



# Staff Report

## City of Manhattan Beach

**TO:** Honorable Mayor Montgomery and Members of the City Council

**THROUGH:** Richard Thompson, Interim City Manager

**FROM:** Laurie Jester, Acting Director of Community Development Department  
 Ken Shuck, Acting Fire Chief  
 Jim Arndt, Director of Public Works Department  
 Carol Jacobson, Building Official  
 John Grimaldi, Fire Marshal

**DATE:** November 3, 2010

**SUBJECT:** Consideration of Ordinances to Amend Titles 3, 5, and 9 and to Adopt the Most Recent California Building Standards Code and City Amendments to the Following Codes: 2010 California Building Code, 2010 California Residential Code, 2010 California Electrical Code, 2010 California Plumbing Code, 2010 California Green Building Standards Code, 2010 California Energy Code, 2010 California Mechanical Code, and to Adopt the 2010 California Fire Code and City Amendments.

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**RECOMMENDATION:**

Staff recommends that Council pass a motion to waive further reading, introduce Ordinance No's 2136 (Building codes) and 2137 (Fire code), and set public hearing for November 16, 2010.

**FISCAL IMPLICATION:**

There is a fiscal implication associated with the water conservation recommendation to waive retrofit plumbing permit fees for one year when associated with the sales of residences. This would reduce possible revenue approximately \$39,200 while encouraging sellers to retrofit their homes with water-saving high-efficiency toilets.

**BACKGROUND:**

The California Building Standards Commission published the State construction codes on July 4, 2010. The California Department of Housing and Community Development then adopted these codes, which will be effective statewide on January 1, 2011. The City must adopt these codes with any amendments before that date. These codes include the Building, Mechanical, Electrical, Plumbing, and Fire construction regulations. The last complete set of building codes was adopted in 2007.

New to the California Building Standards Code are the 2010 California Residential Code and the 2010 California Green Building Standards. A new chapter in the Municipal Code – Title 9, Chapter 9.03 - is proposed to accommodate the new Residential Code. The 2010 California Residential Code is applicable to new and existing one and two family dwellings and townhomes not more than three stories in height. The New Green Building Standards has been incorporated into the existing Title 9, Chapter 9.36 regarding the City's Sustainable Green Building Program and Energy Efficiency Standards, as previously directed by the City Council through the Green Building Subcommittee of the Environmental Task Force. The 2010 California Green Building Standards Code, also known as the CALGreen Code, is applicable to new residential and non-residential buildings. Its purpose is to require design and construction practices that are energy efficient and environmentally friendly. The CALGreen Code differs from existing green rating systems, such as Build It Green, as it is a minimum standard rather than a rating system.

**DISCUSSION:**

Staff is proposing amendments to all codes consistent with the current Manhattan Beach Codes and past practice. The most significant amendments are:

1. Continue to limit the maximum duration of construction permits to two (2) years for construction projects, instead of the State provision which has no definite limit, to minimize neighborhood construction impacts and keep new construction consistent with the most current Codes (pp. 2-3 and 26-27, Ordinance 2136).
2. Continue to prohibit new roof or re-roof covering material of wood shakes and wood shingles due to fire safety concerns (pp. 4 and 35-36, Ordinance 2136).
3. Continue the current requirements for undergrounding or stubbing out of utilities for major remodels and new construction to accommodate possible future utility undergrounding (pp. 39-40, Ordinance 2136).
4. Continue to disallow aluminum conductors because of our unique moist beach climate conditions, which can cause arcing and sparking from aluminum conductors (p. 40, Ordinance 2136).

A majority of the amendments clarify and update the structural requirements due to potential hazards specific to our community. These amendments are part of the joint effort by 89 jurisdictions within the Los Angeles County to develop the Los Angeles Regional Uniform Code Program. The amendments include additional structural engineering design-related provisions for earthquake, wind, and other geologic, topographic, or climatic concerns.

Sustainable Green Building and Energy Efficiency

Staff added sustainable building code amendments in accordance with City Council direction from the March 16, 2010 meeting. Staff has included amendments regarding Energy Efficiency, Water Conservation, Materials and Waste Management Diversion (Title 5), and Air Quality. Zoning issues related to green roofs, landscape, wind turbines and solar panels have been referred to Planning Commission. Staff introduced these measures in July to the Planning Commission. In September, a public hearing and informal workshop was conducted with the Planning Commission. At that time, Commission requested more information regarding these measures, which will be brought back to them early next year.

Included in the attachments (Attachment B) are Life Cycle Costing studies of Energy Conserving Measures (ECM) that the California Energy Commission must review and approve when measures exceed the California Building Energy Efficiency Standards, Title 24, according to the California Public Resources Code. If the Energy Commission has substantive revisions, the Green Building Code changes will be brought back to City Council. After detailed review of the most recent Energy Code measures when applied to four typical buildings in Manhattan Beach, the Green Building team and consultant determined that 15% above Title 24 is more feasible and cost-effective than the original recommendation of 20% (pp. 45 and 48, Ordinance 2136). Exceeding Title 24 Energy Efficiency Standards places Manhattan Beach well ahead of the curve.

#### Toilet Retrofits

Also, at the March 16, 2010 meeting, Council requested that staff provide more information regarding the upgrades to water efficient toilets (1.28 gallons per flush) as well as work with David Kissinger from the South Bay Board of Realtors to find methods to implement the toilet retrofit program when residential properties are sold. Staff met with David Kissinger and another real estate spokesperson to discuss implementation of the program. The real estate representatives agreed upon the concepts and suggested methods to assist the realty industry to help their customers retrofit their homes. This includes utilizing plumbing permits to track those homes that change out toilets and allowing the seller to have either a licensed plumber or City Inspector certify the retrofit. Exemptions to the retrofit requirement, such as foreclosures or transfers within a family, would be allowed. To encourage toilet retrofits, staff is recommending that plumbing permits for toilet retrofits have a fee waiver for one year on a trial basis. The cost to the City to waive retrofit fees for one year would be approximately \$39,200 (\$98/permit - 2 toilets x 400 Record Reports).

Toilet retrofits would also be tracked through the Residential Building Record Reports program that is required whenever there is a sale of residential property (pp. 41 and 46, Ordinance 2136). Subcommittee members discussed this with David Kissinger as well as other representatives that are local real estate brokers and agents. Real estate representatives acknowledged that retrofit requirements prior to property sales or transfer are a common practice – similar to smoke detector installation and water heater strapping requirements. Mr. Kissinger also noted that retrofitting at point of sale is a common method to require water-saving toilets; however, he also states that the real estate industry objects to point-of-sale retrofits (See Attachment C). Examples of cities that require retrofits prior to a residential property being sold include, Santa Monica, City of Los Angeles, Burbank, San Diego, Morro Bay, San Francisco, Napa, Marin, and Santa Cruz require retrofits. Most of these cities require multiple plumbing fixture retrofits, such as shower heads, faucets and toilets. Manhattan Beach is requesting toilet retrofits only.

Water efficient toilets are readily available, reliable and reasonably priced to purchase and install. Toilets are an easy method to significantly reduce water consumption. The Water Sense program by the Environmental Protection Agency lists several hundred selections of high efficiency low water-use toilets from major suppliers as well as smaller manufacturers. West Basin Municipal Water District sometimes provides toilet rebate incentives for high efficiency toilets and other plumbing fixtures. A typical 1.28 gallon per flush (gpf) toilet costs about \$100 to \$200 dollars. Home Depot lists some for as low as \$88, although some “luxurious” toilets cost much more. To have a plumber replace a toilet, costs from \$50 to \$150.

Approximately, 300 to 400 houses are sold per year in Manhattan Beach. Last year, City staff issued about 50 new home permits and approximately 300 permits that included new or replaced toilets last year. Retrofitting would double the amount of toilets that would be replaced with water-saving fixtures. Almost 17,000 gallons of water per year would be saved per household with the high efficiency 1.28 gpf toilets or a total of 2.5 million gallons of water per year Citywide. Additionally, since water is imported via electrical pumps and aqueducts, reducing the water used for toilets would significantly decrease the amount of energy needed to send the additional water and effluents to the Sanitation District and sewer infrastructures.

#### Solar Pool Water Heating

The CALGreen Code prohibits electric pool heating unless a minimum of 60% of pool heating is from solar energy systems (p. 48, Ordinance 2136) or if high efficiency heat pumps and tight-fitting pool covers are used. Council requested staff to provide information regarding cost implications of providing 60 percent of pool heating to be from renewable resources, such as solar energy. Solar pool heating system costs range widely depending on the size of the pool as well as temperature and heating duration desired. An average installation would be approximately \$5,000, and pay back is typically within 2 to 3 years. However, there is an immediate pay back in that the pool owner pays reduced utility fees for that portion of the energy that is provided by solar or renewable energy. High-efficiency heat pumps together with insulated tight-fitting pool covers can also be used to reduce pool energy consumption. Pool covers are currently required; though the new regulation will require tight-fitting pool covers. The cost of these pumps is similar to solar pool heating and the pay back is similar within 2 to 3 years.

#### Residential Code

One noteworthy regulation that California included in the new Residential Code is that fire sprinkler systems are required throughout the entire home for all new residential construction. The City does not have the ability to make this requirement less restrictive; however local amendments can add additional regulations. In the City of Manhattan Beach, homes are often significantly remodeled, as well as new floor area added. Some of these types of projects have major structural alterations and additions, where roofs and interior walls have been removed and only a few exterior wall studs and portions of the foundation remain and the home is practically new construction. The ordinance contains an amended definition of “addition” that clarifies that these types of major remodels with additional square footage will be considered as new construction (p. 28, Ordinance 2136), and thus, fire sprinklers will also be required.

Currently, the Manhattan Beach Fire Code requires fire sprinklers in the garage area and this requirement will continue. Costs for garage-only fire protection systems are approximately \$6,500 (\$3,500 for fire sprinklers; \$3,000 for alarms, electric, and water meter upgrades). The cost for a fire protection system for a new 5,000 square foot home is approximately \$16,000 (\$12,000 for fire sprinklers; \$4,000 for alarms, electric, and water meter upgrades), which represents about 1.5 % of the total cost of a \$1,000,000 home.

#### Fire Code

A majority of the amendments are being carried over from current Code amendments. These continue the more restrictive or specific policies for fire investigation, technical assistance, obstruction of fire apparatus access roads, address number sizes and complex structure directories,

fire sprinklers, and prohibition of manufacturing, possession, storage, sale and use of fireworks. Additionally, these amendments update and clarify code language

There are two new changes regarding local amendments of the Fire Code. One new amendment is to require fire protection systems for private schools identical to the requirements for public schools (p. 5, Ordinance 2137). This ensures that children in private schools will have equal protection with students in the public school system. The second amendment is to require annual maintenance and testing for fire alarm and detection systems for commercial occupancies (p. 5, Ordinance 2137). In this area, due to the salt air and other climatic conditions, many alarm systems are prone to failures, causing unnecessary false alarms and faulty systems.

### Next Steps

According to the California Health and Safety Code Section 17958.7, we must find specific needs to support amendments that are more restrictive than the State-adopted model codes. These findings are included in the attached ordinance and, after City Council approval, will be filed with the California Building Standards Commission.

The California Building Standards Code that will be effective statewide is the 2010 edition. Each of the State construction codes with amendments is based on various model codes as determined by the California Building Standards Commission. These model codes are published by various professional organizations, such as the International Code Council, the International Association of Plumbing and Mechanical Officials, the National Fire Protection Association, and the Western Fire Chiefs Association.

To adopt the codes, the procedure is as follows: introduce the title and ordinance, publish notification for two successive weeks, and conduct a public hearing and adopt the ordinance. After the ordinance is introduced tonight and then notification published, the public hearing will be scheduled for the City Council meeting of November 16, 2010.

This proposed ordinances will not have a significant effect on the environment, and is therefore exempt from the provisions of the California Environmental Quality Act (CEQA) pursuant to Section 15061 (b)(3) of the CEQA Guidelines.

- Attachments:
- A. Draft Ordinance No's. 2136 (Building codes) and 2137 (Fire code)
  - B. Energy Cost Effectiveness Summary and Studies – 4 typical homes
  - C. Point-of-Sale in Manhattan Beach, South Bay Board of Realtors

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ORDINANCE NO 2136

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF MANHATTAN BEACH, CALIFORNIA, AMENDING OR ADDING CHAPTERS 1, 3, 12, 24, 32, 36, AND 64 OF THE MANHATTAN BEACH MUNICIPAL CODE TITLE 9 AND AMENDING CHAPTER 26 OF MANHATTAN BEACH MUNICIPAL CODE TITLE 5 TO ADOPT BY REFERENCE THE RULES, REGULATIONS, PROVISIONS AND CONDITIONS SET FORTH IN THE MOST RECENT CALIFORNIA BUILDING STANDARDS CODE AND CITY AMENDMENTS TO THE FOLLOWING CODES: BUILDING CODE; RESIDENTIAL CODE, ELECTRICAL CODE; PLUMBING CODE; GREEN BUILDING STANDARDS CODE, CALIFORNIA ENERGY CODE; AND MECHANICAL CODE .

THE CITY COUNCIL OF THE CITY OF MANHATTAN BEACH, CALIFORNIA, DOES ORDAIN AS FOLLOWS:

SECTION 1. The City Council of the City of Manhattan Beach, California, hereby finds as follows:

- A. The State of California has adopted the California Building Standard Codes that must in turn be adopted or utilized by each city or county. Certain of the provisions of these Codes are inappropriate for use within the City of Manhattan Beach because of unique climatic, geological and topographical conditions prevailing within the City. The California Health and Safety Code Sections 17958, 17985.7 and 17958.5 provide for certain amendments to the California Building Standard Codes provided findings of necessity can be made. The findings are:
1. Adverse climate conditions such as salt fog air and strong winds such as those in existence in the City of Manhattan Beach increase the likelihood of fire spreading (conflagration) from one building to another. Additionally, we must reduce potential impact to climate change through energy efficient materials and sustainable practices.
  2. Geological conditions of the City of Manhattan Beach are affected by the nearby locations of earthquake faults that can create tremendous loss of life and structures in the City.
  3. Topographical conditions of the City of Manhattan Beach coupled with the density of buildings, limited setbacks, narrow access to buildings, small lots and narrow streets would potentially create a problem for governmental agencies to respond to emergency conditions.
  4. There is a need for proposing certain amendments in the California Building Standard Codes because of climatic, geological and topographical conditions.
- B. The City Council finds that the proposed building energy efficiency standards will save more energy than the current statewide Standards and the basis of the determination is that the local standards are cost-effective based on case studies and research detailed in Exhibit B.
- C. This project will not have a significant effect on the environment, and is therefore exempt from the provisions of the California Environmental Quality Act (CEQA) pursuant to Section 15061 (b)(3) of the CEQA Guidelines.

SECTION 2. Chapter 9.01 of Title 9 of the Manhattan Beach Municipal Code is hereby amended in its entirety as follows:

**Chapter 9.01 Building Code.**

**9.01.010 Adoption of 2010 California Building Code.**

Pursuant to the provisions of Section 50022.1 to 50022.10, inclusive, of the Government Code of the State and subject to the particular additions, deletions and amendments set forth in this chapter, the rules, regulations, provisions and conditions set forth in that certain Code entitled California Building Code 2010 Edition," including the Appendices and Standards (including Chapter/Section 1, Division 2; Chapter 31B; and excluding all Appendices with the exception of Appendices I and J) therein contained, promulgated and published by the International Code Council and the California Building Standards Commission, one (1) full printed copy of which, printed as a Code in book form were by the Council ordered filed and which have been filed in the office of the City Clerk, expressly incorporated herein and made a part hereof as fully and for all intents and purposes as though set forth herein at length, are hereby established and adopted as the rules, regulations, provisions and conditions to be observed and

followed in the construction, alteration, improvements, movement, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal, demolition, conversion, area and height, of buildings or structures or any appurtenances connected or attached to such buildings or structures in the city; and subject to the additions, deletions and amendments set forth in this chapter, said Code with its Appendices and the said Standards containing said rules, regulations, standards, provisions and conditions is hereby established and adopted, and the same shall be designated, known and referred to as the "Building Code" of and for the City.

#### **9.01.020 Scope.**

**Section 101.4 of the California Building Code is hereby amended for administrative requirements as follows:**

**Section 101.4. Referenced codes.** The other codes listed in Sections 101.4.1 through 101.4.6 and referenced elsewhere in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference. Specifically, the Electrical, Gas, Mechanical, Plumbing, Swimming Pool, and Energy Codes; the most recently adopted California State and Manhattan Beach Municipal Codes will take precedence.

#### **9.01.030 Work exempt from permit.**

**Section 105.2, item 9 is hereby amended per administrative requirements as follows:**

9. Prefabricated swimming pools accessory to Group R-3 Occupancy that are less than 24 18 inches (457 mm) deep, do not exceed 5,000 gallons (18925 L) and installed entirely above ground.

#### **9.01.040 Expiration of plan review.**

**Section 105.3.2 is amended in its entirety for administrative requirements as follows:**

**Section 105.3.2 Time limitation of application.** Applications for which no permit is issued within 180 days following the date of application shall expire by limitation and plans and other data submitted for review may thereafter be returned to the applicant or destroyed by the Building Official. The Building Official may extend the time for action by applicant for a period not exceeding 180 days upon written request by the applicant and justifiable cause demonstrated. No application shall be extended more than once. In order to renew action on an application after expiration, the applicant shall resubmit plans and pay a new plan review fee and plans shall be reviewed under the current codes and ordinances at the time of the new applications.

#### **9.01.050 Permit Expiration.**

**Section 105.5 is hereby amended for administrative requirements as follows:**

**105.5 Expiration.** Every permit issued shall become invalid unless the work on the site authorized by such permit is commenced within 180 days after its issuance, or if the work authorized on the site by such permit is suspended or abandoned for a period of 180 days after the work is commenced, or if the building or work authorized by such permit is not completed within 2 calendar years from the issuance date of the permit.

Before such work can be recommenced, a new permit, or a renewed permit as specified below, shall be first obtained. No permit shall be renewed more than once.

For permits where work has not commenced within 180 days from the date of such permit, a renewed permit may be obtained provided that: (1) no changes have been made or will be required in the original plans and specifications for such work; and (2) the expiration has not exceeded two years from the original issuance date.

For permits where work had commenced and was subsequently suspended or abandoned for a period exceeding 180 days, a renewed permit may be obtained provided that: (1) No changes have been made or will be required in the original plans and specifications for such work; and (2) the expiration has not exceeded two years from the issuance date and/or (3) Where construction has progressed and has been approved to the point whereby only a final inspection(s) is required, a fee shall be determined based on the number of estimated inspections, estimated staff time, and required meetings as determined by the Building Official.

For permits that have exceeded two years beyond the issuance date, a new permit is required. The applicant shall pay the fee based on the valuation of the uncompleted work required for a plan check and a new permit and plans will be reviewed under the current codes and ordinances at the time of the new applications.



Any permittee holding an unexpired permit may apply for an extension of the time within which work under that permit may be continued when, for good and satisfactory reasons, the permittee is unable to continue work within the time required by this section. The Building Official may extend the time for action by the permittee for a period not exceeding six calendar months upon written request by the permittee showing that circumstances beyond the control of the permittee have prevented action from being taken. No permit shall be extended more than once.

If the owner or applicant fails to complete the construction work within the time required, the Building Official is authorized to obtain the abatement of any unsafe condition or nuisance created by such incomplete work. The City Attorney is authorized to file an action for the abatement of any such unsafe condition or nuisance if required to do so by the Building Official.

#### **9.01.060 Fees.**

**Sections 109.2 and 109.4 shall be amended in entirety per administrative requirements as follows:**

**109.2 Schedule of permit fees.** The fees shall be determined by the most current City Resolution of Fees.

Plan Review Fees. When submittal documents are required by the building official, a plan review fee shall be paid at the time of submitting the submittal documents for plan review. Said plan review fee shall be determined by the most current City Resolution of Fees.

The plan review fees specified in this section are separate fees from the permit fees and are in addition to the permit fees.

When submittal documents are incomplete or changed so as to require additional plan review or when the project involves deferred submittal items as defined in Section 107.3.4.2, an additional plan review fee shall be charged as determined by the most current City Resolution of Fees.

**109.4 Work commencing before permit issuance.** Any person who commences any work on a building, structure, electrical, gas, mechanical or plumbing system before obtaining the necessary permits shall be subject to a fee established by the Building Official and the most current Manhattan Beach Resolution of Fees in addition to the required permit fees.

Investigation. Whenever any work for which a permit is required by this code has been commenced without first obtaining said permit, a special investigation shall be made before a permit may be issued for such work.

Investigation Fee. An investigation fee, in addition to the permit fee, shall be collected whether or not a permit is then or subsequently issued. The investigation fee shall be equal up to the amount of the permit fee required by this code as determined by the Building Official. The minimum investigation fee shall be determined by the most current Resolution of Fees. The payment of such investigation fee shall not exempt any person from compliance with all other provisions of this code nor from any penalty prescribed by law.

#### **9.01.070 Violation penalties.**

**Section 114.4 is amended for administrative requirements as follows:**

**Section 114.4. Violation penalties.** Any person who violates a provision of this code or fails to comply with any of the requirements thereof or who erects, constructs, alters or repairs a building or structure in violation of the approved construction documents or directive of the building official, or of a permit or certificate issued under the provisions of this code, shall be subject to the penalties as prescribed by law. Every person who willfully resists, delays, obstructs or interferes in any way with any City Building Inspector in the discharge or attempt to discharge any duty of his or her office or employment shall be guilty of a violation of this Chapter

Any person, firm, or corporation violating any of the provisions or failing to comply with any of the mandatory requirements of the ordinances of Manhattan Beach shall be guilty of a misdemeanor. Any person convicted of a misdemeanor under the ordinances of Manhattan Beach shall be punished by a fine of not more than one thousand dollars (\$1,000), or by imprisonment not to exceed six (6) months, or by both such fine and imprisonment. Each such person shall be guilty of a separate offense for each and every day during any portion of which any violation of any provision of the ordinances of Manhattan Beach is committed, continued, or permitted by any such person, and shall be punished accordingly.

**9.01.080 Definitions.**

**Section 202 is hereby amended for administrative requirements by adding as follows:**

**ABANDONED OR SUSPENDED WORK.** Work that has been stopped or no progress in construction and no inspection is required or performed for a period of 180 days.

**9.01.090 Yards.**

**Section 1206.2 of the California Building Code is hereby revised per the above topographical findings to add Exception 1.**

**Exception 1.** One and two family dwellings not exceeding three stories, which are located on a 30 foot wide lot or less may have 3 foot (914 mm) side yards, if additional artificial light and mechanical ventilation are provided for the structure as determined to be adequate by the building official.

**9.01.100 Roofing and Re-roofing.**

**Table 1505 is amended per the above climatic and topographical findings as follows:**

**Table 1505.1. Minimum Roof Covering Classification for Types of Construction.** All roof classifications of "C" shall be deleted from Table 1505.1 and replaced by class "B" roof classification.

**Sections 1505 and 1507 are amended per the above climatic and topographical findings as follows:**

**Add:** Fire-retardant roofs are roofing assemblies complying with California Building Code Standards and listed as Class A or B roofs. The use of fire-retardant wood shakes or fire retardant wood shingles is prohibited.

**1505.5 Non-classified Roofing.** Non-classified roofing is approved material that is not listed as a Class A or B roofing assembly. The use of wood shakes or wood shingles is prohibited.

Sections 1505.4 and 1505.5, 1507.6, and 1507.7 are hereby deleted

**Section 1510.1 is amended per the above climatic and topographical findings to add Exception 2 as follows:**

**Exception 2.** All re-roofing shall conform to the applicable provisions of Chapter 15 of this code and as otherwise required in this chapter.

Roofing materials and methods of application shall comply with the California Building Code standards or shall follow the manufacturer's installation requirements when approved by the building official.

Wood shakes and wood shingles re-roofs of entire structure are prohibited unless approved by the building official because of special circumstances.

**9.01.110 General structural design provisions.**

**The following sections are amended per the above geological and topographical findings as follows:**

- (a) **Tilt up Systems.** Modify Section 12.2.1 of ASCE 7 by adding the following:

**12.2.1.1 Determination of Seismic Force-Resisting Systems for Tilt-up Building.** Tilt-up buildings bearing wall system and building frame system shall be classified as reinforced concrete structural wall system. Only special reinforced concrete structural walls shall be permitted in Seismic Design Categories D, E and F.

- (b) **Re-entrant Corners.** Modify Section 12.12.4 of ASCE 7 by adding the following:

**12.12.4.1 Re-entrant Corners.** For buildings with re-entrant corners the return walls shall be considered for deformation compatibility with the diaphragm and shall be either seismically isolated from the diaphragm or attached by a connection of sufficient capacity to integrate their load into the diaphragm.

(c) **Minimum Base Shear.** Revise equation 12.8-5 of ASCE 7 as follows:

$$C_s = 0.044S_{DS}I \geq 0.01$$

(d) **P-Delta Effects.** Revise equation 12.8-16 of ASCE 7 as follows:

$$\theta = \frac{P_d \Delta}{V_d A_d C_d}$$

(e) **Subdiaphragm Design.** ~~The spacing of continuous ties shall not exceed forty feet. Added chords of diaphragms may be used to form subdiaphragms to transmit the anchorage forces to the main continuous crossties. The maximum diaphragm shear used to determine the depth of the subdiaphragm shall not exceed seventy five percent of the allowable diaphragm shear value.~~

**1613.13 ASCE 7, Section 12.11.2.2.3.** Modify ASCE 7, Section 12.12.4 to read as follows:

**12.11.2.2.3 Wood Diaphragms.** In wood diaphragms, the continuous ties shall be in addition to the diaphragm sheathing. Anchorage shall not be accomplished by use of toe nails or nails subject to withdrawal nor shall wood ledgers or framing be used in cross-grain bending or cross-grain tension. The diaphragm sheathing shall not be considered effective as providing ties or struts required by this section.

For structures assigned to Seismic Design Category D, E or F, wood diaphragms supporting concrete or masonry walls shall comply with the following:

1. The spacing of continuous ties shall not exceed 40 feet. Added chords of diaphragms may be used to form subdiaphragms to transmit the anchorage forces to the main continuous crossties.
2. The maximum diaphragm shear used to determine the depth of the subdiaphragm shall not exceed 75% of the maximum diaphragm shear.

(f) **Building Separations.** Delete Section 12.12.3 of ASCE 7 and amend Equation 16-44 of Section 1613.6.7 of the 2010 California Building Code to read as follows:

~~**12.12.3 Building Separations.** All structures or portions of structures shall be sufficiently separated to allow for the maximum inelastic response displacement ( $\delta_M$ ) with consideration for both translational and rotational displacements using  $\delta_{max}$ , which is the maximum deflection at level x at the location considered.~~

~~$$\delta_M = \frac{C_d \delta_{max}}{I} \quad \text{--- (Equation 16-45)}$$~~

~~Adjacent structures on the same property shall be separated by at least a distance  $\delta_{MT}$ .~~

~~$$\delta_{MT} = \sqrt{(\delta_{M1})^2 + (\delta_{M2})^2} \quad \text{--- (Equation 16-46)}$$~~

~~where  $\delta_{M1}$  and  $\delta_{M2}$  are the maximum inelastic response displacements of adjacent structures. When a structure adjoins a property line not common to the public way, that structure shall also be set back from the property line by at least the dimension  $\delta_M$ .~~

1613.6.7 Minimum distance for building separation. All buildings and structures shall be separated from adjoining structures. Separation shall allow for the maximum inelastic response displacement ( $\delta_M$ ).  $\delta_M$  shall be determined at the critical locations with consideration for both translational and torsional displacements of the structure using Equation 16-44.

$$\delta_M = \frac{C_d \delta_{max}}{I} \quad \text{(Equation 16-44)}$$

where:

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

$\delta_{max}$  = Maximum displacement defined in Section 12.8.4.3 of ASCE 7.

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

Adjacent buildings on the same property shall be separated by a distance not less than  $\delta_{MT}$ , determined by Equation 16-45.

$$\delta_{MT} = \sqrt{(\delta_{M1})^2 + (\delta_{M2})^2} \quad (\text{Equation 16-45})$$

Where:

$\delta_{M1}$  and  $\delta_{M2}$  = The maximum inelastic response displacements of the adjacent buildings in accordance with Equation 16-44.

Where a structure adjoins a property line not common to a public way, the structure shall also be set back from the property line by not less than the maximum inelastic response displacement,  $\delta_M$  of that structure.

(g) **Vertical Combination of Lateral Force Resisting Systems.** Modify ASCE 7 Section 12.2.3.1 Exception 3 to read as follows:

3. Detached one- and two-family dwellings up to two stories in height of light frame construction.

(h) **Buckling Restrained Braced Frame System.** Correct values per ASCE 7 Table 12.8-2 as follows:

Structure Type	$C_r, C_t$	X
Eccentrically braced steel frames and buckling-restrained braced frames	0.03	0.75
	0.03	

(i) **Assumption of Flexible Diaphragm.**

**Exception:** For buildings two stories or less in height with diaphragm constructed of wood structural panels, the cantilevered portion is permitted to be idealized as flexible, provided the length of the overhang does not exceed fifteen percent of the dimension between the lateral force resisting lines of resistance adjacent to the cantilevered portion in the direction considered. Nor shall the overhang dimension exceed twenty-five percent of the width of the diaphragm, where the width is the dimension perpendicular to the direction of applied lateral force.

**(j) Suspended ceilings.** Add Section 1613.16 to Chapter 16 of the 2010 California Building Code to read as follows:

**1613.16 Suspended Ceilings.** Minimum design and installation standards for suspended ceilings shall be determined in accordance with the requirements of Section 2506.2.1 of this Code and this subsection.

**1613.16.1 Scope.** This part contains special requirements for suspended ceilings and lighting systems. Provisions of Section 13.5.6 of ASCE 7 shall apply except as modified herein.

**1613.16.2 General.** The suspended ceilings and lighting systems shall be limited to 6 feet (1828 mm) below the structural deck unless the lateral bracing is designed by a licensed engineer or architect.

**1613.16.3 Design and Installation Requirements.**

**1613.16.3.1 Bracing at Discontinuity.** Bracing to the structure shall be provided at changes in the ceiling plane elevation or at discontinuities in the ceiling grid system.

**1613.16.3.2 Support for Appendages.** Cable trays, electrical conduits and piping shall be independently supported and independently braced from the structure.

**1613.16.3.3 Sprinkler Heads.** All sprinkler heads (drops) except fire-resistance-rated floor/ceiling or roof/ceiling assemblies, shall be designed to allow for free movement of the sprinkler pipes with

oversize rings, sleeves or adaptors through the ceiling tile, in accordance with Section 13.5.6.2.2 (e) of ASCE 7.

Sprinkler heads penetrating fire-resistance-rated floor/ceiling or roof/ceiling assemblies shall comply with Section 713 of this Code.

**1613.16.3.4 Perimeter Members.** A minimum wall angle size of at least a two inch (51 mm) horizontal leg shall be used at perimeter walls and interior full height partitions. The first ceiling tile shall maintain 3/4 inch (19 mm) clear from the finish wall surface. An equivalent alternative detail that will provide sufficient movement due to anticipated lateral building displacement may be used in lieu of the long leg angle subject to the approval of the Building Officer.

**1613.16.4 Special Requirements for Means of Egress.** Suspended ceiling assemblies located along means of egress serving an occupant load of 30 or more shall comply with the following provisions.

**1613.16.4.1 General.** Ceiling suspension systems shall be connected and braced with vertical hangers attached directly to the structural deck along the means of egress serving an occupant load of 30 or more and at lobbies accessory to Group A Occupancies. Spacing of vertical hangers shall not exceed 2 feet (610 mm) on center along the entire length of the suspended ceiling assembly located along the means of egress or at the lobby.

**1613.16.4.2 Assembly Device.** All lay-in panels shall be secured to the suspension ceiling assembly with two hold-down clips minimum for each tile within a 4-foot (1219 mm) radius of the exit lights and exit signs.

**1613.16.4.3 Emergency Systems.** Independent supports and braces shall be provided for light fixtures required for exit illumination. Power supply for exit illumination shall comply with the requirements of Section 1006.3 of this Code.

**1613.16.4.4 Supports for Appendage.** Separate support from the structural deck shall be provided for all appendages such as light fixtures, air diffusers, exit signs, and similar elements.

**(k) Special Inspection for Concrete Construction.** Amend Section 1704.4 of the 2010 California Building Code to read as follows:

#### **9.01.120 Special inspection provisions.**

**The following sections are amended per the above geological and topographical findings as follows:**

**1704.4 Concrete Construction.** The special inspections and verifications for concrete construction shall be as required by this section and Table 1704.4.

**Exceptions:** Special inspection shall not be required for:

1. Isolated spread concrete footings of buildings three stories or less above grade plane that are fully supported on earth or rock, where the structural design of the footing is based on a specified compressive strength,  $f'_c$ , no greater than 2,500 pounds per square inch (psi) (17.2 Mpa).

2. Continuous concrete footings supporting walls of buildings three stories or less in height that are fully supported on earth or rock where:

2.1. The footings support walls of light-frame construction;

2.2. The footings are designed in accordance with Table 1805.4.2; or

2.3. The structural design of the footing is based on a specified compressive strength,  $f'_c$ , no greater than 2,500 pounds per square inch (psi) (17.2 Mpa), regardless of the compressive strength specified in the construction documents or used in the footing construction.

3. Nonstructural concrete slabs supported directly on the ground, including prestressed slabs on grade, where the effective prestress in the concrete is less than 150 psi (1.03 Mpa).

4. Concrete patios, driveways and sidewalks, on grade.

### 9.01.130 Foundation design provisions.

The following sections are amended per the above geological and topographical findings as follows:

**(l) Driven Deep Foundations.** Amend Section 1704.8 of the 2010 California Building Code to read as follows:

**1704.8 Driven deep foundations and connection grade beams.** Special inspections shall be performed during installation and testing of driven deep foundation elements as required by Table 1704.8. Special inspections shall be performed for connection grade beams in accordance with Section 1704.4 for structures assigned to Seismic Design Category D, E or F. The approved geotechnical report, and the construction documents prepared by the registered design professionals, shall be used to determine compliance.

**(m) Cast-In Place Deep Foundations.** Amend Section 1704.9 of the 2010 California Building Code to read as follows:

**1704.9 Cast-in-place deep foundations and connection grade beams.** Special inspections shall be performed during installation and testing of cast-in-place deep foundation elements as required by Table 1704.9. Special inspections shall be performed for connection grade beams in accordance with Section 1704.4 for structures assigned to Seismic Design Category D, E or F. The approved geotechnical report, and the construction documents prepared by the registered design professionals, shall be used to determine compliance.

**(n) Seismic Resistance Inspection.** Amend Section 1705.3 of the 2010 California Building Code to read as follows:

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

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

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

2. The structure is constructed using a reinforced masonry structural system or reinforced concrete structural system; the design spectral response acceleration at short periods,  $S_{DS}$ , as determined in Section 1613.5.4, does not exceed 0.5g, and the height of the structure does not exceed 25 feet (7620 mm) above grade plane; or

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

3.1 Torsional irregularity.

3.2 Nonparallel systems.

3.3 Stiffness irregularity—extreme soft story and soft story.

3.4 Discontinuity in capacity—weak story.

### 9.01.140 Additional structural observation provisions.

The following sections are amended per the above geological and topographical findings as follows:

**Structural Observation - General.** Amend Section 1710.1 of the 2010 California Building Code to read as follows:

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

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

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

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

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

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

(p) **Structural Observation – Seismic.** Amend Section 1710.2 of the 2010 Edition of the California Building Code are amended to read as follows:

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

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

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

3. The structure is classified as Occupancy Category I or II in accordance with Table 1604.5, and a lateral design system is required to be designed by a registered designed professional.

**Exception:** One-story wood framed Group R-3 and Group U Occupancies less than 2000 square feet in area, provided the adjacent grade is not steeper than 1 unit vertical in 10 units horizontal (10% sloped), assigned to Seismic Design Category D.

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

5. When such observation is specifically required by the building official.

#### **9.01.150 Additional foundation design provisions.**

The following sections are amended per the above geological and topographical findings as follows:

(a) **General.** Modify Section 1805.1 of the California Building Code as follows:

**1805.1 General.** The top surface of footings shall be level. The bottom surface of footings is permitted to have a slope not exceeding one unit vertical in ten units horizontal (ten percent slope). Footings shall be stepped where it is necessary to change the elevation of the top surface of the footing or where the surface of the ground slopes more than one unit vertical in ten units horizontal (ten percent slope). This stepping requirement shall also apply to the top surface of grade beams supporting walls. Footings shall be reinforced with minimum of four one-half-inch diameter (12.7 mm) deformed reinforcing bars. Two bars shall be place at the top and bottom of the footings as shown in Figure 1805.1 of this code.

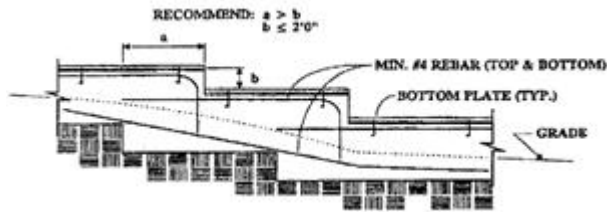


Figure 1805.1

(b) **Footing for Interior Bearing Walls.** Modify Table 1805.4.2 of the California Building Code by deleting Footnote c.

(c) **Wood and Timber Footing.** Delete Sections 1805.4.5 and 1805.4.6 of the California Building Code in their entirety.

(d) Delete Section 1805.5 of the California Building Code in its entirety and replace with the following:

**1805.5 Foundation Walls.** Concrete and masonry foundation walls exceeding eighteen inches in height shall be designed in accordance with Chapter 19 or 21 of the California Building Code, respectively.

**1805.5.1 Foundation Wall Drainage.** Foundation walls shall be designed to support the weight of the full hydrostatic pressure of unretained backfill unless a drainage system in accordance with Sections 1807.4.2 and 1807.4.3 is installed.

**(e) Permanent wood foundation systems.** Amend Section 1807.1.4 of the 2010 California Building Code to read as follows:

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

**(f) Prescriptive design of foundation walls.** Amend Section 1807.1.6 of the 2010 California Building Code to read as follows:

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

**(g) Prescriptive footings.** Amend Section 1809.7 and Table 1809.7 of the 2010 Edition of the California Building Code are amended to read as follows:

**1809.7 Prescriptive footings for light-frame construction.** Where a specific design is not provided, concrete or masonry-unit footings supporting walls of light-frame construction shall be permitted to be designed in accordance with Table 1809.7. Prescriptive footings in Table 1809.7 shall not exceed one story above grade plane for structures assigned to Seismic Design Category D, E or F.



**TABLE 1809.7**

**PRESCRIPTIVE FOOTINGS SUPPORTING WALLS OF  
LIGHT-FRAME CONSTRUCTION<sup>a, b, c, d, e</sup>**

<u>NUMBER OF FLOORS SUPPORTED BY THE FOOTING<sup>f</sup></u>	<u>WIDTH OF FOOTING</u> (inches)	<u>THICKNESS OF FOOTING</u> (inches)
<u>1</u>	<u>12</u>	<u>6</u>
<u>2</u>	<u>15</u>	<u>6</u>
<u>3</u>	<u>18</u>	<u>8<sup>g</sup></u>

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

- a. Depth of footings shall be in accordance with Section 1809.4.
- b. The ground under the floor shall be permitted to be excavated to the elevation of the top of the footing.
- c. See Section 1908 for additional requirements for concrete footings of structures assigned to Seismic Design Category C, D, E or F.
- d. For thickness of foundation walls, see Section 1807.1.6.
- e. Footings shall be permitted to support a roof addition to the stipulated number of floors. Footings supporting roof only shall be as required for supporting one floor.

**(h) Timber footings.** Amend Section 1809.12 of the 2010 California Building Code to read as follows:

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

**(i) Timber.** Amend Section 18010.3.2.4 of the 2010 Edition of the California Building Code to read as follows:

**1810.3.2.4 Timber.** Timber deep foundation elements shall be designed as piles or poles in accordance with AF&PA NDS. Round timber elements shall conform to ASTM D 25. Sawn timber elements shall conform to DOC PS-20. Timber deep foundations shall not be used in structures assigned to Seismic Design Category D, E or F.

**9.01.130 Concrete.**

The following sections are amended per the above geological and topographical findings as follows:

**8.16.040 Concrete.**

(a) **Structural Plain (Unreinforced) Concrete.** Delete Sections 1908.1.14, 1908.1.15, 1908.1.8, 1909 of the California Building Code in their entirety and delete 1909 and replace with following:

**1909.1 Scope.** Plain concrete shall not be used other than as fill. The minimum specified compression strength of concrete used as fill shall be one thousand five hundred psi (10.3 MPa) at twenty-eight days.

(b) **Concrete Special Moment Frame Column Confinement.**

(1) Modify ACI 318 Section 21.4.4.1 by adding a new item as follows:

**21.4.4.1(f).** Where the calculated point of contraflexure is not within the middle half of the member clear height, provide transverse reinforcement as specified in AC 1318 Sections 21.4.4.1, Items (a) through (c), over the full height of the member.

(2) Modify ACI 318 by adding Section 21.4.4.7 as follows:

**21.4.4.7.** At any section where the design strength,  $\phi P_n$ , of the column is less than the sum of the shears  $V_e$  computed in accordance with ACI 318 Sections 21.3.4.1 and 21.4.5.1 for all the beams framing into the column above the level under consideration, transverse reinforcement as specified in ACI 318 Sections 21.4.4.1 through 21.4.4.3 shall be provided. For beams framing into opposite sides of the column, the moment components may be assumed to be of opposite sign. For the determination of the design strength,  $\phi P_n$ , of the column, these moments may be assumed to result from the deformation of the frame in any one principal axis.

(c) **Special Reinforced Concrete Wall Capacity.**

(1) Modify ACI 318 by adding Section 21.7.4.6 as follows:

**21.7.4.6.** Walls and portions of walls with  $P_u > 0.35P_o$  shall not be considered to contribute to the calculated strength of the structure for resisting earthquake-induced forces. Such walls shall conform to the requirements of ACI 318 Section 21.11.

(d) **Reinforced Concrete Diaphragms.**

(4) Modify ACI 318 Section 21.9.4 by adding the following:

**21.9.4.1.** Collector and boundary elements in topping slabs placed over precast floor and roof elements shall not be less than three inches (76 mm) or six  $d_b$  thick, where  $d_b$  is the diameter of the largest reinforcement in the topping slab.

(e) **Tilt Up Buildings.**

Modify Section 1908.1.4 of the California Building Code as follows:

**21.2.1.4.** For structures assigned to Seismic Design Category D, E or F, special moment frames, special reinforced concrete structural walls, diaphragms and trusses and foundations complying with Sections 21.2 through Sections 21.10 shall be used to resist forces induced by earthquake motions. Members not proportioned to resist earthquake forces shall comply with Section 21.11.

(f) **Deflection of Slender Walls.**

(1) Modify equation (14-7) of ACI 318 Section 14.8.3 as follows:

$I_{cr}$  shall be calculated by Equation (14-7), and  $M_a$  shall be obtained by iteration of deflections.

$$I_{cr} = \frac{E_s}{E_c} \left( A_s + \frac{P_u h}{f_y 2d} \right) (d - c)^2 + \frac{I_g c^3}{3} \quad (14-7)$$

and the value  $E_s/E_c$  shall not be taken less than six.

(2) Modify ACI 318 Section 14.8.4 as follows:

**14.8.4.** Maximum out-of-plane deflection,  $\Delta_s$ , due to service loads, including  $P\Delta$  effects, shall not exceed  $l_c/150$ .

If  $M_a$ , maximum moment at mid-height of wall due to service lateral and eccentric loads, including  $P\Delta$  effects, exceed  $(2/3)M_{cr}$ ,  $\Delta_s$  shall be calculated by Equation (14-8):

$$\Delta_s = \frac{2}{3} \Delta_{sr} + \frac{M_a - \frac{2}{3} M_{cr}}{M_a - \frac{2}{3} M_{cr}} \left( \Delta_s - \frac{2}{3} \Delta_{sr} \right) \quad (14-8)$$

where:

$$\Delta_{cr} = \frac{5M_{cr}l_c^2}{48E_cI_g} \text{ and } \Delta_s = \frac{5M_s l_c^2}{48E_cI_g}$$

If  $M_a$  does not exceed  $(2/3)M_{cr}$ ,  $\Delta_s$  shall be calculated by Equation (14-9):

$$\Delta_s = \left( \frac{M_a}{M_{cr}} \right) \Delta_{cr} \quad (14-9)$$

**(g) Reinforcement.** Amend Section 1908.1 to read as shown below and add Sections 1908.1.11 through 1908.1.14 to Chapter 19 of the 2010 California Building Code to read as follows:

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

**1908.1.11 ACI 318, Section 21.6.4.1.** Modify ACI 318, Section 21.6.4.1, to read as follows:

Where the calculated point of contraflexure is not within the middle half of the member clear height, provide transverse reinforcement as specified in ACI 318 Sections 21.6.4.1, Items (a) through (c), over the full height of the member.

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

21.6.4.8 – At any section where the design strength,  $\phi P_n$ , of the column is less than the sum of the shears  $V_e$  computed in accordance with ACI 318 Sections 21.5.4.1 and 21.6.5.1 for all the beams framing into the column above the level under consideration, transverse reinforcement as specified in ACI 318 Sections 21.6.4.1 through 21.6.4.3 shall be provided. For beams framing into opposite sides of the column, the moment components may be assumed to be of opposite sign. For the determination of the design strength,  $\phi P_n$ , of the column, these moments may be assumed to result from the deformation of the frame in any one principal axis.

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

21.9.4.6 – Walls and portions of walls with  $P_u > 0.35P_o$  shall not be considered to contribute to the calculated strength of the structure for resisting earthquake-induced forces. Such walls shall conform to the requirements of ACI 318 Section 21.13.

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

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

**(h) Intermediate structural wall.** Amend Section 1908.1.2 of the 2010 California Building Code to read as follows:

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

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

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

(a) Ordinary moment frames shall satisfy 21.2.

(b) Ordinary reinforced concrete structural walls and ordinary precast structural walls need not satisfy any provisions in Chapter 21.

(c) Intermediate moment frames shall satisfy 21.3.

(d) Intermediate precast structural walls shall satisfy 21.4.

(e) Special moment frames shall satisfy 21.5 through 21.8.

(f) Special structural walls shall satisfy 21.9.

(g) Special structural walls constructed using precast concrete shall satisfy 21.10.

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

(i) **Wall pier.** Amend Section 1908.1.3 of the 2010 California Building Code to read as follows:

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

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

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

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

21.4.6 – Wall piers not designed as part of a moment frame in buildings assigned to Seismic Design Category C shall have transverse reinforcement designed to resist the shear forces determined from 21.3.3. Spacing of transverse reinforcement shall not exceed 8 inches (203 mm). Transverse reinforcement shall be extended beyond the pier clear height for at least 12 inches (305 mm).

**Exceptions:**

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

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

(j) **Minimum reinforcement.** Amend Section 1908.1.8 of the 2010 California Building Code to read as follows:

**1908.1.8 ACI 318, Section 22.10.** Delete ACI 318, Section 22.10, and replace with the following:

22.10 – Plain concrete in structures assigned to Seismic Design Category C, D, E or F.

22.10.1 – Structures assigned to Seismic Design Category C, D, E or F shall not have elements of structural plain concrete, except as follows:

(a) Concrete used for fill shall comply with the requirement of Section 1909 of the California Building Code.

(b) Isolated footings of plain concrete supporting pedestals or columns are permitted, provided the projection of the footing beyond the face of the supported member does not exceed the footing thickness.

(c) Plain concrete footings supporting walls are permitted provided the footings have at least two continuous longitudinal reinforcing bars. Bars shall not be smaller than No. 4 and shall have a total area of not less than 0.002 times the gross cross-sectional area of the footing. A minimum of one bar shall be provided at the top and bottom of the footing. Continuity of reinforcement shall be provided at corners and intersections.

In detached one- and two-family dwellings three stories or less in height and constructed with stud-bearing walls, plain concrete footings with at least two continuous longitudinal reinforcing bars not smaller than No. 4 are permitted to have a total area of less than 0.002 times the gross cross-sectional area of the footing.

#### **9.01.140 Steel construction provisions.**

The following sections are amended per the above geological and topographical findings as follows:

**(a) Special Concentrically Braced Frames (SCBF).** Modify AISC 341 Part I, Section 13.2 Members by adding a new section as follows the following:

**13.2f. Member Types.** The use of rectangular HSS are not permitted for bracing members, unless filled solid with cement grout having a minimum compressive strength of two thousand five hundred psi at twenty-eight days. The effects of composite action in the filled composite brace shall be considered in the sectional properties of the system where it results in the more severe loading condition or detailing.

**(b) Consumables for welding.** Add Section 2204.1.1 to Chapter 22 of the 2010 California Building Code to read as follows:

##### **2204.1.1 Consumables for welding.**

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

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

#### **9.01.150 Wood construction.**

The following sections are amended per the above geological and topographical findings as follows:

**(a) General fastener requirement.** Amend Section 2304.9.1 and Table 2304.9.1 of the 2010 California Building Code to read as follows:

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

~~(a)~~ **(b) Retaining Walls.** Section 2304.11.7 of the California Building Code is deleted in its entirety.

~~(b)~~ **(c) Hold-down Connectors.**

~~**2305.3.7.1.** Hold-down connectors shall be designed to resist shear wall overturning moments using approved cyclic load values or seventy five percent of the allowable earthquake load values that do not consider cyclic loading of the product. Connector bolts into wood posts require steel plate washers on the post on the opposite side of anchorage device. Plates shall be two and one half by two and one half by one quarter for bolts up to five eighths inch in diameter and three by three by three eighths for larger bolts.~~

**2305.5 Hold-down connectors.** In Seismic Design Category D, E or F, hold-down connectors shall be designed to resist shear wall overturning moments using approved cyclic load values or 75 percent of the allowable seismic load values that do not consider cyclic loading of the product. Connector

bolts into wood framing shall require steel plate washers on the post on the opposite side of the anchorage device. Plate size shall be a minimum of 0.229 inch by 3 inches by 3 inches (5.82 mm by 76 mm by 76 mm) in size. Hold-down connectors shall be tightened to finger tight plus one half (1/2) wrench turn just prior to covering the wall framing.

(c) (d) **Shear Walls and Diaphragms.**

(1) **Plaster and Gypsum Shear Walls.** Shear capacities for walls sheathed with lath, plaster or gypsum board shall be in accordance with Table 2306.4.5 and shear walls sheathed with lath, plaster or gypsum board shall be constructed in accordance with Section 2306.4.5.1 of the building code. Walls resisting seismic loads shall be subject to the limitations in Section 12.2.1 of ASCE 7. The allowable shear values shown in Table 2306.4.5 for materials in category 1 are limited to ninety pounds per foot (1.31 kN/m); material in category 2 through 4 are limited to thirty pounds per foot (438 N/m).

(2) **Shear Wall Capacity.** Modify Section 2306.4.1 of the California Building Code as follows:

**2306.4.1. Wood Structural Panel Shear Walls.** The allowable shear capacities for wood structural panel shear walls shall be in accordance with Table 2306.4.1. These capacities are permitted to be increased forty percent for wind design. No increase for sixteen inch on center stud spacing shall be allowed as indicated in Footnote d of Table 2306.4.1 ~~Values for wood shear walls constructed with staples shall be reduced by twenty five percent.~~

For shear walls constructed with wood structural panels of three-ply construction, the maximum allowable shear shall be limited to two hundred pounds per foot. No value shall be given for wood structural sheathing applied over gypsum or plaster sheathing.

(3) **Construction.** Section 2305.3.3 of the California Building Code is modified as follows:

**2305.3.3 Construction.** Wood shearwalls shall be constructed of wood structural panels manufactured with exterior glue and not less than four feet by eight feet (1,219 mm by 2,438 mm), except at boundaries and at changes in framing. All edges of all panels shall be supported by and fastened to framing members or blocking. Wood structural panel thickness for shear walls shall not be less than three eighths inch thick and studs shall not be spaced at more than sixteen inches on center.

(4) **Fasteners.** Fasteners for wood structural panel sheathing on shear walls and diaphragms shall be common nails with full heads unless otherwise approved. Mechanically driven common nails may be used when the fastener meets the same tolerances for head, shank and length allowed in ASTM 1667 for hand-driven nails. Staple fasteners shall not be used.

Nails shall be placed a minimum of one-half inch from the panel edges and a minimum of one-half inch from the edge of the connecting members for shear greater than three hundred pounds per foot.

(5) **Limits on Rotation of Diaphragms.** Except as permitted below, lumber and wood structural panel diaphragms shall not be considered as transmitting lateral forces by rotation.

Transfer of lateral forces by rotation will be permitted for one-story, detached residential garages or similar Group U, Division 1 wood-framed structures with a maximum depth normal to the open side of twenty-five feet and a maximum width of twenty-five feet provided the diaphragm is not constructed of straight sheathing.

(d) (e) **Conventional Light Frame Construction.**

(1) **Number of stories.** Modify Section 2308 of the California Building Code as follows:

**2308.12.1 Number of stories.** Structures of conventional light-frame construction shall not exceed one story in height in Seismic Design Category D or E.

(2) **Braced Wall Line Support.** Modify Section 2308.3.4 of the California Building Code as follows:

**2308.3.4 Braced wall line support.** Braced wall lines shall be supported by continuous foundations.

(3) **Braced Wall Line Sheathing.** Modify Footnotes b and c of Table 2308.12.4 of the California Building Code as follows:

(b) G-P = gypsum board, lath and plaster or gypsum sheathing boards attached to studs at maximum sixteen inches on center; S-W = wood structural panels of minimum 15/32 inch thickness attached to studs at maximum sixteen inches on center.

(c) Nailing as specified below shall occur at all panel edges at studs, at top and bottom plates and, where occurring, at blocking:

For one-half-inch gypsum board, 5d (0.113 inch diameter) cooler nails at seven inches on center;

For 5/8-inch gypsum board, No. 11 gage (0.120 inch diameter) at seven inches on center;

For gypsum sheathing board, one and three-quarter inches long by 7/16-inch head, diamond point galvanized nails at four inches on center;

For gypsum lath, No. 13 gage (0.092 inch) by one and one-eighth inches long, 19/64-inch head, plasterboard at five inches on center;

For Portland cement plaster, No. 11 gage (0.120 inch) by one and one-half inches long, 7/16-inch head at six inches on center;

For S-W sheathing shall be nailed with 10d common nails, at 6:6:12.

(4) **Braced Wall Line Attachment.** Modify Section 2308.12.5 of the California Building Code as follows:

**2308.12.5 Attachment of sheathing.** Fastening of braced wall panel sheathing shall not be less than that prescribed in Table 2308.12.4 or 2304.9.1. Wall sheathing shall not be attached to framing members by adhesives.

All braced wall panels shall extend to the roof sheathing and shall be attached to parallel roof rafters or blocking above with framing clips (18 gauge minimum) spaced at maximum twenty-four inches (6,096 mm) on center with four 8d common nails per leg (total eight 8d common nails per clip). Braced wall panels shall be laterally braced at each top corner and at maximum twenty-four inch (6,096 mm) intervals along the top plate of discontinuous vertical framing.

(f) Wood used in retaining wall. Amend Section 2304.11.7 of the 2010 California Building Code to read as follows:

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

(g) Quality of nails. Add Section 2305.4 to Chapter 23 of the 2010 California Building Code to read as follows:

2305.4 Quality of Nails. In Seismic Design Category D, E or F, mechanically driven nails used in wood structural panel shear walls shall meet the same dimensions as that required for hand-driven nails, including diameter, minimum length and minimum head diameter. Clipped head or box nails are not permitted in new construction. The allowable design value for clipped head nails in existing construction may be taken at no more than the nail-head-area ratio of that of the same size hand-driven nails.

(h) Wood diaphragms. Add Tables 2306.2.1(3) and 2306.2.1(4) to Chapter 23 of the 2010 California Building Code and amend Section 2306.2.1 of the 2010 California Building Code to read as follows:

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

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

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

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

**Exception:** Wood structural panel diaphragm is permitted to be fastened over solid lumber planking or laminated decking, provided the panel joints and lumber planking or laminated decking joints do not coincide.

**TABLE 2306.2.1(3)**

**ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL DIAPHRAGMS WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE<sup>a</sup> FOR SEISMIC LOADING<sup>f</sup>**

**FOR STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY D, E OR F**

PANEL GRADE	COMMON NAIL SIZE	MINIMUM FASTENER PENETRATION IN FRAMING (inches)	MINIMUM NOMINAL PANEL THICKNESS (inch)	MINIMUM NOMINAL WIDTH OF FRAMING MEMBERS AT ADJOINING PANEL EDGES AND BOUNDARIES <sup>a</sup> (inches)	BLOCKED DIAPHRAGMS				UNBLOCKED DIAPHRAGMS	
					Fastener spacing (inches) at diaphragm boundaries (all cases) at continuous panel edges parallel to load (Cases 3, 4), and at all panel edges (Cases 5, 6) <sup>b</sup>				Fastener spaced 6" max. at supported edges <sup>b</sup>	
					6	4	2 1/2 <sup>c</sup>	2 <sup>d</sup>	Case 1 (No unblocked edges or continuous joints parallel to load)	All other configurations (Cases 2, 3, 4, 5 and 6)
					Fastener spacing (inches) at other panel edges (Cases 1, 2, 3 and 4) <sup>b</sup>					
Structural Grades	8d (2 1/2" x 0.131")	1 3/8	3/8	2	270	360	530	600	240	180
				3	300	400	600	675	265	200
	10d <sup>e</sup> (3" x 0.148")	1 1/2	15/32	2	320	425	640	730	285	215
				3	360	480	720	820	320	240
Sheathing, single floor and other grades covered in DQC PS1 and PS2	6d <sup>e</sup> (2" x 0.113")	1 1/4	3/8	2	185	250	375	420	165	125
				3	210	280	420	475	185	140
	8d (2 1/2" x 0.131")	1 3/8	3/8	2	240	320	480	545	215	160
				3	270	360	540	610	240	180
	8d (2 1/2" x 0.131")	1 3/8	7/16	2	255	340	505	575	230	170
				3	285	380	570	645	255	190
	8d (2 1/2" x 0.131")	1 3/8	15/32	2	270	360	530	600	240	180
				3	300	400	600	675	265	200
	10d <sup>e</sup> (3" x 0.148")	1 1/2	15/32	2	290	385	575	655	255	190
				3	324	430	650	735	290	215
	10d <sup>e</sup> (3" x 0.148")	1 1/2	19/32	2	320	425	640	730	285	215
				3	360	480	720	820	320	240

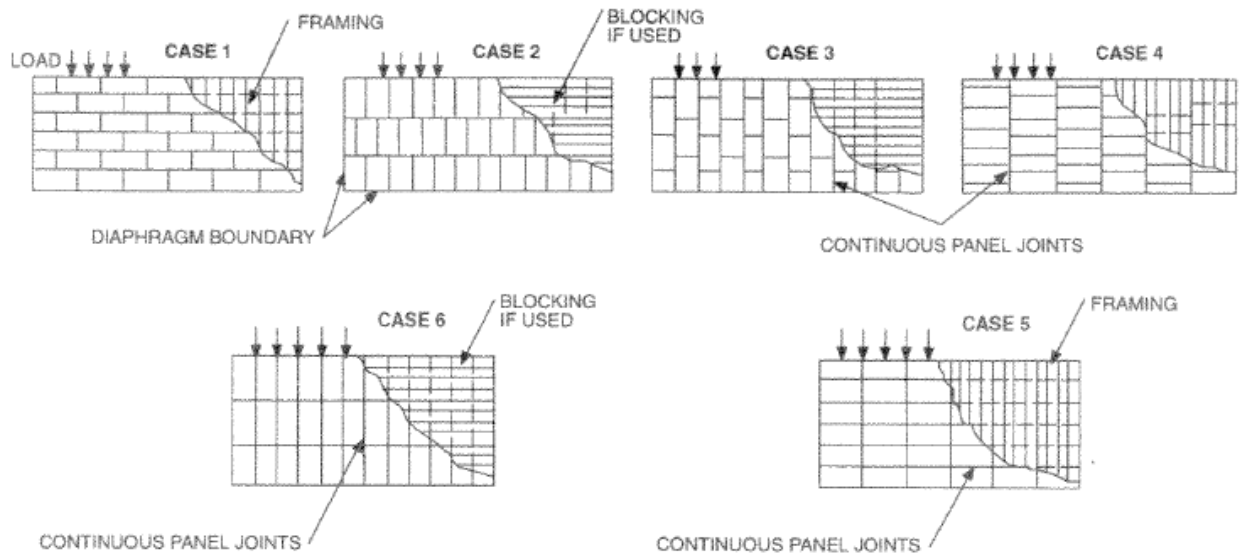
**ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL**

**PANEL DIAPHRAGMS WITH FRAMING OF DOUGLAS FIR-LARCH,**

**OR SOUTHERN PINE<sup>a</sup> FOR SEISMIC LOADING<sup>f</sup>**

**FOR STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY D, E OR F**





For SI: 1 inch = 25.4 mm, 1 pound per foot = 14.5939 N/m.

- a. For framing of other species: (1) Find specific gravity for species of lumber in AF&PA NDS. (2) For nails find shear value from table above for nail size for actual grade and multiply value by the following adjustment factor: Specific Gravity Adjustment Factor =  $[1-(0.5-SG)]$ , where SG = Specific Gravity of the framing lumber. This adjustment factor shall not be greater than 1.
- b. Space fasteners maximum 12 inches o.c. along intermediate framing members (6 inches o.c. where supports are spaced 48 inches o.c.).
- c. Framing at adjoining panel edges shall be 3 inches nominal or thicker, and nails at all panel edges shall be staggered where panel edge nailing is specified at 2 ½ inches o.c. or less.
- d. Framing at adjoining panel edges shall be 3 inches nominal or thicker, and nails at all panel edges shall be staggered where both of the following conditions are met: (1) 10d nails having penetration into framing of more than 1 ½ inches and (2) panel edge nailing is specified at 3 inches o.c. or less.
- e. The minimum nominal width of framing members not located at boundaries or adjoining panel edges shall be 2 inches.
- f. For shear loads of normal or permanent load duration as defined by the AF&PA NDS, the values in the table above shall be multiplied by 0.63 or 0.56, respectively.

**TABLE 2306.2.1(4)**

**ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL BLOCKED DIAPHRAGMS UTILIZING MULTIPLE ROWS OF FASTENERS (HIGH LOAD DIAPHRAGMS) WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE<sup>a</sup> FOR SEISMIC LOADING<sup>b,f,g</sup>**

**FOR STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY D, E OR F**

PANEL GRADE <sup>c</sup>	COMMON NAIL SIZE	MINIMUM FASTENER PENETRATION IN FRAMING (inches)	MINIMUM NOMINAL PANEL THICKNESS (inch)	MINIMUM NOMINAL WIDTH OF FRAMING MEMBERS AT ADJOINING PANEL EDGES AND BOUNDARIES <sup>e</sup> (inches)	LINES OF FASTENERS	BLOCKED DIAPHRAGMS			
						Cases 1 and 2 <sup>d</sup>			
						Fastener Spacing Per Line at Boundaries (inches)			
						4		2 1/2	
						Fastener Spacing Per Line at Other Panel Edges (inches)			
6		4		4		3			
Structural I grades	10d common nails	1 1/2	15/32	3	2	605	815	875	1.150
				4	2	700	915	1,005	1,290
				4	3	875	1,220	1,285	1,395
				3	2	670	880	965	1,255
				4	2	780	990	1,110	1,440
				4	3	965	1,320	1,405	1,790
			23/32	3	2	730	955	1,050	1,365
				4	2	855	1,070	1,210	1,565
				4	3	1,050	1,430	1,525	1,800
				3	2	525	725	765	1,010
				4	2	605	815	875	1,105
				4	3	765	1,085	1,130	1,195
Sheathing, single floor and other grades covered in DOC PS1 and PS2	10d common nails	1 1/2	15/32	3	2	650	860	935	1,225
				4	2	755	965	1,080	1,370
				4	3	935	1,290	1,365	1,485
				3	2	710	935	1,020	1,335
				4	2	825	1,050	1,175	1,445
				4	3	1,020	1,400	1,480	1,565

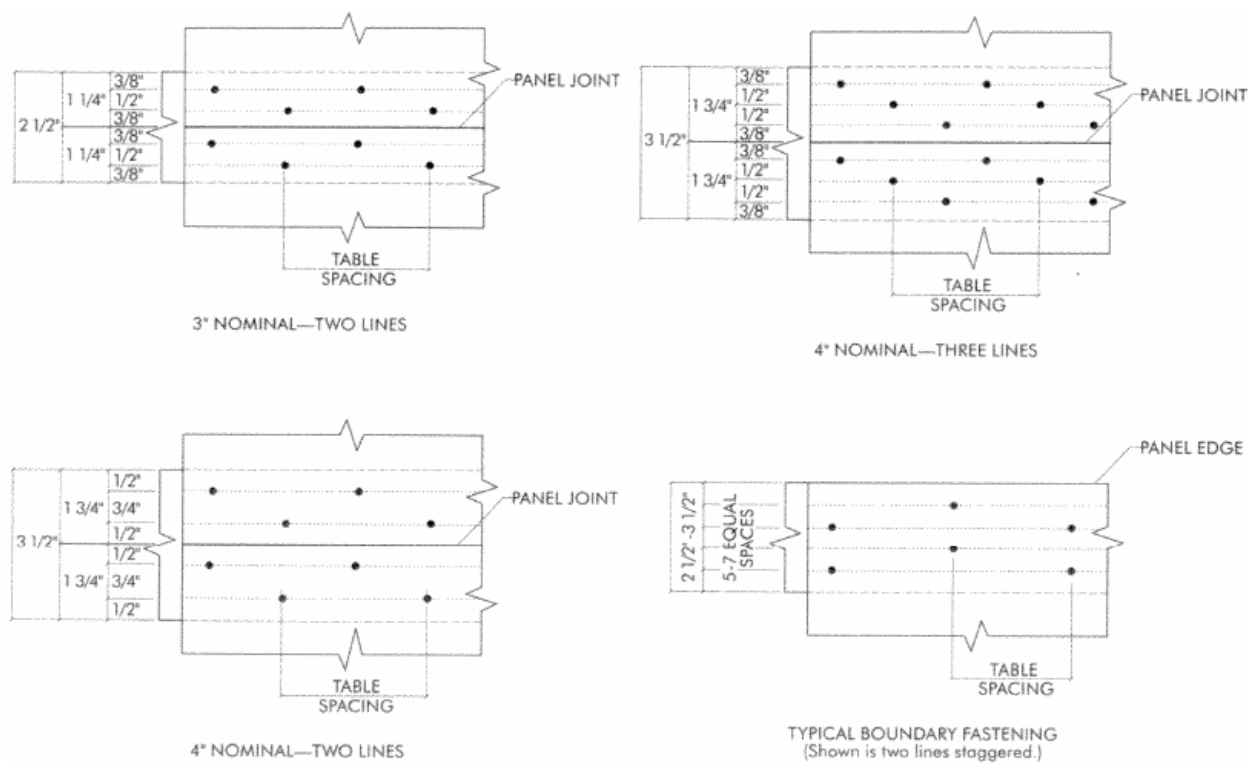
For SI: 1 inch = 25.4 mm, 1 pound per foot = 14.5939 N/m.

- For framing of other species: (1) Find specific gravity for species of lumber in AF&PA NDS. (2) For nails find shear value from table above for nail size for actual grade and multiply value by the following adjustment factor: Specific Gravity Adjustment Factor = [1-(0.5-SG)], where SG = Specific Gravity of the framing lumber. This adjustment factor shall not be greater than 1.
- Fastening along intermediate framing members: Space fasteners a maximum of 12 inches on center, except 6 inches on center for spans greater than 32 inches.
- Panels conforming to PS1 or PS 2.
- This table gives shear values for Cases 1 and 2 as shown in Table 2306.2.1(3). The values shown are applicable to Cases 3, 4, 5 and 6 as shown in Table 2306.2.1(3), providing fasteners at all continuous panels edges are spaced in accordance with the boundary fastener spacing.
- The minimum nominal depth of framing members shall be 3 inches nominal. The minimum nominal width of framing members not located at boundaries or adjoining panel edges shall be 2 inches.
- High load diaphragms shall be subject to special inspection in accordance with Section 1704.6.1.
- For shear loads of normal or permanent load duration as defined by the AF&PA NDS, the values in the table above shall be multiplied by 0.63 or 0.56, respectively.

**TABLE 2306.2.1(4)–continued**

**ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL BLOCKED DIAPHRAGMS UTILIZING MULTIPLE ROWS OF FASTENERS (HIGH LOAD DIAPHRAGMS) WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE<sup>a</sup> FOR SEISMIC LOADING<sup>b,f,g</sup>**

**FOR STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY D, E OR F**



**(i) Wood shear walls.** Add Table 2306.3(2) to Chapter 23 of the 2010 California Building Code and amend Section 2306.3 and Table 2306.3 of the 2010 California Building Code to read as follows:

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

Wood structural panel shear walls used to resist seismic forces in structures assigned to Seismic Design Category D, E or F shall not be less than 4 feet by 8 feet (1219 mm by 2438 mm), except at boundaries and at changes in framing. Wood structural panel thickness for shear walls shall not be less than 3/8 inch thick and studs shall not be spaced at more than 16 inches on center.

The maximum allowable shear value for three-ply plywood resisting seismic forces in structures assigned to Seismic Design Category D, E or F is 200 pounds per foot (2.92 kn/m). Nails shall be placed not less than 1/2 inch (12.7 mm) in from the panel edges and not less than 3/8 inch (9.5mm) from the edge of the connecting members for shear greater than 350 pounds per foot (5.11kN/m). Nails shall be placed not less than 3/8 inch (9.5 mm) from panel edges and not less than 1/4 inch (6.4 mm) from the edge of the connecting members for shears of 350 pounds per foot (5.11kN/m) or less.

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

**TABLE 2306.3(1)**

**ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL SHEAR WALLS WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE<sup>a</sup> FOR WIND OR SEISMIC LOADING<sup>b, h, l, j, i, m, n</sup>**

PANEL GRADE	MINIMUM NOMINAL PANEL THICKNESS (inch)	MINIMUM FASTENER PENETRATION IN FRAMING (inches)	ALLOWABLE SHEAR VALUE FOR SEISMIC FORCES PANELS APPLIED DIRECTLY TO FRAMING				
			COMMON NAIL SIZE	Fastener spacing at panel edges (inches)			
				6	4	3	2 <sup>a</sup>
Structural I sheathing	3/8	1 3/8	8d (2½"x0.131" common)	200	200	200	200
	7/16	1 3/8	8d (2½"x0.131" common)	255	395	505	670
	15/32	1 3/8	8d (2½"x0.131" common)	280	430	550	730
		1 1/2	10d (3"x0.148" common)	340	510	665 <sup>f</sup>	870
Sheathing, plywood siding <sup>g</sup> except Group 5 Species	3/8 <sup>c</sup>	1 3/8	8d (2½"x0.113")	160	200	200	200

**TABLE 2306.3(2)**

**ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL SHEAR WALLS WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE<sup>a</sup> FOR SEISMIC LOADING<sup>b, h, j, k, l</sup>**

**FOR STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY D, E OR F**

For SI: 1 inch = 25.4 mm, 1 foot = 25.4 mm, 1 pound per foot = 14.5939 N/m.

- a. For framing of other species: (1) Find specific gravity for species of lumber in AF&PA NDS. (2) For nails find shear value from table above for nail size for actual grade and multiply value by the following adjustment factor: Specific Gravity Adjustment Factor = [1-(0.5-SG)], where SG = Specific Gravity of the framing lumber. This adjustment factor shall not be greater than 1.
- b. Panel edges backed with 2-inch nominal or thicker framing. Install panels either horizontally or vertically. Space fasteners maximum 6 inches on center along intermediate framing members for 3/8-inch and 7/16-inch panels installed on studs spaced 24 inches on center. For other conditions and panel thickness, space fasteners maximum 12 inches on center on intermediate supports.
- c. 3/8-inch panel thickness or siding with a span rating of 16 inches on center is the minimum recommended where applied direct to framing as exterior siding. For grooved panel siding, the nominal panel thickness is the thickness of the panel measured at the point of nailing.
- d. Allowable shear values are permitted to be increased to values shown for 15/32-inch sheathing with same nailing provided (a) studs are spaced a maximum of 16 inches on center, or (b) panels are applied with long dimension across studs.
- e. Framing at adjoining panel edges shall be 3 inches nominal or thicker, and nails shall be staggered where nails are spaced 2 inches on center or less.
- f. Framing at adjoining panel edges shall be 3 inches nominal or thicker, and nails shall be staggered where both of the following conditions are met: (1) 10d (3"x0.148") nails having penetration into framing of more than 1-1/2 inches and (2) nails are spaced 3 inches on center or less.
- g. Values apply to all-veneer plywood. Thickness at point of fastening on panel edges governs shear values.
- h. Where panels applied on both faces of a wall and nail spacing is less than 6 inches o.c. on either side, panel joints shall be offset to fall on different framing members. Or framing shall be 3-inch nominal or thicker at adjoining panel edges and nails at all panel edges shall be staggered.
- i. Where shear design values exceed 350 pounds per linear foot, all framing members receiving edge nailing from abutting panels shall not be less than a single 3-inch nominal member, or two 2-inch nominal members fastened together in accordance with Section 2306.1 to transfer the design shear value between framing members. Wood structural panel joint and sill plate nailing shall be staggered at all panel edges. See Section 4.3.6.1 and 4.3.6.4.3 of AF&PA SDPWS for sill plate size and anchorage requirements.
- j. Galvanized nails shall be hot dipped or tumbled.
- k. For shear loads of normal or permanent load duration as defined by the AF&PA NDS, the values in the table above shall be multiplied by 0.63 or 0.56, respectively.
- l. The maximum allowable shear value for three-ply plywood resisting seismic forces is 200 pounds per foot (2.92 kn/m).

**(j) Other shear walls.** Amend Section 2306.7 of the 2010 California Building Code to read as follows:

**2306.7 Shear walls sheathed with other materials.** Shear walls sheathed with portland cement plaster, gypsum lath, gypsum sheathing or gypsum board shall be designed and constructed in accordance with AF&PA SDPWS. Shear walls sheathed with these materials are permitted to resist horizontal forces using the allowable shear capacities set forth in Table 2306.7. Shear walls sheathed with portland cement plaster, gypsum lath, gypsum sheathing or gypsum board shall not be used to resist seismic forces in structures assigned to Seismic Design Category E or F.

Shear walls sheathed with lath, plaster or gypsum board shall not be used below the top level in a multi-level building for structures assigned to Seismic Design Category D.

**(k) Brace wall line support.** Amend Section 2308.3.4 of Chapter 23 of the 2010 California Building Code to read as follows:

**2308.3.4 Braced wall line support.** Braced wall lines shall be supported by continuous foundations.

**Exception:** For structures with a maximum plan dimension not over 50 feet (15240 mm), continuous foundations are required at exterior walls only for structures not assigned to Seismic Design Category D, E or F.

**(l) Concrete or masonry.** Amend Section 2308.12.2 of Chapter 23 of the 2010 California Building Code to read as follows:

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

**Exception:** Stone and masonry veneer is permitted to be used in the first story above grade plane in Seismic Design Category D, provided the following criteria are met:

1. Type of brace in accordance with Section 2308.9.3 shall be Method 3 and the allowable shear capacity in accordance with Table 2306.4.1 shall be a minimum of 350 plf (5108 N/m).
2. The bracing of the first story shall be located at each end and at least every 25 feet (7620 mm) o.c. but not less than 45 percent of the braced wall line.
3. Hold-down connectors shall be provided at the ends of braced walls for the first floor to foundation with an allowable design of 2,100 pounds (9341 N).
4. Cripple walls shall not be permitted.
5. Anchored masonry and stone wall veneer shall not exceed 5 inches (127 mm) in thickness, shall conform to the requirements of Chapter 14 and shall not extend more than 5 feet (1524 mm) above the first story finished floor. The height extending above the first story finished floor may be greater than 5 feet (1524mm) provided it is designed by a registered design professional and approved by the Building Officer.

**(m) Braced wall sheathing.** Amend Section 2308.12.4 and Table 2308.12.4 of the 2010 California Building Code to read as follows:

**2308.12.4 Braced wall line sheathing.** Braced wall lines shall be braced by one of the types of sheathing prescribed by Table 2308.12.4 as shown in Figure 2308.9.3. The sum of lengths of braced wall panels at each braced wall line shall conform to Table 2308.12.4. Braced wall panels shall be distributed along the length of the braced wall line and start at not more than 8 feet (2438 mm) from each end of the braced wall line. Panel sheathing joints shall occur over studs or blocking. Sheathing shall be fastened to studs, top and bottom plates and at panel edges occurring over blocking. Wall framing to which sheathing used for bracing is applied shall be nominal 2 inch wide [actual 1 1/2 inch (38 mm)] or larger members and spaced a maximum of 16 inches on center.

**Exception:** Braced wall panels required by Section 2308.12.4 may be eliminated when all of the following requirements are met:

1. One story detached Group U occupancies not more than 25 feet in depth or length.
2. The roof and three enclosing walls are solid sheathed with 15/32 inch nominal thickness wood structural panels with 8d common nails placed 3/8 inches from panel edges and spaced not more than 6 inches on center along all panel edges and 12 inches on center along intermediate framing members. Wall openings for doors or windows are permitted provided a minimum 4 foot wide wood structural braced panel with minimum height to length ratio of 2 to 1 is provided at each end of the wall line and that the wall line be sheathed for 50% of its length.

Wood structural panel sheathing shall be a minimum of 15/32 inch thick nailed with 8d common placed 3/8 inches from panel edges and spaced not more than 6 inches on center and 12 inches on center along intermediate framing members.

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

**TABLE 2308.12.4**

**WALL BRACING IN SEISMIC DESIGN CATEGORIES D AND E**

**(Minimum Length of Wall Bracing per each 25 Linear Feet of Braced Wall Line <sup>a)</sup>**

<b>CONDITION</b>	<b><u>SHEATHING TYPE<sup>b</sup></u></b>	<b><u><math>S_{DS} &lt; 0.50</math></u></b>	<b><u><math>0.50 \leq S_{DS} &lt; 0.75</math></u></b>	<b><u><math>0.75 \leq S_{DS} \leq 1.00</math></u></b>	<b><u><math>S_{DS} &gt; 1.00</math></u></b>
One Story	G-P <sup>c</sup>	10 feet 8 inches	14 feet 8 inches	18 feet 8 inches	25 feet 0 inches
	S-W <sup>d</sup>	5 feet 4 inches	8 feet 0 inches	9 feet 4 inches	12 feet 0 inches

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

- a. Minimum length of panel bracing of one face of the wall for S-W sheathing shall be at least 4'-0" long or both faces of the wall for G-P sheathing shall be at least 8'-0" long; h/w ratio shall not exceed 2:1. For S-W panel bracing of the same material on two faces of the wall, the minimum length is permitted to be one-half the tabulated value but the h/w ratio shall not exceed 2:1 and design for uplift is required.
- b. G-P = gypsum board, portland cement plaster or gypsum sheathing boards; S-W = wood structural panels.
- c. Nailing as specified below shall occur at all panel edges at studs, at top and bottom plates and, where occurring, at blocking:

For 1/2-inch gypsum board, 5d (0.113 inch diameter) cooler nails at 7 inches on center;

For 5/8-inch gypsum board, No 11 gage (0.120 inch diameter) cooler nails at 7 inches on center;

For gypsum sheathing board, 1-3/4 inches long by 7/16-inch head, diamond point galvanized nails at 4 inches on center;

For gypsum lath, No. 13 gage (0.092 inch) by 1-1/8 inches long, 19/64-inch head, plasterboard at 5 inches on center;

For Portland cement plaster, No. 11 gage (0.120 inch) by 1 1/2 inches long, 7/16- inch head at 6 inches on center;

- d. S-W sheathing shall be a minimum of 15/32" thick nailed with 8d common placed 3/8 inches from panel edges and spaced not more than 6 inches on center and 12 inches on center along intermediate framing members.

(n) Attachment of sheathing. Amend Section 2308.12.5 of the 2010 California Building Code to read as follows:

**2308.12.5 Attachment of sheathing.** Fastening of braced wall panel sheathing shall not be less than that prescribed in Table 2308.12.4 or 2304.9.1. Wall sheathing shall not be attached to framing members by adhesives. Staple fasteners in Table 2304.9.1 shall not be used to resist or transfer seismic forces in structures assigned to Seismic Design Category D, E or F.

All braced wall panels shall extend to the roof sheathing and shall be attached to parallel roof rafters or blocking above with framing clips (18 gauge minimum) spaced at maximum 24 inches (6096 mm) on center with four 8d nails per leg (total eight 8d nails per clip). Braced wall panels shall be laterally braced at each top corner and at maximum 24 inch (6096 mm) intervals along the top plate of discontinuous vertical framing.

SECTION 3. Chapter 9.03 of Title 9 of the Manhattan Beach Municipal Code is hereby added as follows:

Chapter 3. RESIDENTIAL CODE

**9.03.010 Adoption of California Residential Code.**

Pursuant to the provisions of Section 50022.1 to 50022.10, inclusive, of the Government Code of the State and subject to the particular additions, deletions and amendments set forth in this chapter, the rules, regulations, provisions and conditions set forth in that certain Code entitled "California Residential Code 2010 Edition," including Chapter 1, Division 2 and Appendix G therein contained, promulgated and published by the International Code Council and the California Building Standards Commission, one (1) full printed copy of which, printed as a Code in book form were by the Council ordered filed and which have been filed in the office of the City Clerk, expressly incorporated herein and made a part hereof as fully and for all intents and purposes as set forth herein at length, are hereby established and adopted as the rules, regulations, and provisions and conditions to be observed and followed in the construction, enlargement, alteration, movement, replacement, repair, equipment, use and occupancy, location, removal and demolition, conversion, use, height, area and maintenance of buildings, structures and improvements of every detached one-and two-family dwelling, townhouse not more than three stories above grade plane in height with a separate means of egress and structures accessory thereto in the city and related subjects, items and matters as set forth in said Code, within the City. Subject to the additions, deletions and amendments set forth in this chapter, said Code, with its said Chapter 1, Division 2 and Appendix G, is hereby established and adopted, and the same shall be designated, known and referred to as the "Residential Code" of and for the City.

**9.03.020 Work exempt from permit.**

**R105.2, item 7 is hereby amended per administrative requirements as follows:**

7. Prefabricated swimming pools that are less than 24 18 inches (457 mm) deep.

**9.03.030 Expiration of plan review.**

**Section R105.3.2 is amended in its entirety for administrative requirements as follows:**

**Section R105.3.2 Time limitation of application.** Applications for which no permit is issued within 180 days following the date of application shall expire by limitation and plans and other data submitted for review may thereafter be returned to the applicant or destroyed by the Building Official. The Building Official may extend the time for action by applicant for a period not exceeding 180 days upon written request by the applicant and justifiable cause demonstrated. No application shall be extended more than once. In order to renew action on an application after expiration, the applicant shall resubmit plans and pay a new plan review fee and plans shall be reviewed under the current codes and ordinances at the time of the new applications.

**9.03.040 Permit Expiration.**

**Section R105.5 is hereby amended for administrative requirements as follows:**

**R105.5 Expiration.** Every permit issued shall become invalid unless the work on the site authorized by such permit is commenced within 180 days after its issuance, or if the work authorized by such permit is suspended or abandoned for a period of 180 days after the work is commenced, or if the building or work authorized by such permit is not completed within 2 calendar years from the issuance date of the permit.

Before such work can be recommenced, a new permit, or a renewed permit as specified below, shall be first obtained. No permit shall be renewed more than once.

For permits where work has not commenced within 180 days from the date of such permit, a renewed permit may be obtained provided that: (1) no changes have been made or will be required in the original plans and specifications for such work; and (2) the expiration has not exceeded two years from the original issuance date.

For permits where work had commenced and was subsequently suspended or abandoned for a period exceeding 180 days, a renewed permit may be obtained provided that: (1) No changes have been made or will be required in the original plans and specifications for such work; and (2) the



expiration has not exceeded two years from the issuance date and/or (3) Where construction has progressed and has been approved to the point whereby only a final inspection(s) is required, a fee shall be determined based on the number of estimated inspections, estimated staff time, and required meetings as determined by the Building Official.

For permits that have exceeded two years beyond the issuance date, a new permit is required. The applicant shall pay the fee based on the valuation of the uncompleted work required for a plan check and a new permit and plans will be reviewed under the current codes and ordinances at the time of the new applications.

Any permittee holding an unexpired permit may apply for an extension of the time within which work under that permit may be continued when, for good and satisfactory reasons, the permittee is unable to continue work within the time required by this section. The Building Official may extend the time for action by the permittee for a period not exceeding six calendar months upon written request by the permittee showing that circumstances beyond the control of the permittee have prevented action from being taken. No permit shall be extended more than once.

If the owner or applicant fails to complete the construction work within the time required, the Building Official is authorized to obtain the abatement of any unsafe condition or nuisance created by such incomplete work. The City Attorney is authorized to file an action for the abatement of any such unsafe condition or nuisance if required to do so by the Building Official.

**9.03.050 Fees.**

**Section R108.2 shall be amended in its entirety per administrative requirements as follows:**

**R108.2 Schedule of permit fees.** The fees shall be determined by the most current City Resolution of Fees.

Plan Review Fees. When submittal documents are required by the building official, a plan review fee shall be paid at the time of submitting the submittal documents for plan review. Said plan review fee shall be determined by the most current City Resolution of Fees.

The plan review fees specified in this section are separate fees from the permit fees and are in addition to the permit fees.

When submittal documents are incomplete or changed so as to require additional plan review or when the project involves phased submittal items as defined in Section R106.3.3, an additional plan review fee shall be charged as determined by the most current City Resolution of Fees.

**Section R108.3 shall be amended per administrative requirements as follows:**

**R108.3 Building permit valuations.** The applicant for a permit shall provide an estimated permit value at time of application. Building permit valuations shall include total value of the work for which a permit is being issued, such as electrical, gas, mechanical, plumbing equipment and other permanent systems, including materials and labor. If, in the opinion of the building official, the valuation is underestimated on the application, the permit shall be denied, unless the applicant can show detailed estimates to meet the approval of the building official. Final building permit valuation shall be set by the building official.

**Section R108.6 shall be amended in its entirety per administrative requirements as follows:**

**R108.6 Work commencing before permit issuance.** Any person who commences any work on a building, structure, electrical, gas, mechanical or plumbing system before obtaining the necessary permits shall be subject to a fee established by the Building Official and the most current Manhattan Beach Resolution of Fees in addition to the required permit fees.

Investigation. Whenever any work for which a permit is required by this code has been commenced without first obtaining said permit, a special investigation shall be made before a permit may be issued for such work.

Investigation Fee. An investigation fee, in addition to the permit fee, shall be collected whether or not a permit is then or subsequently issued. The investigation fee shall be equal up to the amount of the permit fee required by this code as determined by the Building Official. The minimum investigation fee shall be determined by the most current Resolution of Fees. The payment of such investigation fee shall not exempt any person from compliance with all other provisions of this code nor from any penalty prescribed by law.

**9.03.060 Violation penalties.**

**Section R113.4 is amended for administrative requirements as follows:**

**Section R113.4. Violation penalties.** Any person who violates a provision of this code or fails to comply with any of the requirements thereof or who erects, constructs, alters or repairs a building or structure in violation of the approved construction documents or directive of the building official, or of a permit or certificate issued under the provisions of this code, shall be subject to the penalties as prescribed by law. Every person who willfully resists, delays, obstructs or interferes in any way with any City Building Inspector in the discharge or attempt to discharge any duty of his or her office or employment shall be guilty of a violation of this Chapter

Any person, firm, or corporation violating any of the provisions or failing to comply with any of the mandatory requirements of the ordinances of Manhattan Beach shall be guilty of a misdemeanor. Any person convicted of a misdemeanor under the ordinances of Manhattan Beach shall be punished by a fine of not more than one thousand dollars (\$1,000), or by imprisonment not to exceed six (6) months, or by both such fine and imprisonment. Each such person shall be guilty of a separate offense for each and every day during any portion of which any violation of any provision of the ordinances of Manhattan Beach is committed, continued, or permitted by any such person, and shall be punished accordingly.

**9.03.070 Definitions.**

**Section R202 is amended for the above geographic and topographic requirements as follows:**

**Section R202. ADDITION.** An extension or increase in floor area or height of a building or structure. Also, major demolition which includes the removal of roof framing, interior and exterior walls for the purpose of rebuilding with an increase in floor area, shall be considered a new building as determined by the building official.

**Section R202 ATTIC, HABITABLE.** This definition is deleted.

**9.03.080 General Residential Structural Provisions.**

**The following sections are amended for the above geographic and topographic requirements as follows:**

**(a) Woodframe structures.** Amend Section R301.1.3.2 of the 2010 California Residential Code to read as follows:

**R301.1.3.2 Woodframe structures.** The building official shall require construction documents to be approved and stamped by a California licensed architect or engineer for all dwellings of woodframe construction more than two stories and basement in height located in Seismic Design Category A, B or C. Notwithstanding other sections the law, the law establishing these provisions is found in Business and Professions Code Section 5537 and 6737.1.

The building official shall require construction documents and structural calculations to be approved and stamped by a California licensed architect or engineer for all dwellings of woodframe construction more than one story in height located in Seismic Design Category D<sub>0</sub>, D<sub>1</sub>, D<sub>2</sub> or E.

**(b) Slopes steeper than 33-1/3 percent.** Add Section R301.1.4 to the 2010 California Residential Code to read as follows:

**R301.1.4 Seismic Design Provisions for Buildings Constructed On Or Into Slopes Steeper Than One Unit Vertical In Three Units Horizontal (33.3 Percent Slope).**

The design and construction of new buildings and additions to existing buildings when constructed on or into slopes steeper than one unit vertical in three units horizontal (33.3 percent slope) shall comply with Section 1613.15 of the 2010 California Building Code.

**(c) Irregular buildings.** Amend Section R301.2.2.2.5 to the 2010 California Residential Code to read as follows:

**R301.2.2.2.5 1.** When exterior shear wall lines or braced wall panels are not in one plane vertically from the foundation to the uppermost story in which they are required.

- 2. When a section of floor or roof is not laterally supported by shear walls or braced wall lines on all edges.
- 3. When the end of a braced wall panel occurs over an opening in the wall below.
- 4. When an opening in a floor or roof exceeds the lesser of 12 feet (3658 mm) or 50 percent of the least floor or roof dimension.
- 5. When portions of a floor level are vertically offset.
- 6. When shear walls and braced wall lines do not occur in two perpendicular directions.
- 7. When stories above-grade partially or completely braced by wood wall framing in accordance with Section R602 or steel wall framing in accordance with Section R603 include masonry or concrete construction.

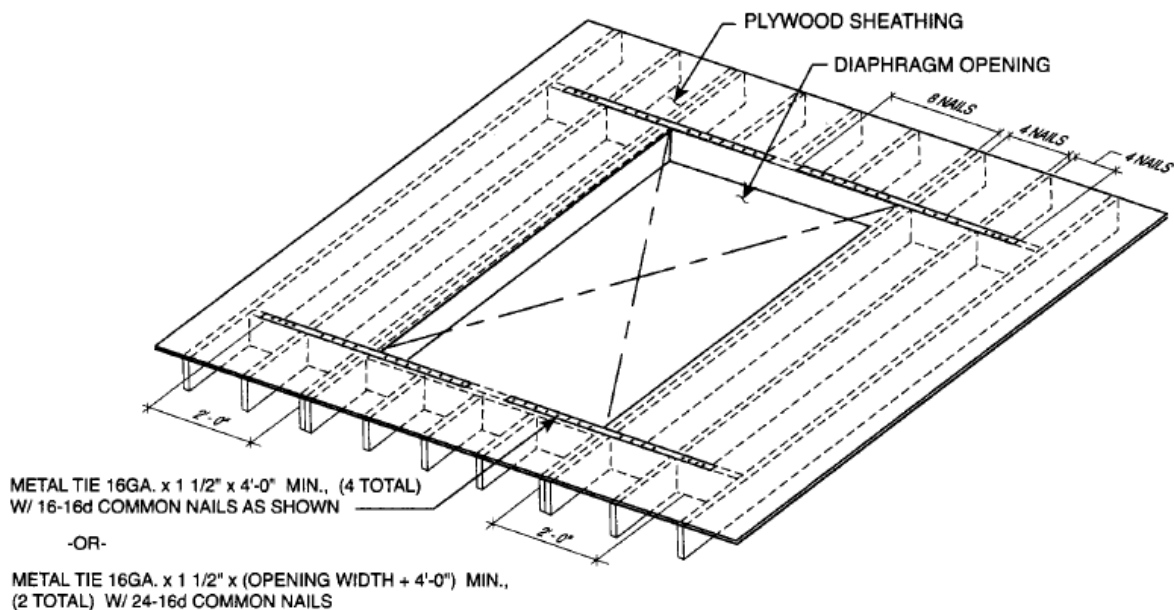
**(d) Application.** Amend Section R501.1 of the 2010 California Residential Code to read as follows:

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

**(e) Openings in horizontal diaphragms.** Add Section R503.2.4 to Chapter 5 of the 2010 California Residential Code to read as follows:

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

**Figure R503.2.4**



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




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




c. Openings in diaphragms shall be further limited in accordance with Section R301.2.2.2.5.

**(f) Bracing requirement.** Amend Table R602.10.1.2(2) of the 2010 California Residential Code to read as follows:

**TABLE R602.10.1.2(2)<sup>a,b,c</sup>**

**BRACING REQUIREMENTS BASED ON SEISMIC DESIGN CATEGORY  
(AS A FUNCTION OF BRACED WALL LINE LENGTH)**

SOIL CLASS D <sup>a</sup> WALL HEIGHT = 10 FT 10 PSF FLOOR DEAD LOAD 15 PSF ROOF/CEILING DEAD LOAD BRACED WALL LINE SPACING ≤ 25FT			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE			
Seismic Design Category (SDC)	Story Location	Braced Wall Line Length	Method LIB	METHODS DWB, SFB,GB, PBS, PCP, HPS	Method WSP	Continuous Sheathing
SDC Do or D <sub>1</sub>		10	NP	6.0	2.0	1.7
		20	NP	12.0	4.0	3.4
		30	NP	18.0	6.0	5.1
		40	NP	24.0	8.0	6.8
		50	NP	30.0	10.0	8.5
		10	NP	NP	4.5	3.8
		20	NP	NP	9.0	7.7
		30	NP	NP	13.5	11.5
		40	NP	NP	18.0	15.3
		50	NP	NP	22.5	19.1
		10	NP	NP	6.0	5.1
		20	NP	NP	12.0	10.2
		30	NP	NP	18.0	15.3
		40	NP	NP	24.0	20.4
		50	NP	NP	30.0	25.5

<b>SOIL CLASS D<sup>a</sup></b> <b>WALL HEIGHT = 10 FT</b> <b>10 PSF FLOOR DEAD LOAD</b> <b>15 PSF ROOF/CEILING DEAD LOAD</b> <b>BRACED WALL LINE SPACING &lt; 25FT</b>			<b>MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED</b>  <b>ALONG EACH BRACED WALL LINE</b>			
Seismic Design Category (SDC)	Story Location	Braced Wall Line Length	Method LIB	METHODS DWB, SFB,GB, PBS, PCP, HPS	Method WSP	Continuous Sheathing
SDC D <sub>2</sub>		10	NP	8.0	2.5	2.1
		20	NP	16.0	5.0	4.3
		30	NP	24.0	7.5	6.4
		40	NP	32.0	10.0	8.5
		50	NP	40.0	12.5	10.6
		10	NP	NP	5.5	4.7
		20	NP	NP	11.0	9.4
		30	NP	NP	16.5	14.0
		40	NP	NP	22.0	18.7
		50	NP	NP	27.5	23.1
		10	NP	NP	NP	NP
		20	NP	NP	NP	NP
		30	NP	NP	NP	NP
		40	NP	NP	NP	NP
		50	NP	NP	NP	NP

For SI: 1 foot = 304.8 mm, 1 pound per square foot = 47.89 Pa.






- a) Wall bracing lengths are based on a soil site class "D." Interpolation of bracing length between the  $S_{ds}$  values associated with the seismic design categories shall be permitted when a site-specific  $S_{ds}$  value is determined in accordance with Section 1613.5 of the California Building Code.
- b) Foundation cripple wall panels shall be braced in accordance with Section R602.10.9.
- c) Methods of bracing shall be as described in Sections R602.10.2, R602.10.4 and R602.10.5.
- d) Methods GB and PCP braced wall panel h/w ratio shall not exceed 1:1 in SDC D<sub>0</sub>, D<sub>1</sub>, and D<sub>2</sub>. Methods DWB, SFB, PBS, and HPS are not permitted in SDC D<sub>0</sub>, D<sub>1</sub>, and D<sub>2</sub>.

**(g) Intermittent Bracing Methods.** Amend Table R602.10.2 of the 2010 California Residential Code to read as follows:

TABLE R602.10.2

INTERMITTENT BRACING METHODS<sup>a</sup>

8d common (2 1/2" x 0.131) nails at 6" spacing (panel edge) at 12" spacing (intermediate supports), 3/8" edge distance to panel edge

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

a. Methods GB and PCP braced wall panel h/w ratio shall not exceed 1:1 in SDC D<sub>0</sub>, D<sub>1</sub>, and D<sub>2</sub>. Methods LIB, DWB, SFB, PBS, HPS, and PFG are not permitted in SDC D<sub>0</sub>, D<sub>1</sub>, and D<sub>2</sub>.

**(h) Alternate braced wall panel.** Amend Figure R602.10.3.2 of the 2010 California Residential Code to read as follows:

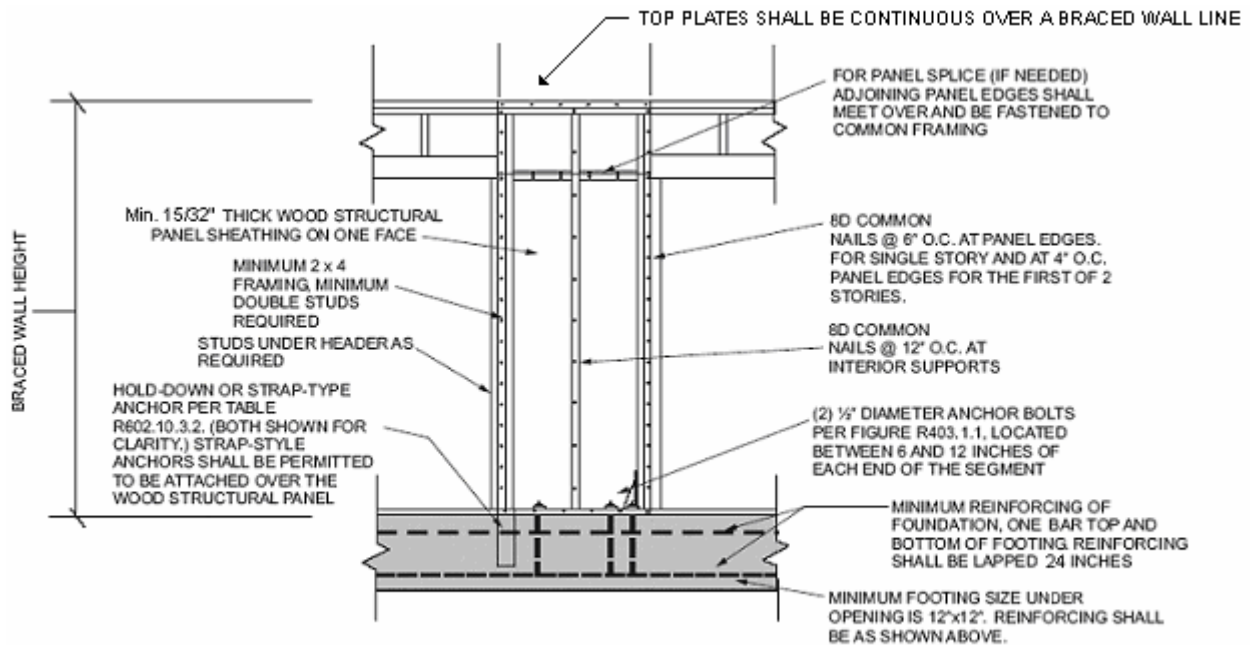


FIGURE R602.10.3.2  
ALTERNATE BRACED WALL PANEL

(i) **Portal frame.** Amend Figure R602.10.3.3 of the 2010 California Residential Code to read as follows:

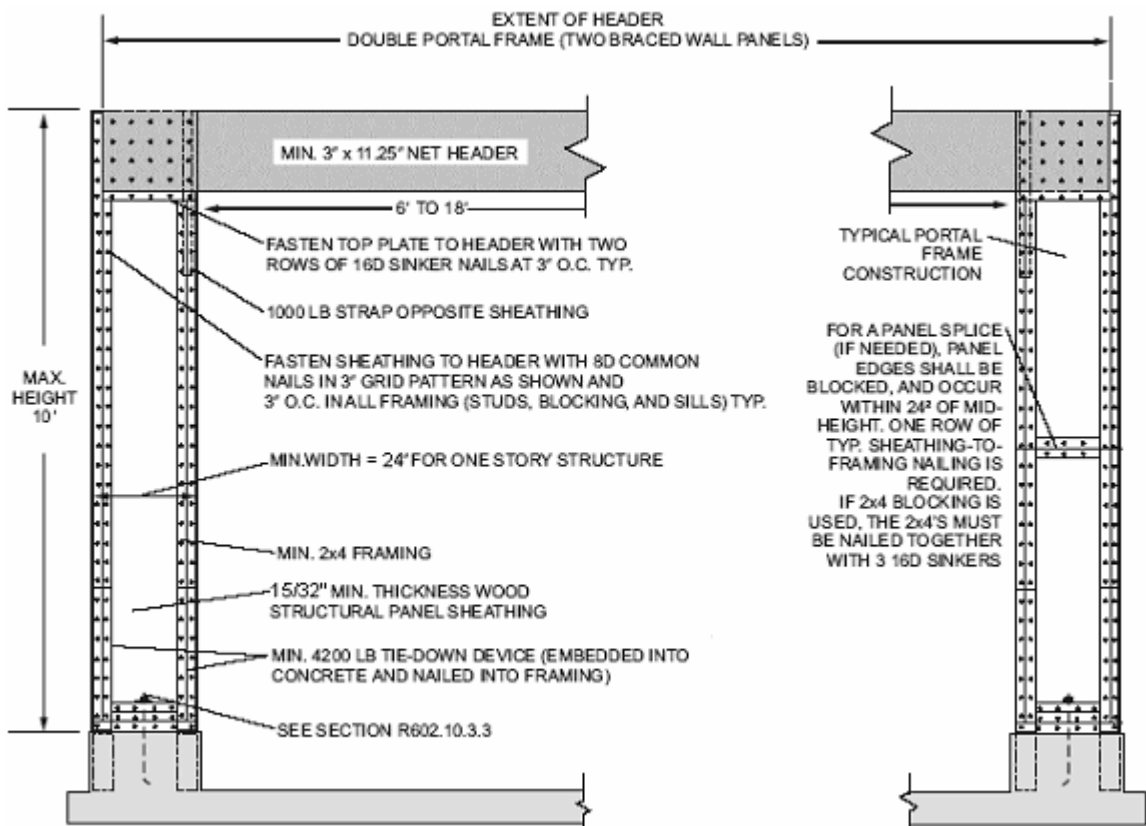


FIGURE R602.10.3.3

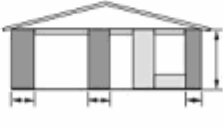
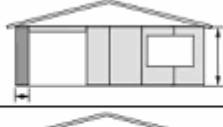

**METHOD PFH: PORTAL FRAME WITH HOLD-DOWNS AT DETACHED GARAGE DOOR OPENINGS**

(i) **Method PFH.** Amend Section R602.10.3.3 Item 1 of the 2010 California Residential Code to read as follows:

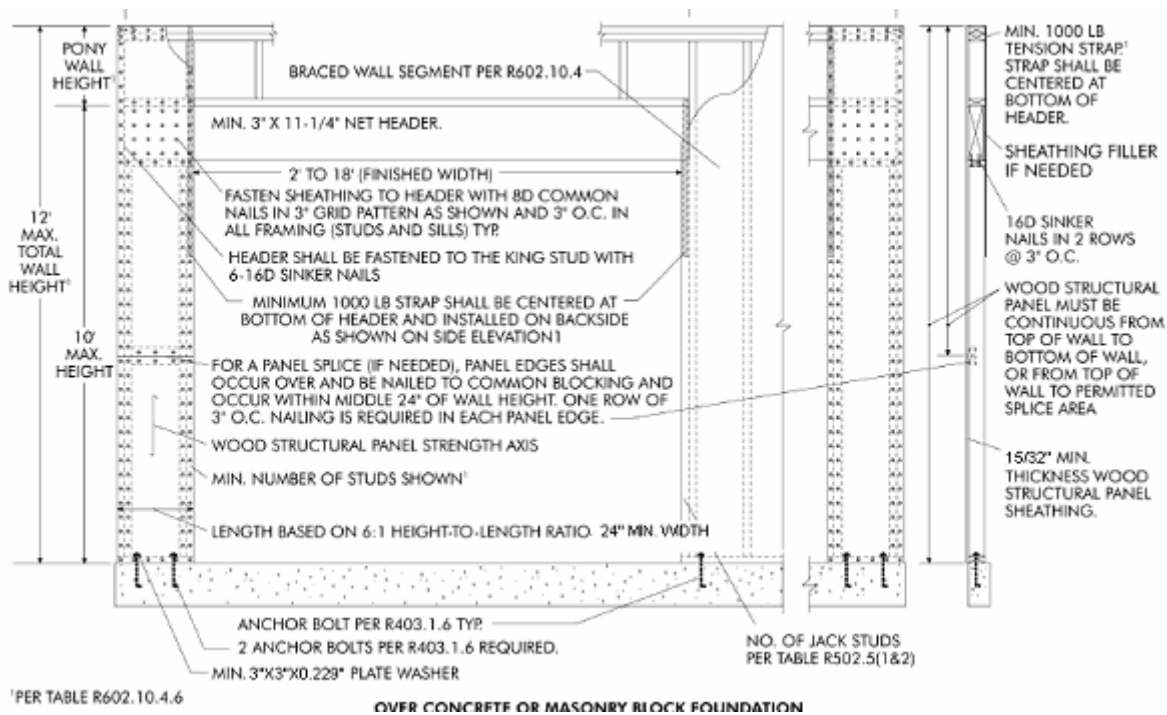
1. Each panel shall be fabricated in accordance with Figure R602.10.3.3. The wood structural panel sheathing shall extend up over the solid sawn or glued-laminated header and shall be nailed in accordance with Figure R602.10.3.3. A spacer, if used with a built-up header, shall be placed on the side of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

**(k) Continuous sheathing.** Amend Table R602.10.4.1 of the 2010 California Residential Code to read as follows:

**TABLE R602.10.4.1  
CONTINUOUS SHEATHING METHODS**

METHOD	MATERIAL	MINIMUM THICKNESS	FIGURE	CONNECTION CRITERIA
CS-WSP	Wood structural panel	15/32"		8d common (2" x 0.113") nails at 6" spacing (panel edges) and at 12" spacing (intermediate supports)
CS-G	Wood structural panel adjacent to garage openings and supporting roof load only <sup>a,b</sup>	15/32"		See Method CS-WSP
CS-PF	Continuous portal frame	See Section R602.10.4.1.1		See Section R602.10.4.1.1

**(l) Method CS-PF.** Amend Figure R602.10.4.1.1 of the 2010 California Residential Code to read as follows:



**(m) Braced wall panel.** Delete Section R602.10.7.1 of the 2010 California Residential Code

**(n) Lateral support.** Amend Section R802.8 of the 2010 California Residential Code to read as follows:

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



**(o) Additional requirements.** Add Section R803.2.4 to Chapter 8 of the 2010 California Residential Code to read as follows:

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

**8.22.050 Residential foundations.**

**(a) Foundation application.** Amend Section R401.1 of the 2010 California Residential Code to read as follows:

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

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

1. In buildings that have no more than two floors and a roof.
2. When interior basement and foundation walls are constructed at intervals not exceeding 50 feet (15 240 mm).

Wood foundations in Seismic Design Category D<sub>0</sub>, D<sub>1</sub> or D<sub>2</sub> shall not be permitted.

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

**(b) Wood foundation walls.** Amend Section R404.2 of the 2010 California Residential Code to read as follows:

**R404.2 Wood foundation walls.** Wood foundation walls shall be constructed in accordance with the provisions of Sections R404.2.1 through R404.2.6 and with the details shown in Figures R403.1(2) and R403.2(3). Wood foundation walls shall not be used for structures located in Seismic Design Category D<sub>0</sub>, D<sub>1</sub>, or D<sub>2</sub>.

**9.03.090 Roof Assemblies.**

**Amend the following sections for the above geographic and topographic requirements as follows:**

**Section R902.1. Roof covering materials.** Roofs shall be covered with materials as set forth in Sections R904 and R905. A minimum Class A, or B ~~C~~ shall be installed in area designated by this section. Classes A and B ~~and C~~ roofing required by this section to be listed shall be tested in accordance with UL 790 or ASTM E 108.

**Section R902.1.3 Roof coverings in all other areas.** The entire roof covering of every existing structure where more than 50 percent of total roof area is replaced within any one-year period, the entire roof covering of every new structure, and any roof covering applied in the alteration, repair or replacement of the roof covering that is at least Class B ~~C~~.

**Delete the following Sections and Tables: Section R902.2 Fire-retardant-treated shingles and shakes, R905.7 Wood shingles, Table R905.7.5 Wood shingle weather exposure, Section R905.8 Wood shakes, Table R905.8.5 Wood shake material requirements, and Table R905.8.6 Wood shake weather exposure.**

**Section R907.1 General.** Materials and methods of application used for re-covering or replacing an existing roof covering shall comply with the requirements of Chapter 9. Wood shakes and wood shingles re-roofs of entire structure are prohibited unless approved by the building official because of special circumstances.

**9.03.100 Residential concrete and masonry chimneys.**

Amend the following sections for the above geographic and topographic requirements as follows:

(a) Vertical reinforcing. Amend Section R1001.3.1 of the 2010 California Residential Code to read as follows:

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

**9.03.110 Residential steel construction.**

Amend the following sections for the above geographic and topographic requirements as follows:

(a) Cold formed steel framing. Add Section R301.2.2.3.5.1 to Section 301.2.2.3.5 of the 2010 California Residential Code to read as follows:

**R301.1.2.2.3.5.1 AISI S230, Section B1.** Modify AISI S230, Section B1 to read as follows:

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

**9.03.110 Residential wood construction.**

Amend the following sections for the above geographic and topographic requirements as follows:

(a) Fastener schedule. Amend Lines 34 thru 37 of Table R602.3(1) of the 2010 California Residential Code to read as follows:

Other wall sheathing <sup>b</sup>				
34	1/2" structural cellulose fiberboard sheathing	1/2" galvanized roofing nail	3	6
35	25/32" structural cellulose fiberboard sheathing	3/4" galvanized roofing nail	3	6
36	1/2" gypsum sheathing <sup>d</sup>	1 1/2" galvanized roofing nail, 1 1/4" screws, Type W or S	7	7
37	5/8" gypsum sheathing <sup>d</sup>	3/4" galvanized roofing nail, 1 5/8" screws, Type W or S	7	7

**(b) Alternate attachment.** Amend Table R602.3(2) of the 2010 California Residential Code to read as follows:

Wood structural panels subfloor, roof and wall sheathing to framing and particleboard wall sheathing to framing <sup>f</sup>			
up to 1/2	0.097 - 0.099 Nail 2 1/4	3	6
19/32 and 5/8	0.113 Nail 2	3	6
	0.097 - 0.099 Nail 2 1/4	4	8
23/32 and 3/4	0.097 - 0.099 Nail 2 1/4	4	8
1	0.113 Nail 2 1/4	3	6

Floor underlayment; plywood-hardboard-particleboard <sup>f</sup>			
Plywood			
1/4 and 5/16	1 1/4" ring or screw shank nail-minimum 12 1/2 ga. (0.099") shank diameter	3	6
1 1/32, 3/8, 15/32, and 1/2	1 1/4" ring or screw shank nail-minimum 12 1/2 ga. (0.099") shank diameter	6	8 <sup>e</sup>
19/32, 5/8, 23/32, and 3/4	1 1/2" ring or screw shank nail-minimum 12 1/2 ga. (0.099") shank diameter	6	8

**(c) Joist heel joint connection.** Add Footnote "i" to Table R802.5.1(9) of the 2010 California Residential Code to read as follows:

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

**(d) Design of wood trusses.** Amend Section R802.10.2 of the 2010 California Residential Code to read as follows:

**R802.10.2 Design.** Wood trusses shall be designed in accordance with accepted engineering practice. The design and manufacture of metal-plate-connected wood trusses shall comply with ANSI/TPI 1. The truss design drawings shall be prepared by a registered professional.

**9.03.060 Violation penalties.**

**Appendix G Section AG 101.1 is amended for administrative requirements as follows:**

**Appendix G Section AG 101.1 General.** The provisions of this appendix shall control the design and construction of swimming pools, spas and hot tubs installed in or on the lot of a one- or two- family dwelling. These must also meet the most current Manhattan Municipal Code requirements.

**SECTION 4.** Chapter 9.12 of Title 9 of the Manhattan Beach Municipal Code is hereby amended in its entirety as follows:

**Chapter 12. Electrical Code.**

**9.12.010 Adoption of California Electrical Code.**

Pursuant to the provisions of Section 50022.1 to 50022.10, inclusive of the Government Code of the State and subject to the particular additions, amendments, and deletions set forth in this chapter, the rules, regulations, provisions, and conditions set forth in those certain Codes entitled "California Electrical Code, 2010 Edition ("NEC"), " including the Appendices and Tables therein contained, promulgated and published by the National Fire Protection Association of Quincy, Massachusetts and the California Building Standards Commission , including the appendices and tables therein

contained, one (1) full printed copy of which, printed as a Code in book form, was by the Council ordered filed and which has been actually filed in the office of the City Clerk, expressly incorporated herein and made a part hereof as fully and for all intents and purposes as though set forth herein at length, are hereby established and adopted as the rules, regulations, standards, provisions, and conditions to be observed and followed in the installation, arrangement, alteration, repair, use, and operation of electrical wire connections, fixtures, and other electrical appliances, and subject to the additions, amendments, and deletions set forth in this chapter, said Code with its Annexes and Tables, containing said rules, regulations, standards, provisions, and conditions, is hereby established and adopted, and the same shall be designated, known, and referred to as the "Electrical Code" of and for the City.

**9.12.020 Fees.**

**California Electrical Code Sections 89.108.4.2 is hereby amended to add the following paragraph for administrative requirements as follows:**

ELECTRICAL PERMIT AND ELECTRICAL PLAN REVIEW FEES. Any person desiring an electrical permit shall, at the time of filing an application therefor, pay to the City fees established by the Council under the Fee Resolution in accordance to the building permit and building plan review fees or may be based on an hourly rate as established in the applicable fee resolution.

**9.12.030 Plans and specifications.**

**California Electrical Code Section 89.108.4.3 is hereby amended to add the following paragraphs for administrative requirements:**

Electrical Plans and Specifications. When required by the Building Official, electrical plans, specifications, and applications shall be filed and approved by the Building Official prior to any electrical wiring or installations.

Electrical plans and specifications for all occupancies listed in the current adopted Uniform Building Code shall be prepared by an Electrical Engineer who possesses a valid Professional Electrical Engineering Registration issued pursuant to and in accordance with the laws of the State of California. All electrical sheets shall be wet stamped and have a wet signature by the licensed Professional Electrical Engineer.

Residential electrical plans shall include but are not limited to load schedule, wiring diagrams, homeruns, wire sizes, location and size of service panels and subpanels, method of grounding of service. The following must be included:

- (1) All Commercial and Industrial tenant improvements, additions, and service changes.
- (2) The mixed Occupancy of R-2 and U Occupancy where U Occupancy is between 1000 and 3000 square feet and over 200 amps.
- (3) R-3 Occupancy and U Occupancy when service is over 200 amps.

"Green Sheet" Plans shall be prepared and submitted by a licensed electrical contractor and/or owner/builder under the following conditions:

- (1) R-3 Occupancy including new construction, additions, and service changes.
- (2) U Occupancy (which is part of the R -3 Occupancy), which does not exceed 1000 square feet in area.

Exception: The Building Official may waive the submission of electrical plans, calculations, etc., if it is found that the nature of the work applied for is such that reviewing of electrical plans is not necessary to obtain compliance with this Code.

**9.12.040 Penalties.**

**California Electrical Code Section 89.108.3.2.6 is hereby added for administrative requirements.**

- (a) Any person, firm, or corporation violating any of the provisions of this Chapter, or of the Electrical Code adopted thereby, shall be guilty of a misdemeanor and upon conviction of any such violation such person shall be punishable by a fine of not more than one thousand dollars or by imprisonment for a period of not to exceed six months, or by both such fine and imprisonment in the discretion of the Court.
- (b) Every such person shall be deemed guilty of a separate offense for each and every day during which, or during any portion of which, any of the provisions of this Code are violated, committed, continued, or permitted by such person, and shall be punishable therefore as herein provided.

**9.12.050 Services undergrounding.**

**California Electrical Code Section 230-30 is amended per the above geological and topographical findings by the addition of subsection (5) to read as follows:**

(5)Underground Utilities Required. All new buildings and structures in the City of Manhattan Beach shall provide underground electrical and communication service laterals on the premises to be served, as hereinafter required.

(a) New Construction. All electrical, telephone, cable television system, and similar service wires and cables which provide direct service to new main buildings, new accessory buildings, and structures, shall be installed underground in compliance with all applicable building and electrical codes, safety regulations, and orders, rules of the Public Utilities Commission of the State of California, and specifications or standards of the Public Works Department.

(b) Existing Buildings. Such service wires and cables shall also be placed underground when existing buildings, existing accessory buildings, and structures are repaired, remodeled, altered or expanded, except where the value, as determined for building permit fee purposes, by the Building Code of the City of Manhattan Beach, of such repairs or remodeling, or expansion does not exceed fifty percent (50%) of the value of the building or structure as determined by the California Building Code.

(c ) Wiring between the accessory buildings and the main buildings shall be in an underground system.

(d) Responsibility for Compliance. The Contractor and Owner are jointly and severally responsible for complying with the requirements of this section and shall make the necessary arrangements with the utility companies servicing the structure for the installation of such facilities.

If a proposed building or structure would create a situation which would make unreasonable, impractical, or physically impossible the continuance of overhead utility service to an existing adjacent property (or properties), then the Contractor and owner of the proposed building or structure shall be responsible for relocating such utilities per utility company specifications, and shall be installed underground in compliance with all applicable codes, safety regulations, and orders, rules of the Public Utilities Commission of the State of California, and specifications or standards of the Public Works Department.

(e) Appurtenances. For the purpose of this section, appurtenances and associated equipment such as, but not limited to, service mounted transformers, pedestal mounted terminal boxes and meter cabinets may be placed above ground if permitted by and in accordance with the rules of the State Public Utilities Commission.

(f) Waiver of Underground Requirements. If topographical, soil, or any other conditions make such underground installations unreasonable or impractical, a waiver of the requirements of this section may be granted by the Building Official, (a written approval from Southern California Edison is required when necessary) subject to the installation of all necessary electrical conduits, terminal boxes and other appurtenances as may be required to provide underground service in the future.

If the utility pole(s) from which underground service would be provided are not situated on the same side of the public street as the permittee, or not within five (5) feet of the area enclosed by the extension of the side property lines to said public street, the permittee may have the

alternative of installing all conduit, wires, pullboxes, electrical panel and other appurtenances which may be required for future underground utility services from the structure to an approved location on the property line of the parcel which will facilitate future underground service; and that the property may continue to be served by overhead wires until said future underground utility conversion.

If a building or structure is served by the rear from utilities not located in the public right-of-way, the permittee may have the alternative of installing all conduit, wires, pullboxes, electrical panel, and other appurtenances which may be required for future underground utility services from the building or structure to an approved location on the property line of the parcel which will facilitate future underground service; and that the property may continue to be served by overhead wires until said future underground utility conversion.

Exceptions: This section shall not apply to:

- (i) Utility lines which do not provide service to the area being developed.
- (ii) Detached dwelling units with separate utility services which are not the subject of a common including permit.

**9.12.060 Service Equipment.**

**California Electrical Code Section 230-62 is amended per the above climatic findings by the addition of subsection (c) as follows:**

(C) Single Family Dwellings, Multi-family Industrial and Commercial Structures Service Equipment. The minimum capacity of the service equipment for a single family dwelling, industrial, and commercial structures shall be as follows:

- (1) A service entry conduit not less than 1-1/2" in diameter of rigid galvanized steel, except 100 amp service may be 1-1/4" rigid galvanized steel.

**9.12.070 Grounding and bonding.**

**California Electrical Code Section 250-53D. 2. is amended to add the following paragraph per the above climatic findings to add subsection (e) as follows:**

Supplemental electrode required. All services shall have a minimum 5/8" by 8-foot long ground rod added, if not existing, when a new electrical service, water main or repipe is installed.

**9.12.080 Conductor material.**

**California Electrical Code Section 310-2(B) is amended per the above climatic findings as follows:**

- (B) Conductor material. Conductors in this article shall be of copper unless otherwise approved by the Building Official.

**9.12.090 Aluminum conductor material.**

**California Electrical Code Section 310-14 per the above climatic findings is deleted.**

**9.12.100 Ampacities of various conductors.**

**California Electrical Code Tables 310-16, 310-17, 310-18, 310-19, including Notes to said Tables, are amended per the above climatic findings to delete all references to aluminum or copper-clad aluminum.**

**SECTION 5.** Chapter 9.24 of Title 9 of the Manhattan Beach Municipal Code is hereby **amended for the climatic findings above** as follows:

Chapter 24. REPORT OF RESIDENTIAL BUILDING RECORDS

9.24.040 shall be amended for the climatic findings above to add:

**Retrofit requirements upon sale of residential real property.** All existing residential buildings shall, at the time of sale before change of ownership, be retrofitted, if not already so, with high efficiency toilets, that meet the most current U.S. Environmental Protection Agency Water Sense program requirements, with a minimum standard of at least 1.28 gallons per flush. See also Chapter 9.36.110 Water Efficiency. Retrofits shall be in accordance with the toilet replacement procedure of the Community Development Department. Exceptions to this requirement shall be listed in the toilet replacement procedure or as determined by the Director of Community Development Department.

**SECTION 6.** Chapter 9.32 of Title 9 of the Manhattan Beach Municipal Code is hereby amended per administrative requirements in its entirety as follows:

Chapter 32. PLUMBING CODE

**9.32.010 Adoption of California Plumbing Code.**

Pursuant to the provisions of Section 50022.1 to 50022.10, inclusive, of the Government Code of the State and subject to the particular additions, deletions and amendments set forth in this chapter, the rules, regulations, provisions and conditions set forth in that certain Code entitled "California Plumbing Code 2010 Edition," including the Appendices therein contained, promulgated and published by the International Association of Plumbing and Mechanical Officials, one (1) full printed copy of which, printed as a Code in book form were by the Council ordered filed and which have been filed in the office of the City Clerk, expressly incorporated herein and made a part hereof as fully and for all intents and purposes as set forth herein at length, are hereby established and adopted as the rules, regulations, and provisions and conditions to be observed and followed in the moving, removal, demolition, condemnation, maintenance and use of plumbing, house drainage, house sewers, sanitary sewers, cesspools, septic tanks, gas piping, gas water heater vents, swimming pools, and gas outlets for swimming pool heaters and related subjects, items and matters as set forth in said Code, within the City. Subject to the additions, deletions and amendments set forth in this chapter, said Code, with its said specified sections of Chapter 1, Division II, Appendices B, G, I, and L, is hereby established and adopted, and the same shall be designated, known and referred to as the "Plumbing Code" of and for the City.

**9.32.020 Violations and penalties.**

**Adopt Chapter 1, Division II, to specifically add and amend Sections 102.3.1 and 102.3.2 of the California Plumbing Code are for administrative requirements as follows:**

Any person, firm or corporation violating any provisions of this Code shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punishable by a fine of not to exceed One thousand and no/100<sup>th</sup> (\$1,000.00) Dollars or by imprisonment in the County Jail of the County of Los Angeles, California, for not to exceed six (6) months, or by both such fine and imprisonment. Each separate day or any portion thereof during which any violation of this Code occurs or continues shall be deemed to constitute a separate offense, and upon conviction thereof shall be punishable as herein provided.

The issuance or granting of a permit or approval of plans and specifications shall not be deemed or construed to be a permit for, or an approval of, any violation of any of the provisions of this Code. No permit presuming to give authority to violate or cancel the provisions of this Code shall be valid, except insofar as the work or use which it authorized is lawful.

The issuance or granting of a permit or approval of plans shall not prevent the Administrative Authority from thereafter requiring the correction of errors in said plans and specifications or from preventing construction operations being carried on thereunder when in violation of this Code or of any other ordinance or from revoking any certificate of approval when issued in error.

Ever permit issued by the Administrative Authority under the provisions of this Code shall expire by limitation and become null and void, if the work authorized by such permit is not commenced within one hundred eighty (180) days from date of such permit, or if the work authorized by such permit is suspended or abandoned at any time after work is commenced for a period of one hundred eighty

(180) days. Before such work can be recommenced, a new permit shall be first obtained, and the fee therefore shall be one-half the amount required for a new permit for such work, provided no changes have been made, or will be made in the original plan and specifications for such work; and provided further, that such suspension or abandonment has not exceeded one (1) year. Whenever any work for which a permit is required by this Code has been commenced without first obtaining said permit, an additional fee shall be collected at the time when the permit is issued. This fee shall be equal to the amount of the permit fees required by the most current City Resolution of Fees.

**9.32.030 Plumbing permit fees.**

**Adopt Chapter 1, Division II, to specifically add and amend Section 103.1 of the California Plumbing Code is hereby amended for administrative requirements as follows**

Table 1-1 Plumbing Permit Fees of the California Plumbing Code 2010 Edition is hereby deleted for administrative requirements. The fees shall be determined as required by the most current City Resolution of Fees.

**9.32.040 Graywater systems general.**

**Section 1601A.0 of the California Plumbing Code is hereby amended for administrative requirements as follows**

Exception 1 is deleted for the exemption from permit requirements

**SECTION 7.** Chapter 9.36 of Title 9 of the Manhattan Beach Municipal Code is hereby **amended for the climatic findings above** in its entirety as follows:

Chapter 36. SUSTAINABLE GREEN BUILDING PROGRAM AND ENERGY EFFICIENCY STANDARDS

**9.36.010 Adoption of California Green Building Standards Code and California Energy Code.**

Pursuant to the provisions of Section 50022.1 to 50022.10, inclusive, of the Government Code of the State and subject to the particular additions, deletions and amendments set forth in this chapter, the rules, regulations, provisions and conditions set forth in that certain Code entitled "California Green Building Standards Code 2010 Edition" and the "California Energy Code 2010 Edition," including the Appendices therein contained, promulgated and published by the California Building Standards Commission, one (1) full printed copy of which, printed as a Code in book form were by the Council ordered filed and which have been filed in the office of the City Clerk, expressly incorporated herein and made a part hereof as fully and for all intents and purposes as set forth herein at length, are hereby established and adopted as the rules, regulations, and provisions and conditions to be observed and followed in the planning, design, operation, construction, demolition, use, occupancy, operations and maintenance regarding the planning, design and construction of buildings and related systems, equipment, and building components for energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality enhancement in the city and related subjects, items and matters as set forth in said Code, within the City. Subject to the additions, deletions and amendments set forth in this chapter, said Code, with its said Appendices, is hereby established and adopted, and the California Green Building Standards shall be designated, known and referred to as "Sustainable Green Building Program" and the California Energy Code shall be designated, know and referred to as the "Energy Efficiency Standards" of and for the City.

Nothing in this chapter shall require the applicant to use covered products, as defined in the federal Energy Policy and Conservation Act (42 U.S.C. §6201 et seq.), that exceed any applicable federal energy conservation standards for such products.

**9.36.020 Program and purpose.**

A. This section sets forth Sustainable Green Building Program as well as minimum Energy Efficiency Standards within the City of Manhattan Beach for new construction and renovation as set forth below.

B. The purpose of the chapter is to enhance the public health and welfare by promoting the environmental and economic health of the City through the design, construction, maintenance,



operation and demolition of buildings and other site development by incorporating sustainable building practices into all development. The sustainable building provisions referred to in this Chapter are designed to achieve the following goals:

1. Increase energy efficiency in buildings;
2. Encourage water and resource conservation through efficient fixtures and irrigation, recycled and renewable materials;
3. Improve indoor air quality; increased natural lighting, and improved thermal comfort/control.
3. Reduce waste generated by construction projects;
4. Provide durable buildings that are efficient and economical to own and operate; and
5. Promote the health and productivity of residents, workers, and visitors to the City.

**9.36.030 Definitions.**

**City:** the City of Manhattan Beach, State of California

**City building:** a building primarily funded by the City or on City owned land.

**Compliance official:** the Building Official or his or her designee.

**Good faith effort:** a project that has not met the required compliance threshold, but for extenuating reasons, the Compliance official has found the project meets the good faith effort provisions of Section 9.36.060.

**LEED™:** the “Leadership in Energy and Environmental Design” green building rating system developed by the U.S. Green Building Council (USGBC).

**LEED® AP:** A person who has been designated a LEED Accredited Professional by the Green Building Certification Institute (GBCI).

**LEED™ checklist:** The credit and point checklists developed by the Leadership in Energy and Environmental Design Green Building Rating System for measuring the sustainability, efficiency, and environmentally soundness of a building.

**Project:** Any proposal for new or changed use, or for new construction, alteration, or enlargement of any structure, that is subject to the provisions of this title.

**Renovation:** any rehabilitation, repair, remodeling, change, or modification to an existing building, where changes to floor area and the footprint of the building are negligible. The valuation of renovation improvements shall be determined by the Director of Community Development per Section 10.68.030(E) of the Manhattan Beach Municipal Code. Additionally, the compliance official may exclude from such valuation the cost of (a) seismic upgrades, (b) accessibility upgrades, or (c) photovoltaic panels or other solar energy or similar devices exterior to the building.

**Sustainable building rating system:** the rating system associated with specific sustainable building criteria and used to determine compliance thresholds. An example of a rating system includes, but is not limited to, the LEED rating system.

**9.36.040 Applicability.**

- A. Projects meeting the following thresholds and for which no use permit, variance, vesting subdivision, or any other discretionary Planning approval has been granted, or for which no valid building permit has been lawfully issued by the City prior to the effective date of this ordinance shall comply with the provisions of this chapter:
1. City buildings of 5,000 square feet or more of new “gross floor area” (new construction), as defined by Section 10.04.030.
  2. Renovations of or in City buildings of 5,000 gross square feet or more, where the project exceeds the total building replacement valuation of 50% of the entire existing building as defined by Section 10.68.030(E) of the Manhattan Beach Municipal Code. For the purposes of this section, estimated construction and reconstruction costs shall be determined by the Community Development Director in the same manner as the Community Development Director determines final valuation for the purposes of building permit fees.
  3. Non-residential buildings of 10,000 square feet or more of “new gross floor area” (new construction) as defined by Section 10.04.030.

4. Renovations of or in non-residential buildings 10,000 gross square feet or greater, where the project exceeds the total building replacement valuation of 50% of the entire existing building as defined by Section 10.68.030(E) of the Manhattan Beach Municipal Code. For the purposes of this section, estimated construction and reconstruction costs shall be determined by the Community Development Director in the same manner as the Community Development Director determines final valuation for the purposes of building permit fees.

**9.36.050 Standards for compliance:**

- A. The City shall adopt by reference the USGBC LEED™ green building rating system as the standard for which a project shall be measured as a green building. Requiring projects to incorporate LEED™ green building measures is necessary and appropriate to achieve the benefits of green building. The specific actions required for project compliance with this chapter are as follows:
  1. All applicable projects are required to retain the services of a LEED® Accredited Professional who is accredited in the appropriate category for the project as determined by the Compliance official and complete LEED™ project registration prior to issuance of a building permit.
  2. All applicable projects shall submit a LEED checklist and supporting documentation indicating points meeting at a minimum LEED ‘Silver’ level incorporated into documentation for a building permit. Projects as described in Section 9.36.040 subsections 3. and 4. of 10,000 square feet or more of new gross square footage or more than 50% renovation shall meet LEED ‘Silver’ level. These projects would include, but not limited to, typical office, retail, medical, private club, religious, and academic buildings with occupied and conditioned spaces. A signed declaration from the LEED AP member of the Project team, stating that the plans and plan details have been reviewed, and that the Project meets the intent of the criteria for certification of the selected LEED™ Rating System. The LEED checklist shall be prepared, signed, and dated by the project LEED accredited professional. All building documents shall indicate in the general notes and/or individual detail drawing, where feasible, the green building measures employed to attain the applicable LEED rating.
  3. Applicable City buildings are required to attain LEED certification and meet, at a minimum LEED ‘Gold’ rating.
  4. Building commissioning, although specified as a prerequisite for LEED™ certification, is not required for applicable projects under this chapter except for City buildings. Applicants are encouraged to verify that fundamental building systems are designed, installed, and calibrated to operate as intended.
  5. All projects must demonstrate compliance with 2008 or the most recent California Energy Efficiency Standards (Title 24, Part 6) by submitting all required forms and calculations for review and approval by compliance official.

**9.36.060 Compliance official’s responsibilities**

- A. The compliance official shall review the required LEED™ checklist and supporting documentation prior to issuance of a grading or building permit. Compliance official will use the appropriate LEED™ scoring system applicable to project and categories within it.
- B. The compliance official shall verify that the building measures and provisions indicated on the project LEED™ checklist and on the supporting approved documentation, including approved plan sets, are being implemented at foundation inspection, framing inspection, and prior to issuance of a final certificate of occupancy.
- C. The compliance official shall conduct any inspections as needed to ensure compliance with this chapter.

**9.36.070 Penalties and administrative remedies**

- A. If, as a result of any inspection, the compliance official determines that the applicable project does not comply with the approved documentation, a stop work order may be issued. At the discretion of the compliance official or designee such a stop work order may apply to the portion of the project impacted by noncompliance or to the entire project. The stop work order shall

remain in effect until the compliance official determines that the project is in compliance with the requirements of this chapter.

- B. If the compliance official determines that the applicable project has not met the requirements of the LEED™ checklist, as set forth in section 9.36.060 of this chapter, he or she shall determine on a case by case basis whether the applicant has made a good faith effort to comply with this chapter. In making this determination, the compliance official shall consider the availability of markets for materials to be recycled, the availability of sustainable building materials and technologies, and the documented efforts of the applicant to comply with this chapter. The compliance official or designee may require additional reasonable sustainable building measures be included in the operation of the covered project to mitigate the failure to comply fully with this chapter.

#### **9.36.080 Mandatory and voluntary requirements.**

**Section 101.10 of the California Green Building Standards Code is hereby amended for administrative requirements and the climatic findings above as follows:**

**101.10 Mandatory and voluntary requirements.** This code contains both mandatory and voluntary green building measures. Mandatory and voluntary measures are identified in the appropriate application checklist contained in this code. The mandatory measures of Chapter 4 and voluntary measures of Appendix A4 are applicable to new residential buildings except where specifically amended hereinafter. The mandatory measures of Chapter 5 and voluntary measures of Appendix A5 are applicable to all buildings which are not low-rise residential buildings except where specifically amended hereinafter.

#### **9.36.090 Low-rise residential building**

**Section 202.10 of the California Green Building Standards Code is hereby amended for administrative requirements and the climatic findings above as follows:**

**LOW-RISE RESIDENTIAL BUILDING.** A building that is of Occupancy Group R and is ~~three~~ six stories or less, or that is a one- or two-family dwelling or townhouse.

#### **9.36.100 Energy Efficiency.**

**Section A4.201.1 of the California Green Building Standards Code is hereby amended for the climatic findings and according to the building energy efficiency findings in Section 1B above as follows:**

**A4.201.1 [Residential] Scope and applicability.** For the purposes of energy efficiency standards in this appendix, the California Energy Commission will continue to adopt mandatory standards. It is the intent of this code to encourage buildings to achieve exemplary performance in the area of energy efficiency. Specifically, a green building should achieve at least a 15 percent reduction in energy usage when compared to the State's mandatory energy efficiency standards. Voluntary measures in Appendix A4 shall be required and applicable to new residential construction and major renovations exceeding 50% where the project exceeds the total building replacement valuation of 50% of the entire existing building as defined by Section 10.68.030(E) of the Manhattan Beach Municipal Code. For the purposes of this section, estimated construction and reconstruction costs shall be determined by the Community Development Director in the same manner as the Community Development Director determines final valuation for the purposes of building permit fees as specifically amended hereinafter.

**Section A4.203.1 of the California Green Building Standards Code is hereby amended for the climatic findings according to the building energy efficiency findings in Section 1B above as follows:**

**A4.203.1 [Residential] Energy performance.** Using an Alternative Calculation Method (ACM) approved by the California Energy Commission, calculate each building's energy and CO<sub>2</sub> emissions, and compare it to the standard or "budget" building to achieve the following:

Requirement Tier 4. Exceed the California Energy Code based on the 2008 energy standards requirements by 15 percent. All projects must demonstrate compliance with 2008 California Energy Efficiency Standards (Title 24, Part 6) by submitting all required forms and calculations for review and approval by the Building Official to demonstrate the base and 15% compliance requirements.

**9.36.110 Water Efficiency**

**Section A4.208 of the California Green Building Standards Code is hereby amended for the climatic findings according to the building energy efficiency findings in Section 1B above as follows:**

**A4.208 [Residential] Water Heating Design, Equipment and Installation.** The following sections shall be mandatory as per 4.201.1:

**A4.208.1 Tank type water heater efficiency.** The Energy Factor (EF) for a gas-fired storage water heater less than or equal to 75,000 BTU/h shall be is higher than .60 and for those exceeding 75,000 BTU/h shall be .84 or higher.

**A4.208.2 Tankless water heater efficiency.** The Energy Factor (EF) for a gas-fired tankless water heater shall be is .80 or higher.

**Add: A4.208.4 Pipe insulation and heat traps.** Pipe insulation of not less than R-6 shall be installed at all hot water distribution and re-circulation system piping. Heat traps shall be installed at all non-circulating hot water heaters and tanks.

**Add: A4.208.5 Solar water heating stub out.** Pre-plumb piping and sensor wiring from water heater to attic for future solar water heating.

**Sections A4.209 and A4.210 of the California Green Building Standards Code is hereby amended for the climatic findings and according to the building energy efficiency findings in Section 1B above as follows:**

**A4.209 and A4.210 [Residential] Lighting and Appliance rating.** The following sections shall be mandatory as per 4.201.1:

**A4.209.1 [Residential] Lighting.** Building lighting shall consist of at least 90 percent ENERGY STAR qualified hard-wired fixtures.

**A4.209.1 [Residential] Appliance rating.** Each major appliance provided by the builder shall meet ENERGY STAR if an ENERGY STAR designation is applicable for that appliance, including but not limited to: exhaust fans, ceiling fans, clothes washers, refrigerators, freezers, wine coolers, primary space heating – ventilating- and air conditioning equipment, and dishwashers.

**4.301.1 [Residential] Scope and applicability** The provisions shall establish the means of conserving water used indoors, outdoors, and in wastewater conveyance. Indoor Water Use Section 4.303 requirements shall apply to any new indoor water fixtures to obtain 20% savings compared to the baseline provided in Table 4.303.1

**Section 4.303.4 of the California Green Building Standards Code is hereby added for the climatic findings above as follows:**

**4.303.4 Retrofit requirements upon sale of residential real property.** All existing residential buildings shall, at the time of sale before change of ownership, be retrofitted, if not already so, with high efficiency toilets, that meet the most current U.S. Environmental Protection Agency Water Sense program requirements, with a minimum standard of at least 1.28 gallons per flush. See Chapter 9.24 Report of Residential Building Records.

**Section 4.304.1 of the California Green Building Standards Code is hereby amended for the climatic findings above as follows:**

**4.304.1 Irrigation controllers.** Automatic irrigation system controllers for landscaping provided by the builder and installed at the time of final inspection shall comply with the following:

1. Controllers shall be weather- or soil moisture-based controllers that automatically adjust irrigation in response to changes in plants' needs as weather conditions change.
2. Weather-based controllers without integral rain sensors or communication systems that account for local rainfall shall have a separate wired or wireless rain sensor which connects or communicates with the controller(s). Soil moisture-based controllers are not required to have rain sensor input.

**Table 4.602 Residential Applications Checklist for Sections 4.303.1, 4.303.2, and 4.303.3 of the California Green Building Standards Code is hereby amended for the climatic findings above as follows:**

**Indoor water use.** These shall be effective 1/1/2011

### **9.36.120 Material Conservation and Resource Efficiency**

**Section 4.408.1 of the California Green Building Standards Code is hereby amended for the climatic findings above as follows:**

**4.408.1 [Residential] Construction Waste Reduction of at least ~~50~~ 65%** Recycle and/or salvage for reuse a minimum of ~~50~~ 65 percent of the nonhazardous construction and demolition debris. See Municipal Code sections: 5.26.010 Definitions: "Diversion Requirement," 5.26.050 Review of Waste Management Plan, and 5.26.060 Compliance with Waste Management Plan

**Section 5.408.3 of the California Green Building Standards Code is hereby amended for the climatic findings above as follows:**

**5.408.3 [Nonresidential] Construction Waste Reduction of at least ~~50~~ 65%** Recycle and/or salvage for reuse a minimum of ~~50~~ 65 percent of the nonhazardous construction and demolition debris. See Municipal Code sections: 5.26.010 Definitions: "Diversion Requirement," 5.26.050 Review of Waste Management Plan, and 5.26.060 Compliance with Waste Management Plan Calculate the amount of materials diverted by weight or volume, but not by both.

**Appendix Section A4.403.2 of the California Green Building Standards Code is hereby amended for the climatic findings above as follows:**

**A4.403.2 Reduction in cement use.** Reduction in cement use is required: cement used in foundation mix design shall be reduced as follows:

Tier Requirement 1. Not less than a 20 percent reduction in cement use.  
[Voluntary] Tier 2. Not less than a 25 percent reduction in cement use.

**Note:** Products commonly used to replace cement in concrete mix designs include, but are not limited to:

1. Fly Ash
2. Slag
3. Silica fume
4. Rice hull ash

### **9.36.130 Environmental Quality**

**Section 4.501.1 of the California Green Building Standards Code is hereby amended for the climatic findings above as follows:**

**4.501.1 [Residential] Scope and Applicability** The provisions of this chapter shall outline means of reducing the quantity of air contaminants that are odorous, irritating and/or harmful to the comfort and well-being of a building's installers, occupants and neighbors. Requirements for adhesives, sealants, caulks, and finishes shall apply to any construction. Fireplace Section 4.503 shall apply to any new gas fireplaces.

**Section 4.503.2 of the California Green Building Standards Code is hereby amended for the climatic findings above as follows:**

**4.503.2 Fireplaces – General.** Any installed gas fireplace shall be a direct-vent sealed-combustion type with a 65% thermal efficiency. Any installed woodstove or pellet stove shall comply with the U.S. EPA Phase II emission limits where applicable. Woodstoves, pellet stoves and fireplaces shall also comply with applicable local ordinances.

**Section 5.501.1 of the California Green Building Standards Code is hereby amended for the climatic findings above as follows:**

**5.501.1 [Nonresidential] Scope and Applicability** The provisions of this chapter shall outline means of reducing the quantity of air contaminants that are odorous, irritating and/or harmful to the comfort and well-being of a building's installers, occupants and neighbors. Requirements for adhesives, sealants, caulks, and finishes shall apply to any construction or renovation. Fireplace Section 5.503 shall apply to any new gas fireplaces.

**Section 5.503.1 of the California Green Building Standards Code is hereby amended for the climatic findings above as follows:**

**5.503.1 Fireplaces – General.** Install only direct-vent sealed-combustion type with a 65% thermal efficiency gas or sealed wood-burning fireplace or a sealed woodstove or pellet stove. Refer to residential requirements in the *California Energy Code*, Title 24, Part 6, Subchapter 7, Section 150. Woodstoves, pellet stoves and fireplaces shall comply with applicable local ordinances.

**9.36.140 California Energy Code**

**Sections 114 (a) 4 & (b) 2 of the California Energy Code are hereby amended for the climatic findings and according to the building energy efficiency findings in Section 1B above as follows:**

**114 (a) 4. Electric resistance heating.** No electric resistance heating; solar collectors shall provide not less than 60% of the energy for heating swimming pools and spas and

Exception 1 to Section 114 (a)4: Listed package units with fully insulated enclosures, and with tight-fitting covers that are insulated to at least R-6.

Exception 2 to Section 114 (a) 4: Pools or spas deriving at least 60 percent of the annual heating energy from site solar energy or recovered energy.

**114 (a) 2. Covers.** A thermal cover or blanket rated at not less than R-15 for outdoor pools or outdoor spas that have a heat pump or gas heater.

**Section 151 (a) 3 of the California Energy Code is hereby amended for the climatic findings and according to the building energy efficiency findings in Section 1B above as follows:**

**151(a) 3. Basic Requirements [New Residential].** Either the performance standards (energy budgets) or the prescriptive standards (alternative component packages) set forth in this section for the climate zone in which the building will be located. Climate zones are shown in Figure 101-A. When utilizing the performance standards, the building shall exceed the California Energy Code based on the 2008 energy standards requirements by 15 percent.

**Section 152 (a) 2 of the California Energy Code is hereby amended for the climatic findings and according to the building energy efficiency findings in Section 1B above as follows:**

**152(a) 2. Performance approach [Residential Additions].** Performance calculations shall meet the requirements of Section 151 (a) through (e), pursuant to either Item A or B below, with the condition that where the project exceeds the total building replacement valuation of 50% of the entire existing building as defined by Section 10.68.030(E) of the Manhattan Beach Municipal Code – the project shall be calculated to exceed the California Energy Code based on the 2008 energy standards requirements by 15 percent. For the purposes of this section, estimated construction and reconstruction costs shall be determined by the Community Development Director in the same manner as the Community Development Director determines final valuation for the purposes of building permit fees

**SECTION 8.** Chapter 9.64 of Title 9 of the Manhattan Beach Municipal Code is hereby amended per administrative requirements in its entirety as follows:

Chapter 64. MECHANICAL CODE

**9.64.010 Adoption of California Mechanical Code.**

Pursuant to the provisions of Section 50022.1 to 50022.10, inclusive, of the Government Code of the State and subject to the particular additions, deletions and amendments set forth in this chapter, the rules, regulations, provisions and conditions set forth in that certain Code entitled “California Mechanical Code 2010 Edition,” including Appendix A therein contained, promulgated and published by the International Association of Plumbing and Mechanical Officials of. One (1) full printed copy of which, printed as a Code in book form were by the Council ordered filed and which have been filed in the office of the City Clerk, expressly incorporated herein and made a part hereof as fully and for all intents and purposes as set forth herein at length, are hereby established and adopted as the rules, regulations, provisions and conditions to be observed and followed in the erection, installation, alteration, repair, relocation, replacement, addition to, use or maintenance of any heating ventilating, comfort cooling, refrigerator systems, incinerators, or other miscellaneous heat producing appliances

in the city; and subject to the additions, deletions, and amendments set forth in this chapter, said Code with Appendix A, containing said rules, regulations, standards, provisions, and conditions is hereby established and adopted, and the same shall be designated, known and referred to as the "Mechanical Code" of and for the City.

**9.64.020 Violations and penalties.**

**Add Section 111.0 of the California Mechanical Code to be amended for administrative requirements as follows**

Any person, firm or corporation violating any provisions of this Code shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punishable by a fine of not to exceed One Thousand and no/100<sup>th</sup> (\$1,000.00) Dollars or by imprisonment in the County Jail of the County of Los Angeles, California, for not to exceed six (6) months, or by both such fine and imprisonment. Each separate day or any portion thereof during which any violation of this Code occurs or continues shall be deemed to constitute a separate offense, and upon conviction thereof shall be punishable as herein provided. The issuance or granting of a permit or approval of plans and specifications shall not be deemed or construed to be a permit for, or an approval of, any violation of any of the provisions of this Code. No permit presuming to give authority to violate or cancel the provisions of this Code shall be valid, except insofar as the work or use which it authorized is lawful.

The issuance or granting of a permit or approval of plans shall not prevent the Administrative Authority from thereafter requiring the correction of errors in said plans and specifications or from preventing construction operations being carried on thereunder when in violation of this code or of any other ordinance or from revoking any certificate of approval when issued in error.

**9.64.030 Mechanical permit fees.**

**Add Section 115.1 of the California Mechanical Code to be amended for administrative requirements as follows:**

Table 1-1 Mechanical Permit Fees per administrative requirements is hereby deleted. The fee shall be determined as required by the most current City Resolution of Fees.

**SECTION 9.** Chapter 5.26 of Title 5 of the Manhattan Beach Municipal Code is hereby **amended for the climatic findings above** as follows:

**Chapter 26. CONSTRUCTION AND DEMOLITION DEBRIS WASTE REDUCTION AND RECYCLING REQUIREMENTS**

Section 5.26.010 shall be amended as follows:

**Definitions. K.** "Diversion requirement" means the redirection of at least ~~fifty percent (50%)~~ sixty-five percent (65%) of the total construction and demolition debris generated by a project via reuse or recycling, unless the applicant has been granted an exemption pursuant to Section 5.26.070 of this chapter, in which case the diversion requirement shall be the maximum feasible diversion rate established by the WMP Compliance Official for the project.

**Section 5.26.050 Review of Waste Management Plan** Subsection A.2. and B. shall be amended as follows:

**A.2.** WMP must indicate that at least ~~fifty percent (50%)~~ sixty-five percent (65%) of all C & D debris generated by the project will be diverted.

**B. Nonapproval.** If the WMP Compliance Official determines that the WMP is incomplete or fails to indicate that at least ~~fifty percent (50%)~~ sixty-five percent (65%) of all C & D debris generated by the project will be reused or recycled, he or she shall either:

Section 5.26.060 A. shall be amended as follows:

**5.26.060 A. Documentation.** Prior to the final building approval, the applicant shall submit to the WMP Compliance Official documentation that it has met the diversion requirement for the project. If the applicant does not submit the required documentation, he or she may be subject to an administrative penalty or enforcement action as described in Sections 5.26.040 and 5.26.080 of this chapter. The diversion requirement shall be that the applicant must divert at least ~~fifty percent (50%)~~ sixty-five percent (65%) of the total C & D debris generated by the project via reuse or recycling. Provided, however, that an applicant granted an exemption pursuant to Section 5.26.070 of this chapter shall be required to comply with the maximum feasible diversion rate established by the WMP

Compliance Official for that project. The documentation for compliance shall include all of the following...

SECTION 10. Any provisions of the Manhattan Beach Municipal Code, or appendices thereto, or any other ordinances of the City, to the extent that they are inconsistent with this ordinance, and no further, are hereby repealed.

SECTION 11. If any section, subsection, sentence, clause, or phrase of this ordinance is for any reason held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions of the ordinance. The City Council hereby declares that it would have passed this ordinance and each section, subsection, sentence, clause, and phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses, or phrases be declared invalid or unconstitutional.

SECTION 12. If any section, subsection, sentence, clause, or phrase of this ordinance is for any reason held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions of the ordinance. The City Council hereby declares that it would have passed this ordinance and each section, subsection, sentence, clause, and phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses, or phrases be declared invalid or unconstitutional.

SECTION 13. Any provisions of the Manhattan Beach Municipal Code, or appendices thereto, or any other ordinances of the City, to the extent that they are inconsistent with this ordinance, and no further, are hereby repealed.

SECTION 14. This notice shall be published by one insertion in *The Beach Reporter*, the official newspaper of the City, and this ordinance shall take effect and be in full force and operation thirty (30) days after its final passage and adoption.

SECTION 15. The City Clerk shall certify to the adoption of this ordinance; shall cause the same to be entered in the book of original ordinances of said City; shall make a minute of the passage and adoption thereof in the records of the meeting at which the same is passed and adopted; and shall within fifteen (15) days after the passage and adoption thereof cause the same to be published by one insertion in *The Beach Reporter*, the official newspaper of the City and a weekly newspaper of general circulation, published and circulated within the City of Manhattan Beach hereby designated for that purpose.

SECTION 16. This Ordinance will become effective no sooner than January 1, 2011.

SECTION 17. The City Clerk shall cause a summary of this Ordinance to be published as provided by law. The summary shall be published and a certified copy of the full text of this Ordinance shall be posted in the Office of the City Clerk at least five (5) days prior to the City Council meeting at which this Ordinance is to be adopted. Within fifteen (15) days after the adoption of this Ordinance, the City Clerk shall cause a summary to be published with the names of those City Council members voting for and against this Ordinance and shall post in the Office of the City Clerk a certified copy of the full text of this Ordinance along with the names of those City Council members voting for and against the Ordinance.

PASSED, APPROVED and ADOPTED this 16th day of November, 2010.

Ayes:  
Noes:  
Absent:  
Abstain:

\_\_\_\_\_  
Mayor, City of Manhattan Beach, California

ATTEST:

\_\_\_\_\_  
City Clerk



ORDINANCE NO. 2137

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF MANHATTAN BEACH, CALIFORNIA, ADOPTING BY REFERENCE THE 2010 EDITION OF THE CALIFORNIA FIRE CODE, 2009 EDITION OF THE INTERNATIONAL FIRE CODE, AND AMENDING THESE CODES THROUGH EXPRESS FINDINGS OF LOCAL NECESSITY.

The Council of the City of Manhattan Beach does ordain as follows:

**SECTION 1: FINDINGS.** The City Council finds that certain local climatic, geological, or topographical conditions exist as follows:

- A. Climatic - The City experiences periods of extremely high temperatures accompanied by low humidity and high winds each year. These conditions could create an environment in which the Fire Department may be unable to control fires occurring in vegetation as well as structures not having built in fire protection.
- B. Geological - The City is located in a seismically active area. A significant earthquake could render the Fire Department incapable of providing adequate fire protection. In that instance, built-in fire protection would be relied upon for controlling most structural fires.
- C. After due consideration, the City Council finds and determines that due to these local climatic, geological, or topographical conditions that amendments, additions, and deletions to the California Fire Code, 2010 Edition, are reasonably necessary to provide sufficient and effective levels of fire safety for the protection of life, health and property. Specifically, these amendments are made as follows:
  - 1. CFC § 901.4.1.1 – 910.1. Provides a means of ensuring that fire protection systems are installed and maintained in a manner that will provide adequate protection during periods of low humidity and high winds, potential seismic activity, or in areas of restricted access present in the City.
  - 2. CFC § 3301.1.3 and 3309. Prohibits the general use of fireworks, including "Safe and Sane" fireworks and authorizes the fire code official to confiscate fireworks in order to reduce the danger from fire during periods of low humidity and high winds, potential seismic activity, or in areas of restricted access present in the City.

**ADOPTION OF CODES.**

Pursuant to California Government Code §§ 50022.1 to 50022.8, the City adopts and incorporates by reference the California Fire Code, 2010 Edition ("CFC"), including Appendix Chapters 1, B, and C published drafted and published by the International Code Council, 500 New Jersey Avenue NW, 6<sup>th</sup> Floor, Washington DC, 20001-2070 and the California Building Standards Commission, 2525, Natoma Park Drive, Ste 130, Sacramento, California 95833. The City also adopts and incorporates by reference the International Fire Code, 2009 Edition, published by the International Code Council, not included in the California Building Standards Code, as modified and amended by this chapter. Should the changes set forth below conflict with the provisions of any other locally adopted code, these changes will prevail. The CFC and the IFC will apply to all occupancies within the City's jurisdiction. One (1) true copy of each code is on file with the City Clerk and is available for public inspection as required by law.

**AMENDMENTS, ADDITIONS, AND DELETIONS.**

After due consideration, the City Council has found that as a result of existing local climatic, geological, or topographical conditions that amendments, additions, and deletions to the CFC are reasonably necessary to provide sufficient and effective levels of fire safety for the protection of life, health and property. Therefore, the CFC is amended, added to, or deleted from, as set forth below.

CHAPTER 16 OF TITLE 3 OF THE MANHATTAN BEACH MUNICIPAL CODE IS HEREBY AMENDED IN ITS ENTIRETY AS FOLLOWS:

**"3.16.010 Adoption of 2010 California Fire Code.**

Pursuant to the provisions of sections 50022.1 to 50022.10, inclusive, of the Government Code of the State and subject to the particular additions, deletions, amendments set forth in this chapter, the Rules, Regulations, Provisions, and Conditions set forth in that certain Code and standards known as the California Fire Code, including appendices, two full printed copies of which, printed as a code in book form, whereby the City Council ordered filed and which have been filed in the office of the City Clerk, and which are expressly incorporated herein and made a part hereof as fully and for all intents and purposes as thought set forth herein at length, are hereby established and adopted as the Rules, Regulations, Provisions, and Conditions to be observed and followed, and which shall control within the City for the safe guarding of life and property from the hazard of fire and explosion arising from the storage, handling and use of hazardous substances, materials and device, and from conditions therein set forth and which are hereby established and adopted are hereby designated and may be known and referenced to as the "Fire Prevention Code" of the City of Manhattan Beach.

**3.16.020 Manhattan Beach Fire Code Amendments**

The following amendments to the 2010 Fire Code are hereby adopted as applicable to the unique conditions of the City of Manhattan Beach:

**Appendix Chapter 1 § 102.8 Subjects Not Specifically Regulated by this Code.** Where no applicable standards or requirements are set forth in this code, or contained within other laws, codes, regulations or ordinances, the fire code official may interpret, administer and enforce this Code by reference to the standards of the National Fire Protection Association and such other nationally recognized fire safety standards as are set out in Chapter 45. Any decision of the fire code official relating to the interpretation of this Code may be appealed to the Board of Appeals.

**§ 106.2.1 Inspection Requests.** It is the duty of the person doing the work authorized by a permit to notify the fire code official that such work is ready for inspection. Every request for inspection must be filed not less than two working days before such inspection is desired. Such request may be in writing or by telephone.

**Appendix Chapter 1 § 104.11.4 Financial Responsibility.** Any person who personally, or through another, willfully, negligently, or in violation of law, sets a fire, allows a fire to be set, or allows a fire kindled or attended by him/her to escape from his/her control, allows any hazardous material to be handled, stored, disposed of, or transported in a manner not in accordance with this Code, State law or nationally recognized Standards, allows any hazardous material to escape from his/her control, allows continuation of a violation of this Code is liable for the expense of fighting the fire or for the expenses incurred during a hazardous materials incident, and such expense will be a charge against that person.

**Appendix Chapter 1 § 104.10 Investigations.** The Fire Department is authorized to promptly investigate the cause, origin and circumstances of each and every fire, explosion, unauthorized release of hazardous materials, or any other hazardous condition within the City. If it appears to the bureau of investigation that such fire is suspicious in origin, it is authorized to take immediate charge of all physical evidence relating to the cause of fire and to pursue investigation to its conclusion.

**Appendix Chapter 1 § 104.10.1 Assistance from other agencies.** The Police Department and other public agencies are authorized to assist the Fire Department in its investigations when requested to do so.

**Appendix Chapter 1 § 104.7.2 Technical assistance.** When there is a fire, explosion, hazardous materials incident or other potential life or serious property threatening situation, the fire code official can request the owner to or operator to hire a private fire protection or hazardous materials investigator, acceptable to the fire code official and at the expense of the owner or operator, to provide a full report of the incident, including, without limitation, such matters as origin, cause, circumstances or proposed solution to the problem.

**Appendix Chapter 1 § 105.2 Application for Permit.** Applications for permits will be made to the fire prevention office in such form and detail as prescribed by the fire code official. Applications for permits must be accompanied by such plans as required by the fire code official. Any applicable permit fees must be paid at the time of application for the permit.

**Appendix Chapter 1 § 105.6.49 Woodworking.** An Operational Permit shall be required to operate a business which conducts woodworking, or operates as a cabinet shop or other similar purposes.

**§ 202 GENERAL DEFINITIONS** are amended to add and/or modify the following definitions to read as follows:

"Administrator" means the City Manager, or designee, of the city of Manhattan Beach.

"Building Access" means an exterior door opening conforming to all of the following:

1. Suitable and available for fire department use, opening onto or adjacent to a public way or a fire department access road as described in Section 902.
2. Located not more than 2 feet (609.6 mm) above adjacent ground level.
3. Leading to a space, room or area having foot traffic communication capabilities with the remainder of the building.
4. Designed to permit access with the use of keys available in an approved key lock box.
5. "Fire Code Official" is the Fire Chief or a duly authorized representative.
6. "High-Rise Building" is every building of any type of construction or occupancy having floors for human occupancy located more than 55 feet above the lowest level of fire vehicle access.

**§ 405.2 Table 405.2 Footnote 'a'**

- a. The frequency in all school levels shall be allowed to be modified in accordance with Section 408.3.2. Secondary level schools need only conduct evacuation drills twice each school year.

**§ 503.1.1 Buildings and facilities.** Approved fire apparatus access roads must be provided for every facility, building or portion of a building hereafter constructed or moved into or within the jurisdiction. The fire apparatus access road must comply with the requirements of this section and shall extend to within 150 feet (45,720 mm) of all portions of the facility and all portions of the exterior walls of the of the first story of the building as measured by an approved route around the exterior of the building or facility. The fire code official has the authority to designate fire apparatus access roads on private property.

**Exception:** The fire code official is authorized to increase to dimension of 150 feet (45,720 mm) where:

1. The building is equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1, 903.1.2 or 903.3.1.3.
2. Fire apparatus access roads cannot be installed because of location on property, topography, waterways, nonnegotiable grades or other similar conditions, and an approved alternative means of fire protection is provided.
3. There are not more than two Group R-3 or Group U occupancies.

**§ 503.4 Obstruction of fire apparatus access roads.** Fire apparatus access roads cannot be obstructed in any manner, including the parking of vehicles. The minimum widths and clearances established in Section 503.2.1 must be maintained at all times. Speed bumps and speed humps must be approved before installation.

**§ 505.1 Address numbers.** Approved address numbers and letters must be placed on all new and existing buildings and units in such a location as to be plainly visible and legible from the street or road fronting such buildings and units. Numbers and letters must be at least four (4) inches in height for residential, six (6) inches in height for commercial, and twelve (12) inches in height for industrial buildings and units and may not be located on doors or other areas that can be obstructed from view. The numbers and letters will be in a color that contrasts with their background and must be in the City's approved numbering sequence. Commercial and industrial buildings and units that are served by an alley must also have approved address numbers and letters posted in a visible location near the primary door to the alley.

**§ 505.1.1 Directory.** For complexes and large buildings, a directory or premises map with approved addressing must be installed and maintained at a location and in format as approved by the fire code official.

**§ 503.2.1 Dimensions.** Fire apparatus access roads must have an unobstructed width of not less than 20 feet (6096 mm) and an unobstructed vertical clearance of not less than 15 feet (4572 mm).

EXCEPTIONS:

1. When serving only one Group R, Division 3 or Group U Occupancy the unobstructed width of the access road may be 12 feet (3658 mm).

**§ 503.2.1.1 Access roads with vehicle parking.** No access roads can be less than 32 feet (9754 mm) in width if the vehicle parking is permitted on one side of the access road and not less than 40 feet (12,192 mm) if vehicle parking is permitted on both sides of the access road. To permit the free passage of vehicles, access roads designated for vehicle parking on only one side must have signs or markings prohibiting the parking of vehicles on the traffic flow side of the roadway.

**§ 507.1 Required Water Supply.** Water supplies and fire hydrant requirements must be required in accordance with Section 508.

**§ 507.1.1 New facilities.** An approved water supply capable of supplying the required fire flow for fire protection must be provided to all premises upon which facilities, buildings or portions of buildings are hereafter constructed or moved into or within the jurisdiction.

**§ 507.1.2 Existing facilities.** When required by the fire code official, water supply and fire hydrants must be provided at existing facilities when the fire load potential exceeds the water supply availability.

**§ 507.5.1 Additional On-site fire hydrants.** When any portion of the facility or building protected is in excess of 150 feet (45 720 mm) from a water supply on a public street, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains capable of supplying the required fire flow must be provided when required by the Fire code official. See Section Appendix C.

**§ 901.4.5 Partial fire sprinkler systems.** Where in this Code or the Building Code a partial fire sprinkler system is required, the fire sprinkler system must be installed, modified or extended to protect the entire building or structure.

**§ 901.10 Problematic systems.** In the event of a failure of a fire protection system or 2 or more alarms in a week where the fire code official finds no evidence of a situation requiring a response, the fire code official is authorized to require the building owner or occupant to provide a fire watch until the system is repaired. Fire watch personnel shall be provided with at least one approved means for notification of the Fire Department and their only duty shall be to perform constant patrols of the protected premises and keep watch for fires. The fire code official shall determine the length of time the fire watch will be in effect.

**§ 903.2.0.1 All Occupancies except Group R Division 3 and Group U, An Automatic Sprinkler System is Required in addition to all applicable items as listed within this section.** An automatic sprinkler system shall be installed throughout all new structures that exceed 2,000 square feet in gross floor area or exceeds two stories in height, and any additional structures attached

thereto. No bells are allowed in water flow systems. Only a horn strobe shall be allowed as the water flow audible device.

**§ 903.2.0.2 Existing Occupancies, except Group R, Division 3.** An automatic sprinkler system shall be installed in all existing occupancies, except Group R, Division 3 whenever:

1. An addition or remodel causes the occupancy to exceed 2,000 square feet in gross floor area, or exceeds two stories in height.
2. The occupancy is 2,000 square feet, or more, in gross floor area and an addition, alteration, or remodel in excess of 50% of the value of the building is constructed. Existing building value shall be determined as set forth in the Uniform Building Code.

**§ 903.2.0.8 Group R Division 3 Occupancies.**

An automatic sprinkler system shall be installed in all **new** attached garages.

An automatic sprinkler system shall be installed in **existing** attached garages when a remodel causes a change in square footage to the garage, or when the remodel causes or increases living area to be next to or above the garage, or if the wall between the garage and living space is altered.

**903.2.3 Group E.** Except as provided for in Section 903.2.3.1 for a new public school campus, an automatic sprinkler system shall be provided for Group E occupancies as follows:

1. Throughout all Group E occupancies.

**903.3 Installation requirements.** *Automatic sprinkler systems* shall be designed and installed in accordance with sections 903.3.1.1, unless otherwise permitted by Sections 903.3.1.2 and 903.3.1.3. All one or two unit single family dwellings must adhere to the Manhattan Beach Fire Department Minimum Requirements for NFPA 13D Fire Sprinkler Systems.

**§ 903.3.1.2.2 Protection of attached garages.** Residential occupancies protected by an automatic sprinkler system in accordance with NFPA 13R must have automatic sprinklers installed in attached garages and in other areas as required by the fire code official.

**§ 903.3.1.3.1 Protection of attached garages.** Residential occupancies protected by an automatic sprinkler system in accordance with NFPA 13D must have automatic sprinklers installed in attached garages and in other areas as required by the fire code official.

**§ 903.3.8 Shutoff valves.** Sprinkler shut off valves are required on each floor of buildings two stories or greater in height.

**§ 905.3.0.1 Required Installations.** All occupancies, except Group R-3, less than 4 stories in height but greater than 10,000 square feet in sprinklered buildings are required to have a type III standpipe.

**907.9.1.1 Maintenance Required.** All fire alarm and fire detection systems in all occupancies except Group R, Division 3, shall be required to have annual maintenance and testing, by a licensed and certified fire alarm company. Any systems failing the annual test, or if a system has caused an excess of 3 false alarms within a 180 day period, shall be immediately repaired. A copy of the maintenance and testing report shall be forwarded to the fire department, fire prevention bureau.

**§ 910.1 General.** Where required by this Code or otherwise installed, smoke and heat vents or mechanical smoke exhaust systems and draft curtains must conform to the requirements of this section.

**Exceptions:**

1. Frozen food warehouses used solely for storage of Class I and II commodities where protected by an approved automatic sprinkler system.
2. Where areas of buildings are equipped with early suppression fast-response (ESFR) sprinklers, smoke and heat venting must be provided by mechanical smoke exhaust systems in accordance with Section 910.4 within these areas.

**§ 1404.8 Fire retardant plastic sheeting and tarpaulins.** Fire retardant tarpaulins and sheeting must be used to barricade construction areas from occupied building spaces and to provide floor or wall protection in occupied buildings.

**§ 2306.2 Table 2306.2, Footnote 'j' is amended to read as follows:**

- j. Smoke and heat removal must be accomplished by mechanical ventilation in accordance with Section 910.4 when storage areas are protected by early suppression fast response (ESFR) sprinkler systems installed in accordance with NFPA 13.

§ 3301.1.3 **Fireworks.** The manufacturing, possession, storage sale, use and handling of fireworks, including without limitation, "Safe and Sane" fireworks, is prohibited

**Exceptions:**

1. Storage of fireworks in accordance with the requirements for low order explosives in Title 19, California Code of Regulations, Chapter 10.
2. Storage of fireworks, 1.4G in accordance with the Building Code.
3. Use and handling of fireworks for professional display in accordance with Title 19, California Code of Regulations, Chapter 6.

§ 3309 **Seizure of Fireworks.** The fire code official has the authority to seize, take and remove fireworks stored, sold, offered for sale, used or handled in violation of the provisions of Title 19, California Code of Regulations, Chapter 6 and California Health and Safety Code, Chapter 9."

**SECTION 2. CALIFORNIA ENVIRONMENTAL QUALITY ACT EXEMPTION.** The City Council determines that this ordinance is exempt from review under the California Environmental Quality Act (California Public Resources Code §§ 21000, *et seq.*, "CEQA") and the regulations promulgated thereunder (14 California Code of Regulations §§ 15000, *et seq.*, the "CEQA Guidelines") because it consists only of minor revisions and clarifications to an existing code of construction-related regulations and specification of procedures related thereto and will not have the effect of deleting or substantially changing any regulatory standards or findings required therefor. This ordinance, therefore, is an action being taken for enhanced protection of the environment and that does not have the potential to cause significant effects on the environment. Consequently, it is categorically exempt in accordance with CEQA Guidelines §§ 15301 as a minor alteration of existing public or private structures involving no expansion of use; 15305 as a minor alteration in land use limitations which do not result in any changes in land use or density; and 15308 as an action taken by a regulatory agency as authorized by California law to assure maintenance or protection of the environment.

**SECTION 3. SAVINGS CLAUSE.** Repeal of any provision of the MBMC or any other city ordinance herein will not affect any penalty, forfeiture, or liability incurred before, or preclude prosecution and imposition of penalties for any violation occurring before, this Ordinance's effective date. Any such repealed part will remain in full force and effect for sustaining action or prosecuting violations occurring before the effective date of this Ordinance.

**SECTION 4. SEVERABILITY.** If any part of this Ordinance or its application is deemed invalid by a court of competent jurisdiction, the city council intends that such invalidity will not affect the effectiveness of the remaining provisions or applications and, to this end, the provisions of this Ordinance are severable.

**SECTION 5. VALIDITY OF PREVIOUS CODE SECTIONS.** If this the entire Ordinance or its application is deemed invalid by a court of competent jurisdiction, any repeal of the MBMC or other the city ordinance by this Ordinance will be rendered void and cause such MBMC provision or other the city ordinance to remain in full force and effect for all purposes.

**SECTION 6.** The City Clerk is directed to certify the passage and adoption of this Ordinance; cause it to be entered into the City of Manhattan Beach's book of original ordinances; make a note of the passage and adoption in the records of this meeting; and, within fifteen (15) days after the passage and adoption of this Ordinance, cause it to be published or posted in accordance with California law.

**SECTION 7.** This Ordinance will become effective thirty (30) days following its passage and adoption.

PASSED, APPROVED AND ADOPTED this 16<sup>th</sup> day of November, 2010.

Ayes:  
Noes:  
Absent:  
Abstain:

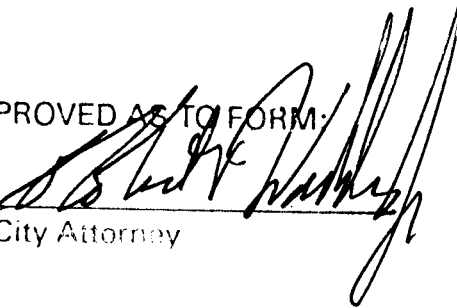
\_\_\_\_\_  
Mayor, City of Manhattan Beach, California

ATTEST:

\_\_\_\_\_  
City Clerk

APPROVED AS TO FORM:

By

  
\_\_\_\_\_  
City Attorney

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# **Cost Effectiveness Study for a Locally Adopted Energy Efficiency Ordinance for the City of Manhattan Beach**

Prepared by:

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blbarchitect@gmail.com**

**Newton Energy, attention Rick Newton  
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(310) 375-2699  
newtonenergy@yahoo.com**

Prepared for:

**The City of Manhattan Beach  
Department of Community Development  
1400 Highland Avenue  
Manhattan Beach, CA 90266**

**Attention: Carol Jacobson, Building Official  
(310) 802-5525**

Issue Date:           **October 20, 2010**

Last Modified:       **October 20, 2010**

**EXHIBIT B  
CC MTG 11-3-10**

## **Background**

In October 2008, City Council formed a resident-based Environmental Task Force (Task Force) to study environmental issues of priority to the community. A Sustainable ("Green") Building Subcommittee was formed and developed a four-pronged approach to sustainable development for the City of Manhattan Beach. Their studies and the resulting recommendations were specifically tailored to the Manhattan Beach's environmental conditions and its largely residential makeup. Specific emphasis was placed on energy efficiency, water conservation, runoff reduction, solid waste reduction and diversion, and air quality and emissions reductions. Among the measures studied and recommended was a policy that would increase overall energy efficiency in the residential sector relative to Title 24 mandates and baselines. Utilizing the services of an energy consultant, the feasibility of this approach was studied and demonstrated to be both reasonable and cost effective.

### **1.0 Executive Summary**

- 1.1 The City of Manhattan Beach has researched and reviewed the feasibility and cost- effectiveness of requiring all permit applicants for new residential construction and residential additions and remodels exceeding 50% valuation to exceed the performance requirements of the 2008 Building Energy Efficiency Standards by a margin of 15%.
- 1.2 Per the criteria stated in the California Code of Regulations, Title 24, Part 1, Section 10-106, Locally Adopted Energy Standards, these local standards shall require buildings to be designed to consume no more energy than permitted by Title 24, Part 6.
- 1.3 If adopted, Ordinance and the Locally Adopted Energy Efficiency Standards shall be submitted to the California Energy Commission for review and approval. The proposed Ordinance and Standards shall take effect only after the Commission has reviewed and formally approved the proposed local energy standards as meeting all requirements of Section 10-106, and the Ordinance has been filed with the Building Standards Commission.
- 1.4 The proposed local energy efficiency standards and implementation have been designed with several key criteria in mind, including;
  - 1.4.1 Consistency with the structure, format and calculation methods of the 2008 Title 24 Building Energy Efficiency Standards;
  - 1.4.2 Local Building Department review, verification enforcement and field inspection;

- 1.4.3 Provide flexibility for building permit applicants to comply with the Ordinance by the performance approach using a wide range of building and appliance energy conservation measures.

## **2.0 Objectives**

- 2.1 It was determined that the City of Manhattan Beach shall draft and adopt a Locally Adopted Energy Standard.

- 2.2 Per the criteria stated in the California Code of Regulations, Title 24, Part 1, Section 10-106, Locally Adopted Energy Standards, this local standard shall;

- 2.2.1 Require buildings to be designed to consume no more energy than permitted by Title 24, Part 6;

- 2.2.2 Require all permit applicants for new residential construction and residential additions and remodels exceeding 50% valuation to exceed the performance requirements of the 2008 Building Energy Efficiency Standards by a margin of 15% (per Cal Green Tier 1).

- 2.2.3 Be consistent with the structure, format and calculation methods of the 2008 Title 24 Building Energy Efficiency Standards;

- 2.2.4 Be specifically tailored and drafted for ease of local building department review, verification enforcement and field inspection;

- 2.2.5 Provide flexibility for building permit applicants to comply with the Ordinance by the performance approach using a wide range of building and appliance energy conservation measures;

- 2.2.6 Be analyzed to the fullest extent possible for;

- a) Cost effectiveness. lowest initial cost(s);

- b) Feasibility;

- c) Flexibility.

## **3.0 Applicability**

- 3.1 The standards and ordinance shall be applicable to all permit applicants for new residential construction and residential additions and remodels exceeding 50% valuation.

### **3.0. Methodology:**

- 3.1 The energy performance impacts of exceeding the performance requirements of the 2008 Title 24 Building Energy Efficiency Standards by a margin of 15% in Climate Zone 6 were evaluated using a range of recent permit applications in the City of Manhattan Beach as Case Study models. These projects were deemed to be representative of those building types typically constructed in Manhattan Beach.
- 3.2 The 2008 Building Energy Efficiency Standards, effective January 1, 2010, were used as the baseline in calculating the energy performance of efficiency measures summarized in this study.
- 3.3 Case Studies were based on actual project designs selected from recent permit applications (herein, "Cases").
- 3.4 To the greatest extent possible and/or practical the Cases were selected by virtue of the fact that they were typical and representative of the building types and lot configurations prevalent to Manhattan Beach.

### **3.5 Cases: The selected Cases are as follows;**

- 3.5.1. 2-Unit Condo: New construction, 2-unit attached multi-family residential (condominium) measuring 5,202 square feet of conditioned area.
- 3.5.2. The Strand SFR: New construction, single family residence measuring 5,557 square feet of conditioned area.
- 3.5.3. East Manhattan SFR: New construction, single family residence measuring 3,137 square feet of conditioned area.
- 3.5.4. East Manhattan E + A (Existing plus Addition) SFR, single family residence measuring 2,742 square feet of conditioned area.

### **3.6 Base Cases:**

The Base Case for each Case is the actual design as submitted including the actual Title 24 compliance documentation for the given project. Note that, in the significant majority of on-file cases, the margin of compliance ranges between 0% -3% for new construction to as high as 8% for additions and remodels.

- 3.7 Where the project data and compliance for a given Base Case pre-dated the current 2008 standards, the project was re-tested and verified for compliance with the 2008 Standards using accepted methodology and computer software modeling program(s).
- 3.8 Each Base Case design was then manipulated by incorporating various Energy Efficiency Measures. These measures were selected by virtue of the fact that they were deemed to be relatively cost effective, readily available, relatively simple to implement and effective as per the professional opinions and with the input of local Architects, Building Officials, Energy Consultants and Contractors. The proposed measures were deemed to represent a reasonable set of measures that accurately reflected how local designers, builders and developers might reasonably achieve a specified level of performance using a relatively low first incremental (additional) cost.
- 3.9 The minimally compliant Base Case designs were then modified to achieve greater levels of energy efficiency by incrementally adding various energy measures and/or combinations of measures so that each Case building exceeded the 2008 standards by 20%.
- 3.10 Initial incremental costs of added energy efficiency measures were established by a variety of research means and with the input of local Architects, Building Officials, Energy Consultants and Contractors to establish first cost data.
- 3.11 Site energy was calculated from the Title 24 simulation results to establish the annual energy savings, energy cost savings and CO<sub>2</sub>-equivalent reductions in greenhouse gases.
- 3.12 Life Cycle Cost (LCC) studies were conducted for each the Energy Efficiency Measures of each Case.
- 3.13 Note that;
  - 3.12.1 In many instances, highly effective energy efficiency measures may carry little or no additional cost. For example, incorporation of passive design elements such as proper orientation of fenestration, overhangs and thermal mass can increase energy efficiency considerably for no increase in initial cost and reducing glazing area may actually reduce initial costs. However, it was recognized that many residential projects are designed and/or built by non-professionals. Therefore, it was determined that the proposed set of measures used in the study to achieve higher levels of energy efficiency should be such that they can be added to virtually any

conventional, design with no special knowledge of or skill in the field of passive architectural design.

3.12.2 The possible range of measures is essentially infinite and, therefore, the relative costs and complexities associated with implementing various measures will vary considerably. The design choices used in the Case studies this study are based on many years of experience with architects, builders, mechanical engineers; and general knowledge of the relative acceptance and preferences of many measures, as well as their incremental costs. This approach tends to reflect how building energy performance is typically evaluated for code compliance and how it's used to select design energy efficiency measures.

3.12.3 Lowest simple payback with respect to building site energy was not the primary focus of selecting measures; but rather the requisite reduction of Title 24 Time Dependent Valuation (TDV) energy at a reasonable incremental cost consistent with other non-monetary but important design considerations.

## **4.0 Analysis:**

### **4.1 Base Cases**

4.1.1 2-Unit Condo: New construction, 2-unit attached multi-family residential (condominium) measuring 5,202 square feet of conditioned area. Framed walls are insulated to R-19. Basement retaining walls are insulated to R-13. Two 50 gal. water heaters 0.60 EF. 470 sf floor area insulated R-30 batts. Contemporary design. 37.8% glazing to conditioned floor area.

4.1.2 The Strand SFR: New construction, single family residence measuring 5,557 square feet of conditioned area. Less than 12' of ducts in unconditioned space. Furnace 80% AFUE. Retaining walls in basement are insulated. West facing glazing is monolithic. Quality insulation installation & duct testing has been specified - These measures require verification by a certified HERS Rater. R-30 Floor Insulation has been specified.

4.1.3 East Manhattan SFR: New construction, single family residence measuring 3,137 square feet of conditioned area. No R-19 ceilings. wall fenestration U-Factor = 0.33, SHGC = 0.31. Gas furnace w/ AFUE = 92.

4.1.4 East Manhattan E + A (Existing plus Addition) SFR, single family residence measuring 2,742 square feet of conditioned area. Assume existing and new fenestration is double-glazed, non-metal, clear glass. Standard gas 50 gal or less water heater.

**4.3 Summary of 15% Margin of Compliance Cases with ECM's Added and Respective Initial Incremental Costs**

4.3.1 2-Unit Condo:

ECM-6: Quality insulation installation, HERS Required  
Initial Incremental Cost = \$675.00 (for 2 systems)

ECM-8: Furnace upgrade - AFUE 80% to 95%  
Initial Incremental Cost = \$600.00 (for 2 systems)

4.3.2 The Strand SFR:

ECM-3 Wall Insulation Upgrade: R-13 to R-19 Batts  
Initial Incremental Cost: \$150.00

ECM-8 Furnace upgrade - AFUE 80% to 95%  
Initial Incremental Cost: (2) units @ \$600.00 = \$1,200.00

ECM-11 Low Leakage Ducts in Conditioned Space - HERS Required  
Initial Incremental Cost: \$0.00

ECM-13 Eliminate (downgrade) (3) ea. skylights  
Initial Incremental Cost: (3) units @ (\$450) = (\$1,350)

4.3.3 East Manhattan SFR:

ECM-6: Quality insulation installation, HERS Required  
Initial Incremental Cost = \$150.00

ECM-11 Low Leakage Ducts in Conditioned Space - HERS Required

Initial Incremental Cost: \$350.00

4.3.4 East Manhattan E+A SFR:

ECM-5 Replace existing furnace: 80% AFUE furnace (E) w/ 95% AFUE furnace

Initial Incremental Cost: \$1,600.00

ECM-7 Skylight Upgrade (Replace w/ Velux)

Initial Incremental Cost: \$450.00

ECM-9 Attic insulation upgrade: Assumed R-19 (E) to R-30

Initial Incremental Cost: \$1,600.00

**4.4 Cost Data & Energy Conserving Measure (ECM) Descriptions and Respective Initial Incremental Costs**

4.4.1 ECM 1: House wrap upgrade: upgrade from 60 minute paper to Typar or Tyvek house wrap. (Note: This ECM not used)

a. Nominal 3,000 sf house = \$560.00

b. Nominal 5,550 sf house = \$950.00.

4.4.2 ECM 2: HERS Rater

a. 2-Unit Condo: \$330.00

b. The Strand SFR = \$150.00

c. East Manhattan SFR: \$500.00.

4.4.3 ECM-3: Wall insulation upgrade: upgrade wall insulation from R-13 to R-19 batts.

a. 3,000 sf house = \$80.00

b. 5,550 sf house = \$150.00

b. The Strand SFR: \$150.00



- 4.4.4 ECM-4: Tankless water heater upgrade: upgrade 75 gal. storage tank water heater 0.58 EF to Takagi or Noritz equivalent tankless (Note: This ECM not used)
- a. \$800.00 w/ no venting
  - b. \$2,100.00 w/ venting
- 4.4.5 ECM-5: Replace (E) existing 80% AFUE furnace w/ 95% AFUE furnace = \$1,600.00 per unit.
- 4.4.6 ECM-6: Quality insulation: upgrade to "quality insulation" w/ HERS verification = \$200-\$330.00 (HERS raters typically quite a package of services including duct verification, insulation verification and envelope testing).
- a. 2-unit condo = \$330.00 (2 units)
  - b. East Manhattan SFR = \$150.00
- 4.4.7 ECM-7: Skylight upgrade: replace 11 sf skylight w/ Velux = \$450.00
- 4.4.8 Furnace upgrade - 80% to 95%: dual-stage 80% AFUE to dual-stage 95% AFUE = \$600.00 per unit.
- a. 2-unit Condo = \$1,200.00 (2 units)
  - b. The Strand SFR = \$1,200.00 (2 units)
- 4.4.9. Replace/upgrade (E) attic insulation: insulate existing 1,665 sf attic w/ R-30 batt insulation = \$1,600.00
- 4.4.10 Replace (E) water heater w/ energy efficient upgrade: replace existing 50 gal. water heater w/ new 50 gal. Tank-type 0.61 EF
- a. \$2,075.00, B-vent, no-recirculation
  - b. \$2,750.00, power vent, no recirculation (Note: This ECM not used)
- 4.4.11 Low leak ducts/ducts in conditioned space: low leakage ducts in conditioned space. Requires ECM-2, HERS rater (see ECM-2).
- a. The Strand SFR = \$0.00 (duct testing is required in the base case)
  - b. East Manhattan SFR = \$350.00.

4.4.12 Upgrade std. 50 gal. storage tank water heater to 50 gal. 0.65 EF = \$188.00 (Note: This ECM not used)

4.4.13 Skylight downgrade (elimination): eliminate three skylights @ \$450.00 ea = net savings of \$1,350.00.

## **5.0 Exhibits (attached)**

5.1.1 Energy Report, 2-Unit Condo, Base Case

5.1.2 Energy Report, 2-Unit Condo, 15% margin of compliance

5.1.3 Life Cycle Cost Summary, 2-Unit Condo

5.1.4 Energy Report, The Strand, Base Case

5.1.5 Energy Report, The Strand, 15% margin of compliance

5.1.6 Life Cycle Cost Summary, The Strand

5.1.7 Energy Report, East Manhattan SFR, Base Case

5.1.8 Energy Report, East Manhattan SFR, 15% margin of compliance

5.1.9 Life Cycle Cost Summary, East Manhattan SFR (20 year study period)

5.1.10 Energy Report, East Manhattan E+A SFR, Base Case

5.1.11 Energy Report, East Manhattan E+A SFR, 15% margin of compliance

5.1.12 Life Cycle Cost Summary, East Manhattan E+A SFR

## **6.0 Conclusions**

Regardless of the specific building design, and/or occupancy profile, the incremental improvement in overall annual energy performance of buildings in exceeding the 2008 Title 24 Building Energy Efficiency Standards appears to be cost-effective. As demonstrated by the Case study Energy Reports and Life Cycle Cost Analyses, each of the four study models could be modified to achieve the targeted 15% minimum margin of compliance over their respective baselines using sets of conventional Energy Conserving Measures and each of the four

cases demonstrate payback of the initial incremental costs associated with those measures.

However, each building's overall design, occupancy type and specific design choices may allow for a large range of incremental first cost and payback. All permit applicants should carefully analyze building energy performance to reduce incremental first cost and the payback for the required additional energy efficiency measures.

It is important to acknowledge that the possible range of measures is essentially infinite and, therefore, the relative initial costs and complexities associated with implementing various measures will vary considerably. In many instances, highly effective energy efficiency measures may carry little or no additional cost. For example, incorporation of passive design elements such as proper orientation of fenestration, overhangs and thermal mass can increase energy efficiency considerably for no increase in initial cost and reducing glazing area may actually reduce initial costs. Conversely, other options such as extensive photovoltaic systems may carry high initial costs. Initial costs may also be higher when efficiency measures are not considered and integrated into the design as a whole system.

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# BUILDING ENERGY ANALYSIS REPORT

## PROJECT:

The Strand SFR (15%) All ECM's  
[REDACTED]  
Manhattan Beach, CA 90266

## Project Designer:

Sexton Homes  
PO Box 1795  
Manhattan Beach, CA 90267  
(310) 545-3432

## Report Prepared by:

Rick Newton  
NEWTON ENERGY  
1401 19th Street  
Manhattan Beach, CA 90266  
310 375-2699



## Job Number:

7273R

## Date:

10/16/2010

The EnergyPro computer program has been used to perform the calculations summarized in this compliance report. This program has approval and is authorized by the California Energy Commission for use with both the Residential and Nonresidential 2008 Building Energy Efficiency Standards.

This program developed by EnergySoft, LLC – [www.energysoft.com](http://www.energysoft.com).

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Form MF-1R Mandatory Measures Summary	10
HVAC System Heating and Cooling Loads Summary	13
Form ECON-1 Energy Use and Cost Summary	14

**PERFORMANCE CERTIFICATE: Residential** (Part 1 of 5) **CF-1R**

Project Name <i>The Strand SFR (15%) All ECM's</i>	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date <i>10/16/2010</i>
Project Address [REDACTED]	California Energy Climate Zone <i>CA Climate Zone 06</i>	Total Cond. Floor Area <i>5,551</i>
	Addition <i>n/a</i>	# of Stories <i>3</i>

**FIELD INSPECTION ENERGY CHECKLIST**

- Yes  No HERS Measures -- If Yes, A CF-4R must be provided per Part 2 of 5 of this form.  
 Yes  No Special Features -- If Yes, see Part 2 of 5 of this form for details.

INSULATION		Area	Special	Status
Construction	Type	Cavity	Features (see Part 2 of 5)	
Roof	Wood Framed Rafter	R-30	1,971	New
Floor	Wood Framed w/o Crawl Space	R-30	656	New
Wall	Wood Framed	R-19	4,877	New
Door	Opaque Door	None	23	New
Roof	Wood Framed Rafter	R-30	751	New
Slab	Unheated Slab-on-Grade	None	2,115 Perim = 242'	New
WallBG	Hollow Unit Masonry	None	1,419 Int=R-13.0 Depth = 30.000"	New

FENESTRATION		U-	Exterior				Status
Orientation	Area(ft <sup>2</sup> )	Factor	SHGC	Overhang	Sidefins	Shades	
Skylight	12.6	0.370	0.29	none	none	None	New
Skylight	6.3	0.370	0.29	none	none	None	New
Skylight	20.0	0.370	0.29	none	none	None	New
Skylight	6.3	0.370	0.29	none	none	None	New
Left (W)	347.0	0.930	0.44	none	none	Bug Screen	New
Rear (N)	330.0	0.370	0.32	none	none	Bug Screen	New
Right (E)	77.0	0.370	0.32	none	none	Bug Screen	New
Front (S)	288.0	0.370	0.32	none	none	Bug Screen	New
Right (E)	36.0	0.340	0.33	none	none	Bug Screen	New

HVAC SYSTEMS						
Qty.	Heating	Min. Eff	Cooling	Min. Eff	Thermostat	Status
2	Central Furnace	95% AFUE	No Cooling	13.0 SEER	Setback	New

HVAC DISTRIBUTION				Duct	Status
Location	Heating	Cooling	Duct Location	R-Value	
Whole House Systems	Ducted	Ducted	Conditioned	4.2	New

WATER HEATING					
Qty.	Type	Gallons	Min. Eff	Distribution	Status
1	Small Gas	75	0.57	Kitchen Pipe Ins	New

**PERFORMANCE CERTIFICATE: Residential** (Part 2 of 5) **CF-1R**

Project Name <i>The Strand SFR (15%) All ECM's</i>	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date <i>10/16/2010</i>
---	---	---------------------------

**SPECIAL FEATURES INSPECTION CHECKLIST**

The enforcement agency should pay special attention to the items specified in this checklist. These items require special written justification and documentation, and special verification to be used with the performance approach. The enforcement agency determines the adequacy of the justification, and may reject a building or design that otherwise complies based on the adequacy of the special justification and documentation submitted.

*The HVAC System Carrier Corp. 58MXB040-12x does not include a cooling system, field verification is not necessary.*

**HERS REQUIRED VERIFICATION**

Items in this section require field testing and/or verification by a certified HERS Rater. The inspector must receive a completed CF-4R form for each of the measures listed below for final to be given.

*Compliance credit for quality installation of insulation has been used. HERS field verification is required.*

*The HVAC System Whole House Systems has Ducts, Plenums and the HVAC unit located totally within Conditioned space. A certified HERS rater must visually verify the installation of the HVAC unit and all Ducts and Plenums.*

*Whole House Systems includes verified duct systems that have air leakage to outside conditions equal to or less than 25 cfm. HERS field verification for ducts in conditioned space and duct leakage is required.*



**PERFORMANCE CERTIFICATE: Residential** (Part 3 of 5) **CF-1R**

Project Name *The Strand SFR (15%) All ECM's* Building Type  Single Family  Addition Alone Date *10/16/2010*  
 Multi Family  Existing+ Addition/Alteration

**ANNUAL ENERGY USE SUMMARY**

TDV (kBtu/ft <sup>2</sup> -yr)	Standard	Proposed	Margin
Space Heating	9.00	6.02	2.98
Space Cooling	1.27	0.97	0.30
Fans	1.78	1.54	0.23
Domestic Hot Water	6.96	7.02	-0.06
Pumps	0.00	0.00	0.00
<b>Totals</b>	<b>19.01</b>	<b>15.56</b>	<b>3.45</b>
<b>Percent Better Than Standard:</b>	<b>18.2 %</b>		

**BUILDING COMPLIES - HERS VERIFICATION REQUIRED**

		Ext. Walls/Roof	Wall Area	Fenestration Area
Building Front Orientation:	(SE) 142 deg			
Number of Dwelling Units:	1.00	(SE)	2,011	288
Fuel Available at Site:	Natural Gas	(SW)	956	347
Raised Floor Area:	656	(NW)	2,557	330
Slab on Grade Area:	2,115	(NE)	454	113
Average Ceiling Height:	10.2	Roof	2,767	45
Fenestration Average U-Factor:	0.57		TOTAL:	1,123
Average SHGC:	0.36		Fenestration/CFA Ratio:	20.2 %

**REMARKS**

*BASE CASE: Less than 12' of ducts are in unconditioned space. Furnace is an 80% AFUE unit. Retaining Walls in basement are insulated. West Facing Glazing is monolithic. Quality Insulation Installation & Duct Testing has been specified - These measures require verification by a certified HERS Rater. R-30 Floor Insulation has been specified.*

15% Case:  
 ECM-3 - Wall Insulation Upgrade: R-13 to R-19 Wall Batts: 9.1%;  
 ECM-8 - Furnace upgrade - AFUE 80% to 95%: 9.4%  
 ECM-11 - Low Leakage Ducts in Conditioned Space: 4.1%

**STATEMENT OF COMPLIANCE**

This certificate of compliance lists the building features and specifications needed to comply with Title 24, Parts 1 the Administrative Regulations and Part 6 the Efficiency Standards of the California Code of Regulations.

The documentation author hereby certifies that the documentation is accurate and complete.

**Documentation Author**

Company *NEWTON ENERGY* Name *Rick Newton* Date *10/16/2010*  
 Address *1401 19th Street* Phone *310 375-2699*  
 City/State/Zip *Manhattan Beach, CA 90266* Signed \_\_\_\_\_

The individual with overall design responsibility hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application, and recognizes that compliance using duct design, duct sealing, verification of refrigerant charge, insulation installation quality, and building envelope sealing require installer testing and certification and field verification by an approved HERS rater.

**Designer or Owner (per Business & Professions Code)**

Company *Sexton Homes* Name \_\_\_\_\_ Date \_\_\_\_\_  
 Address *PO Box 1795* License # \_\_\_\_\_  
 City/State/Zip *Manhattan Beach, CA 90267* Phone *(310) 545-3432* Signed \_\_\_\_\_

**CERTIFICATE OF COMPLIANCE: Residential** (Part 4 of 5) **CF-1R**

Project Name: *The Strand SFR (15%) All ECM's* Building Type:  Single Family  Addition Alone  Multi Family  Existing+ Addition/Alteration Date: *10/16/2010*

**OPAQUE SURFACE DETAILS**

Surface Type	Area	U-Factor	Insulation				Azimuth	Tilt	Status	Joint Appendix 4	Location/Comments
			Cavity	Exterior	Frame	Interior					
Roof	497	0.036	R-30				251	1	New	4.2.2-A16	2nd Floor Zone
Roof	496	0.036	R-30				341	1	New	4.2.2-A16	2nd Floor Zone
Roof	482	0.036	R-30				71	1	New	4.2.2-A16	2nd Floor Zone
Roof	496	0.036	R-30				161	1	New	4.2.2-A16	2nd Floor Zone
Floor	598	0.034	R-30				0	180	New	4.4.2-A7	2nd Floor Zone
Wall	275	0.074	R-19				251	90	New	4.3.1-A5	2nd Floor Zone
Wall	873	0.074	R-19				341	90	New	4.3.1-A5	2nd Floor Zone
Wall	252	0.074	R-19				71	90	New	4.3.1-A5	2nd Floor Zone
Wall	843	0.074	R-19				161	90	New	4.3.1-A5	2nd Floor Zone
Floor	58	0.034	R-30				0	180	New	4.4.2-A7	1st Floor Zone
Wall	182	0.074	R-19				251	90	New	4.3.1-A5	1st Floor Zone
Wall	494	0.074	R-19				341	90	New	4.3.1-A5	1st Floor Zone
Wall	123	0.074	R-19				0	90	New	4.3.1-A5	1st Floor Zone
Door	23	0.500	None				0	90	New	4.5.1-A4	1st Floor Zone
Wall	89	0.074	R-19				71	90	New	4.3.1-A5	1st Floor Zone
Wall	593	0.074	R-19				161	90	New	4.3.1-A5	1st Floor Zone

**FENESTRATION SURFACE DETAILS**

ID	Type	Area	U-Factor <sup>1</sup>	SHGC <sup>2</sup>	Azimuth	Status	Glazing Type	Location/Comments
1	Skylight	12.6	0.370	NFRC	0.29	NFRC	251 New Velux Comfort (75) Lowe2/Arg	2nd Floor Zone
2	Skylight	6.3	0.370	NFRC	0.29	NFRC	341 New Velux Comfort (75) Lowe2/Arg	2nd Floor Zone
3	Skylight	20.0	0.370	NFRC	0.29	NFRC	71 New Velux Comfort (75) Lowe2/Arg	2nd Floor Zone
4	Skylight	6.3	0.370	NFRC	0.29	NFRC	161 New Velux Comfort (75) Lowe2/Arg	2nd Floor Zone
5	Window	88.0	0.930	COG	0.44	COG	251 New PPG Azuria Mono.Non-Metal D/	2nd Floor Zone
6	Window	98.0	0.370	NFRC	0.32	NFRC	341 New IWC 5300 Vinyl/Low-E	2nd Floor Zone
7	Window	65.0	0.370	NFRC	0.32	NFRC	71 New IWC 5300 Vinyl/Low-E	2nd Floor Zone
8	Window	150.0	0.370	NFRC	0.32	NFRC	161 New IWC 5300 Vinyl/Low-E	2nd Floor Zone
9	Window	125.0	0.930	COG	0.44	COG	251 New PPG Azuria Mono.Non-Metal D/	1st Floor Zone
10	Window	110.0	0.370	NFRC	0.32	NFRC	341 New IWC 5300 Vinyl/Low-E	1st Floor Zone
11	Window	36.0	0.340	NFRC	0.33	NFRC	71 New Andersen Permashield	1st Floor Zone
12	Window	12.0	0.370	NFRC	0.32	NFRC	71 New IWC 5300 Vinyl/Low-E	1st Floor Zone
13	Window	60.0	0.370	NFRC	0.32	NFRC	161 New IWC 5300 Vinyl/Low-E	1st Floor Zone
14	Window	134.0	0.930	COG	0.44	COG	251 New PPG Azuria Mono.Non-Metal D/	Basement Zone
15	Window	122.0	0.370	NFRC	0.32	NFRC	341 New IWC 5300 Vinyl/Low-E	Basement Zone
16	Window	78.0	0.370	NFRC	0.32	NFRC	161 New IWC 5300 Vinyl/Low-E	Basement Zone

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value  
 (2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

**EXTERIOR SHADING DETAILS**

ID	Exterior Shade Type	SHGC	Window		Overhang			Left Fin			Right Fin			
			Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt
1	None	1.00												
2	None	1.00												
3	None	1.00												
4	None	1.00												
5	Bug Screen	0.76												
6	Bug Screen	0.76												
7	Bug Screen	0.76												
8	Bug Screen	0.76												
9	Bug Screen	0.76												
10	Bug Screen	0.76												
11	Bug Screen	0.76												
12	Bug Screen	0.76												
13	Bug Screen	0.76												
14	Bug Screen	0.76												
15	Bug Screen	0.76												
16	Bug Screen	0.76												

**CERTIFICATE OF COMPLIANCE: Residential** (Part 4 of 5) **CF-1R**

Project Name <i>The Strand SFR (15%) All ECM's</i>	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date <i>10/16/2010</i>
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**OPAQUE SURFACE DETAILS**

Surface Type	Area	U-Factor	Insulation				Azm	Tilt	Status	Joint Appendix 4	Location/Comments	
			Cavity	Exterior	Frame	Interior						
Roof	751	0.035	R-30				71	1	New	4.2.2-A17	Basement Zone	
Slab	2,115	0.730	None				0	180	New	4.4.7-A1	Basement Zone	
Wall	152	0.074	R-19				251	90	New	4.3.1-A5	Basement Zone	
Wall	454	0.074	R-19				341	90	New	4.3.1-A5	Basement Zone	
Wall	287	0.074	R-19				161	90	New	4.3.1-A5	Basement Zone	
Wall	260	0.074	R-19				0	90	New	4.3.1-A5	Basement Zone	
WallBG	80	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	19	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	12	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	70	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	51	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	35	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	56	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	63	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	14	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	50	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone

**FENESTRATION SURFACE DETAILS**

ID	Type	Area	U-Factor <sup>1</sup>	SHGC <sup>2</sup>	Azm	Status	Glazing Type	Location/Comments

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value  
(2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

**EXTERIOR SHADING DETAILS**

ID	Exterior Shade Type	SHGC	Window		Overhang			Left Fin			Right Fin				
			Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt	

**CERTIFICATE OF COMPLIANCE: Residential** (Part 4 of 5) **CF-1R**

Project Name: *The Strand SFR (15%) All ECM's* Building Type:  Single Family  Addition Alone  Multi Family  Existing+ Addition/Alteration Date: *10/16/2010*

**OPAQUE SURFACE DETAILS**

Surface Type	Area	U-Factor	Insulation				Azimuth	Tilt	Status	Joint Appendix 4	Location/Comments	
			Cavity	Exterior	Frame	Interior						
WallBG	129	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	151	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	615	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone
WallBG	74	0.076	None			13.0	Wood	0	90	New	4.3.5-A9/4.3.13-A6	Basement Zone

**FENESTRATION SURFACE DETAILS**

ID	Type	Area	U-Factor <sup>1</sup>	SHGC <sup>2</sup>	Azm	Status	Glazing Type	Location/Comments

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value  
 (2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

**EXTERIOR SHADING DETAILS**

ID	Exterior Shade Type	SHGC	Window		Overhang			Left Fin			Right Fin				
			Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt	

**CERTIFICATE OF COMPLIANCE: Residential** (Part 5 of 5) **CF-1R**

Project Name: *The Strand SFR (15%) All ECM's* Building Type:  Single Family  Addition Alone  Multi Family  Existing+ Addition/Alteration Date: *10/16/2010*

**BUILDING ZONE INFORMATION**

System Name	Zone Name	Floor Area (ft <sup>2</sup> )				Volume	Year Built
		New	Existing	Altered	Removed		
<i>Whole House Systems</i>	<i>2nd Floor</i>	<i>2,008</i>				<i>19,277</i>	
	<i>1st Floor</i>	<i>1,428</i>				<i>14,708</i>	
	<i>Basement</i>	<i>2,115</i>				<i>22,419</i>	
<b>Totals</b>		<i>5,551</i>	<i>0</i>	<i>0</i>	<i>0</i>		

**HVAC SYSTEMS**

System Name	Qty.	Heating Type	Min. Eff.	Cooling Type	Min. Eff.	Thermostat Type	Status
<i>Whole House Systems</i>	<i>2</i>	<i>Central Furnace</i>	<i>95% AFUE</i>	<i>No Cooling</i>	<i>13.0 SEER</i>	<i>Setback</i>	<i>New</i>

**HVAC DISTRIBUTION**

System Name	Heating	Cooling	Duct Location	Duct R-Value	Ducts Tested?	Status
<i>Whole House Systems</i>	<i>Ducted</i>	<i>Ducted</i>	<i>Conditioned</i>	<i>4.2</i>	<input type="checkbox"/>	<i>New</i>
					<input type="checkbox"/>	
					<input type="checkbox"/>	
					<input type="checkbox"/>	
					<input type="checkbox"/>	

**WATER HEATING SYSTEMS**

System Name	Qty.	Type	Distribution	Rated Input (Btuh)	Tank Cap. (gal)	Energy Factor or RE	Standby Loss or Pilot	Ext. Tank Insul. R-Value	Status
<i>A O Smith Water Products</i>	<i>1</i>	<i>Small Gas</i>	<i>Kitchen Pipe Ins</i>	<i>55,000</i>	<i>75</i>	<i>0.57</i>	<i>n/a</i>	<i>n/a</i>	<i>New</i>

**MULTI-FAMILY WATER HEATING DETAILS**

**HYDRONIC HEATING SYSTEM PIPING**

Control	Qty.	HP	Eff. Premium	Hot Water Piping Length (ft)			Add 1/2" Insulation	System Name	Pipe Length	Pipe Diameter	Insul. Thick.
				Plenum	Outside	Buried					
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				

Project Name

The Strand SFR (15%) All ECM's

Date

10/16/2010

**NOTE:** Low-rise residential buildings subject to the Standards must comply with all applicable mandatory measures listed, regardless of the compliance approach used. More stringent energy measures listed on the Certificate of Compliance (CF-1R, CF-1R-ADD, or CF-1R-ALT Form) shall supersede the items marked with an asterisk (\*) below. This Mandatory Measures Summary shall be incorporated into the permit documents, and the applicable features shall be considered by all parties as minimum component performance specifications whether they are shown elsewhere in the documents or in this summary. Submit all applicable sections of the MF-1R Form with plans.

**Building Envelope Measures:**

§116(a)1: Doors and windows between conditioned and unconditioned spaces are manufactured to limit air leakage.

§116(a)4: Fenestration products (except field-fabricated windows) have a label listing the certified U-Factor, certified Solar Heat Gain Coefficient (SHGC), and infiltration that meets the requirements of §10-111(a).

§117: Exterior doors and windows are weather-stripped; all joints and penetrations are caulked and sealed.

§118(a): Insulation specified or installed meets Standards for Insulating Material. Indicate type and include on CF-6R Form.

§118(i): The thermal emittance and solar reflectance values of the cool roofing material meets the requirements of §118(i) when the installation of a Cool Roof is specified on the CF-1R Form.

\*§150(a): Minimum R-19 insulation in wood-frame ceiling or equivalent U-factor.

§150(b): Loose fill insulation shall conform with manufacturer's installed design labeled R-Value.

\*§150(c): Minimum R-13 insulation in wood-frame wall or equivalent U-factor.

\*§150(d): Minimum R-13 insulation in raised wood-frame floor or equivalent U-factor.

§150(f): Air retarding wrap is tested, labeled, and installed according to ASTM E1677-95(2000) when specified on the CF-1R Form.

§150(g): Mandatory Vapor barrier installed in Climate Zones 14 or 16.

§150(l): Water absorption rate for slab edge insulation material alone without facings is no greater than 0.3%; water vapor permeance rate is no greater than 2.0 perm/inch and shall be protected from physical damage and UV light deterioration.

**Fireplaces, Decorative Gas Appliances and Gas Log Measures:**

§150(e)1A: Masonry or factory-built fireplaces have a closable metal or glass door covering the entire opening of the firebox.

§150(e)1B: Masonry or factory-built fireplaces have a combustion outside air intake, which is at least six square inches in area and is equipped with a with a readily accessible, operable, and tight-fitting damper and or a combustion-air control device.

§150(e)2: Continuous burning pilot lights and the use of indoor air for cooling a firebox jacket, when that indoor air is vented to the outside of the building, are prohibited.

**Space Conditioning, Water Heating and Plumbing System Measures:**

§110-§113: HVAC equipment, water heaters, showerheads, faucets and all other regulated appliances are certified by the Energy Commission.

§113(c)5: Water heating recirculation loops serving multiple dwelling units and High-Rise residential occupancies meet the air release valve, backflow prevention, pump isolation valve, and recirculation loop connection requirements of §113(c)5.

§115: Continuously burning pilot lights are prohibited for natural gas: fan-type central furnaces, household cooking appliances (appliances with an electrical supply voltage connection with pilot lights that consume less than 150 Btu/hr are exempt), and pool and spa heaters.

§150(h): Heating and/or cooling loads are calculated in accordance with ASHRAE, SMACNA or ACCA.

§150(i): Heating systems are equipped with thermostats that meet the setback requirements of Section 112(c).

§150(j)1A: Storage gas water heaters rated with an Energy Factor no greater than the federal minimal standard are externally wrapped with insulation having an installed thermal resistance of R-12 or greater.

§150(j)1B: Unfired storage tanks, such as storage tanks or backup tanks for solar water-heating system, or other indirect hot water tanks have R-12 external insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.

§150(j)2: First 5 feet of hot and cold water pipes closest to water heater tank, non-recirculating systems, and entire length of recirculating sections of hot water pipes are insulated per Standards Table 150-B.

§150(j)2: Cooling system piping (suction, chilled water, or brine lines), and piping insulated between heating source and indirect hot water tank shall be insulated to Table 150-B and Equation 150-A.

§150(j)2: Pipe insulation for steam hydronic heating systems or hot water systems >15 psi, meets the requirements of Standards Table 123-A.

§150(j)3A: Insulation is protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind.

§150(j)3A: Insulation for chilled water piping and refrigerant suction lines includes a vapor retardant or is enclosed entirely in conditioned space.

§150(j)4: Solar water-heating systems and/or collectors are certified by the Solar Rating and Certification Corporation.

Project Name

*The Strand SFR (15%) All ECM's*

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*10/16/2010*

§150(m)1: All air-distribution system ducts and plenums installed, are sealed and insulated to meet the requirements of CMC Sections 601, 602, 603, 604, 605 and Standard 6-5; supply-air and return-air ducts and plenums are insulated to a minimum installed level of R-4.2 or enclosed entirely in conditioned space. Openings shall be sealed with mastic, tape or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape shall be used

§150(m)1: Building cavities, support platforms for air handlers, and plenums defined or constructed with materials other than sealed sheet metal, duct board or flexible duct shall not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts.

§150(m)2D: Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.

§150(m)7: Exhaust fan systems have back draft or automatic dampers.

§150(m)8: Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operated dampers.

§150(m)9: Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.

§150(m)10: Flexible ducts cannot have porous inner cores.

§150(o): All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. Window operation is not a permissible method of providing the Whole Building Ventilation required in Section 4 of that Standard.

#### **Pool and Spa Heating Systems and Equipment Measures:**

§114(a): Any pool or spa heating system shall be certified to have: a thermal efficiency that complies with the Appliance Efficiency Regulations; an on-off switch mounted outside of the heater; a permanent weatherproof plate or card with operating instructions; and shall not use electric resistance heating or a pilot light.

§114(b)1: Any pool or spa heating equipment shall be installed with at least 36" of pipe between filter and heater, or dedicated suction and return lines, or built-up connections for future solar heating.

§114(b)2: Outdoor pools or spas that have a heat pump or gas heater shall have a cover.

§114(b)3: Pools shall have directional inlets that adequately mix the pool water, and a time switch that will allow all pumps to be set or programmed to run only during off-peak electric demand periods.

§150(p): Residential pool systems or equipment meet the pump sizing, flow rate, piping, filters, and valve requirements of §150(p).

#### **Residential Lighting Measures:**

§150(k)1: High efficacy luminaires or LED Light Engine with Integral Heat Sink has an efficacy that is no lower than the efficacies contained in Table 150-C and is not a low efficacy luminaire as specified by §150(k)2.

§150(k)3: The wattage of permanently installed luminaires shall be determined as specified by §130(d).

§150(k)4: Ballasts for fluorescent lamps rated 13 Watts or greater shall be electronic and shall have an output frequency no less than 20 kHz.

§150(k)5: Permanently installed night lights and night lights integral to a permanently installed luminaire or exhaust fan shall contain only high efficacy lamps meeting the minimum efficacies contained in Table 150-C and shall not contain a line-voltage socket or line-voltage lamp holder; OR shall be rated to consume no more than five watts of power as determined by §130(d), and shall not contain a medium screw-base socket.

§150(k)6: Lighting integral to exhaust fans, in rooms other than kitchens, shall meet the applicable requirements of §150(k).

§150(k)7: All switching devices and controls shall meet the requirements of §150(k)7.

§150(k)8: A minimum of 50 percent of the total rated wattage of permanently installed lighting in kitchens shall be high efficacy. EXCEPTION: Up to 50 watts for dwelling units less than or equal to 2,500 ft<sup>2</sup> or 100 watts for dwelling units larger than 2,500 ft<sup>2</sup> may be exempt from the 50% high efficacy requirement when: all low efficacy luminaires in the kitchen are controlled by a manual on occupant sensor, dimmer, energy management system (EMCS), or a multi-scene programmable control system; and all permanently installed luminaries in garages, laundry rooms, closets greater than 70 square feet, and utility rooms are high efficacy and controlled by a manual-on occupant sensor.

§150(k)9: Permanently installed lighting that is internal to cabinets shall use no more than 20 watts of power per linear foot of illuminated cabinet.

Project Name

*The Strand SFR (15%) All ECM's*

Date

*10/16/2010*

§150(k)10: Permanently installed luminaires in bathrooms, attached and detached garages, laundry rooms, closets and utility rooms shall be high efficacy.

EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by a manual-on occupant sensor certified to comply with the applicable requirements of §119.

EXCEPTION 2: Permanently installed low efficacy luminaires in closets less than 70 square feet are not required to be controlled by a manual-on occupancy sensor.

§150(k)11: Permanently installed luminaires located in rooms or areas other than in kitchens, bathrooms, garages, laundry rooms, closets, and utility rooms shall be high efficacy luminaires. EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided they are controlled by either a dimmer switch that complies with the applicable requirements of §119, or by a manual-on occupant sensor that complies with the applicable requirements of §119. EXCEPTION 2: Lighting in detached storage building less than 1000 square feet located on a residential site is not required to comply with §150(k)11.

§150(k)12: Luminaires recessed into insulated ceilings shall be listed for zero clearance insulation contact (IC) by Underwriters Laboratories or other nationally recognized testing/rating laboratory; and have a label that certifies the luminaire is airtight with air leakage less than 2.0 CFM at 75 Pascals when tested in accordance with ASTM E283; and be sealed with a gasket or caulk between the luminaire housing and ceiling.

§150(k)13: Luminaires providing outdoor lighting, including lighting for private patios in low-rise residential buildings with four or more dwelling units, entrances, balconies, and porches, which are permanently mounted to a residential building or to other buildings on the same lot shall be high efficacy. EXCEPTION 1: Permanently installed outdoor low efficacy luminaires shall be allowed provided that they are controlled by a manual on/off switch, a motion sensor not having an override or bypass switch that disables the motion sensor, and one of the following controls: a photocontrol not having an override or bypass switch that disables the photocontrol; OR an astronomical time clock not having an override or bypass switch that disables the astronomical time clock; OR an energy management control system (EMCS) not having an override or bypass switch that allows the luminaire to be always on. EXCEPTION 2: Outdoor luminaires used to comply with Exception 1 to §150(k)13 may be controlled by a temporary override switch which bypasses the motion sensing function provided that the motion sensor is automatically reactivated within six hours. EXCEPTION 3: Permanently installed luminaires in or around swimming pool, water features, or other location subject to Article 680 of the California Electric Code need not be high efficacy luminaires.

§150(k)14: Internally illuminated address signs shall comply with Section 148; OR not contain a screw-base socket, and consume no more than five watts of power as determined according to §130(d).

§150(k)15: Lighting for parking lots and carports with a total of for 8 or more vehicles per site shall comply with the applicable requirements in Sections 130, 132, 134, and 147. Lighting for parking garages for 8 or more vehicles shall comply with the applicable requirements of Sections 130, 131, 134, and 146.

§150(k)16: Permanently installed lighting in the enclosed, non-dwelling spaces of low-rise residential buildings with four or more dwelling units shall be high efficacy luminaires. EXCEPTION: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by an occupant sensor(s) certified to comply with the applicable requirements of §119.



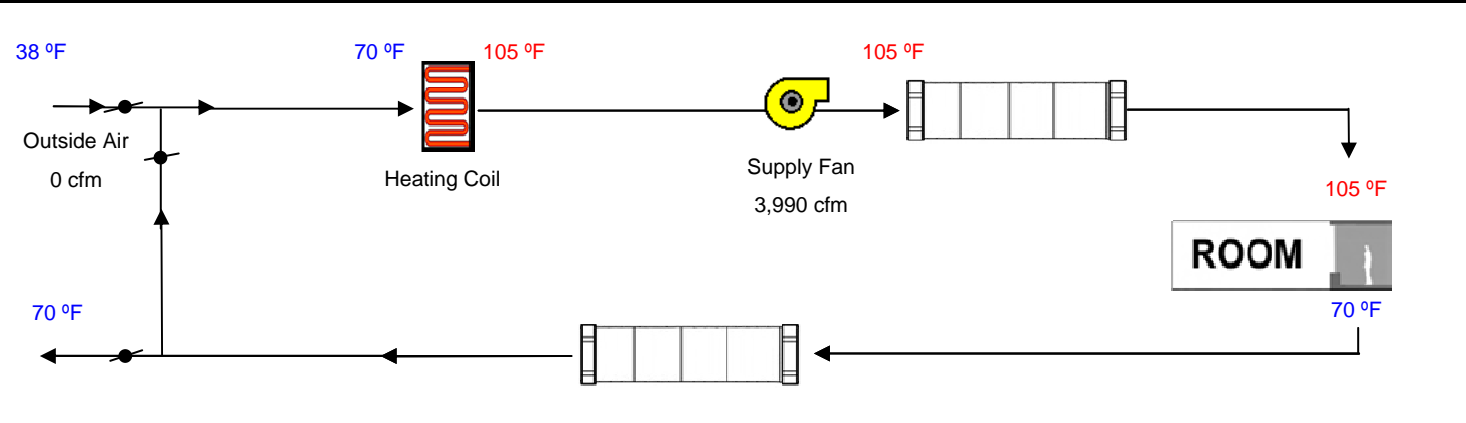
# HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name The Strand SFR (15%) All ECM's	Date 10/16/2010
System Name Whole House Systems	Floor Area 5,551

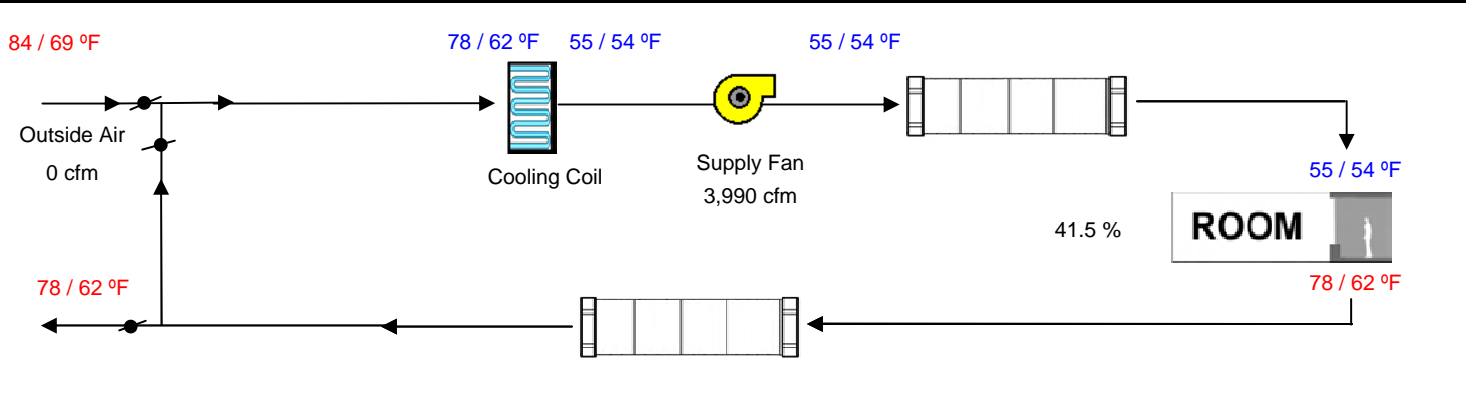
ENGINEERING CHECKS		SYSTEM LOAD							
Number of Systems	2				COIL COOLING PEAK		COIL HTG. PEAK		
Heating System					CFM	Sensible	Latent	CFM	Sensible
Output per System	38,000	Total Room Loads			2,002	49,509	3,373	1,514	56,963
Total Output (Btuh)	76,000	Return Vented Lighting				0			
Output (Btuh/sqft)	13.7	Return Air Ducts				0			0
Cooling System		Return Fan				0			0
Output per System	0	Ventilation			0	0	0	0	0
Total Output (Btuh)	0	Supply Fan				0			0
Total Output (Tons)	0.0	Supply Air Ducts				0			0
Total Output (Btuh/sqft)	0.0								
Total Output (sqft/Ton)	0.0	TOTAL SYSTEM LOAD				49,509	3,373		56,963

Air System		HVAC EQUIPMENT SELECTION						
CFM per System	1,995	Carrier Corp. 58MXB040-12x			0	0		76,000
Airflow (cfm)	3,990							
Airflow (cfm/sqft)	0.72							
Airflow (cfm/Ton)	0.0							
Outside Air (%)	0.0 %	Total Adjusted System Output			0	0		76,000
Outside Air (cfm/sqft)	0.00	(Adjusted for Peak Design conditions)						
Note: values above given at ARI conditions		TIME OF SYSTEM PEAK			Aug 3 PM		Jan 1 AM	

## HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



## COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



# ENERGY USE AND COST SUMMARY

**ECON-1**

Project Name  
The Strand SFR (15%) All ECM's

Date  
10/16/2010

Rate: SCE GS-1

Fuel Type: Electricity

	STANDARD			PROPOSED			MARGIN		
	Energy Use (kWh)	Peak Demand (kW)	Cost (\$)	Energy Use (kWh)	Peak Demand (kW)	Cost (\$)	Energy Use (kWh)	Peak Demand (kW)	Cost (\$)
Jan	112	2	26	93	1	25	18	0	1
Feb	117	6	26	89	5	25	28	1	1
Mar	98	4	25	80	3	24	18	1	1
Apr	89	5	25	67	5	24	21	0	1
May	35	1	22	32	1	22	3	0	0
Jun	78	8	24	76	8	24	2	0	0
Jul	46	8	22	42	7	22	4	1	0
Aug	55	7	23	50	7	23	5	1	0
Sep	134	8	27	106	7	25	27	1	1
Oct	40	7	22	33	6	22	7	1	0
Nov	65	4	23	54	4	23	11	0	1
Dec	149	7	28	117	6	26	31	1	2
Year	1,017	8	293	841	8	284	176	0	9
CO <sub>2</sub>	819	lbs/yr		677	lbs/yr		142	lbs/yr	

Rate: SoCal GN-10

Fuel Type: Natural Gas

	STANDARD			PROPOSED			MARGIN		
	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost (\$)	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost (\$)	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost (\$)
Jan	92	127	30	68	94	22	23	33	8
Feb	72	118	24	55	84	18	17	34	6
Mar	76	105	25	58	75	19	17	30	6
Apr	50	95	16	42	70	14	8	25	3
May	35	90	11	31	66	10	4	24	1
Jun	21	6	7	21	6	7	0	0	0
Jul	22	6	7	22	6	7	0	0	0
Aug	21	6	7	22	6	7	0	0	0
Sep	21	6	7	21	6	7	0	0	0
Oct	22	31	7	22	21	7	0	10	0
Nov	48	109	16	39	77	13	8	32	3
Dec	99	126	32	74	89	24	25	37	8
Year	577	127	190	475	94	156	102	33	34
CO <sub>2</sub>	6,753	lbs/yr		5,557	lbs/yr		1,196	lbs/yr	

Annual Totals	Energy	Demand	Cost	Cost/sqft	Virtual Rate
Electricity	841 kWh	8 kW	\$ 284	\$ 0.05 /sqft	\$ 0.34 /kWh
Natural Gas	475 therms	94 kBtu/hr	\$ 156	\$ 0.03 /sqft	\$ 0.33 /therm
	<b>Total</b>		\$ 440	\$ 0.08 /sqft	

Avoided CO<sub>2</sub> Emissions: 1,338 lbs/yr

# BUILDING ENERGY ANALYSIS REPORT

## PROJECT:

East Manhattan SFR (15%) All ECM's  
[REDACTED]  
Manhattan Beach, CA 90266

## Project Designer:

2100 N. Sepulveda Blvd., #11  
Manhattan Beach, CA 90266  
(310) 379-5867

## Report Prepared by:

Rick Newton  
NEWTON ENERGY  
1401 19th Street  
Manhattan Beach, CA 90266  
310 375-2699



## Job Number:

8152R

## Date:

10/16/2010

The EnergyPro computer program has been used to perform the calculations summarized in this compliance report. This program has approval and is authorized by the California Energy Commission for use with both the Residential and Nonresidential 2008 Building Energy Efficiency Standards.

This program developed by EnergySoft, LLC – [www.energysoft.com](http://www.energysoft.com).

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**PERFORMANCE CERTIFICATE: Residential** (Part 1 of 5) **CF-1R**

Project Name <i>East Manhattan SFR (15%) All ECM's</i>	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date <i>10/16/2010</i>
Project Address	California Energy Climate Zone <i>CA Climate Zone 06</i>	Total Cond. Floor Area <i>3,137</i>
	Addition <i>n/a</i>	# of Stories <i>2</i>

**FIELD INSPECTION ENERGY CHECKLIST**

- Yes  No HERS Measures -- If Yes, A CF-4R must be provided per Part 2 of 5 of this form.  
 Yes  No Special Features -- If Yes, see Part 2 of 5 of this form for details.

INSULATION		Area	Special	Status
Construction	Type	Cavity	Features (see Part 2 of 5)	
Floor	<i>Wood Framed w/o Crawl Space</i>	<i>R-19</i>	<i>404</i>	<i>New</i>
Roof	<i>Wood Framed Rafter</i>	<i>R-30</i>	<i>1,880</i>	<i>New</i>
Wall	<i>Wood Framed</i>	<i>R-13</i>	<i>2,701</i>	<i>New</i>
Slab	<i>Unheated Slab-on-Grade</i>	<i>None</i>	<i>1,512 Perim = 160'</i>	<i>New</i>
Door	<i>Opaque Door</i>	<i>None</i>	<i>21</i>	<i>New</i>

FENESTRATION		U-	Exterior				Status
Orientation	Area(ft <sup>2</sup> )	Factor	SHGC	Overhang	Sidefins	Shades	
<i>Skylight</i>	<i>36.0</i>	<i>0.390</i>	<i>0.29</i>	<i>none</i>	<i>none</i>	<i>None</i>	<i>New</i>
<i>Rear (N)</i>	<i>181.5</i>	<i>0.330</i>	<i>0.31</i>	<i>none</i>	<i>none</i>	<i>Bug Screen</i>	<i>New</i>
<i>Front (S)</i>	<i>189.4</i>	<i>0.330</i>	<i>0.31</i>	<i>none</i>	<i>none</i>	<i>Bug Screen</i>	<i>New</i>
<i>Right (E)</i>	<i>46.7</i>	<i>0.330</i>	<i>0.31</i>	<i>none</i>	<i>none</i>	<i>Bug Screen</i>	<i>New</i>
<i>Left (W)</i>	<i>68.0</i>	<i>0.330</i>	<i>0.31</i>	<i>none</i>	<i>none</i>	<i>Bug Screen</i>	<i>New</i>
<i>Front (S)</i>	<i>84.0</i>	<i>0.330</i>	<i>0.31</i>	<i>6.0</i>	<i>none</i>	<i>Bug Screen</i>	<i>New</i>
<i>Right (E)</i>	<i>17.5</i>	<i>0.330</i>	<i>0.31</i>	<i>11.0</i>	<i>none</i>	<i>Bug Screen</i>	<i>New</i>
<i>Right (E)</i>	<i>16.0</i>	<i>0.330</i>	<i>0.31</i>	<i>3.5</i>	<i>none</i>	<i>Bug Screen</i>	<i>New</i>
<i>Left (W)</i>	<i>20.0</i>	<i>0.330</i>	<i>0.31</i>	<i>3.0</i>	<i>none</i>	<i>Bug Screen</i>	<i>New</i>

HVAC SYSTEMS						
Qty.	Heating	Min. Eff	Cooling	Min. Eff	Thermostat	Status
<i>1</i>	<i>Central Furnace</i>	<i>92% AFUE</i>	<i>No Cooling</i>	<i>13.0 SEER</i>	<i>Setback</i>	<i>New</i>

HVAC DISTRIBUTION					Duct	Status
Location	Heating	Cooling	Duct Location	R-Value		
<i>Whole House System</i>	<i>Ducted</i>	<i>Ducted</i>	<i>Attic, Ceiling Ins, vented</i>	<i>4.2</i>		<i>New</i>

WATER HEATING					
Qty.	Type	Gallons	Min. Eff	Distribution	Status
<i>1</i>	<i>Small Gas</i>	<i>75</i>	<i>0.58</i>	<i>Kitchen Pipe Ins</i>	<i>New</i>

**PERFORMANCE CERTIFICATE: Residential**

(Part 2 of 5)

**CF-1R**

Project Name <i>East Manhattan SFR (15%) All ECM's</i>	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date <i>10/16/2010</i>
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**SPECIAL FEATURES INSPECTION CHECKLIST**

The enforcement agency should pay special attention to the items specified in this checklist. These items require special written justification and documentation, and special verification to be used with the performance approach. The enforcement agency determines the adequacy of the justification, and may reject a building or design that otherwise complies based on the adequacy of the special justification and documentation submitted.

*The HVAC System Carrier Corp. N9MPD060F12 does not include a cooling system, field verification is not necessary.*

**HERS REQUIRED VERIFICATION**

Items in this section require field testing and/or verification by a certified HERS Rater. The inspector must receive a completed CF-4R form for each of the measures listed below for final to be given.

*Compliance credit for quality installation of insulation has been used. HERS field verification is required.*

*Whole House System includes verified duct systems that have air leakage to outside conditions equal to or less than 25 cfm. HERS field verification for ducts in conditioned space and duct leakage is required.*

**PERFORMANCE CERTIFICATE: Residential** (Part 3 of 5) **CF-1R**

Project Name *East Manhattan SFR (15%) All ECM's* Building Type  Single Family  Addition Alone  Multi Family  Existing+ Addition/Alteration Date *10/16/2010*

**ANNUAL ENERGY USE SUMMARY**

TDV (kBtu/ft <sup>2</sup> -yr)	Standard	Proposed	Margin
Space Heating	8.10	5.62	2.48
Space Cooling	1.20	0.32	0.88
Fans	1.94	1.57	0.37
Domestic Hot Water	12.31	12.21	0.11
Pumps	0.00	0.00	0.00
<b>Totals</b>	<b>23.56</b>	<b>19.72</b>	<b>3.84</b>
<b>Percent Better Than Standard:</b>	<b>16.3 %</b>		

**BUILDING COMPLIES - HERS VERIFICATION REQUIRED**

Building Front Orientation:	(S) 180 deg	Ext. Walls/Roof	Wall Area	Fenestration Area
Number of Dwelling Units:	1.00	(S)	594	273
Fuel Available at Site:	Natural Gas	(W)	1,025	88
Raised Floor Area:	404	(N)	853	182
Slab on Grade Area:	1,512	(E)	873	80
Average Ceiling Height:	9.3	Roof	1,916	36
Fenestration Average U-Factor:	0.33	TOTAL:		659
Average SHGC:	0.31	Fenestration/CFA Ratio:		21.0 %

**REMARKS**

BASE CASE: No R-19 Ceilings. Wall Fenestration U-Factor = 0.33, SHGC = 0.31. Gas Furnace w/ AFUE = 92%, no cooling.  
 15% CASE - All ECM's:  
 ECM-6 - Quality Insulation - HERS field verification is required: 6.6%.  
 ECM-11 - Low Leakage Ducts in Conditioned Space: 12.4%.

**STATEMENT OF COMPLIANCE**

This certificate of compliance lists the building features and specifications needed to comply with Title 24, Parts 1 the Administrative Regulations and Part 6 the Efficiency Standards of the California Code of Regulations.

The documentation author hereby certifies that the documentation is accurate and complete.

**Documentation Author**

Company *NEWTON ENERGY* Name *Rick Newton*  Date *10/16/2010*  
 Address *1401 19th Street* Phone *310 375-2699*  
 City/State/Zip *Manhattan Beach, CA 90266* Signed \_\_\_\_\_ Date \_\_\_\_\_

The individual with overall design responsibility hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application, and recognizes that compliance using duct design, duct sealing, verification of refrigerant charge, insulation installation quality, and building envelope sealing require installer testing and certification and field verification by an approved HERS rater.

**Designer or Owner (per Business & Professions Code)**

Company \_\_\_\_\_ Name *Robert Treman Architecture* Signed \_\_\_\_\_ License # \_\_\_\_\_ Date \_\_\_\_\_  
 Address *2100 N. Sepulveda Blvd., #11* Phone *(310) 379-5867*  
 City/State/Zip *Manhattan Beach, CA 90266*

**CERTIFICATE OF COMPLIANCE: Residential** (Part 4 of 5) **CF-1R**

Project Name: *East Manhattan SFR (15%) All ECM's* Building Type:  Single Family  Addition Alone  Multi Family  Existing+ Addition/Alteration Date: *10/16/2010*

**OPAQUE SURFACE DETAILS**

Surface Type	Area	U-Factor	Insulation				Azimuth	Tilt	Status	Joint Appendix 4	Location/Comments
			Cavity	Exterior	Frame	Interior					
Floor	404	0.048	R-19				0	180	New	4.4.2-A4	2nd Floor Zone
Roof	1,589	0.035	R-30				30	24	New	4.2.2-A17	2nd Floor Zone
Wall	229	0.102	R-13				0	90	New	4.3.1-A3	2nd Floor Zone
Wall	188	0.102	R-13				180	90	New	4.3.1-A3	2nd Floor Zone
Wall	393	0.102	R-13				90	90	New	4.3.1-A3	2nd Floor Zone
Wall	372	0.102	R-13				270	90	New	4.3.1-A3	2nd Floor Zone
Slab	1,512	0.730	None				0	180	New	4.4.7-A1	1st Floor Zone
Roof	291	0.035	R-30				30	24	New	4.2.2-A17	1st Floor Zone
Wall	122	0.102	R-13				0	90	New	4.3.1-A3	1st Floor Zone
Door	21	0.500	None				0	90	New	4.5.1-A4	1st Floor Zone
Wall	300	0.102	R-13				0	90	New	4.3.1-A3	1st Floor Zone
Wall	133	0.102	R-13				180	90	New	4.3.1-A3	1st Floor Zone
Wall	400	0.102	R-13				90	90	New	4.3.1-A3	1st Floor Zone
Wall	565	0.102	R-13				270	90	New	4.3.1-A3	1st Floor Zone

**FENESTRATION SURFACE DETAILS**

ID	Type	Area	U-Factor <sup>1</sup>	SHGC <sup>2</sup>		Azm	Status	Glazing Type	Location/Comments	
1	Skylight	36.0	0.390	NFRC	0.29	NFRC	30	New	Velux Comfort+(74) Lowe2/Arg	2nd Floor Zone
2	Window	48.0	0.330	NFRC	0.31	NFRC	0	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
3	Window	32.0	0.330	NFRC	0.31	NFRC	0	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
4	Window	13.4	0.330	NFRC	0.31	NFRC	180	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
5	Window	48.0	0.330	NFRC	0.31	NFRC	180	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
6	Window	60.0	0.330	NFRC	0.31	NFRC	180	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
7	Window	6.7	0.330	NFRC	0.31	NFRC	90	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
8	Window	40.0	0.330	NFRC	0.31	NFRC	90	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
9	Window	30.0	0.330	NFRC	0.31	NFRC	270	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
10	Window	38.0	0.330	NFRC	0.31	NFRC	270	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
11	Window	64.0	0.330	NFRC	0.31	NFRC	0	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
12	Window	20.0	0.330	NFRC	0.31	NFRC	0	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
13	Window	17.5	0.330	NFRC	0.31	NFRC	0	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
14	Window	68.0	0.330	NFRC	0.31	NFRC	180	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
15	Window	84.0	0.330	NFRC	0.31	NFRC	180	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
16	Window	17.5	0.330	NFRC	0.31	NFRC	90	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value  
 (2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

**EXTERIOR SHADING DETAILS**

ID	Exterior Shade Type	SHGC	Window		Overhang				Left Fin			Right Fin		
			Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt
1	None	1.00												
2	Bug Screen	0.76												
3	Bug Screen	0.76												
4	Bug Screen	0.76												
5	Bug Screen	0.76												
6	Bug Screen	0.76												
7	Bug Screen	0.76												
8	Bug Screen	0.76												
9	Bug Screen	0.76												
10	Bug Screen	0.76												
11	Bug Screen	0.76												
12	Bug Screen	0.76												
13	Bug Screen	0.76												
14	Bug Screen	0.76												
15	Bug Screen	0.76	8.0	10.5	6.0	0.1	6.0	6.0						
16	Bug Screen	0.76	5.0	3.5	11.0	0.1	6.0	6.0						



**CERTIFICATE OF COMPLIANCE: Residential (Part 4 of 5) CF-1R**

Project Name *East Manhattan SFR (15%) All ECM's* Building Type  Single Family  Addition Alone Date *10/16/2010*  
 Multi Family  Existing+ Addition/Alteration

**OPAQUE SURFACE DETAILS**

Surface Type	Area	U-Factor	Insulation				Azimuth	Tilt	Status	Joint Appendix 4	Location/Comments
			Cavity	Exterior	Frame	Interior					

**FENESTRATION SURFACE DETAILS**

ID	Type	Area	U-Factor <sup>1</sup>	SHGC <sup>2</sup>	Azm	Status	Glazing Type	Location/Comments
17	Window	16.0	0.330 NFRC	0.31 NFRC	90	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
18	Window	20.0	0.330 NFRC	0.31 NFRC	270	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value  
 (2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

**EXTERIOR SHADING DETAILS**

ID	Exterior Shade Type	SHGC	Window			Overhang			Left Fin			Right Fin		
			Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt
17	Bug Screen	0.76	4.0	4.0	3.5	0.1	3.0	3.0						
18	Bug Screen	0.76	6.0	6.0	3.0	0.1	3.0	3.0						

**CERTIFICATE OF COMPLIANCE: Residential (Part 5 of 5) CF-1R**

Project Name <i>East Manhattan SFR (15%) All ECM's</i>	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date <i>10/16/2010</i>
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**BUILDING ZONE INFORMATION**

System Name	Zone Name	Floor Area (ft <sup>2</sup> )				Volume	Year Built
		New	Existing	Altered	Removed		
<i>Whole House System</i>	<i>Second Floor (1,625 sf)</i>	<i>1,625</i>				<i>14,625</i>	
	<i>First Floor</i>	<i>1,512</i>				<i>14,515</i>	
	<b>Totals</b>	<i>3,137</i>	<i>0</i>	<i>0</i>	<i>0</i>		

**HVAC SYSTEMS**

System Name	Qty.	Heating Type	Min. Eff.	Cooling Type	Min. Eff.	Thermostat Type	Status
<i>Whole House System</i>	<i>1</i>	<i>Central Furnace</i>	<i>92% AFUE</i>	<i>No Cooling</i>	<i>13.0 SEER</i>	<i>Setback</i>	<i>New</i>

**HVAC DISTRIBUTION**

System Name	Heating	Cooling	Duct Location	Duct R-Value	Ducts Tested?	Status
<i>Whole House System</i>	<i>Ducted</i>	<i>Ducted</i>	<i>Attic, Ceiling Ins, vented</i>	<i>4.2</i>	<input type="checkbox"/>	<i>New</i>
					<input type="checkbox"/>	
					<input type="checkbox"/>	
					<input type="checkbox"/>	
					<input type="checkbox"/>	

**WATER HEATING SYSTEMS**

System Name	Qty.	Type	Distribution	Rated Input (Btuh)	Tank Cap. (gal)	Energy Factor or RE	Standby Loss or Pilot	Ext. Tank Insul. R-Value	Status
<i>A O Smith Water Products</i>	<i>1</i>	<i>Small Gas</i>	<i>Kitchen Pipe Ins</i>	<i>70,000</i>	<i>75</i>	<i>0.58</i>	<i>n/a</i>	<i>n/a</i>	<i>New</i>

**MULTI-FAMILY WATER HEATING DETAILS**

**HYDRONIC HEATING SYSTEM PIPING**

Control	Qty.	HP	Eff. Premium	Hot Water Piping Length (ft)			Add 1/2" Insulation	System Name	Pipe Length	Pipe Diameter	Insul. Thick.
				Plenum	Outside	Buried					
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				

**MANDATORY MEASURES SUMMARY: Residential**

(Page 1 of 3)

**MF-1R**

Project Name

*East Manhattan SFR (15%) All ECM's*

Date

*10/16/2010*

**NOTE:** Low-rise residential buildings subject to the Standards must comply with all applicable mandatory measures listed, regardless of the compliance approach used. More stringent energy measures listed on the Certificate of Compliance (CF-1R, CF-1R-ADD, or CF-1R-ALT Form) shall supersede the items marked with an asterisk (\*) below. This Mandatory Measures Summary shall be incorporated into the permit documents, and the applicable features shall be considered by all parties as minimum component performance specifications whether they are shown elsewhere in the documents or in this summary. Submit all applicable sections of the MF-1R Form with plans.

**Building Envelope Measures:**

§116(a)1: Doors and windows between conditioned and unconditioned spaces are manufactured to limit air leakage.

§116(a)4: Fenestration products (except field-fabricated windows) have a label listing the certified U-Factor, certified Solar Heat Gain Coefficient (SHGC), and infiltration that meets the requirements of §10-111(a).

§117: Exterior doors and windows are weather-stripped; all joints and penetrations are caulked and sealed.

§118(a): Insulation specified or installed meets Standards for Insulating Material. Indicate type and include on CF-6R Form.

§118(i): The thermal emittance and solar reflectance values of the cool roofing material meets the requirements of §118(i) when the installation of a Cool Roof is specified on the CF-1R Form.

\*§150(a): Minimum R-19 insulation in wood-frame ceiling or equivalent U-factor.

§150(b): Loose fill insulation shall conform with manufacturer's installed design labeled R-Value.

\*§150(c): Minimum R-13 insulation in wood-frame wall or equivalent U-factor.

\*§150(d): Minimum R-13 insulation in raised wood-frame floor or equivalent U-factor.

§150(f): Air retarding wrap is tested, labeled, and installed according to ASTM E1677-95(2000) when specified on the CF-1R Form.

§150(g): Mandatory Vapor barrier installed in Climate Zones 14 or 16.

§150(l): Water absorption rate for slab edge insulation material alone without facings is no greater than 0.3%; water vapor permeance rate is no greater than 2.0 perm/inch and shall be protected from physical damage and UV light deterioration.

**Fireplaces, Decorative Gas Appliances and Gas Log Measures:**

§150(e)1A: Masonry or factory-built fireplaces have a closable metal or glass door covering the entire opening of the firebox.

§150(e)1B: Masonry or factory-built fireplaces have a combustion outside air intake, which is at least six square inches in area and is equipped with a with a readily accessible, operable, and tight-fitting damper and or a combustion-air control device.

§150(e)2: Continuous burning pilot lights and the use of indoor air for cooling a firebox jacket, when that indoor air is vented to the outside of the building, are prohibited.

**Space Conditioning, Water Heating and Plumbing System Measures:**

§110-§113: HVAC equipment, water heaters, showerheads, faucets and all other regulated appliances are certified by the Energy Commission.

§113(c)5: Water heating recirculation loops serving multiple dwelling units and High-Rise residential occupancies meet the air release valve, backflow prevention, pump isolation valve, and recirculation loop connection requirements of §113(c)5.

§115: Continuously burning pilot lights are prohibited for natural gas: fan-type central furnaces, household cooking appliances (appliances with an electrical supply voltage connection with pilot lights that consume less than 150 Btu/hr are exempt), and pool and spa heaters.

§150(h): Heating and/or cooling loads are calculated in accordance with ASHRAE, SMACNA or ACCA.

§150(i): Heating systems are equipped with thermostats that meet the setback requirements of Section 112(c).

§150(j)1A: Storage gas water heaters rated with an Energy Factor no greater than the federal minimal standard are externally wrapped with insulation having an installed thermal resistance of R-12 or greater.

§150(j)1B: Unfired storage tanks, such as storage tanks or backup tanks for solar water-heating system, or other indirect hot water tanks have R-12 external insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.

§150(j)2: First 5 feet of hot and cold water pipes closest to water heater tank, non-recirculating systems, and entire length of recirculating sections of hot water pipes are insulated per Standards Table 150-B.

§150(j)2: Cooling system piping (suction, chilled water, or brine lines), and piping insulated between heating source and indirect hot water tank shall be insulated to Table 150-B and Equation 150-A.

§150(j)2: Pipe insulation for steam hydronic heating systems or hot water systems >15 psi, meets the requirements of Standards Table 123-A.

§150(j)3A: Insulation is protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind.

§150(j)3A: Insulation for chilled water piping and refrigerant suction lines includes a vapor retardant or is enclosed entirely in conditioned space.

§150(j)4: Solar water-heating systems and/or collectors are certified by the Solar Rating and Certification Corporation.

Project Name

*East Manhattan SFR (15%) All ECM's*

Date

*10/16/2010*

§150(m)1: All air-distribution system ducts and plenums installed, are sealed and insulated to meet the requirements of CMC Sections 601, 602, 603, 604, 605 and Standard 6-5; supply-air and return-air ducts and plenums are insulated to a minimum installed level of R-4.2 or enclosed entirely in conditioned space. Openings shall be sealed with mastic, tape or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape shall be used

§150(m)1: Building cavities, support platforms for air handlers, and plenums defined or constructed with materials other than sealed sheet metal, duct board or flexible duct shall not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts.

§150(m)2D: Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.

§150(m)7: Exhaust fan systems have back draft or automatic dampers.

§150(m)8: Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operated dampers.

§150(m)9: Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.

§150(m)10: Flexible ducts cannot have porous inner cores.

§150(o): All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. Window operation is not a permissible method of providing the Whole Building Ventilation required in Section 4 of that Standard.

**Pool and Spa Heating Systems and Equipment Measures:**

§114(a): Any pool or spa heating system shall be certified to have: a thermal efficiency that complies with the Appliance Efficiency Regulations; an on-off switch mounted outside of the heater; a permanent weatherproof plate or card with operating instructions; and shall not use electric resistance heating or a pilot light.

§114(b)1: Any pool or spa heating equipment shall be installed with at least 36" of pipe between filter and heater, or dedicated suction and return lines, or built-up connections for future solar heating.

§114(b)2: Outdoor pools or spas that have a heat pump or gas heater shall have a cover.

§114(b)3: Pools shall have directional inlets that adequately mix the pool water, and a time switch that will allow all pumps to be set or programmed to run only during off-peak electric demand periods.

§150(p): Residential pool systems or equipment meet the pump sizing, flow rate, piping, filters, and valve requirements of §150(p).

**Residential Lighting Measures:**

§150(k)1: High efficacy luminaires or LED Light Engine with Integral Heat Sink has an efficacy that is no lower than the efficacies contained in Table 150-C and is not a low efficacy luminaire as specified by §150(k)2.

§150(k)3: The wattage of permanently installed luminaires shall be determined as specified by §130(d).

§150(k)4: Ballasts for fluorescent lamps rated 13 Watts or greater shall be electronic and shall have an output frequency no less than 20 kHz.

§150(k)5: Permanently installed night lights and night lights integral to a permanently installed luminaire or exhaust fan shall contain only high efficacy lamps meeting the minimum efficacies contained in Table 150-C and shall not contain a line-voltage socket or line-voltage lamp holder; OR shall be rated to consume no more than five watts of power as determined by §130(d), and shall not contain a medium screw-base socket.

§150(k)6: Lighting integral to exhaust fans, in rooms other than kitchens, shall meet the applicable requirements of §150(k).

§150(k)7: All switching devices and controls shall meet the requirements of §150(k)7.

§150(k)8: A minimum of 50 percent of the total rated wattage of permanently installed lighting in kitchens shall be high efficacy. EXCEPTION: Up to 50 watts for dwelling units less than or equal to 2,500 ft<sup>2</sup> or 100 watts for dwelling units larger than 2,500 ft<sup>2</sup> may be exempt from the 50% high efficacy requirement when: all low efficacy luminaires in the kitchen are controlled by a manual on occupant sensor, dimmer, energy management system (EMCS), or a multi-scene programmable control system; and all permanently installed luminaries in garages, laundry rooms, closets greater than 70 square feet, and utility rooms are high efficacy and controlled by a manual-on occupant sensor.

§150(k)9: Permanently installed lighting that is internal to cabinets shall use no more than 20 watts of power per linear foot of illuminated cabinet.

Project Name

*East Manhattan SFR (15%) All ECM's*

Date

*10/16/2010*

§150(k)10: Permanently installed luminaires in bathrooms, attached and detached garages, laundry rooms, closets and utility rooms shall be high efficacy.

EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by a manual-on occupant sensor certified to comply with the applicable requirements of §119.

EXCEPTION 2: Permanently installed low efficacy luminaires in closets less than 70 square feet are not required to be controlled by a manual-on occupancy sensor.

§150(k)11: Permanently installed luminaires located in rooms or areas other than in kitchens, bathrooms, garages, laundry rooms, closets, and utility rooms shall be high efficacy luminaires. EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided they are controlled by either a dimmer switch that complies with the applicable requirements of §119, or by a manual-on occupant sensor that complies with the applicable requirements of §119. EXCEPTION 2: Lighting in detached storage building less than 1000 square feet located on a residential site is not required to comply with §150(k)11.

§150(k)12: Luminaires recessed into insulated ceilings shall be listed for zero clearance insulation contact (IC) by Underwriters Laboratories or other nationally recognized testing/rating laboratory; and have a label that certifies the luminaire is airtight with air leakage less than 2.0 CFM at 75 Pascals when tested in accordance with ASTM E283; and be sealed with a gasket or caulk between the luminaire housing and ceiling.

§150(k)13: Luminaires providing outdoor lighting, including lighting for private patios in low-rise residential buildings with four or more dwelling units, entrances, balconies, and porches, which are permanently mounted to a residential building or to other buildings on the same lot shall be high efficacy. EXCEPTION 1: Permanently installed outdoor low efficacy luminaires shall be allowed provided that they are controlled by a manual on/off switch, a motion sensor not having an override or bypass switch that disables the motion sensor, and one of the following controls: a photocontrol not having an override or bypass switch that disables the photocontrol; OR an astronomical time clock not having an override or bypass switch that disables the astronomical time clock; OR an energy management control system (EMCS) not having an override or bypass switch that allows the luminaire to be always on. EXCEPTION 2: Outdoor luminaires used to comply with Exception 1 to §150(k)13 may be controlled by a temporary override switch which bypasses the motion sensing function provided that the motion sensor is automatically reactivated within six hours. EXCEPTION 3: Permanently installed luminaires in or around swimming pool, water features, or other location subject to Article 680 of the California Electric Code need not be high efficacy luminaires.

§150(k)14: Internally illuminated address signs shall comply with Section 148; OR not contain a screw-base socket, and consume no more than five watts of power as determined according to §130(d).

§150(k)15: Lighting for parking lots and carports with a total of for 8 or more vehicles per site shall comply with the applicable requirements in Sections 130, 132, 134, and 147. Lighting for parking garages for 8 or more vehicles shall comply with the applicable requirements of Sections 130, 131, 134, and 146.

§150(k)16: Permanently installed lighting in the enclosed, non-dwelling spaces of low-rise residential buildings with four or more dwelling units shall be high efficacy luminaires. EXCEPTION: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by an occupant sensor(s) certified to comply with the applicable requirements of §119.

# HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

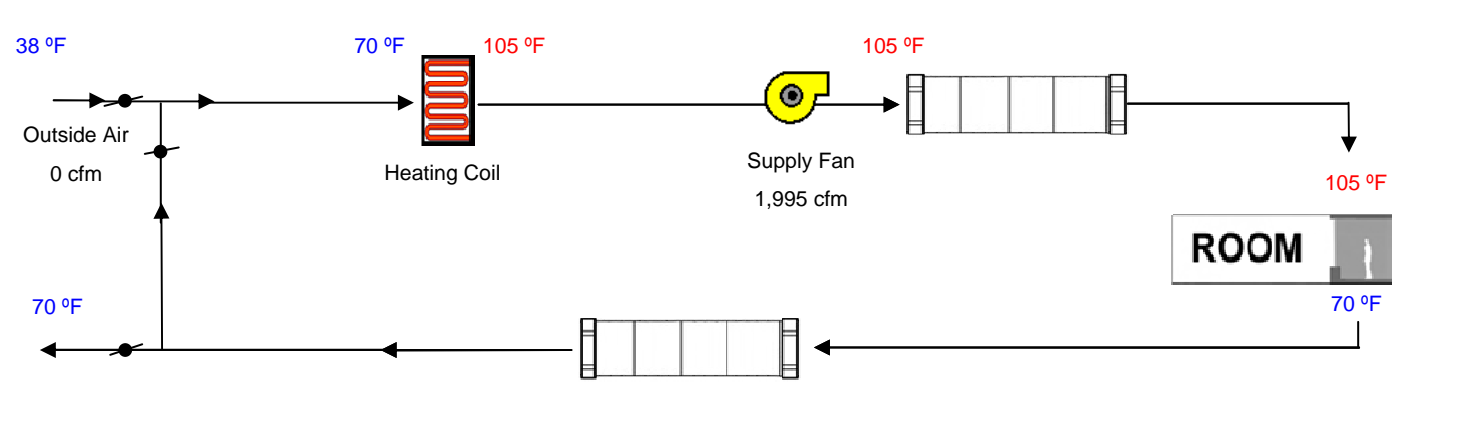
Project Name East Manhattan SFR (15%) All ECM's	Date 10/16/2010
System Name Whole House System	Floor Area 3,137

ENGINEERING CHECKS		SYSTEM LOAD					
Number of Systems	1	<b>Total Room Loads</b> Return Vented Lighting Return Air Ducts Return Fan Ventilation Supply Fan Supply Air Ducts  <b>TOTAL SYSTEM LOAD</b>	COIL COOLING PEAK			COIL HTG. PEAK	
Heating System			CFM	Sensible	Latent	CFM	Sensible
Output per System	55,000		1,013	25,056	2,477	780	29,353
Total Output (Btuh)	55,000			0			
Output (Btuh/sqft)	17.5			0			0
Cooling System							
Output per System	0						
Total Output (Btuh)	0						
Total Output (Tons)	0.0						
Total Output (Btuh/sqft)	0.0						
Total Output (sqft/Ton)	0.0						

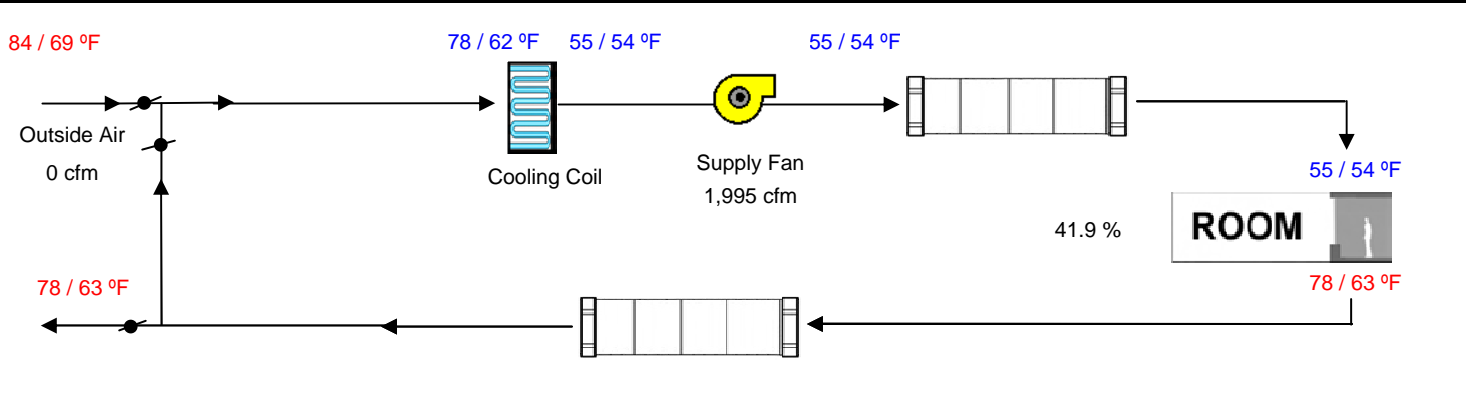
Air System		HVAC EQUIPMENT SELECTION				
CFM per System	1,995	Carrier Corp. N9MPD060F12	0	0		55,000
Airflow (cfm)	1,995					
Airflow (cfm/sqft)	0.64					
Airflow (cfm/Ton)	0.0					
Outside Air (%)	0.0 %	<b>Total Adjusted System Output</b> (Adjusted for Peak Design conditions)		0	0	55,000
Outside Air (cfm/sqft)	0.00					

Note: values above given at ARI conditions TIME OF SYSTEM PEAK Aug 3 PM Jan 1 AM

## HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



## COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



# BUILDING ENERGY ANALYSIS REPORT

## PROJECT:

E. Manhattan E+A SFR (15%) All ECM's

Manhattan Beach, CA 90266

## Project Designer:

Robert Treman Architecture  
2100 N. Sepulveda Blvd. #11  
Manhattan Beach, CA 90266  
(310) 379-8567

## Report Prepared by:

Rick Newton  
NEWTON ENERGY  
1401 19th Street  
Manhattan Beach, CA 90266  
310 375-2699



## Job Number:

8360P

## Date:

10/16/2010

The EnergyPro computer program has been used to perform the calculations summarized in this compliance report. This program has approval and is authorized by the California Energy Commission for use with both the Residential and Nonresidential 2008 Building Energy Efficiency Standards.

This program developed by EnergySoft, LLC – [www.energysoft.com](http://www.energysoft.com).

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HVAC System Heating and Cooling Loads Summary	13



**PERFORMANCE CERTIFICATE: Residential** (Part 1 of 5) **CF-1R**

Project Name <i>E. Manhattan E+A SFR (15%) All ECM's</i>	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input checked="" type="checkbox"/> Existing+ Addition/Alteration	Date <i>10/16/2010</i>
Project Address	California Energy Climate Zone <i>CA Climate Zone 06</i>	Total Cond. Floor Area <i>2,742</i>
	Addition <i>310</i>	# of Stories <i>2</i>

**FIELD INSPECTION ENERGY CHECKLIST**

Yes  No HERS Measures -- If Yes, A CF-4R must be provided per Part 2 of 5 of this form.  
 Yes  No Special Features -- If Yes, see Part 2 of 5 of this form for details.

INSULATION	Construction Type	Cavity	Area (ft <sup>2</sup> )	Special Features (see Part 2 of 5)	Status
Roof	<i>Wood Framed Rafter</i>	<i>R-19</i>	<i>306</i>		<i>New</i>
Wall	<i>Wood Framed</i>	<i>R-13</i>	<i>607</i>		<i>New</i>
Roof	<i>Wood Framed Attic</i>	<i>R-30</i>	<i>1,654</i>		<i>Altered</i>
Wall	<i>Wood Framed</i>	<i>None</i>	<i>2,146</i>		<i>Existing</i>
Floor	<i>Wood Framed w/Crawl Space</i>	<i>None</i>	<i>1,975</i>		<i>Existing</i>
Door	<i>Opaque Door</i>	<i>None</i>	<i>18</i>		<i>New</i>

FENESTRATION	Orientation	Area(ft <sup>2</sup> )	U-Factor	SHGC	Overhang	Sidefins	Exterior Shades	Status
Skylight		<i>4.0</i>	<i>0.710</i>	<i>0.73</i>	<i>none</i>	<i>none</i>	<i>None</i>	<i>New</i>
Rear (S)		<i>108.7</i>	<i>0.550</i>	<i>0.67</i>	<i>none</i>	<i>none</i>	<i>Bug Screen</i>	<i>New</i>
Front (NE)		<i>20.0</i>	<i>0.550</i>	<i>0.67</i>	<i>none</i>	<i>none</i>	<i>Bug Screen</i>	<i>New</i>
Right (NW)		<i>20.0</i>	<i>0.550</i>	<i>0.67</i>	<i>none</i>	<i>none</i>	<i>Bug Screen</i>	<i>New</i>
Right (W)		<i>7.0</i>	<i>0.550</i>	<i>0.67</i>	<i>none</i>	<i>none</i>	<i>Bug Screen</i>	<i>New</i>
Left (E)		<i>4.0</i>	<i>0.550</i>	<i>0.67</i>	<i>none</i>	<i>none</i>	<i>Bug Screen</i>	<i>New</i>
Front (N)		<i>13.3</i>	<i>0.550</i>	<i>0.67</i>	<i>none</i>	<i>none</i>	<i>Bug Screen</i>	<i>New</i>
Left (E)		<i>45.4</i>	<i>0.550</i>	<i>0.67</i>	<i>none</i>	<i>none</i>	<i>Bug Screen</i>	<i>Existing</i>
Right (W)		<i>64.0</i>	<i>0.550</i>	<i>0.67</i>	<i>none</i>	<i>none</i>	<i>Bug Screen</i>	<i>Existing</i>
Skylight		<i>11.0</i>	<i>0.390</i>	<i>0.29</i>	<i>none</i>	<i>none</i>	<i>None</i>	<i>Altered</i>
Rear (SW)		<i>7.6</i>	<i>0.550</i>	<i>0.67</i>	<i>none</i>	<i>none</i>	<i>Bug Screen</i>	<i>Existing</i>

HVAC SYSTEMS	Qty.	Heating	Min. Eff	Cooling	Min. Eff	Thermostat	Status
	<i>1</i>	<i>Central Furnace</i>	<i>95% AFUE</i>	<i>No Cooling</i>	<i>13.0 SEER</i>	<i>Setback</i>	<i>Altered</i>

HVAC DISTRIBUTION	Location	Heating	Cooling	Duct Location	Duct R-Value	Status
	<i>NEW Existing + Addition S)</i>	<i>Ducted</i>	<i>Ducted</i>	<i>Attic, Ceiling Ins, vented</i>	<i>4.2</i>	<i>Altered</i>

WATER HEATING	Qty.	Type	Gallons	Min. Eff	Distribution	Status

**PERFORMANCE CERTIFICATE: Residential** (Part 1 of 5) **CF-1R**

Project Name <i>E. Manhattan E+A SFR (15%) All ECM's</i>	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input checked="" type="checkbox"/> Existing+ Addition/Alteration	Date 10/16/2010
Project Address	California Energy Climate Zone <i>CA Climate Zone 06</i>	Total Cond. Floor Area 2,742
	Addition 310	# of Stories 2

**FIELD INSPECTION ENERGY CHECKLIST**

- Yes  No HERS Measures -- If Yes, A CF-4R must be provided per Part 2 of 5 of this form.  
 Yes  No Special Features -- If Yes, see Part 2 of 5 of this form for details.

INSULATION Construction Type	Cavity	Area (ft <sup>2</sup> )	Special Features (see Part 2 of 5)	Status

FENESTRATION Orientation	Area(ft <sup>2</sup> )	U-Factor	SHGC	Overhang	Sidefins	Exterior Shades	Status
<i>Left (SE)</i>	<i>7.6</i>	<i>0.550</i>	<i>0.67</i>	<i>none</i>	<i>none</i>	<i>Bug Screen</i>	<i>Existing</i>
<i>Front (NE)</i>	<i>7.6</i>	<i>0.550</i>	<i>0.67</i>	<i>none</i>	<i>none</i>	<i>Bug Screen</i>	<i>Existing</i>
<i>Right (NW)</i>	<i>27.6</i>	<i>0.550</i>	<i>0.67</i>	<i>none</i>	<i>none</i>	<i>Bug Screen</i>	<i>Existing</i>
<i>Front (N)</i>	<i>24.0</i>	<i>0.550</i>	<i>0.67</i>	<i>none</i>	<i>none</i>	<i>Bug Screen</i>	<i>Existing</i>
<i>Rear (S)</i>	<i>164.5</i>	<i>0.550</i>	<i>0.67</i>	<i>none</i>	<i>none</i>	<i>Bug Screen</i>	<i>Existing</i>

HVAC SYSTEMS Qty.	Heating	Min. Eff	Cooling	Min. Eff	Thermostat	Status

HVAC DISTRIBUTION Location	Heating	Cooling	Duct Location	Duct R-Value	Status

WATER HEATING Qty.	Type	Gallons	Min. Eff	Distribution	Status

**PERFORMANCE CERTIFICATE: Residential** (Part 2 of 5) **CF-1R**

Project Name <i>E. Manhattan E+A SFR (15%) All ECM's</i>	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input checked="" type="checkbox"/> Existing+ Addition/Alteration	Date <i>10/16/2010</i>
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**SPECIAL FEATURES INSPECTION CHECKLIST**

The enforcement agency should pay special attention to the items specified in this checklist. These items require special written justification and documentation, and special verification to be used with the performance approach. The enforcement agency determines the adequacy of the justification, and may reject a building or design that otherwise complies based on the adequacy of the special justification and documentation submitted.

*The HVAC System Carrier Corp. 58UVB080-20 does not include a cooling system, field verification is not necessary.*

**HERS REQUIRED VERIFICATION**

Items in this section require field testing and/or verification by a certified HERS Rater. The inspector must receive a completed CF-4R form for each of the measures listed below for final to be given.

**PERFORMANCE CERTIFICATE: Residential** (Part 3 of 5) **CF-1R**

Project Name *E. Manhattan E+A SFR (15%) All ECM's* Building Type  Single Family  Addition Alone Date *10/16/2010*  
 Multi Family  Existing+ Addition/Alteration

**ANNUAL ENERGY USE SUMMARY**

TDV (kBtu/ft <sup>2</sup> -yr)	Standard	Proposed	Margin
Space Heating	37.05	27.52	9.53
Space Cooling	16.93	13.55	3.38
Fans	9.26	7.93	1.33
Domestic Hot Water	15.31	15.31	0.00
Pumps	0.00	0.00	0.00
<b>Totals</b>	<b>78.54</b>	<b>64.31</b>	<b>14.23</b>
<b>Percent Better Than Standard:</b>	<b>18.1 %</b>		

**BUILDING COMPLIES - NO HERS VERIFICATION REQUIRED**

Building Front Orientation:	(N) 0 deg	Ext. Walls/Roof	Wall Area	Fenestration Area
Number of Dwelling Units:	1.00	(N)	683	65
Fuel Available at Site:	Natural Gas	(E)	855	57
Raised Floor Area:	1,975	(S)	807	281
Slab on Grade Area:	0	(W)	946	119
Average Ceiling Height:	8.1	Roof	1,975	15
Fenestration Average U-Factor:	0.55	TOTAL:		536
Average SHGC:	0.67	Fenestration/CFA Ratio:		19.6 %

**REMARKS**

BASE CASE (6.2%): Assuming existing & new fenestration is Double Non-Metal Clear. Standard Gas 50 gal or Less water heater.  
 20% CASE:  
 ECM-9 Attic Insul. Upgrade: Assumed R-19 (E) to R-30: 6.9%;  
 ECM-5 Replace Existing Furnace: 9.1%;  
 ECM-7 Skylight Upgrade: 5.9%.

**STATEMENT OF COMPLIANCE**

This certificate of compliance lists the building features and specifications needed to comply with Title 24, Parts 1 the Administrative Regulations and Part 6 the Efficiency Standards of the California Code of Regulations.

The documentation author hereby certifies that the documentation is accurate and complete.

**Documentation Author**  
 Company *NEWTON ENERGY*  
 Address *1401 19th Street* Name *Rick Newton*  Date *10/16/2010*  
 City/State/Zip *Manhattan Beach, CA 90266* Phone *310 375-2699* Signed \_\_\_\_\_ Date \_\_\_\_\_

The individual with overall design responsibility hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application, and recognizes that compliance using duct design, duct sealing, verification of refrigerant charge, insulation installation quality, and building envelope sealing require installer testing and certification and field verification by an approved HERS rater.

**Designer or Owner (per Business & Professions Code)**  
 Company *Robert Treman Architecture*  
 Address *2100 N. Sepulveda Blvd. #11* Name *Robert Treman*  
 City/State/Zip *Manhattan Beach, CA 90266* Phone *(310) 379-8567* Signed \_\_\_\_\_ License # \_\_\_\_\_ Date \_\_\_\_\_

**CERTIFICATE OF COMPLIANCE: Residential** (Part 4 of 5) **CF-1R**

Project Name: *E. Manhattan E+A SFR (15%) All ECM's* Building Type:  Single Family  Addition Alone  Multi Family  Existing+ Addition/Alteration Date: *10/16/2010*

**OPAQUE SURFACE DETAILS**

Surface Type	Area	U-Factor	Insulation				Azimuth	Tilt	Status	Joint Appendix 4	Location/Comments
			Cavity	Exterior	Frame	Interior					
Roof	306	0.062	R-19				225	24	New	4.2.2-A6	Addition 2nd Floor
Wall	60	0.102	R-13				180	90	New	4.3.1-A3	Addition 2nd Floor
Wall	82	0.102	R-13				45	90	New	4.3.1-A3	Addition 2nd Floor
Wall	82	0.102	R-13				315	90	New	4.3.1-A3	Addition 2nd Floor
Wall	159	0.102	R-13				270	90	New	4.3.1-A3	Addition 2nd Floor
Wall	69	0.102	R-13				90	90	New	4.3.1-A3	Addition 2nd Floor
Wall	155	0.102	R-13				0	90	New	4.3.1-A3	Addition 2nd Floor
Roof	457	0.032	R-30				30	24	Altered	4.2.1-A8 (E=4.2.1-A2)	Existing Second Floor
Wall	145	0.356	None				0	90	Removed	4.3.1-A1	Existing Second Floor
Wall	94	0.356	None				270	90	Removed	4.3.1-A1	Existing Second Floor
Wall	59	0.356	None				0	90	Existing	4.3.1-A1	Existing Second Floor
Wall	184	0.356	None				180	90	Existing	4.3.1-A1	Existing Second Floor
Wall	208	0.356	None				90	90	Existing	4.3.1-A1	Existing Second Floor
Wall	110	0.356	None				270	90	Existing	4.3.1-A1	Existing Second Floor
Floor	1,975	0.097	None				0	180	Existing	4.4.1-A1	Existing First Floor
Roof	1,197	0.032	R-30				30	24	Altered	4.2.1-A8 (E=4.2.1-A2)	Existing First Floor

**FENESTRATION SURFACE DETAILS**

ID	Type	Area	U-Factor <sup>1</sup>		SHGC <sup>2</sup>		Azm	Status	Glazing Type	Location/Comments
1	Skylight	4.0	0.710	Default	0.73	Default	225	New	Double Metal Clear	Addition 2nd Floor
2	Window	4.0	0.550	Default	0.67	Default	180	New	Double Non Metal Clear	Addition 2nd Floor
3	Window	20.0	0.550	Default	0.67	Default	45	New	Double Non Metal Clear	Addition 2nd Floor
4	Window	20.0	0.550	Default	0.67	Default	315	New	Double Non Metal Clear	Addition 2nd Floor
5	Window	7.0	0.550	Default	0.67	Default	270	New	Double Non Metal Clear	Addition 2nd Floor
6	Window	4.0	0.550	Default	0.67	Default	90	New	Double Non Metal Clear	Addition 2nd Floor
7	Window	13.3	0.550	Default	0.67	Default	0	New	Double Non Metal Clear	Addition 2nd Floor
8	Window	36.7	0.550	Default	0.67	Default	180	New	Double Non Metal Clear	Existing Second Floor
9	Window	68.0	0.550	Default	0.67	Default	180	New	Double Non Metal Clear	Existing Second Floor
10	Window	110.1	0.550	Default	0.67	Default	180	Removed	Double Non Metal Clear	Existing Second Floor
11	Window	8.3	0.550	Default	0.67	Default	90	Existing	Double Non Metal Clear	Existing Second Floor
12	Window	4.0	0.550	Default	0.67	Default	270	Removed	Double Non Metal Clear	Existing Second Floor
13	Window	14.0	0.550	Default	0.67	Default	270	Existing	Double Non Metal Clear	Existing Second Floor
14	Skylight	11.0	0.390	NFRC	0.29	NFRC	30	Altered	Velux Comfort+(74) Lowe2/Arg	Existing First Floor
15	Existing		1.190	Default	0.83	Default			Single Metal Clear	pre-altered for above
16	Window	7.6	0.550	Default	0.67	Default	225	Existing	Double Non Metal Clear	Existing First Floor

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value  
 (2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

**EXTERIOR SHADING DETAILS**

ID	Exterior Shade Type	SHGC	Window		Overhang			Left Fin			Right Fin			
			Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt
1	None	1.00												
2	Bug Screen	0.76												
3	Bug Screen	0.76												
4	Bug Screen	0.76												
5	Bug Screen	0.76												
6	Bug Screen	0.76												
7	Bug Screen	0.76												
8	Bug Screen	0.76												
9	Bug Screen	0.76												
10	Bug Screen	0.76												
11	Bug Screen	0.76												
12	Bug Screen	0.76												
13	Bug Screen	0.76												
14	None	1.00												
15	None	1.00												
16	Bug Screen	0.76												

**CERTIFICATE OF COMPLIANCE: Residential** (Part 4 of 5) **CF-1R**

Project Name: *E. Manhattan E+A SFR (15%) All ECM's* Building Type:  Single Family  Addition Alone  Multi Family  Existing+ Addition/Alteration Date: *10/16/2010*

**OPAQUE SURFACE DETAILS**

Surface Type	Area	U-Factor	Insulation				Azimuth	Tilt	Status	Joint Appendix 4	Location/Comments
			Cavity	Exterior	Frame	Interior					
Roof	310	0.079	R-11				30	24	Removed	4.2.1-A2	Existing First Floor
Wall	191	0.356	None				0	90	Existing	4.3.1-A1	Existing First Floor
Door	18	0.500	None				0	90	New	4.5.1-A4	Existing First Floor
Wall	67	0.356	None				225	90	Existing	4.3.1-A1	Existing First Floor
Wall	26	0.356	None				135	90	Existing	4.3.1-A1	Existing First Floor
Wall	26	0.356	None				45	90	Existing	4.3.1-A1	Existing First Floor
Wall	79	0.356	None				315	90	Existing	4.3.1-A1	Existing First Floor
Wall	87	0.356	None				0	90	Existing	4.3.1-A1	Existing First Floor
Wall	216	0.356	None				180	90	Existing	4.3.1-A1	Existing First Floor
Wall	495	0.356	None				90	90	Existing	4.3.1-A1	Existing First Floor
Wall	397	0.356	None				270	90	Existing	4.3.1-A1	Existing First Floor

**FENESTRATION SURFACE DETAILS**

ID	Type	Area	U-Factor <sup>1</sup>	SHGC <sup>2</sup>	Azimuth	Status	Glazing Type	Location/Comments
17	Window	7.6	0.550	Default	0.67	Default	135 Existing	Double Non Metal Clear Existing First Floor
18	Window	7.6	0.550	Default	0.67	Default	45 Existing	Double Non Metal Clear Existing First Floor
19	Window	20.0	0.550	Default	0.67	Default	315 Existing	Double Non Metal Clear Existing First Floor
20	Window	7.6	0.550	Default	0.67	Default	315 Existing	Double Non Metal Clear Existing First Floor
21	Window	24.0	0.550	Default	0.67	Default	0 Existing	Double Non Metal Clear Existing First Floor
22	Window	136.0	0.550	Default	0.67	Default	180 Existing	Double Non Metal Clear Existing First Floor
23	Window	28.5	0.550	Default	0.67	Default	180 Existing	Double Non Metal Clear Existing First Floor
24	Window	37.1	0.550	Default	0.67	Default	90 Existing	Double Non Metal Clear Existing First Floor
25	Window	50.0	0.550	Default	0.67	Default	270 Existing	Double Non Metal Clear Existing First Floor

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value  
 (2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

**EXTERIOR SHADING DETAILS**

ID	Exterior Shade Type	SHGC	Window		Overhang			Left Fin			Right Fin				
			Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt	
17	Bug Screen	0.76													
18	Bug Screen	0.76													
19	Bug Screen	0.76													
20	Bug Screen	0.76													
21	Bug Screen	0.76													
22	Bug Screen	0.76													
23	Bug Screen	0.76													
24	Bug Screen	0.76													
25	Bug Screen	0.76													

**CERTIFICATE OF COMPLIANCE: Residential** (Part 5 of 5) **CF-1R**

Project Name <i>E. Manhattan E+A SFR (15%) All ECM's</i>	Building Type <input checked="" type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input type="checkbox"/> Multi Family <input checked="" type="checkbox"/> Existing+ Addition/Alteration	Date 10/16/2010
---	--	--------------------

BUILDING ZONE INFORMATION							
System Name	Zone Name	Floor Area (ft <sup>2</sup> )				Volume	Year Built
		New	Existing	Altered	Removed		
<i>NEW Existing + Addition System</i>	<i>Addition 2nd Floor</i>	310				2,511	
	<i>Existing Second Floor</i>			457		3,702	1956
	<i>Existing First Floor</i>			1,975		15,998	1956
<b>Totals</b>		310	0	2,432	0		

HVAC SYSTEMS							
System Name	Qty.	Heating Type	Min. Eff.	Cooling Type	Min. Eff.	Thermostat Type	Status
<i>NEW Existing + Addition System</i>	1	<i>Central Furnace</i>	<i>95% AFUE</i>	<i>No Cooling</i>	<i>13.0 SEER</i>	<i>Setback</i>	<i>Altered</i>
<i>pre-altered for above</i>		<i>Central Furnace</i>	<i>80% AFUE</i>	<i>No Cooling</i>	<i>13.0 SEER</i>	<i>Setback</i>	

HVAC DISTRIBUTION							
System Name	Heating	Cooling	Duct Location	Duct R-Value	Ducts Tested?	Status	
<i>NEW Existing + Addition System</i>	<i>Ducted</i>	<i>Ducted</i>	<i>Attic, Ceiling Ins, vented</i>	4.2	<input type="checkbox"/>	<i>Altered</i>	
<i>pre-altered for above</i>	<i>Ducted</i>	<i>Ducted</i>	<i>Attic, Ceiling Ins, vented</i>	2.1	<input type="checkbox"/>		
					<input type="checkbox"/>		
					<input type="checkbox"/>		

WATER HEATING SYSTEMS									
System Name	Qty.	Type	Distribution	Rated Input (Btuh)	Tank Cap. (gal)	Energy Factor or RE	Standby Loss or Pilot	Ext. Tank Insul. R-Value	Status
<i>Standard Gas 50 gal or Le</i>	1	<i>Small Gas</i>	<i>Kitchen Pipe Ins</i>	40,000	50	0.53	<i>n/a</i>	<i>n/a</i>	<i>Existing</i>

MULTI-FAMILY WATER HEATING DETAILS							HYDRONIC HEATING SYSTEM PIPING				
Control	Qty.	HP	Eff. Premium	Hot Water Piping Length (ft)			Add 1/2" Insulation	System Name	Pipe Length	Pipe Diameter	Insul. Thick.
				Plenum	Outside	Buried					
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				

**MANDATORY MEASURES SUMMARY: Residential**

(Page 1 of 3)

**MF-1R**

Project Name

*E. Manhattan E+A SFR (15%) All ECM's*

Date

*10/16/2010*

**NOTE:** Low-rise residential buildings subject to the Standards must comply with all applicable mandatory measures listed, regardless of the compliance approach used. More stringent energy measures listed on the Certificate of Compliance (CF-1R, CF-1R-ADD, or CF-1R-ALT Form) shall supersede the items marked with an asterisk (\*) below. This Mandatory Measures Summary shall be incorporated into the permit documents, and the applicable features shall be considered by all parties as minimum component performance specifications whether they are shown elsewhere in the documents or in this summary. Submit all applicable sections of the MF-1R Form with plans.

**Building Envelope Measures:**

§116(a)1: Doors and windows between conditioned and unconditioned spaces are manufactured to limit air leakage.

§116(a)4: Fenestration products (except field-fabricated windows) have a label listing the certified U-Factor, certified Solar Heat Gain Coefficient (SHGC), and infiltration that meets the requirements of §10-111(a).

§117: Exterior doors and windows are weather-stripped; all joints and penetrations are caulked and sealed.

§118(a): Insulation specified or installed meets Standards for Insulating Material. Indicate type and include on CF-6R Form.

§118(i): The thermal emittance and solar reflectance values of the cool roofing material meets the requirements of §118(i) when the installation of a Cool Roof is specified on the CF-1R Form.

\*§150(a): Minimum R-19 insulation in wood-frame ceiling or equivalent U-factor.

§150(b): Loose fill insulation shall conform with manufacturer's installed design labeled R-Value.

\*§150(c): Minimum R-13 insulation in wood-frame wall or equivalent U-factor.

\*§150(d): Minimum R-13 insulation in raised wood-frame floor or equivalent U-factor.

§150(f): Air retarding wrap is tested, labeled, and installed according to ASTM E1677-95(2000) when specified on the CF-1R Form.

§150(g): Mandatory Vapor barrier installed in Climate Zones 14 or 16.

§150(l): Water absorption rate for slab edge insulation material alone without facings is no greater than 0.3%; water vapor permeance rate is no greater than 2.0 perm/inch and shall be protected from physical damage and UV light deterioration.

**Fireplaces, Decorative Gas Appliances and Gas Log Measures:**

§150(e)1A: Masonry or factory-built fireplaces have a closable metal or glass door covering the entire opening of the firebox.

§150(e)1B: Masonry or factory-built fireplaces have a combustion outside air intake, which is at least six square inches in area and is equipped with a readily accessible, operable, and tight-fitting damper and or a combustion-air control device.

§150(e)2: Continuous burning pilot lights and the use of indoor air for cooling a firebox jacket, when that indoor air is vented to the outside of the building, are prohibited.

**Space Conditioning, Water Heating and Plumbing System Measures:**

§110-§113: HVAC equipment, water heaters, showerheads, faucets and all other regulated appliances are certified by the Energy Commission.

§113(c)5: Water heating recirculation loops serving multiple dwelling units and High-Rise residential occupancies meet the air release valve, backflow prevention, pump isolation valve, and recirculation loop connection requirements of §113(c)5.

§115: Continuously burning pilot lights are prohibited for natural gas: fan-type central furnaces, household cooking appliances (appliances with an electrical supply voltage connection with pilot lights that consume less than 150 Btu/hr are exempt), and pool and spa heaters.

§150(h): Heating and/or cooling loads are calculated in accordance with ASHRAE, SMACNA or ACCA.

§150(i): Heating systems are equipped with thermostats that meet the setback requirements of Section 112(c).

§150(j)1A: Storage gas water heaters rated with an Energy Factor no greater than the federal minimal standard are externally wrapped with insulation having an installed thermal resistance of R-12 or greater.

§150(j)1B: Unfired storage tanks, such as storage tanks or backup tanks for solar water-heating system, or other indirect hot water tanks have R-12 external insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.

§150(j)2: First 5 feet of hot and cold water pipes closest to water heater tank, non-recirculating systems, and entire length of recirculating sections of hot water pipes are insulated per Standards Table 150-B.

§150(j)2: Cooling system piping (suction, chilled water, or brine lines), and piping insulated between heating source and indirect hot water tank shall be insulated to Table 150-B and Equation 150-A.

§150(j)2: Pipe insulation for steam hydronic heating systems or hot water systems >15 psi, meets the requirements of Standards Table 123-A.

§150(j)3A: Insulation is protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind.

§150(j)3A: Insulation for chilled water piping and refrigerant suction lines includes a vapor retardant or is enclosed entirely in conditioned space.

§150(j)4: Solar water-heating systems and/or collectors are certified by the Solar Rating and Certification Corporation.



**MANDATORY MEASURES SUMMARY: Residential**

(Page 2 of 3)

**MF-1R**

Project Name

*E. Manhattan E+A SFR (15%) All ECM's*

Date

*10/16/2010*

§150(m)1: All air-distribution system ducts and plenums installed, are sealed and insulated to meet the requirements of CMC Sections 601, 602, 603, 604, 605 and Standard 6-5; supply-air and return-air ducts and plenums are insulated to a minimum installed level of R-4.2 or enclosed entirely in conditioned space. Openings shall be sealed with mastic, tape or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape shall be used

§150(m)1: Building cavities, support platforms for air handlers, and plenums defined or constructed with materials other than sealed sheet metal, duct board or flexible duct shall not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts.

§150(m)2D: Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.

§150(m)7: Exhaust fan systems have back draft or automatic dampers.

§150(m)8: Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operated dampers.

§150(m)9: Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.

§150(m)10: Flexible ducts cannot have porous inner cores.

§150(o): All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. Window operation is not a permissible method of providing the Whole Building Ventilation required in Section 4 of that Standard.

**Pool and Spa Heating Systems and Equipment Measures:**

§114(a): Any pool or spa heating system shall be certified to have: a thermal efficiency that complies with the Appliance Efficiency Regulations; an on-off switch mounted outside of the heater; a permanent weatherproof plate or card with operating instructions; and shall not use electric resistance heating or a pilot light.

§114(b)1: Any pool or spa heating equipment shall be installed with at least 36" of pipe between filter and heater, or dedicated suction and return lines, or built-up connections for future solar heating.

§114(b)2: Outdoor pools or spas that have a heat pump or gas heater shall have a cover.

§114(b)3: Pools shall have directional inlets that adequately mix the pool water, and a time switch that will allow all pumps to be set or programmed to run only during off-peak electric demand periods.

§150(p): Residential pool systems or equipment meet the pump sizing, flow rate, piping, filters, and valve requirements of §150(p).

**Residential Lighting Measures:**

§150(k)1: High efficacy luminaires or LED Light Engine with Integral Heat Sink has an efficacy that is no lower than the efficacies contained in Table 150-C and is not a low efficacy luminaire as specified by §150(k)2.

§150(k)3: The wattage of permanently installed luminaires shall be determined as specified by §130(d).

§150(k)4: Ballasts for fluorescent lamps rated 13 Watts or greater shall be electronic and shall have an output frequency no less than 20 kHz.

§150(k)5: Permanently installed night lights and night lights integral to a permanently installed luminaire or exhaust fan shall contain only high efficacy lamps meeting the minimum efficacies contained in Table 150-C and shall not contain a line-voltage socket or line-voltage lamp holder; OR shall be rated to consume no more than five watts of power as determined by §130(d), and shall not contain a medium screw-base socket.

§150(k)6: Lighting integral to exhaust fans, in rooms other than kitchens, shall meet the applicable requirements of §150(k).

§150(k)7: All switching devices and controls shall meet the requirements of §150(k)7.

§150(k)8: A minimum of 50 percent of the total rated wattage of permanently installed lighting in kitchens shall be high efficacy. EXCEPTION: Up to 50 watts for dwelling units less than or equal to 2,500 ft<sup>2</sup> or 100 watts for dwelling units larger than 2,500 ft<sup>2</sup> may be exempt from the 50% high efficacy requirement when: all low efficacy luminaires in the kitchen are controlled by a manual on occupant sensor, dimmer, energy management system (EMCS), or a multi-scene programmable control system; and all permanently installed luminaries in garages, laundry rooms, closets greater than 70 square feet, and utility rooms are high efficacy and controlled by a manual-on occupant sensor.

§150(k)9: Permanently installed lighting that is internal to cabinets shall use no more than 20 watts of power per linear foot of illuminated cabinet.

Project Name

*E. Manhattan E+A SFR (15%) All ECM's*

Date

*10/16/2010*

§150(k)10: Permanently installed luminaires in bathrooms, attached and detached garages, laundry rooms, closets and utility rooms shall be high efficacy.

EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by a manual-on occupant sensor certified to comply with the applicable requirements of §119.

EXCEPTION 2: Permanently installed low efficacy luminaires in closets less than 70 square feet are not required to be controlled by a manual-on occupancy sensor.

§150(k)11: Permanently installed luminaires located in rooms or areas other than in kitchens, bathrooms, garages, laundry rooms, closets, and utility rooms shall be high efficacy luminaires. EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided they are controlled by either a dimmer switch that complies with the applicable requirements of §119, or by a manual-on occupant sensor that complies with the applicable requirements of §119. EXCEPTION 2: Lighting in detached storage building less than 1000 square feet located on a residential site is not required to comply with §150(k)11.

§150(k)12: Luminaires recessed into insulated ceilings shall be listed for zero clearance insulation contact (IC) by Underwriters Laboratories or other nationally recognized testing/rating laboratory; and have a label that certifies the luminaire is airtight with air leakage less than 2.0 CFM at 75 Pascals when tested in accordance with ASTM E283; and be sealed with a gasket or caulk between the luminaire housing and ceiling.

§150(k)13: Luminaires providing outdoor lighting, including lighting for private patios in low-rise residential buildings with four or more dwelling units, entrances, balconies, and porches, which are permanently mounted to a residential building or to other buildings on the same lot shall be high efficacy. EXCEPTION 1: Permanently installed outdoor low efficacy luminaires shall be allowed provided that they are controlled by a manual on/off switch, a motion sensor not having an override or bypass switch that disables the motion sensor, and one of the following controls: a photocontrol not having an override or bypass switch that disables the photocontrol; OR an astronomical time clock not having an override or bypass switch that disables the astronomical time clock; OR an energy management control system (EMCS) not having an override or bypass switch that allows the luminaire to be always on. EXCEPTION 2: Outdoor luminaires used to comply with Exception 1 to §150(k)13 may be controlled by a temporary override switch which bypasses the motion sensing function provided that the motion sensor is automatically reactivated within six hours. EXCEPTION 3: Permanently installed luminaires in or around swimming pool, water features, or other location subject to Article 680 of the California Electric Code need not be high efficacy luminaires.

§150(k)14: Internally illuminated address signs shall comply with Section 148; OR not contain a screw-base socket, and consume no more than five watts of power as determined according to §130(d).

§150(k)15: Lighting for parking lots and carports with a total of for 8 or more vehicles per site shall comply with the applicable requirements in Sections 130, 132, 134, and 147. Lighting for parking garages for 8 or more vehicles shall comply with the applicable requirements of Sections 130, 131, 134, and 146.

§150(k)16: Permanently installed lighting in the enclosed, non-dwelling spaces of low-rise residential buildings with four or more dwelling units shall be high efficacy luminaires. EXCEPTION: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by an occupant sensor(s) certified to comply with the applicable requirements of §119.

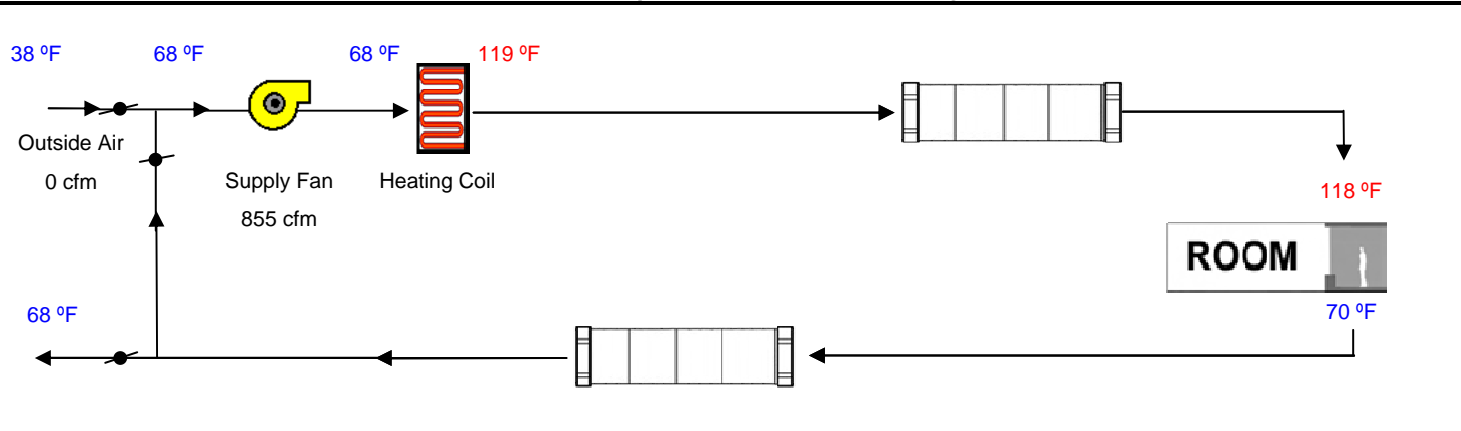
# HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

Project Name E. Manhattan E+A SFR (15%) All ECM's	Date 10/16/2010
System Name NEW Existing + Addition System	Floor Area 2,742

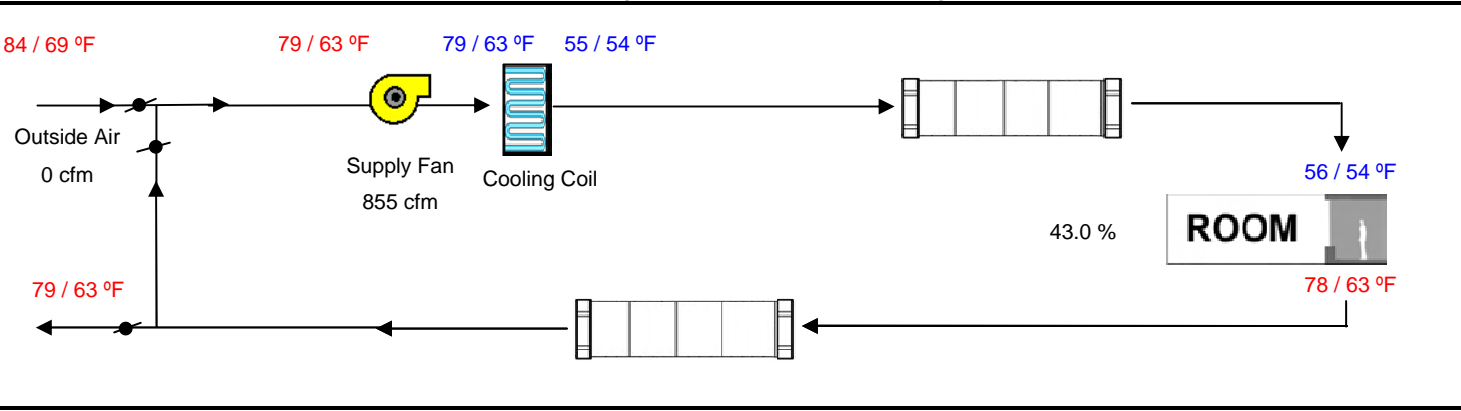
ENGINEERING CHECKS		SYSTEM LOAD							
Number of Systems	1				COIL COOLING PEAK		COIL HTG. PEAK		
Heating System					CFM	Sensible	Latent	CFM	Sensible
Output per System	75,000	Total Room Loads			2,052	47,563	3,267	1,002	51,172
Total Output (Btuh)	75,000	Return Vented Lighting							
Output (Btuh/sqft)	27.4	Return Air Ducts							2,487
Cooling System		Return Fan							0
Output per System	0	Ventilation			0	0	0	0	0
Total Output (Btuh)	0	Supply Fan							0
Total Output (Tons)	0.0	Supply Air Ducts							2,487
Total Output (Btuh/sqft)	0.0	TOTAL SYSTEM LOAD					51,829	3,267	56,147
Total Output (sqft/Ton)	0.0								

Air System		HVAC EQUIPMENT SELECTION						
CFM per System	855	Carrier Corp. 58UVB080-20			0	0	75,000	
Airflow (cfm)	855							
Airflow (cfm/sqft)	0.31							
Airflow (cfm/Ton)	0.0							
Outside Air (%)	0.0 %	Total Adjusted System Output			0	0	75,000	
Outside Air (cfm/sqft)	0.00	(Adjusted for Peak Design conditions)						
Note: values above given at ARI conditions		TIME OF SYSTEM PEAK			Aug 3 PM		Jan 1 AM	

## HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



## COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



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# BUILDING ENERGY ANALYSIS REPORT

## PROJECT:

2-Unit Condo (15%) All ECM's

Manhattan Beach, CA 90266

## Project Designer:

Michael Lee Architects, Inc.  
2200 Highland Avenue  
Manhattan Beach, CA 90266  
(310) 545-5771

## Report Prepared by:

Rick Newton  
NEWTON ENERGY  
1401 19th Street  
Manhattan Beach, CA 90266  
310 375-2699



## Job Number:

8261R

## Date:

10/16/2010

The EnergyPro computer program has been used to perform the calculations summarized in this compliance report. This program has approval and is authorized by the California Energy Commission for use with both the Residential and Nonresidential 2008 Building Energy Efficiency Standards.

This program developed by EnergySoft, LLC – [www.energysoft.com](http://www.energysoft.com).

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Form MF-1R Mandatory Measures Summary	10
HVAC System Heating and Cooling Loads Summary	13
Form ECON-1 Energy Use and Cost Summary	15

**PERFORMANCE CERTIFICATE: Residential** (Part 1 of 5) **CF-1R**

Project Name <i>2-Unit Condo (15%) All ECM's</i>	Building Type <input type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input checked="" type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date <i>10/16/2010</i>
Project Address [REDACTED]	California Energy Climate Zone <i>CA Climate Zone 06</i>	Total Cond. Floor Area <i>5,202</i>
	Addition <i>n/a</i>	# of Stories <i>3</i>

**FIELD INSPECTION ENERGY CHECKLIST**

Yes  No HERS Measures -- If Yes, A CF-4R must be provided per Part 2 of 5 of this form.  
 Yes  No Special Features -- If Yes, see Part 2 of 5 of this form for details.

Construction	Type	Cavity	Area (ft <sup>2</sup> )	Special Features (see Part 2 of 5)	Status
Roof	Wood Framed Rafter	R-30	2,195		New
Wall	Wood Framed	R-19	3,852		New
Floor	Wood Framed w/o Crawl Space	R-30	470		New
Slab	Unheated Slab-on-Grade	None	1,658	Perim = 88'	New
WallBG	Hollow Unit Masonry	None	1,105	Int=R-13.0 Depth = 109.000"	New
Door	Opaque Door	None	40		New
Roof	Span Deck or Concrete	None	161	Int=R-30.0	New

FENESTRATION	Orientation	Area(ft <sup>2</sup> )	U-Factor	SHGC	Overhang	Sidefins	Exterior Shades	Status
	Rear (N)	657.0	0.330	0.31	none	none	Bug Screen	New
	Front (S)	54.0	0.330	0.31	5.0	none	Bug Screen	New
	Front (S)	451.0	0.330	0.31	none	none	Bug Screen	New
	Front (S)	68.5	0.330	0.31	10.0	none	Bug Screen	New
	Left (W)	257.5	0.330	0.31	none	none	Bug Screen	New
	Left (W)	60.0	0.330	0.31	14.0	none	Bug Screen	New
	Left (W)	209.8	0.330	0.31	5.0	none	Bug Screen	New
	Left (W)	112.0	0.330	0.31	10.0	none	Bug Screen	New
	Right (E)	43.0	0.330	0.31	none	none	Bug Screen	New
	Front (S)	54.0	0.330	0.31	7.0	none	Bug Screen	New

HVAC SYSTEMS		Qty.	Heating	Min. Eff	Cooling	Min. Eff	Thermostat	Status
1	Central Furnace		95% AFUE	No Cooling	13.0 SEER	Setback	New	
1	Central Furnace		95% AFUE	No Cooling	13.0 SEER	Setback	New	

HVAC DISTRIBUTION				Duct R-Value	Status
Location	Heating	Cooling	Duct Location		
Unit A System (80% to 95%	Ducted	Ducted	Attic, Ceiling Ins, vented	4.2	New
Unit B System (80% to 95%	Ducted	Ducted	Attic, Ceiling Ins, vented	4.2	New

WATER HEATING		Qty.	Type	Gallons	Min. Eff	Distribution	Status
2	Instant Gas		0	0.84	Kitchen Pipe Ins	New	

**PERFORMANCE CERTIFICATE: Residential**

(Part 2 of 5)

**CF-1R**

Project Name  
*2-Unit Condo (15%) All ECM's*

Building Type  Single Family  Addition Alone  
 Multi Family  Existing+ Addition/Alteration

Date  
*10/16/2010*

**SPECIAL FEATURES INSPECTION CHECKLIST**

The enforcement agency should pay special attention to the items specified in this checklist. These items require special written justification and documentation, and special verification to be used with the performance approach. The enforcement agency determines the adequacy of the justification, and may reject a building or design that otherwise complies based on the adequacy of the special justification and documentation submitted.

*The HVAC System Carrier Corp. 58MXB040-12x does not include a cooling system, field verification is not necessary.*

*HIGH MASS Design - Verify Thermal Mass: 630.0 ft² Covered Slab Floor, 3.500" thick at Basement*

*HIGH MASS Design - Verify Thermal Mass: 465 sqft Concrete, Heavyweight Exterior Mass, 8.000" thick at Basement*

*The HVAC System Carrier Corp. 58MXB040-12x does not include a cooling system, field verification is not necessary.*

*HIGH MASS Design - Verify Thermal Mass: 65 sqft Concrete, Heavyweight Exterior Mass, 8.000" thick at Basement*

*HIGH MASS Design - Verify Thermal Mass: 1,028.0 ft² Covered Slab Floor, 3.500" thick at Basement*

*HIGH MASS Design - Verify Thermal Mass: 575 sqft Concrete, Heavyweight Exterior Mass, 8.000" thick at Basement*


**HERS REQUIRED VERIFICATION**

Items in this section require field testing and/or verification by a certified HERS Rater. The inspector must receive a completed CF-4R form for each of the measures listed below for final to be given.

*Compliance credit for quality installation of insulation has been used. HERS field verification is required.*

*Compliance credit for quality installation of insulation has been used. HERS field verification is required.*




**PERFORMANCE CERTIFICATE: Residential** (Part 3 of 5) **CF-1R**

Project Name *2-Unit Condo (15%) All ECM's* Building Type  Single Family  Addition Alone  Multi Family  Existing+ Addition/Alteration Date *10/16/2010*

**ANNUAL ENERGY USE SUMMARY**

TDV (kBtu/ft <sup>2</sup> -yr)	Standard	Proposed	Margin
Space Heating	20.00	16.45	3.55
Space Cooling	0.23	0.35	-0.12
Fans	3.19	3.22	-0.03
Domestic Hot Water	15.80	11.90	3.91
Pumps	0.00	0.00	0.00
<b>Totals</b>	<b>39.22</b>	<b>31.90</b>	<b>7.31</b>
<b>Percent Better Than Standard:</b>			<b>18.6 %</b>

**BUILDING COMPLIES - HERS VERIFICATION REQUIRED**

Building Front Orientation:	(S) 160 deg	Ext. Walls/Roof	Wall Area	Fenestration Area
Number of Dwelling Units:	2.00	(S)	1,778	628
Fuel Available at Site:	Natural Gas	(W)	989	639
Raised Floor Area:	470	(N)	2,582	657
Slab on Grade Area:	1,658	(E)	510	43
Average Ceiling Height:	8.9	Roof	2,356	0
Fenestration Average U-Factor:	0.33	TOTAL:		1,967
Average SHGC:	0.31	Fenestration/CFA Ratio:		37.8 %

**REMARKS**

BASE CASE: Framed Walls are insulated to R-19. Basement Retaining Walls ARE insulated to R-13. Two 50 gal. W.H. 0.60 EF. 470 sf Floor has R-30 Batts.

15% CASE:  
 ECM-8 Furnace upgrade - AFUE 80% to 95%: 8.0%;  
 ECM-6 - Quality Insulation Installation (Needs HERS): 2.3%.

**STATEMENT OF COMPLIANCE**

This certificate of compliance lists the building features and specifications needed to comply with Title 24, Parts 1 the Administrative Regulations and Part 6 the Efficiency Standards of the California Code of Regulations.

The documentation author hereby certifies that the documentation is accurate and complete.

**Documentation Author**  
 Company *NEWTON ENERGY*  
 Address *1401 19th Street* Name *Rick Newton* Date *10/16/2010*  
 City/State/Zip *Manhattan Beach, CA 90266* Phone *310 375-2699* Signed \_\_\_\_\_

The individual with overall design responsibility hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application, and recognizes that compliance using duct design, duct sealing, verification of refrigerant charge, insulation installation quality, and building envelope sealing require installer testing and certification and field verification by an approved HERS rater.

**Designer or Owner (per Business & Professions Code)**  
 Company *Michael Lee Architects, Inc.*  
 Address *2200 Highland Avenue* Name *Michael Lee*  
 City/State/Zip *Manhattan Beach, CA 90266* Phone *(310) 545-5771* Signed \_\_\_\_\_ License # \_\_\_\_\_ Date \_\_\_\_\_

**CERTIFICATE OF COMPLIANCE: Residential** (Part 4 of 5) **CF-1R**

Project Name: **2-Unit Condo (15%) All ECM's** Building Type:  Single Family  Addition Alone  Multi Family  Existing+ Addition/Alteration Date: **10/16/2010**

**OPAQUE SURFACE DETAILS**

Surface Type	Area	U-Factor	Insulation				Azimuth	Tilt	Status	Joint Appendix 4	Location/Comments	
			Cavity	Exterior	Frame	Interior						
Roof	900	0.036	R-30				0	0	New	4.2.2-A16	2nd Floor Zone	
Wall	352	0.074	R-19				340	90	New	4.3.1-A5	2nd Floor Zone	
Wall	214	0.074	R-19				160	90	New	4.3.1-A5	2nd Floor Zone	
Wall	130	0.074	R-19				70	90	New	4.3.1-A5	2nd Floor Zone	
Wall	111	0.074	R-19				250	90	New	4.3.1-A5	2nd Floor Zone	
Floor	470	0.033	R-30				0	180	New	4.4.2-A15	1st Floor Zone	
Roof	161	0.036	R-30				0	0	New	4.2.2-A16	1st Floor Zone	
Wall	320	0.074	R-19				340	90	New	4.3.1-A5	1st Floor Zone	
Wall	249	0.074	R-19				160	90	New	4.3.1-A5	1st Floor Zone	
Wall	87	0.074	R-19				70	90	New	4.3.1-A5	1st Floor Zone	
Wall	130	0.074	R-19				250	90	New	4.3.1-A5	1st Floor Zone	
Slab	630	0.730	None				0	180	New	4.4.7-A1	Basement Zone	
WallBG	465	0.070	None			13.0	Wood	0	90	New	4.3.5-A10/4.3.13-J9	Basement Zone
Wall	126	0.074	R-19				340	90	New	4.3.1-A5	Basement Zone	
Wall	149	0.074	R-19				0	90	New	4.3.1-A5	Basement Zone	
Door	19	0.500	None				0	90	New	4.5.1-A4	Basement Zone	

**FENESTRATION SURFACE DETAILS**

ID	Type	Area	U-Factor <sup>1</sup>	SHGC <sup>2</sup>		Azimuth	Status	Glazing Type	Location/Comments	
1	Window	51.0	0.330	NFRC	0.31	NFRC	340	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
2	Window	30.0	0.330	NFRC	0.31	NFRC	340	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
3	Window	30.0	0.330	NFRC	0.31	NFRC	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
4	Window	24.0	0.330	NFRC	0.31	NFRC	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
5	Window	20.0	0.330	NFRC	0.31	NFRC	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
6	Window	68.5	0.330	NFRC	0.31	NFRC	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
7	Window	76.5	0.330	NFRC	0.31	NFRC	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
8	Window	60.0	0.330	NFRC	0.31	NFRC	250	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
9	Window	60.0	0.330	NFRC	0.31	NFRC	250	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
10	Window	53.8	0.330	NFRC	0.31	NFRC	250	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
11	Window	20.0	0.330	NFRC	0.31	NFRC	340	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
12	Window	70.0	0.330	NFRC	0.31	NFRC	340	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
13	Window	60.0	0.330	NFRC	0.31	NFRC	160	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
14	Window	90.0	0.330	NFRC	0.31	NFRC	160	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
15	Window	11.0	0.330	NFRC	0.31	NFRC	160	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
16	Window	40.0	0.330	NFRC	0.31	NFRC	250	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value  
 (2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

**EXTERIOR SHADING DETAILS**

ID	Exterior Shade Type	SHGC	Window		Overhang				Left Fin			Right Fin		
			Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt
1	Bug Screen	0.76												
2	Bug Screen	0.76												
3	Bug Screen	0.76	8.0	3.8	5.0	0.1	4.0	4.0						
4	Bug Screen	0.76	8.0	3.0	5.0	0.1	4.0	4.0						
5	Bug Screen	0.76												
6	Bug Screen	0.76	9.9	6.9	10.0	0.1	6.0	6.0						
7	Bug Screen	0.76												
8	Bug Screen	0.76												
9	Bug Screen	0.76	9.9	7.4	14.0	0.1	6.0	6.0						
10	Bug Screen	0.76	6.0	9.0	5.0	0.1	4.0	4.0						
11	Bug Screen	0.76												
12	Bug Screen	0.76												
13	Bug Screen	0.76												
14	Bug Screen	0.76												
15	Bug Screen	0.76												
16	Bug Screen	0.76												

**CERTIFICATE OF COMPLIANCE: Residential** (Part 4 of 5) **CF-1R**

Project Name: **2-Unit Condo (15%) All ECM's** Building Type:  Single Family  Addition Alone  Multi Family  Existing+ Addition/Alteration Date: **10/16/2010**

**OPAQUE SURFACE DETAILS**

Surface Type	Area	U-Factor	Insulation				Azimuth	Tilt	Status	Joint Appendix 4	Location/Comments	
			Cavity	Exterior	Frame	Interior						
Wall	9	0.074	R-19				250	90	New	4.3.1-A5	Basement Zone	
Roof	930	0.036	R-30				0	0	New	4.2.2-A16	2nd Floor Zone	
Wall	322	0.074	R-19				340	90	New	4.3.1-A5	2nd Floor Zone	
Wall	295	0.074	R-19				160	90	New	4.3.1-A5	2nd Floor Zone	
Wall	204	0.074	R-19				70	90	New	4.3.1-A5	2nd Floor Zone	
Wall	26	0.074	R-19				250	90	New	4.3.1-A5	2nd Floor Zone	
Roof	198	0.036	R-30				0	0	New	4.2.2-A16	1st Floor Zone	
Wall	244	0.074	R-19				0	90	New	4.3.1-A5	1st Floor Zone	
Door	21	0.500	None				0	90	New	4.5.1-A4	1st Floor Zone	
Wall	206	0.074	R-19				340	90	New	4.3.1-A5	1st Floor Zone	
Wall	311	0.074	R-19				160	90	New	4.3.1-A5	1st Floor Zone	
Wall	46	0.074	R-19				70	90	New	4.3.1-A5	1st Floor Zone	
Wall	40	0.074	R-19				250	90	New	4.3.1-A5	1st Floor Zone	
Roof	161	0.053	None			30.0	Wood	0	0	New	4.2.6-A7	Basement Zone
Roof	6	0.036	R-30					0	0	New	4.2.2-A16	Basement Zone
Wall	82	0.074	R-19					160	90	New	4.3.1-A5	Basement Zone

**FENESTRATION SURFACE DETAILS**

ID	Type	Area	U-Factor <sup>1</sup>	SHGC <sup>2</sup>	Azm	Status	Glazing Type	Location/Comments		
17	Window	18.0	0.330	NFRC	0.31	NFRC	250	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
18	Window	55.5	0.330	NFRC	0.31	NFRC	250	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone
19	Window	28.0	0.330	NFRC	0.31	NFRC	340	New	Jeld-Wen Wood Windows Low-E	Basement Zone
20	Window	54.0	0.330	NFRC	0.31	NFRC	340	New	Jeld-Wen Wood Windows Low-E	Basement Zone
21	Window	10.0	0.330	NFRC	0.31	NFRC	250	New	Jeld-Wen Wood Windows Low-E	Basement Zone
22	Window	24.0	0.330	NFRC	0.31	NFRC	250	New	Jeld-Wen Wood Windows Low-E	Basement Zone
23	Window	24.0	0.330	NFRC	0.31	NFRC	250	New	Jeld-Wen Wood Windows Low-E	Basement Zone
24	Window	25.0	0.330	NFRC	0.31	NFRC	340	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
25	Window	70.0	0.330	NFRC	0.31	NFRC	340	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
26	Window	44.0	0.330	NFRC	0.31	NFRC	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
27	Window	18.0	0.330	NFRC	0.31	NFRC	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
28	Window	60.0	0.330	NFRC	0.31	NFRC	160	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
29	Window	28.0	0.330	NFRC	0.31	NFRC	70	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
30	Window	156.0	0.330	NFRC	0.31	NFRC	250	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
31	Window	50.0	0.330	NFRC	0.31	NFRC	250	New	Jeld-Wen Wood Windows Low-E	2nd Floor Zone
32	Window	125.0	0.330	NFRC	0.31	NFRC	340	New	Jeld-Wen Wood Windows Low-E	1st Floor Zone

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value  
 (2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

**EXTERIOR SHADING DETAILS**

ID	Exterior Shade Type	SHGC	Window		Overhang				Left Fin			Right Fin			
			Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt	
17	Bug Screen	0.76													
18	Bug Screen	0.76													
19	Bug Screen	0.76													
20	Bug Screen	0.76													
21	Bug Screen	0.76													
22	Bug Screen	0.76													
23	Bug Screen	0.76	6.7	12.0	10.0	0.1	6.0	6.0							
24	Bug Screen	0.76													
25	Bug Screen	0.76													
26	Bug Screen	0.76													
27	Bug Screen	0.76													
28	Bug Screen	0.76													
29	Bug Screen	0.76													
30	Bug Screen	0.76	9.0	17.4	5.0	0.1	4.0	4.0							
31	Bug Screen	0.76													
32	Bug Screen	0.76													

# CERTIFICATE OF COMPLIANCE: Residential

(Part 4 of 5)

CF-1R

Project Name <i>2-Unit Condo (15%) All ECM's</i>	Building Type <input type="checkbox"/> Single Family <input type="checkbox"/> Addition Alone <input checked="" type="checkbox"/> Multi Family <input type="checkbox"/> Existing+ Addition/Alteration	Date <i>10/16/2010</i>
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## OPAQUE SURFACE DETAILS

Surface Type	Area	U-Factor	Insulation					Azimuth	Tilt	Status	Joint Appendix 4	Location/Comments
			Cavity	Exterior	Frame	Interior	Frame					
WallBG	65	0.070	None			13.0	Wood	0	90	New	4.3.5-A10/4.3.13-J9	Basement Zone
Slab	1,028	0.730	None					0	180	New	4.4.7-A1	Basement Zone
WallBG	575	0.070	None			13.0	Wood	0	90	New	4.3.5-A10/4.3.13-J9	Basement Zone
Wall	166	0.074	R-19					340	90	New	4.3.1-A5	Basement Zone
Wall	34	0.074	R-19					250	90	New	4.3.1-A5	Basement Zone

## FENESTRATION SURFACE DETAILS

ID	Type	Area	U-Factor <sup>1</sup>	SHGC <sup>2</sup>		Azm	Status	Glazing Type	Location/Comments
33	Window	11.5	0.330	NFRC	0.31	NFRC	160	New	Jeld-Wen Wood Windows Low-E 1st Floor Zone
34	Window	24.0	0.330	NFRC	0.31	NFRC	160	New	Jeld-Wen Wood Windows Low-E 1st Floor Zone
35	Window	54.0	0.330	NFRC	0.31	NFRC	160	New	Jeld-Wen Wood Windows Low-E 1st Floor Zone
36	Window	15.0	0.330	NFRC	0.31	NFRC	70	New	Jeld-Wen Wood Windows Low-E 1st Floor Zone
37	Window	44.0	0.330	NFRC	0.31	NFRC	250	New	Jeld-Wen Wood Windows Low-E 1st Floor Zone
38	Window	36.0	0.330	NFRC	0.31	NFRC	160	New	Jeld-Wen Wood Windows Low-E Basement Zone
39	Window	174.0	0.330	NFRC	0.31	NFRC	340	New	Jeld-Wen Wood Windows Low-E Basement Zone
40	Window	10.0	0.330	NFRC	0.31	NFRC	340	New	Jeld-Wen Wood Windows Low-E Basement Zone
41	Window	44.0	0.330	NFRC	0.31	NFRC	250	New	Jeld-Wen Wood Windows Low-E Basement Zone

(1) U-Factor Type: 116-A = Default Table from Standards, NFRC = Labeled Value  
 (2) SHGC Type: 116-B = Default Table from Standards, NFRC = Labeled Value

## EXTERIOR SHADING DETAILS

ID	Exterior Shade Type	SHGC	Window		Overhang			Left Fin			Right Fin				
			Hgt	Wd	Len	Hgt	LExt	RExt	Dist	Len	Hgt	Dist	Len	Hgt	
33	Bug Screen	0.76													
34	Bug Screen	0.76													
35	Bug Screen	0.76	7.7	7.0	7.0	0.1	8.0	8.0							
36	Bug Screen	0.76													
37	Bug Screen	0.76	8.0	5.5	10.0	0.1	6.0	6.0							
38	Bug Screen	0.76													
39	Bug Screen	0.76													
40	Bug Screen	0.76													
41	Bug Screen	0.76	6.7	12.0	10.0	0.1	6.0	6.0							

**CERTIFICATE OF COMPLIANCE: Residential** (Part 5 of 5) **CF-1R**

Project Name: *2-Unit Condo (15%) All ECM's* Building Type:  Single Family  Addition Alone  Multi Family  Existing+ Addition/Alteration Date: *10/16/2010*

**BUILDING ZONE INFORMATION**

System Name	Zone Name	Floor Area (ft <sup>2</sup> )				Volume	Year Built
		New	Existing	Altered	Removed		
<i>Unit A System (80% to 95%)</i>	<i>Second Floor</i>	<i>900</i>				<i>8,910</i>	
	<i>First Floor</i>	<i>1,014</i>				<i>8,213</i>	
	<i>Basement</i>	<i>630</i>				<i>5,103</i>	
<i>Unit B System (80% to 95%)</i>	<i>Second Floor</i>	<i>930</i>				<i>8,370</i>	
	<i>First Floor</i>	<i>646</i>				<i>6,848</i>	
	<i>Basement</i>	<i>1,082</i>				<i>8,764</i>	
<b>Totals</b>		<i>5,202</i>	<i>0</i>	<i>0</i>	<i>0</i>		

**HVAC SYSTEMS**

System Name	Qty.	Heating Type	Min. Eff.	Cooling Type	Min. Eff.	Thermostat Type	Status
<i>Unit A System (80% to 95%)</i>	<i>1</i>	<i>Central Furnace</i>	<i>95% AFUE</i>	<i>No Cooling</i>	<i>13.0 SEER</i>	<i>Setback</i>	<i>New</i>
<i>Unit B System (80% to 95%)</i>	<i>1</i>	<i>Central Furnace</i>	<i>95% AFUE</i>	<i>No Cooling</i>	<i>13.0 SEER</i>	<i>Setback</i>	<i>New</i>

**HVAC DISTRIBUTION**

System Name	Heating	Cooling	Duct Location	Duct R-Value	Ducts Tested?	Status
<i>Unit A System (80% to 95%)</i>	<i>Ducted</i>	<i>Ducted</i>	<i>Attic, Ceiling Ins, vented</i>	<i>4.2</i>	<input type="checkbox"/>	<i>New</i>
<i>Unit B System (80% to 95%)</i>	<i>Ducted</i>	<i>Ducted</i>	<i>Attic, Ceiling Ins, vented</i>	<i>4.2</i>	<input type="checkbox"/>	<i>New</i>
					<input type="checkbox"/>	
					<input type="checkbox"/>	
					<input type="checkbox"/>	

**WATER HEATING SYSTEMS**

System Name	Qty.	Type	Distribution	Rated Input (Btuh)	Tank Cap. (gal)	Energy Factor or RE	Standby Loss or Pilot	Ext. Tank Insul. R-Value	Status
<i>TAKAGI T-K1</i>	<i>2</i>	<i>Instant Gas</i>	<i>Kitchen Pipe Ins</i>	<i>165,000</i>	<i>0</i>	<i>0.84</i>	<i>n/a</i>	<i>n/a</i>	<i>New</i>

**MULTI-FAMILY WATER HEATING DETAILS**

**HYDRONIC HEATING SYSTEM PIPING**

Control	Qty.	HP	Eff. Premium	Hot Water Piping Length (ft)			Add 1/2" Insulation	System Name	Pipe Length	Pipe Diameter	Insul. Thick.
				Plenum	Outside	Buried					
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				
			<input type="checkbox"/>				<input type="checkbox"/>				

Project Name

2-Unit Condo (15%) All ECM's

Date

10/16/2010

**NOTE:** Low-rise residential buildings subject to the Standards must comply with all applicable mandatory measures listed, regardless of the compliance approach used. More stringent energy measures listed on the Certificate of Compliance (CF-1R, CF-1R-ADD, or CF-1R-ALT Form) shall supersede the items marked with an asterisk (\*) below. This Mandatory Measures Summary shall be incorporated into the permit documents, and the applicable features shall be considered by all parties as minimum component performance specifications whether they are shown elsewhere in the documents or in this summary. Submit all applicable sections of the MF-1R Form with plans.

**Building Envelope Measures:**

§116(a)1: Doors and windows between conditioned and unconditioned spaces are manufactured to limit air leakage.

§116(a)4: Fenestration products (except field-fabricated windows) have a label listing the certified U-Factor, certified Solar Heat Gain Coefficient (SHGC), and infiltration that meets the requirements of §10-111(a).

§117: Exterior doors and windows are weather-stripped; all joints and penetrations are caulked and sealed.

§118(a): Insulation specified or installed meets Standards for Insulating Material. Indicate type and include on CF-6R Form.

§118(i): The thermal emittance and solar reflectance values of the cool roofing material meets the requirements of §118(i) when the installation of a Cool Roof is specified on the CF-1R Form.

\*§150(a): Minimum R-19 insulation in wood-frame ceiling or equivalent U-factor.

§150(b): Loose fill insulation shall conform with manufacturer's installed design labeled R-Value.

\*§150(c): Minimum R-13 insulation in wood-frame wall or equivalent U-factor.

\*§150(d): Minimum R-13 insulation in raised wood-frame floor or equivalent U-factor.

§150(f): Air retarding wrap is tested, labeled, and installed according to ASTM E1677-95(2000) when specified on the CF-1R Form.

§150(g): Mandatory Vapor barrier installed in Climate Zones 14 or 16.

§150(l): Water absorption rate for slab edge insulation material alone without facings is no greater than 0.3%; water vapor permeance rate is no greater than 2.0 perm/inch and shall be protected from physical damage and UV light deterioration.

**Fireplaces, Decorative Gas Appliances and Gas Log Measures:**

§150(e)1A: Masonry or factory-built fireplaces have a closable metal or glass door covering the entire opening of the firebox.

§150(e)1B: Masonry or factory-built fireplaces have a combustion outside air intake, which is at least six square inches in area and is equipped with a with a readily accessible, operable, and tight-fitting damper and or a combustion-air control device.

§150(e)2: Continuous burning pilot lights and the use of indoor air for cooling a firebox jacket, when that indoor air is vented to the outside of the building, are prohibited.

**Space Conditioning, Water Heating and Plumbing System Measures:**

§110-§113: HVAC equipment, water heaters, showerheads, faucets and all other regulated appliances are certified by the Energy Commission.

§113(c)5: Water heating recirculation loops serving multiple dwelling units and High-Rise residential occupancies meet the air release valve, backflow prevention, pump isolation valve, and recirculation loop connection requirements of §113(c)5.

§115: Continuously burning pilot lights are prohibited for natural gas: fan-type central furnaces, household cooking appliances (appliances with an electrical supply voltage connection with pilot lights that consume less than 150 Btu/hr are exempt), and pool and spa heaters.

§150(h): Heating and/or cooling loads are calculated in accordance with ASHRAE, SMACNA or ACCA.

§150(i): Heating systems are equipped with thermostats that meet the setback requirements of Section 112(c).

§150(j)1A: Storage gas water heaters rated with an Energy Factor no greater than the federal minimal standard are externally wrapped with insulation having an installed thermal resistance of R-12 or greater.

§150(j)1B: Unfired storage tanks, such as storage tanks or backup tanks for solar water-heating system, or other indirect hot water tanks have R-12 external insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.

§150(j)2: First 5 feet of hot and cold water pipes closest to water heater tank, non-recirculating systems, and entire length of recirculating sections of hot water pipes are insulated per Standards Table 150-B.

§150(j)2: Cooling system piping (suction, chilled water, or brine lines), and piping insulated between heating source and indirect hot water tank shall be insulated to Table 150-B and Equation 150-A.

§150(j)2: Pipe insulation for steam hydronic heating systems or hot water systems >15 psi, meets the requirements of Standards Table 123-A.

§150(j)3A: Insulation is protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind.

§150(j)3A: Insulation for chilled water piping and refrigerant suction lines includes a vapor retardant or is enclosed entirely in conditioned space.

§150(j)4: Solar water-heating systems and/or collectors are certified by the Solar Rating and Certification Corporation.

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§150(m)1: All air-distribution system ducts and plenums installed, are sealed and insulated to meet the requirements of CMC Sections 601, 602, 603, 604, 605 and Standard 6-5; supply-air and return-air ducts and plenums are insulated to a minimum installed level of R-4.2 or enclosed entirely in conditioned space. Openings shall be sealed with mastic, tape or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape shall be used

§150(m)1: Building cavities, support platforms for air handlers, and plenums defined or constructed with materials other than sealed sheet metal, duct board or flexible duct shall not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts.

§150(m)2D: Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.

§150(m)7: Exhaust fan systems have back draft or automatic dampers.

§150(m)8: Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operated dampers.

§150(m)9: Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.

§150(m)10: Flexible ducts cannot have porous inner cores.

§150(o): All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. Window operation is not a permissible method of providing the Whole Building Ventilation required in Section 4 of that Standard.

**Pool and Spa Heating Systems and Equipment Measures:**

§114(a): Any pool or spa heating system shall be certified to have: a thermal efficiency that complies with the Appliance Efficiency Regulations; an on-off switch mounted outside of the heater; a permanent weatherproof plate or card with operating instructions; and shall not use electric resistance heating or a pilot light.

§114(b)1: Any pool or spa heating equipment shall be installed with at least 36" of pipe between filter and heater, or dedicated suction and return lines, or built-up connections for future solar heating.

§114(b)2: Outdoor pools or spas that have a heat pump or gas heater shall have a cover.

§114(b)3: Pools shall have directional inlets that adequately mix the pool water, and a time switch that will allow all pumps to be set or programmed to run only during off-peak electric demand periods.

§150(p): Residential pool systems or equipment meet the pump sizing, flow rate, piping, filters, and valve requirements of §150(p).

**Residential Lighting Measures:**

§150(k)1: High efficacy luminaires or LED Light Engine with Integral Heat Sink has an efficacy that is no lower than the efficacies contained in Table 150-C and is not a low efficacy luminaire as specified by §150(k)2.

§150(k)3: The wattage of permanently installed luminaires shall be determined as specified by §130(d).

§150(k)4: Ballasts for fluorescent lamps rated 13 Watts or greater shall be electronic and shall have an output frequency no less than 20 kHz.

§150(k)5: Permanently installed night lights and night lights integral to a permanently installed luminaire or exhaust fan shall contain only high efficacy lamps meeting the minimum efficacies contained in Table 150-C and shall not contain a line-voltage socket or line-voltage lamp holder; OR shall be rated to consume no more than five watts of power as determined by §130(d), and shall not contain a medium screw-base socket.

§150(k)6: Lighting integral to exhaust fans, in rooms other than kitchens, shall meet the applicable requirements of §150(k).

§150(k)7: All switching devices and controls shall meet the requirements of §150(k)7.

§150(k)8: A minimum of 50 percent of the total rated wattage of permanently installed lighting in kitchens shall be high efficacy. EXCEPTION: Up to 50 watts for dwelling units less than or equal to 2,500 ft<sup>2</sup> or 100 watts for dwelling units larger than 2,500 ft<sup>2</sup> may be exempt from the 50% high efficacy requirement when: all low efficacy luminaires in the kitchen are controlled by a manual on occupant sensor, dimmer, energy management system (EMCS), or a multi-scene programmable control system; and all permanently installed luminaries in garages, laundry rooms, closets greater than 70 square feet, and utility rooms are high efficacy and controlled by a manual-on occupant sensor.

§150(k)9: Permanently installed lighting that is internal to cabinets shall use no more than 20 watts of power per linear foot of illuminated cabinet.

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§150(k)10: Permanently installed luminaires in bathrooms, attached and detached garages, laundry rooms, closets and utility rooms shall be high efficacy.

EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by a manual-on occupant sensor certified to comply with the applicable requirements of §119.

EXCEPTION 2: Permanently installed low efficacy luminaires in closets less than 70 square feet are not required to be controlled by a manual-on occupancy sensor.

§150(k)11: Permanently installed luminaires located in rooms or areas other than in kitchens, bathrooms, garages, laundry rooms, closets, and utility rooms shall be high efficacy luminares. EXCEPTION 1: Permanently installed low efficacy luminaires shall be allowed provided they are controlled by either a dimmer switch that complies with the applicable requirements of §119, or by a manual-on occupant sensor that complies with the applicable requirements of §119. EXCEPTION 2: Lighting in detached storage building less than 1000 square feet located on a residential site is not required to comply with §150(k)11.

§150(k)12: Luminaires recessed into insulated ceilings shall be listed for zero clearance insulation contact (IC) by Underwriters Laboratories or other nationally recognized testing/rating laboratory; and have a label that certifies the luminaire is airtight with air leakage less than 2.0 CFM at 75 Pascals when tested in accordance with ASTM E283; and be sealed with a gasket or caulk between the luminaire housing and ceiling.

§150(k)13: Luminaires providing outdoor lighting, including lighting for private patios in low-rise residential buildings with four or more dwelling units, entrances, balconies, and porches, which are permanently mounted to a residential building or to other buildings on the same lot shall be high efficacy. EXCEPTION 1: Permanently installed outdoor low efficacy luminaires shall be allowed provided that they are controlled by a manual on/off switch, a motion sensor not having an override or bypass switch that disables the motion sensor, and one of the following controls: a photocontrol not having an override or bypass switch that disables the photocontrol; OR an astronomical time clock not having an override or bypass switch that disables the astronomical time clock; OR an energy management control system (EMCS) not having an override or bypass switch that allows the luminaire to be always on EXCEPTION 2: Outdoor luminaires used to comply with Exception1 to §150(k)13 may be controlled by a temporary override switch which bypasses the motion sensing function provided that the motion sensor is automatically reactivated within six hours. EXCEPTION 3: Permanently installed luminaires in or around swimming pool, water features, or other location subject to Article 680 of the California Electric Code need not be high efficacy luminaires.

§150(k)14: Internally illuminated address signs shall comply with Section 148; OR not contain a screw-base socket, and consume no more than five watts of power as determined according to §130(d).

§150(k)15: Lighting for parking lots and carports with a total of for 8 or more vehicles per site shall comply with the applicable requirements in Sections 130, 132, 134, and 147. Lighting for parking garages for 8 or more vehicles shall comply with the applicable requirements of Sections 130, 131, 134, and 146.

§150(k)16: Permanently installed lighting in the enclosed, non-dwelling spaces of low-rise residential buildings with four or more dwelling units shall be high efficacy luminaires. EXCEPTION: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by an occupant sensor(s) certified to comply with the applicable requirements of §119.



# HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

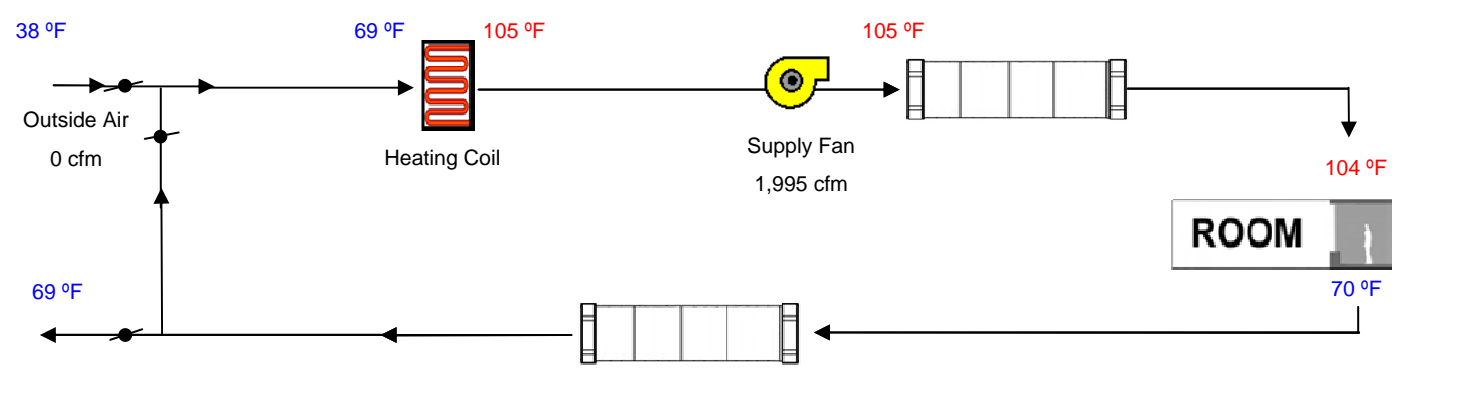
Project Name 2-Unit Condo (15%) All ECM's	Date 10/16/2010
System Name Unit A System (80% to 95%)	Floor Area 2,544

ENGINEERING CHECKS		SYSTEM LOAD					
Number of Systems	1	<b>Total Room Loads</b> Return Vented Lighting Return Air Ducts Return Fan Ventilation Supply Fan Supply Air Ducts  <b>TOTAL SYSTEM LOAD</b>	COIL COOLING PEAK			COIL HTG. PEAK	
Heating System			CFM	Sensible	Latent	CFM	Sensible
Output per System	38,000		1,985	46,993	3,320	690	25,527
Total Output (Btuh)	38,000			0			
Output (Btuh/sqft)	14.9			2,107			1,241
Cooling System				0			0
Output per System	0		0	0	0	0	0
Total Output (Btuh)	0			0			0
Total Output (Tons)	0.0			2,107			1,241
Total Output (Btuh/sqft)	0.0						
Total Output (sqft/Ton)	0.0						

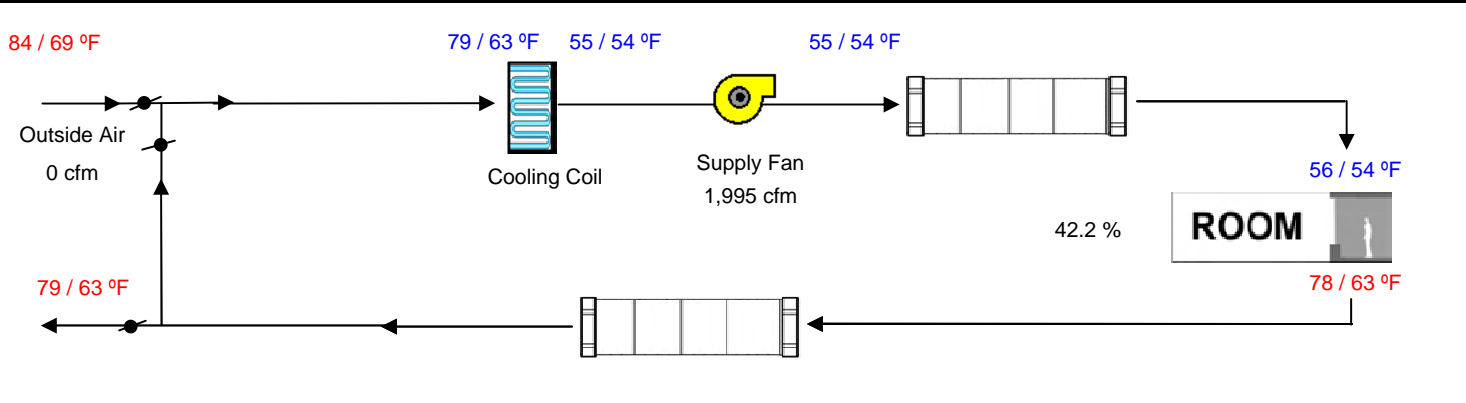
Air System		HVAC EQUIPMENT SELECTION				
CFM per System	1,995	Carrier Corp. 58MXB040-12x	0	0		38,000
Airflow (cfm)	1,995					
Airflow (cfm/sqft)	0.78					
Airflow (cfm/Ton)	0.0					
Outside Air (%)	0.0 %	<b>Total Adjusted System Output</b> (Adjusted for Peak Design conditions)	0	0		38,000
Outside Air (cfm/sqft)	0.00					

Note: values above given at ARI conditions TIME OF SYSTEM PEAK Aug 3 PM Jan 1 AM

## HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



## COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



# HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

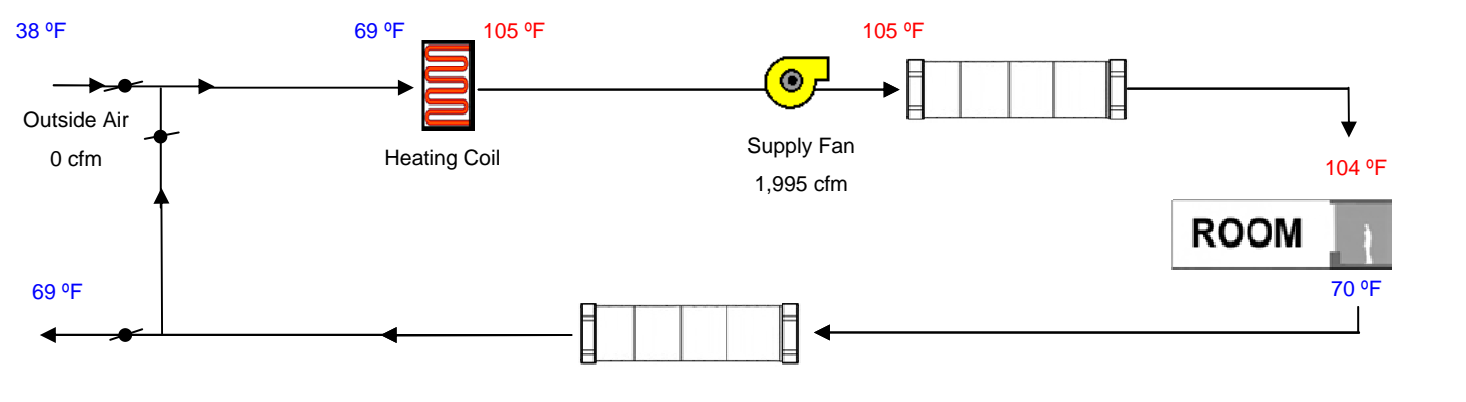
Project Name 2-Unit Condo (15%) All ECM's	Date 10/16/2010
System Name Unit B System (80% to 95%)	Floor Area 2,658

ENGINEERING CHECKS		SYSTEM LOAD					
Number of Systems	1	<b>Total Room Loads</b> Return Vented Lighting Return Air Ducts Return Fan Ventilation Supply Fan Supply Air Ducts  <b>TOTAL SYSTEM LOAD</b>	COIL COOLING PEAK			COIL HTG. PEAK	
Heating System			CFM	Sensible	Latent	CFM	Sensible
Output per System	38,000		2,007	47,481	3,361	729	26,953
Total Output (Btuh)	38,000			0			
Output (Btuh/sqft)	14.3			2,129			1,310
Cooling System				0			0
Output per System	0		0	0	0	0	0
Total Output (Btuh)	0			0			0
Total Output (Tons)	0.0			2,129			1,310
Total Output (Btuh/sqft)	0.0						
Total Output (sqft/Ton)	0.0						

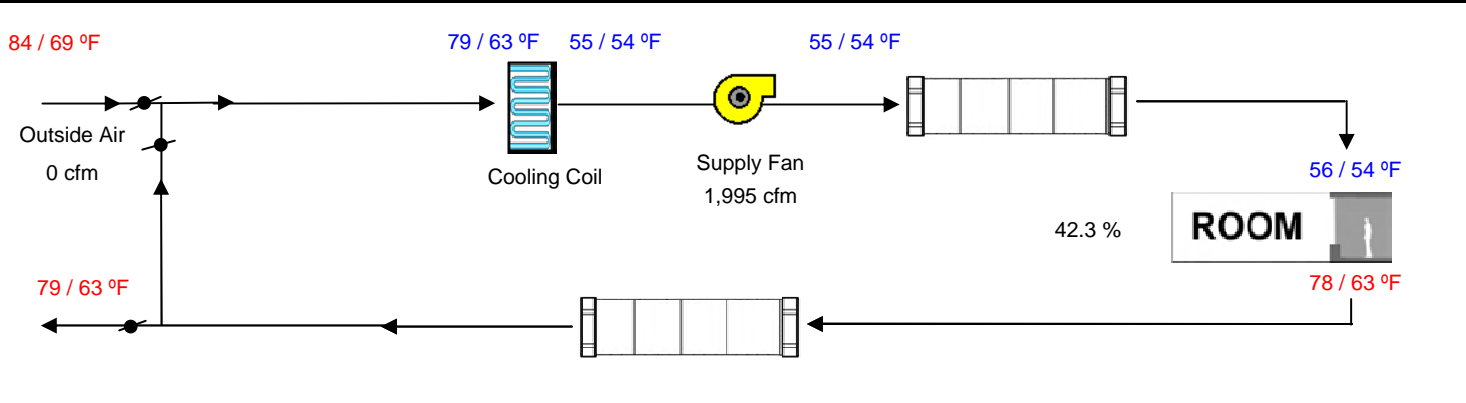
Air System		HVAC EQUIPMENT SELECTION				
CFM per System	1,995	Carrier Corp. 58MXB040-12x	0	0		38,000
Airflow (cfm)	1,995					
Airflow (cfm/sqft)	0.75					
Airflow (cfm/Ton)	0.0					
Outside Air (%)	0.0 %	<b>Total Adjusted System Output</b> (Adjusted for Peak Design conditions)	0	0		38,000
Outside Air (cfm/sqft)	0.00					

Note: values above given at ARI conditions TIME OF SYSTEM PEAK Aug 3 PM Jan 1 AM

## HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



## COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)



# ENERGY USE AND COST SUMMARY

**ECON-1**

Project Name  
2-Unit Condo (15%) All ECM's

Date  
10/16/2010

Rate: SCE GS-1

Fuel Type: Electricity

	STANDARD			PROPOSED			MARGIN		
	Energy Use (kWh)	Peak Demand (kW)	Cost (\$)	Energy Use (kWh)	Peak Demand (kW)	Cost (\$)	Energy Use (kWh)	Peak Demand (kW)	Cost (\$)
Jan	212	2	31	210	2	31	2	0	0
Feb	178	2	29	185	4	29	-7	-1	0
Mar	193	2	30	194	2	30	-2	0	0
Apr	137	2	27	139	3	27	-3	-1	0
May	95	2	25	94	2	25	1	0	0
Jun	41	3	22	44	4	22	-3	-2	0
Jul	44	3	22	46	4	22	-2	-1	0
Aug	47	4	23	48	4	23	-1	0	0
Sep	62	5	23	66	5	23	-4	0	0
Oct	40	0	22	41	0	22	-1	0	0
Nov	117	2	26	123	3	26	-6	-1	0
Dec	231	4	32	246	5	32	-15	-1	-1
Year	1,396	5	311	1,437	5	313	-40	0	-2
CO <sub>2</sub>	1,124	lbs/yr		1,157	lbs/yr		-32	lbs/yr	

Rate: SoCal GN-10

Fuel Type: Natural Gas

	STANDARD			PROPOSED			MARGIN		
	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost (\$)	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost (\$)	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost (\$)
Jan	178	141	59	142	125	47	36	16	12
Feb	149	131	49	120	117	40	29	14	10
Mar	164	118	54	133	103	44	31	15	10
Apr	120	120	39	96	98	32	23	22	8
May	91	137	30	70	110	23	20	27	7
Jun	46	17	15	34	23	11	11	-5	4
Jul	46	13	15	34	18	11	12	-5	4
Aug	46	12	15	34	12	11	12	1	4
Sep	44	23	15	33	34	11	11	-11	4
Oct	48	36	16	36	31	12	12	5	4
Nov	104	121	34	83	107	27	21	14	7
Dec	184	170	61	148	149	49	36	21	12
Year	1,218	170	401	963	149	317	255	21	84
CO <sub>2</sub>	14,253	lbs/yr		11,268	lbs/yr		2,986	lbs/yr	

Annual Totals	Energy	Demand	Cost	Cost/sqft	Virtual Rate
Electricity	1,437 kWh	5 kW	\$ 313	\$ 0.06 /sqft	\$ 0.22 /kWh
Natural Gas	963 therms	149 kBtu/hr	\$ 317	\$ 0.06 /sqft	\$ 0.33 /therm
	<b>Total</b>		\$ 630	\$ 0.12 /sqft	

Avoided CO<sub>2</sub> Emissions: 2,953 lbs/yr

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## Point-of-Sale in Manhattan Beach

### What is the proposal?

On March 16, the City's Environmental Task Force is presenting to the City Council recommendations to amend the Municipal Code for Comprehensive Sustainable Building Measures. There are several different components to this proposal, including Green building guidelines, stormwater retention, landscaping/irrigation, water/energy efficiency, renewable energy, and waste management.

### What part of the proposal do we oppose?

Page 6 of the staff report describes proposal for retrofitting plumbing fixtures in homes to conserve water. A mandate is proposed occur upon new construction, major renovations, plumbing remodels/additions, and at the point of sale. **We are opposed to the provision that mandates point-of-sale plumbing retrofits.**

### What are some key points to remember about point-of-sale?

#### ***POS hurt REALTORS because:***

- **Unfair** - To place the burden of the whole community on homebuyers and sellers is inequitable.
- **Creates higher costs and adds risk to escrow** - The cost of retrofitting or of an inspection can cause the home sale price to increase drastically.
- **Creates unsustainable legal liabilities** - Various retrofitting mandates require agent's signature which forces the real estate professional to act as an expert in a field which they are not trained.

#### ***POS hurts the City because:***

- **It's too slow** - Properties turn over, on average, just 2% per year. At this rate the city will not achieve its goals in a timely fashion. In some real estate markets it takes approximately 15 years to overturn the bulk of the housing supply.
- **It raises the City's costs** - There is no way of knowing which properties will sell next. As a result, the City cannot allocate its limited resources effectively – including staff time and materials. Some cities have found that piecemeal resource allocation will ***double*** its costs.

### What is the status of this proposal?

The Council will formally hear the presentation from the Environmental Task Force and discuss it for potential future action. The public will have the opportunity to speak for or against this proposal as well. Potential Council action may include but is not limited to:

- Direct city staff/city attorney to draft an ordinance upholding the recommendations
- Modify or remove any or all of the recommendations or add new components
- Direct the Task Force to go back and continue their discussions
- Continue the current discussion to a later Council meeting
- Do nothing