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BUILDING SAFETY DIVISION

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SEISMIC DESIGN GUIDELINES

For the Mandatory Retrofit Program Wood Frame Buildings with Soft, Weak or Open-Front Wall Lines (SWOF)

1.0 Introduction

According to the USGS there is a 67% probability that a magnitude 6.7 earthquake will occur in the next 25 years in the Los Angeles area. A significant earthquake will not only affect life safety, but also loss of shelter and significant economic loss. In order to reduce the risk of devastation due to a large earthquake, the City of Culver City has decided to take a proactive approach by addressing the seismic deficiencies in the existing building stock. Current building codes require new buildings to adhere to the most current building standards, however the Code does not require existing buildings to be upgraded unless the building is undergoing major alterations. As such, the City of Culver City has implemented a mandatory seismic ordinance to reduce the risk of these existing potentially vulnerable buildings.

15.02.500 of the Culver City Municipal Code (Ordinance No. 2021-013) requires the mandatory Retrofit of existing wood-framed buildings with Soft, Weak, or Open-Front Walls. These types of buildings were commonly built up to the 1970's and have typically performed poorly in past earthquakes because of the weakened open Wall Line which oftentimes leads to substantial building damage or building collapse. Retrofit requirements apply to buildings where a permit for construction was applied for before October 23, 1978, or if no permit can be located, the structure is determined by the building official to have been built under Building Code standards enacted prior to October 23, 1978. The provisions of the ordinance requires that the Soft/Weak Wall Line be analyzed and strengthened (if required) after performing a structural analysis to determine if any deficiencies exist. A framework for the analysis is contained within the ordinance and in the following Seismic Design Guidelines.

The purpose of these Seismic Design Guidelines is to provide additional information and clarification to Civil or Structural engineers in order to comply with the Soft Story Ordinance for existing buildings with Soft, Weak, or Open-Front Wall Lines.

2.0 Definitions

BUILDING CODE is the current Building Code of the City of Culver City.

CRIPPLE WALL is a wood-framed stud wall extending from the top of the foundation wall to the underside of the lowest floor framing.

GROUND FLOOR is any floor within the wood-frame portion of a building whose elevation is immediately accessible from an adjacent grade by vehicles or pedestrians. The ground floor portion of the structure does not include any floor that is completely below grades.

HISTORICAL BUILDING is any building designated as "qualified historical building" as defined in Part 8, Title 24 of the California Code of Regulations.

OPEN-FRONT WALL LINE is an exterior Wall Line, without vertical elements of the lateral force-

resisting system, which requires tributary seismic forces to be resisted by diaphragm rotation or contains an excessive cantilever beyond parallel lines of shear walls. Diaphragms that cantilever more than 25% of the distance between lines of lateral force resisting elements from which the diaphragm cantilevers shall be considered excessive. Diaphragm cantilevers or exterior balconies of 6 feet or less in width shall not be considered excessive cantilevers.

OWNER or BUILDING OWNER is the individual(s), agent, firm, corporation, or entity having legal possession, equitable interest in the property, or rights to sanction evaluation or Retrofit of a building.

RETROFIT is an improvement of the lateral force system by alteration of existing structural elements and/or addition of new structural elements.

SOFT WALL LINE is a deficiency in a Wall Line in which the lateral stiffness is less than what is required by story drift limitations and deformation compatibility requirements of this guideline. In lieu of the engineering analysis required by this guideline to determine whether a Wall Line's lateral stiffness is less than the aforementioned story drift limitations and deformation compatibility requirements, a Soft Wall Line deficiency may be defined as a Wall Line in a Story where the wall stiffness is less than 70% of the stiffness of the exterior wall above for the direction under consideration.

STORY is as defined in the Building Code, but includes any basement or underfloor space of a building with Cripple Walls exceeding four feet in height.

STORY STRENGTH is the total strength of all seismic-resisting elements sharing the same story shear in the direction under consideration.

OF BUILDING CONFIGURATIONS are the Soft, Weak, or Open-Front Wall configurations as indicated in the Screening Report.

WALL LINE is any length of a wall along a principal axis of the building used to provide resistance to lateral loads.

WEAK WALL LINE is a deficiency of a Wall Line at the Ground Floor in which the wall strength is less than 80 percent of the strength of the wall above in the direction under consideration or is an exterior wall where the majority of the Ground Floor or basement portion of the structure contains an open floor space and the ground floor Story Strength is less than 80 percent of the Story Strength above.

3.0 RETROFIT SCOPE

The scope of the ordinance intends to reduce the risk of full or partial collapse in multi-story wood building containing exterior Soft, Weak, or Open-Front Walls (SWOF) lines. The ordinance therefore mandates the evaluation and possible strengthening of exterior SWOF lines around the building. The City has identified different building configurations that typically contain these SWOF lines as outlined in the screening report. Each building shall be categorized as one of these building configurations. Requirements in Section 3.1 shall be used in identifying SWOF lines that may require strengthening. Sections 3.2 and 3.3 shall then be used to determine overall strengthening scope depending on the building configuration.

Where a mixture of SWOF Building Configurations exist, the design professional must evaluate the scope of each configuration

3.1 Identification of SWOF Lines:

For configuration(s) A, B, C, D, and E, as referenced in the Screening Report, a SWOF Building shall be identified where a Ground Story contains a Weak Wall Line(s). For these SWOF configurations, the deficiency is specific to an individual Wall Line, identified where the cumulative wall segment strength between openings is less than 80% the cumulative wall segment strength on the floor immediately above.

For configuration(s) F and G, as referenced in the Screening Report, a SWOF Building shall be identified where a Ground Story contains a Weak Wall Line(s). For these configurations, the deficiency is identified where the total Story Strength on the Ground Floor is less than 80% of the Story Strength on the floor immediately above, including the contribution of all interior wall strength. In addition, for Configuration(s) F and G, the following applies:

- Story Strength shall be calculated in each orthogonal building direction separately.

- Where interior wall locations and openings are not documented in plan, it shall be permitted to assume the following wall strength: 20psf times floor plan area consisting of interior walls. This strength assumption should apply for each floor supporting interior walls in the relative Story Strength check.

The following two options may be used to identify SWOF Lines. It is noted that using the P-807 methodology does not mandate the use of the same methodology in the Retrofit design.

3.1.1 Prescriptive Requirements for Identification of SWOF Lines:

For the purposes of identifying SWOF lines for all configurations, relative strength calculations in the potential Weak Wall Line shall be evaluated and shall conform to the following requirements:

- Wall segments 2 feet or less shall be permitted to be disregarded in the Weak Wall Line evaluation provided the following conditions are met:
    - Disregarded wall segments for both the potential Weak Wall Line and the Story immediately above.
    - The cumulative 2-foot (or shorter) wall segment strength is less than 25% of the total wall strength for each Story.
- Adequate load path shall be demonstrated for all wall segments considered in the relative strength check.
- The difference in expected strength shall be considered where wall segments vary in material types between the Ground Floor and the Story above.
- Expected strengths of existing elements shall be determined in accordance with Table 4 of these guidelines when performing relative strength checks.

3.1.2 Alternate Method of Identification of SWOF Lines using P-807

As an alternate method of identifying SWOF lines as it relates to perimeter Wall Lines or Story Strength, as stated in Section 3.2 or Section 3.3 respectively of this guideline, it is acceptable to use Section 4.5 of FEMA P-807 as follows:

- Existing materials, wall openings, and overturning effects shall be considered in accordance with Equation no. 4-1 and 4-2 of FEMA P807.
- The input parameters Q_{ot}, Q_{open}, and L_w used in equations 4-1 and 4-2 of FEMA P807 shall be defined per Section 4.5 of FEMA P-807, along with limitations for wall segments and α as dictated in Section 4.5.2 of FEMA P-807.
- $V_w(\delta_{jh})$ and $V_w(\delta_j)$ shall be selected per Table 4 of these guidelines.
- Adequate load path shall be demonstrated for all wall segments being considered in the relative strength check.

3.2 SWOF Retrofit Requirements for Building Configuration(s) A, B, C, D, & E as identified in the Screening Report:

Evaluate or strengthen the existing Weak Wall Lines identified in Section 3.1 to meet the design

strength requirements in Section 5.

Strengthening scope may be limited to the following:

- Connections to the floor diaphragm directly above the new lateral force resisting system(s)
- The foundation of the new system must be included in the design.
- Where existing diaphragms ratios exceed 3:1, the existing diaphragm should be shown to be adequate, strengthened if needed, or new lateral force resisting lines should be added.

3.3 SWOF Retrofit Requirements for Building Configuration(s) F & G as identified in the Screening Report:

Evaluate or strengthen the existing Weak Wall Lines identified in Section 3.1 to meet the design strength requirements in Section 5.

Strengthening scope may be limited to the following:

- Cripple or full height walls in the perimeter of the open floor space in the targeted floor.
- Retrofit may be limited to wood framed wall and connections to the floor diaphragm directly above the open ground floor space and connections to the supporting concrete foundation or concrete or CMU wall below.
- Existing foundations supporting these wood framed walls shall be considered satisfactory and need not be analyzed/strengthened unless significant deterioration exist.
- Where existing diaphragms ratios exceed 3:1 (1 ½ : 1 for cantilevered diaphragm), the existing diaphragm should be shown to be adequate, strengthened if needed, or new lateral force resisting lines should be added.

4.0 Design Methods

The Retrofit shall meet the strength and stiffness prescribed herein including the following considerations:

- The lateral-load-path analysis shall include the resisting elements and connections from the wood frame diaphragm immediately above any Soft, Weak, or Open-Front Wall Lines and down to the foundation.
- Stories above the Weak Wall Line shall be considered in the analysis but need not be modified.
- Wall Lines along parking or similar open space shall be evaluated to determine the Soft, Weak, or Open-Front Wall Lines.
- Weakening the existing lateral force resisting system above the weak line or its load path shall not be permitted as a form of meeting the ordinance.
- New seismic Retrofits shall not reduce the capacity or compromise the stability of the existing gravity system.

5.0 ANALYSIS & DESIGN PARAMETERS

5.1 Building Design Base Shear

The minimum design base shear for buildings, including Historical Buildings, shall be 75 percent of the value specified in ASCE 7-16 Section 12.8.1.

5.2 Response Modification Factor, R. The value of R shall be per ASCE 7-16 Table 12.2-1 however, the value of R used in any direction shall not exceed the value at any Story above, in the same direction per ASCE 7-16, 12.2.3.1.

Exception:

- R need not be less than 3.5, provided the lateral force resisting system R Value as listed in ASCE 7-16, Table 12.2-1 are not less than 3.5.

R values greater than 3.5 shall meet the following requirements:

- Retrofit shall mitigate the Soft or Wea Wall Line as defined in the ordinance.
- The design professional shall perform additional investigation on the walls above the new system to prove the existing materials and details meet the requirements of ASCE 7-16, Table 12.2-1 for the proposed R value.

Investigation shall be documented and submitted to the Building Official for review and approval.

5.3 Seismic Weight. Following loads shall be considered as the minimum unless shown otherwise:

- 10 psf for partition loads per ASCE 7-16 chapter 12
- 15 psf minimum roof dead load or provide detailed dead load calculation
- 15 psf (+8 psf for stucco soffit cover in parking area as applicable) minimum floor dead load or provide detailed dead load calculation
- 15 psf exterior wall weight, per sf of wall, or provide detailed exterior wall dead load calculations
  - +15 psf for floor dead load due to existing concrete topping, if applicable
  - +5 psf for existing solar panels on the roof as applicable

5.4 Redundancy factor, ρ

ρ shall be 1.3 unless the criteria in ASCE 7-16 Section 12.3.4.2 is met for the line being strengthen. For drift calculation, members, and connection design loads using overstrength factor, ρ shall be 1.0.

5.5 Importance factor shall be equal to 1.0 for all residential buildings.

5.6 Vertical distribution of seismic forces over the height of the structure shall be based on ASCE 7-16 Section 12.8.3.

5.7 Story Drift Limitations

The calculated story drift for each retrofitted Story line shall not exceed the allowable deformation compatible with all vertical load-resisting elements and 0.025 times the Story height. Where a cantilever column system utilizes pole footings or single spread footings, soil interaction shall be considered when determining the drift.

5.8 Deflection amplification factor, Cd, and the overstrength factor, Ω_0, shall be as follows:

- For Lateral Force Resisting Systems using an R value equal to 3.5: 3.0 and 3.0, respectively.
- For A**5.9 P-delta effects** shall be considered for new lateral force resisting systems using the tributary area to the system. Where a cantilever column system utilizes pole footings or single spread footings, soil interaction shall be considered when evaluating P-delta effects.

5.10 Deformation Compatibility. All structural framing elements and their connections not required to be part of the lateral system, shall be adequate to maintain support of design dead and live loads when subject to expected deformation of seismic loads. Focus should be placed on the existing columns/post along the Retrofit line to ensure they are positively attached so they can maintain support of the vertical gravity loads during a seismic event.

Deformation compatibility shall also be satisfied for the vertical elements of the new lateral force resisting systems which rely on fixity at the base connection. To satisfy this requirement, the vertical elements of the lateral force resisting system shall be connected to the diaphragm and

designed for the forces associated with the drift in the perpendicular direction to the line of strengthening. Unless a full building analysis is performed to determine drift demands, a 3% drift demand shall be assumed. The analysis may account for flexibility in the foundation and connection.

5.11 Existing Materials

All existing components and materials shall be in sound conditions and constructed in conformance to the Culver City Municipal Code before they can be used to resist lateral loads.

Where allowable values for existing shear walls are required for the design of a Retrofit, it shall be permitted to use the values as follows unless a detailed verification of materials is performed by the engineer:

TABLE 1

EXISTING MATERIALS OR CONFIGURATION OF MATERIALS	ALLOWABLE VALUES (1) (3)
Wood stud walls with lath and plaster or stucco	100 lbs. per foot(2)
Plywood Sheathing	(See NDS SDPWS)

(1) Values provided may not be appropriate to calculate shear transfer connection capacity.
(2) These values can be combined with plywood shear walls at 50% of the value (i.e. 50 plf).
(3) Allowable values referenced from LABC 2018, Table no. 88-H

Where allowable values for existing wood diaphragms are required for the design of a Retrofit, it shall be permitted to use the values as follows unless a detailed verification of materials is performed by the engineer:

TABLE 2

EXISTING MATERIALS OR CONFIGURATION OF MATERIALS	ALLOWABLE VALUES (1) (3)
1. HORIZONTAL DIAPHRAGMS	
a. Roofs with straight sheathing and roofing applied directly to the sheathing.	100 lbs. per foot
b. Roofs with diagonal sheathing and roofing applied directly to the sheathing.	400 lbs. per foot
c. Floors with straight tongue-and-groove	150 lbs. per foot
d. Floors with straight sheathing and finished wood flooring(2)	300 lbs. per foot
e. Floors with diagonal sheathing and finished wood flooring.	450 lbs. per foot
f. Floors and roofs with straight sheathing and plaster applied to the joist or values for items 1 (a) and 1(c) rafters	Add 50 lbs. per foot to the allowable values for items 1(a) and 1(c)

(1) Values provided may not be appropriate to calculate shear transfer connection capacity.
(2) Engineer to investigate existing condition to confirm wood flooring is positively attached to straight sheathing (i.e. not floating).
(3) Allowable values referenced from LABC 2018, Table no. 88-H

For all other existing structural members, allowable design values are as follows unless a detailed

verification of materials is performed by the engineer:

TABLE 3

EXISTING MATERIALS OR CONFIGURATION OF MATERIALS	DESIGN PROPERTIES
1. Plain or reinforced concrete footings	f'_c = 2500 psi unless otherwise shown by tests
2. Douglas fir wood	No. 1 D.F.
3. Reinforcing steel	F_y = 40 ksi
4. Structural steel	F_y = 36 ksi

6.0 New Seismic Strengthening Systems and Limits

6.1 Special Steel Moment Frames (SMF)

- SMF shall be designed per AISC 341 E3 using a prequalified connection per AISC 358.
- At minimum, the top of the moment frame columns shall be braced per AISC 360 Appendix 6 unless a more detailed analysis is provided in accordance with AISC 360 Chapter C. See deformation compatibility section for additional requirements.

6.2 Intermediate Steel Moment Frames (IMF)

- IMF shall be designed per AISC 341 E2 using a prequalified connection per AISC 358.
- At minimum, the top of the moment frame columns shall be braced per AISC 360 Appendix 6 unless a more detailed analysis is provided in accordance with AISC 360 Chapter C. See deformation compatibility section for additional requirements.

6.3 Ordinary Steel Moment Frames (OMF)

- OMF Connections shall be designed per AISC 341 E1 meeting one of the requirements below:
  - Fully restrained moment connections designed per AISC 341 E1-6b (a), (b), or (c).
  - Partially restrained moment connections per AISC E1-6c.

- At minimum, the top of the moment frame columns shall be braced per AISC 360 Appendix 6 unless a more detailed analysis is provided in accordance with AISC 360 Chapter C. See deformation compatibility section for additional requirements.

6.4 Light-Frame Shear Walls shall be designed per ANSI/AF&PA NDS.

6.5 Special Cantilevered Column Systems (SCCS)

- SCCS columns shall comply with AISC 341 E6 and shall be designed using the load combinations including the amplified seismic load with overstrength factor. The design of SCCS shall consider soil interaction.
- A minimum of two columns are required per strengthened line.
- Minimum Column spacing shall be 8 ft.
- Cantilever column sections with eccentric loads (causing torsion in the column) shall consists of closed shapes that can resist torsion or additional bracing shall be provided at the top of the column to resolve the eccentricity.

6.6 Ordinary Cantilevered Column Systems (OCCS) are not permitted.

6.7 New Concrete Walls, Masonry Walls, or Steel Braced Frames are permitted provided the a full building analyses considering diaphragm stiffness and torsional behavior is performed per

ASCE 7-16 with design base shear requirements listed above or appropriate methodologies listed in the Alternative Design Methods section included in these guidelines.

6.8 Specialized Systems require a design criteria to be submitted to the building official per Section 8.1.

7.0 Additional Design Considerations

7.1 Horizontal Structural Irregularities as defined in ASCE 7-16 for buildings with 3 or more stories including either type 2, 3, 4 or 5 shall meet the additional requirements of those sections referenced in the table for the SWOF lines being considered.

7.2 Horizontal Diaphragms shall be designed as follows:

- Cantilever diaphragms shall be designed for shear transfer.
- Limit the existing diaphragm ratio to 3:1 by adding a new lateral resisting element.
- Where existing diaphragms are composed of diagonal sheathing, the wall or drag connections to the diaphragm shall use shear transfer clips on both sides

of the sheathing board, or shear transfer clips that have the ability to transfer out-of-plane forces.

7.3 Transfer Diaphragms shall consider the following:

- Where a diaphragm is utilized to transfer shear load to the new or existing lateral force resisting system from an existing wall above, the diaphragm shall be evaluated. Omega need not be considered if the diaphragm can be shown to satisfy the max load that can be delivered to the diaphragm.
- A maximum horizontal cantilever diaphragm of 10ft shall be permitted without the addition of a new lateral force resisting element if the diaphragm is designed for the horizontal transfer shear load.
- Transfer diaphragms composed of straight sheathing shall not be permitted where boards are oriented parallel to the lateral force resisting system. Strengthening shall be provided.

7.4 Ties and continuity. Design all the new elements in the lateral load resisting path to transfer seismic loads from the diaphragm to the foundation.

7.5 Collector elements. Design of collectors and drag struts shall be per ASCE 7-16 Section 12.10.2.1.

- Collectors shall not be longer than 60 ft between vertical lateral force resisting elements and 30 ft from ends.
- Minimum shear transfer length (length of LFRS plus collector length) shall be equal to the vertical LFRS design force (ASD) divided by the allowable diaphragm capacity in Table 2.

7.6 Steel Moment Frame Collector Elements

- Drag members, drag member connections to the frame, and drag splices shall be designed for the larger of $\Omega_0 F_x$, $\Omega_0 F_{px}$, and F_{px} min. Forces need not exceed F_{px} max.
- Connections from drag member to diaphragm and frame to diaphragm shall be designed for the larger of Fx, Fpx, and Fpx min. Forces need not exceed Fpx max

7.7 Light-Frame Shear Wall Collector Elements

- Drag members, drag member connections to walls, drag splices and connections from drag member to diaphragm and frame to diaphragm shall be designed for the larger of F_x, F_{px}, and F_{px} min. Forces need not exceed F_{px} max.
- Size and spacing of all existing elements in the shear path used in shear transfer calculations shall be clearly identified in the plans as “To be verified in field during construction”.

7.8 Perpendicular to open Wall Line. If side of open Wall Line is also open, then the Wall Line in perpendicular direction shall be checked for Soft/Weak Story definition and be retrofitted if

required. System should be design for entire line where diaphragm is continuous.

7.9 Foundations for New Lateral Force Resisting Systems shall be designed as follows:

- Foundation shall be designed for bearing, overturning, sliding, shear, flexure, and punching shear.
- Where the site contains geological site hazards such as fault rupture, liquefaction, landslide, and flood based on published maps, literature, historical knowledge or by any other assessment, new foundations shall be sufficiently tied to existing foundations in accordance with CBC Section 1809.13. New foundations may be tied to existing reinforced concrete slabs if the slab can be shown to be sufficient to transfer the forces to the existing building prescribed in CBC 1809.13.

Foundations and superstructure-to-foundation connections shall be designed per CBC 12.13.1.1.

- Exception:

For cantilever columns systems utilizing pole footings or single spread footings, Ω_0 level forces shall be applied.

- Use of CBC Alternative Load Combinations is allowed.
- Sliding check may be considered satisfied if minimum 2 feet thick footings are provided.
- Minimum presumptive load-bearing values per CBC Section 1806 may be assumed.
- For cantilever columns, systems utilizing pole footing or single spread footings the coefficient of sub-grade reaction shall be based on an approved geotechnical investigation.
- New foundations that are attached to existing foundation must account for eccentric loads as wells as overturning deformations.

7.10 Additional Anchorage Requirements for Buildings on Hillsides. Where a building within the scope of the ordinance or any portion thereof is constructed on or into a slope steeper than a 33% slope, the lateral-force-resisting system, at and below the base level diaphragm, shall also be analyzed for the effects of concentrated lateral loads caused at the building base from the hillside conditions and comply with the provisions of the Building Code. Existing foundations are not required to satisfy this section.

TABLE 4

EXISTING MATERIALS OR CONFIGURATION OF MATERIALS FOR SHEAR WALLS	**EXPECTED STRENGTH VALUES** (1) (2)
Stucco	333 plf (3)
Horizontal Wood Sheathing	171 plf (3)
Diagonal Wood Sheathing	913 plf (3)
Plaster on wood/metal lath	538 plf (3) (wood lath)
Gypsum Wall board	213 plf (3)
Plaster on gypsum lath	402 plf (3)
Plywood Sheathing	See SDPWS Table 4.3A multiply by 1.5 per ASCE 41 Section 12.4.3.6.2

(1) Expected strength wall capacities of gyp/stucco shall be considered additive when sheathed on both sides of a wall. Where plywood sheathing is used on one side and gyp/stucco on the other, the capacity of the gyp/stucco shall be reduced to 50%.
(2) Values provided may not be appropriate to calculate shear transfer connection capacity.
(3) Expected strength capacities referenced from FEMA P807, Table 4-1.

TABLE 5

EXISTING MATERIALS OR CONFIGURATION OF MATERIALS FOR DIAPHRAGMS	**EXPECTED STRENGTH VALUES** (1)
Single Straight Sheathing	120 plf (w/out wood flooring) (3) 1500 plf (w/ wood flooring) (2) (4)
Double Straight Sheathing	600 plf (chorded) (3) 400 plf (unchorded) (3)
Single Diagonal Sheathing	600 plf (chorded) (3) 420 plf (unchorded) (3) 1800 plf (w/ wood flooring) (2) (4)
Double Diagonal Sheathing	900 plf (chorded) (3) 625 plf (unchorded) (3)
Straight tongue-and-groove sheathing	300 plf (4)
Plywood Sheathing	See SDPWS Table 4.2C multiply by 1.5 per ASCE 41 Section 12.5.3.6.2

(1) Values provided may not be appropriate to calculate shear transfer connection capacity.
(2) Engineer to investigate existing condition to confirm wood flooring is positively attached to straight sheathing (i.e. not floating).
(3) Expect strength capacities referenced from ASCE 41-17 Table 12-2
(4) Expected strength capacity referenced from 2019 CEBC Table A108.1(1)

9.0 QUALITY ASSURANCE

9.1 Structural Observation

All structures affected by this ordinance require structural observations by this ordinance. The Owner shall employ the Engineer of Record responsible for the structural design or another registered Engineer designated by the Engineer of Record to perform structural observations (in person) as defined in the Building Code.

The designated design professional shall visit the site to verify applicable existing materials and framing details in the location of the new work. Where the condition of the materials is observed to be deteriorated or structurally compromised the design professional shall submit a testing and/or repair program for City review and approval. Where access is not available, the design professional shall clearly identify on the construction drawings the elements that need to be verified in the field prior to fabrication and erection.

All structures to be retrofitted require structural observation during construction in accordance with the Building Code. The design professional shall list on the construction drawings the milestones of when the contractor shall notify the design professional to visit the site.

9.2 Special Inspection

Special Inspections shall be provided as required by the Building Code. Additional inspections shall be noted on drawings as required by the Building Official.

10.0 Declarations

10.1 Engineer's or Architects Statement

At a minimum, the responsible engineer or architect shall provide the following statement on the approved plans:

"I am responsible for designing this building's seismic strengthening in compliance with the minimum standards of the Mandatory Seismic Strengthening Provisions for Existing Wood-Frame Buildings with Soft, Weak, or Open-Front Walls (Chapter 15.02.500)."

10.2 Owners Statement

At a minimum, the Owner or Owner's representative shall provide the following statement on the approved plans:

"I-------understand the seismic evaluation and strengthening performed under this project is limited to that specified in the Mandatory Seismic Strengthening Provisions For Existing Wood Frame Buildings With Soft Weak or Open-Front Walls (Chapter 15.02.500) which is intended to reduce the risk under a seismic event. I understand the full building has not been evaluated nor strengthened for other potential structural deficiencies that may cause a life safety concern, injury, or property damage risk under a seismic event".

11.0 INFORMATION REQUIRED ON RETROFIT PLANS

The following information shall be provided on the first page of the plans:

- A statement that clearly identifies the scope and extents of the Retrofit
- Roof/Floor Dead and Live Loads
- Risk Category
- Seismic importance factor, I_e
- Mapped spectral response accelerations parameters, S_s and S_1
- Site Class
- Design spectral response acceleration parameters, S_{DS} and S_{D1}
- Seismic design category
- Design base shear(s)
- Seismic response coefficient(s), C_s
- Response modification coefficient(s), R
- Interior wall capacities utilized in design.

In addition, a copy of the approved Screening Report shall be printed on the plans.