

**Application for Locally Adopted Energy Standards
by the City of Richmond In Accordance With
Section 10-106 of the California Code of Regulations,
Title 24, Part 1**

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From:
Joe Light
City of Richmond
1401 Marina Way South
Richmond, CA 94804
510.620.6703
Email: Joe_Light@ci.richmond.ca.us

Report prepared by:
Michael Gabel
Gabel Associates, LLC
1818 Harmon Street, Suite #1
Berkeley, CA 94703
(510) 428-0803
Email: mike@gabelenergy.com

Table of Contents

1.0 *Executive Summary* 1

2.0 *Impacts of the Ordinance* 3

3.0 *Cost Effectiveness* 9

4.0 *Text of the Resolution and Original Richmond Ordinance* 11

1.0 Executive Summary

The City of Richmond City Council approved and adopted its Green Building Ordinance on April 7, 2009. The new ordinance is scheduled to take effect on August 1, 2009. Gabel Associates has researched and reviewed the feasibility and energy cost-effectiveness of permit applicants exceeding the state's 2008 Building Energy Efficiency Standards in order to meet the minimum energy efficiency requirements of the proposed ordinance.

Overall Scope of the Ordinance

| | |
|---|---|
| New ordinance or revision to previous ordinance? | New Ordinance |
| Projected Effective Date: | August 1, 2009 |
| Green building or stand-alone energy ordinance? | Green Building Ordinance |
| Do minimum energy requirements increase after initial effective date? | No |
| Occupancies covered? | Residential & Commercial |
| Energy requirements apply to new construction, additions, alterations? | New Construction, Additions |
| Special or unusual requirements? | No |
| Third party verification? | LEED AP |
| Implementation details in the ordinance or in a separate document? | Separate Implementation Guidelines |

Key Features of the Ordinance By Occupancy Type

| Occupancy Type | General Requirements | Minimum Energy Requirement |
|---|---|--|
| New Single Family Homes and Duplexes: | 2009 GreenPoint Rated: | |
| < or = 1750 SF | 50 points | 15% Better-than-Title 24 |
| > 1750 SF | 55 points + 2 points for each additional 100 SF | 15% Better-than-Title 24 |
| Additions to Single Family Homes and Duplexes: | 2009 GreenPoint Rated: | |
| Projects subject to Design or Admin. Design Review | 50 points + 2 points for each 100 SF over 1,200 SF | 15% Better-than-Title 24 |
| New Multi-Family Buildings: | 2009 GreenPoint Rated: | |
| All Projects | 60 points | 15% Better-than-Title 24 |
| New Nonresidential Buildings: | LEED-NC | |
| 5,000 to 20,000 SF | LEED Certified | (LEED minimum or Implementation Guidelines) ¹ |
| > 20,000 SF | LEED Certified through 6/30/10 LEED Silver starting 7/1/10 | (LEED minimum or Implementation Guidelines) ¹ |
| Nonresidential Alterations: | Use appropriate LEED system: | |
| 5,000 to 20,000 SF | 35% of possible LEED points | No energy requirement. |
| > 20,000 SF | 45% of possible LEED points | No energy requirement. |

Note 1: Permit applicant must follow LEED rules using the appropriate ASHRAE 90.1 baseline and the Energy Cost Budget (ECB) Method or exceeding Title 24 by the percentage specified by LEED; or follow the local jurisdiction's Implementation Guidelines which establish energy equivalence to the specified version of LEED.

2.0 Impacts of the Ordinance Under the 2008 Title 24 Standards

The energy performance impacts of the Ordinance have been evaluated using five case studies which collectively reflect the broad range of building types covered by the Ordinance.

- Single family house: 2-story 2,025 sf
- Low-rise multi-family: 3-story 8,442 sf, 8 dwelling units
- High-rise residential: 5-story 36,800 sf, 40 dwelling units
- Nonresidential: 2-story 21,160 sf, office building
- Nonresidential: 5-story 52,900 sf, retail/office building

The methodology used in the case studies is based on the way that real buildings are designed and evaluated to meet or exceed the energy standards.

- (a) Each prototype building design is tested for compliance with the 2008 Standards, and all energy measures are adjusted with common construction options to just barely meet the Standards. The energy measures chosen are a combination of measures which reflects how designers, builders and developers are likely to achieve a specified level of performance.
- (b) Starting with a 2008 Standards minimally compliant set of measures, various items are changed to just reach the minimum energy performance required by the Ordinance (e.g, 15% better than 2008 Title 24). In this study, the design choices are based on many years of experience with architects, mechanical engineers and builders and general knowledge of the relative incremental costs of most measures. The intent of this approach is for the study to reflect how building energy performance is actually studied and used to select final energy measures.
- (c) A minimum and maximum range of incremental costs of added energy measures is established by a variety of research means. A construction cost estimator, Building Advisory LLC, was contracted to conduct research and surveys to obtain accurate and current measure cost information. Site energy in KWh and Therms, is calculated for each run to establish the annual energy savings, energy cost savings and CO₂-equivalent reductions in greenhouse gases.

2.1 Single Family House

The following measures were first evaluated so that the house design just meets the 2008 standards in Climate Zone #3:

2,025 SF 2-story home 2008 Title 24 Base Case, 20.2% total glazing area:

- R-38 roof w/ radiant barrier
- R-13 exterior walls
- R-19 raised floor
- Dual vinyl windows, U=0.40, SHGC=0.40 w/ no overhangs
- Furnace: 80% AFUE; No Cooling
- R-6 ducts in the attic
- DHW: 50 gallon gas water heater, EF=0.62; no extra pipe insulation

Single Family Energy Measures Needed to Meet the City's Ordinance

The following energy features have been modified from the 2008 Title 24 set of measures so that the house design uses 15% less TDV energy than the corresponding 2008 Title 24 base case design. The incremental first cost to provide that measure in comparison with the equivalent base case measure is listed to the right.

The incremental energy improvements specified above to meet the proposed Ordinance requirements are variables selected by designer, builder or owner. There are a number of considerations in choosing the final mix of energy measures including first cost, aesthetics, maintenance and replacement.

2,025 sq.ft. Home: Reduction in 2008 T24 TDV Energy by 15%:

| | |
|---|--------------------------------|
| • 92% AFUE furnace | \$ 500 - 1,200 |
| • Reduced duct leakage (installation testing & HERS inspection) | \$ 300 - 600 |
| • House wrap: 2,550 sf @ \$0.08 to \$0.12/sf | \$ 205 - 305 |
| Total incremental cost of Ordinance energy measure: | \$ 1,005 - 2,105 |
| Incremental cost in \$/sq.ft.: | \$ 0.50 to 1.04 /sq.ft. |
| | Avg = \$0.77 /sf |

2.2 Low-rise Multi-family Building

The following measures were first evaluated so that the multi-family building just meets the 2008 standards in Climate Zone #3:

8,442 SF 2-story building 2008 Title 24 Base Case, **12.5% total glazing** area:

- R-38 roof w/ radiant barrier, R-13 exterior walls, slab-on-grade 1st floor
- Dual vinyl windows, U=0.39, SHGC=0.33 w/ no overhangs
- Furnace: 80% AFUE; No Cooling
- R-6 ducts in the attic
- DHW: 50 gallon gas water heater, EF=0.575; no extra pipe insulation

Low-rise Multi-family Energy Measures Needed to Meet the City's Ordinance

8,442 sq.ft. Multi-family: Reduction in 2008 T24 TDV Energy by 15%:

| | |
|---|--------------------------------|
| • Reduced duct leakage (installation testing & HERS inspection) | \$ 2000 - 4000 |
| • R-15 wall insulation: 9,266_sf @ \$0.06 to \$0.08/ sf | \$ 560 - 745 |
| • House wrap: 9,266 sf @ \$0.08 to \$0.12/sf | \$ 745 - 1,115 |
| • (8) 92% AFUE furnaces | \$ 4,000 - 9,600 |
| • R-49 roof/ceiling insulation, 2,880 sf @\$0.19 - \$0.22/sf | \$ 550 - 635 |
| Total incremental cost of Ordinance energy measure: | \$ 7,855- 16,095 |
| Incremental cost in \$/sq.ft.: | \$ 0.93 to 1.91 /sq.ft. |
| | Avg = \$1.42 /sf |

2.3 High-rise Residential Building

The following measures were first evaluated so that the high-rise residential building just meets the 2008 standards in Climate Zone #3:

36,800 SF 5-story building 2008 Title 24 Base Case, 35.2% Window Wall Ratio glazing area, 40 dwelling units:

- R-30 attic insulation w/ cool roof Reflectance=0.30, Emittance=0.75
- R-19 in metal frame exterior walls
- Un-insulated (R-0) raised slab floor over parking garage;
- Dual vinyl NFRC-rated Low-E windows: U-factor=0.33, SHGC=0.30, (SHGC includes minimal exterior shading)
- Split heat pump for each dwelling unit: HSPF=7.2, EER=10.2
- Central domestic hot water boiler, 82.7% AFUE; re-circulating system w/ timer and temperature controls; variable speed drive hot water pump

High-rise Residential Energy Measures Needed to Meet the City's Ordinance

36,800 sq.ft. building: Reduction in 2008 T24 TDV Energy by 10%:

| | |
|---|--------------------------------|
| • R-3.5 (1") K-13 spray-on insulation under raised floor 9,200 sf @ \$1.20 - \$1.50/sf | \$ 11,040 - 13,800 |
| • (2) Munchkin boilers 92% AFUE @ \$1200 - \$2,000 each | \$ 2,400 - 4,000 |
| • Heat pumps: HSPF=7.84 / EER=11.2 80 units @\$150 - \$250 each | \$ 12,000 - 20,000 |
| Total incremental cost of Ordinance energy measure: | \$ 25,440 - 37,800 |
| Incremental cost in \$/sq.ft.: | \$ 0.69 to 1.03 /sq.ft. |
| | Avg = \$0.86 /sf |

2.4 Nonresidential Building: 2-Story

The following measures were first evaluated so that the following 2-story nonresidential building just meets the 2008 standards in Climate Zone #3:

21,160 SF 2-story building 2008 Title 24 Base Case, 37.1% Window Wall Ratio glazing area:

- R-38 attic insulation, R-19 in metal frame exterior walls, slab-on-grade 1st floor;
- NFRC-rated Low-E windows: U-factor=0.50, SHGCc=0.38 (e.g., Viracon VE 1-2M) w/ no exterior shading
- Lighting = 0.867 w/sf: 248 2-lamp 4' T8 fixtures @ 62w each and 104 26w CFLs @ 26 w each; no lighting controls
- (4) 10-ton Packaged DX units: Carrier EER=11.0, 4,000 CFM; (4) 7.5-ton Packaged DX units: Carrier EER=11.0, 3,000 CFM; all standard efficiency fan motors
- Ducts in conditioned space, R-4.2 duct insulation
- Domestic hot water assumed to be standard gas water heater

Nonresidential Energy Measures Needed to Meet the City's Ordinance

21,160 sq.ft. building: Reduction in 2008 T24 TDV Energy by 10%:

- | | |
|---|---------------------------------|
| • U=0.50, SHGCc=0.31 (e.g., Viracon VE 2-2M) 5,160 sf @\$2.00 - 3.00/sq.ft. | \$ 10,320 - 15,480 |
| • 248 2-lamp 4' T8 fixtures with high efficiency instant start ballasts and premium T8 lamps, 50 input watts @\$25.00 - \$30.00/fixture; Installed LPD=0.727 | \$ 5,800 - 6,960 |
| Total incremental cost of Ordinance energy measure: | \$ 16,120 - 22,440 |
| | Avg = \$19,280 |
| Incremental cost in \$/sq.ft.: | \$ 0.76 to \$1.06/sq.ft. |
| | Avg = \$0.91 /sf |

2.5 Nonresidential Building: 5-Story

The following measures were first evaluated so that the following 5-story nonresidential building just meets the 2008 standards in Climate Zone #3:

52,900 SF 5-story building 2008 Title 24 Base Case, 32.5% Window Wall Ratio glazing area:

- R-30 attic insulation, R-19 in metal frame exterior walls, slab-on-grade 1st floor;
- NFRC-rated Low-E windows: U-factor=0.50, SHGC=0.38 (e.g., Viracon VE 1-2M) w/ no exterior shading
- Lighting = 0.887 w/sf: 720 2-lamp 4' T8 fixtures @ 62w each and 260 26w CFLs @ 26 w each; no lighting controls
- 4 identical Packaged VAV units: Aaron 25 ton, EER=10.4, 10,000 CFM, standard efficiency fan motors, 30% VAV boxes w/ reheat
- Ducts in conditioned space, R-4.2 duct insulation
- Hot water assumed to be standard gas water heater

Nonresidential Energy Measures Needed to Meet the City's Ordinance

52,900 sq.ft. building: Reduction in 2008 T24 TDV Energy by 10%

| | |
|---|---------------------------------|
| • R-38 w/ Cool Roof 10,580 sf @ \$0.30 - \$0.40/sf | \$ 3,175 - 4,230 |
| • 10 NEMA Premium fan motors on supply & return fans | \$ 750 - 1,250 |
| • 720 2-lamp 4' T8 fixtures with high efficiency instant start ballasts and premium T8 lamps, 50 input watts @ \$25.00 - \$30.00/fixture; Installed LPD=0.803 | \$ 18,000 - 21,600 |
| • 120 occupant sensors controlling (2) 2-lamp T8 fixtures; @ \$65.00 - \$85.00 each | \$ 7,800 - 10,200 |
| • 40 more recessed CFL fixtures, all CFL fixtures w/ 18w lamps @ \$175 - \$250 each | \$ 7,000 - 10,000 |
| Total incremental cost of Ordinance energy measure: | \$ 36,725 - 47,280 |
| | Avg = \$42,003 |
| Incremental cost in \$/sq.ft.: | \$ 0.69 to \$0.89/sq.ft. |
| | Avg = \$0.79 /sf |

3.0 Cost Effectiveness Under the 2008 Title 24 Standards

- Incremental site electricity (kWh) and natural gas (therms) saved per year as calculated using state-approved energy compliance software for the 2008 Building Energy Efficiency Standards, EnergyPro Version 5 and Micropas 8
- Average utility rates of \$0.163/kWh for electricity and \$1.30/therm for natural gas in current constant dollars
- The assumption of no change (i.e., no inflation or deflation) of utility rates in constant dollars over time
- The assumption of no increase in summer temperatures (though recent scientific studies suggest that global climate change will increase temperatures in the Western U.S. which in turn will increase air conditioning energy use)

Cost-effectiveness analysis of the Ordinance with respect to each building occupancy type and design assumes:

- No external cost of global climate change -- and corresponding value of additional investment in energy efficiency and CO₂-e reduction – is included
- The cost of financing the incremental cost of energy measures is not included.

3.1 Single Family House

| Building Description | Average Incremental First Cost (\$) | Net Incremental Annual Energy Cost Savings (\$) | Simple Payback (years) |
|-----------------------------|--|--|-------------------------------|
| 2,025 sf (T24-15%) | \$1,555 | \$127 | 12.2 |

Annual Reduction in CO₂-equivalent: 0.52 lbs./sq.ft.- year

3.2 Low-rise Residential Building

| Building Description | Average Incremental First Cost (\$) | Net Incremental Annual Energy Cost Savings (\$) | Simple Payback (years) |
|-----------------------------|--|--|-------------------------------|
| 8,442 sf (T24-15%) | \$11,975 | \$471 | 25.4 |

Annual Reduction in CO₂-equivalent: 0.46 lbs./sq.ft.- year

3.3 High-rise Residential Building

| Building Description | Average Incremental First Cost (\$) | Net Incremental Annual Energy Cost Savings (\$) | Simple Payback (years) |
|----------------------|-------------------------------------|---|------------------------|
| 36,800 sf (T24-10%) | \$31,620 | \$1,419 | 22.3 |

Annual Reduction in CO2-equivalent: 0.15 lbs./sq.ft.- year

3.4 Nonresidential Building: 2-Story

| Building Description | Average Incremental First Cost (\$) | Net Incremental Annual Energy Cost Savings (\$) | Simple Payback (years) |
|----------------------|-------------------------------------|---|------------------------|
| 21,160 sf (T24-10%) | \$19,280 | \$2,005 | 9.6 |

Annual Reduction in CO2-equivalent: 0.24 lbs./sq.ft.- year

3.5 Nonresidential Building: 5-Story

| Building Description | Average Incremental First Cost (\$) | Net Incremental Annual Energy Cost Savings (\$) | Simple Payback (years) |
|----------------------|-------------------------------------|---|------------------------|
| 52,900 sf (T24-10%) | \$42,003 | \$4,745 | 8.9 |

Annual Reduction in CO2-equivalent: 0.24 lbs./sq.ft.- year

Conclusions

Regardless of the building occupancy type and number of stories, the incremental improvement in overall annual energy performance of buildings under the Richmond Green Building Ordinance and the 2008 Title 24 Standards is cost-effective. Each building's specific design, occupancy type and design choices used to meet the state's energy code -- and then go beyond code to meet the Ordinance -- may allow for a large range of incremental first cost and payback. Any permit applicant complying with the energy requirements of the Richmond Green Building Ordinance should carefully analyze building energy performance to reduce incremental first cost and reduce the payback for the required additional energy measures.

4.0 Text of the Richmond Green Building Ordinance

ORDINANCE NO. _____ N.S.

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF RICHMOND ADDING CHAPTER 6.46 TO THE CITY OF RICHMOND MUNICIPAL CODE ESTABLISHING GREEN BUILDING STANDARDS FOR THE CONSTRUCTION AND/OR RENOVATION OF COMMERCIAL AND RESIDENTIAL BUILDINGS

Now, therefore, the City Council of the City of Richmond does ordain as follows:

SECTION 1

Chapter 6.46 entitled “**COMMERCIAL AND RESIDENTIAL GREEN BUILDING STANDARDS**” is hereby added to the City of Richmond Municipal Code to read as follows:

CHAPTER 6.46

Sections:

| | |
|-----------------|---|
| 6.46.010 | Title and Purpose |
| 6.46.020 | Findings |
| 6.46.030 | Definitions |
| 6.46.040 | Applicability |
| 6.46.050 | Compliance Tiers, Thresholds and Standards |
| 6.46.060 | Compliance Requirements |
| 6.46.070 | Infeasibility Exemption |
| 6.46.080 | Enforcement |

6.46.010 Title and Purpose

The provisions of Sections 6.46.010 through 6.46.070 inclusive, shall be known as the City of Richmond “**COMMERCIAL AND RESIDENTIAL GREEN BUILDING STANDARDS.**” The purpose of this Chapter is to enhance the public welfare and assure that commercial and residential building renovations and construction projects are consistent with the City’s desire to create a more sustainable community by incorporating Green Building techniques and technologies into the design, construction and maintenance of buildings. The Green Building requirements referenced in this section are designed to achieve the following goals:

- a. To encourage resource conservation;
- b. To reduce construction waste;
- c. To increase energy efficiency and conservation; and
- d. To promote the health and productivity of the City’s residents, workers, and visitors.

6.46.020

Findings

The City Council of the City of Richmond finds as follows:

(a) The City of Richmond's General Plan sets forth goals for preserving and improving the City's natural and built environments, protecting the health of its residents and visitors, and fostering its economy; and

(b) The demolition, design, construction, and maintenance of buildings and structures within the City has a significant impact on the City's environmental sustainability, resource usage and efficiency, greenhouse gas emissions, and solid waste generation; and

(c) Green Building refers to a whole systems approach to the location, design, construction, and operation of buildings, the benefits of which are spread throughout the systems and features of the building and environment; and

(d) Green Building can include, among other things, the use of certified sustainable wood products; a substantial increase in the use of high recycled-content products; recycling of waste that occurs during deconstruction, demolition, and construction; enhancement of indoor air quality by selection and use of construction materials that do not have chemical emissions that are toxic or irritating to building occupants; modification of heating, ventilation, and air-conditioning systems to provide energy efficiency and improved indoor air; installation of energy efficient lighting, equipment, and appliances; use of water conserving methods and equipment; and installation of alternative energy methods for supplemental energy production; and

(e) Green Building design and construction decisions made by the City and private builders in the construction and remodeling of buildings can result in significant cost savings and environmental benefits to City residents over the life of the buildings; and

(f) Given that the purpose of this Ordinance is to adopt stricter local energy efficiency standards for the construction of certain new residences and commercial buildings within the City, the Council finds that the adoption of new standards without additional education and training for City staff responsible for enforcement of the standards could diminish compliance and potentially undermine the efficacy of the Ordinance. In order to ensure greater compliance and enforcement of the applicable energy efficiency standards, to better equip Building Department staff, and to provide a greater resource to the City's building community, the City will seek out additional education and training opportunities for Building Department staff in the areas of energy standards, technology and implementation.

(g) Nothing in this Ordinance is intended to duplicate, infringe or contradict the provisions of the California State Building Code or any other State law. The Ordinance and associated Green Building Guidelines provide many opportunities to attain required credits in manners that do not exceed, alter or contradict standards or provisions in established State building laws; and

(h) This proposed Ordinance will preserve and enhance the environment within the City of Richmond and is exempt from the requirements of the California Environmental Quality Act (“CEQA”), as amended, pursuant to Guideline 15308, Guideline 15183 and Guideline 15061(b)(3) of the CEQA Guidelines.

6.46.030 Definitions

Definitions used in California Code of Regulations, Title 24, Parts 1 and 6, as amended, shall govern this Chapter. In addition, the following words and phrases whenever used in this Chapter shall be defined as follows:

- (a) “City” means the City of Richmond and all of its Departments and Agencies, the Richmond Housing Authority and the Richmond Community Redevelopment Agency.
- (b) “City Certified” means City of Richmond staff has verified that the project has met the Compliance Threshold as specified in this Chapter. City Certified projects need not be registered with or receive a certificate of evaluation from any Green Building certifying body such as Build-it-Green or the U.S. Green Building Council.
- (c) “City Funded Building Project” means any Construction, Demolition or Renovation of any Commercial, Residential or Mixed-Use Building Project within City limits for which a City Department or Agency grants, donates, lends or provides monies or services over \$300,000 in value, or is located on City-owned land.
- (d) “Commercial Project” means all buildings defined as Non-Residential (including Hotel/Motel and industrial building projects) in California Code of Regulations, Title 24, Part 6
- (e) “Conditioned Space” means the space in a building that is either directly conditioned or indirectly conditioned as defined by the California Code of Regulations, Title 24, Part 6, as amended.
- (f) “Conditioned Space, Directly” means an enclosed space that is provided with wood heating, is provided with mechanical heating that has a capacity exceeding 10 Btu/hr-ft², or is provided with mechanical cooling that has a capacity exceeding 5 Btu/hr-ft², unless the space-conditioning system is designed for a process space as defined by the California Code of Regulations, Title 24, Part 6, as amended.
- (g) “Conditioned Space, Indirectly” means an enclosed space, including, but not limited to, unconditioned volume in atria, that (1) is not directly conditioned space; and (2) either (a) has a thermal transmittance area product (UA) to directly conditioned space exceeding that to the outdoors or to unconditioned space and does not have fixed vents or openings to the outdoors or to unconditioned space, or (b) is a space through which air from directly conditioned spaces is transferred at a rate exceeding three air changes per hour as defined by the California Code of Regulations, Title 24, Part 6, as amended.

- (h) “Construction” means the building of any new building or any portion thereof.
- (i) “Covered Project” means all the building projects specified in Section 6.46.040(A).
- (j) “Detached Unit” means a residential dwelling unit built as part of a project containing more than one dwelling unit that does not share a common wall and roof with other units of that project or is situated on an individually recorded parcel.
- (k) “Green Building” means a whole systems approach to the design, construction, and operation of buildings and structures that helps mitigate adverse environmental, economic, and social impacts of the demolition, renovation, construction and operation of buildings.
- (l) “Green Building Checklist” means a checklist or scorecard to calculate a Covered Project’s score on the applicable Green Building Rating System.
- (m) “Green Building Rating System” means the rating system, such as LEED[®] and Green Point Rated, associated with specific Green Building criteria to be used to determine compliance with the Green Building compliance standards and thresholds of this Chapter.
- (n) “LEED[®]” means the “Leadership in Energy and Environmental Design” Green Building Rating System, which provides a suite of standards for environmentally sustainable construction. Refer to the City’s *Implementation Guidelines* to determine the latest version of LEED[®].
- (o) “LEED[®] AP” means a LEED[®] accredited professional, an individual trained and accredited by the U.S. Green Building Council to verify a Building’s compliance with the standards of the LEED[®] Green Building Rating System.
- (p) “LEED[®] AP Verified” means verified by a LEED[®] accredited professional certifying that each LEED[®] checklist point listed was completed.
- (q) “Mixed-Use Building Project” refers to any building within City limits that combines the uses of a Commercial Project and a Residential Project.
- (r) “Multi-Family Residential Project” means any Residential Project containing more than one dwelling unit, including, but not limited to, duplexes, apartments, condominiums, townhouses and developments of multiple single-family homes.
- (s) “Non-Covered Project” means the building projects specified in Section 6.46.040(A).
- (t) “Residential Project” refers to any building within City limits used for living,

sleeping, eating and cooking, including assisted living facilities and senior housing. For purposes of this Chapter, a Residential Project includes Multi-Family Residential Projects and single-family residential projects. A Residential Project does not include hotels, motels, inns or similar commercial enterprises wherein rooms or suites of rooms are rented for transient occupancy and are considered Commercial Projects.

- (s) “Single-Family Addition” means any Residential Project that increases conditioned floor area and conditioned volume to an existing residence. Single-family residential additions may be attached or detached. For the purposes of this Chapter, Single-Family Addition shall include the floor area of an existing Single-Family Dwelling removed and replaced as part of an addition but shall not include portions of an existing dwelling that are retained and remodeled.
- (t) “Single-Family Dwelling” means a Residential Project on a single parcel containing one dwelling unit, a duplex or one dwelling unit with a legal second unit as defined in Section 15.04.810 of the Richmond Municipal Code. For the purposes of this Chapter, townhouses may be considered single-family residential projects provided there are recorded property lines between each unit and the occupancy group, and division of each unit is designated as an R-3 as defined in the California Building Code.
- (u) “Structure” means an edifice or building of any kind or any piece of work artificially built or composed of parts joined together in some definite manner and permanently attached to the ground, as defined in the California Building Code.
- (v) “Threshold” means the minimum number of points or rating level of a Green Building Rating System that must be attained for a particular Covered Project type and Tier.
- (w) “Tier” means the required levels for which a Covered Project must meet the minimum Thresholds established in this Chapter. Tier levels may be determined by various project characteristics, including housing size, number or density for single-family projects, number of dwelling units for multi-family residential projects and/or gross building area as defined in Section 15.04.810.011, Definitions (Zoning) of the Richmond Municipal Code for all other Covered Project types.

6.46.040 Applicability

A. This Chapter shall apply to all Construction and Renovation projects *except* the following:

1. Renovation of Residential Projects not done in conjunction with a building Addition;
2. Single-family Dwelling Additions not subject to design or administrative design review;
3. New commercial buildings or commercial renovation projects less than 5,000 square feet of conditioned space as defined by the California Code of Regulations, Title 24;

4. Renovation or restoration of structures specifically listed on a national, state or local register of historical resources not including contributing structures;
 5. Project applications submitted to and deemed complete by the Planning or Building Divisions on or before the effective date of this Chapter;
 6. Any project below the minimum Compliance Tiers as listed in 6.46.050;
 7. City Building Projects, which are subject to the Green Building Requirements for City Buildings and Traditional Public Works Projects (Richmond Municipal Code 6.45).
- B. Neither this Chapter, nor any of its implementing regulations shall affect in any manner the permissible use of property, density/intensity of development, design and improvement standards, or other applicable standards or requirements, all of which shall remain in full force and effect without limitation. Moreover, green measures required by this Chapter shall not supersede any applicable design guideline established by the City of Richmond and/or in the case of structures over 50 years in age, the State of California Historical Building Code and/or U.S. Secretary of Interior’s Standards for the Treatment or Rehabilitation of Historic Structures. In all instances where there is a conflict between the Commercial and Residential Green Building Standards and Richmond’s Architectural Guidelines, the City’s Architectural Design Guidelines shall take precedent and the Commercial and Residential Green Building Standards shall be adapted to conform to the design standards.
- C. All buildings subject to the provisions of this Chapter shall meet or exceed the energy requirements contained in the 2008 California Building Energy Efficiency Standards, including California Code of Regulations, Title 24, Parts 1 and 6. Should any provisions of this Chapter conflict with the laws of the State of California, State law shall govern.

6.46.050 Compliance Tiers, Thresholds and Standards

- A. Covered Project Tiers, compliance Thresholds and compliance standards shall be defined in Tables 1 through 5 below. During any 24-month period, new construction or renovations on any single lot shall be considered a single project.

| Table 1 – New Single-Family Dwellings including Habitable Accessory Structures & Duplexes | | | | | |
|--|-----------|---|---------------------|---|--------------------------|
| Covered Project Tiers | | Compliance Thresholds | Verification | Rating System* | Publishing Agency |
| Tier 1 | ≤ 1750 SF | 50 points | City Certified | New Home Construction Green Building Guidelines | Build It Green |
| Tier 2 | > 1750 SF | 55 points + 2 for every additional 100 SF | City Certified | | |

| Table 2 – Single-Family Dwelling & Duplex Additions | | | | | |
|--|---|--|---------------------|---|--------------------------|
| Covered Project Tier | | Compliance Thresholds | Verification | Rating System* | Publishing Agency |
| Tier 1 | Subject to Design or Admin. Design Review | 50 Points + 2 for every 100 SF over 1,200 SF | City Certified | Home Remodeling Green Building Guidelines | Build it Green |

| Table 3 – New Multi-Family Dwellings | | | | | |
|---|--------------|------------------------------|---------------------|--|--------------------------|
| Covered Project Tier | | Compliance Thresholds | Verification | Rating System* | Publishing Agency |
| Tier 1 | All Projects | 60 Points | City Certified | Multi-family Green Building Guidelines | Build It Green |

| Table 4 – New Commercial Buildings | | | | | |
|---|-------------------|--|---------------------|---|-----------------------------|
| Covered Project Tiers | | Compliance Thresholds | Verification | Rating System* | Publishing Agency |
| Tier 1 | 5,000 – 20,000 SF | LEED® Certified | LEED® AP Verified | LEED® – NC New Construction -or- LEED® for Schools -or- LEED® – CS Core and Shell | U.S. Green Building Council |
| Tier 2 | > 20,000 SF | LEED® Certified through 6/30/10 LEED® Silver beginning 7/1/10 | LEED® AP Verified | | |

| Table 5 – Commercial Renovations | | | | | |
|----------------------------------|-------------------|--------------------------------|-------------------|--|-----------------------------|
| Covered Project Tiers | | Compliance Thresholds | Verification | Rating System* | Publishing Agency |
| Tier 1 | 5,000 – 20,000 SF | 35% of possible LEED® Points** | City Certified | LEED® – NC New Construction -or- LEED® for Schools -or- LEED® – CS Core and Shell -or- LEED® – EB Existing Buildings | U.S. Green Building Council |
| Tier 2 | > 20,000 SF | 45% of possible LEED® Points** | LEED® AP Verified | | |

* The most recently published versions of each required checklist should be used. The Director of Planning and Building Services may accept alternate Green Building Rating Systems found to be equally or more rigorous, such as, but not limited to LEED® for Homes or Passive House Institute US systems.

** No minimum energy efficiency requirements are required beyond the State Building Code.

1. For those Project Types listed in Table 1 that list multiple LEED® required Green Building rating systems, the project shall be completed using the most appropriate rating system, as specified by the U.S. Green Building Council (“USGBC”) descriptions and instructions or, in the absence of a determination by the USGBC, as interpreted by the Director of Planning and Building Services.
2. Mixed-use projects in which commercial space occupies less than 15% of the gross floor area of a building shall be considered a residential project and be required to use the latest version of the *Multi-family Green Building Guidelines* and corresponding checklist as listed in Table 1. Mixed-use projects in which commercial space occupies more than 15% of the gross floor area of the building shall be treated as both independent residential and commercial projects and be required to meet the appropriate multi-family and commercial green building requirements as detailed in Table 3, depending on the project tier.
3. All residential projects with 30 or more detached units shall also submit a LEED® - ND (Neighborhood Development) checklist for information purposes only.

- B. The Director of Planning and Building Services shall promulgate any rules and regulations necessary or appropriate, including third-party verification, to achieve and verify compliance with the requirements of this Chapter. These rules and regulations shall be entitled “Implementation Guidelines.” The *Implementation Guidelines* shall, at a minimum, provide for the incorporation of the appropriate green building checklist into all planning entitlement submittals and building permit applications for Covered Projects as well as the provision of supporting design, construction, or development documents to demonstrate compliance with this Chapter.
- C. Projects following the LEED® standards must demonstrate energy performance compliance using one of the three following methods (use the LEED® version specified in the *Implementation Guidelines*).
1. Follow the LEED® rules for reducing the annual energy cost of the baseline building using the American Society of Heating, Refrigerating, and Air-Conditioning Engineers/Illuminating Engineering Society of North America (ASHRAE/IESNA) Standard 90.1-2004 for LEED v2.2 and the ASHRAE/IESNA Standard 90.1-2007 for LEED v3.0-2009). The analysis must include detailed accounting of all on-site building energy use, including all exterior and security lighting, elevators, and all process and receptacle loads. The information required for LEED certification by the USGBC for this measure must be kept in the project documents; or,
 2. Employ software (such as EnergyPro v5) which is capable of automatically setting the baseline or reference building for the LEED® ASHRAE/IESNA Standard 90.1-2004 or 90.1-2007 calculations from the data input for the proposed building. In addition to Title 24 performance data, submit documentation showing the annual energy costs for the baseline building and the proposed building demonstrating that the proposed building reduces the annual energy cost by the requisite percentage specified by the appropriate version of LEED; or,
 3. Submit standard 2008 Title 24 energy performance documentation demonstrating that the proposed building uses at least 10% less TDV energy than the standard design. Exterior lighting, receptacle and process loads may be excluded in the “Better than Title 24” calculations. Interior lighting may also be excluded from this calculation when the interior lighting system is not being permitted.
- D. Compliance with the provisions of this Chapter shall be considered a condition of any design review, zoning, subdivision, or other use approvals as well as any building permit that is necessary for a Covered Project. Failure to comply with these requirements shall be subject to penalties as described in Section 6.46.080 of this Chapter.

6.46.060 Compliance Requirements

- A. Discretionary Planning Entitlements. Application materials for all Covered Projects subject to discretionary planning entitlement shall include the completed Green Building Checklist appropriate to the Covered Project type demonstrating compliance with the minimum achievement Thresholds set for the Covered Project Tier.
- B. Building Permit Application. The Building permit application for a Covered Project must include a copy of the Green Building Checklist appropriate to the Covered Project type printed on the plan set that shows that the requisite achievement thresholds have been met. An index locating each detailed drawings, specification or general note that demonstrates means of adherence with each checklist measure claimed shall also be included with the checklist.
- C. Certificate of Occupancy. In no instance shall a Certificate of Occupancy be issued to a Covered Project that fails to meet the requisite achievement threshold for its type and tier.

6.46.070 Infeasibility Exemption

- A. Exemption. If the Applicant for a Covered Project believes that unique circumstances exist that make it infeasible to fully meet the requirements of this Chapter, the Applicant may apply to the Building Official for an Infeasibility Exemption. The burden is on the Applicant to demonstrate infeasibility.
- B. Application. If an applicant for a Covered Project believes such circumstances exist, the applicant may apply for an exemption. The application for an Infeasibility Exemption shall be made on a form provided by the Planning and Building Services Department. The applicant shall indicate the maximum threshold of compliance he or she believes is feasible for the Covered Project and the circumstances that he or she believes make it infeasible to fully comply with this Chapter. Such circumstances may include an unavailability of technologies for specific measures and a lack of Green Building measures that are compatible with the scope of the project.
- C. Timing of Decision. The Building Official shall render a decision on the application within 30 days from the time that the application is deemed complete.
- D. Granting of Exemption. If an exemption is granted, the Applicant must still comply with this Chapter in all other respects and shall be required to achieve the applicable compliance threshold, less the credits or points that would have been achieved for the exempted items.
- E. Appeal.
 - 1. The applicant may appeal the Building Official's denial of an infeasibility exemption. Any appeal must be made to the Board of Appeals in accordance with Richmond Municipal Code section 6.02.130 within fifteen (15) days of the denial by the Building Official.

2. The applicant may appeal the Board of Appeals' denial of an infeasibility exemption to the City Council. Written appeals must be submitted to the City Clerk within (10) days of the denial by the Board of Appeals.

6.46.080 Enforcement

- A. Administrative Citations. In accordance with Chapter 2.62 of the Richmond Municipal Code, the City shall have the authority to issue an administrative citation for violating any provision of this Chapter.
- B. Civil Penalties. In addition to an administrative citation, any person who violates any part of this Chapter shall be subject to the civil penalties provided by Section 1.04.150 of this Municipal Code and any other penalties provided by law.

SECTION 2

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 3

This Ordinance shall become effective on August 1, 2009 and shall remain in effect until the expiration of the 2008 State of California Building Energy Efficiency Standards.

All buildings within the scope of this Chapter must meet or exceed the energy requirements contained in the 2008 California Building Energy Efficiency Standards, including California Code of Regulations, Title 24, Parts 1 and 6. This Ordinance shall expire concurrent with the expirations of the 2008 California Building Energy Efficiency Standards and shall be replaced with an Ordinance reflecting the most recently enacted State Building Code.

First introduced at a regular meeting of the City Council of the City of Richmond held on April 7, 2009 and finally passed and adopted at a regular meeting held on ____, 2009 by the following vote:

AYES:

NOES:

ABSTENTIONS:

ABSENT:

CLERK OF THE CITY OF RICHMOND

(SEAL)
Approved:

Mayor

Approved as to form:

City Attorney