

1 RESOLUTION NO.

2
3 A RESOLUTION OF THE CITY COUNCIL OF THE
4 CITY OF LONG BEACH ADOPTING AND MAKING
5 EXPRESS FINDINGS AND DETERMINATIONS RELATING
6 TO THE ENACTMENT OF ADMINISTRATIVE
7 AMENDMENTS, AND, WHERE APPROPRIATE, MORE
8 RESTRICTIVE BUILDING CODE PROVISIONS THAN
9 THOSE OF THE CALIFORNIA BUILDING CODE; FINDING
10 THAT SAID AMENDMENTS AND MODIFICATIONS TO
11 THE CODE ARE REASONABLY NECESSARY BECAUSE
12 OF THE LOCAL CLIMATIC, GEOLOGICAL OR
13 TOPOGRAPHICAL CONDITIONS EXISTING IN LONG
14 BEACH; AND INSTRUCTING THE DIRECTOR OF
15 PLANNING AND BUILDING TO TRANSMIT SAID
16 FINDINGS AND DETERMINATIONS TO THE CALIFORNIA
17 BUILDING STANDARDS COMMISSIONS IN
18 ACCORDANCE WITH CALIFORNIA HEALTH AND
19 SAFETY CODE SECTION 17958.7

20
21 WHEREAS, California Health and Safety Code Section 17922 requires all
22 cities to adopt, as the City Building Standards Code, the State Building Standards Code
23 adopted pursuant to the provisions of Chapter 4 of Part 2.5 of Division 13 of the California
24 Health and Safety Code; and

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

27 "... a city or county may make such changes or modifications in the
28 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 (δ_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 _____, 20__ by the
15 following vote:

16 Ayes: Councilmembers: _____
17 _____
18 _____
19 _____

20 Noes: Councilmembers: _____
21 _____

22 Absent: Councilmembers: _____
23 _____

24 _____
25 _____
26 _____
27 City Clerk
28