

ORDINANCE NO. 10-2007

AN ORDINANCE OF THE CITY OF FREMONT, CALIFORNIA, AMENDING FREMONT MUNICIPAL CODE TITLE VII (BUILDING REGULATIONS), CHAPTER 10 (EARTHQUAKE HAZARD REDUCTION REQUIREMENTS IN EXISTING WOOD FRAME RESIDENTIAL BUILDINGS WITH SOFT OR OPEN- FRONT WALLS) REGARDING THE RETROFIT OF SOFT STORY RESIDENTIAL BUILDINGS

The City Council of the City of Fremont does ordain as follows:

Section 1. Amendment to the heading of Chapter 10.

The heading of Fremont Municipal Code Title VII, Chapter 10 is amended to read as follows:

CHAPTER 10. EARTHQUAKE RETROFIT STANDARDS AND REQUIREMENTS FOR SOFT STORY RESIDENTIAL BUILDINGS

Section 2. Addition of Article 1 to Fremont Municipal Code Title VII, Chapter 10.

Fremont Municipal Code Title VII, Chapter 10 is amended and reorganized by adding Article 1 (commencing with section 7-10100) to read:

Article 1. General Provisions

Section 3. Reorganization and amendment of section 7-10100.

Fremont Municipal Code Title VII, Chapter 10, section 7-10100 is added to Article 1 and amended to read:

Sec. 7-10100 Title

This Chapter shall be known as “Soft-Story Residential Buildings Retrofit Ordinance.”

Section 4. Renumbering and amendment of section 7-10105 to 7-10101

Fremont Municipal Code Title VII, Chapter 10, section 7-10105 is renumbered section 7-10101, added to Article 1, and amended to read:

Sec. 7-10101 Purpose

This Chapter sets forth earthquake hazard reduction standards for existing wood frame multiunit residential buildings with soft-story, weak, or open-front walls, as identified in Section 7-10103, and establishes voluntary retrofit requirements for existing condominiums and mandatory retrofit requirements for apartments to strengthen the more vulnerable portions of these structures. The purpose of these standards is to promote the public welfare and safety by reducing the risk of death or injury that may result from the

effects of earthquakes on these structures. When fully followed, the minimum standards will considerably improve the performance of these buildings but will not necessarily prevent earthquake damage to retrofitted buildings.

Section 5. Renumbering and amendment of section 7-10110 to 7-10102

Fremont Municipal Code Title VII, Chapter 10, section 7-10110 is renumbered section 7-10102, added to Article 1, and amended to read:

Sec. 7-10102 Findings and intent.

- (a) The City of Fremont is located within Seismic Zone 4.
- (b) The City Council desires to lessen the risks to life and property of the residents of the City of Fremont posed by a major earthquake along the Hayward Fault.
- (c) Neither the Uniform Building Code nor the California Building Standards Code contain provisions governing the earthquake retrofit of soft-story residential buildings.
- (d) In 1999, the City of Fremont adopted this Chapter to notify owners of the potential earthquake hazard of soft-story residential apartment buildings, to provide standards for retrofitting soft-story structures, and to establish a goal of twelve months for voluntary compliance with this Chapter.
- (e) In 2003, the International Code Counsel published the first edition of the “International Existing Building Code.” Chapter A4 of that code, entitled “Earthquake Hazard Reduction in Existing Wood-Frame Residential Buildings with Soft, Weak, or Open-Front Walls”, was based on this Chapter.
- (f) In 2005, California Health and Safety Code sections 19162 and 19163 were amended to expressly authorize the cities to adopt by ordinance mandatory retrofit standards for soft story residential buildings that comply with a nationally recognized model code relating to the retrofit of existing buildings or substantially equivalent standards.
- (g) The current nationally recognized model code for the retrofit of soft story residential buildings is Appendix Chapter A4 of the International Existing Building Code. The provisions of this Chapter, as amended by Ordinance 10-2007, comply with or are substantially equivalent to Appendix Chapter A4 of the IEBC.
- (h) The City Council has determined to make this Chapter’s seismic hazard mitigation standards mandatory for apartment buildings containing soft or open wall lines and require that these buildings be retrofitted to comply with those standards within the timetable set forth herein.

Section 6. Renumbering and amendment of section 7-10115 to 7-10103.

Fremont Municipal Code Title VII, Chapter 10, section 7-10115 is renumbered section 7-

10103, added to Article 1, and amended to read:

Sec. 7-10103 Scope.

The provisions of this Chapter shall apply to wood-frame, multi-unit residential buildings constructed before January 1, 1978, where the ground floor portion of the wood frame structure contains parking or other similar open floor space that causes soft, weak, or open wall lines as defined in this Chapter, and having one or more levels above the ground floor. These buildings are hereinafter referred to as “soft-story” construction.

The criteria for these provisions is intended to achieve a life safety performance level for the building. Higher performance levels, in which damage to the building would be further reduced, may be obtained through more detailed evaluation and design.

Section 7. Renumbering and amendment of section 7-10120 to 7-10104.

Fremont Municipal Code Title VII, Chapter 10, section 7-10120 is renumbered section 7-10104, added to Article 1, and amended to read:

Sec. 7-10104 Definitions.

The following definitions shall apply for the purposes of this Chapter:

(a) *Apartment House* is a building or portion thereof containing three or more units and does not include condominiums as defined in Title VIII this Code.

(b) *Aspect ratio* is the ratio of the height of a wall section to its width. Wall height is measured from sill plate to top of double top plate.

(c) *Building Code* is the latest edition of the California Building Code, as adopted and modified in Chapter 1.

(d) *Cripple Wall* is a wood-framed stud wall extending from the top of the foundation wall to the underside of the lowest floor framing, and not enclosing a parking or otherwise habitable area.

(e) *Concrete Anchors.*

(1) *Expansion Anchor* is an approved mechanical fastener placed in hardened concrete, designed to expand in a self-drilled or pre-drilled hole of a specified size and engage the sides of the hole in one or more locations to develop shear and tension resistance to applied loads without grout, adhesive or drypack.

(2) *Chemical Anchor* is an approved metal fastener and structural epoxy anchoring device in hardened concrete or solid masonry. It is designed to adhere to the sides of a pre-drilled hole of specified size to develop shear and tension resistance to applied loads.

(3) *Undercut Anchor* is an approved mechanical fastener placed in hardened concrete, designed to expand into an undercut specially pre-drilled hole of specified size. The anchor engages the sides and undercut surfaces of the hole in one or more locations to develop high shear and tension resistance to applied loads without grout, adhesive or drypack.

(f) *Floor Diaphragm Aspect Ratio* is the ratio of the diaphragm depth to its width (diaphragm depth measured perpendicular to the open front).

(g) *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 level that is completely below adjacent grades.

(h) *Level* is a story, basement, or underfloor space of a building with cripple walls exceeding four feet in height.

(i) *Multi-Unit Residential Buildings* are hotels, lodging houses, congregate residences, apartment houses, and condominiums.

(j) *Nonconforming Structural Materials* are wall bracing materials which are no longer permitted by this Code. These methods or materials include, but are not limited to, cement or gypsum plaster, gypsum wallboard, diagonal or let-in bracing, straight or diagonal wood sheathing, particle board and structural wood panels.

(k) *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 excessive cantilever beyond parallel lines of shear walls. Diaphragms that cantilever more than twenty-five percent of the distance between adjacent lines of lateral force resisting elements shall be considered excessive. Exterior exit balconies shall not be considered as excessive cantilevers.

(l) *Retrofit* is an improvement of the lateral force resisting system by alteration of existing structural elements or addition of new structural elements.

(m) *Second Floor* is the first elevated floor level.

(n) *Soft Wall Line* is a wall line whose lateral stiffness is less than required by the story drift limitations or deformation compatibility requirements of this Chapter. In lieu of analysis, this may be defined as a wall line in a story where the story stiffness is less than 70 percent of the story above for the direction under consideration.

(o) *Story Strength* is the total strength of all compatible seismic resisting elements sharing the story shear in the direction under consideration.

(p) *Wall Diaphragm Aspect Ratio* is the ratio of the height of a wall section to its width.

(q) *Wall Line* is any length of a wall along a principal axis of the building used to provide resistance to lateral loads. Parallel wall lines separated by less than four feet shall be considered one wall line for the distribution of loads.

(r) *Weak Wall Line* is a wall line in a story where the story strength is less than 80 percent of the story above in the direction under consideration.

Section 8. New section 7-10105.

Fremont Municipal Code Title VII, Chapter 10 is amended by adding section 7-10105 to Article 1 to read:

Sec. 7-10105 Investigation; retrofit requirement

(a) *Comprehensive investigation and retrofit.* To comply with all the performance requirements of this Chapter, the owner(s) of a building within the scope of this Chapter shall cause to be made an investigation of the existing construction of the building and a structural analysis of the building by a civil or structural engineer or architect licensed by the State of California, including completion of the survey checklists set forth in section 7-10307. If the building does not meet the minimum earthquake performance standards specified in section 7-10301 or is non-compliant with an item on the survey checklist, the owner shall cause the building to be structurally altered to conform to those standards and correct any non-compliant items. Except as provided in section 8-22135 and as may otherwise be provided in this Code, the investigation, analysis and retrofit requirements described in this subsection are voluntary.

(b) *Mandatory retrofit for apartment houses.* The owner(s) of an apartment house that has been determined by the Building Official to be within the scope of this Chapter shall cause to be made an investigation of the existing construction of the building and a structural analysis of the building by a civil or structural engineer or architect licensed by the State of California to determine whether the building complies with the minimum performance standards of section 7-10301 for soft or open wall lines. If the building does not meet the performance standards for soft or open wall lines, the owner must cause the building to be structurally altered to conform to those performance standards within the following timeframe.

Rating Classification	Submittal of engineered plans and issuance of building permit	Completion of Construction
Group I: Apartment house with more than 10 units or more than two stories	24 months from date of notice	48 months from date of notice

Group II: Apartment house with 10 or less units and fewer than three stories high	36 months from date of notice	60 months from date of notice
---	----------------------------------	-------------------------------

(c) *Extension of retrofit deadline.* The owner of an apartment house may apply to the City for a financial hardship extension of the retrofit timeframes provided in subsection (b). The application shall be presented to the Building Official and contain a complete explanation of the reasons why compliance within the timeframes set forth in subsection (b) would constitute a financial hardship and the length of extension requested. The Building Official may grant or condition an appropriate extension or deny the request. The Building Official's decision may be appealed to the City Council as provided in section 1-5100 *et seq.*

(d) *Alternative to mandatory retrofit of substandard apartments.* When the owner of an apartment house that does not meet the performance standards of section 7-10301 for soft or open wall lines intends to demolish the building, the demolition shall be completed within the timeframe set forth in subsection (b), provided however that the Building Official may grant an extension up to two (2) years if all of the following conditions are met:

- (1) The owner applies for a Voluntary Demolition Extension in writing with all necessary supporting documents before the expiration deadline for obtaining a retrofit permit; and,
- (2) The owner posts a performance bond equal to the cost of demolition including any cost of relocating existing businesses; and,
- (3) The owner provides written statements from all of the building tenants acknowledging receipt of the owner's notice of intent to demolish the premises on a specific date and agreeing to vacate the building no later than 90 days before that date.

Section 9. Renumbering and amendment of section 7-10180 to section 7-10106.

Fremont Municipal Code Title VII, Chapter 10, section 7-10180 is renumbered section 7-10106, added to Article 1, and amended to read:

Sec. 7-10106 Waiver of certain plan check and building fees.

Plan check and building permit fees for mandated soft-story apartment building retrofit projects which are submitted after the effective date of the ordinance adopting this section shall be waived subject to the following limitations:

- (a) All required retrofit construction work is completed according to the timetables

specified in this Chapter.

(b) The scope of work for which the above fees are refundable is limited to the seismic retrofit of a soft-story building and provision of disabled access compliances triggered by any seismic retrofit.

(c) Any additional work done in conjunction with seismic retrofit will be assessed and fees will be charged in accordance with the fee provisions applicable to work under Chapter 1.

(d) Plan check fees beyond the third cycle of review, plan check fees for revisions to approved plans, and re-inspection fees shall not be waived and shall be assessed on a per-hour basis.

(e) The provisions of this section do not apply to residential condominium conversions projects under section 8-22135.

Section 10. New section 7-10107.

Fremont Municipal Code Title VII, Chapter 10 is amended by adding section 7-10107 to Article 1 to read:

Sec. 7-10107 Violation and remedies

(a) Any apartment building not in compliance with the mandatory retrofit requirements of this Chapter is deemed a public nuisance.

(b) It shall be unlawful for any person, firm or corporation to maintain, use or occupy an apartment building that is not in compliance with the mandatory retrofit requirements of this Chapter, and any person who violates or causes or permits another person to violate this provision is guilty of a misdemeanor that may be charged as set forth in section 1-3100. For purposes of this section, any person includes an owner, lessor, sublessor, manager, or person in control of a building subject to this Chapter, but shall not include tenants in residential units.

(c) All remedies available to the City for correcting violations of any other Chapter in this Code shall be available to remedy violations of this Chapter. The remedies described herein are cumulative and in addition to any other remedies available for violation of the is Chapter.

(d) The Building Official may order an apartment building subject to this Chapter vacated and order the owner to demolish the building if the Building Official determines that vacating the building will not adequately mitigate the earthquake hazard to adjacent property or the general public. Should the owner refuse to demolish the building, the City may hire a contractor to demolish the building and place a lien on the property for any costs, including City administrative costs, incurred in such an action. For purposes of this section, the procedures set forth in the Fremont Municipal Code shall be followed.

Section 11. Addition of Article 2 to Fremont Municipal Code Title VII, Chapter 10.

Fremont Municipal Code Title VII, Chapter 10 is amended and reorganized by adding Article 2 (commencing with section 7-10201) to read:

Article 2. Notification, Recordation and Appeal

Section 12. Renumbering and amendment of section 7-10125 to 7-10201.

Fremont Municipal Code Title VII, Chapter 10, section 7-10125 is renumbered section 7-10201, added to Article 2, and amended to read:

Sec. 7-10201 Notice of determination.

(a) Whenever the Building Official determines that any multi-unit apartment building contains soft-story construction, the Building Official shall notify the owner(s) of the building of the standards of this Chapter. The failure of the Building Official to give notice as set forth in this section shall not otherwise affect the owner's obligation to comply with this Chapter.

(b) The Building Official shall issue a notice to the owner(s) of record of the building containing the following information:

- (1) The street address and Assessor's Parcel Number of the subject building.
- (2) The potential for seismic hazard due to the soft-story construction of the building.
- (3) The standards for mandatory seismic retrofit and the applicable time frames.
- (4) Notification of recordation of a Notice of Potentially Hazardous Structure.
- (5) The name and telephone number of a City employee who will be able to answer questions concerning the ordinance and notice.
- (6) The appeal procedures of Section 7-10203.

(c) The notice shall be served upon the owner(s) of record either personally or by depositing a copy of the notice in the U.S. Mail, postage prepaid, return receipt requested, addressed to the owner(s) at the last address listed on the last equalized assessment roll of the county. If no address appears on the last equalized assessment roll of the county or is known to the Building Official, a copy of the notice shall be mailed, by first class mail, addressed to the owner(s) of record, to the address of the subject building. The failure of any owner or other person to receive notice shall not affect the validity of the proceedings under this Chapter.

(d) Service of the notice shall be deemed complete upon deposit in the mail as set forth in this section.

(e) Upon service of the notice, the Building Official shall complete a declaration certifying the date and manner in which the notice was served. If the Building Official receives a returned receipt card acknowledging service of the notice, the declaration shall be amended by attaching the return receipt.

Section 13. Repeal of section 7-10130.

Fremont Municipal Code Title VII, Chapter 10 is amended by repealing section 7-10130.

Note: As set forth in this ordinance, the text of the first paragraph of repealed section 7-10130 was renumbered without substantial change as new Section 7-10201 (c) and the text of the second paragraph of repealed section 7-10130 was renumbered as new Section 7-10201 (e).

Section 14. Renumbering and amendment of section 7-10135 to 7-10202.

Fremont Municipal Code Title VII, Chapter 10, section 7-10135 is renumbered section 7-10202, added to Article 2, and amended to read:

Sec. 7-10202 Recordation of Notice.

At the time the notice described in section 7-10201 is served on the owner(s) of record, the Building Official shall cause to be filed with the Office of the County Recorder a "Notice of Potentially Hazardous Structure," setting forth the determination of the Building Official and the standards of this Chapter.

Section 15. Renumbering and amendment of section 7-10140 to 7-10203.

Fremont Municipal Code Title VII, Chapter 10, section 7-10140 is renumbered section 7-10203, added to Article 2, and amended to read:

Sec. 7-10203 Appeal of Determination.

The notice of determination may be appealed to the Building Official within thirty (30) days of the date of service of the notice. The appeal must be filed with the Building Official in writing stating the grounds for the appeal clearly and concisely, and must be accompanied by a letter of findings by a registered architect or civil or structural engineer stating why the identified building is not within the scope of this Chapter, or other reasons why the provisions of this Chapter should not apply. If the owner is dissatisfied with the Building Official's determination, he or she may appeal the Building Official's decision to the City Council, or other designated body.

Section 16. Renumbering and amendment of section 7-10145 to 7-10204.

Fremont Municipal Code Title VII, Chapter 10, section 7-10145 is renumbered section 7-10204, added to Article 2, and amended to read:

Sec. 7-10204. Recordation of Rescission.

If, after issuance of the notice, a building is determined by the Building Official not to be subject to the standards of this Chapter, the Building Official shall file in the Office of the County Recorder a certificate rescinding the Notice of Potentially Hazardous Structure and finding the building not to be subject to the standards of this Chapter.

Section 17. Renumbering and amendment of section 7-10150 to 7-10205.

Fremont Municipal Code Title VII, Chapter 10, section 7-10150 is renumbered section 7-10205, added to Article 2, and amended to read:

Sec. 7-10205. Recordation of Compliance.

After completion of retrofitting in compliance with the standards of this Chapter, the Building Official shall file in the Office of the County Recorder a finding that the building is in compliance with the standards of this Chapter.

Section 18. Addition of New Article 3 to Fremont Municipal Code Title VII, Chapter 10.

Fremont Municipal Code Title VII, Chapter 10 is amended and reorganized by adding Article 3 (commencing with section 7-10301) to read:

Article 3. Design and Construction

Section 19. Renumbering and amendment of section 7-10155 to 7-10301.

Fremont Municipal Code Title VII, Chapter 10, section 7-10155 is renumbered section 7-10301, added to Article 3, and amended to read:

Sec. 7-10301. Performance Standards.

(a) Buildings within the scope of this Chapter shall be analyzed, designed and constructed in conformance with the Building Code, except as modified by this Chapter, and shall conform to sections 7-10302 and 7-10304.

EXCEPTION: The seismic retrofit of buildings that meet the limitations and additional conditions for prescriptive measures under section 7-10303 may be constructed according to those prescriptive measures without complying with 7-10302.

(b) No alteration of the existing force-resisting or vertical load-carrying system shall reduce the strength or stiffness of the existing structure.

(c) When any portion of a building within the scope of this Chapter is constructed on or into a slope steeper than one unit vertical in three units horizontal, the lateral-force-resisting system at and below the base level diaphragm shall be analyzed for the effects of concentrated lateral forces at the base due to this hillside condition.

Section 20. Renumbering and amendment of section 7-10160 to 7-10302.

Fremont Municipal Code Title VII, Chapter 10, section 7-10160 is renumbered section 7-10302, added to Article 3, and amended to read:

Sec. 7-10302 Analysis and retrofit

(a) *Scope of analysis.* This Chapter requires the alteration, repair, replacement or addition of structural elements and their connections to meet the strength and stiffness requirements herein. The lateral load path analysis shall include the resisting elements and connections from the wood diaphragm above any soft, weak or open front wall lines to the foundation soil interface or the upper level of a rigid substructure such as concrete subterranean or podium below. The top story of any building need not be analyzed. The lateral load path analysis for added structural elements shall also include evaluation of the allowable soil bearing and lateral pressures in accordance with the Building Code.

EXCEPTION: When an open front, weak or soft wall line exists due to parking at the ground level of a two-level building and the parking area is less than 20% of the ground floor level, then only the wall lines in the open, weak or soft directions of the enclosed parking area need comply with the provisions of this Chapter.

(b) *Design base shear.* The design base shear in a given direction shall be 75% of the base shear required for similar new buildings as set forth in the Building Code.

(c) *Vertical distribution of forces.* The total seismic force shall be distributed over the height of the structure based on the Building Code.

(d) *Weak story limitation.* Weak story construction shall be strengthened to the lesser of:

1. Ω_0 times the story shear prescribed by subsection (b) and (c).
2. In two-story buildings up to 30 feet in height, 65% of the strength of the story above. In all other buildings, 80% of the strength of the story above.

(e) *Story drift limitation.* The calculated story drift for each retrofitted level shall not exceed the allowable deformation compatible with all vertical load resisting elements and be no more than 0.025 times the story height. The calculated story drift shall not be reduced by the effects of horizontal diaphragm stiffness but shall be increased when these effects produce rotation.

The effects of rotation and soil stiffness shall be included in the calculated story drift when lateral loads are resisted by vertical elements whose required depth of embedment is determined by pole formulas such as Formula (6A-1) and (6A-2) in Building Code Section 1806.8.2. The coefficient of variation of subgrade reaction used in the deflection calculations shall be provided from an approved geotechnical engineering report or other approved methods.

(f) *P effects*. The requirements of the Building Code regarding P-delta effects shall apply except as modified herein. All structural framing elements and their connections, not required by design to be part of the lateral-force resisting system, shall be designed and/or detailed to be adequate to maintain support of design dead plus live loads when subjected to the expected deformations caused by seismic forces. The stress analysis of cantilever columns shall use a buckling factor of 2.1 for the direction normal to the axis of the beam.

(g) *Ties and continuity*. All parts of the structure included in the scope of this section shall be interconnected and the connection shall be capable of resisting the seismic force created by the parts being connected.

(h) *Cripple walls*. Cripple walls braced with nonconforming structural materials shall be braced in accordance with this Chapter. When a single top plate exists in the cripple wall, all end joints in the top plate shall be tied.

(i) *Collector elements*. Collector elements shall be provided which can transfer the seismic forces originating in other portions of the building to the elements within the scope of this section.

(j) *Horizontal diaphragms*. The strength of an existing horizontal diaphragm sheathed with wood structural panels or diagonal sheathing need not be investigated unless the diaphragm is required to transfer lateral forces from vertical elements of the seismic-force-resisting system above the diaphragm to elements below the diaphragm because offset in placement of the elements. Wood diaphragms with stories above shall not be allowed to transmit lateral forces by rotation or cantilever except as allowed by the Building Code; however, rotational effects shall be accounted for when unsymmetric wall stiffness increases shear demands.

EXCEPTION: Diaphragms that cantilever 25 % or less of the distance between lines of lateral-load resisting elements from which the diaphragm cantilevers may transmit their shears by cantilever, provided that rotational effects on shear walls parallel and perpendicular to the load are taken into account.

(j) *Wood-framed shear walls*. Wood-framed shear walls shall have strength and stiffness to resist the seismic loads and shall conform to the requirements of this section.

(1) *Gypsum or plaster products*. Gypsum or cement plaster products shall not be used to provide lateral resistance in a soft or weak story or in a story with an open-front wall line, whether or not new elements are added to mitigate the soft, weak or open-front condition

(2) *Wood structural panels*.

(A) *Drift limit*. Wood structural panel shear walls shall meet the story drift limitation of this section. Conformance to the story drift limitation shall be determined by approved testing or calculation, not by the use of an aspect ratio. Calculated deflection shall be determined according to International

Building Code Equation 23-1 and shall be increased by 25%. Contribution to the shear wall deflection from the anchor or tie-down slippage shall also be included. The slippage contribution shall include the vertical elongation of the metal components, the vertical slippage of the connectors to framing members, localized crushing of wood due to bearing loads and shrinkage of the wood elements because of changes in moisture content as a result of aging. The total vertical slippage shall be multiplied by the shear panel aspect ratio and added to the total horizontal deflection. Individual shear panels shall be permitted to exceed the maximum aspect ratio, provided the allowable story drift and allowable shear capacities are not exceeded.

- (B) *Openings.* Shear walls are permitted to be designed for continuity around openings in accordance with the building code. Blocking and steel strapping shall be provided at corners of the openings to transfer forces from discontinuous boundary elements into adjoining panel elements. Alternatively, perforated shear wall provisions of the building code are permitted to be used.
- (C) *Wood species of framing members.* Allowable shear values for wood structural panels shall consider the species of the framing members. When the allowable shear values are based on Douglas fir-larch framing members, and framing members are constructed of other species of lumber, the allowable shear values shall be multiplied by the following factors: 0.82 for species with specific gravities greater than or equal to 0.42 but less than 0.49, and 0.65 for species with specific gravities less than 0.42. Redwood shall use a factor of 0.65 and hem fir shall use a factor of 0.82 unless otherwise approved.
- (3) *Substitution for 3-inch (76 mm) nominal width framing members.* Two 2-inch (51 mm) nominal width framing members shall be permitted in lieu of any required 3-inch (76 mm) nominal width framing member when the existing and new framing member are of equal dimensions, are connected as required to transfer the in-plane shear between them, and when the sheathing fasteners are equally divided between them.
- (4) *Hold-down connectors.*
 - (A) *Expansion anchors in tension.* Expansion anchors that provide tension strength by friction resistance shall not be used to connect hold-down devices to existing concrete or masonry elements. Expansion anchors that provide tension strength by bearing (commonly referred to as "undercut" anchors) shall be permitted.
 - (B) *Required depth of embedment.* The required depth of embedment or edge distance for the anchor used in the hold-down connector shall be provided in the concrete or masonry below any plain concrete slab unless satisfactory evidence is submitted to the Building Official that shows that the concrete slab and footings are of monolithic construction.

- (C) *Required preload of bolted hold-down connectors.* Bolted hold-down connectors shall be preloaded to reduce slippage of the connector. Preloading shall consist of tightening the nut on the tension anchor after the placement but before the tightening of the shear bolts in the panel flange member. The tension anchor shall be tightened until the shear bolts are in firm contact with the edge of the hole nearest the direction of the tension anchor. Hold-down connectors with self-jigging bolt standoffs shall be installed in a manner to permit preloading.

Section 21. Renumbering and amendment of section 7-10165 to 7-10303.

Fremont Municipal Code Title VII, Chapter 10, section 7-10165 is renumbered section 7-10303, added to Article 3, and amended to read:

Sec. 7-10303. Prescriptive measures for soft story.

(a) *Limitation.* These prescriptive measures shall apply only to two-story building and only when deemed appropriate by the Building Official. These prescriptive measures rely on rotation of the second floor diaphragm to distribute the seismic load between the side and rear walls of the ground floor open area. In the absence of an existing floor diaphragm of wood structural panel or diagonal sheathing, a new wood structural panel diaphragm of minimum thickness of $\frac{3}{4}$ inch (19 mm) and with 10d common nails at 6 inches (152 mm) on center shall be applied.

(b) *Additional conditions.* To qualify for these prescriptive measures, the following additional conditions need to be satisfied by the retrofitted structure:

- (1) Diaphragm aspect ratio L/W is less than 0.67, where W is the diaphragm dimension parallel to the soft, weak or open-front wall line and L is the distance in the orthogonal direction between that wall line and the rear wall of the ground floor open area.
- (2) Minimum length of side shear walls = 20 feet (6096 mm).
- (3) Minimum length of rear shear wall = $\frac{3}{4}$ of rear wall.
- (4) No plan or vertical irregularities other than a soft, weak or open-front wall line.
- (5) Roofing weight less than or equal to 5 pounds per square foot (240 N/m²).
- (6) Aspect ratio of the full second floor diaphragm meets the requirements of the Building Code for new construction.

(c) *Performance.* The improved earthquake performance of the structure due to the proposed prescriptive measures varies and is greatly controlled by all of the following: proximity to the fault line, soil type, weight of roof and floor above, quality of existing walls, posts and columns and their connections to the floor diaphragm, and the quality of construction provided in order to comply with the prescriptive measures. The

implementation of the proposed measures is not intended to improve the earthquake performance of the building above the first story.

(d) *Minimum required retrofit.*

(1) *Anchor bolt size and spacing.* The anchor bolt size and spacing shall be a minimum of ¾ inch (19 mm) in diameter at 32 inches (813 mm) on center. Where existing bolts are inadequate, new steel plates bolted to the side of the foundation and nailed to the sill may be used, such as an approved connector.

(2) *Connection to floor above.* Shear wall top plates shall be connected to blocking or rim joist at upper floor with a minimum of 18-gage galvanized steel angle clips 4 ½ inches (114 mm) long with 12-8d nails spaced no farther than 16 inches (406 mm) on center, or by equivalent shear transfer methods.

(3) *Shear wall sheathing.* The shear wall sheathing shall be a minimum of 15/32 inch (11.9 mm) 5-ply structural I with 10d nails at 4 inches (102 mm) on center at edges and 12 inches (305 mm) on center at field; blocked all edges with 3 by 4 or larger. Where existing sill plates are less than 3-by thick, place flat 2-by on top of sill between studs, with flat 18-gage galvanized steel clips 4 ½ inches (114 mm) long with 12-8d nails or 3/8-inch-diameter (9.5 mm) lags through blocking for shear transfer to sill plate. Stagger nailing from wall sheathing between existing sill and new blocking. Anchor new blocking to foundation as specified above.

(4) *Shear wall hold-downs.* Shear walls shall be provided with hold-down anchors at each end. Two hold-down anchors are required at intersecting corners. Hold-downs shall be approved connectors with a minimum 5/8-inch diameter (15.9 mm) threaded rod or other approved anchor with a minimum allowable load of 4,000 pounds (17.8 kN). Anchor embedment in concrete shall not be less than 5 inches (127 mm). Tie-rod systems shall not be less than 5/8 inch (15.9 mm) in diameter unless using high strength cable. Threaded rod or high strength cable elongation shall not exceed 5/8 inch (15.9 mm) using design forces.

Section 22. Addition of new section 7-10304.

Fremont Municipal Code Title VII, Chapter 10 is amended by adding section 7-10304 to Article 3 to read:

Sec. 7-10304. Materials of construction.

(a) *New materials.* All materials approved by the Building Code, including their appropriate allowable stresses and minimum aspect ratios, shall be permitted to meet the requirements of this Chapter.

(b) *Allowable foundation and lateral pressures.* The use of default values from the Building Code for continuous and isolated concrete spread footings shall be permitted. For soil that supports embedded vertical elements, section 7-10302(e) shall apply.

(c) *Existing materials.* All existing materials shall be in sound condition and constructed in conformance to the Building Code before they can be used to resist the lateral loads prescribed in this Chapter. The verification of existing material conditions and their conformance to these requirements shall be made by physical observation reports, material testing or record drawings as determined by the structural designer and approved by the Building Official.

(1) *Horizontal wood diaphragms.* Allowable shear values for existing horizontal wood diaphragms that require analysis under section 7-10302 may be taken from the following table. The values in the table shall be used for allowable stress design. Design forces based on strength design shall be reduced to allowable stress levels before comparison with the limiting values in the table.

EXISTING MATERIALS OR CONFIGURATIONS OF MATERIALS	ALLOWABLE VALUES x 14,594 for N/m
1. Horizontal diaphragms. 1.1. Roofs with straight sheathing and roofing applied directly to the sheathing 1.2. Roofs with diagonal sheathing and roofing applied directly to the sheathing 1.3. Floors with straight tongue-and-groove sheathing 1.4. Floors with straight sheathing and finished wood flooring with board edges offset or perpendicular 1.5. Floors with diagonal sheathing and finished wood flooring	-100 lbs. per ft. for seismic shear 250 lbs. per ft. for seismic shear 100 lbs. per ft. for seismic shear 500 lbs. per ft. for seismic shear 600 lbs. per ft. for seismic shear
2. Crosswalls 2.1. Plaster on wood or metal lath 2.2. Plaster on gypsum lath 2.3. Gypsum wallboard, unblocked edges 2.4. Gypsum wallboard, blocked edges	Per side: 200 lbs. per ft. for seismic shear 175 lbs. per ft. for seismic shear 75 lbs. per ft. for seismic shear 125 lbs. per ft. for seismic shear
3. Existing footings, wood framing, structural steel and reinforced steel 3.1. Plain concrete footings 3.2. Douglas fir wood 3.3. Reinforcing steel 3.4. Structural steel	$f_c = 1,500$ psi (10.3 MPa) unless otherwise shown by tests Allowable stress same as D.E No. 1d $F_s = 18,000$ psi (124 MPa) maximum $F_s = 20,000$ psi (138 MPa) maximum

For SI: 1 foot = 304.8 mm.

- a. Material must be sound and in good condition.
- b. A 1/3 increase in allowable stress is not allowed.
- c. Shear values of these materials may be combined, except the total combined value shall not exceed 300 pounds per foot.
- d. Stresses given may be increased for combination of loads as specified in the building code.

(2) *Wood structural-panel shear walls.*

(A) *Allowable nail slip values.* The use of box nails an unseasoned lumber are permitted to be assumed. When the required drift calculations of section 7-10302(j)(2)(A) (drift limit for wood-framed shear walls) rely on the slip values for common nails or surfaced dry lumber, their use in construction

shall be verified by exposure. The design value of the box nails shall be assumed to be similar to that of common nails having the same diameter. Verification of surfaced dry lumber shall be by identification conforming to the Building Code.

(B) *Plywood panel construction.* When verification of the existing plywood materials is by use of record drawings alone, the panel construction for plywood modulus “G” shall be assumed equal to 50,000 pounds per square inch (345 MPa).

(3) *Existing wood framing.* Wood framing is permitted to use the design stresses specified in the building code under which the building was constructed or other stress criteria approved by the building official.

(4) *Structural steel.* All existing structural steel shall be permitted to use the allowable stresses for Grade A36. Existing pipe or tube columns shall be assumed to be of minimum wall thickness unless verified by testing or exposure.

(5) *Strength of concrete.* All existing concrete footings shall be permitted to be assumed to be plain concrete with compressive strength of 2,000 pounds per square inch (13.8 MPa). Existing concrete compressive strength taken greater than 2,000 pounds per square inch (13.8 MPa) shall be verified by tested, record drawings or department records.

(6) *Existing sill plate anchorage.* Existing cast-in-place anchor bolts shall be permitted to use the allowable service loads for bolts with proper embedment when used for shear resistance to lateral loads.

Section 23. Renumbering and amendment of section 7-10170 to 7-10305.

Fremont Municipal Code Title VII, Chapter 10, section 7-10170 is renumbered section 7-10305, added to Article 3, and amended to read:

Sec. 7-10305 Required information on plans.

(a) *General.* The plans shall show all necessary dimensions and materials for plan review and construction and shall accurately reflect the results of the engineering investigation and design. Details, specific to the actual condition found, shall be shown on the drawings to assure installation of all elements required for construction of the necessary complete load path.

(b) *Existing construction.* The plans shall show the existing diaphragm and shear wall sheathing and framing materials, fastener type and spacing, diaphragm and shear wall connections, continuity ties, and collector elements. The plans shall also show the portion of the existing materials that needs verification during construction.

(c) *New construction.*

(1) *Foundation plan elements.* The foundation plan shall include the size, type, location and spacing of all anchor bolts with the required depth of embedment, edge and end distance; the location and size of all columns for braced or moment frames; referenced details for the connection of braced or moment frames to their footing and referenced sections for any grade beams and footings.

(2) *Framing plan elements.* The framing plan shall include the width, location and material of shear walls; the width, location and material of frames; references on details for the column to beam connectors, beam to wall connections, and shear transfers at floor and roof diaphragms; and the required nailing and length for wall top plate splices.

(3) *Shear wall schedule, notes and details.* Shear walls shall have a referenced schedule on the plans that includes the correct shear wall capacity in pounds per foot; the required fastener type, length, gauge and head size; and a complete specification for the sheathing material and its thickness. The schedule shall also show the required location of 3 inch nominal or two 2 inch nominal edge members; the spacing of shear transfer elements such as framing anchors or added sill plate nails; the required hold-down with its bolt, screw or nail sizes; and the dimensions, lumber grade and species of the attached framing member.

Notes shall show required edge distance for fasteners on structural wood panels and framing members; required flush nailing at the plywood surface; limits of mechanical penetrations; and the sill plate material assumed in the design. The limits of mechanical penetrations shall also be detailed showing the maximum notching and drilled hole sizes.

(4) *General notes.* General notes shall show the requirements for material testing, special inspection, structural observation and the proper installation of newly added materials.

(5) *Engineer's or architect's statement.* The responsible engineer or architect shall provide the following statements on the approved plans:

"I am responsible for designing this building's seismic strengthening in compliance with the minimum regulations of this Chapter," and when applicable, "The registered deputy inspector, required as a condition of the use of structural design stresses requiring continuous inspection, will be responsible to me."

Section 24. Addition of new section 7-10306.

Fremont Municipal Code Title VII, Chapter 10 is amending by adding section 7-10306 Article 3 to read:

Sec. 7-10306 Structural observation, testing and inspection.

(a) Structural observation, in accordance with Building Code, shall be required for all structures in which seismic retrofit is being performed in accordance with this Chapter.

Structural observation shall include visual observation of work for conformance with the approved construction documents and confirmation of existing conditions assumed during design.

(b) Structural testing and inspection for new construction materials shall be in accordance with the Building Code, except as modified by this Chapter.

Section 25. Renumbering and amendment of section 7-10175.

Fremont Municipal Code Title VII, Chapter 10, section 7-10175 is renumbered section 7-10307, added to Article 3, and amended to read:

Sec.7-10307 Basic structural checklist

The following checklists apply to the voluntary investigation and analysis of buildings under section 7-10105(a).

(a) Building systems

compliant	non compliant	n/a	BUILDING SYSTEMS
✓	✓	✓	
			LOAD PATH: The structure shall contain one complete load path for seismic force effects from any horizontal direction that serves to transfer the inertial forces from the mass to the foundation.
			WEAK STORY: The strength of the lateral-force system in any story shall not be less than 80% of the strength in an adjacent story above or below.
			SOFT STORY: The stiffness of the lateral-force resisting system in any story shall not be less than 70% of the stiffness in an adjacent story above or below or less than 80% of the average stiffness of the three stories above or below.
			VERTICAL DISCONTINUITIES: All vertical elements in the lateral-force resisting systems shall be continuous to the foundation.
			DETERIORATION OF WOOD: There shall be no signs of decay, shrinkage, splitting, fire damage, or sagging in any of the wood members and none of the metal accessories shall be deteriorated, broken, or loose.
			WALL ANCHORAGE: Exterior concrete or masonry walls shall be anchored for out-of-plane forces at each diaphragm level with steel anchors

			or straps that are developed into the diaphragm. Straps shall be minimum 7 gauge.
--	--	--	---

(b) Vertical lateral force resisting system

compliant	non compliant	n/a	VERTICAL LATERAL FORCE RESISTING SYSTEM
✓	✓	✓	
			REDUNDANCY: The number of lines of shear walls in each principal direction shall be greater than or equal to 2.
			STUCCO (EXTERIOR PLASTER) SHEAR WALLS: Multistory buildings shall not rely on exterior stucco walls as the primary lateral force-resisting systems.
			GYPSUM WALLBOARD OR PLASTER SHEAR WALLS: Interior plaster or gypsum wallboard shall not be used as shear walls on buildings over one story in height.
			NARROW WOOD SHEAR WALLS: Narrow wood shear walls with an aspect ratio greater than 2 to 1 for Life Safety shall not be used to resist lateral forces developed in the building.
			WALLS CONNECTED THROUGH FLOORS: Shear walls shall have interconnection between stories to transfer overturning and shear forces through the floor.
			HILLSIDE SITE: For a sloping site greater than 1 vertical to 3 horizontal and with greater than one-half story above the base, the base shear in the downhill direction, including forces from the base level diaphragm, shall be resisted through primary anchors from diaphragm struts or collectors provided in the base level framing to the foundation.
			CRIPPLE WALLS: All cripple walls below first floor level shear walls shall be braced to the foundation with shear elements.

(c) Connections

compliant	non compliant	n/a	CONNECTIONS
✓	✓	✓	
			WOOD POSTS: There shall be a positive connection of wood posts to the foundation.
			WOOD SILLS: All wood sills shall be bolted to the foundation.
			GIRDER/COLUMN CONNECTION: There shall be a positive connection between the girder and the column support.
			WOOD SILL BOLTS: Sill bolts shall be spaced at 6 ft. or less, with proper edge distance provided for wood and concrete.

(d) Horizontal lateral force resisting system

compliant	non compliant	n/a	HORIZONTAL LATERAL FORCE RESISTING SYSTEM ¹
✓	✓	✓	
			OPENINGS: Walls with garage doors or other large openings shall be braced with plywood shear walls or shall be supported by adjacent construction through substantial positive ties.
			HOLD DOWN ANCHORS: All walls shall have properly constructed hold down anchors.
			DIAPHRAGM CONTINUITY: The diaphragms shall not be composed of split level floors. In wood buildings, the diagrams shall not have expansion joints.
			STRAIGHT SHEATHING: All straight sheathed diaphragms shall have aspect ratios less than 2 to 1.
			SPANS: All wood diaphragms with spans greater than 24 feet shall consist of wood structural panels or diagonal sheathing. Wood commercial and industrial buildings may have rod-braced systems.

			UNBLOCKED DIAPHRAGMS: All unblocked wood structural panel diaphragms shall have horizontal spans less than 40 feet and shall have aspect ratios less than or equal to 4 to 1.
--	--	--	---

¹ The basic structural checklist shall be completed prior to completing this supplemental structural checklist.

Section 26. Amendment to section 8-22135.

Fremont Municipal Code Title VIII, Chapter 2, Article 21.3, section 8-22135 is amended by modifying subsection (f)(14) to read as follows. The remainder of section 8-22135 is not modified.

Sec. 8-22135 Condominium conversion; residential projects.

(a) – (e) [text unchanged]

(f)(1) – (f)(13) [text unchanged]

(14) Earthquake hazard reduction requirements in existing wood frame residential buildings with soft, weak or open-front walls. For all residential condominium conversion projects containing soft story construction as specified in section Title VII, Chapter 10, section 7-10103, compliance with the investigation, analysis, performance and retrofit requirements of Title VII, Chapter 10 as set forth in section 7-10105(a) is mandatory.

(f)(15) – (f)(17) [text unchanged]

(g) – (h) [text unchanged]

Section 27. CEQA – Exemption.

The City Council finds, under Title 14 of the California Code of Regulations, section 15061(b)(3), that this ordinance is exempt from the requirements of the California Environmental Quality Act (CEQA) in that it is not a Project which has the potential for causing a significant effect on the environment. The Council therefore directs that a Notice of Exemption be filed with the Alameda County Clerk.

Section 28. Severability.

If any section, subsection, sentence, clause or phrase of this Ordinance is for any reason held by a court of competent jurisdiction to be invalid, such a decision shall not affect the validity of the remaining portions of this Ordinance. The City Council of the City of Fremont hereby declares that it would have passed this Ordinance and each section or subsection, sentence, clause and phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases be declared invalid.

Section 29. Effective date.

This Ordinance shall take effect and will be enforced thirty (30) days after its adoption.

Section 30. Publication and Posting

The City Clerk has caused to be published a summary of this ordinance, prepared by the City Attorney under section 36933(c) of the Government Code, once, in *The Argus*, a newspaper of general circulation printed and published in Alameda County and circulated in the City of Fremont, at least five days before the date of adoption. A certified copy of the full text of the ordinance was posted in the office of the City Clerk since at least five days before this date of adoption. Within 15 days after adoption of this ordinance, the City Clerk shall cause to be again published in *The Argus* the summary of this ordinance with the names of those City Council members voting for and against the ordinance; and the City Clerk shall post in the office of the City Clerk a certified copy of the full text of this adopted ordinance with the names of those City Council members voting for and against the ordinance.

* * *

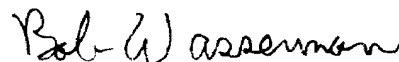
The foregoing ordinance was introduced before the City Council of the City of Fremont, County of Alameda, State of California, at the regular meeting of the City Council, held on the 24th day of April, 2007 and finally adopted at a regular meeting of the City Council held on the 1st day of May, 2007 by the following vote, to wit:

AYES: Mayor Wasserman, Vice Mayor Wieckowski, Councilmembers,
Harrison and Natarajan

NOES: Councilmember Cho

ABSTAINED: None

ABSENT: None



Mayor

ATTEST:

APPROVED AS TO FORM:



City Clerk



Senior Deputy City Attorney