toilets, no showers | 25 (94.6) per person |
| Day camps (no meals served) | 15 (56.8) per person |
| Summer and seasonal | 50 (189.3) per person |
| 5. Churches (Sanctuary) | 5 (18.9) per seat |
| with kitchen waste | 7 (26.5) per seat |
| 6. Dance halls | .5 (18.9) per person |
| 7. Factories | |
| No showers | 25 (94.6) per employee |
| with showers | 35 (132.5) per employee |
| Cafeteria, add | 5 (18.9) per employee |
| 8. Hospitals | 250 (946.4) per bed |
| Kitchen waste only | 25 (94.6) per bed Laundry |
| waste only | 40 (151.4) per bed |
| 9. Hotels (no kitchen waste) | 60 (227.1) per bed (2 person) |
| 10. Institutions (Resident) | 75 (283.9) per person Nursing home |
| | 125 (473.2) per person |
| Rest home | 125 (473.2) per person |
| 11. Laundries, self-service (minimum 10 hours per day) | 50 (189.3) per wash cycle |
| Commercial | Per manufacturer's specifications |
| 12. Motel | 50 (189.3) per bed space |
| with kitchen | 60 (227.1) per bed space |
| 13. Offices | 20 (75.7) per employee |
| 14. Parks, mobile homes | 250 (946.4) per space |
| picnic parks (toilets only) | 20 (75.7) per parking space |
| recreational vehicles - without water hook up | 75 (283.9) per space |
| with water and sewer hook-up | 100 (378.5) per space |
| 15. Restaurants - cafeterias | 20 (75.7) per employee |
| toilet | 7 (26.5) per customer |
| kitchen waste | 6 (22.7) per meal |
| add for garbage disposal | 1 (3.8) per meal |
| add for cocktail lounge | 2 (7.6) per customer |
| kitchen waste - Disposable service | 2 (7.6) per meal |
| 16. Schools -Staff and office | 20 (75.7) per person Elementary students |
| | 15 (56.8) per person Intermediate and high |
| with gym and showers, add | 20 (75.7) per student |
| with cafeteria, add | 5 (18.9) per student |
| | 3 (11.4) per student |

Boarding, total waste ..... 100 (378.5) per person
17. Service station, toilets .....1000 (3785) for 1st bay
500 (1892.7) for each additional bay
18. Stores .....20 (75.7) per employee
public restrooms, add ..... 1 per 10 sq. ft. (4.1/m2) of floor space
19. Swimming pools, public ..... 10 (37.9) per person
20. Theaters, auditoriums .....5 (18.9) per seat drive-in
.....10 (37.9) per space

**(A) Recommended Design Criteria.** Sewage disposal systems sized using the estimated waste/sewage
flow rates should be calculated as follows:

(1) Waste/sewage flow, up to 1,500 gallons/day (5,678 L/day)
Flow x 1.5 = septic tank size.

(2) Waste/sewage flow, over 1,500 gallons/day (5,678 L/day)
Flow x 0.75 + 1,125 = septic tank size.

(3) Secondary system shall be sized for total flow per 24 hours.

**(B)** Also see Section K 2.0 of this appendix.

**TABLE K-4**
**DESIGN CRITERIA OF FIVE TYPICAL SOILS**

| TYPE OF SOIL | REQUIRED sq. ft. OF LEACHING AREA/100 gal. ($m^2$/L) | | MAXIMUM ABSORPTION CAPACITY IN gals./sq. ft. OF LEACHING AREA FOR A 24 HR. PERIOD (L/$m^2$) | |
|---|---|---|---|---|
| Coarse sand or gravel | 20 | (0.005) | 5.0 | (203.7) |
| Fine sand | 25 | (0.006) | 4.0 | (162.9) |
| Sandy loam or sandy clay | 40 | (0.010) | 2.5 | (101.8) |
| Clay with considerable sand or gravel | 90 | (0.022) | 1.1 | (44.8) |
| Clay with small amount of sand or gravel | 120 | (0.030) | 0.8 | (32.6) |

**TABLE K-5**

| REQUIRED SQUARE FEET OF LEACHING AREA/100 gal. SEPTIC TANK CAPACITY | | MAXIMUM SEPTIC TANK SIZE ALLOWABLE | |
|---|---|---|---|
| | ($m^2$/L) | (gallons) | (liters) |
| 20-25 | (0.005-0.006) | 7,500 | (28,390) |
| 40 | (0.010) | 5,000 | (18,927) |
| 90 | (0.022) | 3,500 | (13,249) |
| 120 | (0.030) | 3,000 | (11,356) |

**SECTION 24.** The text of **Section 15.04.620** of the municipal code, relating to Appendix M, Swimming Pools, is readopted and unchanged, except that the first sentence of that section is revised to read: "Appendix M is created and added to the ~~2007~~ 2010 California Plumbing Code to read, in words and figures, as follows:"

**SECTION 25.** Section **15.04.640** Appendix S Solar Potable Water Heating Systems Remains unchanged

The text of **Section 15.04.640** of the municipal code, relating to Appendix S, Portable Water Heating Systems, is readopted and unchanged.

**SECTION 26.** The title of Article V of Chapter 15.04 of the Calabasas Municipal Code is hereby amended to be, "2010 California Electrical Code." The following sections shall be amended to provide as follows, and each shall be in the new Article V.

### 15.04.720 ~~2007~~ 2010 California Electrical Code adopted.

A. The ~~2007~~ 2010 California Electrical Code, which provides minimum requirements and standards for the protection of the public health, safety, and welfare by regulating the installation or alteration of electrical wiring, equipment, materials, and workmanship in the city, provides for the issuance of permits and collection of fees therefor and provides penalties for the violations thereof, with all changes and amendments thereto, is hereby adopted by reference, and all conflicting ordinances are hereby repealed.

B. All of the regulations, provisions, conditions, and terms of said codes, together with their appendices, one copy of which will be on file and accessible to the public for inspection at the City Clerk's office, are hereby referred to, adopted, and made part of this chapter as if fully set Forth in this chapter with the exceptions, deletions, additions, and amendments thereto as set forth in this subchapter.

### 15.04.730 Penalty.

Every person violating any provision of the ~~2007~~ 2010 California Electrical Code and appendices, adopted by reference by 15.04.720, or of any permit or license granted thereunder, or any rules or regulations promulgated pursuant thereto, is guilty of a misdemeanor. Upon conviction thereof, he or she shall be punishable by a fine not-to-exceed one thousand dollars or imprisonment not-to-exceed six months, or by both such fine and imprisonment. The imposition of such penalty for any violation shall not excuse the violation or permit it to continue. Each day that a violation occurs shall constitute a separate offense.

### 15.04.740 Definitions.

Wenever the names or terms defined in this section are used in this code, each such name or term shall be deemed or construed to have in the meaning ascribed to it in this section.

A. "Board of Supervisors" shall mean the City of Calabasas City Council.

B. "County" or "County of Los Angeles" or Unincorporated Territory of the County of Los Angeles" shall mean the City of Calabasas.

C. "Building Official and Engineer" or "County Engineer" shall mean the Building Official of the City of Calabasas.

**15.04.750 Fees**

The amount of every fee set forth in the code shall be the fee set forth in the most current resolution of the City Council establishing fees.

**SECTION 27.** The title of **Article VI** of Chapter 15.04 of the Calabasas Municipal Code is shall be revised to "California Energy Code." Article VI is hereby amended to include the following sections which shall read as follows:

**15.04.800 ~~2007~~ 2010 California Energy Code adopted.**

A. The ~~2007~~ 2010 California Energy Code, together with the appendices, which regulate the building envelope, space-conditioning systems, water-heating systems, outdoor lighting systems and signs located either indoors or outdoors within the city, are hereby adopted by reference, and conflicting ordinances are hereby repealed.

B. All of the regulations, provisions, conditions, and terms of said codes, together with their appendices, one copy of which will be on file and accessible to the public for inspection at the City Clerk's office, are hereby referred to, adopted and made part of this chapter as if fully set forth in this chapter with the exceptions, deletions, additions, and amendments thereto as set forth in this subchapter.

**15.04.810 Penalty**

Every person violating any provision of the ~~2007~~ 2010 California Energy Code and appendices, adopted by reference by 15.04.800, or of any permit or license granted thereunder, or any rules or regulations promulgated pursuant thereto, is guilty of a misdemeanor. Upon conviction thereof, he or she shall be punishable by a fine not-to-exceed one thousand dollars ($1,000.00) or imprisonment not-to-exceed six months, or by both such fine and imprisonment. The imposition of such penalty for any violation shall not excuse the violation or permit it to continue. Each day that a violation occurs shall constitute a separate offense.

**SECTION 28.** The title of **Article VII** of Chapter 15.04 of the Calabasas Municipal Code is shall be revised to "California Historical Building Code." Article VII is hereby amended to include the following sections which shall read as follows:

**15.04.820 ~~2007~~ 2010 California Historical Building Code adopted.**

(A) The ~~2007~~ 2010 California Historical Building Code, which provides regulations, minimum requirements and standards for the preservation, restoration, rehabilitation, relocation of buildings or properties designated as historical building or properties, with all changes and amendments thereto, is hereby adopted by reference, and all conflicting ordinances are hereby repealed.

(B) All of the regulations, provisions, conditions, and terms of said codes, together with their appendices, one copy of which will be on file and accessible to the public for

inspection at the City Clerk's office, are hereby referred to, adopted, and made part of this chapter as if fully set forth in this chapter with the exceptions, deletions, additions, and amendments thereto as set forth in this subchapter.

### 15.04.830 Penalty

Every person violating any provision of the ~~2007~~ 2010 California Historical Building Code and appendices, adopted by reference by 15.04.840, or of any permit or license granted thereunder, or any rules or regulations promulgated pursuant thereto, is guilty of a misdemeanor. Upon conviction thereof, he or she shall be punishable by a fine not-to-exceed one thousand dollars ($1,000.00) or imprisonment not-to-exceed six months, or by both such fine and imprisonment. The imposition of such penalty for any violation shall not excuse the violation or permit it to continue. Each day that a violation occurs shall constitute a separate offense.

**SECTION 29.** The title of **Article VIII** of Chapter 15.04 of the Calabasas Municipal Code is shall be revised to "California Historical Building Code." Article VIII is hereby amended to include the following sections which shall read as follows:

### 15.04.840 ~~2007~~ 2010 California Existing Building Code adopted.

(A) The ~~2007~~ 2010 California Existing Building Code, which provides minimum requirements and standards for the protection of the public health, safety, and welfare by providing minimum standards for structural seismic resistance for structures with one or more unreinforced masonry walls, with all changes and amendments thereto, is hereby adopted by reference, and all conflicting ordinances are hereby repealed.

(B) All of the regulations, provisions, conditions, and terms of said codes, together with their appendices, one copy of which will be on file and accessible to the public for inspection at the City Clerk's office, are hereby referred to, adopted, and made part of this chapter as if fully set forth in this chapter with the exceptions, deletions, additions, and amendments thereto as set forth in this subchapter.

### 15.04.850 Penalty

Every person violating any provision of the ~~2007~~ 2010 California Existing Building Code and appendices, adopted by reference by 15.04.840, or of any permit or license granted thereunder, or any rules or regulations promulgated pursuant thereto, is guilty of a misdemeanor. Upon conviction thereof, he or she shall be punishable by a fine not-to-exceed one thousand dollars ($1,000.00) or imprisonment not-to-exceed six months, or by both such fine and imprisonment. The imposition of such penalty for any violation shall not excuse the violation or permit it to continue. Each day that a violation occurs shall constitute a separate offense.

**SECTION 30.** The title of **Article IX** of Chapter 15.04 of the Calabasas Municipal Code shall be revised to "California Referenced Standards Code." Article IX is hereby amended to include the following sections which shall read as follows:

**15.04.860 ~~2007~~ 2010 California Referenced Standards Codes adopted.**

The ~~2007~~ 2010 California Referenced Standards Codes, which provides cross references to applicable standards referenced throughout the California Building Standards Codes, are hereby adopted by reference, and all conflicting ordinances are hereby repealed.

**SECTION 31.** The title of **Article X** of Chapter 15.04 of the Calabasas Municipal Code shall be revised to "California Administrative Code." Article X is hereby amended to include the following section which shall read as follows:

**15.04.870 ~~2007~~ 2010 California Administrative Code adopted.**

The ~~2007~~ 2010 California Administrative Code, which provides, provisions for the duties and responsibilities of the California Building Standards Commission, are hereby adopted by reference, and all conflicting ordinances are hereby repealed.

**SECTION 32.** The new title of **Article XI** of Chapter 15.04 of the Calabasas Municipal Code shall be "2008 Consolidated Fire Protection District Code of Los Angeles." Article XI is hereby amended to include the following sections which shall be readopted without amendment:

**15.04.900 2008 Consolidated Fire Protection District Code of Los Angeles.**

**15.04.910 Designation of the City of Calabasas.**

**15.04.920 Findings in support of adoption of more restrictive building standards.**

**15.04.930 Penalty.**

**SECTION 33.** The new title of **Article XII** of Chapter 15.04 of the Calabasas Municipal Code shall be "2010 California Green Building Standards Code." Article XII is hereby amended to include the following sections which shall be revised or added to provide as follows:

**15.04.950 ~~2008~~ 2010 California Green Building Standards Code adopted.**

~~**15.04.960 Section 101 amended.**~~

A. The ~~2008~~ 2010 California Green Building Standards Code, together with its appendices, which regulate the planning, design, construction, operation, replacement, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenance connected or attached to such building structures throughout the State of California, are hereby adopted by reference, and ordinances of the city which conflict with that Code are hereby repealed to the extent of the conflict.

B. All of the regulations, provisions, conditions, and terms of the ~~2008~~ 2010 California Green Building Standards Code, together with its appendices, one copy of which will be on file and accessible to the public for inspection at the city clerk's office, are hereby referred to, adopted and made part of this chapter as if fully set forth in this chapter with the exceptions, deletions, additions, and amendments thereto as set forth in this chapter.

**15.04.960 ~~Section 101 amended.~~ 101.10 Mandatory requirements.**

~~Subsection 101.10 of Section 101 of the California Green Building Standards code is hereby amended to read as follows:~~ This code contains both voluntary and mandatory green building measures. The Building Official shall have the authority to develop checklists identifying appropriate mandatory and voluntary measures for different types of construction projects but, in so doing, shall implement and not amend the requirements of this code and the codes it adopts by reference.

**15.04.965 Penalty**

Every person violating any provision of the 2010 Green Building Standards Code and appendices, adopted by reference by 15.04.950, or of any permit or license granted thereunder, or any rules or regulations promulgated pursuant thereto, is guilty of a misdemeanor. Upon conviction thereof, he or she shall be punishable by a fine not-to-exceed one thousand dollars ($1,000.00) or imprisonment not-to-exceed six months, or by both such fine and imprisonment. The imposition of such penalty for any violation shall not excuse the violation or permit it to continue. Each day that a violation occurs shall constitute a separate offense.

**SECTION 34.** A new **Article XIII** shall be added to Chapter 15.04 of the Calabasas Municipal Code, and shall be entitled, "Violations Abatement and Penalties." The existing Municipal Code section 15.04.970 shall move into this new [7]Article XIII but otherwise remain unchanged.

**SECTION 35.** Findings. The City Council hereby adopts the findings set forth in **Exhibit 1** as if fully set forth herein. The City Council finds that each amendment to the

[7] Revised November 8, 2010

Building Standards Code was an administrative change for which no findings need be legally made and/or was made due to local climatic, geological, and/or topographical conditions such as the hot, dry summers, the hilly terrain and the high potential for seismic activity which make structures particularly vulnerable to rapidly spreading fires and structural damage.

**SECTION 36.** References in Documents and Continuing Legal Effect. References to prior versions of any portion of the Building Standards Code, or of the Calabasas Municipal Code that are amended or renumbered in this Municipal Code, that are cited on notices issued by the City or other documents of ongoing or continuing legal effect, including resolutions adopting or imposing fees or charges, until converted, are deemed to be references to the new counterpart part of the Building Standards Code or amended Municipal Code sections for the purposes of notice and enforcement. The provisions adopted hereby shall not in any manner affect deposits, established fees or other matters of record which refer to, or are otherwise connected with, ordinances which are specifically designated by number, code section or otherwise, but such references shall be deemed to apply to the corresponding provisions set forth in the code sections adopted or amended hereby.

**SECTION 37.** Continuity. To the extent the provisions of this Ordinance are substantially the same as previous provisions of the Calabasas Municipal Code, these provisions shall be construed as continuations of those provisions and not as [8]new enactments.

**SECTION 38.** No Effect on Enforceability. The repeal of any sections of the Municipal Code, shall not affect or impair any act done, or right vested or approved, or any proceeding, suit or prosecution had or commenced in any cause before such repeal shall take effect; but every such act, vested right, proceeding, suit, or prosecution shall remain in full force and effect for all purposes as if the applicable provisions of the Municipal Code, or part thereof, had remained in force and effect. No offense committed and no liability, penalty, or forfeiture, either civil or criminal, incurred prior to the repeal or alteration of any applicable provision of the 2007 Code as amended, shall be discharged or affected by such repeal or alteration but prosecutions and suits for such offenses, liabilities, penalties or forfeitures shall be instituted and proceed in all respects as if the applicable provisions of the 2007 Code, as amended, had not been repealed or altered.

**SECTION 39.** CEQA. This Ordinance is exempt from the California Environmental Quality Act pursuant to State Guidelines §15061 (b) (3) as a project that has no potential for causing a significant effect on the environment.

**SECTION 40.** [9]Certification. The City Clerk shall certify to the adoption of this ordinance and shall cause the same to be processed in the manner required by law.

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[8] Revised November 8, 2010

[9] Revised November 8, 2010

**SECTION 41.** Building Standards Commission. The City Clerk shall file a certified copy of this Ordinance with the California Building Standards Commission.

**SECTION 42.** Severability. Should any section, subsection, clause, or provision of this Ordinance for any reason be held to be invalid or unconstitutional, such invalidity or unconstitutionality shall not affect the validity or constitutionality of the remaining portions of this Ordinance; it being hereby expressly declared that this Ordinance, and each section, subsection, sentence, clause, and phrase hereof would have been [10]adopted irrespective of the fact that any one or more sections, subsections, sentences, clauses, or phrases be declared invalid or unconstitutional.

**SECTION 43.** Findings of Urgency. The Council finds that unless it adopts this ordinance to take [11]immediate effect, effective January 1, 2011, the California Building Standards Codes will become effective in Calabasas without any Calabasas specific amendments applying to those codes. If that were to occur, Calabasas could be required to issue permits for construction that is not up to the City's seismic, sanitation, electrical, energy, and fire and life safety standards, and there could be a gap in the law that would apply in the window between January 1, 2011 and the date that a permanent ordinance takes effect. Failure to mandate compliance with these important safety and public health standards could allow potentially unsafe buildings and living conditions. This urgency ordinance is necessary to immediately preserve the public peace, health, and safety.

**SECTION 44.** Effective Date. This Urgency Ordinance is adopted by 4/5 vote of the City Council and shall take effect immediately. Although the ordinance is immediately *in* effect, it does not immediately *cause* an effect. This is because the ordinance is intended to amend the 2010 Building Standards Codes when they become effective until January 1, 2011. No portion of this ordinance shall cause any effect until January 1, 2011.

**SECTION 45.** Publication. The City Clerk shall cause this Urgency Ordinance to be published in accordance with California Government Code Section 36933, shall certify to the adoption of this Urgency Ordinance, and shall cause this Urgency Ordinance and its certification, together with proof of publication, to be entered in the Book of Ordinances of the City Council.

[10] Revised November 8, 2010
[11] Revised November 8, 2010

**PASSED, APPROVED AND ADOPTED** this 24th day of November, 2010.

Barry Groveman, Mayor

ATTEST:

Gwen Peirce, CMC, City Clerk

APPROVED AS TO FORM:

11/24/10

Michael G. Colantuono, City Attorney

## EXHIBIT 1

## 2010 California Building Standards Code

## FACTUAL FINDINGS ESTABLISHING THE REASONABLE NEED FOR LOCAL AMENDMENTS TO PORTIONS OF THE BUILDING STANDARDS CODE BASED UPON CLIMATIC, GEOLOGICAL AND/OR TOPOGRAPHICAL CONDITIONS or ADMINISTRATIVE PROVISION

Section 1 of this Exhibit sets forth various findings that apply in Calabasas, explaining the administrative provisions, various local climatic, geological and/or topographical conditions that necessitate the various changes.

Section 2 of this Exhibit explains which findings apply to which amendments.

In numerous instances herein, the City has opted to make findings even though it is not legally required to do so. For example, if a change to a building standard is administrative in nature, then no finding is legally required. Likewise, if a proposal does not contradict a building standard, but merely supplements the standard, then the city need not make a finding. The city nevertheless has opted to make findings in many such circumstances.

### Section 1. General Findings

The following findings apply in the City of Calabasas, and explain why the changes to the Building Standards Code are necessary because of climatic, geological, topographical or local administrative regulations in the city.

### A. Climatic Conditions

1. Hot, dry Santa Ana winds are common to all areas within the City of Calabasas and Los Angeles County in general. These winds, which can cause small fires to spread quickly, are a contributing factor to the high fire danger in the area, and create the need for an increased level of fire protection. This added protection will supplement normal fire department response available and provide immediate protection for life and safety of multiple occupants during fire occurrences.

2. Los Angeles County and the City of Calabasas are located in a semi-arid Mediterranean type climate which predisposes all fuels, including wood shingles, to rapid ignition and spread of fire. Therefore, there exists a need for additional fire protection measures.

3. The greater Los Angeles region is within a climate capable of producing major rain related disasters, including but not limited to those caused by el Nino (or La Nina) subtropical –like weather.

### B. Geologic Conditions

1. Los Angeles County and the City of Calabasas are located in a highly active seismic area. There are earthquake faults that run along boundaries of Los Angeles and in the vicinity of Calabasas. The Chatsworth Fault runs through Simi Valley and Chatsworth, both of which are close to Calabasas. The epicenter of the 1994

Northridge earthquake was less than 10 miles from Calabasas, and produced the strongest ground swells ever instrumentally recorded in an urban setting in North America. Damage was wide-spread, sections of major freeways collapsed, parking structures and office buildings collapsed, and numerous apartment buildings suffered irreparable damage. Damage to wood-frame apartment houses was very widespread in the San Fernando Valley and Santa Monica areas.

The Newport-Inglewood Fault Zone (NIFZ) which runs through Los Angeles and Orange County was the source of the destructive 1933 Long Beach earthquake (6.3 magnitude, hypocenter off Newport Beach coast), which took 120 lives, with areas damaged from Laguna Beach to Marina del Rey and inland to Whittier, and poses one of the greatest hazards to lives and property in the nation. Regional planning for reoccurrence is recommended by the State of California, Department of Conservation.

The October 17, 1989, Santa Cruz earthquake resulted in only one major San Francisco fire in the Marina district, but when combined with the 34 other fires and over 500 responses, the department was taxed to its full capabilities. The Marina fire was difficult to contain because mains supplying water to the district burst during the earthquake. If more fires had been ignited by the earthquake, it would have been difficult for the fire department to contain them. Experts predict a major earthquake in our area within the next 50 years. This situation creates the need for both additional fire protection measures and automatic on-site fire protection for building occupants since a multitude of fires may result from breakage of gas and electric lines as a result of an earthquake. As noted by "Planning Scenario on a Major Earthquake on the Newport-Inglewood Fault Zone, 1988, State Department of Conservation," page 59, "unfortunately, barely meeting the minimum earthquake standards of building codes places a building on the verge of being legally unsafe";

2. Traffic and circulation congestion presently existing in the City of Calabasas often places fire department response time to fire occurrences at risk. This condition will be exacerbated by any major disaster, including any earthquake wherein damage to the highway system will occur. This condition makes the need for additional on-site protection for property occupants necessary.

3. The City of Calabasas is located in an area subject to a climatic condition of high winds and low humidity. This combination of events creates an environment, which is conducive to rapidly spreading fires. Control of such fires requires rapid response. Obstacles generated by a strong wind, such as fallen trees, street lights and utility poles. Additionally, Section 6, Figure 6-2 of ASCE 7 identifies a significant increase in the amount of wind force at 60 feet above the ground. Use of aerial type fire fighting apparatus above this height would place rescue personnel at increased risk of injury.

   The City of Calabasas is located in the middle of the seismically active area. The viability of the public water system would be questionable at best after a major seismic event. A severe seismic event has the potential to negatively impact any rescue or fire suppression activities because it is likely to create obstacles similar to

those indicated under the high wind section above. With the probability of strong aftershocks there exists a need to provide increased protection for anyone on upper floors.

4. Untreated wood roofs cause or contribute to serious fire hazard and to the rapid spread of fires when such fires are accompanied by high winds. Pieces of burning wooden roofs become flying brands and are carried by the wind to other locations and thereby spread fire quickly. Recent Grand Jury Report findings support this concern.

5. Improperly sitting and malfunctioning onsite wastewater treatment systems are a known source of water way contamination in the City of Calabasas. The groundwater absorption and filtration rates are largely dependent on geologic conditions, and the hilly and rocky terrain contributes to a lessening of the absorption and percolation of contaminated water.

C. **Administrative Regulations**

Local regulations necessary to carry out the application of the CBSC that do not establish building standards may be enacted without meeting the requirements of the HSC sections 18941.5, 17958, 17958.5 and 17958.7. Additional amendments have been made to Codes. Through recommendation of the City Attorney, City Prosecutor, or the Community Development Department, such amendments are hereby found to be either administrative or procedural in nature which do not impact the technical standards within the California Building Standards Codes or concern themselves with subjects which are not covered in such Codes. The changes made include provisions making each of said Codes compatible with other Codes and Ordinances enforced by the City.

D. **Not Applicable (N/A).** No findings need to be made, because the code section that is at issue does not amend any building standard.

E. **Topographical Conditions**

1. Calabasas is in a mountainous area with a high percentage development on hills, or bounded by hills. This pattern of development exacerbates pollution and water runoff problems because water runoff is forced to more quickly run down hill than it would otherwise, decreasing the ability of the land to naturally absorb and disperse and remediate the effects of pollution. Further, because of the topography, runoff is channelized, and all pollution congregates in a more limited number of areas than would otherwise occur. This has caused the need to adopt health and safety precautions to combat the negative effects of such results.

2. Because Calabasas is in a mountainous area with a high percentage of development on hills or bounded by hills, and most roads are windy as a result, emergency response is more difficult, and it becomes necessary to implement additional fire and life safety precautions

## Section 2 – Which Findings Apply to Which Amendments

Amendments to the 2010 Edition of the California Codes are found reasonably necessary based on the climatic and/or geologic conditions cited in Section 1 of this ordinance.

| Calabasas Municipal Code Section | Applicable Finding |
|---|---|
| 15.04 | A-1, A-2, B-1, B-2, B-3, B-4, B-5, C, E-1 and E-2 |
| 15.04.010 | N/A |
| 15.04.020 | C |
| 15.04.030 | N/A |
| 15.04.035 | C |
| 15.04.040 | N/A |
| 15.04.200 | See California Building Code Sections (CBC) below |
| 15.04.250 | C |
| 15.04.300 | N/A |
| 15.04.360 | N/A |
| 15.04.370 | N/A |
| 15.04.375 | N/A |
| 15.04.380 | N/A |
| 15.04.385 | N/A |
| 15.04.390 | N/A |
| 15.04.395 | N/A |
| 15.04.410 | N/A |
| 15.04.460 | C |
| 15.04.470 | C |
| 15.04.480 | C |
| 15.04.490 | N/A |
| 15.04.510 | N/A |
| 15.04.520 | C |
| 15.04.530 | C |
| 15.04.540 | C |
| 15.04.560 | N/A |
| 15.04.590 | C |
| 15.04.610* | C and E-1 |
| 15.04.720 | N/A |
| 15.04.750 | C |
| 15.04.800 | N/A |
| 15.04.820 | C |
| 15.04.840 | N/A |
| 15.04.860 | C |
| 15.04.870 | N/A |
| 15.04.900 | C |
| 15.04.950 | C |
| 15.04.960 | C |
| 15.04.970 | C |

* Revised November 8, 2010

| California Building Code Section | Applicable Finding |
|---|---|
| 103.1 | C |
| 103.2 | C |
| 105.1, 105.2, 105.3.2, | C |
| 105.5, 105.5.1, 105.5.2, | C |
| 105.6 | C |
| 109.4, 109.6 | C |
| 111.1.1, 111.3, 111.4 | C |
| 112.3, 112.3.1, 112.3.2, | C |
| 112.3.3 | C |
| 114.1 | C |
| 116.1, 116.2, 116.3 | C |
| 116.4 | C |
| 116.5 | C and see exhibit 2 |
| 1613.6.1 | B-1, B-3 and see exhibit 2 |
| 1613.6.7 | B-1, B-3 and see exhibit 2 |
| 1613.8 | B-1, B-3 and see exhibit 2 |
| 1613.9 | B-1, B-3 and see exhibit 2 |
| 1613.10 | B-1, B-3 and see exhibit 2 |
| 1613.11 | B-1, B-3 and see exhibit 2 |
| 1613.12 | B-1, B-3 and see exhibit 2 |
| 1613.12.1, 1613.12.2, 1613.12.3, | B-1, B-3 and see exhibit 2 |
| 1613.12.4, 1613.12.4.1, 1613.12.4.2, | B-1, B-3 and see exhibit 2 |
| 1613.12.4.2.1, 1613.12.4.2.2 | B-1, B-3 and see exhibit 2 |
| 1613.12.5, 1613.12.5.2, | B-1, B-3 and see exhibit 2 |
| 1613.12.5.3, 1613.12.5.4, | B-1, B-3 and see exhibit 2 |
| 1613.12.6, 1613.12.6.1 | B-1, B-3 and see exhibit 2 |
| 1613.12.6.2, 1613.12.6.3 | B-1, B-3 and see exhibit 2 |
| 1613.12.7, 1613.12.7.1, | B-1, B-3 and see exhibit 2 |
| 1613.12.7.2, 1613.12.7.3, | B-1, B-3 and see exhibit 2 |
| 1613.12.7.4, 1613.12.7.4.1, | B-1, B-3 and see exhibit 2 |
| 1613.12.7.4.2, 1613.12.7.4.3 | B-1, B-3 and see exhibit 2 |
| 1613.12.8, 1613.12.9, | B-1, B-3 and see exhibit 2 |
| 1613.12.9.1, 1613.12.9.2, | B-1, B-3 and see exhibit 2 |
| 1613.12.9.3, 1613.12.9.4, | B-1, B-3 and see exhibit 2 |
| 1613.12.9.5, 1613.12.9.5.1, | B-1, B-3 and see exhibit 2 |
| 1613.12.9.5.2, | B-1, B-3 and see exhibit 2 |
| 1613.12.9.5.3 and 1613.12.9.6. | B-1, B-3 and see exhibit 2 |
| 1613.12.10, | B-1, B-3 and see exhibit 2 |
| 1613.12.10.1, | B-1, B-3 and see exhibit 2 |
| 1613.12.10.2, 1613.12.10.3, | B-1, B-3 and see exhibit 2 |
| 1613.12.10.4, 1613.12.10.5 | B-1, B-3 and see exhibit 2 |
| 1613.13 | B-1, B-3 and see exhibit 2 |
| 1613.13.1, 1613.13.2, | B-1, B-3 and see exhibit 2 |
| 1613.13.3, 1613.13.3.1, | B-1, B-3 and see exhibit 2 |
| 1613.13.3.2, 1613.13.3.3, | B-1, B-3 and see exhibit 2 |
| 1613.13.3.4, 1613.13.4.1, | B-1, B-3 and see exhibit 2 |
| 1613.13.4.2, 1613.13.4.3 | B-1, B-3 and see exhibit 2 |
| 1613.13.4.4. | B-1, B-3 and see exhibit 2 |
| 1704.4, 1704.8 and1704.9 | C |

| | |
|---|---|
| 1705.3 | B-1, B-3 and see exhibit 2 |
| 1710.1, 1710.2 | C |
| 1807.1.4 | B-1, B-3 and see exhibit 2 |
| 1807.1.6 | B-1, B-3 and see exhibit 2 |
| 1809.3 | B-1, B-3 and see exhibit 2 |
| 1809.7 and Table 1809.7 | B-1, B-3 and see exhibit 2 |
| 1809.12 | B-1, B-3 and see exhibit 2 |
| 1810.3.2.4 | B-1, B-3 and see exhibit 2 |
| 1908.1, 1908.1.11, 1908.1.12, 1908.1.13, 1908.1.14, 1908.1.2, 1908.1.3, 1908.1.8) B-1, | B-1, B-3 and see exhibit 2 |
| 1909.4 | B-1, B-3 and see exhibit 2 |
| 2204.1.1, 2204.1.1.1, 2204.1.1.2 | B-1, B-3 and see exhibit 2 |
| 2205.4 | B-1, B-3 and see exhibit 2 |
| 2304.9.1, 2304.11.7 | B-1, B-3 and see exhibit 2 |
| 2305.4, 2305.5 | B-1, B-3 and see exhibit 2 |
| 2306.2.1 | B-1, B-3 and see exhibit 2 |
| 2306.2.1(3) | B-1, B-3 and see exhibit 2 |
| 2306.2.1(4) | B-1, B-3 and see exhibit 2 |
| 2306.3 and Table 2306.3(2) | B-1, B-3 and see exhibit 2 |
| 2306.4.5 | B-1, B-3 and see exhibit 2 |
| 2308.3.4, 2308.12.2, 2308.12.4, 2308.12.5 | B-1, B-3 and see exhibit 2 |

| California Residential Code | Applicable Finding |
|---|---|
| R301.1.3.2 | B-1, B-3 and see exhibit 2 |
| R301.1.4 | B-1, B-3 and see exhibit 2 |
| R301.2.2.3.5.1 | B-1, B-3, E-2 and see exhibit 2 |
| R322.1.4.1 | C and E-1 |
| R401.1 | A-3, B-1, B-3, E-1 and see exhibit 2 |
| R403.1.2 | B-1, B-3 and see exhibit 2 |
| R403.1.3 | B-1, B-3 and see exhibit 2 |
| R403.1.5 | B-1, B-3 and see exhibit 2 |
| R404.2 | A-3, B-1, B-3 and see exhibit 2 |
| R501.1 | B-1, B-3 and see exhibit 2 |
| R503.2.4 | B-1, B-3 and see exhibit 2 |
| R602.3(1), Table R602.3(2), Table R602.10.1.2(2), Table R602.10.2, Table R602.10.3, R602.10.4, R602.10.4.1, R602.10.7.1) | B-1, B-3 and see exhibit 2 |
| R606.2.4 | B-1, B-3 and see exhibit 2 |
| R606.12.2.2.3 | B-1, B-3 and see exhibit 2 |
| R802.5.1(9), R802.8 | B-1, B-3 and see exhibit 2 |
| R802.10.2 | B-1, B-3 and see exhibit 2 |
| R803.2.4 | B-1, B-3 and see exhibit 2 |
| R1001.3.1 | B-1, B-3 and see exhibit 2 |
| R1101 | C |
| R1102 | C |
| R1103 | C, B-1, B-3, E-2 and see exhibit 2 |
| R1104 | C |
| R1104.1, R1104.1.1, | C, B-1 and B-3 |

| | |
|---|---|
| R1104.1.1.2 and Table, R1104.1.1.3, R1104.1.2) | C, B-1 and B-3 |
| R1105 | B-1, B-3 |
| R1105.2.1, R1105.2.2, | C, B-1, B-3, E-2 and see exhibit 2 |
| R1105.2.2.1, R1105.2.2.2, | C, B-1, B-3, E-2 and see exhibit 2 |
| R1105.2.2.3, | C, B-1, B-3, E-2 and see exhibit 2 |
| R1105.2.3, R1105.2.3.1, | C, B-1, B-3, E-2 and see exhibit 2 |
| R1105.2.4 | C, B-1, B-3, E-2 and see exhibit 2 |

| **California Plumbing Code** | **Applicable Finding** |
|---|---|
| Appendix K 1 (1)* | C |
| Appendix K 3* | C and E-1 |
| Appendix K 4* | C and E-1 |
| Appendix K 5 (H)* | C and E-1 |
| Appendix K 13 (E) (4) (ii)* | C and E-1 |
| Appendix K 13 (E) (4) (iv)* | C and E-1 |
| Appendix K 16 (C) (1) | C |
| Appendix K 16 (C) (2) | C |

| **California Green Building Standards Code** | **Applicable Finding** |
|---|---|
| 101.10 | C |

* Revised November 8, 2010

# LOS ANGELES REGION
# UNIFORM CODE PROGRAM

# RECOMMENDED TECHNICAL AMENDMENTS TO THE 2010 CALIFORNIA BUILDING CODE, 2010 CALIFORNIA RESIDENTIAL CODE, AND 2010 CALIFORNIA GREEN BUILDING STANDARDS CODE

**Final Draft: August 26, 2010**

PREPARED BY:

ICC LOS ANGELES BASIN CHAPTER'S
**STRUCTURAL CODE COMMITTEE,**
**CRC CODE COMMITTEE, AND**
**GREEN BUILDING STANDARDS CODE COMMITTEE.**

## PREFACE

In 1957 our founding members established one of the earliest chapters of the International Conference of Building Officials and now the International Code Council. Today the Chapter has grown to over eighty-nine Southern California jurisdictions, plus consulting firms and members of the construction industry. When ICBO merged with two other building official organizations to create the International Code Council, the Los Angeles Basin Chapter officially became an ICC Chapter in December 2002.

With the recent change of the model codes from the Uniform Codes to the International Codes, the ICC Los Angeles Basin Chapter has been very active throughout the years in leading the effort to create uniformity of building codes and regulations in the greater Los Angeles region as well as addressing policy issues of interest to building officials and the construction industry.

One such effort to promote uniformity of building regulations is through the Los Angeles Regional Uniform Code Program (LARUCP). The LARUCP program began in July 1999 with the purpose of developing uniform interpretations and handouts to serve as guidelines for building officials, contractors, engineers and architects in the consistent application of the codes. The mission of this program was to minimize the number of and to develop uniformity in local technical amendments to model codes for adoption by jurisdictions in the greater Los Angeles region.

Leading the efforts to creating uniformity of building codes and regulations within the region are the dedicated members of the Los Angeles County Building and Safety Division, City of Los Angeles Department of Building and Safety, City of Long Beach Building and Safety Bureau, and other jurisdictional members in the greater Los Angeles region. Through the coordination of the ICC Los Angeles Basin Chapter's CRC Committee, Structural Code Committee, and Green Building Standards Committee, the following regulatory streamlining tasks to be completed are:

1. Create uniformity of building, plumbing, mechanical, electrical, energy efficiency and green codes that can be adopted in most of the jurisdictions in the greater Los Angeles region.

2. Reduces the total number of local technical amendments to the model code in the greater Los Angeles region.

3. Received support from most, if not all, of the 89 jurisdictions in the greater Los Angeles region.

4. Obtain active participation from a majority of the jurisdictions in the greater Los Angeles region in formulating and implementing this program.

5. With construction valuation of over $5 billion in the region, conservatively assuming that this program produces a 1% construction cost savings, achieve an estimated cost saving of $50 million per year in the greater Los Angeles region.

## DISCUSSION

Section 17958 of the California Health and Safety Code requires that the latest California Building Standards Codes apply to local construction 180 days after they become effective at the State level. The California Building Standards Commission has adopted the 2010 Edition of the California Building Code, California Residential Code, and California Green Building Standards Code. State Law requires that these Codes become effective at the local level on January 1, 2011.

State Law requires that local amendments to the California Building Standards Codes be enacted only when an express finding is made that such modifications or changes are reasonably necessary because of local climatic, geological or topographical conditions.

The ICC Los Angeles Basin Chapter's CRC Committee, Structural Committee, and Green Building Standards Committee are recommending that the FY 2010 LARUCP Recommended Technical

Amendments contained in this document, some of which continues amendments enacted during the previous code adoption cycle, be considered for local adoption for the following reasons:

1. To protect the community within the greater Los Angeles region from a vast array of fault systems capable of producing major earthquakes and/or climate systems capable of producing major winds, fire and rain related disaster.

2. To ensure and encourage energy efficiency and sustainable practices are incorporated into building designs and constructions.

The FY 2010 LARUCP Recommended Technical Amendments have been widely circulated and/or discussed over the past several months with various local jurisdictional members, structural engineering associations or committees such as, but not limited to, Seismology, Steel, Light Frame Construction, Quality Assurance and Building Code Committee, design professionals in the construction/engineering industry, and other interested groups or individuals. The proposed languages, reasons and findings as to climatic, topographic or geologic conditions are detailed in this document for each of the recommended technical amendments to the model code.

## STATEMENT ON USE OF DOCUMENT

The primary purpose of the ICC Los Angeles Basin Chapter's Committees is to serve and benefit its members. To this end, the Committees provides a forum for the exchange, consideration, and discussion of ideas and proposals that are relevant to the construction industry and the consensus of which forms the basis for the proposed amendments contained in this document.

By making available the recommendations in this document, the ICC Los Angeles Basin Chapter's Committees does not insure any jurisdiction using the information it contains against any liability arising from that use. The Committees disclaims liability for any injury to persons or to property, or other damages of any nature whatsoever, whether special, indirect, consequential or compensatory, directly or indirectly resulting from the publication, use of, or reliance on this document. The Committees makes no guaranty or warranty as to the accuracy or completeness of any information provided herein. Any jurisdiction using this document should rely on their own independent judgment and exercise reasonable care in any given circumstances. Each jurisdiction adopting the proposed amendments contained in this document should make an independent, substantiating investigation of the validity of that information for their particular use.

## ACKNOWLEDGEMENT

The ICC Los Angeles Basin Chapter would like to express its gratitude and appreciation to all the participating committee members and correspondents that spent countless hours over the past several months assisting in the review, discussion, evaluation and drafting of the proposed recommended technical amendments to the 2010 Edition of the California Building Code, 2010 Edition of the California Residential Code and 2010 Edition of the California Green Building Standards Code. Special thanks go out to the following individuals without whose support and effort the recommendations presented herein would not be possible.

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# PART I

## RECOMMENDED LARUCP AMENDMENTS TO THE

## 2010 EDITION OF THE CALIFORNIA BUILDING CODE

## SUMMARY OF RECOMMENDED LARUCP AMENDMENTS TO THE 2010 CBC

| (N) 2010 LARUCP NO. | (E) 2007 LARUCP NO. | TITLE/DESCRIPTION | STATUS[1] | DATE |
|---|---|---|---|---|
| 16-01 | 16-01 | Amend CBC Section 1613.6.1 Assumption of Flexible Diaphragm | AM | 5/25/10 |
| 16-02 | 16-10 | Amend CBC Section 1613.6.7 Building Separation | AM | 4/27/10 |
| 16-03 | 16-07 | Add CBC Section 1613.8 BRBF Period Parameter | AS | 4/27/10 |
| 16-04 | 16-04 | Add CBC Section 1613.9 Values for Vertical Combinations | AS | 4/27/10 |
| 16-05 | 16-08 | Add CBC Section 1613.10 Stability Coefficient | AS | 4/27/10 |
| 16-06 | 16-02 | Add CBC Section 1613.11 Subdiaphragm | AM | 4/27/10 |
| 16-07 | 16-03 | Add CBC Section 1613.12 Hillside Building | AM | 6/14/10 |
| 16-08 | 16-09 | Add CBC Section 1613.13 Suspended Ceiling | AM | 5/25/10 |
| 17-01 | 17-02 | Amend CBC Section 1704.4 SI for Concrete Construction | AM | 4/27/10 |
| 17-02 | 17-03 | Amend CBC Section 1704.8 Driven Deep Foundations | AS | 5/25/10 |
| 17-03 | 17-03 | Amend CBC Section 1704.9 Cast-in-Place Deep Foundations | AS | 5/25/10 |
| 17-04 | 17-01 | Amend CBC Section 1705.3 Seismic Resistance Inspection | AM | 4/27/10 |
| 17-05 | 17-04 | Amend CBC Section 1710.1 Structural Observations General | AM | 4/27/10 |
| 17-06 | 17-04 | Amend CBC Section 1710.2 Structural Observations Seismic | AM | 4/27/10 |
| 18-01 | 18-01 | Amend CBC Section 1807.1.4 Permanent Wood Foundation System | AS | 4/27/10 |
| 18-02 | 18-01 | Amend CBC Section 1807.1.6 Prescriptive Design of Foundation Walls | AS | 4/27/10 |
| 18-03 | 18-01 | Amend CBC Section 1809.3 Stepped Footings | AS | 4/27/10 |
| 18-04 | 18-01 | Amend CBC Table 1809.7 Prescriptive Footings | AS | 4/27/10 |
| 18-05 | 18-01 | Amend CBC Section 1809.12 Timber Footings | AS | 4/27/10 |
| 18-06 | 18-01 | Amend CBC Section 1810.3.2.4 Timber | AS | 4/27/10 |
| 19-01 | 19-02 | Add CBC Sections 1908.1.11 thru 14 Reinforcement | AS | 4/27/10 |
| 19-02 | N/A | Amend CBC Section 1908.1.2 Intermediate Structural Wall | AS | 4/27/10 |
| 19-03 | N/A | Amend CBC Section 1908.1.3 Wall Pier | AS | 4/27/10 |
| 19-04 | 19-03 | Amend CBC Section 1908.1.8 Minimum Reinforcement | AS | 4/27/10 |
| 19-05 | N/A | Amend CBC Section 1909.4 Structural Plain Concrete Design | AM | 6/14/10 |
| 22-01 | N/A | Add CBC Section 2204.1.1 Consumables for Welding | AS | 4/27/10 |
| 22-02 | 22-01 | Add CBC Section 2205.4 SCBF Member Type | AS | 4/27/10 |
| 23-01 | N/A | Amend CBC Section 2304.11.7 Wood Used in Retaining Wall | AM | 5/11/10 |
| 23-02 | 23-03 | Add CBC Section 2305.4 Quality of Nails | AS | 5/11/10 |
| 23-03 | 23-02 | Add CBC Section 2305.5 Hold-down Connectors | AM | 5/11/10 |
| 23-04 | 23-04 | Amend CBC Section 2306.2.1 Wood Diaphragm | AM | 5/11/10 |
| 23-05 | 23-04 | Amend CBC Section 2306.3 Wood Shear Walls | AM | 6/24/10 |
| 23-06 | 23-05 | Amend CBC Section 2306.7 Other Shear Walls | AM | 6/24/10 |
| 23-07 | N/A | Amend CBC Section 2308.3.4 Brace Wall Line Support | AM | 5/11/10 |
| 23-08 | 23-06 | Amend CBC Section 2308.12.2 Concrete or Masonry | AM | 5/11/10 |
| 23-09 | 23-06 | Amend CBC Section 2308.12.4 Braced Wall Sheathing | AM | 6/14/10 |
| 23-10 | N/A | Amend CBC Section 2304.9.1 Fastener Requirement | AM | 6/14/10 |
| 23-11 | 23-06 | Amend CBC Section 2308.12.5 Attachment of Sheathing | AM | 5/11/10 |

**FOOTNOTE:**

1. AS = Approved as submitted. AM = Approved as modified. N/A = Not Applicable.

**2010 LARUCP 16-01.** Section 1613.6.1 of the 2010 Edition of the California Building Code is amended to read 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:

1. 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.

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

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

4. Portions of wood structural panel diaphragms that cantilever beyond the vertical elements of the ~~lateral~~seismic-force-resisting system are designed in accordance with Section 4.2.5.2 of AF&PA SDPWS.

**RATIONALE:**

This proposed amendment changes "lateral" to "seismic" to reflect consistency of the application of this provision.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 emphasize that the design concern is for seismic-force-resisting elements and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 16-02.** Equation 16-44 of Section 1613.6.7 of the 2010 Edition of the California Building Code is amended to read as follows:

$$\delta_M = \frac{C_d \delta_{max}}{~~I~~} \qquad \textbf{(Equation 16-44)}$$

where:

$C_d$ = Deflection amplification factor in Table 12.2-1 of ASCE 7.

$\delta_{max}$ = Maximum displacement defined in Section 12.8.4.3 of ASCE 7.

~~I = Importance factor in accordance with Section 11.5.1 of ASCE 7.~~

**RATIONALE:**

The inclusion of the importance factor in this equation has the unintended consequence of reducing the minimum seismic separation distance for important facilities such as hospital, school, police and fire station, etc. from adjoining structures. The proposal to omit the importance factor from Equation 16-44 will ensure that a safe seismic separation distance is provided. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 omit the importance factor in the equation ensures that a safe seismic separation distance is maintained for important facilities from adjoining structures and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 16-03.** Section 1613.8 is added to Chapter 16 of the 2010 Edition of the California Building Code to read as follows:

**1613.8 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 |

**RATIONALE:**

The steel Buckling Restrained Braced Frame (BRBF) system was first approved for use in 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 was an oversight that these parameters were not carried forward into the 2005 Edition of the ASCE 7. 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. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 amendment provides clarification on the design parameters for BRBF members and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code and ASCE 7-05.

**2010 LARUCP 16-04.** Section 1613.9 is added to Chapter 16 of the 2010 Edition of the California Building Code to read as follows:

**1613.9 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.

**RATIONALE:**

Observed damages to one and two family dwellings of light frame construction after the Northridge Earthquake may have been partially attributed to vertical irregularities common to this type of occupancy and construction. In an effort to improve quality of construction and incorporate lesson learned from studies after the Northridge Earthquake, the proposed modification to ASCE 7-05 Section 12.2.3.1 by limiting the number of stories and height of the structure to two stories will significantly minimize the impact of vertical irregularities and concentration of inelastic behavior from mixed structural systems. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 mixed structural system to two stories is intended to improve quality of construction by reducing potential damages that may result from vertical irregularities of the structural system in buildings subject to high seismic load and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 16-05.** Section 1613.10 is added to Chapter 16 of the 2010 Edition of the California Building Code to read as follows:

**1613.10 ASCE 7, Section 12.8.7.** Modify ASCE 7 Section 12.8.7 by amending Equation 12.8-16 as follows:

$$\theta = \frac{P_x \Delta I}{V_x h_{sx} C_d} \qquad (12.8\text{-}16)$$

**RATIONALE:**

The importance factor, I, was 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 consistent with the provisions adopted by OSPHD and DSA-SS as reflected in Section 1615.10.5 of the 2010 California Building Code. SEAOSC Steel Committee had supported the proposed modification during the 2007 code adoption process. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 is intended to improve the likelihood that important and critical buildings and structures remain operational in the event of an emergency resulting from seismic activities and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 16-06.** Section 1613.11 is added to Chapter 16 of the 2010 Edition of the California Building Code to read as follows:

**1613.11 ASCE 7, Section 12.11.2.2.3.** Modify ASCE 7, Section 12.12.4 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 structures assigned to Seismic Design Category D, E or F, wood diaphragms supporting concrete or masonry walls 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.

**RATIONALE:**

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, there was a need to limit subdiaphragm allowable shear loads to control combined orthogonal stresses within the diaphragm. Recognizing the importance and need to continue the recommendation made by the task force while taking into consideration the improve performances and standards for diaphragm construction today, this proposal increases 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 and is deemed appropriate and acceptable. Due to the frequency of this type of failure during the past significant earthquakes, various jurisdictions within the Los Angeles region have taken this additional step to prevent roof or floor diaphragms from pulling away from concrete or masonry walls. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 special anchorage of the diaphragm to the wall and limit the allowable shear will address special needs for concrete and masonry construction with flexible wood diaphragm and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 16-07.** Section 1613.12 is added to Chapter 16 of the 2010 Edition of the California Building Code to read as follows:

**1613.12 Seismic Design Provisions for Hillside Buildings.**

**1613.12.1 Purpose.** The purpose of this section is to establish minimum regulations for the design and construction of new buildings and additions to existing buildings when constructing such buildings on or into slopes steeper than one unit vertical in three units horizontal (33.3%). These regulations establish minimum standards for seismic force resistance to reduce the risk of injury or loss of life in the event of earthquakes.

**1613.12.2 Scope.** The provisions of this section shall apply to the design of the lateral-force-resisting system for hillside buildings at and below the base level diaphragm. The design of the lateral-force-resisting system above the base level diaphragm shall be in accordance with the provisions for seismic and wind design as required elsewhere in this division.

**Exception:** Non-habitable accessory buildings and decks not supporting or supported from the main building are exempt from these regulations.

**1613.12.3 Definitions.** For the purposes of this section certain terms are defined as follows:

BASE LEVEL DIAPHRAGM is the floor at, or closest to, the top of the highest level of the foundation.

DIAPHRAGM ANCHORS are assemblies that connect a diaphragm to the adjacent foundation at the uphill diaphragm edge.

DOWNHILL DIRECTION is the descending direction of the slope approximately perpendicular to the slope contours.

FOUNDATION is concrete or masonry which supports a building, including footings, stem walls, retaining walls, and grade beams.

FOUNDATION EXTENDING IN THE DOWNHILL DIRECTION is a foundation running downhill and approximately perpendicular to the uphill foundation.

HILLSIDE BUILDING is any building or portion thereof constructed on or into a slope steeper than one unit vertical in three units horizontal (33.3%). If only a portion of the building is supported on or into the slope, these regulations apply to the entire building.

PRIMARY ANCHORS are diaphragm anchors designed for and providing a direct connection as described in Sections 1613.12.5 and 1613.12.7.3 between the diaphragm and the uphill foundation.

SECONDARY ANCHORS are diaphragm anchors designed for and providing a redundant diaphragm to foundation connection, as described in Sections 1613.12.6 and 1613.12.7.4.

UPHILL DIAPHRAGM EDGE is the edge of the diaphragm adjacent and closest to the highest ground level at the perimeter of the diaphragm.

UPHILL FOUNDATION is the foundation parallel and closest to the uphill diaphragm edge.

**1613.12.4 Analysis and Design.**

**1613.12.4.1 General.** Every hillside building within the scope of this section shall be analyzed, designed, and constructed in accordance with the provisions of this division. When the code-

prescribed wind design produces greater effects, the wind design shall govern, but detailing requirements and limitations prescribed in this and referenced sections shall be followed.

**1613.12.4.2 Base Level Diaphragm-Downhill Direction.** The following provisions shall apply to the seismic analysis and design of the connections for the base level diaphragm in the downhill direction.

**1613.12.4.2.1 Base for Lateral Force Design Defined.** For seismic forces acting in the downhill direction, the base of the building shall be the floor at or closest to the top of the highest level of the foundation.

**1613.12.4.2.2 Base Shear.** In developing the base shear for seismic design, the response modification coefficient (R) shall not exceed 5 for bearing wall and building frame systems. The total base shear shall include the forces tributary to the base level diaphragm including forces from the base level diaphragm.

**1613.12.5 Base Shear Resistance-Primary Anchors.**

**1613.12.5.1 General.** The base shear in the downhill direction shall be resisted through primary anchors from diaphragm struts provided in the base level diaphragm to the foundation.

**1613.12.5.2 Location of Primary Anchors.** A primary anchor and diaphragm strut shall be provided in line with each foundation extending in the downhill direction. Primary anchors and diaphragm struts shall also be provided where interior vertical lateral-force-resisting elements occur above and in contact with the base level diaphragm. The spacing of primary anchors and diaphragm struts or collectors shall in no case exceed 30 feet (9144 mm).

**1613.12.5.3 Design of Primary Anchors and Diaphragm Struts.** Primary anchors and diaphragm struts shall be designed in accordance with the requirements of Section 1613.12.8.

**1613.12.5.4 Limitations.** The following lateral-force-resisting elements shall not be designed to resist seismic forces below the base level diaphragm in the downhill direction:

1. Wood structural panel wall sheathing,
2. Cement plaster and lath,
3. Gypsum wallboard, and
4. Tension only braced frames.

Braced frames designed in accordance with the requirements of Section 2205.2.2 may be used to transfer forces from the primary anchors and diaphragm struts to the foundation provided lateral forces do not induce flexural stresses in any member of the frame or in the diaphragm struts. Deflections of frames shall account for the variation in slope of diagonal members when the frame is not rectangular.

**1613.12.6. Base Shear Resistance-Secondary Anchors.**

**1613.12.6.1 General.** In addition to the primary anchors required by Section 1613.12.5, the base shear in the downhill direction shall be resisted through secondary anchors in the uphill foundation connected to diaphragm struts in the base level diaphragm.

**Exception:** Secondary anchors are not required where foundations extending in the downhill direction spaced at not more than 30 feet (9144 mm) on center extend up to and are directly connected to the base level diaphragm for at least 70% of the diaphragm depth.

**1613.12.6.2 Secondary Anchor Capacity and Spacing.** Secondary anchors at the base level diaphragm shall be designed for a minimum force equal to the base shear, including forces tributary to the base level diaphragm, but not less than 600 pounds per lineal foot (8.76 kN/m). The secondary anchors shall be uniformly distributed along the uphill diaphragm edge and shall be spaced a maximum of four feet (1219 mm) on center.

**1613.12.6.3 Design.** Secondary anchors and diaphragm struts shall be designed in accordance with Section 1613.12.8.

**1613.12.7 Diaphragms Below the Base Level-Downhill Direction.** The following provisions shall apply to the lateral analysis and design of the connections for all diaphragms below the base level diaphragm in the downhill direction.

**1613.12.7.1 Diaphragm Defined.** Every floor level below the base level diaphragm shall be designed as a diaphragm.

**1613.12.7.2 Design Force.** Each diaphragm below the base level diaphragm shall be designed for all tributary loads at that level using a minimum seismic force factor not less than the base shear coefficient.

**1613.12.7.3 Design Force Resistance-Primary Anchors.** The design force described in Section 1613.12.7.2 shall be resisted through primary anchors from diaphragm struts provided in each diaphragm to the foundation. Primary anchors shall be provided and designed in accordance with the requirements and limitations of Section 1613.12.5.

**1613.12.7.4 Design Force Resistance-Secondary Anchors.**

**1613.12.7.4.1 General.** In addition to the primary anchors required in Section 1613.12.7.3, the design force in the downhill direction shall be resisted through secondary anchors in the uphill foundation connected to diaphragm struts in each diaphragm below the base level.

**Exception:** Secondary anchors are not required where foundations extending in the downhill direction, spaced at not more than 30 feet (9144 mm) on center, extend up to and are directly connected to each diaphragm below the base level for at least 70% of the diaphragm depth.

**1613.12.7.4.2 Secondary Anchor Capacity.** Secondary anchors at each diaphragm below the base level diaphragm shall be designed for a minimum force equal to the design force but not less than 300 pounds per lineal foot (4.38 kN/m). The secondary anchors shall be uniformly distributed along the uphill diaphragm edge and shall be spaced a maximum of four feet (1219 mm) on center.

**1613.12.7.4.3 Design.** Secondary anchors and diaphragm struts shall be designed in accordance with Section 1613.12.8.

**1613.12.8 Primary and Secondary Anchorage and Diaphragm Strut Design.** Primary and secondary anchors and diaphragm struts shall be designed in accordance with the following provisions:

1. Fasteners. All bolted fasteners used to develop connections to wood members shall be provided with square plate washers at all bolt heads and nuts. Washers shall be minimum 0.229 inch by 3 inches by 3 inches (5.82 mm by 76 mm by 76 mm) in size. Nuts shall be tightened to finger tight plus one half (1/2) wrench turn prior to covering the framing.

2. Fastening. The diaphragm to foundation anchorage shall not be accomplished by the use of toenailing, nails subject to withdrawal, or wood in cross-grain bending or cross-grain tension.

3. Size of Wood Members. Wood diaphragm struts collectors, and other wood members connected to primary anchors shall not be less than three-inch (76 mm) nominal width. The effects of eccentricity on wood members shall be evaluated as required per Item 9.

4. Design. Primary and secondary anchorage, including diaphragm struts, splices, and collectors shall be designed for 125% of the tributary force.

5. Allowable Stress Increase. The one-third allowable stress increase permitted under Section 1605.3.2 shall not be taken when the working (allowable) stress design method is used.

6. Steel Element of Structural Wall anchorage System. The strength design forces for steel elements of the structural wall anchorage system, with the exception of anchor bolts and reinforcing steel, shall be increased by 1.4 times the forces otherwise required.

7. Primary Anchors. The load path for primary anchors and diaphragm struts shall be fully developed into the diaphragm and into the foundation. The foundation must be shown to be adequate to resist the concentrated loads from the primary anchors.

8. Secondary Anchors. The load path for secondary anchors and diaphragm struts shall be fully developed in the diaphragm but need not be developed beyond the connection to the foundation.

9. Symmetry. All lateral force foundation anchorage and diaphragm strut connections shall be symmetrical. Eccentric connections may be permitted when demonstrated by calculation or tests that all components of force have been provided for in the structural analysis or tests.

10. Wood Ledgers. Wood ledgers shall not be used to resist cross-grain bending or cross-grain tension.

**1613.12.9 Lateral-Force-Resisting Elements Normal to the Downhill Direction.**

**1613.12.9.1 General.** In the direction normal to the downhill direction, lateral-force-resisting elements shall be designed in accordance with the requirements of this section.

**1613.12.9.2 Base Shear.** In developing the base shear for seismic design, the response modification coefficient (R) shall not exceed 5 for bearing wall and building frame systems.

**1613.12.9.3 Vertical Distribution of Seismic Forces.** For seismic forces acting normal to the downhill direction the distribution of seismic forces over the height of the building using Section 12.8.3 of ASCE 7 shall be determined using the height measured from the top of the lowest level of the building foundation.

**1613.12.9.4 Drift Limitations.** The story drift below the base level diaphragm shall not exceed 0.007 times the story height at strength design force level. The total drift from the base level diaphragm to the top of the foundation shall not exceed 3/4 inch (19 mm). Where the story height or the height from the base level diaphragm to the top of the foundation varies because of a stepped footing or story offset, the height shall be measured from the average height of the top of the foundation. The story drift shall not be reduced by the effect of horizontal diaphragm stiffness.

**1613.12.9.5 Distribution of Lateral Forces.**

**1613.12.9.5.1 General.** The design lateral force shall be distributed to lateral-force-resisting elements of varying heights in accordance with the stiffness of each individual element.

**1613.12.9.5.2 Wood Structural Panel Sheathed Walls.** The stiffness of a stepped wood structural panel shear wall may be determined by dividing the wall into adjacent rectangular elements, subject to the same top of wall deflection. Deflections of shear walls may be estimated by AF&PA SDPWS Section 4.3.2. Sheathing and fastening requirements for the stiffest section shall be used for the entire wall. Each section of wall shall be anchored for shear and uplift at each step. The minimum horizontal length of a step shall be eight feet (2438 mm) and the maximum vertical height of a step shall be two feet, eight inches (813 mm).

**1613.12.9.5.3 Reinforced Concrete or Masonry Shear Walls.** Reinforced concrete or masonry shear walls shall have forces distributed in proportion to the rigidity of each section of the wall.

**1613.12.9.6 Limitations.** The following lateral force-resisting-elements shall not be designed to resist lateral forces below the base level diaphragm in the direction normal to the downhill direction:

1. Cement plaster and lath,

2. Gypsum wallboard, and

3. Tension-only braced frames.

Braced frames designed in accordance with the requirements of Section 2205.2.2 of this Code may be designed as lateral-force-resisting elements in the direction normal to the downhill direction, provided lateral forces do not induce flexural stresses in any member of the frame. Deflections of frames shall account for the variation in slope of diagonal members when the frame is not rectangular.

**1613.12.10 Specific Design Provisions.**

**1613.12.10.1 Footings and Grade Beams.** All footings and grade beams shall comply with the following:

1. Grade beams shall extend at least 12 inches (305 mm) below the lowest adjacent grade and provide a minimum 24-inch (610 mm) distance horizontally from the bottom outside face of the grade beam to the face of the descending slope.

2. Continuous footings shall be reinforced with at least two No. 4 reinforcing bars at the top and two No. 4 reinforcing bars at the bottom.

3. All main footing and grade beam reinforcement steel shall be bent into the intersecting footing and fully developed around each corner and intersection.

4. All concrete stem walls shall extend from the foundation and reinforced as required for concrete or masonry walls.

**1613.12.10.2 Protection Against Decay and Termites.** All wood to earth separation shall comply with the following:

1. Where a footing or grade beam extends across a descending slope, the stem wall, grade beam, or footing shall extend up to a minimum 18 inches (457 mm) above the highest adjacent grade.

**Exception:** At paved garage and doorway entrances to the building, the stem wall need only extend to the finished concrete slab, provided the wood framing is protected with a moisture proof barrier.

2. Wood ledgers supporting a vertical load of more than 100 pounds per lineal foot (1.46 kN/m) and located within 48 inches (1219 mm) of adjacent grade are prohibited. Galvanized steel ledgers and anchor bolts, with or without wood nailers, or treated or decay resistant sill plates supported on a concrete or masonry seat, may be used.

**1613.12.10.3 Sill Plates.** All sill plates and anchorage shall comply with the following:

1. All wood framed walls, including nonbearing walls, when resting on a footing, foundation, or grade beam stem wall, shall be supported on wood sill plates bearing on a level surface.

2. Power-driven fasteners shall not be used to anchor sill plates except at interior nonbearing walls not designed as shear walls.

**1613.12.10.4 Column Base Plate Anchorage.** The base of isolated wood posts (not framed into a stud wall) supporting a vertical load of 4,000 pounds (17.8 kN) or more and the base plate for a steel column shall comply with the following:

1. When the post or column is supported on a pedestal extending above the top of a footing or grade beam, the pedestal shall be designed and reinforced as required for concrete or masonry columns. The pedestal shall be reinforced with a minimum of four No. 4 bars extending to the bottom of the footing or grade beam. The top of exterior pedestals shall be sloped for positive drainage.

2. The base plate anchor bolts or the embedded portion of the post base, and the vertical reinforcing bars for the pedestal, shall be confined with two No. 4 or three No. 3 ties within the top five inches (127 mm) of the concrete or masonry pedestal. The base plate anchor bolts shall be embedded a minimum of 20 bolt diameters into the concrete or masonry pedestal. The base plate anchor bolts and post bases shall be galvanized and each anchor bolt shall have at least two galvanized nuts above the base plate.

**1613.12.10.5 Steel Beam to Column Supports.** All steel beam to column supports shall be positively braced in each direction. Steel beams shall have stiffener plates installed on each side of the beam web at the column. The stiffener plates shall be welded to each beam flange and the beam web. Each brace connection or structural member shall consist of at least two 5/8 inch (15.9 mm) diameter machine bolts.

**RATIONALE:**

Due to the difficulty of fire suppression vehicles accessing winding and narrow hillside properties and the probabilities for future earthquakes in the Los Angeles region, this technical amendment is required to address the special needs for buildings constructed on hillside locations. A joint Structural Engineers Association of Southern California (SEAOSC) and both the Los Angeles County and Los Angeles City Task Force investigated the performance of hillside building failures after the Northridge earthquake. Numerous hillside failures resulted in loss of life and millions of dollars in damage. These criteria were developed to minimize the damage to these structures and have been in use by both the City and County of Los Angeles for several years with much success. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Topographical and Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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. Additionally, the topography within the Los Angeles region includes significant hillsides with narrow and winding access that makes timely response by fire suppression vehicles challenging and difficult. The proposed modification establishes design parameters to better mitigate and limit property damage that are the results of increased seismic forces which are imparted upon hillside buildings and structures and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 16-8.** Section 1613.13 is added to Chapter 16 of the 2010 Edition of the California Building Code to read as follows:

**1613.13 Suspended Ceilings.** Minimum design and installation standards for suspended ceilings shall be determined in accordance with the requirements of Section 2506.2.1 of this Code and this subsection.

**1613.13.1 Scope.** This part contains special requirements for suspended ceilings and lighting systems. Provisions of Section 13.5.6 of ASCE 7 shall apply except as modified herein.

**1613.13.2 General.** The suspended ceilings and lighting systems shall be limited to 6 feet (1828 mm) below the structural deck unless the lateral bracing is designed by a licensed engineer or architect.

**1613.13.3 Design and Installation Requirements.**

**1613.13.3.1 Bracing at Discontinuity.** Positive bracing to the structure shall be provided at changes in the ceiling plane elevation or at discontinuities in the ceiling grid system.

**1613.13.3.2 Support for Appendages.** Cable trays, electrical conduits and piping shall be independently supported and independently braced from the structure.

**1613.13.3.3 Sprinkler Heads.** All sprinkler heads (drops) except fire-resistance-rated floor/ceiling or roof/ceiling assemblies, shall be designed to allow for free movement of the sprinkler pipes with oversize rings, sleeves or adaptors through the ceiling tile, in accordance with Section 13.5.6.2.2 (e) of ASCE 7.

Sprinkler heads penetrating fire-resistance-rated floor/ceiling or roof/ceiling assemblies shall comply with Section 713 of this Code.

**1613.13.3.4 Perimeter Members.** A minimum wall angle size of at least a two-inch (51 mm) horizontal leg shall be used at perimeter walls and interior full height partitions. The first ceiling tile shall maintain 3/4 inch (19 mm) clear from the finish wall surface. An equivalent alternative detail that will provide sufficient movement due to anticipated lateral building displacement may be used in lieu of the long leg angle subject to the approval of the Superintendent of Building.

**1613.13.4 Special Requirements for Means of Egress.** Suspended ceiling assemblies located along means of egress serving an occupant load of 30 or more shall comply with the following provisions.

**1613.13.4.1 General.** Ceiling suspension systems shall be connected and braced with vertical hangers attached directly to the structural deck along the means of egress serving an occupant load of 30 or more and at lobbies accessory to Group A Occupancies. Spacing of vertical hangers shall not exceed 2 feet (610 mm) on center along the entire length of the suspended ceiling assembly located along the means of egress or at the lobby.

**1613.13.4.2 Assembly Device.** All lay-in panels shall be secured to the suspension ceiling assembly with two hold-down clips minimum for each tile within a 4-foot (1219 mm) radius of the exit lights and exit signs.

**1613.13.4.3 Emergency Systems.** Independent supports and braces shall be provided for light fixtures required for exit illumination. Power supply for exit illumination shall comply with the requirements of Section 1006.3 of this Code.

**1613.13.4.4 Supports for Appendage.** Separate support from the structural deck shall be provided for all appendages such as light fixtures, air diffusers, exit signs, and similar elements.

**RATIONALE:**

The California Building Code has little to no information regarding the safe design and construction requirements for ceiling suspension systems subject to seismic loads. It is through the experience of prior earthquakes, such as the Northridge Earthquake, that this amendment is proposed so as to minimize the amount of bodily and building damage within the spaces in which this type of ceiling will be installed. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**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 requiring safe design and construction requirements for ceiling suspension systems to resist seismic loads is intended to minimize the amount of damage within a building and therefore 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.

**2010 LARUCP 17-01.** Section 1704.4 of the 2010 Edition of the California Building Code is amended to read 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 above grade plane 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. Concrete foundation walls constructed in accordance with Table 1807.1.6.2.~~

~~5~~4. Concrete patios, driveways and sidewalks, on grade.

**RATIONALE:**

Results from studies after the 1994 Northridge Earthquake indicated that a lot of the damages were attributed to lack of quality control during construction resulting in poor performance of the building or structure. Therefore, the proposed amendment requires special inspection for concrete with a compressive strength greater than 2,500 pounds per square inch. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 special inspection for concrete with a compressive strength greater than 2,500 psi to improve quality of control during construction and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 17-02.** Section 1704.8 of the 2010 Edition of the California Building Code is amended to read as follows:

**1704.8 Driven deep foundations and connection grade beams.** Special inspections shall be performed during installation and testing of driven deep foundation elements as required by Table 1704.8. Special inspections shall be performed for connection grade beams in accordance with Section 1704.4 for structures assigned to Seismic Design Category D, E or F. The approved geotechnical report, and the construction documents prepared by the registered design professionals, shall be used to determine compliance.

**RATIONALE:**

Studies after the Northridge Earthquake revealed that great confusion exist in the field over what is required by the code in the way of special inspection beyond just piles and caissons. Connecting grade beams used in driven deep foundations will generally act like concrete beams and should not be treated like typical footings. Section 1704.4 requires concrete beams to have special inspection, but exempts the footings of buildings three stories or less in height. This amendment clarifies that the grade beams that connect driven deep foundations are not exempt from special inspection even if they are used as part of the foundation system. They are an essential part of the driven deep foundation system and should receive the same level of inspection, particularly since this type of system must resist the higher seismic demand loads in this region.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 special inspection of connecting grade beams to ensure adequate performance of the foundation system and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 17-03.** Section 1704.9 of the 2010 Edition of the California Building Code is amended to read as follows:

**1704.9 Cast-in-place deep foundations and connection grade beams.** Special inspections shall be performed during installation and testing of cast-in-place deep foundation elements as required by Table 1704.9. Special inspections shall be performed for connection grade beams in accordance with Section 1704.4 for structures assigned to Seismic Design Category D, E or F. The approved geotechnical report, and the construction documents prepared by the registered design professionals, shall be used to determine compliance.

**RATIONALE:**

Studies after the Northridge Earthquake revealed that great confusion exist in the field over what is required by the code in the way of special inspection beyond just piles and caissons. Connecting grade beams used in cast-in-place deep foundations will generally act like concrete beams and should not be treated like typical footings. Section 1704.4 requires concrete beams to have special inspection, but exempts the footings of buildings three stories or less in height. This amendment clarifies that the grade beams that connect cast-in-place deep foundations are not exempt from special inspection even if they are used as part of the foundation system. They are an essential part of the cast-in-place deep foundation system and should receive the same level of inspection, particularly since this type of system must resist the higher seismic demand loads in this region.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 special inspection of connecting grade beams to ensure adequate performance of the foundation system and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 17-04.** Section 1705.3 of the 2010 Edition of the California Building Code is amended to read as follows:

**1705.3 Seismic resistance.** The statement of special inspections shall include seismic requirements for cases covered in Sections 1705.3.1 through 1705.3.5.

**Exception:** Seismic requirements are permitted to be excluded from the statement of special inspections for structures designed and constructed in accordance with the following:

1. The structure consists of light-frame construction; the design spectral response acceleration at short periods, $S_{DS}$, as determined in Section 1613.5.4, does not exceed 0.5g; and the height of the structure does not exceed 35 feet (10 668 mm) above grade plane; or

2. The structure is constructed using a reinforced masonry structural system or reinforced concrete structural system; the design spectral response acceleration at short periods, $S_{DS}$, as determined in Section 1613.5.4, does not exceed 0.5g, and the height of the structure does not exceed 25 feet (7620 mm) above grade plane; or

3. Detached one- or two-family dwellings not exceeding two stories above grade plane, provided the structure is not assigned to Seismic Design Category D, E or F and does not have any of the following plan or vertical irregularities in accordance with Section 12.3.2 of ASCE 7:

   3.1 Torsional irregularity.

   3.2 Nonparallel systems.

   3.3 Stiffness irregularity—extreme soft story and soft story.

   3.4 Discontinuity in capacity—weak story.

**RATIONALE:**

In southern California, very few detached one- or two-family dwellings not exceeding two stories above grade plane are built as "box-type" structures, specially for those in hillside areas and near the oceanfront. Many steel moment frames or braced frames and/or cantilevered columns within buildings can still be shown as "regular" structures by calculations. With the higher seismic demand placed on buildings and structures in this region, the language in Sections 1705.3 Item 3 of the California Building Code would permit many detached one- or two-family dwellings not exceeding two stories above grade plane with complex structural elements to be constructed without the benefit of special inspections. By requiring special inspections, the quality of major structural elements and connections that affect the vertical and lateral load resisting systems of the structure will greatly be increased. The exception should only be allowed for detached one- or two-family dwellings not exceeding two stories above grade plane assigned to Seismic Design category A, B and C.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 special inspections for detached one- or two-family dwellings not exceeding two stories above grade plane assigned to Seismic Design Category D, E and F will help ensure that acceptable standards of workmanship and quality of construction are provided and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 17-05.** Section 1710.1 of the 2010 Edition of the California Building Code is amended to read as follows:

**1710.1 General.** Where required by the provisions of Section 1710.2 or 1710.3, the owner shall employ a ~~registered design professional~~ structural observer to perform structural observations as defined in Section 1702. The structural observer shall be one of the following individuals:

1. The registered design professional responsible for the structural design, or

2. A registered design professional designated by the registered design professional responsible for the structural design.

Prior to the commencement of observations, the structural observer shall submit to the building official a written statement identifying the frequency and extent of structural observations.

~~At the conclusion of the work included in the permit, the structural observer shall submit to the building official a written statement that the site visits have been made and identify any reported deficiencies that, to the best of the structural observer's knowledge, have not been resolved.~~

The owner or owner's representative shall coordinate and call a preconstruction meeting between the structural observer, contractors, affected subcontractors and special inspectors. The structural observer shall preside over the meeting. The purpose of the meeting shall be to identify the major structural elements and connections that affect the vertical and lateral load resisting systems of the structure and to review scheduling of the required observations. A record of the meeting shall be included in the report submitted to the building official.

Observed deficiencies shall be reported in writing to the owner or owner's representative, special inspector, contractor and the building official. Upon the form prescribed by the building official, the structural observer shall submit to the building official a written statement at each significant construction stage stating that the site visits have been made and identifying any reported deficiencies which, to the best of the structural observer's knowledge, have not been resolved. A final report by the structural observer which states that all observed deficiencies have been resolved is required before acceptance of the work by the building official.

**RATIONALE:**

The language in Section 1710.1 of the California Building Code permits the owner to employ any registered design professional to perform structural observations with minimum guideline. However, it is important to recognize that the registered design professional responsible for the structural design has thorough knowledge of the building he/she designed. By requiring the registered design professional responsible for the structural design or their designee who were involved with the design to observe the construction, the quality of the observation for major structural elements and connections that affect the vertical and lateral load resisting systems of the structure will greatly be increased. Additional requirements are provided to help clarify the role and duties of the structural observer and the method of reporting and correcting observed deficiencies to the building official. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 the registered design professional in responsible charge for the structural design to observe the construction will help ensure acceptable standards of workmanship is provided and to

improve the quality of the observation and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 17-06.** Section 1710.2 of the 2010 Edition of the California Building Code is amended to read as follows:

**1710.2 Structural observations for seismic resistance.** Structural observations shall be provided for those structures assigned to Seismic Design Category D, E or F, as determined in Section 1613, where one or more of the following conditions exist:

1. The structure is classified as Occupancy Category III or IV in accordance with Table 1604.5.
2. The height of the structure is greater than 75 feet (22860 mm) above the base.
3. The structure ~~is assigned to Seismic Design Category E,~~ is classified as Occupancy Category I or II in accordance with Table 1604.5, and ~~is greater than two stories one stories above grade plane~~ a lateral design is required for the structure or portion thereof.

   **Exception:** One-story wood framed Group R-3 and Group U Occupancies less than 2,000 square feet in area, provided the adjacent grade is not steeper than 1 unit vertical in 10 units horizontal (10% sloped), assigned to Seismic Design Category D.

4. When so designated by the registered design professional responsible for the structural design.
5. When such observation is specifically required by the building official.

**RATIONALE:**

With the higher seismic demand placed on buildings and structures in this region, the language in Section 1710.2 Item 3 of the California Building Code would permit many low-rise buildings and structures with complex structural elements to be constructed without the benefit of a structural observation. By requiring a registered design professional to observe the construction, the quality of the observation for major structural elements and connections that affect the vertical and lateral load resisting systems of the structure will greatly be increased. An exception is provided to permit simple structures and buildings to be excluded. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 the registered design professional in responsible charge for the structural design to observe the construction will help ensure acceptable standards of workmanship is provided and to improve the quality of the observation and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 18-01.** Section 1807.1.4 of the 2010 Edition of the California Building Code is amended to read as follows:

**1807.1.4 Permanent wood foundation systems.** Permanent wood foundation systems shall be designed and installed in accordance with AF&PA PWF. Lumber and plywood shall be treated in accordance with AWPA U1 (Commodity Specification A, Use Category 4B and Section 5.2) and shall be identified in accordance with Section 2303.1.8.1. Permanent wood foundation systems shall not be used for structures assigned to Seismic Design Category D, E or F.

**RATIONALE:**

No substantiating data has been provided to show that wood foundation is effective in supporting buildings and structures during a seismic event while being subject to deterioration caused by the combined detrimental effect of constant moisture in the soil and wood-destroying organisms. Wood foundation systems, 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 and temperate weather in the Southern California region and are not generally familiar with the necessary precautions and treatment of wood that makes it suitable for both seismic event and wet applications. The proposed amendment takes the precautionary steps to reduce or eliminate potential problems that may result in using wood foundation systems that experience relatively rapid decay due to the fact that the region does not experience temperatures cold enough to destroy or retard the growth and proliferation of wood-destroying organisms. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Climatic and Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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. In addition, the region is within a climate system capable of producing major winds, fire and rain related disasters, including but not limited to those caused by the Santa Ana winds and El Nino (or La Nina) subtropical-like weather. This region is especially susceptible to more active termite and wood attacking insects and microorganisms. The proposed modification to prohibit the use of wood foundation systems as well as limit prescriptive design provisions in an effort to mitigate potential problems or deficiencies due to the proliferation of wood-destroying organisms and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 18-02.** Section 1807.1.6 of the 2010 Edition of the California Building Code is amended to read as follows:

**1807.1.6 Prescriptive design of concrete and masonry foundation walls.** Concrete and masonry foundation walls that are laterally supported at the top and bottom shall be permitted to be designed and constructed in accordance with this section. Prescriptive design of foundation walls shall not be used for structures assigned to Seismic Design Category D, E or F.

**RATIONALE:**

With the higher seismic demand placed on buildings and structures in this region, it is deemed necessary to take precautionary steps to reduce or eliminate potential problems that may result by following prescriptive design provisions that does not take into consideration the surrounding environment. Plain concrete performs poorly in withstanding the cyclic forces resulting from seismic events. In addition, no substantiating data has been provided to show that under-reinforced foundation walls are effective in resisting seismic loads and may potentially lead to a higher risk of failure. It is important that the benefit and expertise of a registered design professional be obtained to properly analyze the structure and take these issues into consideration. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

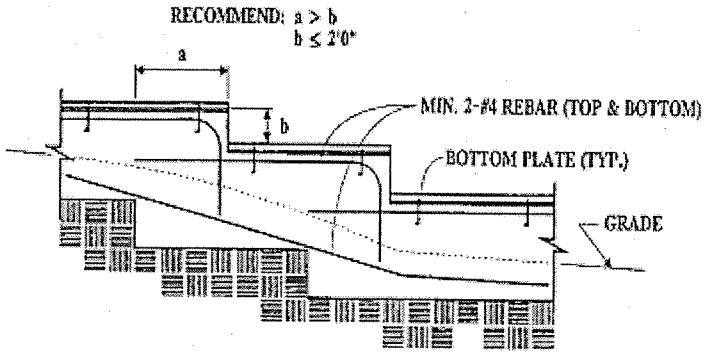
**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 prohibit prescriptive design provisions for foundation walls as plain concrete have performed poorly in withstanding the cyclic forces resulting from seismic events and to require the walls to be designed by a registered design professional to ensure that the proper analysis of the structure takes into account the surrounding condition and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 18-03.** Section 1809.3 of the 2010 Edition of the California Building Code is amended to read as follows:

**1809.3 Stepped footings.** The top surface of footings shall be level. The bottom surface of footings shall be 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).

For structures assigned to Seismic Design Category D, E or F, the 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 1809.3.




STEPPED FOUNDATIONS

**FIGURE 1809.3**
**STEPPED FOOTING**

**RATIONALE:**

With the higher seismic demand placed on buildings and structures in this region, precautionary steps are proposed to reduce or eliminate potential problems that may result for under reinforced footings located on sloped surfaces. Requiring minimum reinforcement for stepped footings is intended to address the problem of poor performance of plain or under-reinforced footings during a seismic event. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 minimum reinforcement in stepped footings is intended to improve performance of buildings and structures and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 18-04.** Section 1809.7 and Table 1809.7 of the 2010 Edition of the California Building Code are amended to read as follows:

**1809.7 Prescriptive footings for light-frame construction.** Where a specific design is not provided, concrete or masonry-unit footings supporting walls of light-frame construction shall be permitted to be designed in accordance with Table 1809.7. Prescriptive footings in Table 1809.7 shall not exceed one story above grade plane for structures assigned to Seismic Design Category D, E or F.

**TABLE 1809.7**
**PRESCRIPTIVE FOOTINGS SUPPORTING WALLS OF LIGHT-FRAME CONSTRUCTION** [a, b, c, d, e]

| 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 1809.4.
b. The ground under the floor shall be permitted to be excavated to the elevation of the top of the footing.
c. ~~Interior stud-bearing walls shall be permitted to be supported by isolated footings. The footing width and length shall be twice the width shown in this table, and footings shall be spaced not more than 6 feet on center.~~ Not Adopted.
d. See Section 1908 for additional requirements for concrete footings of structures assigned to Seismic Design Category C, D, E or F.
e. For thickness of foundation walls, see Section 1807.1.6.
f. Footings shall be permitted to support a roof 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 shall be permitted to be 6 inches thick.~~

**RATIONALE:**

No substantiating data has been provided to show that under-reinforced footings are effective in resisting seismic loads and may potentially lead to a higher risk of failure. Therefore, this proposed amendment requires minimum reinforcement in continuous footings to address the problem of poor performance of plain or under-reinforced footings during a seismic event. With the higher seismic demand placed on buildings and structures in this region, precautionary steps are proposed to reduce or eliminate potential problems that may result by following prescriptive design provisions for footing that does not take into consideration the surrounding environment. It was important that the benefit and expertise of a registered design professional be obtained to properly analysis the structure and takes these issues into consideration. 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. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 use of the prescriptive design provisions and under-reinforced or plain concrete is to ensure that the proper analysis of the structure takes into account the surrounding condition and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 18-05.** Section 1809.12 of the 2010 Edition of the California Building Code is amended to read as follows:

**1809.12 Timber footings.** Timber footings shall be permitted for buildings of Type V construction and as otherwise approved by the building official. Such footings shall be treated in accordance with AWPA U1 (Commodity Specification A, Use Category 4B). Treated timbers are not required where placed entirely below permanent water level, or where used as capping for wood piles that project above the water level over submerged or marsh lands. The compressive stresses perpendicular to grain in untreated timber footing supported upon treated piles shall not exceed 70 percent of the allowable stresses for the species and grade of timber as specified in the AF&PA NDS. Timber footings shall not be used in structures assigned to Seismic Design Category D, E or F.

RATIONALE:

No substantiating data has been provided to show that timber footings is effective in supporting buildings and structures during a seismic event while being subject to deterioration caused by the combined detrimental effect of constant moisture in the soil and wood-destroying organisms. Timber footings, when they are not properly treated and protected against deterioration, have performed very poorly. Most contractors are typically accustomed to construction in dry and temperate weather in the Southern California region and are not generally familiar with the necessary precautions and treatment of wood that makes it suitable for both seismic event and wet applications. The proposed amendment takes the precautionary steps to reduce or eliminate potential problems that may result by using timber footings that experience relatively rapid decay due to the face that the region does not experience temperatures cold enough to destroy or retard the growth and proliferation of wood-destroying organisms. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

FINDINGS:

Local Climatic and Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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. In addition, the region is within a climate system capable of producing major winds, fire and rain related disasters, including but not limited to those caused by the Santa Ana winds and El Nino (or La Nina) subtropical-like weather. This region is especially susceptible to more active termite and wood attacking insects and microorganisms. The proposed modification to prohibit the use of timber footings in an effort to mitigate potential problems or deficiencies due to the proliferation of wood-destroying organisms and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 18-06.** Section 1810.3.2.4 of the 2010 Edition of the California Building Code is amended to read as follows:

**1810.3.2.4 Timber.** Timber deep foundation elements shall be designed as piles or poles in accordance with AF&PA NDS. Round timber elements shall conform to ASTM D 25. Sawn timber elements shall conform to DOC PS-20. Timber shall not be used in structures assigned to Seismic Design Category D, E or F.

**RATIONALE:**

No substantiating data has been provided to show that timber deep foundation is effective in supporting buildings and structures during a seismic event while being subject to deterioration caused by the combined detrimental effect of constant moisture in the soil and wood-destroying organisms. Timber deep foundation, when they are not properly treated and protected against deterioration, has performed very poorly. Most contractors are typically accustomed to construction in dry and temperate weather in the Southern California region and are not generally familiar with the necessary precautions and treatment of wood that makes it suitable for both seismic event and wet applications. The proposed amendment takes the precautionary steps to reduce or eliminate potential problems that may result by using timber deep foundation that experience relatively rapid decay due to the face that the region does not experience temperatures cold enough to destroy or retard the growth and proliferation of wood-destroying organisms. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Climatic and Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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. In addition, the region is within a climate system capable of producing major winds, fire and rain related disasters, including but not limited to those caused by the Santa Ana winds and El Nino (or La Nina) subtropical-like weather. This region is especially susceptible to more active termite and wood attacking insects and microorganisms. The proposed modification to prohibit the use of timber deep foundation in an effort to mitigate potential problems or deficiencies due to the proliferation of wood-destroying organisms and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 19-01.** Section 1908.1 is amended to read as shown below and Sections 1908.1.11 thru 1908.1.14 is added to Chapter 19 of the 2010 Edition of the 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 ~~1908.1.10~~1908.1.14.

**1908.1.11 ACI 318, Section 21.6.4.1.** Modify ACI 318, Section 21.6.4.1, to read 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 21.6.4.1, Items (a) through (c), over the full height of the member.

**1908.1.12 ACI 318, Section 21.6.4.** Modify ACI 318, Section 21.6.4, by adding Section 21.6.4.8 to read as follows:

21.6.4.8 – At any section where the design strength, $\varphi P_n$, of the column is less than the sum of the shears $V_e$ computed in accordance with ACI 318 Sections 21.5.4.1 and 21.6.5.1 for all the beams framing into the column above the level under consideration, transverse reinforcement as specified in ACI 318 Sections 21.6.4.1 through 21.6.4.3 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, $\varphi P_n$, of the column, these moments may be assumed to result from the deformation of the frame in any one principal axis.

**1908.1.13 ACI 318, Section 21.9.4.** Modify ACI 318, Section 21.9.4, by adding Section 21.9.4.6 to read as follows:

21.9.4.6 – 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 ACI 318 Section 21.13.

**1908.1.14 ACI 318, Section 21.11.6.** Modify ACI 318, Section 21.11.6, 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.

**RATIONALE:**

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 it is provided 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 the 1994 Northridge Earthquake. Rebar placed in very thin concrete topping slabs have been observed in some instances to have popped out of the slab due to insufficient concrete coverage. This modification ensures that critical boundary and collector rebars are placed in sufficiently thick slab to prevent buckling of such reinforcements.

This proposed amendment is a continuation of amendment 19-02 (2007) adopted during previous code adoption cycle with editorial revisions of ACI section numbering.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 increase confinement in critical columns, limiting the use of highly gravity loaded walls, and increase concrete coverage in thin slabs will have to prevent failure of the structure and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 19-02.** Section 1908.1.2 of the 2010 Edition of the California Building Code is amended to read as follows:

**1908.1.2 ACI 318, Section 21.1.1.** Modify ACI 318, Sections 21.1.1.3 and 21.1.1.7 as follows:

21.1.1.3 – Structures assigned to Seismic Design Category A shall satisfy requirements of Chapters 1 to 19 and 22; Chapter 21 does not apply. Structures assigned to Seismic Design Category B, C, D, E or F also shall satisfy 21.1.1.4 through 21.1.1.8, as applicable. Except for structural elements of plain concrete complying with Section 1908.1.8 of the International Building Code, structural elements of plain concrete are prohibited in structures assigned to Seismic Design Category C, D, E or F.

21.1.1.7 – Structural systems designated as part of the seismic-force-resisting system shall be restricted to those permitted by ASCE 7. Except for Seismic Design Category A, for which Chapter 21 does not apply, the following provisions shall be satisfied for each structural system designated as part of the seismic-force-resisting system, regardless of the Seismic Design Category:

(a) Ordinary moment frames shall satisfy 21.2.
(b) Ordinary reinforced concrete structural walls and ordinary precast structural walls need not satisfy any provisions in Chapter 21.
(c) Intermediate moment frames shall satisfy 21.3.
(d) Intermediate precast structural walls shall satisfy 21.4.
(e) Special moment frames shall satisfy 21.5 through 21.8.
(f) Special structural walls shall satisfy 21.9.
(g) Special structural walls constructed using precast concrete shall satisfy 21.10.

All special moment frames and special structural walls shall also satisfy 21.1.3 through 21.1.7. Concrete tilt-up wall panels classified as intermediate precast structural wall system shall satisfy 21.9 in addition to 21.4.2 and 21.4.3 for structures assigned to Seismic Design Category D, E or F.

**RATIONALE:**

By virtue of ACI 318 Section 21.1.1.7(d), intermediate precast structural walls designed under Section 21.4, material requirements intended under provisions 21.1.4, 21.1.5, 21.1.6, and 21.1.7 would be excluded for structures assigned to Seismic Design Category D, E or F. Clarification of ACI 318 Chapter 21 is needed to ensure that structural walls designed under ASCE 7 Table 12.2-1 using the intermediate wall panel category would conform to ductility requirements comparable to special structural wall; and conformance to the long standing practice of ACI 318 to impose special requirements for high seismic design regions. This amendment gives explicit requirement under which design and detailing need to conform to special structural wall system provision in ACI-318 Section 21.9, which covers both cast-in-place as well as precast. This amendment further gives building officials the tools to enforce minimum life safety building performance under earthquake forces in Seismic Design Category D, E or F.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 intermediate structural wall system is intended to assure that ductility requirements for high seismic region is provided and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code and ACI 318.

**2010 LARUCP 19-03.** Section 1908.1.3 of the 2010 Edition of the California Building Code is amended to read as follows:

**1908.1.3 ACI 318, Section 21.4.** Modify ACI 318, Section 21.4, by renumbering Section 21.4.3 to become 21.4.4 and adding new Sections 21.4.3, 21.4.5, ~~and~~ 21.4.6 and 21.4.7 to read as follows:

21.4.3 – Connections that are designed to yield shall be capable of maintaining 80 percent of their design strength at the deformation induced by the design displacement or shall use Type 2 mechanical splices.

21.4.4 – Elements of the connection that are not designed to yield shall develop at least 1.5 $S_y$.

21.4.5 – Wall piers in Seismic Design Category D, E or F shall comply with Section 1908.1.4 of this Code.

~~21.4.5~~21.4.6 – Wall piers not designed as part of a moment frame in buildings assigned to Seismic Design Category C shall have transverse reinforcement designed to resist the shear forces determined from 21.3.3. Spacing of transverse reinforcement shall not exceed 8 inches (203 mm). Transverse reinforcement shall be extended beyond the pier clear height for at least 12 inches (305 mm).

**Exceptions:**
1. Wall piers that satisfy 21.13.
2. Wall piers along a wall line within a story where other shear wall segments provide lateral support to the wall piers and such segments have a total stiffness of at least six times the sum of the stiffnesses of all the wall piers.

~~21.4.6~~21.4.7 – Wall segments with a horizontal length-to-thickness ratio less than 2.5 shall be designed as columns.

**RATIONALE:**

The design provision for wall pier detailing was originally introduced by SEAOC in 1987 to legacy Uniform Building Code (UBC) and was included in the 1988 UBC through the 1997 UBC (2002 CBC). The wall pier detailing provision prescribed under Section 1908.1.4 was intended for high seismic zones equivalent to current Seismic Design Category D, E or F. Section 1908.1.3 was added as a complement of wall pier detailing in Seismic Design Category C (formerly seismic zones 2A and 2B under the legacy model code). ACI 318 Commentary R 21.1.1 emphasized "it is essential that structures assigned to higher Seismic Design Categories possess a higher degree of toughness", and further encourages practitioners to use special structural wall system in regions of high seismic risk. ASCE 7 Table 12.2-1 permits intermediate precast structural wall system in Seismic Design Category D, E or F. Current Section 1908.1.3 does not limit to just structures assigned to Seismic Design Category C. The required shear strength under 21.3.3, referenced in current Section 21.4.5, is based on $V_u$ under either nominal moment strength or two times the code prescribed earthquake force. The required shear strength in 21.6.5.1, referenced in Section 21.9.10.2 (IBC 1908.1.4), is based on the probable shear strength, $V_e$ under the probable moment strength, $M_{pr}$. In addition, the spacing of required shear reinforcement is 8 inches on center under current Section 21.4.5 instead of 6 inches on center with seismic hooks at both ends under Section 21.9.10.2. Requirement of wall pier under Section 21.9.10.2 would enhance better ductility.

Current practice in commercial buildings constructed using precast panels wall system have large window and door openings and/or narrow wall piers. Wall panels varying up to three stories high with openings resembles wall frame which is not currently recognized under any of the defined seismic-force resisting systems other than consideration of structural wall system. Conformance to special structural wall system design and detailing of wall piers ensures minimum life safety performance in resisting earthquake forces for structures in Seismic Design Category D, E or F. Proposed modification separates wall piers designed for structures assigned to Seismic Design Category C from those assigned to Seismic Design Category D, E or F.

This modification is consistent with the amendment adopted by DSA-SS as reflected in Section 1916.4.4 of the 2010 Edition of the California Building Code; and reflects code change proposal approved for 2012 IBC during the 2009/2010 code development hearing.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 wall pier detailing is intended to assure that ductility requirements for high seismic region is provided and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code and ACI 318.

**2010 LARUCP 19-04.** Section 1908.1.8 of the 2010 Edition of the California Building Code is amended to read as follows:

**1908.1.8 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.~~

**RATIONALE:**

This proposed amendment requires minimum reinforcement in continuous footings to address 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 Joint Task Force that investigated the poor performance observed in 1994 Northridge Earthquake. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 minimum reinforcement to address the problem of poor performance of plain or under-reinforced footings during a seismic event and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 19-05.** Section 1909.4 of the 2010 Edition of the California Building Code is amended to read as follows:

**1909.4 Design.** Structural plain concrete walls, footings and pedestals shall be designed for adequate strength in accordance with ACI 318, Section 22.4 through 22.8.

**Exception:** For Group R-3 occupancies and buildings or other occupancies less than two stories above grade plane of light-frame construction, the required edge thickness of ACI 318 is permitted to be reduced to 6 inches (152 mm), provided that the footing does not extend more than 4 inches (102 mm) on either side of the supported wall. This exception shall not apply to structural elements designed to resist seismic lateral forces for structures assigned to Seismic Design Category D, E or F.

**RATIONALE:**

With the higher seismic demand placed on buildings and structures in this region, the proposed amendment takes the precautionary steps to reduce or eliminate potential problems that may result permitting a reduced edge thickness of the footing that support walls without taking into consideration the surrounding environment. In addition, no substantiating data has been provided to show that the reduced edge thickness is effective in resisting seismic loads and may potentially lead to a higher risk of failure. It is important that the benefit and expertise of a registered design professional be obtained to properly analyze the structure and take these issues into consideration.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 prohibit the reduced edge thickness of footings supporting walls is intended to ensure that the proper analysis of the structure takes into account the surrounding condition and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 22-01.** Section 2204.1.1 is added to Chapter 22 of the 2010 Edition of the California Building Code to read as follows:

**2204.1.1 Consumables for welding.**

**2204.1.1.1 Seismic Force Resisting System (SFRS) welds.** All welds used in members and connections in the SFRS shall be made with filler metals meeting the requirements specified in AWS D1.8 Clause 6.3. AWS D1.8 Clauses 6.3.5, 6.3.6, 6.3.7 and 6.3.8 shall apply only to demand critical welds.

**2204.1.1.2 Demand critical welds.** Where welds are designated as demand critical, they shall be made with filler metals meeting the requirements specified in AWS D1.8 Clause 6.3.

**RATIONALE:**

A number of significant technical modifications have been made since the adoption of AISC 341-05. One such change incorporates AWS D1.8/D1.8M by reference for welding related issues. This change will be included in AISC 341-10 that is to be incorporated by reference into the 2012 Edition of the International Building Code. This proposed amendment is consistent with actions taken by both DSA-SS and OSHPD to incorporate such language in the 2010 Edition of the California Building Code.

AWS D1.8/D1.8M requires that all seismic force resisting system welds be made with filler metals classified using AWS A5 standards that achieve the following mechanical properties:

| Filler Metal Classification Properties for Seismic Force Resisting System Welds | | |
|---|---|---|
| Property | Classification | |
| | 70 ksi (480 MPa) | 80 ksi (550 MPa) |
| Yield Strength, ksi (MPa) | 58 (400) min. | 68 (470) min. |
| Tensile Strength, ksi (MPa) | 70 (480) min. | 80 (550) min. |
| Elongation, % | 22 min. | 19 min. |
| CVN Toughness, ft-lbf (J) | 20 (27) min. @ 0 °F (–18 °C) [a] | |
| [a] Filler metals classified as meeting 20 ft-lbf (27 J) min. at a temperature lower than 0 °F (–18 °C) also meet this requirement. | | |

In addition to the above requirements, AWS D1.8/D1.8M requires, unless otherwise exempted from testing, that all demand critical welds are to be made with filler metals receiving Heat Input Envelope Testing that achieve the following mechanical properties in the weld metal:

| Mechanical Properties for Demand Critical Welds | | |
|---|---|---|
| Property | Classification | |
| | 70 ksi (480 MPa) | 80 ksi (550 MPa) |
| Yield Strength, ksi (MPa) | 58 (400) min. | 68 (470) min. |
| Tensile Strength, ksi (MPa) | 70 (480) min. | 80 (550) min. |
| Elongation (%) | 22 min. | 19 min. |
| CVN Toughness, ft-lbf (J) | 40 (54) min. @ 70 °F (20 °C) [b, c] | |
| [b] For LAST of +50 °F (+10 °C). For LAST less than + 50 °F (+10 °C), see AWS D1.8/D1.8M Clause 6.3.6.<br>[c] Tests conducted in accordance to AWS D1.8/D1.8M Annex A meeting 40 ft-lbf (54 J) min. at a temperature lower than +70 °F (20 °C) also meet this requirement. | | |

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 amendment is consistent with requirements in AISC 341-10 for improving quality of critical welds and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code and ASCE 7-05.

**2010 LARUCP 22-02.** Section 2205.4 is added to Chapter 22 of the 2010 Edition of the California Building Code to read as follows:

**2205.4 AISC 341, Part I, Section 13.2 Members.** Add Section 13.2f to read as follows:

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 3,000 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.

**RATIONALE:**

Past test results on braces used in steel concentrically braced frames (SCBF) indicated 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 recommended this modification during the 2007 code amendment process. This recommendation is a continuation of the proposal adopted in 2007. Furthermore, OSPHD has taken the same position and is continuing this recommendation as reflected in Section 2205A.4.1.5.1 to Chapter 22 of the 2010 Edition of the California Building Code. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

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 region is a densely populated area having buildings and structures 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 amendment is intended to reduce and minimize fracture of rectangular and square brace frame members due to local buckling behavior of the cross section and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code and ASCE 7-05.

**2010 LARUCP 23-01.** Section 2304.11.7 of the 2010 Edition of the California Building Code is amended to read as follows:

**2304.11.7 Wood used in retaining walls and cribs.** Wood installed in retaining or crib walls shall be preservative treated in accordance with AWPA U1 (Commodity Specifications A or F) for soil and fresh water use. Wood shall not be used in retaining or crib walls for structures assigned to Seismic Design Category D, E or F.

**RATIONALE:**

No substantiating data has been provided to show that wood used in retaining or crib walls are effective in supporting buildings and structures during a seismic event while being subject to deterioration caused by the combined detrimental effect of constant moisture in the soil and wood-destroying organisms. Wood used in retaining or crib walls, when they are not properly treated and protected against deterioration, have performed very poorly. Most contractors are typically accustomed to construction in dry and temperate weather in the Southern California region and are not generally familiar with the necessary precautions and treatment of wood that makes it suitable for both seismic event and wet applications. The proposed amendment takes the precautionary steps to reduce or eliminate potential problems that may result by using wood in retaining or crib walls that experience relatively rapid decay due to the face that the region does not experience temperatures cold enough to destroy or retard the growth and proliferation of wood-destroying organisms. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Climatic and Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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. In addition, the region is within a climate system capable of producing major winds, fire and rain related disasters, including but not limited to those caused by the Santa Ana winds and El Nino (or La Nina) subtropical-like weather. This region is especially susceptible to more active termite and wood attacking insects and microorganisms. The proposed modification to prohibit the use of wood in retaining or crib walls in an effort to mitigate potential problems or deficiencies due to the proliferation of wood-destroying organisms and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 23-02.** Section 2305.4 is added to Chapter 23 of the 2010 Edition of the California Building Code to read as follows:

**2305.4 Quality of Nails.** In Seismic Design Category D, E or F, 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. Clipped head or box nails are not 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.

**RATIONALE:**

The overdriving of nails into the structural wood panel still remains a concern when pneumatic nail guns are used for wood structural panel shear wall nailing. Box nails were observed to cause massive and multiple failures of the typical 3/8-inch thick plywood during the 1994 Northridge Earthquake. The use of clipped head nails continues to be restricted from being used in wood structural panel shear walls 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 wood structural panel shear wall construction were found to perform much less in previous wood structural panel shear wall testing done at the University of California Irvine. The existing test results indicated that, under cyclic loading, the wood structural panel shear walls 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. This amendment reflects the recommendations by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the poor performance observed in 1994 Northridge Earthquake. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 dimensions as hand-driven nail will result in improved quality of construction and performance of wood structural panel shear walls and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 23-03.** Section 2305.5 is added to Chapter 23 of the 2010 Edition of the California Building Code to read as follows:

**2305.5 Hold-down connectors.** In Seismic Design Category D, E or F, hold-down connectors shall be designed to resist shear wall overturning moments using approved cyclic load values or 75 percent of the allowable seismic load values that do not consider cyclic loading of the product. Connector bolts into wood framing shall 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-down connectors shall be tightened to finger tight plus one half (1/2) wrench turn just prior to covering the wall framing.

**RATIONALE:**

Many of the hold-down connectors currently in use do not have any acceptance report based on dynamic testing protocol. This proposed amendment continues to limit the allowable capacity to 75% of the acceptance report value to provide an additional factor of safety for statically tested anchorage devices. Cyclic forces imparted on buildings and structures by seismic activity cause more damage than equivalent forces that are applied in a static manner. Steel plate washers will reduce the additional damage that can result when hold-down connectors are fastened to wood framing members. This amendment reflects the recommendations by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the poor performance observed in 1994 Northridge Earthquake. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 minimum performance requirements for hold-down connectors will reduce failure of wood structural panel shear walls due to excessive deflection and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 23-04.** Tables 2306.2.1(3) and 2306.2.1(4) are added to Chapter 23 of the 2010 Edition of the California Building Code and Section 2306.2.1 of the 2010 Edition of the California Building Code is amended to read as follows:

**2306.2.1 Wood structural panel diaphragms.** Wood structural panel diaphragms shall be designed and constructed in accordance with AF&PA SDPWS. Wood structural panel diaphragms are permitted to resist horizontal forces using the allowable shear capacities set forth in Table 2306.2.1(1) or 2306.2.1(2). For structures assigned to Seismic Design Category D, E or F, the allowable shear capacities shall be set forth in Table 2306.2.1(3) or 2306.2.1(4). The allowable shear capacities in Table 2306.2.1(1) or 2306.2.1(2) are permitted to be increased 40 percent for wind design.

Wood structural panel diaphragms fastened with staples shall not used to resist seismic forces in structures assigned to Seismic Design Category D, E or F.

**Exception:** Staples may be used for wood structural panel diaphragms when the allowable shear values are substantiated by cyclic testing and approved by the building official.

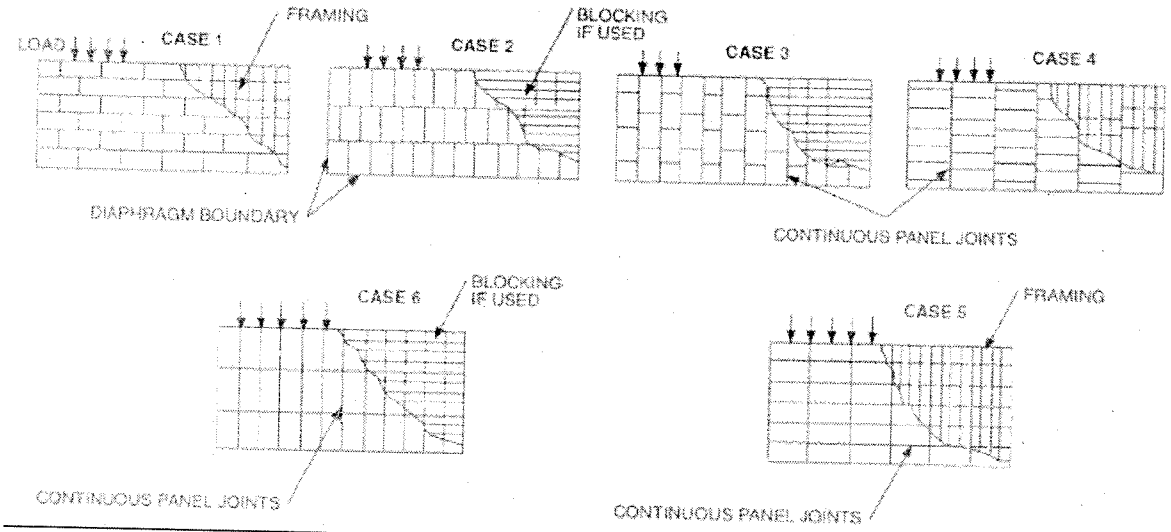
Wood structural panel diaphragms used to resist seismic forces in structures assigned to Seismic Design Category D, E or F shall be applied directly to the framing members.

**Exception:** Wood structural panel 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 2306.2.1(3)
## ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL DIAPHRAGMS WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE[a] FOR SEISMIC LOADING[f] FOR STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY D, E OR F

| PANEL GRADE | COMMON NAIL SIZE | MINIMUM FASTENER PENETRATION IN FRAMING (inches) | MINIMUM NOMINAL PANEL THICKNESS (inch) | MINIMUM NOMINAL WIDTH OF FRAMING MEMBERS AT ADJOINING PANEL EDGES AND BOUNDARIES[e] (inches) | BLOCKED DIAPHRAGMS | | | | UNBLOCKED DIAPHRAGMS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Fastener spacing (inches) at diaphragm boundaries (all cases) at continuous panel edges parallel to load (Cases 3,4), and at all panel edges (Cases 5, 6)[b] | | | | Fastener spaced 6" max. at supported edges[b] | |
| | | | | | 6 | 4 | 2 ½[c] | 2[c] | Case 1 (No unblocked edges or continuous joints parallel to load) | All other configurations (Cases 2, 3, 4, 5 and 6) |
| | | | | | Fastener spacing (inches) at other panel edges (Cases 1,2,3 and 4)[b] | | | | | |
| | | | | | 6 | 6 | 4 | 3 | | |
| Structural I Grades | 8d (2 ½" x 0.131") | 1 3/8 | 3/8 | 2 | 270 | 360 | 530 | 600 | 240 | 180 |
| | | | | 3 | 300 | 400 | 600 | 675 | 265 | 200 |
| | 10d[d] (3" x 0.148") | 1 1/2 | 15/32 | 2 | 320 | 425 | 640 | 730 | 285 | 215 |
| | | | | 3 | 360 | 480 | 720 | 820 | 320 | 240 |
| Sheathing, single floor and other grades covered in DOC PS1 and PS2 | 6d[e] (2" x 0.113") | 1 1/4 | 3/8 | 2 | 185 | 250 | 375 | 420 | 165 | 125 |
| | | | | 3 | 210 | 280 | 420 | 475 | 185 | 140 |
| | 8d (2 ½" x 0.131") | 1 3/8 | | 2 | 240 | 320 | 480 | 545 | 215 | 160 |
| | | | | 3 | 270 | 360 | 540 | 610 | 240 | 180 |
| | 8d (2 ½" x 0.131") | 1 3/8 | 7/16 | 2 | 255 | 340 | 505 | 575 | 230 | 170 |
| | | | | 3 | 285 | 380 | 570 | 645 | 255 | 190 |
| | 8d (2 ½" x 0.131") | 1 3/8 | 15/32 | 2 | 270 | 360 | 530 | 600 | 240 | 180 |
| | | | | 3 | 300 | 400 | 600 | 675 | 265 | 200 |
| | 10d[d] (3" x 0.148") | 1 1/2 | | 2 | 290 | 385 | 575 | 655 | 255 | 190 |
| | | | | 3 | 324 | 430 | 650 | 735 | 290 | 215 |
| | 10d[d] (3" x 0.148") | 1 1/2 | 19/32 | 2 | 320 | 425 | 640 | 730 | 285 | 215 |
| | | | | 3 | 360 | 480 | 720 | 820 | 320 | 240 |

**TABLE 2306.2.1(3)–continued**
**ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL DIAPHRAGMS WITH FRAMING OF DOUGLAS FIR-LARCH, OR SOUTHERN PINE[a] FOR SEISMIC LOADING[f] FOR STRUCTURES ASSIGNED TO SEISMIC DESIGN CATERGORY D, E OR F**




For SI: 1 inch = 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 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. Space fasteners maximum 12 inches o.c. along intermediate framing members (6 inches o.c. where supports are spaced 48 inches o.c.).

c. Framing at adjoining panel edges shall be 3 inches nominal or thicker, and nails at all panel edges shall be staggered where panel edge nailing is specified at 2 ½ inches o.c. or less.

d. Framing at adjoining panel edges shall be 3 inches nominal or thicker, and nails at all panel edges shall be staggered where both of the following conditions are met: (1) 10d nails having penetration into framing of more than 1 ½ inches and (2) panel edge nailing is specified at 3 inches o.c. or less.

e. The minimum nominal width of framing members not located at boundaries or adjoining panel edges shall be 2 inches.

f. 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.

## TABLE 2306.2.1(4)
## ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL BLOCKED DIAPHRAGMS UTILIZING MULTIPLE ROWS OF FASTENERS (HIGH LOAD DIAPHRAGMS) WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE[a] FOR SEISMIC LOADING[b,f,g] FOR STRUCTURES ASSIGNED TO SEISMIC DESIGN CATERGORY D, E OR F

| PANEL GRADE[c] | COMMON NAIL SIZE | MINIMUM FASTENER PENETRATION IN FRAMING (inches) | MINIMUM NOMINAL PANEL THICKNESS (inch) | MINIMUM NOMINAL WIDTH OF FRAMING MEMBERS AT ADJOINING PANEL EDGES AND BOUNDARIES[e] (inches) | LINES OF FASTENERS | BLOCKED DIAPHRAGMS | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Cases 1 and 2[d] | | | |
| | | | | | | Fastener Spacing Per Line at Boundaries (inches) | | | |
| | | | | | | 4 | | 2 1/2 | |
| | | | | | | Fastener Spacing Per Line at Other Panel Edges (inches) | | | |
| | | | | | | 6 | 4 | 4 | 3 |
| Structural I grades | 10d common nails | 1 1/2 | 15/32 | 3 | 2 | 605 | 815 | 875 | 1,150 |
| | | | | 4 | 2 | 700 | 915 | 1,005 | 1,290 |
| | | | | 4 | 3 | 875 | 1,220 | 1,285 | 1,395 |
| | | | 19/32 | 3 | 2 | 670 | 880 | 965 | 1,255 |
| | | | | 4 | 2 | 780 | 990 | 1,110 | 1,440 |
| | | | | 4 | 3 | 965 | 1,320 | 1,405 | 1,790 |
| | | | 23/32 | 3 | 2 | 730 | 955 | 1,050 | 1,365 |
| | | | | 4 | 2 | 855 | 1,070 | 1,210 | 1,565 |
| | | | | 4 | 3 | 1,050 | 1,430 | 1,525 | 1,800 |
| Sheathing, single floor and other grades covered in DOC PS1 and PS2 | 10d common nails | 1 1/2 | 15/32 | 3 | 2 | 525 | 725 | 765 | 1,010 |
| | | | | 4 | 2 | 605 | 815 | 875 | 1,105 |
| | | | | 4 | 3 | 765 | 1,085 | 1,130 | 1,195 |
| | | | 19/32 | 3 | 2 | 650 | 860 | 935 | 1,225 |
| | | | | 4 | 2 | 755 | 965 | 1,080 | 1,370 |
| | | | | 4 | 3 | 935 | 1,290 | 1,365 | 1,485 |
| | | | 23/32 | 3 | 2 | 710 | 935 | 1,020 | 1,335 |
| | | | | 4 | 2 | 825 | 1,050 | 1,175 | 1,445 |
| | | | | 4 | 3 | 1,020 | 1,400 | 1,480 | 1,565 |

For SI: 1 inch = 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 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. Fastening along intermediate framing members: Space fasteners a maximum of 12 inches on center, except 6 inches on center for spans greater than 32 inches.

c. Panels conforming to PS1 or PS 2.

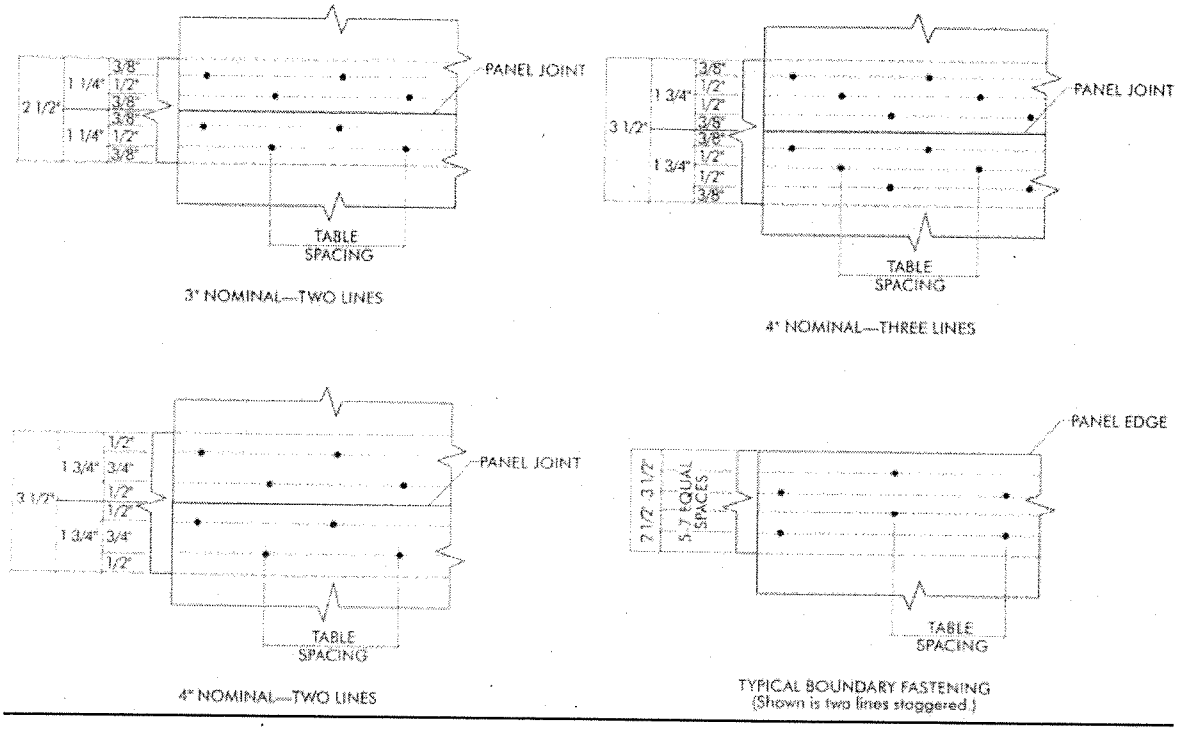
d. This table gives shear values for Cases 1 and 2 as shown in Table 2306.2.1(3). The values shown are applicable to Cases 3, 4, 5 and 6 as shown in Table 2306.2.1(3), providing fasteners at all continuous panels edges are spaced in accordance with the boundary fastener spacing.

e. The minimum nominal depth of framing members shall be 3 inches nominal. The minimum nominal width of framing members not located at boundaries or adjoining panel edges shall be 2 inches.

f. High load diaphragms shall be subject to special inspection in accordance with Section 1704.6.1.

g. 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.

**TABLE 2306.2.1(4)–continued**
**ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL BLOCKED DIAPHRAGMS UTILIZING MULTIPLE ROWS OF FASTENERS (HIGH LOAD DIAPHRAGMS) WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE[a] FOR SEISMIC LOADING[b,f,g]**
**FOR STRUCTURES ASSIGNED TO SEISMIC DESIGN CATERGORY D, E OR F**




NOTE: SPACE PANEL END AND EDGE JOINT 1/8-INCH. REDUCE SPACING BETWEEN LINES OF NAILS AS NECESSARY TO MAINTAIN MINIMUM 3/8-INCH FASTENER EDGE MARGINS, MINIMUM SPACING BETWEEN LINES IS 3/8-INCH

**RATIONALE:**

The Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the damages to buildings and structures during the 1994 Northridge Earthquake recommended reducing allowable shear values in wood structural panel shear walls or diaphragms that were not substantiated by cyclic testing. That recommendation was consistent with a report to the Governor from the Seismic Safety Commission of the State of California recommending that code requirements be "more thoroughly substantiated with testing." The allowable shear values for wood structural panel shear walls or diaphragms fastened with staples are based on monotonic testing and does not take into consideration that earthquake forces load shear wall or diaphragm in a repeating and fully reversible manner.

In September 2007, limited cyclic testing was conducted by a private engineering firm to determine if wood structural panels fastened with staples would exhibit the same behavior as the wood structural panels fastened with common nails. The test result revealed that wood structural panel fastened with staples appeared to be much lower in strength and stiffness than wood structural panels fastened with common nails. It was recommended that the use of staples as fasteners for wood structural panel shear walls or diaphragms not be permitted to resist seismic forces in structures assigned to Seismic Design Category D, E and F unless it can be substantiated by cyclic testing.

Furthermore, the cities and county within the Los Angeles region has taken extra measures to maintain the structural integrity of the framing of shear walls and diaphragms designed for high levels of seismic forces by requiring wood sheathing be applied directly over the framing members and prohibiting the use of panels placed over gypsum sheathing. This proposed 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.

This proposed amendment continues the previous amendment adopted during the 2007 code adoption cycle.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 design and construction limits on staples as fasteners used in wood structural panel or diaphragms not substantiated with cyclic testing will help to maintain minimum quality of construction and performance standards of structures and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 23-05.** Table 2306.3(2) is added to Chapter 23 of the 2010 Edition of the California Building Code and Section 2306.3 and Table 2306.3 of the 2010 Edition of the California Building Code are amended to read as follows:

**2306.3 Wood structural panel shear walls.** Wood structural panel shear walls shall be designed and constructed in accordance with AF&PA SDPWS. Wood structural panel shear walls are permitted to resist horizontal forces using the allowable shear capacities set forth in Table 2306.3(1). For structures assigned to Seismic Design Category D, E or F, the allowable shear capacities shall be set forth in Table 2306.3(2). The allowable shear capacities in Table 2306.3(1) are permitted to be increased 40 percent for wind design.

Wood structural panel shear walls used to resist seismic forces in structures assigned to Seismic Design Category D, E or F shall not be 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 in structures assigned to Seismic Design Category D, E or F 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.

Wood structural panel shear walls fastened with staples shall not used to resist seismic forces in structures assigned to Seismic Design Category D, E or F.

**Exception:** Staples may be used for wood structural panel shear walls when the allowable shear values are substantiated by cyclic testing and approved by the building official.

Wood structural panel shear walls used to resist seismic forces in structures assigned to Seismic Design Category D, E or F shall be applied directly to the framing members.

**TABLE 2306.3(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]**

## TABLE 2306.3(2)
## ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL SHEAR WALLS WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE[a] FOR SEISMIC LOADING[b, h, j, k, l] FOR STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY D, E OR F

| PANEL GRADE | MINIMUM NOMINAL PANEL THICKNESS (inch) | MINIMUM FASTENER PENETRATION IN FRAMING (inches) | ALLOWABLE SHEAR VALUE FOR SEISMIC FORCES PANELS APPLIED DIRECTLY TO FRAMING | | | | |
|---|---|---|---|---|---|---|---|
| | | | COMMON NAIL SIZE | Fastener spacing at panel edges (inches) | | | |
| | | | | 6 | 4 | 3 | 2[e] |
| Structural I sheathing | 3/8 | 1 3/8 | 8d (2½"x0.131" common) | 200 | 200 | 200 | 200 |
| | 7/16 | 1 3/8 | 8d (2½"x0.131" common) | 255 | 395 | 505 | 670 |
| | 15/32 | 1 3/8 | 8d (2½"x0.131" common) | 280 | 430 | 550 | 730 |
| | | 1 1/2 | 10d (3"x0.148" common) | 340 | 510 | 665[f] | 870 |
| Sheathing, plywood siding[g] except Group 5 Species | 3/8[c] | 1 3/8 | 8d (2½"x0.113") | 160 | 200 | 200 | 200 |

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 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 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. For grooved panel siding, the nominal panel thickness is the thickness of the panel measured at the point of nailing.

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 thicker, and nails shall be staggered where nails are spaced 2 inches on center or less.

f. Framing at adjoining panel edges shall be 3 inches nominal or 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 or less.

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 at all panel edges shall be staggered.

i. 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 at all panel edges. See Section 4.3.6.1 and 4.3.6.4.3 of AF&PA SDPWS for sill plate size and anchorage requirements.

j. Galvanized nails shall be hot dipped or tumbled.

k. 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.

l. The maximum allowable shear value for three-ply plywood resisting seismic forces is 200 pounds per foot (2.92 kn/m).

**RATIONALE:**

The Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the damages to buildings and structures during the 1994 Northridge Earthquake recommended reducing allowable shear values in wood structural panel shear walls or diaphragms that were not substantiated by cyclic testing. That recommendation was consistent with a report to the Governor from the Seismic Safety Commission of the State of California recommending that code requirements be "more thoroughly substantiated with testing." The allowable shear values for wood structural panel shear walls or diaphragms fastened with stapled nails are based on monotonic testing and does not take into consideration that earthquake forces load shear wall or diaphragm in a repeating and fully reversible manner.

In September 2007, limited cyclic testing was conducted by a private engineering firm to determine if wood structural panels fastened with stapled nails would exhibit the same behavior as the wood structural panels fastened with common nails. The test result revealed that wood structural panel fastened with stapled nails appeared to be much lower in strength and stiffness than wood structural panels fastened with common nails. It was recommended that the use of stapled nail as fasteners for wood structural panel shear walls or diaphragms not be permitted to resist seismic forces in structures assigned to Seismic Design Category D, E and F unless it can be substantiated by cyclic testing.

Furthermore, the cities and county within the Los Angeles region has taken extra measures to maintain the structural integrity of the framing of shear walls and diaphragms designed for high levels of seismic forces by requiring wood sheathing be applied directly over the framing members and prohibiting the use of panels placed over gypsum sheathing. This proposed 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.

This proposed amendment continues the previous amendment adopted during the 2007 code adoption cycle.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 design and construction limits on stapled nail fasteners used in wood structural panel shear walls or diaphragms not substantiated with cyclic testing will help to maintain minimum quality of construction and performance standards of structures and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 23-06.** Section 2306.7 of the 2010 Edition of the California Building Code are amended to read as follows:

**2306.7 Shear walls sheathed with other materials.** Shear walls sheathed with portland cement plaster, gypsum lath, gypsum sheathing or gypsum board shall be designed and constructed in accordance with AF&PA SDPWS. Shear walls sheathed with these materials are permitted to resist horizontal forces using the allowable shear capacities set forth in Table 2306.7. Shear walls sheathed with portland cement plaster, gypsum lath, gypsum sheathing or gypsum board shall not be used to resist seismic forces in structures assigned to Seismic Design Category E or F.

Shear walls sheathed with lath, plaster or gypsum board shall not be used below the top level in a multi-level building for structures assigned to Seismic Design Category D.

**RATIONALE:**

Due to the high geologic activities in the Southern California area and the expected higher level of performance on buildings and structures, this proposed local amendment limits the location where shear walls sheathed with lath, plaster or gypsum board are used in multi-level buildings. 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 and formed the basis for this proposed amendment. Considering that shear walls sheathed with lath, plaster or gypsum board are less ductile than steel moment frames or wood structural panel shear walls, the cities and county of the Los Angeles region has taken the necessary measures to limit the potential structural damage that may be caused by the use of such walls at the lower level of multi-level building that are subject to higher levels of seismic loads. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 location where shear walls sheathed with lath, plaster or gypsum board are used will help to ensure that multi-level building will reach it's performance objective in resisting higher levels of seismic loads and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 23-07.** Section 2308.3.4 of Chapter 23 of the 2010 Edition of the 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 for structures not assigned to Seismic Design Category D, E or F.

**RATIONALE:**

With the higher seismic demand placed on buildings and structures in this region, interior walls can easily be called upon to resist over half of the seismic loading imposed on simple buildings or structures. Without a continuous foundation to support the braced wall line, seismic loads would be transferred through other elements such as non-structural concrete slab floors, wood floors, etc. The proposed change is to limit the use of the exception to structures assigned to Seismic Design Category A, B or C where lower seismic demands are expected. Requiring interior braced walls be supported by continuous foundations is intended to reduce or eliminate the poor performance of buildings or structures. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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. The proposed modification to require continuous footings under braced wall lines will improve performance of buildings or structure during a seismic event and therefore 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.

**2010 LARUCP 23-08.** Section 2308.12.2 of Chapter 23 of the 2010 Edition of the California Building Code is amended to read as follows:

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

**Exception:** Stone and 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 Chapter 14 and shall not extend more than 5 feet (1524 mm) above the first story finished floor.

**RATIONALE:**

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. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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.

**2010 LARUCP 23-09.** Section 2308.12.4 and Table 2308.12.4 of the 2010 Edition of the California Building Code are amended to read as follows:

**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 and spaced a maximum of 16 inches on center.

**Exception:** 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 15/32 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.

Wood structural panel sheathing shall be a minimum of 15/32 inch thick nailed with 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.

**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] | $S_{DS} < 0.50$ | $0.50 \leq S_{DS} < 0.75$ | $0.75 \leq S_{DS} \leq 1.00$ | $S_{DS} > 1.00$ |
|---|---|---|---|---|---|
| One Story | G-P[c] | 10 feet 8 inches | 14 feet 8 inches | 18 feet 8 inches | 25 feet 0 inches |
| | S-W[d] | 5 feet 4 inches | 8 feet 0 inches | 9 feet 4 inches | 12 feet 0 inches |

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~~.

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. S-W sheathing shall be a minimum of 15/32" thick nailed with 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.

**RATIONALE:**

This proposed amendment specifies minimum sheathing thickness and nail size and spacing so as to provide a uniform standard of construction for designers and buildings to follow. This is intended to improve the performance level of buildings and structures that are subject to the higher seismic demands placed on buildings or structure in this region. This proposed amendment reflects the recommendations by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the poor performance observed in 1994 Northridge Earthquake. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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. The proposed modification to provide specific detailing requirements will improve the performance of buildings and structures and therefore needs 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.

**2010 LARUCP 23-10.** Section 2304.9.1 and Table 2304.9.1 of the 2010 Edition of the California Building Code are amended to read as follows:

**2304.9.1 Fastener requirements.** Connections for wood members shall be designed in accordance with the appropriate methodology in Section 2301.2. The number and size of fasteners connecting wood members shall not be less than that set forth in Table 2304.9.1. Staple fasteners in Table 2304.9.1 shall not be used to resist or transfer seismic forces in structures assigned to Seismic Design Category D, E or F.

**Exception:** Staples may be used to resist or transfer seismic forces when the allowable shear values are substantiated by cyclic testing and approved by the building official.

Add new footnote q to Table 2304.9.1.

q. Staples shall not be used to resist or transfer seismic forces in structures assigned to Seismic Design Category D, E or F.

**RATIONALE:**

Due to the high geologic activities in the Southern California area and the expected higher level of performance on buildings and structures, this proposed local amendment limit the use of staple fasteners in resisting or transferring seismic forces. In September 2007, limited cyclic testing data was provided to the ICC Los Angeles Chapter Structural Code Committee showing that stapled wood structural shear panels do not exhibit the same behavior as the nailed wood structural shear panels. The test results of the stapled wood structural shear panels appeared much lower in strength and drift than the nailed wood structural shear panel test results. Therefore, the use of staples as fasteners to resist or transfer seismic forces shall not be permitted without being substantiated by cyclic testing. This proposed amendment is a continuation of a similar amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 use of staple fasteners to resist or transfer seismic load improve the performance of buildings and structures during a seismic event and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

**2010 LARUCP 23-11.** Section 2308.12.5 of the 2010 Edition of the California Building Code are amended to read as follows:

**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 2304.9.1. Wall sheathing shall not be attached to framing members by adhesives. Staple fasteners in Table 2304.9.1 shall not be used to resist or transfer seismic forces in structures assigned to Seismic Design Category D, E or F.

**Exception:** Staples may be used to resist or transfer seismic forces when the allowable shear values are substantiated by cyclic testing and approved by the building official.

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 inches (6096 mm) intervals along the top plate of discontinuous vertical framing.

**RATIONALE:**

Due to the high geologic activities in the Southern California area and the expected higher level of performance on buildings and structures, this proposed local amendment limit the use of staple fasteners in resisting or transferring seismic forces. In September 2007, limited cyclic testing data was provided to the ICC Los Angeles Chapter Structural Code Committee showing that stapled wood structural shear panels do not exhibit the same behavior as the nailed wood structural shear panels. The test results of the stapled wood structural shear panels appeared much lower in strength and drift than the nailed wood structural shear panel test results. Therefore, the use of staples as fasteners to resist or transfer seismic forces shall not be permitted without being substantiated by cyclic testing. This proposed amendment is a continuation of a similar amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 use of staple fasteners to resist or transfer seismic load improve the performance of buildings and structures during a seismic event and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Building Code.

# PART II

## RECOMMENDED LARUCP AMENDMENTS TO THE

## 2010 EDITION OF THE CALIFORNIA RESIDENTIAL CODE

## SUMMARY OF RECOMMENDED LARUCP AMENDMENTS TO THE 2010 CRC

| 2010 LARUCP NO. | TITLE/DESCRIPTION | STATUS[1] | DATE |
|---|---|---|---|
| R3-01 | Amend CRC Section R301.1.3.2 Woodframe Structures | AS | 6/24/10 |
| R3-02 | Amend CRC Section R301.1.4 Slopes Steeper Than 33% | AS | 6/24/10 |
| R3-03 | Amend CRC Section R301.2.2.2.5 Irregular Buildings | AS | 6/24/10 |
| R3-04 | Amend CRC Section R301.2.2.3.5.1 Modify AISI S230 Section B1 | AS | 6/24/10 |
| R3-05 | Amend CRC Section R322.1.4.1 Design Flood Elevations | AS | 6/24/10 |
| R4-01 | Amend CRC Section R401.1 Foundation Application | AS | 6/24/10 |
| R4-02 | Amend CRC Section R403.1 General Footings | AS | 6/24/10 |
| R4-03 | Amend CRC Section R404.2 Wood Foundation Walls | AS | 6/24/10 |
| R5-01 | Amend CRC Section R501.1 Application | AS | 6/24/10 |
| R5-02 | Amend CRC Section R503.2.4 Openings In Horizontal Diaphragms | AM | 6/24/10 |
| R6-01 | Amend CRC Table R602.3(1) Fastener Schedule | AS | 5/25/10 |
| R6-02 | Amend CRC Table R602.3(2) Alternate Attachment | AM | 5/25/10 |
| R6-03 | Amend CRC Table R602.10.1.2(2) Bracing Requirement | AS | 5/25/10 |
| R6-04 | Amend CRC Table R602.10.2 Intermittent Bracing Method | AM | 5/25/10 |
| R6-05 | Amend CRC Figure R602.10.3.2 Alternate Braced Wall Panel | AM | 6/8/10 |
| R6-06 | Amend CRC Figure R602.10.3.3 Portal Frame | AM | 6/8/10 |
| R6-07 | Amend CRC Section R602.10.3.3 Method PFH | AS | 6/8/10 |
| R6-08 | Amend CRC Table R602.10.4.1 Continuous Sheathing | AM | 6/8/10 |
| R6-09 | Amend CRC Figure R602.10.4.1.1 Method CS-PF | AS | 6/24/10 |
| R6-10 | Delete CRC Section R602.10.7.1 Braced Wall Panel | AS | 6/8/10 |
| R6-11 | Amend CRC Section R606.2.4 Parapet Walls | AS | 6/8/10 |
| R6-12 | Amend CRC Section R606.12.2.2.3 Reinforcement for Masonry | AS | 6/8/10 |
| R6-13 | Amend CRC Section R602.3.2 Single Top Plate | AS | 6/24/10 |
| R8-01 | Amend CRC Table R802.5.1(9) Joist Heel Joint Connection | AM | 6/24/10 |
| R8-02 | Amend CRC Section R802.8 Lateral Support | AS | 6/24/10 |
| R8-03 | Amend CRC Section R802.10.2 Design of Wood Trusses | AS | 6/24/10 |
| R8-04 | Add CRC Section R803.2.4 Openings in Horizontal Diaphragms | AS | 6/24/10 |
| R10-01 | Amend CRC Section R1001.3.1 Vertical Reinforcing | AS | 6/24/10 |
| | | | |

FOOTNOTE:
1. AS = Approved as submitted. AM = Approved as modified.

**2010 LARUCP R3-01.** Section R301.1.3.2 of the 2010 Edition of the California Residential Code is amended to read as follows:

**R301.1.3.2 Woodframe structures ~~greater than two stories~~.** The building official shall require construction documents to be approved and stamped by a California licensed architect or engineer for all dwellings of woodframe construction more than two stories and basement in height located in Seismic Design Category A, B or C. Notwithstanding other sections the law, the law establishing these provisions is found in Business and Professions Code Section 5537 and 6737.1.

The building official shall require construction documents to be approved and stamped by a California licensed architect or engineer for all dwellings of woodframe construction more than one story in height or with a basement located in Seismic Design Category $D_0$, $D_1$, $D_2$ or E.

**RATIONALE:**

After the 1994 Northridge Earthquake, the Wood Frame Construction Joint Task Force recommended that the quality of wood frame construction need to be greatly improved. One such recommendation identified by the Task Force is to improve the quality and organization of structural plans prepared by the engineer or architect so that plan examiners, building inspectors, contractors and special inspectors may logically follow and construct the presentation of the seismic force-resisting systems in the construction documents. For buildings or structures located in Seismic Design Category $D_0$, $D_1$, $D_2$ or E that are subject to a greater level of seismic forces, the requirement to have a California licensed architect or engineer prepare the construction documents is intended to minimize or reduce structural deficiencies that may cause excessive damage or injuries in wood frame buildings. Structural deficiencies such as plan and vertical irregularities, improper shear transfer of the seismic force-resisting system, missed details or connections important to the structural system, and the improper application of the prescriptive requirements of the California Residential Code can be readily addressed by a registered design professional.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 construction documents for wood frame construction greater than one story in height or with a basement to be approved and stamped by a California licensed architect or engineer is intended to assure that the both the structural design and prescriptive requirement of the code are properly utilized and presented and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R3-02**. Section R301.1.4 is added to Chapter 3 of the 2010 Edition of the California Residential Code to read as follows:

**R301.1.4 Seismic design provisions for buildings constructed on or into slopes steeper than one unit vertical in three units horizontal (33.3 percent slope).** The design and construction of new buildings and additions to existing buildings when constructed on or into slopes steeper than one unit vertical in three units horizontal (33.3 percent slope) shall comply with Section 1613.12 of the California Building Code.

**RATIONALE:**

Due to the difficulty of fire suppression vehicles accessing winding and narrow hillside properties and the probabilities for future earthquakes in the Los Angeles region, this technical amendment is required to address the special needs for buildings constructed on hillside locations. A joint Structural Engineers Association of Southern California (SEAOSC) and both the Los Angeles County and Los Angeles City Task Force investigated the performance of hillside building failures after the Northridge earthquake. Numerous hillside failures resulted in loss of life and millions of dollars in damage. These criteria were developed to minimize the damage to these structures and have been in use by both the City and County of Los Angeles for several years with much success. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.

**FINDINGS:**

Local Topographical and Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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. Additionally, the topography within the Los Angeles region includes significant hillsides with narrow and winding access that makes timely response by fire suppression vehicles challenging and difficult. The proposed modification establishes design parameters to better mitigate and limit property damage that are the results of increased seismic forces which are imparted upon hillside buildings and structures and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R3-03.** Section R301.2.2.2.5 of the 2010 Edition of the California Residential Code is amended to read as follows:

1. When exterior shear wall lines or braced wall panels are not in one plane vertically from the foundation to the uppermost story in which they are required.

   ~~**Exception:** For wood light-frame construction, floors with cantilevers or setbacks not exceeding four times the nominal depth of the wood floor joists are permitted to support braced wall panels that are out of plane with braced wall panels below provided that:~~
   ~~1. Floor joists are nominal 2 inches by 10 inches (51 mm by 254 mm) or larger and spaced not more than 16 inches (406 mm) on center.~~
   ~~2. The ratio of the back span to the cantilever is at least 2 to 1.~~
   ~~3. Floor joists at ends of braced wall panels are doubled.~~
   ~~4. For wood-frame construction, a continuous rim joist is connected at ends to all cantilever joists. When spliced, the rim joists shall be spliced using a galvanized metal tie not less than 0.058 inch (1.5 mm) (16 gage) and 11/2 inches (38 mm) wide fastened with six 16d nails on each side of the splice or a block of the same size as the rim joist of sufficient length to fit securely between the joist space at which the splice occurs fastened with eight 16d nails on each side of the splice; and~~
   ~~5. Gravity loads carried at the end of cantilevered joists are limited to uniform wall and roof loads and the reactions from headers having a span of 18 feet (2438 mm) or less.~~

3. When the end of a braced wall panel occurs over an opening in the wall below ~~and ends at a horizontal distance greater than 1 foot (305 mm) from the edge of the opening. This provision is applicable to shear walls and braced wall panels offset in plane and to braced wall panels offset out of plane as permitted by the exception to item 1 above.~~

   ~~**Exception:** For wood light-frame wall construction, one end of a braced wall panel shall be permitted to extend more than one foot (305 mm) over an opening not more than 8 feet (2438 mm) wide in the wall below provided that the opening includes a header in accordance with the following:~~
   ~~1. The building width, loading condition and framing member species limitations of Table R502.5(1) shall apply; and~~
   ~~2. Not less than one 2x12 or two 2x10 for an opening not more than 4 feet (1219 mm) wide; or~~
   ~~3. Not less than two 2x12 or three 2x10 for an opening not more than 6 feet (1829 mm) wide; or~~
   ~~4. Not less than three 2x12 or four 2x10 for an opening not more than 8 feet (2438 mm) wide; and~~
   ~~5. The entire length of the braced wall panel does not occur over an opening in the wall below.~~

5. When portions of a floor level are vertically offset.

   ~~**Exceptions:**~~
   ~~1. Framing supported directly by continuous foundations at the perimeter of the building.~~
   ~~2. For wood light-frame construction, floors shall be permitted to be vertically offset when the floor framing is lapped or tied together as required by section R502.6.1.~~

**RATIONALE:**

With the higher seismic demand placed on buildings and structures in this region, precautionary steps are proposed to reduce or eliminate potential problems that may result by limiting the type of irregular conditions specified in the International Residential Code. Such limitations are intended to reduce the potential structural damage expected in the event of an earthquake. 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 and all associated elements when designed for high levels of seismic loads.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 amendment limits the type of irregular conditions within buildings that may lead to higher structural damage during a seismic event and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code and consistent with the requirements in the ASCE 7-05.

**2010 LARUCP R3-04**. Section R301.2.2.3.5.1 is added to Section 301.2.2.3.5 of the 2010 Edition of the California Residential Code as follows:

**R301.2.2.3.5.1 AISI S230, Section B1.** Modify AISI S230, Section B1 to read as follows:

Where No. 8 screws are specified, the required number of screws in a steel-to-steel connection shall be permitted to be reduced in accordance with the reduction factors in Table B1-1 when larger screws are used or when ~~one of~~ the sheets of steel being connected is thicker than 33 mils (0.84mm). When applying the reduction factor, the resulting number of screws shall be rounded up.

**RATIONALE:**

The term "one" conflicts with Table B1-1, whereas in the table it states the "thinnest connected steel sheet". The term "one" in the code language can misleadingly be interpreted as though one of the sheets can be 33 mils and the other sheet thicker, but that one would still qualify for a reduction factor; this is not the intent of the tables. For example, in a steel-to-steel connection consisting of a 33 mils and 44 mils, and if in any part of the code it is required to provide (4) No. 8 screws; according to Table B1-1 the factor 1.0 would apply to the required number of screws and thus a reduction of screws would not be allowed.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 clarify that the thinnest connected steel sheets need to be thicker than 33 mils to qualify for the reduction factors and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R3-05.** Section R322.1.4.1 of the 2010 Edition of the California Residential Code is amended to read as follows:

**R322.1.4.1 Determination of design flood elevations.** If design flood elevations are not specified, the building official is authorized to require the applicant to:

1. Obtain and reasonably use data available from a federal, state or other source; or
2. Determine the design flood elevation in accordance with accepted hydrologic and hydraulic undertaken by a registered ~~design professional~~ civil engineer who shall determine that the technical methods used reflect currently accepted engineering practice. Studies, analyses and computations shall be submitted insufficient detail to allow thorough review and approval.

**RATIONALE:**

This amendment is intended to clarify the appropriate design professional who should perform studies and analysis for design flood elevations. Registered civil engineers are highly trained and equipped to perform such design and analysis.

**FINDINGS:**

Local Topographical and Geological Conditions – The greater Los Angeles region is affected by both natural and man-made topographic conditions, such as, steep hillsides conditions where dry brush may cause brush fires and are fanned by strong concentrated winds caused by steep ravines and valley areas of the hillsides, or when it rains, mudflow or landslides caused by steep bare (no vegetation) slopes. Man-made topography may include very densely populated areas or areas of many high-rise buildings, including but not limited to, Century City, Wilshire Corridor, Westwood or Downtown Los Angeles, where street access for local fire department may be challenging and difficult to navigate or impeded during times of high traffic activity. The proposed modification to require a registered civil engineer to perform design and analysis ensures that a more reliable and better performance is achieved and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alternations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R4-01.** Section R401.1 of the 2010 Edition of the California Residential Code is amended to read as follows:

**R401.1 Application.** The provisions of this chapter shall control the design and construction of the foundation and foundation spaces for all buildings. In addition to the provisions of this chapter, the design and construction of foundations in areas prone to flooding as established by Table R301.2(1) shall meet the provisions of Section R322. Wood foundations shall be designed and installed in accordance with AF&PA PWF.

**Exception**: The provisions of this chapter shall be permitted to be used for wood foundations only in the following situations:

1. In buildings that have no more than two floors and a roof.
2. When interior basement and foundation walls are constructed at intervals not exceeding 50 feet (15 240 mm).

Wood foundations in Seismic Design Category $D_0$, $D_1$ or $D_2$ shall ~~be designed in accordance with accepted engineering practice~~ not be permitted.

**Exception:** In non-occupied, single-story, detached storage sheds and similar uses other than carport or garage, provided the gross floor area does not exceed 200 square feet, the plate height does not exceed 12 feet in height above the grade plane at any point, and the maximum roof projection does not exceed 24 inches.

**RATIONALE:**

No substantiating data has been provided to show that wood foundation is effective in supporting buildings and structures during a seismic event while being subject to deterioration caused by the combined detrimental effect of constant moisture in the soil and wood-destroying organisms. Wood foundation, 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 and temperate weather in the Southern California region and are not generally familiar with the necessary precautions and treatment of wood that makes it suitable for both seismic event and wet applications. The proposed amendment takes the precautionary steps to reduce or eliminate potential problems that may result in using wood foundation that experience relatively rapid decay due to the fact that the region does not experience temperatures cold enough to destroy or retard the growth and proliferation of wood-destroying organisms. However, an exception is made for non-occupied, single-story storage structures that pose significantly less risk to human safety and may utilize the wood foundation guidelines specified in this Chapter. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles for the California Building Code.

**FINDINGS:**

Local Climatic and Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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. In addition, the region is within a climate system capable of producing major winds, fire and rain related disasters, including but not limited to those caused by the Santa Ana winds and El Nino (or La Nina) subtropical-like weather. This region is especially susceptible to more active termite and wood attacking insects and microorganisms. The proposed modification to prohibit the use of wood foundation systems as well as limit prescriptive design provisions in an effort to mitigate potential problems or deficiencies due to the proliferation of wood-destroying organisms and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R4-02.** Sections R403.1.2, R403.1.3, R403.1.5 of the 2010 Edition of the California Residential Code are amended to read as follows:

**R403.1.2 Continuous footing in Seismic Design Categories $D_0$, $D_1$ and $D_2$.** The braced wall panels at exterior walls of buildings located in Seismic Design Categories $D_0$, $D_1$ and $D_2$ shall be supported by continuous footings. All required interior braced wall panels in buildings ~~with plan dimensions greater than 50 feet (15240 mm)~~ shall ~~also~~ be supported by continuous footings.

**R403.1.3 Seismic reinforcing.** Concrete footings located in Seismic Design Categories $D_0$, $D_1$ and $D_2$, as established in Table R301.2(1), shall have minimum reinforcement. Bottom reinforcement shall be located a minimum of 3 inches (76 mm) clear from the bottom of the footing.

In Seismic Design Categories $D_0$, $D_1$ and $D_2$ where construction joint is created between a concrete footing and a stem wall, a minimum of one No. 4 bar shall be installed at not more than 4 feet (1219 mm) on center. The vertical bar shall extend to 3 inches (76 mm) clear of the bottom of the footing, have a standard hook and extend a minimum of 14 inches (357 mm) into the stem wall.

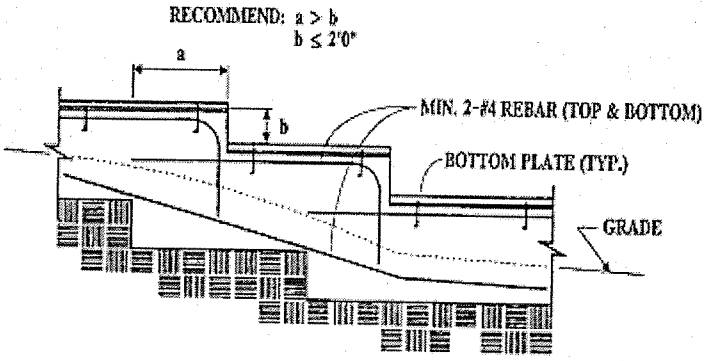
In Seismic Design Categories $D_0$, $D_1$ and $D_2$ where a grouted masonry stem wall is supported on a concrete footing and stem wall, a minimum of one No. 4 bar shall be installed at not more than 4 feet (1219 mm) on center. The vertical bar shall extend to 3 inches (76 mm) clear of the bottom of the footing and have a standard hook.

In Seismic Design Categories $D_0$, $D_1$ and $D_2$ masonry stem walls without solid grout and vertical reinforcing are not permitted.

**Exception:** In detached one- and two-family dwellings <u>located in Seismic Design Category A, B or C</u> which are three stories or less in height and constructed with stud bearing walls, plain concrete footings without longitudinal reinforcement supporting walls and isolated plain concrete footings supporting columns or pedestals are permitted.

**R403.1.5 Slope.** The top surface of footings shall be level. The bottom surface of footings shall be 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).

<u>For structures located in Seismic Design Categories $D_0$, $D_1$ or $D_2$, stepped 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 R403.1.5.</u>




STEPPED FOUNDATIONS

**FIGURE R403.1.5**
**STEPPED FOOTING**

## RATIONALE:

With the higher seismic demand placed on buildings and structures in this region, precautionary steps are proposed to reduce or eliminate potential problems that may result for under-reinforced footings located on sloped surfaces. Requiring minimum reinforcement for stepped footings is intended to address the problem of poor performance of plain or under-reinforced footings during a seismic event. Furthermore, interior walls can easily be called upon to resist over half of the seismic loading imposed on simple buildings or structures. Without a continuous foundation to support the braced wall line, seismic loads would be transferred through other elements such as non-structural concrete slab floors, wood floors, etc. The proposed change is to limit the use of the exception to structures assigned to Seismic Design Category A, B or C where lower seismic demands are expected. Requiring interior braced walls be supported by continuous foundations is intended to reduce or eliminate the poor performance of buildings or structures. This proposed amendment is consistent with an amendment adopted during previous code adoption cycles for the California Building Code.

## FINDINGS:

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 continuous footings under braced wall lines, require reinforcement in one- and two-family dwelling, and minimum reinforcement in stepped footings will improve performance of buildings or structure during a seismic event and minimize potential problems or deficiencies and therefore 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 Residential Code.

**2010 LARUCP R4-03.** Section R404.2 of the 2010 Edition of the California Residential Code is amended to read as follows:

**R404.2 Wood foundation walls.** Wood foundation walls shall be constructed in accordance with the provisions of Sections R404.2.1 through R404.2.6 and with the details shown in Figures R403.1(2) and R403.2(3). Wood foundation walls shall not be used for structures located in Seismic Design Category $D_0$, $D_1$ or $D_2$.

**RATIONALE:**

No substantiating data has been provided to show that wood foundation wall is effective in supporting buildings and structures during a seismic event while being subject to deterioration caused by the combined detrimental effect of constant moisture in the soil and wood-destroying organisms. Wood foundation 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 and temperate weather in the Southern California region and are not generally familiar with the necessary precautions and treatment of wood that makes it suitable for both seismic event and wet applications. The proposed amendment takes the precautionary steps to reduce or eliminate potential problems that may result in using wood foundation walls that experience relatively rapid decay due to the fact that the region does not experience temperatures cold enough to destroy or retard the growth and proliferation of wood-destroying organisms. This proposed amendment is consistent with an amendment adopted during previous code adoption cycles for the California Building Code.

**FINDINGS:**

Local Climatic and Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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. In addition, the region is within a climate system capable of producing major winds, fire and rain related disasters, including but not limited to those caused by the Santa Ana winds and El Nino (or La Nina) subtropical-like weather. This region is especially susceptible to more active termite and wood attacking insects and microorganisms. The proposed modification to prohibit the use of wood foundation wall in an effort to mitigate potential problems or deficiencies due to the proliferation of wood-destroying organisms and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R5-01.** Section R501.1 of the 2010 Edition of the California Residential Code is amended to read as follows:

**R501.1 Application.** The provision of this chapter shall control the design and construction of the floors for all buildings including the floors of attic spaces used to house mechanical or plumbing fixtures and equipment weighing less than 400 lbs and maximum height of 4 feet above the floor or attic level.

**RATIONALE:**

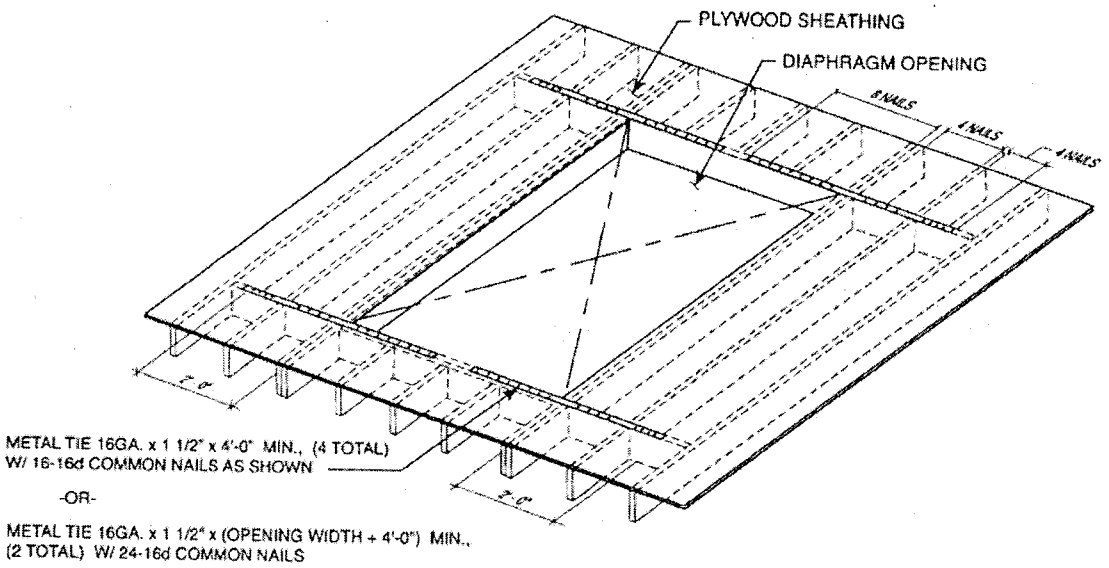
There is no limitation for weight of mechanical and plumbing fixtures and equipments in the International Residential Code. Requirements from ASCE 7-05 and the International Building Code would permit equipment weighing up to 400 lbs when mounted at 4 feet or less above the floor or attic level without engineering design. Where equipment exceeds this requirement, it is the intent of this proposed amendment that a registered design professional be required to analyze if the floor support is adequate and structurally sound.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 equipment weight is intended to reduce injuries, save lives, and minimize structural damages and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R5-02.** Section R503.2.4 is added to Chapter 5 of the 2010 Edition of the California Residential Code to read as follows:

**R503.2.4 Openings in horizontal diaphragms.** Openings in horizontal diaphragms with a dimension perpendicular to the joist that is greater than 4 feet (1.2 m) shall be constructed in accordance with Figure R503.2.4.




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

a. Blockings shall be provided beyond headers.
b. Metal ties not less than 0.058 inch [1.47 mm (16 galvanized gage)] by 1.5 inches (38 mm) wide with eight 16d common nails on each side of the header-joist intersection. The metal ties shall have a minimum yield of 33,000 psi (227 MPa).
c. Openings in diaphragms shall be further limited in accordance with Section R301.2.2.2.5.

**FIGURE R503.2.4**
**OPENINGS IN HORIZONTAL DIAPHRAGMS**

**RATIONALE:**

Section R502.10 of the Code does not provide any prescriptive criteria to limit the maximum floor opening size nor does Section R503 provide any details to address the issue of shear transfer near larger floor openings. With the higher seismic demand placed on buildings and structures in this region, it is important to ensure that a complete load path is provided to reduce or eliminate potential damages caused by seismic forces. Requiring blocking with metal ties around larger floor openings and limiting opening size is consistent with the requirements of Section R301.2.2.2.5.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 specific detailing at large floor openings is intended to address the poor

performance of floor diaphragms with openings and limit or reduce property damages during a seismic event and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R6-01.** Lines 34 thru 37 of Table R602.3(1) of the 2010 Edition of the California Residential Code are amended to read as follows:

| | | | | |
|---|---|---|---|---|
| | Other wall sheathing[h] | | | |
| 34 | 1/2" structural cellulosic fiberboard sheathing | 1/2" galvanized roofing nail; ~~7/16" crown or 1" crown staple 16 ga., 1 1/4" long~~ | 3 | 6 |
| 35 | 25/32" structural cellulosic fiberboard sheathing | 1 3/4" galvanized roofing nail; ~~7/16" crown or 1" crown staple 16 ga., 1 1/2" long~~ | 3 | 6 |
| 36 | 1/2" gypsum sheathing[d] | 1 1/2" galvanized roofing nail; ~~staple galvanized, 1 1/2" long;~~ 1 1/4 screws, Type W or S | 7 | 7 |
| 37 | 5/8" gypsum sheathing[d] | 1 3/4" glavanized roofing nail; ~~staple galvanized, 1 5/8" long;~~ 1 5/8" screws, Type W or S | 7 | 7 |

**RATIONALE:**

The Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the damages to buildings and structures during the 1994 Northridge Earthquake recommended reducing allowable shear values in wood structural panel shear walls or diaphragms that were not substantiated by cyclic testing. That recommendation was consistent with a report to the Governor from the Seismic Safety Commission of the State of California recommending that code requirements be "more thoroughly substantiated with testing." The allowable shear values for wood structural panel shear walls or diaphragms fastened with staples are based on monotonic testing and does not take into consideration that earthquake forces load shear wall or diaphragm in a repeating and fully reversible manner.

In September 2007, limited cyclic testing was conducted by a private engineering firm to determine if wood structural panels fastened with staples would exhibit the same behavior as the wood structural panels fastened with common nails. The test result revealed that wood structural panel fastened with staples appeared to be much lower in strength and stiffness than wood structural panels fastened with common nails. It was recommended that the use of staples as fasteners for wood structural panel shear walls or diaphragms not be permitted to resist seismic forces in structures assigned to Seismic Design Category $D_0$, $D_1$ and $D_2$ unless it can be substantiated by cyclic testing.

This proposed amendment is consistent with an amendment adopted during previous code adoption cycles for the California Building Code.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 design and construction limits on staples as fasteners used in wood structural panel or diaphragms not substantiated with cyclic testing will help to maintain minimum quality of construction and performance standards of structures and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R6-02.** Table R602.3(2) of the 2010 Edition of the California Residential Code is amended to read as follows:

| Wood structural panels subfloor, roof and wall sheathing to framing and particleboard wall sheathing to framing[f] | | | |
|---|---|---|---|
| up to 1/2 | ~~Staple 15 ga. 1 3/4~~ | ~~4~~ | ~~8~~ |
| | 0.097 - 0.099 Nail 2 1/4 | 3 | 6 |
| | ~~Staple 16 ga. 1 3/4~~ | ~~3~~ | ~~6~~ |
| 19/32 and 5/8 | 0.113 Nail 2 | 3 | 6 |
| | ~~Staple 15 and 16 ga. 2~~ | ~~4~~ | ~~8~~ |
| | 0.097 - 0.099 Nail 2 1/4 | 4 | 8 |
| 23/32 and 3/4 | ~~Staple 14 ga. 2~~ | ~~4~~ | ~~8~~ |
| | ~~Staple 15 ga. 1 3/4~~ | ~~3~~ | ~~6~~ |
| | 0.097 - 0.099 Nail 2 1/4 | 4 | 8 |
| | ~~Staple 16 ga. 2~~ | ~~4~~ | ~~8~~ |
| 1 | ~~Staple 14 ga. 2 1/4~~ | ~~4~~ | ~~8~~ |
| | 0.113 Nail 2 1/4 | 3 | 6 |
| | ~~Staple 15 ga. 2 1/4~~ | ~~4~~ | ~~8~~ |

| Floor underlayment; plywood-hardboard-particleboard[f] | | | |
|---|---|---|---|
| Plywood | | | |
| 1/4 and 5/16 | 1 1/4 ring or screw shank nail-minimum 12 1/2 ga. (0.099") shank diameter | 3 | 6 |
| | ~~Staple 18 ga., 7/8, 3/16 crown width~~ | ~~2~~ | ~~5~~ |
| 11/32, 3/8, 15/32, and 1/2 | 1 1/4 ring or screw shank nail-minimum 12 1/2 ga. (0.099") shank diameter | 6 | 8[e] |
| 19/32, 5/8, 23/32 and 3/4 | 1 1/2 ring or screw shank nail-minimum 12 1/2 ga. (0.099") shank diameter | 6 | 8 |
| | ~~Staple 16 ga. 1 1/2~~ | ~~6~~ | ~~0~~ |

## RATIONALE:

The Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the damages to buildings and structures during the 1994 Northridge Earthquake recommended reducing allowable shear values in wood structural panel shear walls or diaphragms that were not substantiated by cyclic testing. That recommendation was consistent with a report to the Governor from the Seismic Safety Commission of the State of California recommending that code requirements be "more thoroughly substantiated with testing." The allowable shear values for wood structural panel shear walls or diaphragms fastened with staples are based on monotonic testing and does not take into consideration that earthquake forces load shear wall or diaphragm in a repeating and fully reversible manner.

In September 2007, limited cyclic testing was conducted by a private engineering firm to determine if wood structural panels fastened with staples would exhibit the same behavior as the wood structural panels fastened with common nails. The test result revealed that wood structural panel fastened with staples appeared to be much lower in strength and stiffness than wood structural panels fastened with common nails. It was recommended that the use of staples as fasteners for wood structural panel shear walls or diaphragms not be permitted to resist seismic forces in structures assigned to Seismic Design Category $D_0$, $D_1$ and $D_2$ unless it can be substantiated by cyclic testing.

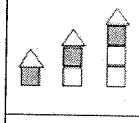
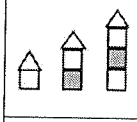
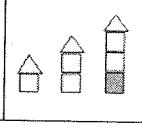
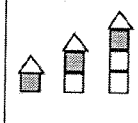
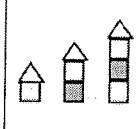
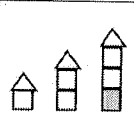
This proposed amendment is consistent with an amendment adopted during previous code adoption cycles for the California Building Code.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 design and construction limits on staples as fasteners used in wood structural panel or diaphragms not substantiated with cyclic testing will help to maintain minimum quality of construction and performance standards of structures and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R6-03.** Table R602.10.1.2(2) of the 2010 Edition of the California Residential Code is amended to read as follows:

**TABLE R602.10.1.2(2)[a, b, c]**
**BRACING REQUIREMENTS BASED ON SEISMIC DESIGN CATEGORY**
**(AS A FUNCTION OF BRACED WALL LINE LENGTH)**

| SOIL CLASS D[a]<br>WALL HEIGHT = 10 FT<br>10 PSF FLOOR DEAD LOAD<br>15 PSF ROOF/CEILING DEAD LOAD<br>BRACED WALL LINE SPACING ≤ 25 FT | | | MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE | | | |
|---|---|---|---|---|---|---|
| Seismic Design Category (SDC) | Story Location | Braced Wall Line Length | Method LIB | Methods[d] DWB, SFB, GB, PBS, PCP, HPS | Method WSP | Continuous Sheathing |
| SDC $D_0$ or $D_1$ |  | 10 | NP | ~~3.0~~ 6.0 | 2.0 | 1.7 |
| | | 20 | NP | ~~6.0~~ 12.0 | 4.0 | 3.4 |
| | | 30 | NP | ~~9.0~~ 18.0 | 6.0 | 5.1 |
| | | 40 | NP | ~~12.0~~ 24.0 | 8.0 | 6.8 |
| | | 50 | NP | ~~15.0~~ 30.0 | 10.0 | 8.5 |
| |  | 10 | NP | ~~6.0~~ NP | 4.5 | 3.8 |
| | | 20 | NP | ~~12.0~~ NP | 9.0 | 7.7 |
| | | 30 | NP | ~~18.0~~ NP | 13.5 | 11.5 |
| | | 40 | NP | ~~24.0~~ NP | 18.0 | 15.3 |
| | | 50 | NP | ~~30.0~~ NP | 22.5 | 19.1 |
| |  | 10 | NP | ~~8.5~~ NP | 6.0 | 5.1 |
| | | 20 | NP | ~~17.0~~ NP | 12.0 | 10.2 |
| | | 30 | NP | ~~25.5~~ NP | 18.0 | 15.3 |
| | | 40 | NP | ~~34.0~~ NP | 24.0 | 20.4 |
| | | 50 | NP | ~~42.5~~ NP | 30.0 | 25.5 |
| SDC $D_2$ |  | 10 | NP | ~~4.0~~ 8.0 | 2.5 | |
| | | 20 | NP | ~~8.0~~ 16.0 | 5.0 | |
| | | 30 | NP | ~~12.0~~ 24.0 | 7.5 | |
| | | 40 | NP | ~~16.0~~ 32.0 | 10.0 | |
| | | 50 | NP | ~~20.0~~ 40.0 | 12.5 | |
| |  | 10 | NP | ~~7.5~~ NP | 5.5 | |
| | | 20 | NP | ~~15.0~~ NP | 11.0 | |
| | | 30 | NP | ~~22.5~~ NP | 16.5 | |
| | | 40 | NP | ~~30.0~~ NP | 22.0 | |
| | | 50 | NP | ~~37.5~~ NP | 27.5 | |
| |  | 10 | NP | NP | NP | |
| | | 20 | NP | NP | NP | |
| | | 30 | NP | NP | NP | |
| | | 40 | NP | NP | NP | |
| | | 50 | NP | NP | NP | |

d. Methods GB and PCP braced wall panel h/w ratio shall not exceed 1:1 in SDC $D_0$, $D_1$, and $D_2$. Methods DWB, SFB, PBS, and HPS are not permitted in SDC $D_0$, $D_1$, and $D_2$.

**RATIONALE:**

Due to the high geologic activities in the Southern California area and the expected higher level of performance on buildings and structures, this proposed local amendment increase the length and limits the location where shear walls sheathed with lath, plaster or gypsum board are used in multi-level

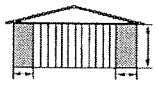
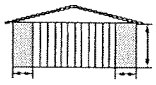
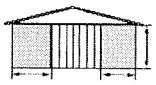
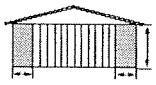
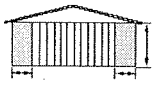
buildings. In addition, shear walls sheathed with other materials are prohibited in Seismic Design Category $D_0$, $D_1$ and $D_2$ to be consistent with the design limitation for similar shear walls found in the California Building Code. The poor performance of such shear walls in the 1994 Northridge Earthquake was investigated by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Task Force and formed the basis for this proposed amendment. Considering that shear walls sheathed with lath, plaster or gypsum board are less ductile than steel moment frames or wood structural panel shear walls, the cities and county of the Los Angeles region has taken the necessary measures to limit the potential structural damage that may be caused by the use of such walls at the lower level of multi-level building that are subject to higher levels of seismic loads. This proposed amendment is consistent with an amendment adopted during previous code adoption cycles for the California Building Code.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 increase the length and limit the location where shear walls sheathed with lath, plaster or gypsum board are used will help to ensure that multi-level building will reach it's performance objective in resisting higher levels of seismic loads and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R6-04.** Table R602.10.2 of the 2010 Edition of the California Residential Code is amended to read as follows:

TABLE R602.10.2
INTERMITTENT BRACING METHODS[a]

| | | | | 8d common (2 ½" x 0.131) nails at 6" spacing (panel edge) at 12" spacing (intermediate supports), 3/8" edge distance to panel edge |
|---|---|---|---|---|
| WSP | Wood structural panel (see Section R604) | $\frac{3}{8}$" 15/32" |  | ~~For exterior sheathing see Table R602.3(3)~~ ~~For interior sheathing see Table R602.3(1)~~ |
| SFB | Structural fiberboard sheathing | $\frac{1}{2}$" or $\frac{25}{32}$" for maximum 16" stud spacing |  | $1\frac{1}{2}$" galvanized roofing nails or 8d common ($2\frac{1}{2}$" x 0.131) nails at 3" spacing (panel edges) at 6" spacing (intermediate supports) |
| GB | Gypsum board | $\frac{1}{2}$" |  | Nails or screws at 7" spacing at panel edges including top and bottom plates; for all braced wall panel locations for exterior sheathing nail or screw size, see Table R602.3(1); for interior gypsum board nail or screw size, see Table R702.3.5 |
| PBS | Particleboard sheathing (see Section R605) | $\frac{3}{8}$" or $\frac{1}{2}$" for maximum 16" stud spacing |  | $1\frac{1}{2}$" galvanized roofing nails or 8d common ($2\frac{1}{2}$" x 0.131) nails at 3" spacing (panel edges) at 6 spacing (intermediate supports) |
| PCP | Portland cement plaster | See Section R703.6 For maximum 16" stud spacing |  | $1\frac{1}{2}$", 11 gage, $\frac{7}{16}$" head nails at 6" spacing ~~or~~ ~~$\frac{7}{8}$", 16 gage staples at 6" spacing~~ |

a. Methods GB and PCP braced wall panel h/w ratio shall not exceed 1:1 in SDC $D_0$, $D_1$, and $D_2$. Methods LIB, DWB, SFB, PBS, HPS, and PFG are not permitted in SDC $D_0$, $D_1$, and $D_2$.

**RATIONALE:**

3/8" thick 3 ply-plywood shear walls experienced many failures during the Northridge Earthquake. Box nails were observed to cause massive and multiple failures of the typical 3/8" thick 3-ply plywood during the Northridge Earthquake. This proposed amendment specifies minimum sheathing thickness, nail size and spacing so as to provide a uniform standard of construction for designers and buildings to follow. This is intended to improve the performance level of buildings and structures that are subject to the higher seismic demands and reduce and limit potential damages to property. This proposed amendment reflects the recommendations by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the poor performance observed in 1994 Northridge Earthquake.

In September 2007, limited cyclic testing was conducted by a private engineering firm to determine if wood structural panels fastened with staples would exhibit the same behavior as the wood structural panels fastened with common nails. The test result revealed that wood structural panel fastened with staples appeared to be much lower in strength and stiffness than wood structural panels fastened with common nails. It was recommended that the use of staples as fasteners for wood structural panel shear walls or diaphragms not be permitted to resist seismic forces in structures assigned to Seismic Design Category $D_0$, $D_1$ and $D_2$ unless it can be substantiated by cyclic testing.

This proposed amendment is consistent with an amendment adopted during previous code adoption cycles for the California Building Code.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 design and construction limits on stapled nail fasteners used in wood structural panel shear walls not substantiated with cyclic testing and requiring minimum sheathing thickness and nailing type and size will help to maintain minimum quality of construction and performance standards of structures and therefore 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 Residential Code.

**2010 LARUCP R6-05.** Figure R602.10.3.2 of the 2010 Edition of the California Residential Code is amended to read as follows:

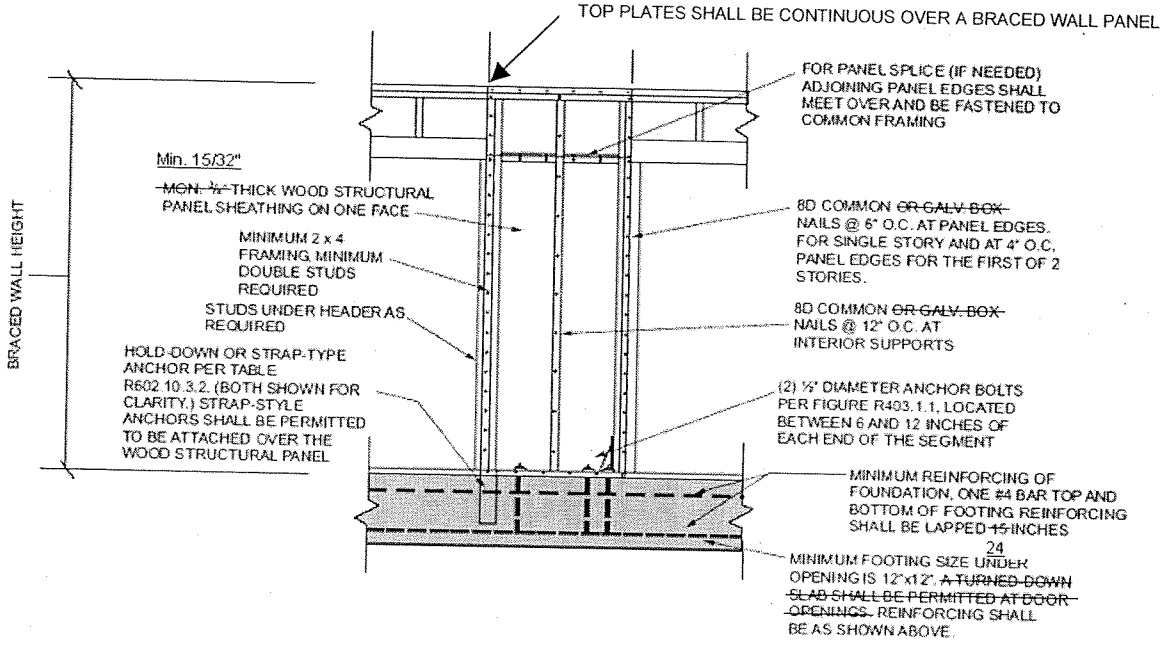



FIGURE R602.10.3.2
ALTERNATE BRACED WALL PANEL

**RATIONALE:**

3/8" thick 3 ply-plywood shear walls experienced many failures during the Northridge Earthquake. Box nails were observed to cause massive and multiple failures of the typical 3/8" thick 3-ply plywood during the Northridge Earthquake. This proposed amendment specifies minimum sheathing thickness, nail size and spacing so as to provide a uniform standard of construction for designers and buildings to follow. This is intended to improve the performance level of buildings and structures that are subject to the higher seismic demands and reduce and limit potential damages to property. This proposed amendment reflects the recommendations by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the poor performance observed in 1994 Northridge Earthquake. This proposed amendment is consistent with an amendment adopted during previous code adoption cycles for the California Building Code.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 requiring minimum sheathing thickness and nailing type and size will help to maintain minimum quality of construction and performance standards of structures and therefore 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 Residential Code.

**2010 LARUCP R6-06.** Figure R602.10.3.3 of the 2010 Edition of the California Residential Code is amended to read as follows:

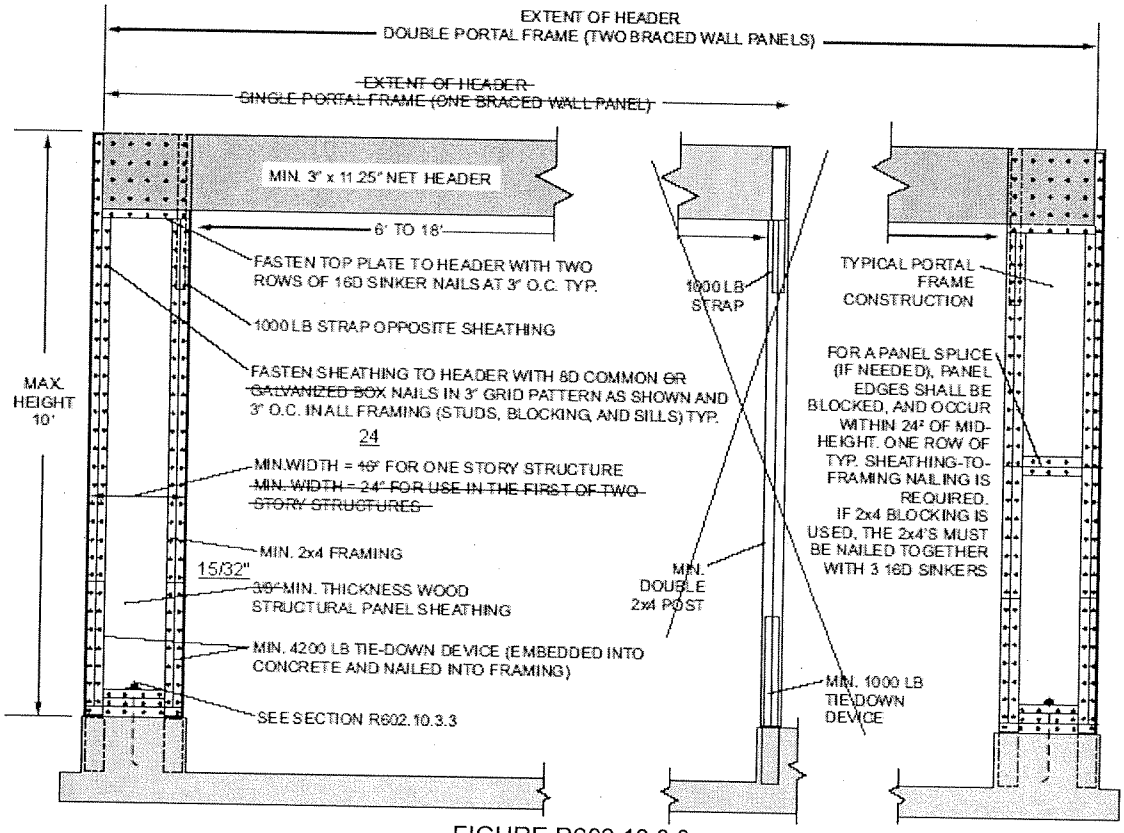



FIGURE R602.10.3.3
METHOD PFH: PORTAL FRAME WITH HOLD-DOWNS AT DETACHED GARAGE DOOR OPENINGS

**RATIONALE:**

3/8" thick 3 ply-plywood shear walls experienced many failures during the Northridge Earthquake. Box nails were observed to cause massive and multiple failures of the typical 3/8" thick 3-ply plywood during the Northridge Earthquake. This proposed amendment specifies minimum sheathing thickness, nail size and spacing so as to provide a uniform standard of construction for designers and buildings to follow. This is intended to improve the performance level of buildings and structures that are subject to the higher seismic demands and reduce and limit potential damages to property. This proposed amendment reflects the recommendations by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the poor performance observed in 1994 Northridge Earthquake. This proposed amendment is consistent with an amendment adopted during previous code adoption cycles for the California Building Code.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 requiring minimum sheathing thickness and nailing type and size will help to maintain

minimum quality of construction and performance standards of structures and therefore 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 Residential Code.

**2010 LARUCP R6-07.** Item 1 of Section R602.10.3.3 of the 2010 Edition of the California Residential Code is amended to read as follows:

1. Each panel shall be fabricated in accordance with Figure R602.10.3.3. The wood structural panel sheathing shall extend up over the solid sawn or glued-laminated header and shall be nailed in accordance with Figure R602.10.3.3. A spacer, if used with a built-up header, shall be placed on the side of the built-up beam opposite the wood structural panel sheathing. The header shall extend between the inside faces of the first full-length outer studs of each panel. One anchor bolt not less than 5/8-inch-diameter (16 mm) and installed in accordance with Section R403.1.6 shall be provided in the center of each sill plate. The hold-down devices shall be an embedded-strap type, installed in accordance with the manufacturer's recommendations. The panels shall be supported directly on a foundation that is continuous across the entire length of the braced wall line. The foundation shall be reinforced as shown on Figure R602.10.3.2. This reinforcement shall be lapped not less than ~~15~~24 inches (~~381~~ 610 mm) with the reinforcement required in the continuous foundation located directly under the braced wall line.

**RATIONALE:**

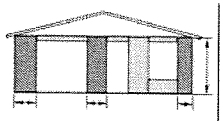
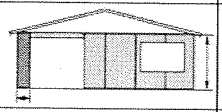
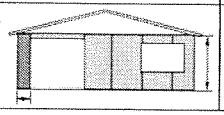
The proposal change to the minimum lap splice requirement ensures design and construction consistency with Section 12.16.1 of ACI 318-05.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 increase the lap splice requirement will improve performance of buildings and structures and is consistent with ACI 318 and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code and ACI 318.

**2010 LARUCP R6-08.** Table R602.10.4.1 of the 2010 Edition of the California Residential Code is amended to read as follows:

**TABLE R602.10.4.1**
**CONTINUOUS SHEATHING METHODS**

| METHOD | MATERIAL | MINIMUM THICKNESS | FIGURE | CONNECTION CRITERIA |
|---|---|---|---|---|
| CS-WSP | Wood structural panel | 15/32" <br> ~~3/8"~~ |   | ~~6d~~ common (2" × 0.113") nails at 6" spacing (panel edges) and at 12" spacing (intermediate supports) ~~or 16 ga. × 1 3/4 staples at 3" spacing (panel edges) and 6" spacing (intermediate supports)~~ |
| CS-G | Wood structural panel adjacent to garage openings and supporting roof load only[a,b] | 15/32" <br> ~~3/8"~~ |  | See Method CS-WSP |
| CS-PF | Continuous portal frame | See Section R602.10.4.1.1 |  | See Section R602.10.4.1.1 |

**RATIONALE:**

3/8" thick 3 ply-plywood shear walls experienced many failures during the Northridge Earthquake. Box nails were observed to cause massive and multiple failures of the typical 3/8" thick 3-ply plywood during the Northridge Earthquake. This proposed amendment specifies minimum sheathing thickness, nail size and spacing so as to provide a uniform standard of construction for designers and buildings to follow. This is intended to improve the performance level of buildings and structures that are subject to the higher seismic demands and reduce and limit potential damages to property. This proposed amendment reflects the recommendations by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the poor performance observed in 1994 Northridge Earthquake.

In September 2007, limited cyclic testing was conducted by a private engineering firm to determine if wood structural panels fastened with staples would exhibit the same behavior as the wood structural panels fastened with common nails. The test result revealed that wood structural panel fastened with staples appeared to be much lower in strength and stiffness than wood structural panels fastened with common nails. It was recommended that the use of staples as fasteners for wood structural panel shear walls or diaphragms not be permitted to resist seismic forces in structures assigned to Seismic Design Category $D_0$, $D_1$ and $D_2$ unless it can be substantiated by cyclic testing.

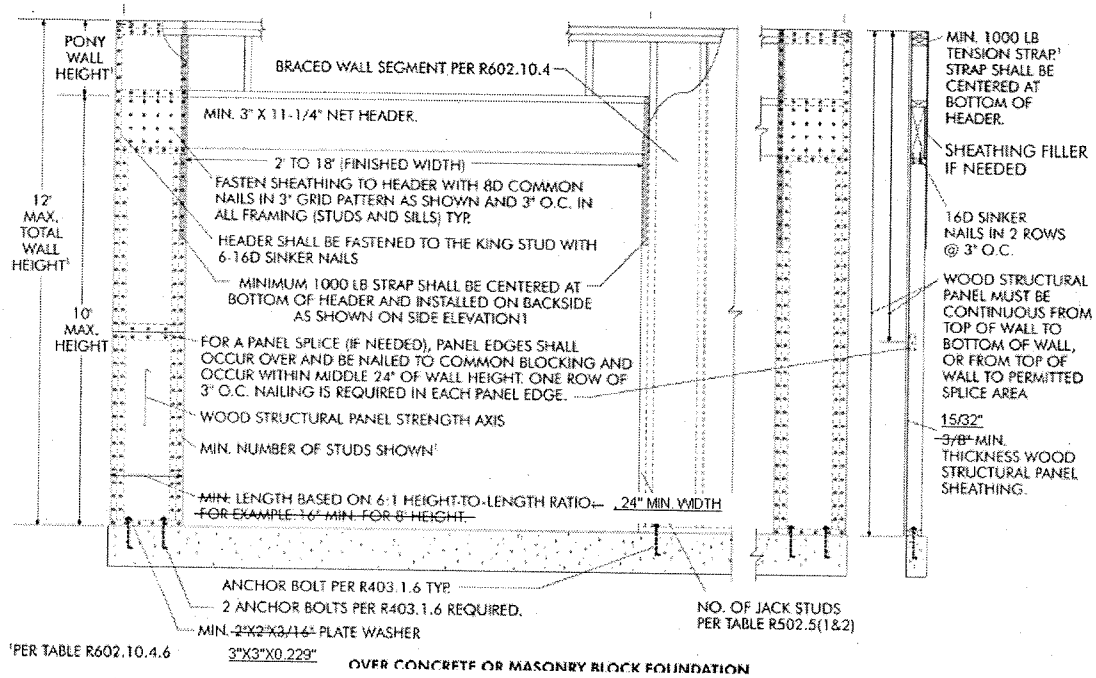
This proposed amendment is consistent with an amendment adopted during previous code adoption cycles for the California Building Code.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 design and construction limits on stapled nail fasteners used in wood structural panel shear walls not substantiated with cyclic testing and requiring minimum sheathing thickness and nailing type and size will help to maintain minimum quality of construction and performance standards of structures and therefore 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 Residential Code.

**2010 LARUCP R6-09.** Figure R602.10.4.1.1 of the 2010 Edition of the California Residential Code is amended to read as follows:




## RATIONALE:

3/8" thick 3 ply-plywood shear walls experienced many failures during the Northridge Earthquake. Box nails were observed to cause massive and multiple failures of the typical 3/8" thick 3-ply plywood during the Northridge Earthquake. This proposed amendment specifies minimum sheathing thickness, nail size and spacing so as to provide a uniform standard of construction for designers and buildings to follow. This is intended to improve the performance level of buildings and structures that are subject to the higher seismic demands and reduce and limit potential damages to property. This proposed amendment reflects the recommendations by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the poor performance observed in 1994 Northridge Earthquake. This proposed amendment is consistent with an amendment adopted during previous code adoption cycles for the California Building Code.

## FINDINGS:

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 requiring minimum sheathing thickness and nailing type and size will help to maintain minimum quality of construction and performance standards of structures and therefore 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 Residential Code.

**2010 LARUCP R6-10.** Section R602.10.7.1 of the 2010 Edition of the California Residential Code is deleted in its entirety:

~~**R602.10.7.1 Braced wall panel support for Seismic Design Category $D_2$.** In one-story buildings located in Seismic Design Category $D_2$, braced wall panels shall be supported on continuous foundations at intervals not exceeding 50 feet (15 240 mm). In two-story buildings located in Seismic Design Category $D_2$, all braced wall panels shall be supported on continuous foundations.~~

~~**Exception:** Two-story buildings shall be permitted to have interior braced wall panels supported on continuous foundations at intervals not exceeding 50 feet (15 240 mm) provided that:~~

1. ~~The height of cripple walls does not exceed 4 feet (1219 mm).~~
2. ~~First-floor braced wall panels are supported on doubled floor joists, continuous blocking or floor beams.~~
3. ~~The distance between bracing lines does not exceed twice the building width measured parallel to the braced wall line.~~

## RATIONALE:

With the higher seismic demand placed on buildings and structures in this region, interior walls can easily be called upon to resist over half of the seismic loading imposed on simple buildings or structures. Without a continuous foundation to support the braced wall line, seismic loads would be transferred through other elements such as non-structural concrete slab floors, wood floors, etc. Requiring interior braced walls be supported by continuous foundations is intended to reduce or eliminate the poor performance of buildings or structures. This proposed amendment is consistent with an amendment adopted during previous code adoption cycles for the California Building Code.

## FINDINGS:

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 all exterior walls and interior braced wall panels in buildings be supported on continuous footings for a complete load path will improve performance of buildings or structure during a seismic event and therefore, need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R6-11.** Section R606.2.4 of the 2010 Edition of the California Residential Code is amended to read as follows:

**R606.2.4 Parapet walls.** Unreinforced solid masonry parapet walls shall not be less than 8 inches (203 mm) thick and their height shall not exceed four times their thickness. Unreinforced hollow unit masonry parapet walls shall be not less than 8 inches (203 mm) thick, and their height shall not exceed three times their thickness. Masonry parapet walls in areas subject to wind loads of 30 pounds per square foot (1.44 kPa) or located in Seismic Design Category $D_0$, $D_1$ or $D_2$, or on townhouses in Seismic Design Category C shall be reinforced in accordance with Section R606.12.

**RATIONALE:**

The addition of the word "or" will prevent the use of unreinforced parapets in Seismic Design Category $D_0$, $D_1$ or $D_2$, or on townhouses in Seismic Design Category C.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 not allow the use of unreinforced masonry is intended to prevent non-ductile failures and sudden structural collapses and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R6-12.** Section R606.12.2.2.3 of the 2010 Edition of the California Residential Code is amended to read as follows:

**R606.12.2.2.3 Reinforcement of requirements for masonry elements.** Masonry elements listed in Section R606.12.2.2.2 shall be reinforced in either the horizontal or vertical direction as shown in Figure ~~R606.11(2)~~R606.11(3) and in accordance with the following:

1. Horizontal reinforcement. Horizontal joint reinforcement shall consist of ~~at least two longitudinal W1.7 wires spaced not more than 16 inches (406 mm) for walls greater than 4 inches (102 mm) in width and at least one longitudinal W1.7 wire spaced not more than 16 inches (406 mm) for walls not exceeding 4 inches (102 mm) in width; or~~ at least one No. 4 bar spaced not more than 48 inches (1219 mm). ~~Where two longitudinal wires of joint reinforcement are used, the space between these wires shall be the widest that the mortar joint will accommodate.~~ Horizontal reinforcement shall be provided within 16 inches (406 mm) of the top and bottom of these masonry elements.

2. Vertical reinforcement. Vertical reinforcement shall consist of at least one No. 4 bar spaced not more than 48 inches (1219 mm). Vertical reinforcement shall be within ~~16~~ 8 inches (406mm) of the ends of masonry walls.

**RATIONALE:**

Reinforcement using longitudinal wires for buildings and structures located in high seismic areas are deficient and not as ductile as deformed rebar. Having vertical reinforcement closer to the ends of masonry walls helps to improve the seismic performance of masonry buildings and structures.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 increase reinforcements will ensure that the ductility requirements for buildings in high seismic region meet the intent of the code and limit potential property damages and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R6-13.** Exception of Section 602.3.2 of the 2010 Edition of the California Residential Code is amended to read as follows:

Exception: In other than Seismic Design Category $D_0$, $D_1$ or $D_2$, a ~~A~~ single top plate may be installed in stud walls, provided the plate is adequately tied at joints, corners and interesting walls by a minimum 3-inch-by-6-inch by a 0.036-inch-thick (76 mm by 152 mm by 0.914 mm) galvanized steel plate that is nailed to each wall or segment of wall by six 8d nails on each side, provided the rafters or joists are centered over the studs with a tolerance of no more than 1 inch (25 mm). The top plate may be omitted over lintels that are adequately tied to adjacent wall sections with steel plates or equivalent as previously described.

**RATIONALE:**

The cities and county of the Los Angeles region have taken extra measures to maintain the structural integrity of the framing of the shear wall system for buildings and structures subject to high seismic loads by eliminating single top plate construction. The performance of modern day braced wall panel construction is directly related to an adequate load path extending from the roof diaphragm to the foundation system. A single top plate is likely to be over nailed due to the nailing requirements at a rafter, stud, top plate splice, and braced wall panel edge in a single location. In addition, notching on a single top plate for plumbing, ventilation and electrical wiring may reduce the load transfer capacity of the plate without proper detailing. Majority of buildings and structures designed and built per the California Residential Code with a single top plate may not need structural observation and special inspections. The potential construction mistakes mentioned above could not be caught and corrected by knowledgeable engineers and inspectors, and could jeopardize structural performance of buildings and structures located in high seismic areas.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 eliminate the usage of a single top plate will help to maintain minimum quality of construction and performance standards of structures and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R8-01.** Footnote "i" is added to Table R802.5.1(9) of the 2010 Edition of the California Residential Code to read as follows:

i. Edge distances, end distances and spacings for nails shall be sufficient to prevent splitting of the wood.

**RATIONALE:**

The number of nails required for the heel joint connection per Table R802.5.1(9) can be excessive depending on the rafter slope, spacing, and roof span. This footnote is intended to help prevent the splitting of connecting wood members when large numbers of nail are required as stated in the National Design Specification for Wood Construction (NDS).

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 connecting members to be of sufficient size will help to prevent splitting of connecting wood members and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R8-02.** Section R802.8 of the 2010 Edition of the California Residential Code is amended to read as follows:

**R802.8 Lateral support.** Roof framing members and ceiling joists having a depth-to-thickness ratio exceeding ~~5~~2 to 1 based on nominal dimensions shall be provided with lateral support at points of bearing to prevent rotation. For roof rafters with ceiling joists attached per Table R602.3(1), the depth-thickness ratio for the total assembly shall be determined using the combined thickness of the rafter plus the attached ceiling joist.

**RATIONALE:**

This proposed amendment provides provisions to ensure that the ends of wood members and the points of bearing have adequate lateral support to prevent rotation and to help stabilized the members during construction. This proposed amendment is consistent with and similar to requirements contained in the National Design Specification for Wood Construction (NDS).

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 provide lateral bracing at the ends of members will prevent rotation and stabilize the members during construction and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R8-03.** Section R802.10.2 of the 2010 Edition of the California Residential Code is amended to read as follows:

**R802.10.2 Design.** Wood trusses shall be designed in accordance with accepted engineering practice. The design and manufacture of metal-plate-connected wood trusses shall comply with ANSI/TPI 1. The truss design drawings shall be prepared by a registered professional ~~where required by the statutes of the jurisdiction in which the project is to be constructed in accordance with Section R106.1~~.

**RATIONALE:**

Wood trusses are engineered structural elements that require engineered design and calculations. This amendment provides clarifications that all wood truss design drawings are to be prepared by a registered professional.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 a registered design professional will help ensure the proper design of wood trusses and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R8-04.** Section R803.2.4 is added to Chapter 8 of the 2010 Edition of the California Residential Code to read as follows:

**R803.2.4 Openings in horizontal diaphragms.** Openings in horizontal diaphragms shall conform with Section R503.2.4.

**RATIONALE:**

Section R802 of the Code does not provide any prescriptive criteria to limit the maximum roof opening size nor does Section R803 provide any details to address the issue of shear transfer near larger roof openings. With the higher seismic demand placed on buildings and structures in this region, it is important to ensure that a complete load path is provided to reduce or eliminate potential damages caused by seismic forces. Requiring blocking with metal ties around larger roof openings and limiting opening size is consistent with the requirements of Section R301.2.2.2.5.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 specific detailing at large roof openings is intended to address the poor performance of roof diaphragms with openings and limit or reduce property damages during a seismic event and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

**2010 LARUCP R10-01.** Section R1001.3.1 of the 2010 Edition of the California Residential Code is amended to read as follows:

**R1001.3.1 Vertical reinforcing.** For chimneys up to 40 inches (1016 mm) wide, four No. 4 continuous vertical bars adequately anchored into the concrete foundation shall be placed between wythes of solid masonry or within the cells of hollow unit masonry and grouted in accordance with Section R609. Grout shall be prevented from bonding with the flue liner so that the flue liner is free to move with thermal expansion. For chimneys more than 40 inches (1016 mm) wide, two additional No. 4 vertical bars adequately anchored into the concrete foundation shall be provided for each additional flue incorporated into the chimney or for each additional 40 inches (1016 mm) in width or fraction thereof.

**RATIONALE:**

The performance of fireplace/chimney without anchorage to the foundation has been observed to be inadequate during major earthquakes. The lack of anchorage to the foundation can result in the overturning or displacement of the fireplace/chimney.

**FINDINGS:**

Local Geological Conditions – The greater Los Angeles region is a densely populated area having buildings and structures 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 anchor masonry chimneys into concrete foundation will reduce injuries, save lives, and minimize structural damages and therefore needs to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the International Residential Code.

# PART III

## RECOMMENDED LARUCP AMENDMENTS TO THE

## 2010 EDITION OF THE CALIFORNIA GREEN BUILDING STANDARDS CODE

## SUMMARY OF RECOMMENDED LARUCP AMENDMENTS TO THE 2010 CGBSC

| 2010 LARUCP NO. | TITLE/DESCRIPTION | STATUS[1] | DATE |
|---|---|---|---|
| G1-01 | Amend CGBSC Section 101.10 Mandatory and Voluntary Requirements | AM | 6/24/10 |
| G1-02 | Add CGBSC Section 101.12 Fee for Mandatory Measures | AS | 6/24/10 |
| G1-03 | Add CGBSC Section 101.12.1 Fee for Tier Measures | AS | 6/24/10 |
| G2-01 | Amend CGBSC Section 202 Sustainability Definition | AS | 6/24/10 |
| G2-02 | Amend CGBSC Section 202 Low-Rise Residential Building Definition | AM | 6/24/10 |
| G4-01 | Amend CGBSC Section 4.304.1 Irrigation Controller | AM | 6/24/10 |
| G4-02 | Amend CGBSC Section 4.408 Construction Waste Reduction | AS | 6/24/10 |
| | | | |

**FOOTNOTE:**

1. AS = Approved as submitted. AM = Approved as modified.

**2010 LARUCP G1-01.** Section 101.10 of the 2010 Edition of the California Green Building Standards Code is amended to read as follows:

**101.10 Mandatory and voluntary requirements.** This code contains both mandatory and voluntary green building measures. Mandatory and voluntary measures are identified in the appropriate application checklist contained in this code. The mandatory measures of Chapter 4 and voluntary measures of Appendix A4 shall apply to new low-rise residential buildings. The mandatory measures of Chapter 5 and voluntary measures of Appendix A5 shall apply to all buildings which are not low-rise residential buildings.

**RATIONALE:**

Under the existing definition of Low-Rise Residential Building, measures in the California Green Building Standards Code would not be applicable to new residential buildings and structures four stories and greater. With the proposed amendment for Low-Rise Residential Building, this proposed amendment would allow application of the measures in Chapter 5 and Appendix Chapter A5 for new residential buildings greater than six stories. This proposed amendment would also allow applicability Chapter 5 and Appendix Chapter A5 to OSHPD 3 occupancies.

**FINDINGS:**

Local Environmental/Climatic Conditions – The greater Los Angeles region is a densely populated area having residential buildings constructed within a region where environmental resources are scarce due to varying and occasional immoderate temperatures and weather conditions. The proposed modification to require higher efficiencies of energy usage and greater beneficial use of environmental material will be achieved with the proposed expansion of the Mandatory and Voluntary requirements and therefore need to be incorporated into the code to assure that new residential buildings are designed and constructed in accordance with the scope and objectives of the California Green Building Standards Code.

**2010 LARUCP G1-02.** Section 101.12 is added to the 2010 California Green Building Standards Code to read as follows:

**101.12 Fee for Mandatory Measures.** A fee of ten percent (10%) of the plan check/permit fee shall be assessed to verify compliance with the mandatory measure of the California Green Building Standards Code.

OR ALTERNATIVELY

**2010 LARUCP G1-02.** Section [INSERT NUMBER] is added to the [INSERT NAME OF CITY] Municipal Code to read as follows:

**[INSERT SECTION NUMBER] Fee for Mandatory Measures.** A fee of ten percent (10%) of the plan check/permit fee shall be assessed to verify compliance with the mandatory measure of the California Green Building Standards Code.

**RATIONALE:**

Due to the extra work it will take staff to review and verify compliance with the measures in the new code, a recommended fee of 10% of either the permit and plan check is proposed. While it is understood that each jurisdiction must determine what fee is appropriate for their jurisdiction, the recommended 10% is a starting point. This amount is based upon similar fees assessed for other supplemental reviews or inspection such as accessibility or energy compliance. It may be used as a basis for justifying the proposed fees based upon comparison to other similar fees as indicated above.

**FINDINGS:**

Local Administrative Finding – This amendment is necessary for administrative clarification and does not modify a Building Standards pursuant to Sections 17958, 17958.5 and 17958.7 of the California Health and Safety Code. This amendment establishes administrative standards for the effective enforcement of building standards and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the California Green Building Standards Code.

**2010 LARUCP G1-03.** Section 101.12.1 is added to the 2010 California Green Building Standards Code to read as follows:

**101.12.1 Fee for Tier Measures.** When Tier 1 or Tier 2 measures need to be verified by the enforcing agency, an additional ten percent (10%) of the plan check/permit fee may be assessed.

OR ALTERNATIVELY

**2010 LARUCP G1-02.** Section [INSERT NUMBER] is added to the [INSERT NAME OF CITY] Municipal Code to read as follows:

**[INSERT SECTION NUMBER] Fee for Tier Measures.** When Tier 1 or Tier 2 measures need to be verified by the enforcing agency, an additional ten percent (10%) of the plan check/permit fee may be assessed.

**RATIONALE:**

Due to the extra work it will take staff to review and verify compliance with the tier 1 or 2 measures in the new code, a recommended fee of 10% of either the permit and plan check is proposed. While it is understood that each jurisdiction must determine what fee is appropriate for their jurisdiction, the recommended 10% is a starting point. This amount is based upon similar fees assessed for other supplemental reviews or inspection such as accessibility or energy compliance. It may be used as a basis for justifying the proposed fees based upon comparison to other similar fees as indicated above.

**FINDINGS:**

Local Administrative Finding – This amendment is necessary for administrative clarification and does not modify a Building Standards pursuant to Sections 17958, 17958.5 and 17958.7 of the California Health and Safety Code. This amendment establishes administrative standards for the effective enforcement of building standards and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the California Green Building Standards Code.

**2010 LARUCP G2-01.** Section 202 of the 2010 Edition of the California Green Building Standards Code is amended to read as follows:

**LOW-RISE RESIDENTIAL BUILDING.** A building that is of Occupancy Group R and is ~~three~~six stories or less, or that is a one- or two-family dwelling or townhouse.

**RATIONALE:**

Under the existing definition of Low-Rise Residential Building, measures in the California Green Building Standards Code would not be applicable to new residential buildings and structures four stories and greater. This proposed amendment would allow application of the measures in Chapter 4 and Appendix Chapter A4 for new residential buildings and structures six stories and less.

**FINDINGS:**

Local Environmental/Climatic Conditions – The greater Los Angeles region is a densely populated area having residential buildings constructed within a region where environmental resources are scarce due to varying and occasional immoderate temperatures and weather conditions. The proposed modification to require higher efficiencies of energy usage and greater beneficial use of environmental material will be achieved with the proposed expansion of Low Rise Residential Building and therefore need to be incorporated into the code to assure that new residential buildings are designed and constructed in accordance with the scope and objectives of the California Green Building Standards Code.

**2010 LARUCP G2-02.** Section 202 of the 2010 Edition of the California Green Building Standards Code is amended to read as follows:

**SUSTAINABILITY.** Consideration of present development and construction impacts on the community, the economy, and the environment without compromising the needs of the future.

**RATIONALE:**

The 2010 California Green Building Standards Code contains the word "sustainable" but does not define it. Although it is a term used in association with green building, the word "sustainability" is often confused to mean the same as green building. The proposed amendment allows clarity and distinguishing understanding while providing for a general definition.

**FINDINGS:**

Local Administrative Finding – This amendment is necessary for administrative clarification and does not modify a Building Standards pursuant to Sections 17958, 17958.5 and 17958.7 of the California Health and Safety Code. This amendment establishes administrative standards for the effective enforcement of building standards and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the California Green Building Standards Code.

**2010 LARUCP G4-01.** Section 4.304.1 of the 2010 Edition of the California Green Building Standards Code is amended to read as follows:

**4.403.1 Irrigation controllers.** Automatic irrigation system controllers for landscaping provided ~~by the builder~~ and installed at the time of final inspection and shall comply with the following:

1. Controllers shall be weather- or soil moisture-based controllers that automatically adjust irrigation in response to changes in plants' needs as weather conditions change.
2. Weather-based controllers without integral rain sensors or communication systems that account for local rainfall shall have a separate wired or wireless rain sensor which connects or communicates with the controller(s). Soil moisture-based controllers are not required to have rain sensor input.

RATIONALE:

The proposed amendment requires that weather-based or soil moisture-based irrigation controllers shall be provided regardless of which entity provides and installs landscaping. The proposed amendment will then capture a larger number of landscaping projects with greater flexibility for water savings. The existing code requirement that conditions a smart controller when landscaping is provided and installed at the time of final inspection will remain as it appears in the California Green Building Standards Code.

FINDINGS:

Local Environmental/Climatic Conditions – The greater Los Angeles region is a densely populated area having residential buildings constructed within a region where water resource is scarce. The proposed modification to install weather-based or soil moisture-based irrigation controllers for any new residential building subject to Chapter 4, regardless of which entity provides landscaping, will allow greater efficiencies of outdoor water-use and therefore need to be incorporated into the code to assure that new residential buildings are designed and constructed in accordance with the scope and objectives of the California Green Building Standards Code.

**2010 LARUCP G4-02.** Section 4.408 of the 2010 Edition of the California Green Building Standards Code is amended to read as follows:

No recommended language provided.
[INSERT YOUR OWN LANGUAGE]

**RATIONALE:**

Each jurisdiction is recommended to evaluate and compare their existing Construction and Debris Recycling Ordinance, if applicable, against the requirements in this Section for applicability, duplication, or recommend change to their local ordinance. Since each jurisdiction may contain different requirement based upon their locally adopted ordinance, no recommended language is provided.

**FINDINGS:**

Local Environmental/Climatic Conditions – The greater Los Angeles region [OR NAME OF CITY OR REGION] is a densely populated area having buildings and structures constructed within [SPECIFY ENVIRONMENTAL CONDITIONS AND WHAT IMPACT IT HAS ON THE ENVIRONMENT]. The proposed modification to [SPECIFY PROPOSED REQUIREMENT AND WHAT IT HOPES TO ACCOMPLISH] and therefore need to be incorporated into the code to assure that new buildings and structures and additions or alterations to existing buildings or structures are designed and constructed in accordance with the scope and objectives of the California Green Building Standards Code.

**STATE OF CALIFORNIA )**
**COUNTY OF LOS ANGELES ) SS**
**CITY OF CALABASAS )**

**I, GWEN PEIRCE,** City Clerk of the City of Calabasas, California, **DO HEREBY CERTIFY** that the foregoing ordinance, being **Ordinance No. 2010-278U** was duly adopted by the City Council of the City of Calabasas, at a regular meeting of the City Council held November 24, 2010 and that it was adopted by the following vote, to wit:

AYES: Mayor Groveman, Mayor pro Tem Washburn, Cou ncilmembers Bozajian, Maurer and Wolfson.

NOES: None.

ABSTAIN: None.

ABSENT: None.

Gwen Peirce, CMC
City Clerk
City of Calabasas, California