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RESOLUTION NO. RES-07-0153

A RESOLUTION OF THE CITY COUNCIL OF THE  
CITY OF LONG BEACH ADOPTING AND MAKING  
EXPRESS FINDINGS AND DETERMINATIONS RELATING  
TO THE ENACTMENT OF ADMINISTRATIVE  
AMENDMENTS, AND, WHERE APPROPRIATE, MORE  
RESTRICTIVE BUILDING CODE PROVISIONS THAN  
THOSE OF THE CALIFORNIA BUILDING CODE; FINDING  
THAT SAID AMENDMENTS AND MODIFICATIONS TO  
THE CODE ARE REASONABLY NECESSARY BECAUSE  
OF THE LOCAL CLIMATIC, GEOLOGICAL OR  
TOPOGRAPHICAL CONDITIONS EXISTING IN LONG  
BEACH; AND INSTRUCTING THE DIRECTOR OF  
PLANNING AND BUILDING TO TRANSMIT SAID  
FINDINGS AND DETERMINATIONS TO THE CALIFORNIA  
BUILDING STANDARDS COMMISSIONS IN  
ACCORDANCE WITH CALIFORNIA HEALTH AND  
SAFETY CODE SECTION 17958.7

WHEREAS, California Health and Safety Code Section 17922 requires all  
cities to adopt, as the City Building Standards Code, the State Building Standards Code  
adopted pursuant to the provisions of Chapter 4 of Part 2.5 of Division 13 of the California  
Health and Safety Code; and

WHEREAS, Section 17958.5 of the California Health and Safety Code  
provides, in pertinent part, as follows:

“... a city or county may make such changes or modifications in the  
requirements contained in the provisions published in the California

1 Building Code and the other regulations adopted pursuant to Section  
2 17922 as it determines, pursuant to the provisions of Section 17958.7, are  
3 reasonably necessary because of local climatic, geological or  
4 topographical conditions;" and

5 WHEREAS, prior to making the modifications permitted under Section  
6 17958.5 of the California Health and Safety Code, this Council is required to make an  
7 express finding that such modifications or changes are reasonably necessary because of  
8 local climatic, geological or topographical conditions; and

9 WHEREAS, the City of Long Beach is traversed by the Newport Inglewood  
10 Fault System, is near the San Andreas Fault, and is surrounded by other earthquake  
11 faults; and

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

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

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

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

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

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

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

9                   WHEREAS, the California Building Code has not yet fully addressed the  
10 lessons learned from the Northridge Earthquake.

11                   NOW, THEREFORE, in order to provide adequate protection under the  
12 unique local geologic conditions set forth above, the City of Long Beach makes the  
13 following findings and determinations relative to the adoption of administrative  
14 amendments, and where appropriate, the adoption of more restrictive Building Code  
15 provisions than those of the California Building Code:

16                   Section 1.

17                   Section 18.24.010 – Administrative amendment which adopts the latest  
18 edition of the California Building Code and makes minor editorial changes.

19                   Section 18.24.020 – Administrative amendment which adopts the latest  
20 edition of the California Building Code and makes minor editorial changes.

21                   Section 18.24.030 – Administrative amendment which adopts the latest  
22 edition of the California Building Code and makes minor editorial changes to reflect the  
23 state agencies and the applicable referenced sections.

24                   Section 18.24.040 – Administrative amendment which adopts the latest  
25 edition of the California Building Code and the Los Angeles Regional Uniform Code  
26 Program set of amendments adopted by the cities and county of the Los Angeles region  
27 and makes minor editorial changes. Certain chapter, appendices, and/or sections deleted  
28 are non-mandatory provisions.

1           Section 18.24.050 – Administrative amendment which adopts the latest  
2 edition of the California Building Code and makes minor editorial changes to the title and  
3 provision of this section, previously known as Section 18.24.730. Chapter 18.56 “Signs”  
4 will no longer remain in effect with the adoption of Appendix H of the CBC that contains  
5 provisions for sign regulation. Existing administrative language in Chapter 18.56 will be  
6 moved into Section 18.12.010. Chapter 18.72 “Gas Appliances” will no longer be in effect  
7 as many of these provisions are incorporated in the Plumbing Code. New voluntary  
8 earthquake hazard reduction standards are proposed.

9           Section 18.24.060 – Administrative amendment which adopts the latest  
10 edition of the California Building Code and makes minor editorial changes to include a  
11 reference to a dictionary to be used for words not defined in the code. Unlike the UBC,  
12 the IBC does not have such reference any longer.

13           Section 18.24.070 – Administrative amendment which adopts the latest  
14 edition of the California Building Code and makes minor editorial changes. This  
15 administrative amendment was previously Section 18.24.080.

16           Section 18.24.071 – Amendment due to local geological conditions. The  
17 inclusion of the language “lowest level of Fire Department vehicle access” is a more  
18 accurate reflection of Fire Department capability to address fire-safety issue in high-rise  
19 building. The greater Los Angeles/Long Beach region is a densely populated area having  
20 buildings constructed over and near a vast array of fault systems capable of producing  
21 major earthquakes, including but not limited to the recent 1994 Northridge Earthquake,  
22 and requires these extra margins of safety due to the necessity of providing on site fire  
23 protection in an emergency during seismic event when fire department resources could  
24 be greatly delayed and overwhelmed.

25           Section 18.24.072 – Amendment due to local geological conditions. The  
26 greater Los Angeles/Long Beach region is a densely populated area having buildings  
27 constructed over and near a vast array of fault systems capable of producing major  
28 earthquakes, including but not limited to the recent 1994 Northridge Earthquake, and

1 requires these extra margins of safety due to the necessity of providing on site fire  
2 protection in an emergency during seismic event when fire department resources could  
3 be greatly delayed and overwhelmed.

4           Section 18.24.073 – Amendment due to local geological conditions. The  
5 greater Los Angeles/Long Beach region is a densely populated area having buildings  
6 constructed over and near a vast array of fault systems capable of producing major  
7 earthquakes, including but not limited to the recent 1994 Northridge Earthquake, and  
8 requires these extra margins of safety due to the necessity of providing on site fire  
9 protection in an emergency during seismic event when fire department resources could  
10 be greatly delayed and overwhelmed.

11           Section 18.24.074 – Amendment due to local geological conditions. The  
12 greater Los Angeles/Long Beach region is a densely populated area having buildings  
13 constructed over and near a vast array of fault systems capable of producing major  
14 earthquakes, including but not limited to the recent 1994 Northridge Earthquake, and  
15 requires these extra margins of safety due to the necessity of providing on site fire  
16 protection in an emergency during seismic event when fire department resources could  
17 be greatly delayed and overwhelmed.

18           Section 18.24.075 – Amendment due to local geological conditions. The  
19 greater Los Angeles/Long Beach region is a densely populated area having buildings  
20 constructed over and near a vast array of fault systems capable of producing major  
21 earthquakes, including but not limited to the recent 1994 Northridge Earthquake, and  
22 requires these extra margins of safety due to the necessity of providing on site fire  
23 protection in an emergency during seismic event when fire department resources could  
24 be greatly delayed and overwhelmed.

25           Section 18.24.076 – Amendment due to local geological conditions. The  
26 greater Los Angeles/Long Beach region is a densely populated area having buildings  
27 constru/cted over and near a vast array of fault systems capable of producing major  
28 earthquakes, including but not limited to the recent 1994 Northridge Earthquake, and

1 requires these extra margins of safety due to the necessity of providing on site fire  
2 protection in an emergency during seismic event when fire department resources could  
3 be greatly delayed and overwhelmed.

4           Section 18.24.077 – Amendment due to local geological conditions. The  
5 greater Los Angeles/Long Beach region is a densely populated area having buildings  
6 constructed over and near a vast array of fault systems capable of producing major  
7 earthquakes, including but not limited to the recent 1994 Northridge Earthquake, and  
8 requires these extra margins of safety due to the necessity of providing on site fire  
9 protection in an emergency during seismic event when fire department resources could  
10 be greatly delayed and overwhelmed.

11           Section 18.24.078 – Amendment due to local geological conditions. The  
12 greater Los Angeles/Long Beach region is a densely populated area having buildings  
13 constructed over and near a vast array of fault systems capable of producing major  
14 earthquakes, including but not limited to the recent 1994 Northridge Earthquake, and  
15 requires these extra margins of safety due to the necessity of providing on site fire  
16 protection in an emergency during seismic event when fire department resources could  
17 be greatly delayed and overwhelmed.

18           Section 18.24.080 – Amendment due to local geological conditions.  
19 Additional reinforcement for heavy veneer, stone and masonry veneer was needed after  
20 the 1994 Northridge Earthquake. There were numerous observations of veneer pulling  
21 away from wood stud framing following the Northridge Earthquake. Most of it was due to  
22 corrosion and weakness in the anchor ties and mesh connections to the framing. Where  
23 sheathing was beneath the veneer, nail attachments were often not attached to the wall  
24 framing below. Northridge SEAOSC/LA City Post Northridge Earthquake committee  
25 findings indicated significant loss of veneer from buildings due to inadequate design and  
26 construction. The Los Angeles/Long Beach region is a densely populated area that has  
27 buildings constructed over and near a vast and complex network of faults that are  
28 believed to be capable of producing future earthquakes similar or greater in size than the

1 1994 Northridge and the 1971 Sylmar earthquakes. Design provisions developed based  
2 on a detailed study of the 1994 Northridge Earthquake need to be incorporated into the  
3 local building codes to assure new buildings, and additions to existing buildings, are  
4 designed and constructed in accordance with the scope and objectives of the  
5 International Building Code.

6 Section 18.24.085 – Administrative amendment which adopts the latest  
7 edition of the California Building Code and makes minor editorial changes to reflect the  
8 appropriate reference to the Municipal Code for submission of construction documents.

9 Section 18.24.090 – Administrative amendment which adopts the latest  
10 edition of the California Building Code and makes minor editorial changes to reference  
11 the appropriate flood hazard information.

12 Section 18.24.095 – Administrative amendment which adopts the latest  
13 edition of the California Building Code and makes minor editorial changes to reflect the  
14 appropriate reference to the Municipal Code for inspections.

15 Section 18.24.100 – Amendment due to local geological conditions. This  
16 section/amendment is consistent with the Los Angeles Regional Uniform Code Program  
17 set of amendments adopted by the cities and county of the Los Angeles region. This local  
18 amendment carries forward the previous 1999 and 2002 LARUCP structural amendment  
19 adopted by the cities and county of the Los Angeles region to limit the maximum span of  
20 cantilevered diaphragms supporting lateral-force-resisting elements from above, thereby  
21 addressing the problem of poor performance of diaphragms transmitting seismic loads to  
22 lateral-force-resisting elements below. This amendment reflects the recommendations by  
23 the Structural Engineers Association of Southern California (SEAOSC) and the Los  
24 Angeles City Task Force that investigated the poor performance observed in 1994  
25 Northridge Earthquake. The greater Los Angeles/Long Beach region is a densely  
26 populated area having buildings constructed over and near a vast array of fault systems  
27 capable of producing major earthquakes, including but not limited to the recent 1994  
28 Northridge Earthquake. The proposed modification to limit the maximum span of

1 cantilevered diaphragms that supports lateral-force-resisting elements from above need  
2 to be incorporated into the Code to assure that new buildings and additions to existing  
3 buildings are designed and constructed in accordance with the scope and objectives of  
4 the International Building Code.

5           Section 18.24.110 – Amendment due to local geological conditions. This  
6 section/amendment is consistent with the Los Angeles Regional Uniform Code Program  
7 set of amendments adopted by the cities and county of the Los Angeles region. The  
8 California Building Code has no information regarding the design requirements for ceiling  
9 suspension systems for seismic loads. It is through the experience of prior earthquakes,  
10 such as the 1994 Northridge Earthquake, that this amendment is proposed so as to  
11 minimize the amount of bodily and building damage within the spaces in which this type  
12 of ceiling will be installed. The greater Los Angeles/Long Beach region is a densely  
13 populated area having buildings constructed over and near a vast array of fault systems  
14 capable of producing major earthquakes, including but not limited to the recent 1994  
15 Northridge Earthquake. The proposed modification requiring design requirements for  
16 ceiling suspension systems to resist seismic loads need to be incorporated into the Code  
17 to assure that new buildings and additions to existing buildings are designed and  
18 constructed in accordance with the scope and objectives of the International Building  
19 Code.

20           Section 18.24.120 – Amendment due to local geological conditions. This  
21 section/amendment is consistent with the Los Angeles Regional Uniform Code Program  
22 set of amendments adopted by the cities and county of the Los Angeles region. The  
23 proposed modifications need to be incorporated into the Code to assure that new  
24 buildings and additions to existing buildings are designed and constructed in accordance  
25 with the scope and objectives of the International Building Code. Observed damages to  
26 one and two family dwellings of light frame construction after the Northridge Earthquake  
27 may have been partially attributed to vertical irregularities common to this type of  
28 occupancy and construction. In an effort to improve quality of construction and



1 incorporate lessons learned from studies after the Northridge Earthquake, the proposed  
2 modification to ASCE 7-05 Section 12.2.3.1 by limiting the number of stories and height  
3 of the structure to two stories will significantly minimize the impact of vertical irregularities  
4 and concentration of inelastic behavior from mixed structural systems. This local  
5 amendment carries forward the previous 1999 and 2002 LARUCP amendment to limit the  
6 maximum span of cantilevered diaphragms supporting lateral-force-resisting elements  
7 from above, thereby addressing the problem of poor performance of diaphragms  
8 transmitting seismic loads to lateral-force-resisting elements below. This amendment  
9 reflects the recommendations by the Structural Engineers Association of Southern  
10 California (SEAOSC) and the Los Angeles City Task Force that investigated the poor  
11 performance observed in 1994 Northridge Earthquake. Results from the 75% Draft of  
12 ATC-63, Quantification of Building System Performance and Response Parameters,  
13 indicate that tall buildings may fail at an unacceptably too low of a seismic level unless  
14 the minimum base shear level is increased to the value used in ASCE 7-02. Thus it is  
15 recommended that the adoption of the minimum base shear is appropriate due to the  
16 recent research in PEER and the ATC 63 project. The conclusion suggested that the  
17 reduction of the base shear in the previous Code led to a trend in which tall buildings had  
18 decreasing safety with increasing height. To minimize the potential increased fire-life  
19 safety associated with such a seismic failure of tall buildings, this proposed modification  
20 increases the minimum base shear level to be consistent with previous editions of the  
21 building codes. The proposed amendment to the current ASCE 7 is very well supported  
22 by the engineering community. Both SEAOSC and other structural engineer  
23 organizations from the state level are in support of adopting the revised minimum base  
24 shear. The Buckling Restrained Steel Frame (BRBF) system was first approved for the  
25 2003 NEHRP Provisions. The values for the approximate period perimeters  $C_t$  and  $x$   
26 were also approved as part of that original BSSC Proposal 6-6R (2003). It seems to be a  
27 simple oversight that these parameters were not carried forward into the 2005 edition of  
28 ASCE 7-05. Currently, these two factors can be found in Appendix R of AISC 341-05.

1 There, they function only as a placeholder that will be removed in the next version upon  
2 approval by ASCE 7 Task Committee on Seismic. The SEAOSC Steel Committee  
3 supports the proposed modification. Importance Factor, I, seems to have been dropped  
4 from equation 12.8-16 by mistake while transcribing it from NEHRP Recommended  
5 Provisions (2003) equation 5.2-16. For buildings with importance factor, I, higher than  
6 1.0, stability coefficient should include the importance factor. The proposed modification  
7 is recommended and adopted by OSPHD and DSA-SS as reflected in Section 1614A1.8  
8 to Chapter 16 of the 2007 California Building Code. Furthermore, the SEAOSC Steel  
9 Committee supports the proposed modification. A joint Structural Engineers Association  
10 of Southern California (SEAOSC), Los Angeles County and Los Angeles City Task Force  
11 investigated the performance of concrete and masonry construction with flexible wood  
12 diaphragm failures after the Northridge earthquake. It was concluded at that time that  
13 continuous ties are needed at specified spacing to control cross grain tension in the  
14 interior of the diaphragm. Additionally, subdiaphragm shears need to be limited to control  
15 combined orthogonal stresses within the diaphragm. Recognizing the importance and  
16 need to continue the recommendation made by the task force, but also taking into  
17 consideration the improved performance and standards for diaphragm construction  
18 today, a proposal to increase the continuous tie spacing limit to 40 ft in lieu of 25 ft and to  
19 use 75% of the allowable code diaphragm shear to determine the depth of the sub-  
20 diaphragm in lieu of the 300 plf is deemed appropriate and acceptable. These  
21 requirements are variations of Items 4 and 7 of Section 1633.2.9 from the previous 1999  
22 and 2002 LARUCP structural provision that amended the California Building Code. The  
23 Los Angeles/Long Beach region is within a very active geological location. The various  
24 jurisdictions within this region have taken additional steps to prevent roof or floor  
25 diaphragms from pulling away from concrete or masonry walls. This decision was made  
26 due to the frequency of this type of failure during the past significant earthquakes. This  
27 section was a portion of the previous Code and has been adjusted to accommodate  
28 higher diaphragm shear allowable as noted above. Section 12.12.3 of ASCE 7-05

1 including Supplement No. 1 does not provide requirements for separation distances  
2 between adjacent buildings. Requirements for separation distances between adjacent  
3 buildings, not structurally connected, were included in previous editions of the IBC and  
4 UBC. However, when ASCE 7-05 was adopted by reference for IBC 2006, these  
5 requirements were omitted. In addition, ASCE 7-05 defines ( $\Delta_x$ ) in Section 12.8.6 to refer  
6 to the deflection of Level x at the center of mass. The actual displacement that needs to  
7 be used for building separation is the displacement at critical locations with consideration  
8 of both the translational and torsional displacements. These values can be significantly  
9 different. This Code change fills the gap of this inadvertent oversight in establishing  
10 minimum separation distance between adjoining buildings that are not structurally  
11 connected. The purpose of seismic separation is to permit adjoining buildings, or parts  
12 thereof, to respond to earthquake ground motion independently and thus preclude  
13 possible structural and non-structural damage caused by pounding between buildings or  
14 other structures. This local amendment carries forward the previous 1999 and 2002  
15 LARUCP 16-5 amendment adopted by the cities and county of the Los Angeles region  
16 regulating return walls and fins/canopies at entrances to ensure the seismic compatibility  
17 of the diaphragm. This amendment reflects the recommendations by the Structural  
18 Engineers Association of Southern California (SEAOSC) and the Los Angeles City Task  
19 Force that investigated the poor performance observed in 1994 Northridge Earthquake.  
20 The study concluded that stiffness incompatibility between entrance canopies need to be  
21 addressed. This decision was made due to the frequency of this type of failure during the  
22 past significant earthquakes.

23           Section 18.24.130 – Administrative amendment which adopts the latest  
24 edition of the California Building Code and makes minor editorial changes to reflect the  
25 appropriate reference to the Municipal Code for inspection regulation.

26           Section 18.24.140 – Amendment due to local geological and topographic  
27 conditions. This section/amendment is consistent with the Los Angeles Regional Uniform  
28 Code Program set of amendments adopted by the cities and county of the Los Angeles

1 region. The greater Los Angeles/Long Beach region is a densely populated area having  
2 buildings constructed over and near a vast array of fault systems capable of producing  
3 major earthquakes, including but not limited to the recent 1994 Northridge Earthquake.  
4 One of the significant problems discovered from the studies after the Northridge  
5 Earthquake was the extent of poor quality in construction, especially for residential wood  
6 frame buildings and/or accessories structures. Requiring that special inspectors be  
7 provided for work listed under Section 1704 to observe the actual construction will ensure  
8 that acceptable standards of workmanship are provided. The proposed modification  
9 needs to be incorporated into the Code to assure that new buildings and additions to  
10 existing buildings are designed and constructed in accordance with the scope and  
11 objectives of the International Building Code. Minor editorial changes to reflect the  
12 appropriate section reference from "Section 109, Appendix Chapter 1" to "Chapter 18.16  
13 Inspection".

14                 Section 18.24.145 – Administrative amendment to reflect change to the  
15 appropriate reference to the Long Beach Municipal Code for the proper statues regulating  
16 the submission of construction documents within the Long Beach jurisdiction.

17                 Section 18.24.150 – Amendment due to local geological and topographic  
18 conditions. This section/amendment is consistent with the Los Angeles Regional Uniform  
19 Code Program set of amendments adopted by the cities and county of the Los Angeles  
20 region. The greater Los Angeles/Long Beach region is a densely populated area having  
21 buildings constructed over and near a vast array of fault systems capable of producing  
22 major earthquakes, including but not limited to the recent 1994 Northridge Earthquake.  
23 Results from studies after the Northridge Earthquake indicated that a lot of the damages  
24 were attributed to lack of quality control during construction resulting in poor performance  
25 of the building or structure. The proposed modification to improve quality control during  
26 construction needs to be incorporated into the Code to assure that new buildings and  
27 additions to existing buildings are designed and constructed in accordance with the  
28 scope and objectives of the International Building Code.

1                   Section 18.24.160 – Amendment due to local geological conditions. This  
2 section/amendment is consistent with the Los Angeles Regional Uniform Code Program  
3 set of amendments adopted by the cities and county of the Los Angeles region. The  
4 grade beams in the pile or caisson supported foundation system are designed to act like  
5 concrete beams and not like footings. Section 1704.4 requires concrete beams to have  
6 special inspection, but exempts the footings of buildings three stories or less in height.  
7 This amendment clarifies that the grade beams that connect piles or caissons are not  
8 exempt even though they are part of the foundation system. They are an essential part of  
9 the piles/caissons foundation system and should receive the same level of inspection.  
10 This amendment is for clarification purposes only. It does not change the intent of the  
11 Code provisions. The greater Los Angeles/Long Beach region is a densely populated  
12 area having buildings constructed over and near a vast array of fault systems capable of  
13 producing major earthquakes, including but not limited to the recent 1994 Northridge  
14 Earthquake. Studies after the Northridge Earthquake revealed that great confusion exists  
15 in the field over what is required by the Code in the way of special inspection beyond just  
16 piles and caissons. Grade and tie beams are essential components of a pile/caisson  
17 foundation system, especially for how such a system responds to earthquake loads.  
18 Special inspection is needed to ensure that construction complies with Code  
19 requirements. The proposed modification needs to be incorporated into the Code to  
20 assure that new buildings and additions to existing buildings are designed and  
21 constructed in accordance with the scope and objectives of the International Building  
22 Code.

23                   Section 18.24.170 – Amendment due to local geological and topographic  
24 conditions. This section/amendment is consistent with the Los Angeles Regional Uniform  
25 Code Program set of amendments adopted by the cities and county of the Los Angeles  
26 region. The greater Los Angeles/Long Beach region is a densely populated area having  
27 buildings constructed over and near a vast array of fault systems capable of producing  
28 major earthquakes, including but not limited to the recent 1994 Northridge Earthquake.

1 This local amendment expands the California Building Code requirements for structural  
2 observation of the construction of certain types of buildings by the registered design  
3 professional in responsible charge for the structural design. One of the significant  
4 problems discovered from the studies after the Northridge Earthquake was the extent of  
5 poor quality in construction, especially for wood frame buildings. By requiring that the  
6 registered design professional in responsible charge for the structural design observe the  
7 actual construction to ensure acceptable standards of workmanship, the quality will be  
8 greatly increased. The proposed modification needs to be incorporated into the Code to  
9 assure that new buildings and additions to existing buildings are designed and  
10 constructed in accordance with the scope and objectives of the International Building  
11 Code.

12 Section 18.24.180 – Amendment due to local geological and topographic  
13 conditions. This section/amendment is consistent with the Los Angeles Regional Uniform  
14 Code Program set of amendments adopted by the cities and county of the Los Angeles  
15 region. The greater Los Angeles/Long Beach region is a densely populated area having  
16 buildings constructed over and near a vast array of fault systems capable of producing  
17 major earthquakes, including but not limited to the recent 1994 Northridge Earthquake.

18 This local amendment expands the California Building Code requirements for structural  
19 observation of the construction of certain types of buildings by the registered design  
20 professional in responsible charge for the structural design. One of the significant  
21 problems discovered from the studies after the Northridge Earthquake was the extent of  
22 poor quality in construction, especially for wood frame buildings. By requiring that the  
23 registered design professional in responsible charge for the structural design observe the  
24 actual construction to ensure acceptable standards of workmanship, the quality will be  
25 greatly increased. The proposed modification needs to be incorporated into the Code to  
26 assure that new buildings and additions to existing buildings are designed and  
27 constructed in accordance with the scope and objectives of the International Building  
28 Code.

1                   Section 18.24.185 – Administrative amendment which adopts the latest  
2 edition of the California Building Code and makes minor editorial changes to reflect the  
3 appropriate reference to the Municipal Code for alternative material and design.

4                   Section 18.24.190 – Amendment due to local geological and topographic  
5 conditions. This section/amendment is consistent with the Los Angeles Regional Uniform  
6 Code Program set of amendments adopted by the cities and county of the Los Angeles  
7 region. After the Northridge Earthquake, it was discovered that footings on sloping lots  
8 suffered severe damages and it was important to provide stronger footings in these  
9 situations by providing a detail of the stepped footing. The greater Los Angeles/Long  
10 Beach region is a densely populated area having buildings constructed over and near a  
11 vast array of fault systems capable of producing major earthquakes, including but not  
12 limited to the recent 1994 Northridge Earthquake. The proposed modification needs to be  
13 incorporated into the Code to assure that new buildings and additions to existing  
14 buildings are designed and constructed in accordance with the scope and objectives of  
15 the International Building Code.

16                   Section 18.24.200 – Amendment due to local geological and topographic  
17 conditions. This section/amendment is consistent with the Los Angeles Regional Uniform  
18 Code Program set of amendments adopted by the cities and county of the Los Angeles  
19 region. Footnote c regarding interior stud bearing walls that are not continuous was not  
20 adopted. The Long Beach region has varying geologic and topographic conditions that  
21 make it difficult to ensure uniformity in soil conditions over time. Additionally, due to the  
22 extremely high seismic nature in the region, structures perform better when continuous  
23 footings are provided for all bearing walls. The greater Los Angeles/Long Beach region is  
24 a densely populated area having buildings constructed over and near a vast array of fault  
25 systems capable of producing major earthquakes, including but not limited to the recent  
26 1994 Northridge Earthquake. The proposed modification needs to be incorporated into  
27 the Code to assure that new buildings and additions to existing buildings are designed  
28 and constructed in accordance with the scope and objectives of the International Building

1 Code.

2                   Section 18.24.201 – Amendment due to local geological and climatic  
3 conditions. This section/amendment is consistent with the Los Angeles Regional Uniform  
4 Code Program set of amendments adopted by the cities and county of the Los Angeles  
5 region. Wood foundations without proper protection have proven to be ineffective in  
6 supporting structures and buildings due to deterioration caused by presence of water in  
7 the soil as well as other material detrimental to wood foundations. Most contractors are  
8 typically accustomed to construction in dry weather in the Southern California region and  
9 are not generally familiar with the necessary precautions and treatment of wood that  
10 makes it suitable for wet applications. The greater Los Angeles/Long Beach region is a  
11 densely populated area having buildings constructed over and near a vast array of fault  
12 systems capable of producing major earthquakes, including but not limited to the recent  
13 1994 Northridge Earthquake. This region is especially susceptible to more active termite  
14 activity and wood attacking insects and microorganisms. The proposed modification to  
15 prohibit the use of wood for foundation support needs to be incorporated into the Code to  
16 assure that new buildings and additions to existing buildings are designed and  
17 constructed in accordance with the scope and objectives of the International Building  
18 Code.

19                   Section 18.24.202 – Amendment due to local geological and climatic  
20 conditions. This section/amendment is consistent with the Los Angeles Regional Uniform  
21 Code Program set of amendments adopted by the cities and county of the Los Angeles  
22 region. Wood foundations without proper protection have proven to be ineffective in  
23 supporting structures and buildings due to deterioration caused by presence of water in  
24 the soil as well as other material detrimental to wood foundations. Most contractors are  
25 typically accustomed to construction in dry weather in the Southern California region and  
26 are not generally familiar with the necessary precautions and treatment of wood that  
27 makes it suitable for wet applications. The greater Los Angeles/Long Beach region is a  
28 densely populated area having buildings constructed over and near a vast array of fault



1 systems capable of producing major earthquakes, including but not limited to the recent  
2 1994 Northridge Earthquake. This region is especially susceptible to more active termite  
3 activity and wood attacking insects and microorganisms. The proposed modification to  
4 prohibit the use of wood for foundation support need to be incorporated into the Code to  
5 assure that new buildings and additions to existing buildings are designed and  
6 constructed in accordance with the scope and objectives of the International Building  
7 Code.

8           Section 18.24.210 – Amendment due to local geological and topographic  
9 conditions. This section/amendment is consistent with the Los Angeles Regional Uniform  
10 Code Program set of amendments adopted by the cities and county of the Los Angeles  
11 region. With the higher seismic demand placed on buildings and structures in this region,  
12 coupled with the geologic and topographic conditions here as opposed to the northern  
13 and eastern part of the country, it is deemed necessary to take precautionary steps to  
14 reduce or eliminate potential problems that may result by following a prescriptive design  
15 provision that does not take into consideration the surrounding environment. It was  
16 important that the benefit and expertise of a registered design professional be obtained to  
17 properly analyzed the structure and takes these issues into consideration. The greater  
18 Los Angeles/Long Beach region is a densely populated area having buildings constructed  
19 over and near a vast array of fault systems capable of producing major earthquakes,  
20 including but not limited to the recent 1994 Northridge Earthquake. The proposed  
21 modification to limit prescriptive design provisions that does not take into consideration  
22 the surrounding environment needs to be incorporated into the Code to assure that new  
23 buildings and additions to existing buildings are designed and constructed in accordance  
24 with the scope and objectives of the International Building Code.

25           Section 18.24.220 – Amendment due to local geological conditions. This  
26 section/amendment is consistent with the Los Angeles Regional Uniform Code Program  
27 set of amendments adopted by the cities and county of the Los Angeles region. This local  
28 amendment carries forward the previous 1999 and 2002 LARUCP amendment to require

1 minimum reinforcement in continuous footings, thereby addressing the problem of poor  
2 performance of plain or under-reinforced footings during a seismic event. This  
3 amendment reflects the recommendations by the Structural Engineers Association of  
4 Southern California (SEAOSC) and the Los Angeles City Task Force that investigated the  
5 poor performance observed in 1994 Northridge Earthquake. Section 14.8 was introduced  
6 in ACI 318-99 based on requirements of the Uniform Building Code and experimental  
7 research and on the basis that design of slender wall must satisfy both strength and  
8 serviceability requirements. ACI 318-05 provision was found to grossly under-estimate  
9 service load deflection. This update reduces the differences in serviceability provisions.  
10 The revision will essentially replace equations (14-8) and (14-9) with two new equations  
11 to reflect the UBC procedure for service load out-of-pane deflection. The proposed  
12 revision will be included in ACI 318-08. This amendment is intended to carry over critical  
13 provisions for the design of concrete columns in moment frames from the UBC.  
14 Increased confinement is critical to the integrity of such columns and these modifications  
15 ensure that is provided for when certain thresholds are exceeded. In addition, this  
16 amendment carries over from the UBC a critical provision for the design of concrete  
17 shear walls. It essentially limits the use of very highly gravity-loaded walls being included  
18 in the seismic load resisting system, since their failure could have a catastrophic effect on  
19 the building. Furthermore, this amendment was incorporated in the Code based on  
20 observations from Northridge earthquake. Rebar placed in a very thin concrete topping  
21 slab in some instances popped out of the slab due to insufficient concrete coverage. The  
22 modification ensures that critical boundary and collector rebars are placed in sufficiently  
23 thick slab to prevent buckling of such reinforcement. The greater Los Angeles/Long  
24 Beach region is a densely populated area having buildings constructed over and near a  
25 vast array of fault systems capable of producing major earthquakes, including but not  
26 limited to the recent 1994 Northridge Earthquake. The proposed modification need to be  
27 incorporated into the Code to assure that new buildings and additions to existing  
28 buildings are designed and constructed in accordance with the scope and objectives of

1 the International Building Code.

2           Section 18.24.230 – Amendment due to local geological conditions. This  
3 section/amendment is consistent with the Los Angeles Regional Uniform Code Program  
4 set of amendments adopted by the cities and county of the Los Angeles region. Recent  
5 test results on braces used in steel concentrically braced frames (SCBF) indicate that  
6 many commonly used sections and brace configurations do not meet seismic  
7 performance expectations. Specific parameters that were shown to affect the ductility of  
8 braces included net-section, section type, width-thickness ratio of the cross section and  
9 member slenderness. Square and rectangular cross-section HSS were shown to be  
10 particularly susceptible to fracture due to local buckling behavior of the cross section and,  
11 therefore, are not recommended by SEAOSC Seismology and Steel Committee for  
12 special concentric braced frame applications. Grout-filled HSS members exhibit more  
13 favorable local buckling characteristics, significantly altering the post-yield behavior of  
14 these sections. Both SEAOSC Seismology and Steel Committee recommend the  
15 proposed modification. Furthermore, OSPHD and DSA-SS has taken the same position  
16 and added Section 2205A.4.1.5.1 to Chapter 22 of the 2007 California Building Code to  
17 reflect this recommendation. The greater Los Angeles/Long Beach region is a densely  
18 populated area having buildings constructed over and near a vast array of fault systems  
19 capable of producing major earthquakes, including but not limited to the recent 1994  
20 Northridge Earthquake. Recent test studies regarding rectangular and square brace  
21 frame members need to be incorporated into the Code to assure that new buildings and  
22 additions to existing buildings are designed and constructed in accordance with the  
23 scope and objectives of the International Building Code.

24           Section 18.24.240 – Amendment due to local geological conditions. This  
25 section/amendment is consistent with the Los Angeles Regional Uniform Code Program  
26 set of amendments adopted by the cities and county of the Los Angeles region. The  
27 proposed amendment continues the application of previous existing amendment by  
28 prohibiting the use of wood diaphragms in rotation based on numerous failures observed

1 in the 1994 Northridge Earthquake. The greater Los Angeles/Long Beach region is a  
2 densely populated area having buildings constructed over and near a vast array of fault  
3 systems capable of producing major earthquakes, including but not limited to the recent  
4 1994 Northridge Earthquake. The proposed modification to place limits on design of  
5 buildings based on rotation of wood diaphragm, which will reduce potential soft-story  
6 designs and excessive deflections in buildings, need to be incorporated into the code to  
7 assure that new buildings and additions to existing buildings are designed and  
8 constructed in accordance with the scope and objectives of the International Building  
9 Code.

10           Section 18.24.250 – Amendment due to local geological conditions. This  
11 section/amendment is consistent with the Los Angeles Regional Uniform Code Program  
12 set of amendments adopted by the cities and county of the Los Angeles region. Many of  
13 the hold-down devices currently used still do not have any acceptance report based on  
14 dynamic testing protocol. The amendment continues limiting the allowable capacity to  
15 75% of the evaluation report to provide an additional factor of safety for statically tested  
16 anchorage devices. Since the IBC now specifies the minimum size of steel plate washer,  
17 this proposed amendment, for purpose of consistency and uniformity of requirement,  
18 revised the size of the steel plate washer used in hold-down connectors to match that in  
19 IBC Section 2305.3.11 from the previous 1999 and 2002 LARUCP amendments. The  
20 greater Los Angeles/Long Beach region is a densely populated area having buildings  
21 constructed over and near a vast array of fault systems capable of producing major  
22 earthquakes, including but not limited to the recent 1994 Northridge Earthquake. The  
23 proposed modification to establish certain performance requirements for hold-down  
24 connectors, which is essential to preventing failure of a shear wall due to excessive  
25 deflection, needs to be incorporated into the Code to assure that new buildings and  
26 additions to existing buildings are designed and constructed in accordance with the  
27 scope and objectives of the International Building Code.

28           Section 18.24.260 – Amendment due to local geological conditions. This

1 section/amendment is consistent with the Los Angeles Regional Uniform Code Program  
2 set of amendments adopted by the cities and county of the Los Angeles region. The word  
3 “tolerances” is too broad a term. It is to be replaced with “dimensions”, including  
4 diameter, minimum length and minimum head diameter. The overdriving of nails into the  
5 structural wood panel still remains a concern when pneumatic nail guns are used for  
6 shear wall nailing. Box nails were observed to cause massive and multiple failures of the  
7 typical 3/8-inch thick plywood during the Northridge Earthquake. The use of clipped head  
8 nails continues to be restricted from being used in shear wall panels where the minimum  
9 nail head size must be maintained in order to minimize nails from pulling through  
10 sheathing materials. Clipped or mechanically driven nails used in shear wall construction  
11 were found to perform much less in previous wood shear wall panel testing done at UCI.  
12 The existing test results indicated that, under cyclic loading, the shear panels were less  
13 energy absorbent and less ductile. The panels reached ultimate load capacity and failed  
14 at substantially less lateral deflection than those using same size hand driven nails. The  
15 greater Los Angeles/Long Beach region is a densely populated area having buildings  
16 constructed over and near a vast array of fault systems capable of producing major  
17 earthquakes, including but not limited to the recent 1994 Northridge Earthquake. The  
18 proposed modification to require mechanically driven nails to have the same dimension  
19 as hand driven nails resulting in improved quality of construction and performance of  
20 shear wall panels needs to be incorporated into the Code to assure that new buildings  
21 and additions to existing buildings are designed and constructed in accordance with the  
22 scope and objectives of the International Building Code.

23 Section 18.24.270 – Amendment due to local geological conditions. This  
24 section/amendment is consistent with the Los Angeles Regional Uniform Code Program  
25 set of amendments adopted by the cities and county of the Los Angeles region. This local  
26 amendment puts additional restrictions on the design of wood structural panel  
27 diaphragms. The amendment continues the application of the previous 1999 and 2002  
28 LARUCP 23-3 amendment by allowing shear value capacities based on testing only and

1 not calculations alone. By deleting the words that allow calculation of shear wall values, it  
2 will no longer be possible to circumvent the reductions in allowable shear capacities  
3 established in the Table. In September 2007, limited cyclic testing data was provided to  
4 the ICC Structural Code Committee showing that stapled wood structural shear panels do  
5 not exhibit the same behavior as the nailed wood structural shear panels. As a matter of  
6 fact, the test results of the stapled wood structural shear panels appeared much lower in  
7 strength and drift than the nailed wood structural shear panel test results. Therefore, the  
8 use of staples as fasteners for structural shear wall panels or diaphragms shall not be  
9 permitted without being substantiated by cyclic testing. The greater Los Angeles/Long  
10 Beach region is a densely populated area having buildings constructed over and near a  
11 vast array of fault systems capable of producing major earthquakes, including but not  
12 limited to the recent 1994 Northridge Earthquake. The proposed modification to place  
13 certain design and construction limits on structural wood panel diaphragms thus resulting  
14 in improved quality of construction and performance of structures needs to be  
15 incorporated into the Code to assure that new buildings and additions to existing  
16 buildings are designed and constructed in accordance with the scope and objectives of  
17 the International Building Code.

18 Section 18.24.275 – Amendment due to local geological conditions. This  
19 section/amendment is consistent with the Los Angeles Regional Uniform Code Program  
20 set of amendments adopted by the cities and county of the Los Angeles region. This local  
21 amendment puts additional restrictions on the design of wood structural panel  
22 diaphragms. The amendment continues the application of the previous 1999 and 2002  
23 LARUCP 23-3 amendment by allowing shear value capacities based on testing only and  
24 not calculations alone. By deleting the words that allow calculation of shear wall values, it  
25 will no longer be possible to circumvent the reductions in allowable shear capacities  
26 established in the Table. In September 2007, limited cyclic testing data was provided to  
27 the ICC Structural Code Committee showing that stapled wood structural shear panels do  
28 not exhibit the same behavior as the nailed wood structural shear panels. As a matter of

1 fact, the test results of the stapled wood structural shear panels appeared much lower in  
2 strength and drift than the nailed wood structural shear panel test results. Therefore, the  
3 use of staples as fasteners for structural shear wall panels or diaphragms shall not be  
4 permitted without being substantiated by cyclic testing. The greater Los Angeles/Long  
5 Beach region is a densely populated area having buildings constructed over and near a  
6 vast array of fault systems capable of producing major earthquakes, including but not  
7 limited to the recent 1994 Northridge Earthquake. The proposed modification to place  
8 certain design and construction limits on structural wood panel diaphragms thus resulting  
9 in improved quality of construction and performance of structures needs to be  
10 incorporated into the Code to assure that new buildings and additions to existing  
11 buildings are designed and constructed in accordance with the scope and objectives of  
12 the International Building Code.

13           Section 18.24.280 – Amendment due to local geological conditions. This  
14 section/amendment is consistent with the Los Angeles Regional Uniform Code Program  
15 set of amendments adopted by the cities and county of the Los Angeles region. This local  
16 amendment carries forward the previous LARUCP amendment to limit the maximum  
17 shear capacity for 3-ply plywood along with requiring greater edge distance for nails in  
18 shear walls resisting high loads, thereby addressing the problem of nails pulling out of the  
19 edges of the plywood under seismic loading. In addition, by deleting the words that allow  
20 calculation of shear wall values, it will no longer be possible to circumvent the reductions  
21 in allowable shear capacities established in the Table. This amendment reflects the  
22 recommendations by the Structural Engineers Association of Southern California  
23 (SEAOSC) and the Los Angeles City Task Force that investigated the poor performance  
24 observed in 1994 Northridge Earthquake. Furthermore, the cities and county of the Los  
25 Angeles region have taken extra measures to maintain the structural integrity of the  
26 framing of the shear walls when designed for high levels of seismic loads by requiring  
27 wood sheathing be applied directly over framing members, thereby prohibiting the use of  
28 the second portion of Table 2306.4.1, which provides allowable values for panels placed

1 over gypsum sheathing. This amendment is intended to prevent the undesirable  
2 performance of nails when gypsum board softens due to cyclic earthquake displacements  
3 and the nail ultimately does not have any engagement in a solid material within the  
4 thickness of the gypsum board. In September 2007, limited cyclic testing data was  
5 provided to the structural code committee showing that stapled wood structural shear  
6 panels do not exhibit the same behavior as the nailed wood structural shear panels. As a  
7 matter of fact, the test results of the stapled wood structural shear panels appeared much  
8 lower in strength and drift than the nailed wood structural shear panel test results. The  
9 allowable shear values for wood structural panel shear walls with stapled nails are based  
10 on monotonic testing. Earthquakes load shear walls in a repeating fully reversible  
11 manner. The Structural Engineers Association of Southern California (SEAOSC) and the  
12 Los Angeles City Task Force previously investigated, documented damages, and  
13 reviewed existing test reports. The proposed amendment to omit the allowable shear  
14 capacity of shear wall with stapled nails is consistent with the Task Force previous  
15 recommendations made after the 1994 Northridge Earthquake. At that time, the report to  
16 the Governor from the Seismic Safety Commission of the State of California  
17 recommended that Code requirements be "more thoroughly substantiated with testing."  
18 Therefore, the use of staples as fasteners for structural shear wall panels or diaphragms  
19 shall not be permitted without being substantiated by cyclic testing. Wood structural shear  
20 panels fastened with nails (common and galvanized box) have been tested using various  
21 cyclic testing protocols that substantiate their design values in Table 2306.4.1. The  
22 greater Los Angeles/Long Beach region is a densely populated area having buildings  
23 constructed over and near a vast array of fault systems capable of producing major  
24 earthquakes, including but not limited to the recent 1994 Northridge Earthquake. The  
25 proposed modification to place certain design and construction limits on structural wood  
26 panel shear walls thus resulting in improved quality of construction and performance of  
27 structures needs to be incorporated into the Code to assure that new buildings and  
28 additions to existing buildings are designed and constructed in accordance with the



1 scope and objectives of the International Building Code.

2           Section 18.24.290 – Amendment due to local geological conditions. This  
3 section/amendment is consistent with the Los Angeles Regional Uniform Code Program  
4 set of amendments adopted by the cities and county of the Los Angeles region. This local  
5 amendment carries forward the previous LARUCP amendment to limit the maximum  
6 shear capacity for 3-ply plywood along with requiring greater edge distance for nails in  
7 shear walls resisting high loads, thereby addressing the problem of nails pulling out of the  
8 edges of the plywood under seismic loading. In addition, by deleting the words that allow  
9 calculation of shear wall values, it will no longer be possible to circumvent the reductions  
10 in allowable shear capacities established in the Table. This amendment reflects the  
11 recommendations by the Structural Engineers Association of Southern California  
12 (SEAOSC) and the Los Angeles City Task Force that investigated the poor performance  
13 observed in 1994 Northridge Earthquake. Furthermore, the cities and county of the Los  
14 Angeles region have taken extra measures to maintain the structural integrity of the  
15 framing of the shear walls when designed for high levels of seismic loads by requiring  
16 wood sheathing be applied directly over framing members, thereby prohibiting the use of  
17 the second portion of Table 2306.4.1, which provides allowable values for panels placed  
18 over gypsum sheathing. This amendment is intended to prevent the undesirable  
19 performance of nails when gypsum board softens due to cyclic earthquake displacements  
20 and the nail ultimately does not have any engagement in a solid material within the  
21 thickness of the gypsum board. In September 2007, limited cyclic testing data was  
22 provided to the structural code committee showing that stapled wood structural shear  
23 panels do not exhibit the same behavior as the nailed wood structural shear panels. As a  
24 matter of fact, the test results of the stapled wood structural shear panels appeared much  
25 lower in strength and drift than the nailed wood structural shear panel test results. The  
26 allowable shear values for wood structural panel shear walls with stapled nails are based  
27 on monotonic testing. Earthquakes load shear walls in a repeating fully reversible  
28 manner. The Structural Engineers Association of Southern California (SEAOSC) and the

1 Los Angeles City Task Force previously investigated, documented damages, and  
2 reviewed existing test reports. The proposed amendment to omit the allowable shear  
3 capacity of shear wall with stapled nails is consistent with the Task Force previous  
4 recommendations made after the 1994 Northridge Earthquake. At that time, the report to  
5 the Governor from the Seismic Safety Commission of the State of California  
6 recommended that Code requirements be "more thoroughly substantiated with testing."  
7 Therefore, the use of staples as fasteners for structural shear wall panels or diaphragms  
8 shall not be permitted without being substantiated by cyclic testing. Wood structural shear  
9 panels fastened with nails (common and galvanized box) have been tested using various  
10 cyclic testing protocols that substantiate their design values in Table 2306.4.1. The  
11 greater Los Angeles/Long Beach region is a densely populated area having buildings  
12 constructed over and near a vast array of fault systems capable of producing major  
13 earthquakes, including but not limited to the recent 1994 Northridge Earthquake. The  
14 proposed modification to place certain design and construction limits on structural wood  
15 panel shear walls thus resulting in improved quality of construction and performance of  
16 structures need to be incorporated into the Code to assure that new buildings and  
17 additions to existing buildings are designed and constructed in accordance with the  
18 scope and objectives of the International Building Code.

19 Section 18.24.300 – Amendment due to local geological conditions. This  
20 section/amendment is consistent with the Los Angeles Regional Uniform Code Program  
21 set of amendments adopted by the cities and county of the Los Angeles region. This  
22 amendment is consistent with the previous 1999 and 2002 LARUCP 25-2 amendment  
23 adopted by the cities and county of the Los Angeles region that reduced allowable shear  
24 values. Due to the high geologic activities in the Southern California area and the  
25 expected higher level of performance on buildings and structures, this local amendment  
26 continues to reduce the allowable shear values for shear walls sheathed with lath, plaster  
27 or gypsum board. The poor performance of such shear walls sheathed with other  
28 materials in the 1994 Northridge Earthquake was investigated by the Structural

1 Engineers Association of Southern California (SEAOSC) and the Los Angeles City Task  
2 Force. The cities and county of the Los Angeles region have taken extra measures to  
3 maintain the structural integrity of the framing of the shear walls when designed for high  
4 levels of seismic loads. In September 2007, limited cyclic testing data was provided to the  
5 structural code committee showing that stapled wood structural shear panels do not  
6 exhibit the same behavior as the nailed wood structural shear panels. As a matter of fact,  
7 the test results of the stapled wood structural shear panels appeared much lower in  
8 strength and drift than the nailed wood structural shear panel test results. Therefore, the  
9 use of staples as fasteners for shear walls sheathed with other materials shall not be  
10 permitted without being substantiated by cyclic testing. The greater Los Angeles/Long  
11 Beach region is a densely populated area having buildings constructed over and near a  
12 vast array of fault systems capable of producing major earthquakes, including but not  
13 limited to the recent 1994 Northridge Earthquake. The proposed modification needs to be  
14 incorporated into the Code to assure that new buildings and additions to existing  
15 buildings are designed and constructed in accordance with the scope and objectives of  
16 the International Building Code.

17 Section 18.24.310 – Amendment due to local geological conditions. This  
18 section/amendment is consistent with the Los Angeles Regional Uniform Code Program  
19 set of amendments adopted by the cities and county of the Los Angeles region. This  
20 amendment is consistent with the previous 1999 and 2002 LARUCP 25-2 amendment  
21 adopted by the cities and county of the Los Angeles region that reduced allowable shear  
22 values. Due to the high geologic activities in the Southern California area and the  
23 expected higher level of performance on buildings and structures, this local amendment  
24 continues to reduce the allowable shear values for shear walls sheathed with lath, plaster  
25 or gypsum board. The poor performance of such shear walls sheathed with other  
26 materials in the 1994 Northridge Earthquake was investigated by the Structural  
27 Engineers Association of Southern California (SEAOSC) and the Los Angeles City Task  
28 Force. The cities and county of the Los Angeles region has taken extra measures to

1 maintain the structural integrity of the framing of the shear walls when designed for high  
2 levels of seismic loads. In September 2007, limited cyclic testing data was provided to the  
3 structural code committee showing that stapled wood structural shear panels do not  
4 exhibit the same behavior as the nailed wood structural shear panels. As a matter of fact,  
5 the test results of the stapled wood structural shear panels appeared much lower in  
6 strength and drift than the nailed wood structural shear panel test results. Therefore, the  
7 use of staples as fasteners for shear walls sheathed with other materials shall not be  
8 permitted without being substantiated by cyclic testing. The greater Los Angeles/Long  
9 Beach region is a densely populated area having buildings constructed over and near a  
10 vast array of fault systems capable of producing major earthquakes, including but not  
11 limited to the recent 1994 Northridge Earthquake. The proposed modification needs to be  
12 incorporated into the Code to assure that new buildings and additions to existing  
13 buildings are designed and constructed in accordance with the scope and objectives of  
14 the International Building Code.

15           Section 18.24.320 – Amendment due to local geological conditions. This  
16 section/amendment is consistent with the Los Angeles Regional Uniform Code Program  
17 set of amendments adopted by the cities and county of the Los Angeles region. The  
18 proposed amendment continues the previous 1999 and 2002 LARUCP amendment to  
19 require that interior braced walls be supported by continuous foundations. Interior walls  
20 can easily be called upon to resist over half of the seismic loading imposed on simple  
21 structures. Without a continuous foundation, earthquake loads would be transferred  
22 through a non-structural concrete slab floor or by a wood floor. Raised wood floor  
23 diaphragms and bolting of the perimeter walls can become inadequate to resist the  
24 imposed horizontal shear. The greater Los Angeles/Long Beach region is a densely  
25 populated area having buildings constructed over and near a vast array of fault systems  
26 capable of producing major earthquakes, including but not limited to the recent 1994  
27 Northridge Earthquake. Conventional framing does not address the need for a continuous  
28 load path, critical shear transfer mechanisms, connection ties, irregular and flexible

1 portions of complex shaped structures. Unless designed by a registered design  
2 professional, such buildings built by conventional framing requirements will be prone to  
3 serious damage in future large earthquakes. The proposed modification needs to be  
4 incorporated into the Code to assure that new buildings and additions to existing  
5 buildings are designed and constructed in accordance with the scope and objectives of  
6 the International Building Code.

7           Section 18.24.330 – Amendment due to local geological conditions. This  
8 section/amendment is consistent with the Los Angeles Regional Uniform Code Program  
9 set of amendments adopted by the cities and county of the Los Angeles region. The  
10 proposed amendment continues the previous 1999 and 2002 LARUCP amendment to  
11 limit the use of conventional wood frame construction to simple one story residential  
12 buildings when using conventional framing design. The greater Los Angeles/Long Beach  
13 region is a densely populated area having buildings constructed over and near a vast  
14 array of fault systems capable of producing major earthquakes, including but not limited  
15 to the recent 1994 Northridge Earthquake. Conventional framing does not address the  
16 need for a continuous load path, critical shear transfer mechanisms, connection ties,  
17 irregular and flexible portions of complex shaped structures. Unless designed by a  
18 registered design professional, such buildings built by conventional framing requirements  
19 will be prone to serious damage in future large earthquakes. The proposed modification  
20 needs to be incorporated into the Code to assure that new buildings and additions to  
21 existing buildings are designed and constructed in accordance with the scope and  
22 objectives of the International Building Code.

23           Section 18.24.340 – Amendment due to local geological conditions. This  
24 section/amendment is consistent with the Los Angeles Regional Uniform Code Program  
25 set of amendments adopted by the cities and county of the Los Angeles region. The  
26 proposed amendment continues the previous 1999 and 2002 LARUCP amendment to  
27 limit the additional weight attributed to the use of heavy veneer substantially increases  
28 loads to conventionally braced walls in an earthquake. Moreover, normal to wall loads

1 that occur in an earthquake can seriously overstress wood bearing walls in combined  
2 seismic/gravity load combinations. Numerous conventionally framed veneer covered  
3 structures sustained serious damage in the Northridge Earthquake as a result of the  
4 heavy weight of the veneer. The greater Los Angeles/Long Beach region is a densely  
5 populated area having buildings constructed over and near a vast array of fault systems  
6 capable of producing major earthquakes, including but not limited to the recent 1994  
7 Northridge Earthquake. Conventional framing does not address the need for a continuous  
8 load path, critical shear transfer mechanisms, connection ties, irregular and flexible  
9 portions of complex shaped structures. Unless designed by a registered design  
10 professional, such buildings built by conventional framing requirements will be prone to  
11 serious damage in future large earthquakes. The proposed modification need to be  
12 incorporated into the Code to assure that new buildings and additions to existing  
13 buildings are designed and constructed in accordance with the scope and objectives of  
14 the International Building Code.

15 Section 18.24.350 – Amendment due to local geological conditions. This  
16 section/amendment is consistent with the Los Angeles Regional Uniform Code Program  
17 set of amendments adopted by the cities and county of the Los Angeles region. The  
18 proposed amendment continues the previous 1999 and 2002 LARUCP amendment to  
19 limit the use of conventional wood frame construction to 25 feet maximum spacing when  
20 using conventional framing design. The greater Los Angeles/Long Beach region is a  
21 densely populated area having buildings constructed over and near a vast array of fault  
22 systems capable of producing major earthquakes, including but not limited to the recent  
23 1994 Northridge Earthquake. Conventional framing does not address the need for a  
24 continuous load path, critical shear transfer mechanisms, connection ties, irregular and  
25 flexible portions of complex shaped structures. Unless designed by a registered design  
26 professional, such buildings built by conventional framing requirements will be prone to  
27 serious damage in future large earthquakes. The proposed modification needs to be  
28 incorporated into the Code to assure that new buildings and additions to existing

1 buildings are designed and constructed in accordance with the scope and objectives of  
2 the International Building Code.

3 Section 18.24.360 – Amendment due to local geological conditions. This  
4 section/amendment is consistent with the Los Angeles Regional Uniform Code Program  
5 set of amendments adopted by the cities and county of the Los Angeles region. The  
6 greater Los Angeles/Long Beach region is a densely populated area having buildings  
7 constructed over and near a vast array of fault systems capable of producing major  
8 earthquakes, including but not limited to the recent 1994 Northridge Earthquake.  
9 Conventional framing does not address the need for a continuous load path, critical shear  
10 transfer mechanisms, connection ties, irregular and flexible portions of complex shaped  
11 structures. Unless designed by a registered design professional, such buildings built by  
12 conventional framing requirements will be prone to serious damage in future large  
13 earthquakes. The proposed modification needs to be incorporated into the Code to  
14 assure that new buildings and additions to existing buildings are designed and  
15 constructed in accordance with the scope and objectives of the International Building  
16 Code.

17 Section 18.24.370 – Amendment due to local geological conditions. This  
18 section/amendment is consistent with the Los Angeles Regional Uniform Code Program  
19 set of amendments adopted by the cities and county of the Los Angeles region. The  
20 greater Los Angeles/Long Beach region is a densely populated area having buildings  
21 constructed over and near a vast array of fault systems capable of producing major  
22 earthquakes, including but not limited to the recent 1994 Northridge Earthquake.  
23 Conventional framing does not address the need for a continuous load path, critical shear  
24 transfer mechanisms, connection ties, irregular and flexible portions of complex shaped  
25 structures. Unless designed by a registered design professional, such buildings built by  
26 conventional framing requirements will be prone to serious damage in future large  
27 earthquakes. The proposed modification needs to be incorporated into the Code to  
28 assure that new buildings and additions to existing buildings are designed and

1 constructed in accordance with the scope and objectives of the International Building  
2 Code.

3           Section 18.24.380 – Administrative amendment which adopts the latest  
4 edition of the California Building Code and makes minor editorial changes to reflect the  
5 appropriate reference to the Municipal Code for inspections.

6           Section 18.24.390 – Administrative amendment which adopts the latest  
7 edition of the California Building Code and makes minor editorial changes to reference  
8 the appropriate section.

9           Section 18.24.400 – Administrative amendment which adopts the latest  
10 edition of the California Building Code and makes minor editorial changes to reflect the  
11 appropriate reference to the Municipal Code for application information.

12           Section 18.24.410 – Administrative amendment which adopts the latest  
13 edition of the California Building Code and makes minor editorial changes to reflect the  
14 appropriate reference to the Municipal Code for submittal requirements for construction  
15 documents.

16           Section 18.24.420 – Administrative amendment which adopts the latest  
17 edition of the California Building Code and makes minor editorial changes to reflect the  
18 appropriate reference to the Municipal Code for inspections.

19           Section 18.24.430 – Administrative amendment which adopts the latest  
20 edition of the California Building Code and makes minor editorial changes to reflect the  
21 new section reference.

22           Section 18.28.010 – Administrative amendment which adopts the latest  
23 edition of the California Electrical Code and makes minor editorial changes to update the  
24 references.

25           Section 18.28.020 – Administrative amendment which adopts the latest  
26 edition of the California Electrical Code and makes minor editorial changes to update the  
27 reference.

28           Section 18.36.010 – Administrative amendment which adopts the latest



1 edition of the California Mechanical Code and makes minor editorial changes to update  
2 the reference.

3 Section 18.36.015 – Administrative amendment which adopts the latest  
4 edition of the California Mechanical Code and makes minor editorial changes to update  
5 the reference.

6 Section 18.36.030 – Administrative amendment which adopts the latest  
7 edition of the California Mechanical Code and makes minor editorial changes to update  
8 the reference.

9 Section 18.40.010 – Administrative amendment which adopts the latest  
10 edition of the California Plumbing Code and makes minor editorial changes to update the  
11 reference.

12 Section 18.40.020 – Administrative amendment which adopts the latest  
13 edition of the California Plumbing Code and makes minor editorial changes to update the  
14 reference.

15 Section 18.40.022 – Administrative amendment which adopts the latest  
16 edition of the California Plumbing Code and makes minor editorial changes to update the  
17 reference.

18 Chapter 18.69 – Amendment due to local geological conditions. The greater  
19 Los Angeles/Long Beach region is a densely populated area having buildings constructed  
20 over and near a vast array of fault systems capable of producing major earthquakes,  
21 including but not limited to the recent 1994 Northridge Earthquake. The provisions of this  
22 proposed chapter are intended to promote public safety and welfare by reducing the risk  
23 of earthquake-induced damage to existing wood-framed residential buildings. The  
24 voluntary minimum standards contained in this proposed chapter shall substantially  
25 improve the seismic performance of these residential buildings but will not necessarily  
26 prevent all earthquake damage. When fully followed, these standards will strengthen the  
27 portion of the structure that is most vulnerable to earthquake damage. Prior to 1960, most  
28 wood frame residential buildings were built with raised wood floors supported by short

1 wood stud walls known as cripple walls. These cripple walls are typically braced with  
2 weak seismic materials such as portland cement plaster or horizontal wood siding. In  
3 addition, wood frame buildings built under building codes in effect prior to July 1938 were  
4 not required to be bolted to their foundations. Recent earthquakes have shown that if a  
5 building has weak cripple walls or is unbolted, it may fall off its foundation even in  
6 moderate earthquakes. Fallen buildings have collapsed, caught fire or needed extensive  
7 repairs to restore their occupancy. This proposed chapter sets prescriptive standards for  
8 strengthening of under floor enclosures, if permitted by the building official, without  
9 requiring construction documents prepared by a registered design professional licensed  
10 by the State of California. This chapter also provides a design standard for the use of  
11 alternate materials or an alternate method of construction in lieu of the prescriptive  
12 standards.

13 Chapter 18.70 – Amendment due to local geological conditions. The greater  
14 Los Angeles/Long Beach region is a densely populated area having buildings constructed  
15 over and near a vast array of fault systems capable of producing major earthquakes,  
16 including but not limited to the recent 1994 Northridge Earthquake. The purpose of this  
17 chapter is to promote the public welfare and safety by reducing the risk of death or injury  
18 that may result from the effects of earthquakes on existing wood-frame multi-unit  
19 residential buildings. The ground motion of the Northridge earthquake caused the loss of  
20 human life, personal injury and property damage in these types of buildings. This chapter  
21 creates minimum standards to strengthen the more vulnerable portions of these  
22 structures. When fully followed, these minimum standards will substantially improve the  
23 performance of these buildings but will not necessarily prevent all earthquake-related  
24 damage.

25 Chapter 18.71 – Amendment due to local geological conditions. The greater  
26 Los Angeles/Long Beach region is a densely populated area having buildings constructed  
27 over and near a vast array of fault systems capable of producing major earthquakes,  
28 including but not limited to the recent 1994 Northridge Earthquake. The purpose of this

1 chapter is to promote public safety and welfare by reducing the risk of death or injury that  
2 may result from the effects of earthquakes on concrete buildings and concrete frame  
3 buildings with masonry infills. The Northridge earthquake caused widespread damage to  
4 these buildings, including some collapses. The recent Great Hanshin earthquake in  
5 Kobe, Japan, also caused several hundred of these buildings to collapse. These  
6 nonductile concrete buildings are frequently used in Long Beach for department stores,  
7 office buildings, hotels, parking structures and some mid-rise condominiums. Their  
8 performance in an earthquake is essential to the life and safety of their occupants and the  
9 overall stability of the local economy. This chapter provides voluntary retrofit standards  
10 that, when fully followed, will substantially improve the seismic performance of these  
11 buildings but will not necessarily prevent all earthquake damage.

12 Chapter 18.72 – Amendment due to local geological conditions. The greater  
13 Los Angeles/Long Beach region is a densely populated area having buildings constructed  
14 over and near a vast array of fault systems capable of producing major earthquakes,  
15 including but not limited to the recent 1994 Northridge Earthquake. The purpose of this  
16 chapter is to promote public safety and welfare by reducing the risk of death or injury that  
17 may result from the effects of earthquakes on reinforced concrete and masonry wall  
18 buildings with flexible diaphragms designed under the building codes in effect prior to  
19 January 1, 1995. These buildings are potentially hazardous and prone to significant  
20 damage, including possible collapse, in a moderate to major earthquake. These  
21 structures typically shelter large numbers of persons and property for retail, food markets,  
22 food distribution centers, warehousing, aerospace, industrial/manufacturing and general  
23 business and office use. Their continued use after an earthquake is also essential to the  
24 local economy and its post-earthquake recovery. The provisions of this chapter are  
25 minimum standards for structural seismic resistance established primarily to reduce the  
26 risk of loss of life or injury on both subject and adjacent properties and will not necessarily  
27 prevent all earthquake damage to an existing building which complies with these  
28 standards. This Chapter shall not require existing electrical, plumbing, mechanical or fire

1 safety systems to be altered unless they constitute a hazard to life or property. This  
2 Chapter provides voluntary retrofit standards for deficient wall anchorage systems on  
3 structures that are not subject to the mandatory provisions of Chapter 18.68. When fully  
4 followed, these standards will strengthen the portion of the structure that is most  
5 vulnerable to earthquake damage.

6 Section 2. The Director of Planning and Building is instructed to, and  
7 shall, transmit a copy of this resolution together with any appropriate supporting  
8 documentation, to the California Building Standards Commission in accordance with  
9 California Health and Safety Code Section 17958.7.

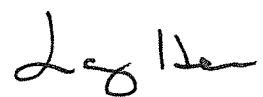
10 Section 3. This resolution shall take effect on January 1, 2008, upon its  
11 adoption by the City Council, and the City Clerk shall certify to the vote adopting this  
12 resolution.

13 I hereby certify that the foregoing resolution was adopted by the City  
14 Council of the City of Long Beach at its meeting of November 13, 2007 by the  
15 following vote:

16 Ayes: Councilmembers: B. Lowenthal, DeLong, O'Donnell,  
17 Schipske, Andrews, Gabelich, Lerch.  
18 \_\_\_\_\_  
19 \_\_\_\_\_

20 Noes: Councilmembers: None.  
21 \_\_\_\_\_  
22 \_\_\_\_\_

23 Absent: Councilmembers: S. Lowenthal, Reyes Uranga.  
24 \_\_\_\_\_  
25 \_\_\_\_\_

26   
27 \_\_\_\_\_  
28 City Clerk