EXHIBIT "A"

FINDINGS OF FACT AND NEED FOR CHANGES OR MODIFICATIONS TO THE CALIFORNIA BUILDING STANDARDS CODE TITLE 24, PARTS 1, 2, 2.5, 3, 4, 5, 6, 8, 10, 11, AND 12

CHANGES OR MODIFICATIONS: Pursuant to Section 17958 of the State of California Health and Safety Code, the governing body of the City of Petaluma in its ordinance adopting and amending the 2010 Editions of the California Building Standards Administrative Code; California Building Code; California Residential Building Code; California Electrical Code; California Mechanical Code; California Plumbing Code; California Energy Code; California Historical Building Code; California Existing Building Code; California Green Building Standards Code and California Reference Standards Code, changes or modifies certain provisions of the California Building Standards Code as it pertains to the regulation of buildings used for human habitation. A copy of the text of such changes or modifications is attached.

FINDINGS: Pursuant to Sections 17958.5 and 17958.7 (a) of the State of California Health and Safety Code, the governing body of the City of Petaluma has determined and finds that all the attached changes or modifications are needed and are reasonably necessary because of local climatic, geological and topographic conditions as discussed below.

LOCAL CONDITIONS: Local conditions have an adverse effect on the prevention of (1) major loss fires, (2) major earthquake damage, and (3) the potential for life and property loss, making the changes or modifications in the California Building Standards Code necessary in order to provide a reasonable degree of property security, and fire and life safety in the City of Petaluma.

Below are adverse local climatic, geological and topographic conditions that necessitate the modifications to the California Building Standards Code.

CLIMATIC

Precipitation: Precipitation ranges from twenty inches (20") to approximately twenty-five inches (25") per year. Approximately ninety percent (90%) falls during the months of November through April, and ten percent (10%) from May through October. Severe flooding occurred during the months of January and March, 1995 and in 1998 and 2006.

Relative Humidity: Humidity generally ranges from fifty percent (50%) during daytime and eighty-six percent (86%) at night. It drops to twenty-percent (20%) during the summer months and occasionally drops lower during the months of September through November.

Temperatures: Temperatures have been recorded as high as 104 degrees Fahrenheit. Average summer highs are in the 78-85 degree range.

Winds: Prevailing winds are from the northwest. However, winds are experienced from virtually every direction at one time or another. Velocities are generally in the 5-15 mph range, gusting to 7.4-30 mph, particularly during the summer months. Extreme winds, up to 50 mph, have been known to occur.

Soils: Much of Petaluma has "Adobe" soil. This soil has very high clay content and is extremely expansive. With Petaluma's dry summers and wet winters, the moisture content of the soil varies greatly during the course of the year. This moisture content change causes expansion/contraction of the clay soil. This expansion/contraction can place large loads on concrete slabs and foundation systems making some "standard" foundation methods/materials inappropriate for the local conditions encountered.

Summary: These local climatic conditions affect the acceleration intensity, and size of fires in the community. Times of little or no rainfall, of low humidity and high temperatures create extremely hazardous conditions, particularly as they relate to wood shake and shingle roof fires and conflagrations. The winds experienced in this area also adversely impact structure fires in buildings in close proximity to one another. Winds can carry sparks and burning branches to other structures, thus spreading the fire and causing conflagrations. In building fires, winds can literally force fires back into the building and create a blowtorch effect, in addition to preventing "natural" ventilation and cross-ventilation efforts. Petaluma's downtown and surrounding areas contain numerous historic and older buildings that are located very close together, which exacerbates the fire danger from dry conditions, wind, and shake/shingle roofs.

TOPOGRAPHIC

The topographic fire environment of a community is primarily a combination of two (2) factors: the area's physical geographic characteristics and the historic pattern of urban-suburban development. These two (2) factors, alone and combined, create a mixture of environments which ultimately determine the areas' fire protection needs.

The basic geographical boundaries of the city include hills to the south and west, and valley floor in the central area and to the north and east. The Petaluma River bisects the city through the central area. The City of Petaluma covers 13 square miles, including an urban population estimated at 57,000. The city's service area is a conglomeration of bay, plains, hills, valleys, and ridges. Within the City are three (3) fire stations and fifty-six (56) fire personnel. Because of the size of the City of Petaluma, the characteristics of the fire environment changes from one location to the next. For example, the central downtown area contains older buildings situated

close together, which increases the ability of fire to spread from one building to the next. In contrast, some of the properties on the outlying hills are far apart, but contain large grassy acreages that promote quickly-spreading wildfires during the long dry season.

The City's development pattern also contributes to its unique fire protection needs. Development has traditionally occurred on the flat lands (0 – 5% slope) in the central and eastern portions of the city. However, over the last ten (10) years, development has spread into the hills and the smaller valleys and canyons. This development has significantly increased the service area for the city's fire department and added complicated logistical challenges for getting fire equipment to remote fires or fires on steep hillsides. The majority of the hillsides in these areas have slopes ranging from 15 - 30%. As a basic rule of thumb, the rate of spread will double as the slope percentage doubles, all other factors remaining the same.

The local vegetation further contributes to fire dangers in the city. Petaluma's semi-arid Mediterranean-type climate produces vegetation similar to that of most of Sonoma County. In the long periods of the year with little or no rain (April through October), this vegetation provides ready fuel for fast-spreading wildfires.

Moreover, some of all the structures in the city have combustible wood-shingle or shake roofs. This very flammable material is susceptible to ignition by embers from a wild land fire, furthering the spread of fire to adjacent buildings.

GEOLOGICAL

The above local topographic conditions enhance the magnitude, exposure, accessibility problems, and fire hazards presented to the City of Petaluma. Fire following an earthquake has the potential of causing greater loss of life and damage than the earthquake itself.

The relatively young geological processes that have created the San Francisco Bay Area are still active today. Two (2) active earthquake faults (San Andreas and the Hayward-Rodgers Creek) affect the Petaluma area. Approximately fifty percent (50%) of the city's land surface is in the high-to-moderate seismic hazard zones.

The majority of the City's industrial complexes are located in the highest seismic risk zones. The highest seismic risk zone also contains the largest concentration of hazardous materials. Hazardous materials, particularly toxic gases, could pose the greatest threat to the largest number of persons, should a significant seismic event occur. The City's resources would have to be prioritized to mitigate the greatest threat, and may likely be unavailable for fires in smaller single-dwellings and structures.

Other variables that may intensify the fire danger after a major seismic event include:

- The extent of damage to the water system;
- The extent of isolation due to bridge and/or freeway overpass collapse;
- The extent of roadway damage and/or amount of debris blocking the roadways;
- Climatic conditions (hot, dry weather with high winds);
- Time of day, which will influence the amount of traffic on roadways and could intensify the risk of life during normal business hours;
- The availability of timely mutual aid or assistance from neighboring departments, which will likely have similar emergencies at the same time; and
- The large portion of dwellings with wood shingle roof coverings will increase the likelihood of conflagrations.

ENVIRONMENTAL

Design and construction methods, and materials used in the construction of new buildings can have a large impact on the City's environmental sustainability, energy usage, waste management, and the health and productivity of it's citizens and visitors.

The new CalGreen requirements will have a significant, positive effect on resource conservation, energy usage, waste and pollution control, and the health and productivity of the citizens and visitors of the City of Petaluma

CalGreen offers regulations titled "Tier One" which contain even higher standards of all the regulated features within it's regulations. Making Tier One's optional requirements mandatory will help the City of Petaluma to achieve greater levels of health and productivity for it's citizens and visitors to the City of Petaluma

Requiring new commercial and residential projects to incorporate CalGreen Tier One standards is appropriate to help Petaluma achieve it's goal of raising public health and welfare benefits for it's citizens and visitors in a more timely fashion.

DEFINITION CLARIFICATION

Due to code enforcement problems in the past, the description of buildings not requiring permits was expanded to help clarify when permits are/are not required.

CONCLUSION

Local climatic, geological and topographic conditions impact fire protection efforts, and the frequency, spread, acceleration, intensity and size of fire involving buildings in this community. Further, they impact potential damage to all structures from earthquake and subsequent fire. Therefore it is found to be reasonably necessary that the California Fire Code be changed or modified to mitigate the effects of the above conditions.

The local climatic, topographic, and geological conditions necessitate the modifications to the California Building Codes (Title 24).

Exhibit B

CA Statewide Codes and Standards Program
Title 24 Local Energy Efficiency Ordinances

Title:
Climate Zone 2
Energy Cost-Effectiveness Study

Prepared for:

Pat Eilert
Codes and Standards Program
Pacific Gas and Electric Company

Maril Pitcock
Government Partnership Program
Pacific Gas and Electric Company

Prepared by:
Gabel Associates, LLC

Last Modified: August 11, 2010

Climate Zone 2 Energy Cost-Effectiveness Study

August 11, 2010

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

Report on behalf of:
Pacific Gas and Electric Company's Codes and Standards Program,
Pat Eilert, 202 Cousteau Place, Davis, CA 95616
(530) 757-5261 Email: PLE2@pge.com

Pacific Gas and Electric Company's Government Partnership Program,
Maril Pitcock, 245 Market, , San Francisco, Room 687, CA 94105
(415) 973-9944 Email: MxWL@pge.com

LEGAL NOTICE

This report was prepared by Pacific Gas and Electric Company and funded by the California utility customers under the auspices of the California Public Utilities Commission.

Neither PG&E nor any of its employees makes any warranty, express of implied; or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any data, information, method, product, policy or process disclosed in this document; or represents that its use will not infringe any privately-owned rights including, but not limited to, patents, trademarks or copyrights.

Table of Contents

1.0 Executive Summary 1

2.0 Methodology and Assumptions 2

3.0 Minimum Compliance With 2008 Standards 4

4.0 Incremental Cost to Exceed Title 24 By 15% 7

5.0 Cost-Effectiveness Determination. 14

1.0 Executive Summary

This report presents the results of Gabel Associates' research and review of the feasibility and energy cost-effectiveness of building permit applicants exceeding the 2008 Building Energy Efficiency Standards to meet the minimum energy-efficiency requirements of local energy efficiency standards covering Climate Zone 2. A local government may use this report as a basis for demonstrating energy cost-effectiveness of a proposed green building or energy ordinance. The study assumes that such an ordinance requires, for the building categories covered, that building energy performance exceeds the 2008 TDV energy standard budget by at least 15%.

The study is also contained in the local government's application to the California Energy Commission (CEC) which must meet all requirements specified in Section 10-106 of the California Code of Regulations, Title 24, Part 1, Article 1: Locally Adopted Energy Standards. An ordinance shall be legally enforceable (a) after the CEC has reviewed and approved the local energy standards as meeting all requirements of Section 10-106; and (b) the ordinance has been adopted by the local government and filed with the Building Standards Commission.

The 2008 Building Energy Efficiency Standards, which took effect on January 1, 2010, are the baseline used to calculate the cost-effectiveness data.

2.0 Methodology and Assumptions

The energy performance impacts of exceeding the performance requirements of the 2008 Title 24 Building Energy Efficiency Standards (2008 Standards) have been evaluated in Climate Zone 2 using the following residential and nonresidential prototypical building types:

Single Family House 2-story 2,025 sf	**Single Family House** 2-story 2,682 sf
Low-rise Multi-family Apartments 8 dwelling units/2-story 8,442 sf	**High-rise Multi-family Apartments** 40 dwelling units/4-story 36,800 sf
Low-rise Office Building 2-story 21,160 sf	**High-rise Office Building** 5-story 52,900 sf

Methodology

The methodology used in the case studies is based on a design process for each of the proposed prototypical building types that first meets the minimum requirements and then exceeds the 2008 Standards by 15%. The process includes the following major stages:

Stage 1: Minimum Compliance with 2008 Standards:

Each prototype building design is tested for minimum compliance with the 2008 Standards, and the mix of energy measures are adjusted using common construction options so the building first just meets the Standards. The set of energy measures chosen represent a reasonable combination which reflects how designers, builders and developers are likely to achieve a specified level of performance using a relatively low first incremental (additional) cost.

Stage 2: Incremental Cost for Exceeding 2008 Standards by 15%:

Starting with that set of measures which is minimally compliant with the 2008 Standards, various energy measures are upgraded so that the building just exceeds the 2008 Standards by 15%. The design choices by the consultant authoring 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. Note that lowest simple payback with respect to building site energy is 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. A minimum and

maximum range of incremental costs of added energy efficiency measures is established by a variety of research means. A construction cost estimator was contracted to conduct research to obtain current measure cost information for many energy measures; and Gabel Associates performed its own additional research to establish first cost data.

Stage 3: Cost Effectiveness Determination:

Energy savings in kWh and therms is calculated from the Title 24 simulation results to establish the annual energy cost savings and CO_2-equivalent reductions in greenhouse gases. A simple payback analysis in years is calculated by dividing the incremental cost for exceeding the 2008 Standards by the estimated annual energy cost savings.

Assumptions

Annual Energy Cost Savings

1. Annual site electricity (kWh) and natural gas (therms) saved are calculated using Micropas 8, state-approved energy compliance software for the 2008 Building Energy Efficiency Standards.

2. Average residential utility rates of $0.173 /kWh for electricity and $1.15/therm for natural gas in current constant dollars; nonresidential rates are time-of-use rate schedules modeled explicitly in the DOE-2.1E computer simulation: PG&E A-6 schedule for electricity and PG&E G-NR1 schedule for natural gas.

3. No change (i.e., no inflation or deflation) of utility rates in constant dollars

4. No increase in summer temperatures from global climate change

Simple Payback Analysis

1. No external cost of global climate change -- and corresponding value of additional investment in energy efficiency and CO_2 reduction – is included

2. The cost of money (e.g., opportunity cost) invested in the incremental cost of energy efficiency measures is not included.

3.0 Minimum Compliance with 2008 Standards

The following energy design descriptions of t. he following building prototypes just meet the 2008 Standards in Climate Zone 2.

Single Family House

- 2,025 square feet
- 2-story
- 20.2% glazing/floor area ratio

Energy Efficiency Measures
R-38 Roof w/ Radiant Barrier
R-13 Walls
R-0 Slab on Grade
R-19 Raised Floor over Garage/Open at 2nd Floor
Low E2 Vinyl Windows, U=0.36, SHGC=0.30
Furnace: 80% AFUE
Air Conditioner: 13 SEER
R-6 Attic Ducts
Reduced Duct Leakage/Testing (HERS)
50 Gallon Gas Water Heater: EF=0.60

Single Family House

- 2,682 square feet
- 2-story
- 20.2% glazing/floor area ratio

Energy Efficiency Measures
R-30 Roof w/ Radiant Barrier
R-13 Walls
R-19 Raised Floor
Low E2 Vinyl Windows, U=0.36, SHGC=0.30
Furnace: 80% AFUE
Air Conditioner: 13 SEER
R-6 Attic Ducts
Reduced Duct Leakage/Testing (HERS)
50 Gallon Gas Water Heaters: EF=0.60

Low-rise Multi-family Apartments

- 8,442 square feet
- 8 units/2-story
- 12.5% glazing/floor area ratio

Energy Efficiency Measures
R-38 Roof w/ Radiant Barrier
R-15 Walls
R-0 Slab on Grade
Low E2 Vinyl Windows, U=0.36, SHGC=0.30
(8) Furnaces: 80% AFUE
(8) Air Conditioners: 13 SEER
R-8 Attic Ducts
(8) 40 Gallon Gas Water Heaters: EF=0.63

High-rise Multifamily Apartments

- 36,800 sf,
- 40 units
- 4-story
- Window to Wall Ratio = 35.2%

Energy Efficiency Measures to Meet Title 24
R-30 Attic; Cool Roof Reflectance=0.70; Emittance=0.75
R-19 in Metal Frame Walls
R-6 (2" K-13 spray-on) Raised Slab over parking garage
Vinyl Windows, NFRC U=0.36, SHGC=0.35
Split Heat Pumps: HSPF=7.2, EER=10.2
Central DHW boiler: 82.7% AFUE and recirculating system w/ timer-temperature controls & VSD hot water pump

Low-rise Office Building

- Two Story
- 21,160 sf,
- Window to Wall Ratio = 37.1%

Energy Efficiency Measures to Meet Title 24
R-38 Attic w/ No Cool Roof
R-19 in Metal Frame Walls
R-0 (un-insulated) slab-on-grade 1st floor
Windows NFRC U=0.50 and SHGCc=0.38, no exterior shading
(248) 2-lamp 4' T8 fixtures, 62w each; and (104) 26w CFLs @ 26w each; no lighting controls (beyond mandatory)
(4) 10-ton Packaged DX units EER=11.0, 4,000 cfm; and
(4) 7.5-ton Packaged DX units EER=11.0, 3,000 cfm;
all standard efficiency fan motors
R-4.2 duct insulation w/ ducts in conditioned space
Standard 50 gallon gas water heater, EF=0.575

High-rise Office Building

- 5-story
- 52,900 sf,
- Window to Wall Ratio = 34.5%

Energy Efficiency Measures to Meet Title 24
R-38 Attic w/ No Cool Roof
R-19 in Metal Frame Walls
R-0 (un-insulated) slab-on-grade 1st floor
Windows NFRC U=0.50 and SHGCc=0.31, 2' overhang 1st floor front elevation only
(720) 2-lamp 4' T8 fixtures w/ high efficiency instant start ballasts & premium lamps, 50w; and (300) 18w CFLs @ 18w each; no lighting controls (beyond mandatory)
(5) 30-ton Packaged VAV units EER=10.4, 10,000 cfm; 20% VAV boxes w/ reheat; all standard efficiency fan motors
R-4.2 duct insulation w/ ducts in conditioned space
Standard hot water boiler, AFUE=80%

4.0 Incremental Cost to Exceed 2008 Standards by 15%

The following tables list the energy feat ures and/or equipment included in the 2008 Standards base design, the e fficient measure options, and an estimate of the incremental cost for each measure included **to improve the building performance to use 15% less TDV energy than the corresponding Title 24 base case design.**

Single Family House

- 2,025 square feet
- 2-story
- 20.2% glazing/floor area ratio

Incremental Cost Estimate to Exceed Title 24 by 15%
Single Family Prototype: 2,025 SF, Option 1 **2025 sf** **Climate Zone 2**

Energy Efficiency Measures	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-38 Roof w/ Radiant Barrier	-	$ -	$ -	$ -
R-19 Walls (from R-13): 2,550 sf @ $0.55 to $0.85/sf	Upgrade	$ 1,403	$ 2,168	$ 1,786
R-0 Slab on Grade	-	$ -	$ -	$ -
R-19 Raised Floor over Garage/Open at 2nd Floor	-	$ -	$ -	$ -
Low E2 Vinyl Windows, U=0.36, SHGC=0.30	-	$ -	$ -	$ -
Furnace: 80% AFUE	-	$ -	$ -	$ -
Air Conditioner: 13 SEER, 11 EER (HERS)	Upgrade	$ 25	$ 75	$ 50
Air Conditioner: Refrig. Charge (HERS)	Upgrade	$ 150	$ 200	$ 175
R-6 Attic Ducts	-	$ -	$ -	$ -
Reduced Duct Leakage/Testing (HERS)	-	$ -	$ -	$ -
50 Gallon Gas Water Heater: EF=0.60	-	$ -	$ -	$ -
Total Incremental Cost of Energy Efficiency Measures:		**$ 1,578**	**$ 2,443**	**$ 2,011**
Total Incremental Cost per Square Foot:		**$ 0.78**	**$ 1.21**	**$ 0.99**

Incremental Cost Estimate to Exceed Title 24 by 15%
Single Family Prototype: 2,025 SF, Option 2 **2025 sf** **Climate Zone 2**

Energy Efficiency Measures	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-38 Roof w/ Radiant Barrier	-	$ -	$ -	$ -
R-21 Walls (from R-13): 2,550 sf @ $0.70 to $0.95/sf	Upgrade	$ 1,785	$ 2,423	$ 2,104
R-0 Slab on Grade	-	$ -	$ -	$ -
R-19 Raised Floor over Garage/Open at 2nd Floor	-	$ -	$ -	$ -
Low E2 Vinyl Windows, U=0.36, SHGC=0.30	-	$ -	$ -	$ -
Furnace: 80% AFUE	-	$ -	$ -	$ -
Air Conditioning: 13 SEER	-	$ -	$ -	$ -
R-6 Attic Ducts	-	$ -	$ -	$ -
Reduced Duct Leakage/Testing (HERS)	-	$ -	$ -	$ -
50 Gallon Gas Water Heater: EF=0.60	-	$ -	$ -	$ -
Total Incremental Cost of Energy Efficiency Measures:		**$ 1,785**	**$ 2,423**	**$ 2,104**
Total Incremental Cost per Square Foot:		**$ 0.88**	**$ 1.20**	**$ 1.04**

Single Family House

- 2,682 square feet
- 2-story
- 20.2% glazing/floor area ratio

Incremental Cost Estimate to Exceed Title 24 by 15%
Single Family Prototype: 2,682 SF, Option 1 **2682 sf** **Climate Zone 2**

Energy Efficiency Measures	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-30 Roof w/ Radiant Barrier	-	$ -	$ -	$ -
R-19 Walls (from R-13): 2,638 sf @ $0.55 to $0.85/sf	Upgrade	$ 1,451	$ 2,242	$ 1,847
R-19 Floor	-	$ -	$ -	$ -
Low E2 Vinyl Windows, U=0.36, SHGC=0.30	-	$ -	$ -	$ -
Furnace: 80% AFUE	-	$ -	$ -	$ -
Air Conditioner: 13 SEER, 11 EER (HERS)	Upgrade	$ 25	$ 75	$ 50
Air Conditioner: Refrig. Charge (HERS)	Upgrade	$ 150	$ 200	$ 175
R-6 Attic Ducts	-	$ -	$ -	$ -
Reduced Duct Leakage/Testing (HERS)	-	$ -	$ -	$ -
50 Gallon Gas Water Heater: EF=0.60	-	$ -	$ -	$ -
Total Incremental Cost of Energy Efficiency Measures:		**$ 1,626**	**$ 2,517**	**$ 2,072**
Total Incremental Cost per Square Foot:		**$ 0.61**	**$ 0.94**	**$ 0.77**

Incremental Cost Estimate to Exceed Title 24 by 15%
Single Family Prototype: 2,682 SF, Option 2 **2682 sf** **Climate Zone 2**

Energy Efficiency Measures	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-38 Roof w/ Radiant Barrier (from R-30): 1,402sf @ 0.40 to 0.60/sf	Upgrade	$ 561	$ 841	$ 701
R-15 Walls (from R-13): 2,638 sf @ $0.12 to $0.20/sf	Upgrade	$ 317	$ 528	$ 422
R-19 Floor	-	$ -	$ -	$ -
Quality Insulation Installation (HERS)	Upgrade	$ 450	$ 600	$ 525
Low E2 Vinyl Windows, U=0.36, SHGC=0.30	-	$ -	$ -	$ -
Furnace: 90% AFUE (from 80% AFUE)	Upgrade	$ 500	$ 1,000	$ 750
Air Conditioner: 13 SEER	-	$ -	$ -	$ -
R-6 Attic Ducts	-	$ -	$ -	$ -
Reduced Duct Leakage/Testing (HERS)	-	$ -	$ -	$ -
50 Gallon Gas Water Heater: EF=0.62 (from EF=0.60)	Upgrade	$ 100	$ 200	$ 150
Total Incremental Cost of Energy Efficiency Measures:		**$ 1,928**	**$ 3,169**	**$ 2,548**
Total Incremental Cost per Square Foot:		**$ 0.72**	**$ 1.18**	**$ 0.95**

Incremental Cost Estimate to Exceed Title 24 by 15%
Single Family Prototype: 2,682 SF, Option 3 2682 sf Climate Zone 2

Energy Efficiency Measures	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-30 Roof w/ Radiant Barrier	-	$ -	$ -	$ -
R-21 Walls (from R-13): 2,638 sf @ $0.70 to $0.95/sf	Upgrade	$ 1,847	$ 2,506	$ 2,177
R-19 Floor	-	$ -	$ -	$ -
Low E2 Vinyl Windows, U=0.36, SHGC=0.30	-	$ -	$ -	$ -
Furnace: 80% AFUE	-	$ -	$ -	$ -
Air Conditioner: 13 SEER	-	$ -	$ -	$ -
R-6 Attic Ducts	-	$ -	$ -	$ -
Reduced Duct Leakage/Testing (HERS)	-	$ -	$ -	$ -
50 Gallon Gas Water Heater: EF=0.62 (from EF=0.60)	Upgrade	$ 100	$ 200	$ 150
Total Incremental Cost of Energy Efficiency Measures:		**$ 1,947**	**$ 2,706**	**$ 2,327**
Total Incremental Cost per Square Foot:		**$ 0.73**	**$ 1.01**	**$ 0.87**

Low-rise Multi-family Apartments

- 8,442 square feet
- 8 units/2-story
- 12.5% glazing/floor area ratio

Incremental Cost Estimate to Exceed Title 24 by 15%
Low-rise Multifamily Prototype: 8,442 SF, Option 1 8442 sf Climate Zone 2

Energy Efficiency Measures	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-38 Roof w/ Radiant Barrier	-	$ -	$ -	$ -
R-21 Walls (from R-15): 10,146 sf @ $0.50 to $0.75/sf	Upgrade	$ 5,073	$ 7,510	$ 6,292
R-0 Slab on Grade	-	$ -	$ -	$ -
Low E2 Vinyl Windows, U=0.36, SHGC=0.30	-	$ -	$ -	$ -
(8) Furnaces: 80% AFUE	-	$ -	$ -	$ -
(8) Air Conditioner: 13 SEER, 11 EER (HERS)	Upgrade	$ 200	$ 600	$ 400
(8) Air Conditioner: Refrig. Charge (HERS)	Upgrade	$ 1,200	$ 1,600	$ 1,400
R-8 Attic Ducts	-	$ -	$ -	$ -
(8) 40 Gallon Gas Water Heaters: EF=0.63	-	$ -	$ -	$ -
Total Incremental Cost of Energy Efficiency Measures:		**$ 6,473**	**$ 9,710**	**$ 8,092**
Total Incremental Cost per Square Foot:		**$ 0.77**	**$ 1.15**	**$ 0.96**

Incremental Cost Estimate to Exceed Title 24 by 15%
Low-rise Multifamily Prototype: 8,442 SF, Option 2 8442 sf Climate Zone 2

Energy Efficiency Measures	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-38 Roof w/ Radiant Barrier	-	$ -	$ -	$ -
R-19 Walls (from R-15): 10,146 sf @ $0.45 to $0.75/sf	Upgrade	$ 4,566	$ 7,610	$ 6,088
R-0 Slab on Grade	-	$ -	$ -	$ -
Low E2 Vinyl Windows, U=0.36, SHGC=0.30	-	$ -	$ -	$ -
(8) Furnaces: 80% AFUE	-	$ -	$ -	$ -
(8) Air Conditioners: 13 SEER	-	$ -	$ -	$ -
R-4.2 Attic Ducts (from R-8)	Downgrade	$ (3,000)	$ (2,000)	$ (2,500)
Reduced Duct Leakage/Testing (HERS)	Upgrade	$ 2,000	$ 4,000	$ 3,000
(8) 40 Gallon Gas Water Heaters: EF=0.62 (from 0.63 EF)	Downgrade	$ -	$ (400)	$ (200)
Total Incremental Cost of Energy Efficiency Measures:		**$ 3,566**	**$ 9,210**	**$ 6,388**
Total Incremental Cost per Square Foot:		**$ 0.42**	**$ 1.09**	**$ 0.76**

High-rise Multifamily Apartments

- 36,800 sf,
- 40 units/4-story
- Window to Wall Ratio = 31.6%

Incremental Cost Estimate to Exceed Title 24 by 15%
High-rise Residential Prototype: 36,800 SF, Option 1 Climate Zone 2

Energy Efficiency Measures to Exceed Title 24 by 15%	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-30 Attic, Cool Roof Reflectance=0.70, Emittance=0.75	-	$ -	$ -	$ -
R-19 in Metal Frame Walls	-	$ -	$ -	$ -
R-8 (2.5" K-13 spray-on) Raised Slab over parking garage	Upgrade	$ 3,680	$ 5,520	$ 4,600
Vinyl Windows, NFRC U=0.33, SHGC=0.25; 6,240 sf @ $1.40 to $1.60/sf	Upgrade	$ 8,736	$ 9,984	$ 9,360
(80) Room Heat Pumps: HSPF=7.84, eer=11.2 (No Ducts) @ $150 to $250/unit	Upgrade	$ 12,000	$ 20,000	$ 16,000
Premium Efficiency DHW Hot Water Pump	Upgrade	$ 150	$ 250	$ 200
Total Incremental Cost of Energy Efficiency Measures:		**$ 24,566**	**$ 35,754**	**$ 30,160**
Total Incremental Cost per Square Foot:		**$ 0.67**	**$ 0.97**	**$ 0.82**

Incremental Cost Estimate to Exceed Title 24 by 15%
High-rise Residential Prototype: 36,800 SF, Option 2 **Climate Zone 2**

Energy Efficiency Measures to Exceed Title 24 by 15%	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-30 Attic; Cool Roof Reflectance=0.70, Emittance=0.75	-	$ -	$ -	$ -
R-19 in Metal Frame Walls + R-5 exterior rigid insulation 11,472 sf @ $5.00 to $8.00/sf	Upgrade	$ 57,360	$ 91,776	$ 74,568
R-6 (2" K-13 spray-on) Raised Slab over parking garage	-	$ -	$ -	$ -
Vinyl Windows, NFRC U=0.33, SHGC=0.25; 6,240 sf @ $1.40 to $1.60/sf	Upgrade	$ 8,736	$ 9,984	$ 9,360
Split Heat Pumps: HSPF=7.2, EER=10.2	-	$ -	$ -	$ -
(2) 94% AFUE DHW boilers @ $1500 to$2500 each	Upgrade	$ 3,000	$ 5,000	$ 4,000
Total Incremental Cost of Energy Efficiency Measures:		**$ 69,096**	**$106,760**	**$ 87,928**
Total Incremental Cost per Square Foot:		**$ 1.88**	**$ 2.90**	**$ 2.39**

Low-rise Office Building

- Two Story
- 21,160 sf,
- Window to Wall Ratio = 37.1%

Incremental Cost Estimate to Exceed Title 24 by 15%
Nonresidential Prototype: 21,160 SF, Option 1 **Climate Zone 2**

Energy Efficiency Measures to Exceed Title 24 by 15%	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-38 Attic w/ No Cool Roof	-	$ -	$ -	$ -
R-19 in Metal Frame Walls	-	$ -	$ -	$ -
R-0 (un-insulated) slab-on-grade 1st floor				
Windows, NFRC U=0.50, SHGC=0.31; 5,160 sf @ $2.00 to $3.00/sf	Upgrade	$ 10,320	$ 15,480	$ 12,900
(248) 2-lamp 4' T8 fixtures w/ high efficiency instant start ballasts & premium lamps, 50w @ $25.00 - $30.00 each	Upgrade	$ 6,000	$ 7,200	$ 6,600
(4) 10-ton Packaged DX units, EER= 13.4 @ $2300 - $2600 ea,	Upgrade	$ 16,000	$ 24,000	$ 20,000
(4) 7.5-ton Packaged DX units, EER= 13.4 @ $1950 - $2450 ea,	Upgrade	$ 12,000	$ 18,800	$ 15,400
(8) Premium Efficiency supply fans @ $100 to $200 each	Upgrade	$ 800	$ 1,600	$ 1,200
R-4.2 duct insulation w/ ducts in conditioned space	-	$ -	$ -	$ -
Standard 50 gallon gas water heater, EF=0.575	-	$ -	$ -	$ -
Total Incremental Cost of Energy Efficiency Measures:		**$ 45,120**	**$ 67,080**	**$ 56,100**
Total Incremental Cost per Square Foot:		**$ 2.13**	**$ 3.17**	**$ 2.65**

Incremental Cost Estimate to Exceed Title 24 by 15%
Nonresidential Prototype: 21,160 SF, Option 2 **Climate Zone 2**

Energy Efficiency Measures to Exceed Title 24 by 15%	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-38 Attic w/ No Cool Roof	-	$ -	$ -	$ -
R-19 in Metal Frame Walls + R-6.5 (1") rigid insulation 8,752 sf @ $3.00 to $4.00/sf	-	$ 26,256	$ 35,008	$ 30,632
R-0 (un-insulated) slab-on-grade 1st floor				
Windows, NFRC U=0.50, SHGC=0.28; 5,160 sf @ $3.50 to $4.50/sf	Upgrade	$ 18,060	$ 23,220	$ 20,640
(72) [30% of] 2-lamp 4' T8 fixtures on (36) multi-level occupant sensors in small offices @ $65.00 to $85.00 each	Upgrade	$ 2,340	$ 3,060	$ 2,700
(248) 2-lamp 4' T8 fixtures w/ high efficiency instant start ballasts & premium lamps, 50w @ $25.00 - $30.00 each	Upgrade	$ 6,000	$ 7,200	$ 6,600
(4) 10-ton Packaged DX units EER=11.0, 4,000 cfm; and (4) 7.5-ton Packaged DX units EER=11.0, 3,000 cfm; all standard efficiency fan motors	-	$ -	$ -	$ -
R-4.2 duct insulation w/ ducts in conditioned space	-	$ -	$ -	$ -
Standard 50 gallon gas water heater, EF=0.575	-	$ -	$ -	$ -
Total Incremental Cost of Energy Efficiency Measures:		**$ 52,656**	**$ 68,488**	**$ 60,572**
Total Incremental Cost per Square Foot:		**$ 2.49**	**$ 3.24**	**$ 2.86**

High-rise Office Building

- 5-story
- 52,900 sf,
- Window to Wall Ratio = 34.5%

Incremental Cost Estimate to Exceed Title 24 by 15%
Nonresidential Prototype: 52,900 SF, Option 1 **Climate Zone 2**

Energy Efficiency Measures to Exceed Title 24 by 15%	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-38 Attic w/ Cool Roof Reflectance=0.70, Emittance=0.75 10,580 sf @ $0.40 to $0.60/sf	Upgrade	$ 4,235	$ 6,348	$ 5,292
R-19 in Metal Frame Walls	-	$ -	$ -	$ -
R-0 (un-insulated) slab-on-grade 1st floor				
Windows, NFRC U=0.50, SHGC=0.31; 5,160 sf @ $2.00 to $3.00/sf	-	$ -	$ -	$ -
(180) [25% of] 2-lamp 4' T8 fixtures on (90) multi-level occupant sensors in small offices @ $65.00 to $85.00 each	Upgrade	$ 5,850	$ 7,650	$ 6,750
(5) 10-ton Packaged DX units, EER= 11.0 w/ Premium fan motors @ $10,800 to $15,600 ea,	Upgrade	$ 54,000	$ 78,000	$ 66,000
R-4.2 duct insulation w/ ducts in conditioned space	-	$ -	$ -	$ -
Standard hot water boiler, AFUE=80%	-	$ -	$ -	$ -
Total Incremental Cost of Energy Efficiency Measures:		**$ 59,850**	**$ 85,650**	**$ 72,750**
Total Incremental Cost per Square Foot:		**$ 1.13**	**$ 1.62**	**$ 1.38**

Incremental Cost Estimate to Exceed Title 24 by 15%
Nonresidential Prototype: 52,900 SF, Option 2 **Climate Zone 2**

Energy Efficiency Measures to Exceed Title 24 by 15%	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-38 Attic w/ Cool Roof Reflectance=0.70, Emittance=0.75 10,580 sf @ $0.40 to $0.60/sf	Upgrade	$ 4,235	$ 6,348	$ 5,292
R-19 in Metal Frame Walls + R-6.5 (1") rigid insulation 8,752 sf @ $3.00 to $4.00/sf	Upgrade	$ 26,256	$ 35,008	$ 30,632
R-0 (un-insulated) slab-on-grade 1st floor				
Windows, NFRC U=0.50, SHGC=0.28; 8,500 sf @ $2.00 to $3.00/sf	Upgrade	$ 17,000	$ 25,500	$ 21,250
(180) [25% of] 2-lamp 4' T8 fixtures on (90) multi-level occupant sensors in small offices @ $65.00 to $85.00 each	Upgrade	$ 5,850	$ 7,650	$ 6,750
(248) 2-lamp 4' T8 fixtures w/ high efficiency instant start ballasts & premium lamps, 50w @ $25.00 - $30.00 each	Upgrade	$ 6,000	$ 7,200	$ 6,600
(5) 30-ton Packaged VAV units EER=10.4, 10,000 cfm; 20% VAV boxes w/ reheat; (10) Premium Effiiciency fan motors	Upgrade	$ 1,000	$ 1,500	$ 1,250
R-4.2 duct insulation w/ ducts in conditioned space	-	$ -	$ -	$ -
Standard hot water boiler, AFUE=80%	-	$ -	$ -	$ -
Total Incremental Cost of Energy Efficiency Measures:		**$ 56,106**	**$ 76,858**	**$ 66,482**
Total Incremental Cost per Square Foot:		**$ 1.06**	**$ 1.45**	**$ 1.26**

5.0 Cost -Effectiveness Determination

Regardless of the building design, occ upancy profile and number of stories, the incremental improvement in overall annual energy performance of buildings in exceeding the 2008 Standards is determined to be cost-effe ctive. However, each building's overall design, occupancy type and specific design choices may allow for a large range of incremental costs for exceeding 2008 Standards , estimated annual energy cost savings, and subsequent payback period.

Small Single Family: 2,025 sf

Building Description	Total Annual KWh Saving	Total Annual Therms Saving	Incremental First Cost ($)	Annual Energy Cost Savings ($)	Simple Payback (Years)
2,025 sf (Option 1)	399	69	$2,011	$148	13.5
2,025 sf (Option 2)	348	81	$2,104	$153	13.7
Averages:	374	75	$2,057	$151	13.6

Annual Reduction in CO2-equivalent: ***1,041 lb./building-year***
0.51 lb./sq.ft.-year

Small Single Family: 2,682 sf

Building Description	Total Annual KWh Saving	Total Annual Therms Saving	Incremental First Cost ($)	Annual Energy Cost Savings ($)	Simple Payback (Years)
2,682 sf (Option 1)	524	71	$2,072	$172	12.0
2,682 sf (Option 2)	338	111	$2,549	$186	13.7
2,682 sf (Option 3)	427	92	$2,327	$180	12.9
Averages:	430	91	$2,316	$179	12.9

Annual Reduction in CO2-equivalent: ***1,256 lb./building-year***
0.47 lb./sq.ft.-year

Low-rise Multi-family Apartments

Building Description	Total Annual KWh Saving	Total Annual Therms Saving	Incremental First Cost ($)	Annual Energy Cost Savings ($)	Simple Payback (Years)
8,442 sf (Option 1)	1575	261	$8,089	$573	14.1
8,442 sf (Option 2)	1468	284	$6,388	$581	11.0
Averages:	1522	273	$7,238	$577	12.6

Annual Reduction in CO2-equivalent: ***3,857 lb./building-year***
0.10 lb./sq.ft.-year

High-rise Multi-family Apartments

Building Description	Total Annual KWh Saving	Total Annual Therms Saving	Incremental First Cost ($)	Annual Energy Cost Savings ($)	Simple Payback (Years)
36,800 sf (Option 1)	14292	0	$30,160	$2,473	12.2
36,800 sf (Option 2)	9590	268	$87,428	$1,967	44.4
Averages:	11941	134	$58,794	$2,220	28.3

Annual Reduction in CO2-equivalent: *6,933 lb./building-year*
0.19 lb./sq.ft.-year

Low-rise Office Building

Building Description	Total Annual KWh Saving	Total Annual Therms Saving	Incremental First Cost ($)	Annual Energy Cost Savings ($)	Simple Payback (Years)
21,160 sf (Option 1)	19085	-95	$56,100	$3,192	17.6
21,160 sf (Option 2)	15862	90	$60,572	$2,848	21.3
Averages:	17474	-3	$58,336	$3,020	19.4

Annual Reduction in CO2-equivalent: *7,834 lb./building-year*
0.37 lb./sq.ft.-year

High-rise Office Building

Building Description	Total Annual KWh Saving	Total Annual Therms Saving	Incremental First Cost ($)	Annual Energy Cost Savings ($)	Simple Payback (Years)
52,900 sf (Option 1)	40514	-506	$72,750	$6,427	11.3
52,900 sf (Option 2)	35774	-653	$66,482	$5,438	12.2
Averages:	38144	-580	$69,616	$5,932	11.8

Annual Reduction in CO2-equivalent: *10,419 lb./building-year*
0.20 lb./sq.ft.-year

Conclusions

Regardless of the building design, occupancy profile and number of stories, the incremental improvement in overall annual energy performance of buildings which exceed the 2008 Title 24 Building Energy Efficiency Standards by 15% appears cost-effective. However, each building's overall design, occupancy type and specific design choices may allow for a large range of incremental first cost and payback. As with simply meeting the requirements of the Title 24 energy standards, a permit applicant complying with the energy requirements of a green building ordinance should carefully analyze building energy performance to reduce incremental first cost and the payback for the required additional energy efficiency measures.

Tier One Additional Requirements beyond the Mandatory Cal Green regulations

Residential

A4.601.4 Tier 1. To achieveTier 1 status a project must comply with the following:

A4.601.4.1 Mandatory measures for Tier 1. The project shall meet or exceed all of the mandatory measures in Chapter 4, Divisions 4.1 through 4.5 and Chapter 7 as applicable.

A4.601.4.2 Prerequisite and elective measures for Tier 1.
In addition to the mandatory measures, compliance with the following prerequisite and elective measures from Appendix A4 is also required to achieve Tier 1 status:

1. From Division A4.1, Planning and Design.

    1.1. Comply with the topsoil protection requirements in Section A4.106.2.3.

    1.2. Comply with the 20 percent permeable paving requirements in Section A4.106.4.

    1.3. Comply with the cool roof requirements in Section A4.106.5.

    1.4. Comply with at least two elective measures selected from Division A4.1.

2. From Division A4.2, Energy Efficiency.

    2.1. Exceed the *California Energy Code* requirements, based on the 2008 Energy Efficiency Standards by 15 percent.

    2.2. Comply with at least four elective measures selected from Division A4.2.

3. From Division A4.3, Water Efficiency and Conservation.

    3.1. Comply with the reduced flow rate for kitchen sink faucets in Section A4.303.1

    3.2. Comply with the Tier 1 potable water use reduction for landscape irrigation design in Section A4.304.4.

    3.3. Comply with at least one elective measure selected from Division A4.3.

4. From Division A4.4, Material Conservation and Resource Efficiency.

    4.1. Comply with the 20 percent cement reduction requirements in Section A4.403.2.

    4.2. Comply with the 10 percent recycled content requirements in Section A4.405.3.

    4.3. Comply with the 65 percent reduction in construction waste in Section A4.408.1.

    4.4. Comply with at least two elective measures selected from Division A4.4.

5. From Division A4.5, Environmental Quality.

    5.1. Comply with the 80 percent resilient flooring systems requirements in Section A4.504.2.

    5.2. Comply with the thermal insulation requirements for Tier 1 in Section A4.504.3.

    5.3. Comply with at least one elective measure selected from Division A4.5.

Nonresidential

A5.601.2.4 Voluntary measures for *CALGreen* Tier 1. In addition to the provisions of Sections A5.601.2.1 and A5.601.2.3 above, compliance with the following voluntary measures from Appendix A5 is required for Tier 1:1. From Division A5.1,

a. Comply with the designated parking requirements for fuel efficient vehicles for a minimum of 10 percent of parking capacity per Section A5.106.5.1 and Table A5.106.5.1.1.

b. Comply with thermal emittance, solar reflectance or SRI values for cool roofs in Section A5.106.11.2 and Table A5.106.11.2.1.1

c. Comply with one elective measure selected from this division.

2. From Division A5.3,

a. Comply with the reduction for indoor potable water use in Section A5.303.2.3.1.

b. Comply with the reduction in outdoor potable water use in Section A5.304.4.1.

c. Comply with one elective measure selected from this division.

3. From Division A5.4,

a. Comply with recycled content of 10 percent of materials based on estimated total cost in Section A5.405.4.

b. Comply with the 65 percent reduction in construction waste in Section A5.408.3.1.

c. Comply with one elective measure selected from this division.

4. From Division A5.5,

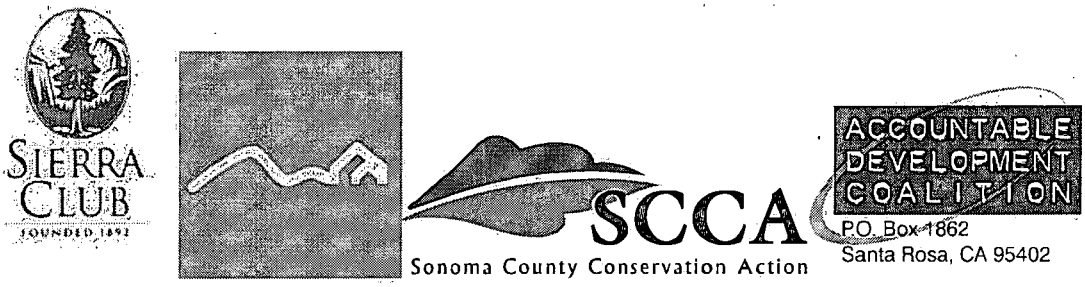
a. Comply with resilient flooring systems for 80 percent of resilient flooring in Section A5.504.4.7.

b. Comply with thermal insulation meeting 2009 CHPS low-emitting materials list in Section A5.504.4.8.

c. Comply with one elective measure selected from this division.

5. Comply with one additional elective measure selected from any division.

Attachment 3



November 8th, 2010

Petaluma City Council
11 English Street
Petaluma,CA 94952

Dear Mayor Torliatt and Council Members,

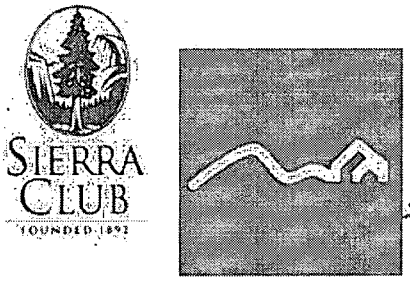
The State of California 's introduction of the mandatory CalGreen building standard offers a great opportunity to make green building standards both consistent and ambitious throughout Sonoma county. This will make permitting easier for planning departments and builders while moving towards our long-term greenhouse gas reduction goals.

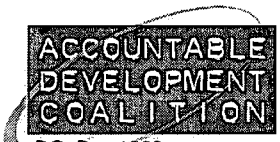
CalGreen requires all new buildings comply with its Basic standard, which is pretty much the California Building Code. CalGreen then defines a Tier One and Tier Two, which contain optional actions for a higher level of green building.

Comparisons of CalGreen to previous Build it Green (BIG) and LEED point systems are difficult because the checklists of building practices are not the same in all cases.

Some cities in Sonoma County have already adopted ambitious standards using these point systems. Let's not lose ground in setting a common standard for all cities and unincorporated areas in the county.

It seems that the Tier I requirements under residential get us to within 5 points average of the 66 points under BIG. And we're aware that the City of Santa Rosa commissioned a committee to come up with a LEED equivalent, and they found that two electives per category under Tier I would give a slight variance in either direction on the LEED scale. We also recognize that if all the cities in the county adopted the same standards, we feel we'd have a much better chance of achieving compliance with a strong, yet manageable green building program for new construction.





P.O. Box 1862
Santa Rosa, CA 95402

We recommend that all jurisdictions in the county adopt the same standard of mandatory requirements within CalGreen as follows:

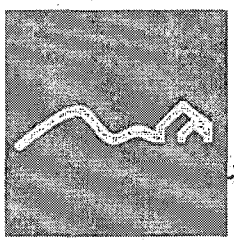
Residential: Basic + Tier One Required

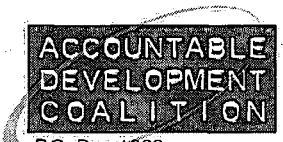
Commercial: Basic + Tier One Required

We are also strongly recommending that the council require recycling/salvage of construction debris to the Tier II level of 75% diversion, as a standalone requirement for both residential and commercial construction. We feel that this item is cost effective, and is a direction that we've been heading in as a County for quite some time. Our recommendation would be for this to be implemented alongside CalGreen, and not be counted as the elective under CalGreen, so that the developer would have to choose another elective under the Material Conservation and Resource Efficiency section. Staff estimates this would be the equivalent of adding an additional 2 points under BIG, which will get us closer to staying equal to current standards using the new system.

This approach will not guarantee an exact equivalent of our current standards; but we are hopeful that by having all the cities using the same green building guidelines, we will continue to be leaders in the region and state on green building for new construction. The state may also "ramp up" the requirements in three years, and the public will have the opportunity to participate in these regular reviews, unlike the closed systems of LEED and BIG that were closed to public participation.

Our organizations, Sierra Club, Greenbelt Alliance, Accountable Development Coalition and Sonoma County Conservation Action, have been working on this policy issue for the past 4 years and beyond. We humbly request that you follow the lead of Santa Rosa and implement standards that can be applied in all the jurisdictions within Sonoma County. We feel our recommendations are reasonable and very





P.O. Box 1862
Santa Rosa, CA 95402

achievable within the development community, as well as in terms of user friendliness for the municipal building inspectors.

Thank you for considering these amendments to CalGreen that will keep our county and cities in the forefront of environmental planning.

Sincerely,

Dennis Rosatti
Executive Director, SCCA

Suzanne Doyle
Sierra Club

Amanda Bornstein
Greenbelt Alliance

Ben Boyce
Accountable Development Coalition