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Small, detached, green, and passive solar design units : three second-unit designs

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SMALL, DETACHED, GREEN, AND PASSIVE SOLAR DESIGN

UNITS: THREE SECOND-UNIT DESIGNS

A Creative Project

Presented to

The Faculty of the Interdisciplinary Studies Program

San José State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

by

Shaun M. Tai

August 2007

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STATEMENT OF THE PROJECT

SMALL, DETACHED, GREEN, AND PASSIVE SOLAR DESIGN UNITS: THREE SECOND-UNIT DESIGNS

By Shaun M. Tai

The City of San José authorized a temporary second-unit pilot program on November 29, 2005, allowing the issuance of 100 second-unit permits. The process, per state law, does not allow for flexibility with design criteria.

This project uses a property in the pilot program. The plot is located at 1164 Britton Avenue in San José, California. The project proposes three second-unit designs on the property with similar square footage. Design Variation A uses conventional construction methods and meets design criteria under City regulations; Design Variation B is the greenest unit allowed under the ordinance, using green building and passive solar design. Design Variation C is also energy efficient, using alternative roof features and materials.

The designs suggest that if the City allowed flexibility by permitting green building materials or different design standards, resource- and energy- friendly features could be incorporated and fewer natural resources would be required during construction.

DEDICATION

For my mother who taught me good was never good enough. To my family, who has provided me with emotional and financial support. For all the good times and bad times, and cheers to the future unknown. I'm ready...

ACKNOWLEDGEMENTS

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CHAPTER 1: INTRODUCTION

Design Problem

The purpose of this creative project is to design three second-unit building prototypes that integrate green building and solar passive design. This project demonstrates a real life scenario where different levels of design flexibility are exercised. The homeowners of 1164 Britton Avenue in San José, California, wish to add a 400 square foot (sq. ft.) second-unit to their property. Currently there is a shed on the proposed site for the second-unit, which needs to be torn down. The shed is located behind a recently remodeled 2-car garage. The clients wish to remove the shed and replace it with a 400 sq. ft. secondary unit, to be used as a poolroom. The homeowners do not rule out the possibility of turning the unit into a rental property for future use. Quite a few secondary units (Figure 1) or garages exist in the neighborhood, many of which were built when the primary dwelling units were constructed.

Figure 1. Site perspective showing project second-unit site and existing secondary units in neighborhood along Britton Avenue. *Source:* ©2007 Shaun M. Tai, All rights reserved. *Note:* Some secondary units are garages or garages converted to second-units.

City of San José's Valuable Form of Housing

The notion of sustainability and energy efficiency has become a hot topic in California and serves as the driving force behind this creative project. According to the U.S. Environmental Protection Agency, sustainability is about balancing a growing economy, protecting the environment, and being socially responsible for future generations and ourselves. The City of San José supports building owners, architects, developers, and contractors who include sustainable building objectives early in the building design process (What the City Is Doing, para. 1). To show that the City was serious about green building opportunities, the City Council of San José passed a recommendation on November 12th, 1998, which led to the creation of a Green Building Taskforce (Green Building Program Background, para. 1). Three years later, the City Council accepted the findings and adopted the green building policies as developed by the community with the help of City departments and the taskforce (Green Building Policy, para. 2).

As required by state law, the City of San José's second-unit program is ministerial. The process is very quick because it eliminates the building permit process, but the City code is not flexible with design criteria.

The ministerial process requirement means that the City would have no discretion over the approval of a second-unit permit—if the application meets the city's criteria, it is approved administratively, without public notice or input (Zoning Ordinance Proposed Amendments, n.d.).

Almost all aesthetic features must match the primary dwelling unit. Given a ministerial process, this ensures compatibility with the primary dwelling unit. However, if the City Council allowed for additional design criteria flexibility, then resource- and energy-

friendly features could be incorporated. Resource- and energy- friendly features would not necessarily clash with the aesthetic features of the primary dwelling unit as shown in Design Variation B.

California Assembly Bill AB 1866

San José's spectacular growth in the last five decades has brought with it a wide range of urban problems. The biggest problem is rapidly inflating home prices, which has increased the demand for affordable housing. The City of San José's urbanized area is dense, with more than 5,900 people per square mile (U.S., San Jose, 2007). However, the affordable housing is mostly apartments, town homes, and condominiums that do not retain community character. Second-units are built on existing residential plots and can help fill the lack of affordable housing for the City.

California Assembly Bill AB 1866 (Appendix D) encouraged the City of San José to re-evaluate the 1984 findings that stated there would be adverse health, safety and welfare impacts caused by the addition of housing units beyond the impacts planned for in the General Plan (Chapter 1062, Statutes of 2002). The City examined types of changes that would need to be made in order to continue the creation of secondary units. After revisiting the issue, the City Council of San José deemed them "a valuable form of housing" (Creswell, 2003, p. 2). AB 1866 amends two sections of governmental code that set forth the creation of secondary units.

Government Code Section 65852.2 requires cities to adopt an ordinance that allows ministerial approval of second-units where local governments must "... accept the application and approve or disapprove the application ministerially without discretionary

review...” Because the City has no discretion over the permit, Creswell (2003) states that the process must apply “predictable, objective, fixed, quantifiable and clear standards.”

Section 65852.2 (second-unit law) – Amendments require local governments with a local second-unit ordinance to ministerially consider second-unit applications as of July 1, 2003; and local governments without a local second-unit ordinance or a local ordinance not in compliance with subsections (a) or (c) of second-unit law should ministerially consider second-unit applications in accordance with State standards, established in subsection (b), as of January 1, 2003 (Creswell, 2003).

Government Code Section 65583.1 allows a city to identify adequate sites by examining current land designations according to the need for second-units.

Section 65583.1 (a portion of State housing element law) – Amendments clarify existing housing element law to allow identification of realistic capacity for second-units in addressing a locality’s share of the regional housing need. The identification of realistic capacity should be based on the development trends of second-units in the previous housing element-planning period and other relevant factors. These amendments were effective as of January 1, 2003 (Creswell, 2003).

San José City Council subcommittee discussions about secondary units took place in June, August, and October 2003, March 2004, and October 2005. The meetings advised staff to develop language for an ordinance. Finally, on November 29th, 2005, the City Council adopted an ordinance that allowed for a limited secondary unit program running from January 2nd until December 31st, 2006. The pilot program (Appendix C) allowed for up to 100 permits for new secondary units; existing units that comply with the approved requirements could also obtain a second-unit permit (Zoning Ordinance: Second-Units, n.d.).

Defining Secondary Units

A secondary unit (SU) is an additional, self-contained housing unit that is secondary to the main residence. It can be attached as an add-on to an existing home, as a second-story level over an attached garage, or detached as an independent, stand-alone building such as a small house or bungalow (Secondary Unit Housing Reform, n.d.). In order to be considered a true secondary unit, it must have a full kitchen (sink, food storage, and cooking facilities), full bathroom, a place to sleep, and the property owner must occupy the existing house (Adding a Guest House, 2005). They are also referred to as “Accessory Dwelling Units (ADU’s),” “Accessory Living Units,” “Granny units,” “Granny flats,” “Mother-In-Law units,” “In-law apartments,” “Garage apartments,” “Carriage houses,” “Companion Units,” “Ancillary units” or “Accessory apartments”. In California, as of the year 2000, 332 jurisdictions have adopted some variety of secondary unit ordinance (J. Davidson, public presentation, October, 2004).

Advantages of Secondary Units

Secondary units provide a much needed and important source of affordable housing. The secondary unit program can help ease a rental-housing deficit by maximizing limited land resources and existing infrastructure (Green Building Policy, n.d.). The second-unit concept allows additional units to be fit in existing development patterns, providing a range of housing types exhibiting compact building design that preserves open space (Daly, 2002). Homeowners can benefit from supplemental income from renting the unit. Additionally, secondary units can help with mortgage payments.

In Courtside Village, a neighborhood in Santa Rosa, California, garage apartments are included with every single-family home located on an

alley. To date, 50 units have been completed, and developer and designer Alan Cohen estimates that half the 600 square feet, one-bedroom apartments are rented out at a rate of \$850 to \$900. The alley homes currently sell for \$390,000, including the ADU. Assuming a 15 percent down payment and a 30-year mortgage at 7 percent, Cohen calculates the monthly mortgage to be \$2,205. A rental fee of \$900 covers 41 percent of the mortgage. Cohen adds that conventional developers in the area have noticed the success of Courtside's ADUs, and have begun to build them in other subdivisions (Granny flats add flexibility and affordability, 2001).

Second-units also provide many community-oriented benefits. For the City, the units offer suitable living conditions at below market prices within existing San José neighborhoods. People needing caregivers, children caring for elderly parents, students, disabled or adult children returning home are all utilizing these units. When designed with the environment in mind, second-units can exhibit a distinct sense of place. Second-units can be used as a home office or a pool house, situated specifically for an increased sense of security by filling unused, open space (Accessory Dwelling Units, 2006). Safer areas encourage children and adults to use them for socialization. Compact development reduces pollution hazards. The demand for public transportation increases as the dependence upon the automobile decreases. Distances to shops and services can be shortened (Green Building Policy, n.d.).

Secondary units are increasingly becoming a popular amenity and an important selling point (Granny flats add flexibility and affordability). The affordable housing movement helps urban communities stand out compared to conventional subdivisions. Furthermore, in the December 2001 issue of New Urban News, it states that second-units are a practical way of achieving a livable, sustainable community.

Successful Secondary Unit Programs

The City of San José examined a number of successful secondary unit programs throughout Northern California. The City looked at six different categories for secondary residential units that were important references for developing their own successful secondary unit program (Table 1). The findings conclude that in cities where affordable housing is in high demand the popularity of obtaining secondary unit permits increases. According to the U.S. Census Bureau (2005), nearly 70 percent of the homes in San José are valued in excess of \$500,000. The City of San José has 175,828 owner-occupied units (Selected Housing Characteristics, 2005). Furthermore, the median household income is \$70,921 and the median earning for workers is just \$37,321, indicating an evident need for affordable housing (Selected Economic Characteristics, 2005).

Most cities have a second-unit ordinances including Santa Clara, Mountain View, Santa Cruz, Los Gatos, Sunnyvale, Cupertino, Oakland, Milpitas, Palo Alto, and Fremont. Some cities are stricter than others regarding the criteria for building second-units, but all of these cities realize that there is a need for more affordable housing.

Table 1

Secondary Residential Units (the number of) – California Cities

City	Owner Occupancy Requirement	Lot Size Max. / Min.	Parking Requirement	Other Requirement	Units Created in 2002	Total # of Homes in City
Santa Clara	No	7,000 / 640 sq. ft.	Yes, one space	Front, side, rear yard restrictions	15	39,630
Mountain View	No	35 larger than min req / 700 sq. ft.	Yes, one per bedroom	10 ft. from main house and rear prop line	2	32,432
Santa Cruz	Yes	5,000 / 500 sq. ft.	Yes, one per bedroom	Setbacks of 3 ft, 15 ft in height	139	21,504
Los Gatos	No	10,000 / 750 sq. ft.	Yes, one space	Architecture and site approval	n/a	12,367
Sunnyvale	Yes	9,000 / 700 sq. ft.	Yes, one space	Unit must be in back of primary dwelling	70	53,753
Cupertino	n/a	10,000 / 640 sq. ft.	Yes, one space	Architecture consistent with primary	25	18,682
Oakland	Yes	None / 650 sq. ft.	Yes, one space	Special Residential Design Review	n/a	157,508
Milpitas	Yes	6,000 / 475 sq. ft.	n/a	Applicable Zoning Requirements	n/a	17,364
Palo Alto	No	6,000 / ax 900 sq. ft.	Yes, two spaces	Conforming permitted uses	90	26,048
Fremont	Yes	None / 275 sq. ft.	Yes, one space	Size, location, character	5	69,452

Source: Secondary Residential Units – California Cities, Attachment A, October 2003.

Note: Table 1 entries simplified to fit allotted space; cities not local to San José removed.

CHAPTER 2: GREEN BUILDING

Design Variations B and C take green building principles into account from top to bottom. Green building involves a commitment to conservation and common-sense design. The foundation of green building is built upon three primary principles. First, to build for the long-term – building durable homes and livable communities. Second, to build for our children – making their homes healthier and the communities and the environment safer. Third, to build for the planet – using natural resources wisely and judiciously (*New Home Construction Green Building Guidelines*, 2005). These principles create a “whole-systems” approach for designing and constructing buildings that abide by these values. Green building means designing and constructing a home with the least negative impact to the environment while providing the healthiest living space possible; it is both energy-efficient and resource-friendly (Let the Green In, 2006).

The four fundamental objectives of green building include conserving natural resources, using energy wisely, improving indoor air quality, and planning for livable communities. Traditional construction processes consume large quantities of wood, water, metals, fossil fuels, and other natural resources (*New Home Construction Green Building Guidelines*, 2005). The National Association of Home Builders (NAHB) says that in the U.S., it takes 1.5 acres of forest to build a single 2,100 sq. ft. home. This wasteful practice is avoidable as there are many practical, well-established green building practices and strategies that provide environmental benefits while conserving natural resources. Furthermore, the *New Home Construction Green Building Guidelines* (2005) say that building an average 2,000 sq. ft. house produces about 7,000 pounds of waste. In

the case of a typical 500 sq. ft. second-unit, approximately 1,750 pounds of waste would be produced. Green building practices and strategies involve using recycled-content products, durable products with extended warranties, high efficiency appliances, and landscape water management systems (*New Home Construction Green Building Guidelines*, 2005).

Green building means being energy efficient. It has been reported that homes account for roughly 31 percent of the electricity consumed in the State of California (U.S. Household Electricity Report, 2005). Energy Star, a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy, claims that something as simple as replacing a light bulb with a compact fluorescent light bulb in every home would save enough energy to light more than 2.5 million homes for a year. These energy friendly savings (Table 2) are equivalent to the emissions of 800,000 cars. The U.S. Department of Energy also states that compact fluorescent light bulbs use two-thirds less energy and last ten times longer.

Table 2

Lighting Comparison Chart

Lighting Type	Efficiency (watts)	Lifetime (hours)	Indoors / Outdoors
Standard "A" bulb, Incandescent	10 – 17	750 – 2500	Both
Compact fluorescent lamp (CFL), Fluorescent	50 – 70	10,000	Both

Source: Lighting and Daylighting.

Americans spending 90 percent of their time indoors, yet the air in new homes can be ten times more polluted than outdoor air, according to the U.S. Environmental Protection Agency (1993). A report in the *New England Journal of Medicine* states that 40 percent of children will develop respiratory diseases in part due to chemicals in their homes. EPA's Total Exposure Assessment Methodology (TEAM) studies found levels of about a dozen common organic pollutants to be 2 to 5 times higher inside homes than outside, regardless of where the homes were located (*New Home Construction Green Building Guidelines*, 2005). To combat these pollutants, the building industry has developed low-volatile organic compound (VOC) paints, cleaners, and adhesives that do not contribute to photochemical smog in the atmosphere (Merriam-Webster's Medical Dictionary, 2002). Exposure to VOCs can cause a range of symptoms from “short-term nausea, eye irritation and headaches to more severe, longer-lasting effects” (Build It Green Home Tour, 2005, p. 73).

Green Building Materials

The demand for green building has materialized as society makes a conscious effort to conserve. Design Variations B and C make an effort to conserve by using environmentally friendly, green building materials. Traditional building in the United States creates 136 million tons of construction and demolition waste each year (Green Building 101, 2005). In recent years, California homebuilders have been looking for alternative and trendy construction methods. Americans use 40 percent of the world's raw materials. With decreasing natural resources and an increasing focus on building

quality, health, quality of life, and energy costs, green building has drawn the attention of homebuilders, homeowners and communities alike (About USGBC: Core Purpose, n.d.).

Contrary to the common myth and belief that green building is “too expensive”:

The ‘too expensive’ idea of green building is a myth. The Habitat for Humanity East Bay is a nonprofit and we are doing it! Green Building can be done on various income levels. Many materials are comparable in price to their traditional counterparts. As we build green, we try to incorporate as many techniques and materials... (Habitat for Humanity East Bay, n.d.).

Flooring materials such as natural linoleum, cork, bamboo, wood and wood alternatives, or finished concrete can reduce air pollution inside homes. These materials last longer, require less maintenance, and because they are durable products they generate less waste and some are readily renewable resources (New Home Construction Build It Green Home Tour, 2005, p. 19). Salvaged building materials are energy efficient and reduce landfill pressure (Checklist for Environmentally Responsible Design & Construction, n.d.). Fly-ash is a salvaged material, a coal power plant by-product that is cost effective and improves the performance of products it is added to. One way to enhance concrete foundations is to use concrete made of fly-ash (Chiras, 2002, p. 50). Originally treated as waste and disposed of in landfills, the addition of fly-ash in concrete displaces cement use, reducing the need for cement production – a major energy user and source of greenhouse gas emissions (Producing More than Energy, 2005). This innovation is crucial because traditional building is responsible for 30 percent of total green house gas emissions (Green Building 101, 2005).

Green Building Benefits

The benefits of green building range from cleaner air to reduced traffic congestion, from more appealing recreational opportunities to greater economic strength. For the City of San José, green building can provide many long-lasting economic and sustainable construction benefits. Communities that are designed to reduce automobile reliance possibly could ease traffic congestion and promote mixed-use development (Solutions to the Bay Area's Automobile Crisis, para. 6). Intangible benefits such as open space and natural wildlife habitats are preserved, while neighborhoods become more pedestrian- and bicycle- friendly. The more efficient a plot of land is designed, the more a second-unit owner is likely to use public transportation. Green buildings are more than just buildings. They are the end result of collaborations between people on all levels of design and construction that is focused on improving past practices making the homes of today ready for the future (*New Home Construction Green Building Guidelines*, 2005).

Solar Photovoltaic (PV) Panels

Solar photovoltaic (PV) panels installed on Design Variations B and C can meet 100 percent of the secondary unit's electricity needs. The panels convert the sun's light directly into electricity using solar cells (Build It Green Home Tour, 2005, p.72). Solar cells, also called photovoltaic cells, are small, square-shaped panels primarily made of silicon; individual PV cells are grouped together on solar panels. Once light from the sun comes in contact with a solar cell, chemical reactions release electrons creating an electric current. The electrical current can then be used in a home for lighting and household appliances (Solar 101, para. 4). Electrical current is measured in kilowatts (kW), a unit of electrical power equivalent to 1,000 watts. Design Variations B and C utilize grid-connected solar PV systems commonly referred to as grid tie systems. The process of a grid tie system is relatively simple (Figure 2): the sun's rays and solar panels create electricity; the inverter converts direct current (DC) electricity to useable, alternating current (AC) electricity that we consume everyday.

Figure 2. The process of a grid-connected or grid tie solar PV system. *Source:* ©2007 Shaun M. Tai, All rights reserved.

CHAPTER 3: PASSIVE SOLAR DESIGN

Design Variations B and C are designed with features that make the units comfortable while reducing utility bills. Passive solar design is important for year-round cooling and heating needs without the use of mechanical equipment (Solar Energy For Homes, n.d.). It achieves year-round comfort minimizing negative impacts while reducing energy consumption and lowering operating costs. The building must be designed as a functional unit; it should be designed to collect, store and distribute the sun's heat in winter while blocking the sun's rays in summer (Passive Solar Design, para. 2). Two fundamental building components of passive solar design are south-facing windows (solar glazing) and heat absorbing material (thermal mass); these building components share a vital relationship. South-facing windows, for instance, maximize the light from the sun's rays while thermal mass absorbs and stores its heat energy, releasing the warmth when temperatures cool (Chiras, 2002, p. 23). Materials with a high thermal mass include rocks, earth, and concrete (Build It Green Home Tour, 2005, p. 73).

Chiras (2002) identifies fourteen principles (Figure 3) of passive solar design.

Fourteen Principles

1. Ensure site has good solar exposure
2. Orient the east-west (long) axis of the home within 10 degrees of true south
3. Concentrate windows on the south side of the house
4. Minimize east and west glazing
5. Provide overhangs and shade to regulate solar gain
6. Provide well-positioned thermal mass for heating and cooling
7. Insulate ceilings, walls, floors, and foundations
8. Protect insulation from moisture
9. Design house so that rooms are heated directly and for optimal natural heat distribution
10. Create sun-free zones for computer work and television watching
11. Seal leaks and cracks to reduce air infiltration but ensure adequate ventilation for fresh air
12. Provide efficient, properly sized, environmentally responsible backup heating and cooling systems
13. Protect homes from winter winds by landscaping, earth sheltering, and other measures
14. Design interior space to correspond with solar gain and living patterns

Figure 3. Principles of Passive Solar Design. Source: Chiras, 2002, p. 218-23.

Passive Solar Heating

There are two differing passive solar heating designs. The most straightforward and least expensive design is the sun-tempered design, which passively heats a building by orienting the east-west axis of a house to true south (Chiras, 2002, p. 90-1). This method modestly increases the number of south facing windows and usually requires moving windows from the other sides of the house; it does not require thermal mass. According to Chiras (2002), on the south-end, facing glass should not exceed 7 percent of the total floor area. In the case of a typical 500 sq. ft detached second-unit, the south facing glass should not exceed 35 sq. ft. This method can satisfy up to 20 to 30 percent of the annual heating load (Chiras, 2002, p. 30).

Design Variations B and C use passive solar design that provides substantially more heat than sun-tempered designs. A passive solar design building features a greater

percentage of windows on the south side while reducing the number of windows on the north, east and west sides (Chiras, 2002, p. 90-2). This method is straightforward and requires greater use of thermal mass and does so with the following three options: 1) direct gain (vertical south-facing site and windows, clerestory windows, skylights, insulation, thermal mass, and overhangs), 2) indirect gain (thermal storage walls and trombe walls), and 3) isolated gain (attached sunspaces). Passive solar design uses the overhangs (Figure 4) to screen the home during the warmth of the summer and allows heat to penetrate the living space of the house during the colder months (Solar Energy For Homes, n.d.). Solar oriented homes should be designed this way so that windows facing south are exposed to maximized solar contact (Residential Design Guidelines, 1999, p. 72). A combination of direct gain and thermal mass is used in both Design Variations B and C.

Figure 4. Overhang helps to shade home during summer and allows sunlight in, during cold winter months. Source: ©2007 Shaun M. Tai, All rights reserved.

Direct gain is radiant heat resulting from sunlight admitted directly to the home through south-facing windows (Figure 5) warming up thermal mass and the interior surfaces. For true direct gain, the south-facing window area must be sized for the climate and the type of window used must allow solar gain. Clerestory windows (Figure 6), a narrow pane of glass at the top of a wall, stream sunlight even further into the building allowing it passage to thermal mass. Thermal mass materials such as concrete with recycled fly-ash, brick or tile are common choices for a passive solar home. They are most effective when dark colored and located in direct sunlight. These dense materials absorb and release heat slowly and are easily and inexpensively integrated into the building's design. The addition of thermal mass allows saved solar energy to heat the

house at night or on overcast days. In addition, Chiras says, for a modest cost increase, the combination increases the performance and energy-saving characteristics of the home (2002).

Figure 5. Sunlight admitted directly to the home through south-facing windows being absorbed by thermal mass; Design Variation B (left) and Design Variation C (right).
Source: ©2007 Shaun M. Tai, All rights reserved.

Figure 6. Detailed drawing of Design Variation C that shows sunlight streaming through clerestory window onto north wall, sun making contact with floor mass, and solar panels collecting south facing sun. *Source:* ©2007 Shaun M. Tai, All rights reserved.

Passive Cooling

There are two primary ways to passively cool a home: reducing internal heat gain and reducing external heat gain. Design Variation B and C are designed to reduce internal and external heat gain. The easiest way to reduce internal heat gain is by installing fluorescent light fixtures throughout the house (Chiras, 2002, p. 164-5). Fluorescent lamps must be handled and stored carefully and be kept away from the rain so if they break, the mercury from broken lamps won't be washed with the rain into the water system. Because fluorescent lamps contain mercury, they are considered hazardous waste under the universal waste rules. Universal waste may not be discarded in solid waste landfills; it has to be sent to an authorized recycling facility (Recycle, n.d.). The California Integrated Waste Management Board states that fluorescent lamps and tubes are three to four times more energy-efficient. Fluorescent lamps and tubes reduce greenhouse gas emissions and other pollution from energy production. Chiras maintains that compact fluorescent light bulbs emit 90 percent less heat so they are safer to operate and can help cut energy costs associated with home cooling (2002). Heat and energy efficient appliances such as Energy Star use less energy, save money, and help protect the environment. Another practical way to passively cool a home is with ceiling and portable fans. These fans can cool a house in the summer evenings, usually within 30 minutes, as the warm air is pulled up and out (Build It Green Home Tour, 2005, p. 51).

Chiras recognizes eight ways to reducing external heat gain: 1) proper orientation of a home and correct window placement, 2) avoiding two-story glass and inappropriate skylights, 3) natural shading such as trees and other vegetation, 4) mechanical shading

devices like blinds, 5) light-colored house and roof, 6) good quality, low-emission windows, 7) proper ceiling, roof, wall and floor insulation and 8) reducing air infiltration by purging built-up heat through natural and cross-ventilation (2002).

Advantages of Passive Solar Design

Passive solar design plays a key role with each of the three designs in this creative project because of its countless benefits. Passive solar design helps consumers be more energy efficient, lowering their bills year-round while maintaining independence from the utility companies. Future long-term savings from lower energy and fuel bills can be enjoyed. From an economic standpoint, the designs are low maintenance and reduce operating costs and repairs. The designs leave high levels of owner satisfaction and property valuations (Green Building 101, 2005). From an aesthetic standpoint, attractive and inviting living environments are created with large view permitting windows enhancing the interiors and open floor plan. Clean renewable energy can replace fossil fuels, leaving less pollution and destruction to the environment, while strengthening energy security in the United States (Renewables, para. 2).

Case Study Definition

As defined by the Merriam-Webster Online Dictionary (n.d.), a case study is:

... An intensive analysis of an individual unit (as a person or community) stressing developmental factors in relation to environment (Case study, n.d.).

This creative project presents three case studies. The first case study is a standard second-unit that serves as the control. The second case study features green building materials and methods. The third case study features green building and passive solar design. Each case study has key elements featured in Design Variation A, B and C. The case studies suggest that green building and passive solar design are practical and should be used in second-unit design.

CHAPTER 4: GREEN BUILDING EXAMPLES

Case Study 1 - 3435 Silver Springs Court

The primary dwelling unit on 3435 Silver Springs Court is 3,032 sq. ft. situated on a large 48,000 sq. ft. plot of land. A detached, 24 foot by 22 foot, 528 sq. ft. second-unit (Figure 7) sits on the south-west portion of the lot. Similar to Design Variation A, the primary use is a pool house. However, the previous owners rented the unit out to a college student for rental income. The second-unit features a standard wood light-frame construction with a typical 12-inch on center stud spacing. A conventional slab on grade foundation rests as a surface for the second-unit.

Figure 7. North-east view of Silver Springs second-unit, Lafayette, CA. Source: ©2007 Photography by Shaun M. Tai, All rights reserved.

Three large west-facing single-hung windows and two smaller fixed windows facing east, light up the second-unit during the day and act as a heat source (Figure 9). There are two vision panel doors (Figure 10) that allow entry from either the street or backyard. Conventional wood siding (Figure 8), painted white to match the primary dwelling unit, covers the majority of the exterior. Part of the exterior is covered in a

common bond (pattern) brick that adds aesthetic value to the second-unit. Weathered wood shingles cover the traditional hip roof. The landscape surrounding the second-unit is non-native with a large green lawn, large trees and unique vegetation. Case Study 1 is an example of a typical second-unit with standard, conventional building materials.

Figure 8. 3435 Silver Springs Court signage (left); Wood siding and brick exterior close up (right). Source: ©2007 Photography by Shaun M. Tai, All rights reserved.

Figure 9. West view of Silver Springs second-unit with three large single-hung windows, Lafayette, CA. Source: ©2007 Photography by Shaun M. Tai, All rights reserved.

Figure 10. Vision panel door (left); Green lawn and landscaping (middle); Three large west facing single-hung windows (right). Source: ©2007 Photography by Shaun M. Tai, All rights reserved.

Case Study 2 – Yu Residence

Gloria and Peter Yu live in the Oakland Hills at 5020 Proctor Avenue. Their home (Figure 11) showcases contemporary design with modern green building features. They built a 4,500 sq. ft. house on a plot of land that was consumed in the 1991 Oakland firestorm. The Yu's home features a fundamental green building concept that serves as a practical 'green home' example. The first energy efficient feature is passive solar design; the home was designed to provide sufficient daytime interior lighting. The home is also designed to provide passive solar heating with strategic use of concrete; 50 percent recycled fly-ash in the foundation, exterior stairs, walls, and rear patio with planter boxes

Figure 11. The Yu's Residence: a contemporary home showcases the possibilities of eco-friendly concrete, in Oakland, CA. *Source:* ©2007 Photography by Shaun M. Tai, All rights reserved.

absorbing sunlight and heat to moderate comfortable temperatures.

Another green building example is the “cool” roof (Figure 12) because it uses a light-colored metal made from zinc and aluminum, an efficient composition called Galvalume (GALVALUME, n.d.). Galvalume sheet steel can be used for almost any type of roofing project. The material is practical and readily available. Since the early 1970's, almost 20 million tons of Galvalume have been produced in North America alone. The sheet steel is versatile, easy to use, looks great, and has proven long-term performance (Featuring GALVALUME Sheet Steel, n.d.). The “cool” roof keeps the Yu’s home cool on hot days by reflecting the sun’s rays; Design Variation C features a “cool” roof. The Yu’s residence’s most notable green feature is a 1.2-kW solar photovoltaic system (Figure 13). This system generates enough energy to run the hydronic radiant-floor heating system and provide solar hot water during the warmer months. Solar passive design in conjunction with the metal roof and solar photovoltaic system seem to work well together (Build It Green Home Tour, 2005, pg 30-31) and are utilized in Design Variation C.

Figure 12. Two different views of the “cool” roof - a light-colored metal roof made of a zinc/aluminum composition; keeps the home cool on hot days. *Source:* ©2007 Photography by Shaun M. Tai, All rights reserved.

Figure 13. Rooftop 1.2-kW solar photovoltaic system; consists of four four-by-ten feet Sharp modules mounted towards the sun. *Source:* ©2007 Photography by Shaun M. Tai, All rights reserved. *Note.* Lightly colored roof top and exterior paint.

Case Study 3 - Edes Avenue, Habitat for Humanity Development

Edes Avenue is part of the Sobrante Park neighborhood located in East Oakland. The surrounding scenery is comprised of vacant lots, freeway overpasses and railroad tracks, the 'breeding ground' for crime and disinvestment. The Habitat for Humanity East Bay has invested in a 1.92-acre lot that was contaminated with industrial waste. The Habitat for Humanity East Bay cleaned the area up making the land acceptable according to Oakland residential zoning standards. Habitat for Humanity East Bay is building twenty-six (Figure 15) new environmentally green homes; to date, six homes (Figure 14) have been completed. These two-story homes are designed for low-income families with severe housing needs. The estimated total cost of the housing development is roughly \$6 million. The goal of Habitat for Humanity East Bay is to maintain or exceed the level of sustainable green features while providing a source of affordable housing for the community; the Edes Avenue site is being designed with these features in mind.

Habitat for Humanity East Bay uses a number of green features and green building materials (Figure 15) in the Edes Avenue Development. One of the materials is high fly-ash concrete that looks like slightly discolored, conventional concrete. Using fly-ash content concrete reduces the amount of Portland (conventional) cement needed, decreasing the negative environmental impacts caused from coal-fired power plants (Chiras, 2002, p. 50). High fly-ash content cement is a key green feature in Design Variations B and C. Habitat for Humanity East Bay uses optimal framing 24-inches on center; a framing method that eliminates 30 percent of the wood used for traditional 12-

inches on center framing. Design Variation A uses a slightly upgraded, but wasteful 16-inches on center when placing studs.

Figure 14. Edes Avenue Homes facing towards street, 10900 Edes Avenue, Oakland, CA 94603. Source: ©2007 Photography by Shaun M. Tai, All rights reserved.

Design Variations B and C use Structural Insulating Panels, a non-conventional framing method that eliminates the use of traditional wood-framing. HardiePanel Fiber Cement Siding is used on the exterior of the homes because the material is durable, non-combustible and it reduces the demand for cedar and redwood siding. HardiePanel Fiber Cement Siding is practical since over 3 million households are currently using them (Fiber cement siding from James Hardie, n.d.). Each unit in the Edes Avenue Development is equipped with a 2.2-kW solar photovoltaic system (Figure 16) that feeds

into the existing Pacific Gas and Electric Company's infrastructure (Figure 17) via a Sunny Boy 2500 Grid-Tie Inverter (Figure 18). The energy generating process starts when sunlight makes contact with the solar panels mounted on top of a home, which feeds into a grid-tie inverter. The inverter provides comprehensive solar panel information including ways to track, store, transmit, display and manage solar energy use. The raw energy is converted to a usable energy resulting in energy savings directly through PG&E's utility system. Similar energy saving features are utilized in Design Variations B and C.

*Figure 15. A photo of the Edes Avenue Development site plan and streetscape elevation.
Source: ©2007 Photography by Shaun M. Tai, All rights reserved.*

Figure 16. 2.2-kW solar photovoltaic system installed on all Edes Avenue homes.
Source: ©2007 Photography by Shaun M. Tai, All rights reserved.

Figure 17. Solar components integrated into existing PG&E utility grid electrical system (left) and PG&E's contribution towards "building solar communities" (right). *Source:* ©2007 Photography by Shaun M. Tai, All rights reserved.

Figure 18. Three images of the Sunny Boy 2500 Grid-Tie Inverter - each LCD display provides comprehensive solar panel information including ways to track, store, transmit, display and manage solar energy use. *Source:* ©2007 Photography by Shaun M. Tai, All rights reserved.

Figure 19. Green information booth displaying green building products, materials and features as seen at all Habitat for Humanity neighborhood developments. *Source:* ©2007 Photography by Shaun M. Tai, All rights reserved.

CHAPTER 5: DESIGN VARIATIONS A, B, and C

1164 Britton Avenue

The plot at 1164 Britton Avenue was used for the three proposed secondary unit designs. It is a 1,449 sq. ft., single family, 3 bedroom, 2 bathroom dwelling unit situated on .24 acres or 10,094 sq. ft. The City of San José also refers to the plot as Assessor's parcel #429-15-034, with a legal description of TRACT 34 LOT 12 (Figure 20). The parcel has an R-1-8, single-family residential zoning designation. The City development standards include the following setbacks (Figure 30) for this property: 25' in front, 5' on its interior side, 12.5' on its corner side, 20' on its interior rear, 20' on its corner rear, and a minimum driveway length of 23' (Residential Design Guidelines, 1999, p. 84-5).

The house was constructed in 1936 with wood framing. More recent renovations include a garage, a shed and fresh off-white paint (Figure 22). The garage has wood vinyl siding painted to match the house, an enclosed archway, and a single door attached from the house to the garage. A walkway made of staggered sand stone material leads from the street to the entrance of the primary dwelling unit (Figure 23). Supporting part of the roof by the entrance are 6" x 6" wood posts with standard 2" x 4" support beams for the rest of its structure. The house exterior is stucco, made of Portland cement and water, with exposed red brick masonry. There are artificial shutters and black canopies for aesthetic purposes. The roofing material is a standard dark gray composite shingle rated for 15-year durability. Houses surrounding (Figures 24-6) 1164 Britton Avenue demonstrate differing and unique characteristics.

Figure 20. Assessor's parcel map. Shaded area indicates 1164 Britton Avenue, TRACT 34, LOT 12. Source: John Davidson, City of San José Planning Divisions, 2006.

Willow Glen

The neighborhood of Britton Avenue is located in Willow Glen, 3 miles southwest of Downtown San José, nestled between Lincoln Avenue and Willow Street (Figure 21). It is essentially a small town in the middle of a bustling Californian city. Willow Glen features distinguished and architecturally unique homes with outstanding schools and walkable neighborhoods; the homes on Britton Avenue are no different. Lincoln Avenue is the tree-lined main street and it is home to outdoor cafes, boutique clothing shops, bookstores, and small businesses.

In the 2005 American Community Survey, the median value of homes in San José was estimated at \$625,400. Zillow.com is an online home valuation tool that appraises

the current market value of a home. The homes on Britton Avenue range from the low figure of \$744,000 to a high of \$1,450,000. In comparison to the other parts of San José, this is an upper middle class area. The location of Britton Avenue is desirable because it is half a mile away from Bramhall Park and close in proximity to downtown San José.

Figure 21. Project vicinity map with project location marker (central, red star). Source: ©2007 Shaun M. Tai, All rights reserved.

Second-Unit Criteria

The City of San José's criteria (Table 3) for building a secondary unit requires the lot size to be either 6,000 sq. ft. for an attached unit or 8,000 sq. ft. if it is detached. The maximum unit size is 600 sq. ft., and the second-unit requires an additional off-street parking space. The exterior materials, roof pitch, and form must match the design of the

primary dwelling unit. Windows cannot overlook adjacent properties and the property owners must certify that they are residing at the home when the application is submitted.

Table 3

Second-Unit Criteria

	Secondary Unit Review Criteria / Requirements
Applicable Zoning Districts	R-1 Districts (single-family residence)
Minimum Lot Size	Attached unit (6,000 sq. ft. lot), Detached unit (8,000 sq. ft. lot)
Maximum Unit Size	600 sq. ft.
Maximum Number of Bedrooms	One
Maximum Bedroom Size	400 sq. ft.
Maximum Storage Space	60 sq. ft.
Required Parking Site Criteria	One open parking space Attached unit (same setback requirements as primary dwelling unit), Detached unit (same setback requirements as primary dwelling unit; must be behind the primary dwelling unit, minimum of six feet from existing structures)
Maximum Height / Average Height	16 feet, 12 feet
Exterior Materials	Must match primary dwelling unit
Roof pitch and Form	Must match primary dwelling unit
Front Door Elevation	Must be different from the front door to primary dwelling unit
Windows	Shall not have views into adjacent properties
Ownership	Property owner must certify that they occupy existing house at time of application

Source: City of San José's summary of second-unit permit requirements, 2005.

Application Process

The application process (Appendix B) requires that the homeowner fills out a form from the City Planning Office and that photographs are taken of the existing structures (Figure 22) on the property (Figure 23). The views of adjoining properties

from the secondary unit location also need to be photographed (Figures 24-6). A building permits application, and a project worksheet also has to be completed. There is a \$250 planning clearance fee including the building permit fees and applicable taxes.

California's tax law provides for a property tax exemption, up to \$7,000 of the assessed value. This property tax exemption is only applicable if the primary dwelling unit is the principal residence for the owner and it must be confirmed as part of the application process.

The plans must provide all the information required for a building permit submittal. They also need to provide the important information depicting the proposed second-unit: the total sq. ft., the bedroom sq. ft. and the storage sq. ft. All plans in this creative project are generated by computer. The proposals first examine existing site conditions (Figure 27), locating plot boundaries including City setbacks, and a site plan. The computer generated site plan (Figure 28) is important because it gives approximate dimensions and illustrates the existing site conditions that influence each of the three designs.

New Home Green Points Checklist

The New Home Green Points Checklist (Appendix A) tracks green features and materials incorporated into the home. A home can be considered green if it earns 50 points or more, and meets the following minimum points per category: Energy (11), Indoor Air Quality/Health (5), Resources (6), and Water (3). Additional points can be achieved from any category to add up to a total of 50. Its strategies help preserve open space, promote social interaction, physical activity and community safety. This makes

homes more accessible to people of all physical abilities (*New Home Construction Green Building Guidelines*, 2005). Design Variations B and C both exceed 50 points.

Figure 22. Northwest photograph of 1164 Britton Avenue. *Source:* ©2007 Photography by Shaun M. Tai, All rights reserved.

Figure 23. Close-up of landscape and entry path to 1164 Britton Avenue. *Source:* ©2007 Photography by Shaun M. Tai, All rights reserved.

Figure 24. 1160 Britton Avenue, adjoining property west. *Source:* ©2007 Photography by Shaun M. Tai, All rights reserved.

Figure 25. 1168 Britton Avenue, adjoining property east. Source: ©2007 Photography by Shaun M. Tai, All rights reserved.

Figure 26. 1165 Britton Avenue, property directly across the street from 1164 Britton Avenue. Source: ©2007 Photography by Shaun M. Tai, All rights reserved.

Figure 27. Site conditions with labeled features and landmarks. Source: ©2007 Shaun M. Tai, All rights reserved.

Figure 28. Computer generated site plan of 1164 Britton Avenue with correct and defined proportions used for design study. *Source:* ©2007 Shaun M. Tai, All rights reserved.

Figure 29. Aerial photograph of 1164 Britton Avenue and its adjacent, neighboring properties. The yellow dotted line represents the property line, the orange dotted line represents City setbacks, the red arrow indicates vehicle entry direction, and the blue box is the proposed 400 sq. ft. second-unit site. *Source:* John Davidson, City of San José Planning Divisions, 2006.

Design Variation A (Control)

Design Concept

Design Variation A adheres to the current ministerial City ordinance and meets the homeowners needs. The homeowners of 1164 Britton Avenue will use Variation A as a multi-use pool house. The overall design is a 360 sq. ft., square shaped, open-space floor plan that is orientated towards the pool (Figure 31). The front door elevation is different from and does not conflict with the front door elevation of the primary dwelling unit. The large open space (Figure 30) can be used for recreation, living and even dining. An electric, wall mounted space heater provides heat during the winter. East facing, standard casement windows made by Andersen overlook the pool area. The bathroom, with a stand-up shower, single flush toilet and vanity, is situated in the southwest corner of the floor plan. An energy efficient kitchen with freestanding appliances is directly parallel. Title 24, of the California Code of Regulations, requires standard florescent lighting to reduce California's energy consumption (Title 24, Part 6, para. 1).

The City ordinance states that the exterior materials must match the primary dwelling unit. The structure stands 13 feet tall and the roof pitch and form matches the primary dwelling unit with a gable roof. The exterior of second-unit uses conventional vinyl siding, painted off-white to match the primary dwelling unit. The roof material is a conventional composite roof shingle with a standard 15-year warranty. The fixed framework for the secondary-unit is built with standard construction materials: Douglass fir-larch wood for framing, rafters and paneling. Its design places studs 16-inches on center, which is a standard construction practice. Design Variation A uses a standard 2

inch by 4 inch wall and fiberglass insulation with an R-value of 11. The foundation is slab-on-grade, an inexpensive foundation that has thickened edges and rests as a single slab on the surface of the ground (McMorrough, 2006, p. 139). Bamboo flooring is made from a long-lasting, renewable material that is durable for heavy use (Environmentally Friendly Building Materials, para. 7). Bamboo is an environmentally friendly alternative to conventional hardwood because it is harvested every three to five years (Build It Green Home Tour, 2005, p. 70).

David Levine, project manager for Canyon Construction Inc, estimates that the cost of Design Variation A would be \$250 per sq. ft. Levine specifies that this estimate is for “standard, bare minimum materials.” Design Variation A will serve as the control (standard) for Design Variation B and C. The per sq. ft. cost of \$250 multiplied by approximately 400 sq. ft. means that the final cost of Design Variation A is approximately \$100,000 (D. Levine, personal communication, March, 2007).

Figure 30. Design Variation A – Floor Plan & Site Plan, north oriented; primary use: pool house, secondary use: rental unit. Note: East facing windows with view of pool area, open floor plan, and overhead storage. Source: ©2007 Shaun M. Tai, All rights reserved.

Figure 31. Design Variation A – East, North, South & West Elevations; colored building is second-unit. Source: ©2007 Shaun M. Tai, All rights reserved.

Isometrics Definition

As defined by the American Heritage Dictionary, an isometric view is:

... A method of projection (isometric projection) in which a three-dimensional object is represented by a drawing (isometric drawing) having the horizontal edges of the object drawn usually at a 30° angle and all verticals estimated perpendicularly from a horizontal base, all lines being drawn to scale (Isometrics, n.d.).

This creative project uses isometric views to show the proportion of the second-unit in relation to the primary dwelling unit. Isometrics ensure that the second-unit's design does not overwhelm the overall aesthetics of 1164 Britton Avenue and its surrounding environment.

Figure 32. Design Variation A – Northeast isometric view. Source: ©2007 Shaun M. Tai, All rights reserved.

Figure 33. Design Variation A – Northwest isometric view. Source: ©2007 Shaun M. Tai, All rights reserved.

Figure 34. Design Variation A – Southeast isometric view. Source: ©2007 Shaun M. Tai, All rights reserved.

Figure 35. Design Variation A – Southwest isometric view. Source: ©2007 Shaun M. Tai, All rights reserved.

Figure 36. Design Variation A – Southeast shaded rendering showing second-unit entry, shed and pool, proportionally. Source: ©2007 Shaun M. Tai, All rights reserved.

Figure 37. Design Variation A – Southeast photo realistic rendering with matching primary dwelling exterior and native landscape vegetation; photo-rendered example shows “recreational” and/or “pool house” use. Source: ©2007 Shaun M. Tai, All rights reserved.

Design Variation B

Design Concept

Design Variation B has the same square footage as Design Variation A. The 360 sq. ft., open floor plan differs from Design Variation A because its primary use is a rental unit and its secondary use is a pool house. The simple floor plan (Figure 43) has a living quarter and for additional storage, a closet with sliding doors integrated into the design. The layout is orientated for passive solar design, instead of designing the layout with east facing windows, the windows are facing south (Figure 44). South facing windows are the essence of passive solar design. The windows are wood-framed, double pane and contain 30 percent recycled materials. The front door elevation is different from and does not conflict with the front door elevation of the primary dwelling unit. The exposed concrete floor acts as thermal mass and is decorative and flood resistant, eliminating the need for wasteful disposal of floor covering materials (Environmentally Friendly Building Materials, para. 7). Beneath the floor is the environmentally friendly foundation made from high volume fly-ash concrete. The mixture is 50 percent fly-ash and 50 percent Portland cement.

To increase energy efficiency, the kitchen has built-in energy star kitchen appliances with overhead cabinetry for storage space. Design Variation B adds a low-flow showerhead, as well as a Kohler dual-flush toilet and an on-demand water re-circulation pump, so more water is conserved. Low-flow shower heads can reduce water consumption and energy heating costs by 50 percent (Low Flow Aerators, n.d.). A Kohler dual-flush toilet is designed to reduce water with the option of a short or long

flush (Build It Green Home Tour, 2005, p. 70). An electric, energy efficient wall heater heats the second-unit. Dedicated, energy efficient fluorescent lighting fixtures with a combination of linear and compact bulbs light up the interior. Ensuring that the interior is pollutant free, it is painted with a low odor, no-VOC acrylic paint by Benjamin Moore, Pristine Eco Spec. Eco Spec Interior Latex paints do not have the odor of conventional paints that contain harmful ingredients known as Volatile Organic Compounds (Eco Spec Interior, para. 1).

Structural Insulated Panels (SIPs)

The framework for the Design Variation B is Structural Insulating Panels (SIPs). Structural Insulating Panels is a high quality alternative to conventional construction materials that is used to build well-insulated floors walls and roofs (Build It Green Home Tour, 2005, p. 73). SIPs are large pre-fabricated boards that connect together to make a home. They provide higher thermal resistance and reduced air leakage because of superior R-values (Murus Structural Insulating Panels, 2006). R-value is a key measurement of heat resistance. As the R-value increases, less heat is transmitted (Chiras, 2002, p. 81) and the more effective the material as insulation, which helps to conserve energy (Build It Green Home Tour, 2005, p. 72).

Each SIP panel consists of rigid foam insulation in-between thin boards reducing the level of outside noise (Highest Performing! Building Systems, n.d.). For this design variation, SIP expanded polystyrene foam core panels are used. Expanded polystyrene Structural Insulated Panels are the least expensive type of foam and they are an industry standard (Murus Structural Insulating Panels, 2006). EPS Structural Insulated Panels

provide reliable performance and are environment friendly containing no Chlorofluorocarbons (CFCs), Hydrochlorofluorocarbon (HCFCs), or formaldehyde. Both CFCs and HCFCs have been implicated in the “accelerated depletion of ozone in the Earth's stratosphere” (Chlorofluorocarbons and Ozone Depletion, n.d.). Most impressive, EPS Structural Insulated Panels carry high insulation properties, with an R-value of 16 (Murus Structural Insulating Panels, 2006) compared to a standard 2 inch by 4 inch wall with a fiberglass insulation with an R-value of 11 (Choosing Wall Insulation, para. 2).

The assembly of an SIP framework is straightforward, consisting of 4 panels for 4 walls that which have prefabricated openings for the windows and doors. The maximum size for an individual SIP EPS foam core panel is 8 feet by 24 feet. Two SIP panels are required for each side of the roof. The estimated cost is \$3.37 per sq. ft. for an EPS panel system (Muras, n.d.). The wall panels cost \$2,156 for 640 sq. ft. and the roof panels cost an estimated \$1,779 for 528 sq. ft. (M. Carmichael, personal communication). The costs do not including freight charges. Mic Carmichael of SIPbuilder, Inc., an SIP builder and consultant, calls SIPs “simplicity in motion.”

The exterior siding is upgraded from conventional vinyl, as featured in Design Variation A. The exterior is covered in HardiePanel Fiber Cement Siding to resemble the primary dwelling unit. Fiber cement siding is “durable, impact-resistant, noncombustible, termite-resistant, low-maintenance and economical” (Environmentally Friendly Building Materials, n.d.). HardiePanel Fiber Cement Siding (Figure 39) is made from a mixture of traditional cement, ground sand and cellulose fiber. HardiePanel Fiber

Cement Siding is more durable than wood or stucco and is significantly less expensive than wood. It is fire, fungus and mildew resistant. Also because of HardiePanel Fiber Cement Siding's strength and thickness, it is impact and weather resistant in the most severe climate, increasing the buildings lifespan and helps reduce maintenance costs (Vinyl siding vs. James Hardie, n.d.). Another outstanding benefit of HardiePanel fiber cement siding is the 50-year transferable limited warranty; a long-term warranty increases house resale value and cuts down siding material replacement costs (Johnson, 2006). To match the primary dwelling's appearance Low-VOC exterior paint by Kelly Moore, E-coat Recycled Acrylic Latex, is used. No- and low- VOC paints contain no or low solvents that result in less odor and low emission of volatile organic compounds, harmful air contaminants (Environmentally Friendly Building Materials, para. 8).

Figure 38. James Hardie Fiber Cement Siding ready for installation at an Oakland construction site (left); Hardie Fiber Cement Siding resembling wood siding installed, but not painted on the exterior of a home. Source: ©2007 Photography by Shaun M. Tai, All rights reserved.

JamesHardie

Vinyl Siding

----- **Flame Resistance** -----

Non-combustible.
Approved for fire-rated
construction.

Vinyl siding will melt
or burn when exposed
to a significant source
of heat or flame.

----- **Color Flexibility** -----

Can be painted
any color you can
imagine
and lasts longer
than with wood.

Color cannot be
changed and is
susceptible to fading.
And it's difficult to
get a perfect match
when repairs are
necessary.

----- **Weather Resistance** -----

So durable it's
guaranteed for up to
50 years, even in the
most severe climates
on earth.

Becomes brittle in
cold weather. Can
be damaged by hail,
limbs, and other
flying debris.

----- **Thickness** -----

James Hardie siding's
strength and thickness
provide impact
resistance
caused by hail or wind.

Premium vinyl siding
is only 5/100" thick.

Figure 39. Fiber Cement Siding from James Hardie compared to conventional vinyl siding. Source: Vinyl siding vs. James Hardie; © 2007 James Hardie International Finance B.V. All rights reserved.

Eco-Shake Roof

Design Variation B stands 13 feet tall and matches the primary dwelling unit with a gable roof. The roof materials are upgrades from conventional composite roof shingles to an alternative wood shake by Eco-Shake. Eco-Shake made by Re-New Wood, Incorporated, is a unique roofing material because it is composed of 50 percent recycled plastic from vinyl garden hoses and 50 percent recycled wood scraps and sawdust (Eco-Shake, n.d.). Eco-Shake provides the appearance of a traditional wood shake roof (Figure 37) and is available in four colors (Figure 40): teak, umber, charcoal and driftwood. Kim Ternes of Eco-Shake says their most “green” color is the light gray driftwood with a 38 percent solar reflectance rate (K. Ternes, personal communication, April, 2007); lightly colored roofs attract less sunlight, keeping homes cool (Chiras, 2002, p.171). Eco-Shake roofs are more durable because the shingles are able to withstand 110 mph winds and severe hail and they require less maintenance than cedar roof shingles (The New Harmony House, 1999).

Figure 40. Eco-Shakes are available in a natural range of colors: teak, umber, and charcoal with custom colors available. *Source:* Eco-Shake Color; ©2007 Re-New Wood, Incorporated. All rights reserved.

There are no additional special skills required to install Eco-Shake shingles, and the cost is almost the same as traditional shake shingles. In Design Variation B, the cost for materials is \$1650 estimated from \$2.75 per 100 sq. ft. bundle covering the 528 sq. ft. roof. The significant benefit of Eco-Shake is that the material lasts over 3 times longer

compared to a standard 15-year warranty. In other words, the home owner can expect to replace conventional shingles three times over the life of a single Eco-Shake installation. “Eco-Shake promises to revolutionize the residential roofing market” (Celebrate Oklahoma, n.d.). More impressive the 50-year warranty is transferable.

Figure 41. Eco-Shakes in use. Source: Eco-Shake Color; ©2007 Re-New Wood, Incorporated. All rights reserved.

Eco-Shake Advantages

1. 50 year warranty 2. Class A fire rating (UL® 790) 3. Class 4 impact rating (UL® 2218) 4. Freeze thaw resistant 5. Passes 110 mph Wind Driven Rain Testing 6. No maintenance 7. Color solid throughout (no chipping, peeling, scratching) 8. UV protected 9. 100 percent recycled material

Figure 42. Advantages of Eco-Shake. Source: Eco-Shake.

Solar Photovoltaic (PV) System

Design Variation B adds a solar photovoltaic system that ties into Pacific Gas and Electric Company's (PG&E) existing infrastructure. PG&E credits customers with solar photovoltaic systems for excess electricity that they feed into the grid infrastructure, essentially spinning the meter backwards, selling the power back to PG&E (Build It Green Home Tour, 2005, p. 72). The credits are highest for power provided during periods of heavy load when solar systems are providing the most power (GREEN Solar Gets Practical, 2006). In California the credits are based on kilowatt hours; currently residential customers are rebated on an incentive plan based on the watts that their system generates (Your Own Energy Source, n.d.).

Design Variation B is a 360 sq. ft. second-unit that has a 180 sq. ft. roof suitable for solar panels. Following compatibility issues set forth in the City of San José's Residential Design Guidelines (1999, p. 74), the exterior solar panels face south so they are not easily visible from Britton Avenue. Solar panels have a 25-year warranty and the inverter has a 10-year warranty; the installation also has a 10-year warranty. Each solar panel produces approximately 187 watts and twelve panels can be installed on a 180 sq. ft. space. This solar photovoltaic setup is a 2.2-kilowatt system (187 watts multiplied by twelve panels equals 2.24 watts). This 2.2-kW PV system produces about 3504-kilowatt hours per year leading to electrical savings of \$1,192 per year; each kilowatt per hour saves \$.34 (California Solar Initiative, para. 3). The cost to install this system is \$18,000 but the state gives a \$4,500 performance based rebate, and the federal government gives a

\$2,000 tax credit, reducing the cost to \$11,500. If the system is saving the homeowner \$1,192 per year, it will take less than 10 years to pay for itself.

Design Variation B unifies the second-unit with the primary dwelling by adding a freestanding, sunshade resting area. A dual sliding glass door leads to the sunshade structure made of 2 inch by 4 inch and 4 inch by 4 inch salvaged wood beams, providing a place for native vegetation to grow and flourish. The second-unit and resting area create a harmonious relationship with surroundings that emphasize the tranquility of outdoor living space; an attribute that coincides with the City of San José's notion of "sensitivity and respect" for natural landscape (Residential Design Guidelines, 1999, p. 7). The resting area also provides a much needed, covered overhead space for scorching summer months (Figure 49).

Levine estimates that Design Variation B will cost an additional 5 percent, plus the costs of the solar photovoltaic system to the cost of Design Variation A (D. Levine, personal communication, March, 2007). Using these calculations, the 5 percent would equate to \$5,000 and the solar photovoltaic system an additional \$11,500. The final cost of Design Variation B is approximately \$120,000 (final cost is \$116,500 with additional miscellaneous costs calculated).

Figure 43. Variation B – Floor Plan north oriented; primary use: rental unit, secondary use: pool house. *Note:* South-facing windows and east-facing, sliding doors that lead to detached sunshade / resting area. *Source:* ©2007 Shaun M. Tai, All rights reserved.

EAST ELEVATION

NORTH ELEVATION

SOUTH ELEVATION

WEST ELEVATION

Figure 44. Design Variation B – East, North, South & West Elevations; colored building is second-unit. Source: ©2007 Shaun M. Tai, All rights reserved.

Figure 45. Design Variation B – Northeast isometric view. Source: ©2007 Shaun M. Tai, All rights reserved.

Figure 46. Design Variation B – Northwest isometric view. Source: ©2007 Shaun M. Tai, All rights reserved.

Figure 47. Design Variation B – Southeast isometric view. Source: ©2007 Shaun M. Tai, All rights reserved.

Figure 48. Design Variation B – Southwest isometric view. Source: ©2007 Shaun M. Tai, All rights reserved.

Figure 49. Design Variation B – Southeast shaded rendering showing second-unit, detached patio, pool, garage and primary dwelling unit, proportionally. *Source:* ©2007 Shaun M. Tai, All rights reserved.

Figure 50. Design Variation B – Southwest rendering showing form and mass, black and white; used to determine material selection and proper proportion(s). *Source:* ©2007 Shaun M. Tai, All rights reserved.

Figure 51. Design Variation B – Southwest rendering in photo realistic setting and environment showing possible for “college student” or “single, working adult” use. Note: Optional herb garden for home grown, organic vegetables; solar panels can be seen (not visible from Britton Avenue) on top of Eco-Shake roofing material. Source: ©2007 Shaun M. Tai, All rights reserved.

Figure 52. Design Variation B – Alternative color combination showing southeast rendering in photo realistic setting and environment showing possible for “college student” or “single, working adult” use. *Note:* Siding and parts of exterior painted to match primary dwelling unit; exposed wood beams blend with the environment. *Source:* ©2007 Shaun M. Tai, All rights reserved.

Accessory Dwelling Unit Contest

Recognizing the housing value of second-units, the Humboldt Association of Realtors co-sponsored with the County of Humboldt, held a second-unit design contest:

The contest was designed to allow additions of accessory dwelling units that would fit on a lot with an existing home effectively promoting the creation of more affordable housing, providing affordable rentals and help reduce the cost of paying for a home (Humboldt Association of Realtors Accessory Dwelling Unit Contest, n.d.).

The accessory dwelling unit contest was open to “designers, architects and others interested in design.” Design Variation B was entered into the contest and it was selected as one of three winning designs. With the help of McCall Design Group, an architecture firm located in San Francisco, the County of Humboldt approved the design plans (Appendix E) on May 15th, 2007.

Design Variation C

Design Concept

Design Variation C's primary use is a rental unit and its secondary use is a pool house. The floor plan (Figure 55) changes from a square to a rectangle; rectangular floor plans work best for passive solar design. Rectangular floor plans minimize sun exposure on the east and west walls and maximize the amount of sunlight from south-facing windows (Chiras, 2002, p. 22). The refined design creates a harmonious and inviting living and kitchen area. The kitchen is expanded and the central overhead cabinetry creates additional storage space. The front door elevation is different from and does not conflict with the front door elevation of the primary dwelling unit. An East-facing dual entry consists of a main entry and an entry that leads to the bathroom. The bathroom includes a Kohler dual-flush toilet, low-flow showerhead, sink, and an on-demand water heater. A dual-flush toilet is designed to reduce water with the option of a short or long flush (Build It Green Home Tour, 2005, p. 70). Low-flow shower heads can reduce water consumption and energy heating costs by 50 percent (Low Flow Aerators, n.d.). An electric, energy efficient wall heater heats the small second-unit. Dedicated, energy efficient, fluorescent lighting fixtures with a combination of linear and compact bulbs light up the interior. The floor plan is better for entertaining because of the circulatory layout of the kitchen and living space.

The double-pane, low emission, wood-framed windows that Design Variation B has are replaced with standard low emission windows by Anderson. Standard, south facing windows allow more heat absorption into thermal mass. North and East facing

windows are triple paned; they are ten times more efficient than the single pane windows used in Design Variation A and three times more efficient than the double paned windows in Design Variation B (Triple-Pane Windows, n.d., para. 1). Clerestory windows are placed high on a wall above the main roofline used to enhance the passive solar design by providing increased day lighting (Build It Green Home Tour, 2005, p. 70). The clerestory windows also have shutters that increase air circulation. The clerestory windows allow additional rays of sunlight to be absorbed by the thermal mass; energy collected during the day and released at night. The absorption process allows direct gain and passive solar heating.

Also differing from Design Variations A and B, Design Variation C features a foundation with a three-way mix of fly-ash, slag (a recycled industrial waste product) and conventional cement. Slag, also referred to as ground granulated blast-furnace slag (GGBFS), makes concrete better and more consistent. Slag reduces construction life-cycle costs and lowers maintenance costs (SCIC #1 - Slag Cement, n.d.). The three-way mix uses recycled materials combining concrete performance by producing superior, long-term strength and "increased workability with less water and reduced efflorescence and permeability" (Environmentally Friendly Building Materials, para. 1). Natural cork flooring from Eco-Cork covers the high volume fly-ash cement foundation. Cork flooring, a green building material harvested from the cork oak tree, regenerates without damaging the tree, conserving natural resources (Build It Green Home Tour, 2005, p. 70).

Structural Insulated Panels (SIPs)

The straightforward SIP framing in Design Variation B is the same for Design Variation C. However, this design uses SIPs with a Polyurethane foam core.

Polyurethane foam core Structural Insulated Panels (Figure 53) are even better for the environment because they do not contain any CFCs, HCFCs or formaldehyde, and they are 100 percent organic (Muras, n.d.).

Polyurethane Structural Insulated Panels provide reliable, cost saving (Figure 54) performance with an R-value of 26 (Muras, n.d.) compared to a standard 2 inch by 4 inch wall with fiberglass insulation with an R-value of 11 (Choosing Wall Insulation, para. 2). Polyurethane Structural Insulated Panels have a plastic inter-locking system that saves time during the installation process. The locking system helps seal the space between panels eliminating unwanted moisture and air infiltration. When combined with the standard connections, the locking system creates a strong and superior building system. The maximum size for a Polyurethane foam core SIP is 4 feet by 20 feet. The estimated cost is \$5.03 per sq. ft. for a Polyurethane foam core panel system (Muras, n.d.). The wall panels cost \$3,219 for 640 sq. ft. and the roof panels cost an estimated \$2,655 for 528 sq. ft. (SIPbuilder, Inc., n.d.). The costs do not including freight charges.

Figure 53. Side by side structural analysis comparing an Expanded Polystyrene SIP foam core (left) to that of a Polyurethane SIP foam core (right). *Source:* Murus Structural Insulating Panels, 2006; ©2006 The Murus Company, All Rights Reserved.

	SIP Energy Efficient Home	Conventionally Constructed Home	Homeowners Pocketed Savings
5 Years	\$2,464	\$5,647	\$3,183
10 Years	\$5,463	\$11,552	\$6,089
15 Years	\$9,111	\$17,742	\$8,631
20 Years	\$13,549	\$24,246	\$10,697

Figure 54. Analysis comparing the operating costs of a standard 1,522 sq. ft. home using two different framing materials. *Source:* SIP Home Systems, 2007.

The exterior of Design Variation C is covered with aluminum siding, a green alternative to wood or vinyl siding, that requires less maintenance than the exterior siding of Design Variation A and B. This recycled, sustainable material is more expensive than

conventional vinyl siding, but aluminum siding offers greater energy efficiency, which translates into lower cooling and heating bills (Revive Your Home, para. 3). Aluminum siding comes in horizontal or vertical panels strips and has holes for fastening into the exterior wall with inter-locking lips to seal against weather. Aluminum siding comes in a variety of textures and styles including wood shake or wood shingle style. It can be painted any color and can be custom-bent to accommodate custom design (Types of Home Siding, para. 1-3). The photo realistic rendering (Figure 62) uses the aluminum siding to give the second-unit a modern, fashionable look. Low-VOC exterior paint by Kelly Moore, E-coat Recycled Acrylic Latex, is used. No- and low- VOC paints contain no or low solvents that result in less odor and low emission of volatile organic compounds which are harmful air contaminants (Environmentally Friendly Building Materials, para. 8).

Design Variation C deviates from Design Variations A and B by using a different roof design: a double-tiered metal roof. The change in roof design raises the second-unit height to 14 feet 6 inches. The double-tiered metal roof cools the secondary unit because of its solar reflectance (Build It Green Home Tour, 2005, p. 36-7); light colored roofs attract less sunlight. The reflective material releases heat very readily reducing the amount of energy needed to air-condition the unit (Build It Green Home Tour, 2005, p. 70). Metal roofs, also known as “cool” roofs are more durable and lower maintenance compared to conventional construction as designed in Design Variation A. In addition to the metal roof, the exterior has a complimenting aluminum siding made of high recycled-content that is recyclable and carries a desirable 50-year warranty (Environmentally

Friendly Building Materials, para. 4). The “cool” roof contains 100 percent recycled content and after its life cycle, can be recycled again. The short-lived conventional composite roof shingles in Design Variation A have less than one third the life span of a metal roof. Although they are more expensive than Design Variation A and B roof materials, metal roofs inherently have less leaks and are more structurally sound (Environmentally Friendly Building Materials, para. 5).

Solar Photovoltaic (PV) System

Design Variation C has the same solar photovoltaic system that ties into Pacific Gas and Electric Company’s existing system as Design Variation B. Levine estimates that the cost of Design Variation C would be an additional 15 percent to the estimated cost of Design Variation B (D. Levine, personal communication, March, 2007). Using these calculations, the additional 15 percent would equate \$17,475. The final cost of Design Variation C is approximately \$140,000 (final cost is \$133,975 with additional miscellaneous costs calculated).

Design Variation C adds a porch and overhangs constructed with Forest Stewardship Council (FSC) certified wood, a green building material that supports environmentally responsible forestry (Environmentally Friendly Building Materials, n.d.). A number of architects and builders use FSC-certified wood in their building projects to demonstrate their own commitment to the environment (The Forest Stewardship Council, n.d.). The living space in the second-unit combined with the private wood porch creates a tranquil relationship with the native drought water plants

outside. The combination coincides with the City of San José's notion of "sensitivity and respect" for natural landscape (Residential Design Guidelines, 1999, p. 7).

Figure 55. Design Variation C – Floor Plan north oriented; primary use: rental unit, secondary use: pool house. Note: South-facing windows, private porch, custom kitchen arrangement, and dual option entry. Source: ©2007 Shaun M. Tai, All rights reserved.

Figure 56. Design Variation C – East, North, South & West Elevations; colored building is second-unit. Source: ©2007 Shaun M. Tai, All rights reserved.

Figure 57. Design Variation C- Northeast isometric view. Source: ©2007 Shaun M. Tai, All rights reserved.

Figure 58. Design Variation C- Northwest isometric view. Source: ©2007 Shaun M. Tai, All rights reserved.

Figure 59. Design Variation C- Southeast isometric view. Source: ©2007 Shaun M. Tai, All rights reserved.

Figure 60. Design Variation C- Southwest isometric view. Source: ©2007 Shaun M. Tai, All rights reserved.

*Figure 61. Design Variation C – Southwest shaded rendering showing second-unit (colors shown do *not* represent actual exterior materials and color selection). Source: ©2007 Shaun M. Tai, All rights reserved.*

Figure 62. Design Variation C – Southeast rendering showing form and mass, black and white; used to determine appropriate proportions and landscape. Source: ©2007 Shaun M. Tai, All rights reserved.

Figure 63. Design Variation C – Southwest rendering in photo realistic setting and environment showing possible “grandparent” or “elderly” use. Note: Clerestory windows, double-tiered roof, solar panels, private patio, and south-facing windows. Source: ©2007 Shaun M. Tai, All rights reserved.

Side-by-Side Comparison

Design Variation A (Table 4) is a 360 sq. ft. second-unit. All materials from the foundation to the roof match the primary dwelling unit. Design Variation A does not feature green building materials or passive solar design. Estimated construction costs are approximately \$100,000. Design Variation A costs \$772.00 per year to operate (Residential - Appliance Calculators, n.d.).

Design Variation B is a 360 sq. ft. second-unit. All materials from the foundation to the roof are green building materials. Design Variation B features green and passive solar design. The green building materials featured in Design Variation B are fiber cement siding, double pane wood-framed windows, Structural Insulated Panels with an R-value of 16, high volume fly-ash slab-on-grade concrete, and an alternative wood shake shingle. The energy saving features are a 2.2-kW solar photovoltaic system and south facing windows and thermal mass. Estimated construction costs are approximately \$116,500. Design Variation B will reduce operating costs by over 90 percent per year.

Design Variation C is a 400 sq. ft. second-unit. All materials from the foundation to the roof are green building materials. Design Variation C features green and passive solar design. The green building materials featured in Design Variation C are recycled aluminum siding, clerestory and triple pane windows, Structural Insulated Panels with an increased R-value of 24, high volume fly-ash slab-on-grade concrete, and a double tiered metal “cool” roof. The energy saving features are a 2.2-kW solar photovoltaic system, clerestory and south facing windows, thermal mass, and a double tiered "cool" roof. Estimated construction costs are approximately \$133,975 Design Variation B will reduce

operating costs by over 90 percent per year. In addition to the improved aesthetic appearance, the green building materials used in Design Variation C will exceed the life of materials featured in Design Variation B.

It is difficult to quantify the numerical savings of Design Variation B and C because the amount saved is based on usage. However, the City of San José should be promoting sustainable and environmentally friendly methods of home construction featuring green building and passive solar design meant for long-term, energy efficient communities.

Table 4

Comparison of Variation A, B, & C

	Secondary Unit - Variation A	Secondary Unit - Variation B	Secondary Unit - Variation C
Square feet (sq. ft.)	360 sq. ft. (perimeter of foundation is 400 sq. ft.), square shape	360 (perimeter of foundation is 400 sq. ft.), square shape	400 sq. ft., rectangle shape
Height	13'	13'	14'6"
Exterior Materials	Match primary dwelling unit, Conventional Vinyl siding	Fiber cement siding (by HardiePanel, 50-year transferable limited warranty) to resemble stucco – color to match primary dwelling unit	Recycled aluminum siding – can be painted any color
Roof Pitch & Form	Match primary dwelling unit, Gable roof form	Match primary dwelling unit, Gable roof form	Different from primary dwelling unit, Double tiered “cool” roof,
Roof Material	Match primary dwelling unit, Conventional composite roof shingle (15-year warranty)	Alternative Wood Shake (by Eco-Shake, 50-year warranty) – color can match primary dwelling unit, optional	Metal “cool” roof w/ white roof coating (50-year warranty)
Windows	Casement Windows	Double-pane, wood-framed windows; 30 percent of windows are reused (by Anderson)	Clerestory window, triple pane windows north & east facing, standard low-e on south end (by Anderson)
Paint	Match primary dwelling unit)	Low-VOC interior paint (by Benjamin Moore, Pristine Eco Spec), Low-VOC exterior paint (by Kelly Moore, E-coat Recycled Acrylic Latex Flat)	Low-VOC interior paint (by Benjamin Moore, Pristine Eco Spec), Low-VOC exterior paint (by Kelly Moore, E-coat Recycled Acrylic Latex Flat)
Energy Efficient Products	Energy efficient appliances (GE, Energy Star)	Solar electricity, 2.2-kW photovoltaic system, Energy efficient appliances (by GE, Energy Star certified)	Solar electricity, 2.2-kW photovoltaic system, Energy efficient appliances (GE, Energy Star)
Flooring	Renewable Bamboo	Exposed fly-ash concrete as finish flooring, semi-shiny finish	Natural Cork flooring (Eco-Cork) covering 50 percent fly-ash concrete
Cooling & Heating	Wall-mounted space heater (electric)	Wall heater (electric, energy efficient); On-demand hot water circulation pump	Energy efficient wall heater (electric, energy efficient); On-demand hot water circulation pump
Passive Solar Design	NO	YES (south-facing	YES (south-facing

Insulation (Walls & Ceilings)	Fiberglass (formaldehyde free)	windows, thermal mass, proper ventilation, overhangs, etc.) SIP, Structural Insulated Panels (Murus)	windows, thermal mass, proper ventilation, double-tiered roof, etc.) SIP, Structural Insulated Panels (Murus)
Foundation	Slab-on-grade, Concrete	Slab-on-grade, Concrete, 50 percent fly-ash (coal combustion product)	Slab-on-grade, Concrete, Three-way mix containing 50 percent recycled fly-ash (coal combustion product)
Lighting	Standard fluorescent, as required by Title 24	Dedicated fluorescent fixtures, combination of linear & compact	Dedicated fluorescent fixtures, combination of linear & compact
Water Conservation	Standard Water Heater (50 gallon), Standard single flush	Dual-flush toilet (Kohler), On-demand water re-circulation pump, low-flow shower heads	Dual-flush toilets (Kohler), On-demand water re-circulation pump, low-flow shower heads
Framing	Conventional fixed framing, 16-inches on center	Structural Insulated Panels (SIPs)	Structural insulated panels (SIPs)
Primary Use	Poolroom / Multi-use	Rental property	Rental property
Secondary Use	Rental property	Poolroom	Poolroom
Sunshade	none	Salvaged wood structure, detached	Integrated overhangs made of FSC-certified wood and recycled materials
Landscape / Plants	Native vegetation	Native vegetation, drought water native plants	Native vegetation, drought water native plants
Cost of Construction (estimated by Canyon Construction in Moraga, CA)	\$100,000	\$116,500	\$133,975

Recommendations

Design Variation B and C feature green building materials and passive solar design. Design Variation B and C show that, with slight changes to the strict design criteria in the second-unit ordinance, resource- and energy- friendly second-units can be built. The City of San José should remove the follow requirements from the second-unit ordinance: exterior materials must match the primary dwelling unit, and roof pitch and form must match the primary dwelling unit. The recommended design criteria changes do not dramatically alter the existing City of San José second-unit criteria.

John Davidson, senior planner for the City of San José is in charge of the second-unit program. When asked if the pilot program was a success, Davidson said that the program was neither a failure nor a huge success, calling the program “ok”; the mediocre success was because of the restrictive ministerial process (J. Davidson, City of San José, personal communication). Davidson continued, “Single-family homes are also part of a ministerial process but they aren’t subject to specific design criteria that second-units are.” Although the second-unit ordinance has a number of requirements, more second-units might be built if the City followed the recommendations set forth in this creative project.

The City of San José should also look into the possibility of offering cash rebates for newly constructed second-units earning 50 points or more on the New Home Green Points Checklist. This rebate program encourages homeowners to use green building materials and passive solar design, reducing the use of natural resources required during construction and providing enduring benefits for the City.

CHAPTER 6: CONCLUSION

Second-units are a valuable form of affordable housing for the City of San José. Green building and passive solar design are practical and environmentally friendly approaches for designing and constructing buildings. If the City of San José allowed for flexibility, with its strict design criteria and guidelines, then alternative, energy efficient construction could be practiced. Design criteria can be a limiting step in a homeowners choice to build second-units in an environmentally sensitive way. Not only does design flexibility encourage homeowners to “do the right thing,” second-units constructed with green building materials and passive solar design reward them with long-term cost savings.

During the year 2006, approximately 50 second-units were built in San José (J. Davidson, City of San José, personal communication) – about half the number the City allowed during its pilot program. Davidson noted that the City of San José has extended the second-unit ordinance to June 30th, 2007 and that there is a possibility of making it a full-blown program (Ordinance No. 27932, 2006, p. 1). The second-unit ordinance in San José should be re-written with less regulation on second-unit design criteria. The City should focus on the affordable housing crisis and move toward encouraging homeowners to adopt green building and environmentally friendly construction.

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APPENDIX A: NEW HOME GREEN POINTS CHECKLIST

New Home Green Points Checklist

The Green Points checklist tracks green features incorporated into the home. The recommended minimum requirements for a green home are: Earn a total of 50 points or more; obtain the following minimum points per category: Energy (11), Indoor Air Quality/Health (5), Resources (6), and Water (3); and meet the prerequisites A.3.a (50% construction waste diversion) and N.1 (Incorporate Green Points checklist in blueprints).

The green building practices listed below are described in the New Home Construction Green Building Guidelines, available at www.builditgreen.org.

Build It Green
Smart Solutions From The Ground Up

ENTER PROJECT NAME		Community	Energy	IAQ/Health	Resources	Water
A. SITE		Possible Points				
1. Protect Native Soil and Minimize Disruption of Existing Plants & Trees						
☐	a. Protect Native Topsoil from Erosion and Reuse after Construction	1				1
☐	b. Limit and Delineate Construction Footprint for Maximum Protection					1
2. Deconstruct Instead of Demolishing Existing Buildings On Site		2				
3. Recycle Job Site Construction Waste (Including Green Waste)						
☐	a. Minimum 50% Waste Diversion by Weight (Recycling or Reuse) - Required				R	
☐	b. Minimum 65% Diversion by Weight (Recycling or Reuse)				2	
☐	c. Minimum 80% Diversion by Weight (Recycling or Reuse)				2	
4. Use Recycled Content Aggregate (Minimum 25%)						
☐	a. Walkway and Driveway				1	
☐	b. Roadway Base				1	
B. LANDSCAPING		Possible Points				
1. Construct Resource-Efficient Landscapes						
☐	a. No Invasive Species Listed by Cal-IPC Are Planted					1
☐	b. No Plant Species Will Require Hedging				1	
☐	c. 75% of Plants Are California Natives or Mediterranean Species					1
2. Use Fire-Safe Landscaping Techniques		1				
3. Minimize Turf Areas in Landscape Installed by Builder						
☐	a. All Turf Will Have a Water Requirement Less than or Equal to Tall Fescue					2
☐	b. Turf Shall Not Be Installed on Slopes Exceeding 10% or in Areas Less than 8 Feet Wide					2
☐	c. Turf is <33% of Landscaped Area					2
☐	d. Turf is <10% of Landscaped Area					2
4. Plant Shade Trees		1				1
5. Implement Hydrozoning: Group Plants by Water Needs						1
6. Install High-Efficiency Irrigation Systems						
☐	a. System Uses Only Low-Flow Drip, Bubblers, or Low-flow Sprinklers					1
☐	b. System Has Smart (Weather-Based) Controllers					2
7. Apply Two Inches of Compost in the Top 6 to 12 Inches of Soil						2
8. Mulch All Planting Beds to the Greater of 2 Inches or Local Water Ordinance Requirement						1
9. Use 50% Salvaged or Recycled-Content Materials for 50% of Non-Plant Landscape Elements						1
10. Reduce Light Pollution by Shielding Fixtures and/or Directing Light Downward		1				
C. FOUNDATION		Possible Points				
1. Incorporate Recycled Flyash in Concrete						
☐	a. Minimum 20% Flyash					1
☐	b. Minimum 25% Flyash					1
2. Use Frost-Protected Shallow Foundation in Cold Areas (C.E.C. Climate Zone 16)						1
3. Use Radon Resistant Construction (in At-Risk Locations Only)						1
D. STRUCTURAL FRAME & BUILDING ENVELOPE		Possible Points				
1. Apply Optimal Value Engineering						
☐	a. 2x4 Studs at 24-Inch On Center Framing					1
☐	b. Door and Window Headers Sized for Load					1
☐	c. Use Only Jack and Cripple Studs Required for Load					1

ENTER PROJECT NAME		Community	Energy	IAQ/Health	Resources	Water
2. Use Engineered Lumber						
☐	a. Beams and Headers					
☐	b. Insulated Engineered Headers					
☐	c. Wood I-Joists or Web Trusses for Floors					
☐	d. Wood I-Joists for Ceilings					
☐	e. Engineered or Finger-Jointed Studs for Vertical Applications					
3. Use FSC-Certified Wood						
☐	a. Dimensional Studs: Minimum 40%				2	
☐	b. Dimensional Studs: Minimum 75%				2	
☐	c. Panel Products: Minimum 40%				1	
☐	d. Panel Products: Minimum 70%				1	
4. Design Energy Heels on Trusses (75% of Attic Insulation Height at Outside Edge of Exterior Wall)						
☐	5. Design Trusses to Accommodate Ductwork					
6. Use Oriented Strand Board (OSB)						
☐	a. Subfloor					
☐	b. Sheathing					
☐	7. Use Recycled-Content Steel Studs for 90% of Interior Wall Framing					
8. Use Solid Wall Systems (Includes SIPs, ICFs, & Any Non-Stick Frame Assembly)						
☐	a. Floors		2		2	
☐	b. Walls		2		2	
☐	c. Roofs		2		2	
☐	9. Thermal Mass Walls: 5/8-Inch Drywall on All Interior Walls or Walls Weigh more than 40 lb/cu.ft.		1			
10. Design and Build Structural Pest Controls						
☐	a. Install Termite Shields & Separate All Exterior Wood-to-Concrete Connections by Metal or Plastic Fasteners/Dividers				1	
☐	b. All New Plants Have Trunk, Base, or Stem Located At Least 36 inches from Foundation				1	
11. Reduce Pollution Entering the Home from the Garage						
☐	a. Tightly Seal the Air Barrier between Garage and Living Area			1		
☐	b. Install Separate Garage Exhaust Fan			1		
12. Install Overhangs and Gutters						
☐	a. Minimum 16-inch Overhangs and Gutters				1	
☐	b. Minimum 24-inch Overhangs and Gutters		1			
E. EXTERIOR FINISH		Possible Points				
☐	1. Use Recycled-Content (No Virgin Plastic) or FSC-Certified Wood Decking					2
☐	2. Install a Drainage Plane (Rain Screen Wall System)					2
☐	3. Use Durable and Non-Combustible Siding Materials					1
☐	4. Select Durable and Non-Combustible Roofing Materials					2
F. PLUMBING		Possible Points				
1. Distribute Domestic Hot Water Efficiently						
☐	a. Insulate Hot Water Pipes from Water Heater to Kitchen					1
☐	b. Insulate All Hot Water Pipes OR Install On-Demand Hot Water Circulation System in conjunction with F.1.a Insulate Hot Water Pipes from Water Heater to Kitchen		1			1
☐	c. Locate the Water Heater within 25 feet of All Hot Water Fixtures and Appliances					1
☐	d. Use Engineered Parallel Piping		1			1
☐	2. Install Only High Efficiency Toilets (Dual-Flush or <=1.3 gpf)					1
G. APPLIANCES		Possible Points				
1. Install ENERGY STAR Dishwasher						
☐	a. ENERGY STAR		1			1
☐	b. Dishwasher Uses No More than 6.5 Gallons/Cycle					1
☐	2. Install ENERGY STAR Clothes Washing Machine with Water Factor of 6 or Less		1			1
3. Install ENERGY STAR Refrigerator						
☐	a. ENERGY STAR: 15% above Federal Minimum		1			1
☐	b. Super-Efficient Home Appliance Tier 2: 25% above Federal Minimum					1
☐	4. Install Built-In Recycling Center					1

ENTER PROJECT NAME		Community	Energy	IAQ/Health	Resource	Water
H. INSULATION		Possible Points				
1. Install Insulation with 75% Recycled Content						
☐	a. Walls and/or Floors					
☐	b. Ceilings					
2. Install Insulation that is Low-Emitting (Certified Section 01350)						
☐	a. Walls and/or Floors					
☐	b. Ceilings					
☐	3. Pre-Drywall Inspection Shows Quality Installation of Insulation					
I. HEATING, VENTILATION & AIR CONDITIONING		Possible Points				
☐	1. Design and Install HVAC System to ACCA Manual J, D, and S Recommendations	4				
2. Install Sealed Combustion (Direct Vent) Units in Conditioned Space						
☐	a. Furnaces	2				
☐	b. Water Heaters	2				
☐	3. No Fireplace or Sealed Gas Fireplace with Efficiency Rating Not Less Than 80%	1				
☐	4. Install ENERGY STAR Ceiling Fans with CFLs in Living Areas and Bedrooms	1				
5. Install Ventilation System for Nighttime Cooling						
☐	a. Whole House Fan	1				
☐	b. Automatically Controlled Integrated System	2				
☐	c. Integrated System with Variable Speed Control	3				
☐	6. Install Air Conditioning with Non-HCFC Refrigerants	1				
7. Design and Install Effective Ductwork						
☐	a. Install HVAC Unit and Ductwork within Conditioned Space	3				
☐	b. Use Duct Mastic on All Duct Joints and Seams	1				
☐	c. Install Ductwork under Attic Insulation (Buried Ducts)	1				
☐	d. Pressure Balance the Ductwork System for Master Bedroom	1				
☐	e. Protect Ducts during Construction and Clean All Ducts before Occupancy	1				
☐	8. Install High Efficiency HVAC Filter (MERV 8+)	1				
☐	9. Install Zoned, Hydronic Radiant Heating with Slab Edge Insulation	1				
10. Install Mechanical Ventilation System						
☐	a. Any Whole House Ventilation System That Meets ASHRAE 62.2	1				
☐	b. Install ENERGY STAR Bathroom Fan	1				
☐	c. All Bathroom Fans Are on Timer or Humidistat	1				
☐	11. Use Low-Sone Range Hood Vented to the Outside	1				
☐	12. Install Carbon Monoxide Alarm(s)	1				
J. BUILDING PERFORMANCE		Possible Points				
0%	1. Design and Build High Performance Homes (2 points for each 1% above T-24, up to 30 pts) Enter the percent above Title 24 in the cell at left. Any value over 15% will automatically earn 30 points.	30				
☐	2. House Obtains ENERGY STAR with Indoor Air Package Certification	5				
3. Inspection and Diagnostic Evaluations						
☐	a. Third Party Energy and Green Building Review of Home Plans	1				
☐	b. Blower Door Test Performed	1				
☐	c. House Passes Combustion Safety Backdraft Test	1				
K. RENEWABLE ENERGY		Possible Points				
☐	1. Pre-Plumb for Solar Hot Water Heating	4				
☐	2. Install Solar Water Heating System	10				
☐	3. Install Wiring Conduit for Future Photovoltaic Installation & Provide 200 ft ² of South-Facing Roof	2				
4. Install Photovoltaic (PV) Panels						
☐	a. 1.2 kW System	5				
☐	b. 2.4 kW System	5				
☐	c. 3.6 kW or more	5				

ENTER PROJECT NAME		Community	Energy	IAQ/Health	Resources	Water
L. FINISHES		Possible Points				
☐	1. Provide Permanent Walk-Off Mats and Shoe Storage at Home Entrances					1
☐	2. Use Low/No-VOC Paint					
☐	a. Low-VOC Interior Wall/Ceiling Paints (<50 gpl VOCs (Flat) and <150 gpl VOCs (Non-Flat))					1
☐	b. Zero-VOC: Interior Wall/Ceiling Paints (<5 gpl VOCs (Flat))					2
☐	3. Use Low VOC, Water-Based Wood Finishes (<150 gpl VOCs)					2
☐	4. Use Low-VOC Construction Adhesives (<70 gpl VOCs) for All Adhesives					2
☐	5. Use Recycled-Content Paint					1
☐	6. Use Environmentally Preferable Materials for Interior Finish: A) FSC-Certified Wood, B) Reclaimed Lumber, C) Rapidly Renewable D) Recycled-Content or E) Finger-Jointed					
	At Least 50% of Each Material (1 pt each):					
☐	a. Cabinets					1
☐	b. Interior Trim					1
☐	c. Shelving					1
☐	d. Doors					1
☐	e. Countertops					1
☐	7. Reduce Formaldehyde In Interior Finish (Section 01350) for At Least 50% of Each Material Below:					
☐	a. Cabinets					1
☐	b. Interior Trim					1
☐	c. Shelving					1
☐	d. Subfloor					1
☐	8. After Installation of Finishes, Test of Indoor Air Shows Formaldehyde Level <27ppb					2
M. FLOORING		Possible Points				
☐	1. Use Environmentally Preferable Flooring: A) FSC-Certified or Reclaimed Wood, B) Rapidly Renewable Flooring Materials, C) Recycled-Content Ceramic Tiles, D) Exposed Concrete as Finished Floor or E) Recycled-Content Carpet. Note: Flooring Adhesives Must Have <50 gpl VOCs.					
☐	a. Minimum 15% of Floor Area					1
☐	b. Minimum 30% of Floor Area					2
☐	c. Minimum 50% of Floor Area					3
☐	d. Minimum 75% of Floor Area					4
☐	2. Thermal Mass Floors: Floor Covering Other than Carpet on 50% or More of Concrete Floors					1
☐	3. Flooring Meets Section 01350 or CRI Green Label Plus Requirements (50% Minimum)					2
N. OTHER		Possible Points				
☐	1. Incorporate Green Points Checklist in Blueprints - Required					R
☐	2. Develop Homeowner Manual of Green Features/Benefits					1
3. Community Design Measures & Local Priorities: See the Community Planning & Design section in Chapter 4 of the New Home Guidelines for measures. Maximum of 20 points for suggested measures. Local requirements may also be listed here.						
0	Enter description here					
0	Enter description here					
0	Enter description here					
0	Enter description here					
4. Innovation: List innovative measures that meet the green building objectives of the Guidelines. Enter up to a maximum combined total of 20 pts. See Innovation Checklist for suggested measures.						
0	Innovation in Community: Enter description here					
0	Innovation in Energy: Enter description here					
0	Innovation in IAQ/Health: Enter description here					
0	Innovation in Resources: Enter description here					
0	Innovation in Water: Enter description here					
Summary						
Points Achieved from Specific Categories		0	0	0	0	0
Total Points Achieved		0				
Project has not yet met the recommended minimum requirements						
- Total Project Score of At Least 50 Points						
- Minimum points in specific categories: Energy (11), IAQ/Health (5), Resources (6), Water (3)						
- Required measures A.3.a and/or N.1						

**APPENDIX B: CITY OF SAN JOSE – SECONDARY UNIT CLEARANCE
APPLICATION FORM**

CITY OF SAN JOSE
 Planning, Building and Code Enforcement
 200 East Santa Clara Street
 San José, CA 95113-1905
 tel (408) 535-3555 fax (408) 292-6055
 Website: www.sanjoseca.gov/planning

SECONDARY UNIT CLEARANCE APPLICATION FORM

Please print clearly or type.

STAFF	File Number SU		Receipt #: _____																						
	Council District		Zoning																						
APPLICANT INFORMATION	Property Owner		Phone (w)	Phone (h)																					
	Address		Fax	Cell																					
			E-Mail																						
	Project Contact Person		Phone (w)	Phone (h)																					
	Address		Fax	Cell																					
			E-Mail																						
PROJECT INFORMATION	Project Address		APN(s)																						
	Application Type (check all that apply)																								
	☐ Detached ☐ Attached ☐ New ☐ Existing, unpermitted																								
	Brief Project Description																								
	<table border="1"> <thead> <tr> <th>PROJECT DATA</th> <th>EXISTING</th> <th>PROPOSED</th> </tr> </thead> <tbody> <tr> <td>Net Parcel Size (square feet)</td> <td></td> <td></td> </tr> <tr> <td>Secondary Unit Square Footage</td> <td></td> <td></td> </tr> <tr> <td>Bedroom Square Footage</td> <td></td> <td></td> </tr> <tr> <td>Number of bedrooms</td> <td></td> <td></td> </tr> <tr> <td>Storage area square footage</td> <td></td> <td></td> </tr> <tr> <td>Building Height</td> <td>____ ft ____ stories</td> <td>____ ft ____ stories</td> </tr> </tbody> </table>				PROJECT DATA	EXISTING	PROPOSED	Net Parcel Size (square feet)			Secondary Unit Square Footage			Bedroom Square Footage			Number of bedrooms			Storage area square footage			Building Height	____ ft ____ stories	____ ft ____ stories
	PROJECT DATA	EXISTING	PROPOSED																						
	Net Parcel Size (square feet)																								
	Secondary Unit Square Footage																								
	Bedroom Square Footage																								
	Number of bedrooms																								
Storage area square footage																									
Building Height	____ ft ____ stories	____ ft ____ stories																							
<i>I certify that the foregoing statements are true and correct to the best of my knowledge. I understand that a misrepresentation of any submitted data may invalidate an approval by the City of San Jose of this application.</i>																									
Applicant's Signature			Date																						
<i>I declare under penalty of perjury that I am the owner of the primary dwelling unit at the property referenced above and that said dwelling unit is my primary residence.</i>																									
Print Property Owner's Name																									
CANVASSER	Signature			Date																					

**PLEASE CALL THE APPOINTMENT DESK AT (408) 535-3555 FOR AN APPLICATION APPOINTMENT.
 THIS APPLICATION APPOINTMENT IS LOCATED ON THE 1ST FLOOR OF CITY HALL.**

Secondary Unitpm65/applications rev. 14/10/2006

Application Requirements

- ☐ Completed Secondary Unit Clearance form
- ☐ Photographs
 - ☐ Existing structures on property
 - ☐ Views to adjoining properties from proposed secondary unit location
- ☐ Completed building permit application and project worksheet
- ☐ Completed homeowner's property tax exemption
- ☐ Plan sets (3 plan sets, minimum 18" x 24") Plan sets must provide all information required for a building permit submittal, and the following additional information:
 - ☐ Total secondary unit square footage
 - ☐ Bedroom square footage
 - ☐ Storage square footage
- ☐ \$250 Planning clearance fee, plus all normal and customary building permit fees and taxes for the proposed secondary unit. Please note that as an example, building permit fees and taxes for a 600 square foot unit can range from \$4,800 to \$5,500, depending on configuration.

Incomplete applications will not be accepted, and will forfeit the required \$100 appointment deposit.

Secondary Unit Criteria:

Prior to application, please be sure that your secondary unit proposal conforms to the following criteria. If you have any questions, please contact the Planning Division at 408-535-7801, or secondary.units@sanjoseca.gov.

Applicable Districts:	All R-1 Districts and Planned Development districts using R-1 standards	
Minimum lot size:	Attached units 6,000 square feet	Detached units 8,000 square feet
Maximum unit size:	600 square feet	
Maximum square footage devoted to bedrooms:	400 square feet	
Maximum number of bedrooms:	One	
Maximum storage space:	60 square feet	
Required parking:	One additional open parking space, outside of front and side setbacks	
Siting criteria:	Attached units: same setbacks as primary structure	Detached Units: <ul style="list-style-type: none"> • same setbacks as primary structure • Behind primary dwelling unit • Minimum six feet from existing structures • Maximum height = 16' • Average height = 12'
Design criteria:	<ul style="list-style-type: none"> • Exterior materials to match existing house • Roof pitch and form to match existing house • Front door of second unit not on same building elevation as the main house's front door • Second unit's windows shall not have views into adjacent properties. 	
Ownership:	Property owner must certify that they occupy existing house at time of application.	

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THIS APPLICATION APPOINTMENT IS LOCATED ON THE 1ST FLOOR OF CITY HALL.**

Secondary Unitpm65/applications rev. 14/10/2006

**INDEMNIFICATION AGREEMENT
FOR DEVELOPMENT APPLICATIONS**

Applicant submitted an application to the City of San José Planning Division on _____, 200__ for the following development approval(s): _____

(the "Project"). For good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Applicant hereby expressly agrees in connection with the processing of Applicant's Project application(s) to each and every one of the following terms and conditions:

1. Applicant agrees, as part of and in connection with each and any of the application(s), to defend, indemnify, and hold harmless the City of San José ("City") and its officers, contractors, consultants, attorneys, employees and agents from any and all claim(s), action(s), or proceeding(s) (collectively referred to as "proceeding") brought against City or its officers, contractors, consultants, attorneys, employees, or agents to challenge, attack, set aside, void, or annul:
 - a. Any approvals issued in connection with any of the above described application(s) by City; and/or
 - b. Any action taken to provide related environmental clearance under the California Environmental Quality Act of 1970, as amended ("CEQA") by City's advisory agencies, boards or commissions; appeals boards or commissions; Planning Commission, or City Council.

Applicant's indemnification is intended to include, but not be limited to, damages, fees and/or costs awarded against or incurred by City, if any, and costs of suit, claim or litigation, including without limitation attorneys' fees and other costs, liabilities and expenses incurred in connection with such proceeding whether incurred by Applicant, City, and/or parties initiating or involved in such proceeding.

2. Applicant agrees to indemnify City for all of City's costs, fees, and damages incurred in enforcing the indemnification provisions of this Agreement.

APPLICANT:

By: _____
(Signature)

(Print)

Date: _____

Its: _____
(Title, if any)

3. Applicant agrees to defend, indemnify and hold harmless City, its officers, contractors, consultants, attorneys, employees and agents from and for all costs and fees incurred in additional investigation or study of, or for supplementing, redrafting, revising, or amending, any document (such as an environmental impact report, negative declaration, specific plan, or general plan amendment) if made necessary by said proceeding and if Applicant desires to pursue such City approvals and/or clearances, after initiation of the proceeding and that are conditioned on the approval of these documents.
4. In the event that Applicant is required to defend City in connection with such proceeding, City shall have and retain the right to approve:
 - a. The counsel to so defend City; and
 - b. All significant decisions concerning the manner in which the defense is conducted; and
 - c. Any and all settlements, which approval shall not be unreasonably withheld.

City shall also have and retain the right to not participate in the defense, except that City agrees to reasonably cooperate with Applicant in the defense of the proceeding. If City chooses to have counsel of its own defend any proceeding where Applicant has already retained counsel to defend City in such matters, the fees and expenses of the additional counsel selected by City shall be paid by City. Notwithstanding the immediately preceding sentence, if City's Attorney's Office participates in the defense, all City Attorney fees and costs shall be paid by Applicant.

5. Applicant's defense and indemnification of City set forth herein shall remain in full force and effect throughout all stages of litigation including any and all appeals of any lower court judgments rendered in the proceeding.

After review and consideration of all of the foregoing terms and conditions, Applicant, by its signature below, hereby agrees to be bound by and to fully and timely comply with all of the foregoing terms and conditions.

APPENDIX C: CITY OF SAN JOSE – SECONDARY UNITS BROCHURE

Interested San José homeowners are saying:

"Our full-time caregiver will soon have the privacy of her own living space while still being right there whenever my wife and I need her."

"My husband's parents stay with us several months out of the year. An in-law unit would give us the extra space we all need to feel comfortable."

"I plan to rent my one-bedroom cottage to a local college student. She'll have an affordable, safe place to stay, and the rent will help supplement my fixed income."

"When our son became disabled and had to move back home, we decided a second unit would give him the independence and security he needed."

For More Information

To obtain a permit application and general pilot program information and updates:

WEBSITE
www.santoseca.gov/planning

CITY HALL
Development Center
200 East Santa Clara Street

To ask staff about application criteria or requirements, or to receive program updates and information:

PHONE
408.535.7801
E-MAIL
secondary.units@santoseca.gov

To schedule an appointment for a preliminary review meeting or to submit your permit application:

PHONE
408.535.3555

In accordance with the Americans with Disabilities Act, City of San José materials can be made available upon request in alternative formats such as Braille, large print, audio tape or computer disk. Requests may be made by calling 408.535.3555 (v) or 408.294.9337 (TTY).

Si desea hablar con alguien en español en cuanto a esta información, favor de llamar al 408.535.3555.

Nếu quý vị muốn nói chuyện với nhân viên nào bằng tiếng Việt về thông tin này, xin gọi số 408.535.3555.

2/4/10/06

Adding a Guest House

*Build the space you need for
relatives, visitors, caregivers*

City of San José
**New Pilot Program Offers Permits
for Secondary Units
Through December 2006**

What is a Secondary Unit?

Often called guest houses, in-law suites, "granny units," or backyard cottages, a secondary unit is a residential structure, either attached or detached from a primary residence. These units contain at least a bathroom and a full kitchen. A full kitchen includes a kitchen sink, a food storage area, and a permanent cooking stove/oven.

What is the Secondary Unit Pilot Program?

In late 2005, the City Council adopted an ordinance to allow up to 100 permits for new secondary units. Owners with existing units that comply with the program's requirements also can apply to obtain a secondary unit permit. The pilot runs from January 2 through December 31, 2006.

Why is the City implementing the pilot?

Recent changes in State law required the City to revisit permits for secondary units, which historically have not been allowed in San José. Secondary units can provide much-needed affordable housing opportunities and appropriate living arrangements for people needing caregivers, children caring for elderly parents, or adult children returning home. The Council created a pilot program to test the criteria and assess the impacts on neighborhoods.

How do I participate in the pilot program?

First, review the program's criteria and application requirements. Next, schedule a free preliminary review meeting to discuss your plans and questions with City planning staff. Finally, make an appointment to submit your application.

THREE STEPS TO APPLY FOR A SECONDARY UNIT PERMIT

Review Criteria/Requirements

Before applying, ensure that your proposal meets the following criteria:

APPLICABLE ZONING DISTRICTS All R-1 Districts (single-family residence) and Planned Development districts using R-1 standards

MINIMUM LOT SIZE

- Attached unit – 6,000 square foot lot – an attached unit is structurally connected to the main house
- Detached unit – 8,000 square foot lot – the unit stands independent of the main house (minimum 6 feet from the main house)

MAXIMUM UNIT SIZE 600 square feet

MAXIMUM NUMBER OF BEDROOMS One

MAXIMUM BEDROOM SIZE 400 square feet

MAXIMUM STORAGE SPACE 60 square feet

REQUIRED PARKING One open parking space outside of front and side setbacks (this is in addition to those spaces required for the main house)

SITE CRITERIA

- Attached unit – Same setback requirements as main house
- Detached unit
 - Same setback requirements as main house
 - Must be behind the main house
 - Minimum of six feet from existing structures
 - Maximum height = 16 feet
 - Average height = 12 feet

DESIGN CRITERIA

- Exterior materials must match main house
- Roof pitch and form must match main house
- Front door elevation must be different from the front door to main house
- Windows shall not have views into adjacent properties

OWNERSHIP Property owner must certify that they occupy existing house at time of application

Schedule a Preliminary Review

Prior to submitting your application, you can schedule a free preliminary review meeting with City Planning staff. We recommend that you bring a site plan (drawing of the lot, your home, property lines and required setbacks) and application so that City staff can review your materials, answer any questions you may have, and provide guidance on the final application step.

Submit Application by Appointment

To apply for your Secondary Unit permit, make an appointment by calling 408.535.3555. Applications are available at www.sanjoseca.gov/planning or from the Development Center located on the first floor of City Hall. Your application package must include the following:

- ☐ Completed Secondary Unit Clearance application
- ☐ Photographs
 - Existing structures on property
 - Views to adjoining properties from proposed secondary unit location
- ☐ Completed building permit application and project worksheet
- ☐ Homeowner's property tax exemption
- ☐ Plan sets (3 plan sets, minimum 18" x 24") each containing information required for a building permit submittal, plus the following additional information:
 - Total secondary unit square footage
 - Bedroom square footage
 - Storage square footage
- ☐ Planning clearance fee (\$250), plus all normal and customary building permit fees and taxes for the proposed secondary unit
- Building permit fees and taxes for a typical 600 square foot unit can range from \$4,800 to \$5,500 depending upon the configuration
- For this pilot period, City Council has suspended the park impact fee (approximately \$10,000)
- ☐ Appointment reservation fee (\$100, non-refundable). This fee reserves your appointment and is put toward the cost of the permit when you submit a completed application.

APPENDIX D: HOUSING POLICY DEVELOPMENT – MEMO AB 1866

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
Division of Housing Policy Development

1800 Third Street, Suite 430
P. O. Box 952053
Sacramento, CA 94252-2053
(916) 323-3177 / FAX (916) 327-2643
www.hcd.ca.gov

August 6, 2003

MEMORANDUM FOR: Planning Directors and Interested Parties

FROM:
Cathy E. Creswell, Deputy Director
Division of Housing Policy Development

SUBJECT: **Second-Unit Legislation Effective January 1, 2003
and July 1, 2003**

AB 1866 (Chapter 1062, Statutes of 2002) amends two sections of Government Code to encourage the creation of second-units, generally as follows:

1. *Section 65852.2 (second-unit law)* – Amendments require local governments with a local second-unit ordinance to ministerially consider second-unit applications as of July 1, 2003; and local governments without a local second-unit ordinance or a local ordinance not in compliance with subsections (a) or (c) of second-unit law should ministerially consider second-unit applications in accordance with State standards, established in subsection (b), as of January 1, 2003.
2. *Section 65583.1 (a portion of State housing element law)* – Amendments clarify existing housing element law to allow identification of realistic capacity for second-units in addressing a locality's share of the regional housing need. The identification of realistic capacity should be based on the development trends of second-units in the previous housing element planning period and other relevant factors. These amendments were effective as of January 1, 2003.

The following attachments are provided to inform localities of Chapter 1062 and to assist in evaluating how these new provisions of State law affect communities. This memo supplements prior technical assistance issued by the Department of Housing and Community Development (Department) on second-unit law. A copy of the legislation can be found on the Department's website at www.hcd.ca.gov. You may obtain copies of published bills from the 2002 session from the Legislative Bill Room at (916) 445-2323 or from the Senate's website at: www.senate.ca.gov. If you have any questions or would like additional information, please contact Paul Mc Dougall, of our staff, at (916) 445-4728.

Attachments

Second Unit Law as Amended by
Chapter 1062, Statutes of 2002
(Assembly Bill 1866)

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Chapter 1062, Statutes of 2002 (Assembly Bill 1866)

B. CHANGES TO GOVERNMENT CODE SECTION 65583.1

Government Code Section 65583.1 was amended by Chapter 1062 (AB 1866) as follows (additions or changes in italics/underlined and deletions indicated by asterisks):

65583.1. (a) The Department of Housing and Community Development, in evaluating a proposed or adopted housing element for compliance with state law, may allow a city or county to identify adequate sites, as required pursuant to Section 65583, by a variety of methods, including, but not limited to, redesignation of property to a more intense land use category and increasing the density allowed within one or more categories. *The department may also allow a city or county to identify sites for second units based on the number of second units developed in the prior housing element planning period whether or not the units are permitted by right, the need for these units in the community, the resources or incentives available for their development, and any other relevant factors, as determined by the department.* Nothing in this section reduces the responsibility of a city or county to identify, by income category, the total number of sites for residential development as required by this article.

(b) *Omitted – Chapter 1062 did not have changes to this subsection*

Any city, city and county, or county using this subdivision shall address the progress in meeting this section in the reports provided pursuant to paragraph (1) of subdivision (b) of Section 65400.

(c) *Omitted – Chapter 1062 did not have major changes to this subsection, only minor clean up*

ATTACHMENT 1

Government Code Section 65852.2

State Second Unit Law

Chapter 1062, Statutes of 2002 **(Assembly Bill 1866)**

A. IMPLEMENTATION DISCUSSION FOR SECOND UNIT LAW GOVERNMENT CODE SECTION 65852.2

Introduction

Second-units (i.e., in-law apartments, granny flats, or accessory apartments) provide an important source of affordable housing. By promoting the development of second-units, a community may ease a rental housing deficit, maximize limited land resources and existing infrastructure and assist low and moderate-income homeowners with supplemental income. Second-units can increase the property tax base and contribute to the local affordable housing stock. Government Code Section 65852.2 (a.k.a. second-unit law) was enacted in 1982 and has been amended four times (1986, 1990, 1994 and 2002) to encourage the creation of second-units while maintaining local flexibility for unique circumstances and conditions. Local governments may allow for the creation of second-units in residential zones, set development standards (i.e., height, setbacks, lot coverage), require minimum unit sizes and establish parking requirements. However, State standards apply if localities do not adopt a second-unit ordinance in accordance with the intent of second-unit law and subsections (a) or (c).

Chapter 1062 amends second-unit law to require ministerial consideration of second-unit applications to encourage the creation of second-units. For the text of Chapter 1062 (AB 1866) relating to Government Code Section 65852.2, see the second section of this attachment, titled "Changes to Government Code Section 65852.2". Following is a discussion of the new legislation to assist localities in carrying out the provisions of Chapter 1062:

Intent of Second-Unit Law (Government Code Section 65852.150)

The preparation, adoption, amendment and implementation of local second-unit ordinances should be carried out consistent with Government Code Section 65852.150:

The Legislature finds and declares that second units are a valuable form of housing in California. Second units provide housing for family members, students, the elderly, in-home health care providers, the disabled, and others, at below market prices within existing neighborhoods. Homeowners who create second units benefit from added income, and an increased sense of security.

It is the intent of the Legislature that any second-unit ordinances adopted by local agencies have the effect of providing for the creation of second units and that provisions in these ordinances relating to matters including unit size, parking, fees and other requirements, are not so arbitrary, excessive, or burdensome so as to unreasonably restrict the ability of homeowners to create second units in zones in which they are authorized by local ordinance.

When Does a Local Second-Unit Ordinance Apply versus State Standards?

Second-unit law contains provisions to guide the adoption of a local ordinance (subsections (a) and (c-g)) and describes State standards that apply in the absence of a local ordinance (subsection (b)). When a local second-unit ordinance is enacted in accordance with subsections (a) or (c), the local ordinance provides the criteria for approving and denying second-unit applications. In the absence of a local second-unit ordinance in accordance with subsection (a) or (c), the State standards contained in subsection (b) of Government Code Section 65852.2 establish the criteria for approving and denying second-unit applications. While the State standards, under subsection (b), do not necessarily apply to the preparation or update of a local ordinance, they are appropriate to use as a guideline.

Does a Locality Have Flexibility in Adopting a Local Second-Unit Ordinance?

Second-unit law was created and amended within the context of providing "...a minimum of limitation...", so localities "...may exercise the maximum degree of control over local zoning matters..." (Government Code 65800). Chapter 1062 requires localities to consider applications for the development of second-units ministerially with the intent to create second-units and not constrain their development. Second-unit law provides local flexibility to manage the opportunity for creating second-units. For example, Government Code Section 65852.2(a)(1) provides that:

65852.2.(a)(1) Any local agency may, by ordinance, provide for the creation of second units in single-family and multifamily residential zones. The ordinance may do any of the following:

- (A) Designate areas within the jurisdiction of the local agency where second units may be permitted. The designation of areas may be based on criteria that may include, but are not limited to, the adequacy of water and sewer services and the impact of second units on traffic flow.*
- (B) Impose standards on second units that include, but are not limited to, parking, height, setback, lot coverage, architectural review, maximum size of a unit, and standards that prevent adverse impacts on any real property that is listed in the California Register of Historic Places.*
- (C) Provide that second units do not exceed the allowable density for the lot upon which the second unit is located, and that second units are a residential use that is consistent with the existing general plan and zoning designation for the lot.*

A local government may apply quantifiable, fixed and objective standards, such as height, setback, and lot coverage requirements so the second-unit will be compatible with other structures in the neighborhood. A local government may designate areas appropriate for second-units based on criteria such as the adequacy of water and sewer services and the impact of second-units on traffic flow. At the same time, a locality must adopt an ordinance with the intent of facilitating the development of second-units in appropriate residential zones without arbitrary, excessive, or burdensome provisions and requirements.

Under limited circumstances, a locality may prohibit the development of second-units in single-family or multifamily zones (Government Code Section 65852.2(c)). This prohibition may only be enacted if a locality adopts formal written findings based on substantial evidence identifying the adverse impact of second-units on the public health, safety, and welfare and acknowledging such action may limit housing opportunities in the region (Section 65852.2(c)). Prior to making findings of specific adverse impact, the agency should explore feasible alternatives to mitigate and avoid the impact. Written findings should also acknowledge efforts to adopt an ordinance consistent with the intent of second-unit law.

A local government may also establish reasonable minimum and maximum unit size requirements for both attached and detached second-units according to Government Code Section 65852.2(d). Minimum and maximum unit sizes should be reasonable and should not arbitrarily and excessively restrict the development of second-units. For example, a maximum unit size of 400 square feet might be unduly restrictive on minimum lot sizes of 7,000 square feet, barring unusual circumstances, and would restrict the development of second-units. Minimum unit sizes should also uphold health and safety standards.

Also, localities should ensure parking requirements are consistent with standards set forth in subsection (e). This subsection limits parking requirements to one parking space per unit or bedroom, unless a locality makes specific findings.

When Does Chapter 1062 Take Effect for Second-Unit Law?

Government Code Section 65852.2(a)(3) requires where a local agency has a local ordinance in accordance with subsections (a) or (c), an application for a second-unit permit is to be considered ministerially without discretionary review or public hearing on or after **July 1, 2003**. Local jurisdictions without an ordinance must utilize the State second-unit standards set forth in Section 65852.2(b) and are required to ministerially consider second-unit applications after **January 1, 2003**.

Chapter 1062 does not necessarily require a local agency to adopt or amend a second-unit ordinance (Section 65852.2(a)(3)). If a locality has a second-unit ordinance in accordance with subsections (a) or (c) of second-unit law, an application should be considered ministerially. For example, if a locality has an ordinance with development standards in accordance with the intent of second-unit law and subsection (a) and requires a conditional use permit, the locality should consider a second-unit application ministerially according to the adopted development standards.

and any provisions of the local ordinance which are in conflict with second-unit law, such as a conditional use permit, should be considered null and void. However, if a locality has a second-unit ordinance that does not meet the intent and subsections (a) or (c), the locality is required to ministerially consider a second-unit application in accordance with the State standards in subsection (b).

What is Ministerial Review?

Chapter 1062 requires development applications for second-units to be "...considered ministerially without discretionary review or a hearing..." or, in the case where there is no local ordinance in compliance with subsections (a) or (c), a local government must "...accept the application and approve or disapprove the application ministerially without discretionary review..." In order for an application to be considered ministerially, the process must apply predictable, objective, fixed, quantifiable and clear standards. These standards must be administratively applied to the application and not subject to discretionary decision-making by a legislative body (For clarification see the attached definition of ministerial under California Environmental Quality Act (CEQA) Guidelines, Section 15369.). The definition is generally accepted and was prepared pursuant to Public Resources Code.

An application should not be subject to excessively burdensome conditions of approval, should not be subject to a public hearing or public comment and should not be subject to any discretionary decision-making process. There should be no local legislative, quasi-legislative or discretionary consideration of the application, except provisions for authorizing an administrative appeal of a decision (see Appeal discussion below).

The intent of Chapter 1062 is to improve certainty and predictability in the approval process. Where special use or variances must apply, the locality should grant the variance or special use permit without a public hearing for legislative, quasi-legislative or discretionary consideration, as authorized by Government Code Section 65901. An application for consideration by a board of zoning adjustments or zoning administrator should apply a limited and fixed set of clear, predictable and objective standards without the application of discretionary conditions or public comment.

Chapter 1062 does not affect local government measures to keep the public apprised of pending applications and the status of the decision-making process. A local government should handle public noticing in the same manner as other ministerial actions. For example, if a local government allows new construction of a single-family residence by right or ministerially and public notice is not given for these applications, then a local government should employ the same procedures for second-unit applications. The appropriate point for public comment is the discretionary action adopting or amending a second-unit ordinance.

As explicitly stated in the provisions of 65852.2(a), a locality may require second-units to comply with development standards such as height, setback and architectural review. At the same time, architectural review should be handled in a ministerial fashion without discretionary public hearings or review. Architectural review in a ministerial fashion includes architectural standards and design guidelines with clear, fixed and objective standards. These standards should provide a

predictable concept of appropriate second-unit development. For example, the compatibility of the materials with the existing structure, exterior color, subordinate bulk or compatible exterior surface texture are architectural standards that can be applied in a ministerial manner, especially with the aid of design review guidelines. Architectural review standards should not impede the creation of second-units and should not detrimentally affect the feasibility or affordability of second-units.

Can a Locality Accept Appeals If a Second-unit Application Is Denied?

A locality can provide an appeal process for applicants whose second-unit proposal is denied. The appeal process should maintain predictable and fixed approval standards, consistent with the intent of Chapter 1062. Accordingly, an appeal should not include a public hearing with public comment as part of a discretionary decision. The appeal process should be handled in a ministerial and administrative manner and should be limited in scope, only considering the proposal's compliance with the objective standards of the second-unit ordinance.

Can a Locality Consider an Additional Process to Consider Second Units if the Standards Established by Chapter 1062 Have Been Met?

If a local ordinance is consistent with subdivisions (a) and (c-g) of second-unit law and consistent with the intent of the law, a local government could also adopt an ancillary set of broader standards under which second-units might be allowed under a discretionary review process as exceptions to existing zoning. While the statute does not preclude a broader and more flexible set of standards, localities must be very careful that any criteria or process for a secondary set of standards is only ancillary to the ministerial consideration required by Chapter 1062. Typical exceptions to zoning could be handled administratively or quasi-judicially.

Homeowners in the community are entitled to have a realistic opportunity to create second-units. If the locality fails to provide an adequate ministerial process pursuant to subdivision (a) and (c-g), applications for second-units should be subject to the State standards of subdivision (b) of Section 65852.2.

Is a Locality Required to Allow Second-Units in Multifamily Zones?

While second-units may be allowed in both single- and multi-family zones (Sections 65852.2(a)(1) and (b)(1)(B)), nothing in the statute requires more than one second-unit to be permitted on a single parcel. The State standards specifically require that the lot contain an existing single-family dwelling (Section 65852.2(b)(1)(C)) and localities could adopt a similar requirement. Alternatively localities could permit second-units on parcels containing, for example, a duplex. The guiding principle for the local ordinance should be to avoid provisions that are "...so arbitrary, excessive or burdensome so as to unreasonably restrict the ability of homeowners to create second-units in zones where they are authorized by local ordinance." (Section 65852.150). For example, second-units should not be arbitrarily excluded from appropriate geographic areas.

Are Second-Units Exempt from Local Growth Control?

Yes. Government Code Section 65852.2(a)(2) states second-units shall not be considered in the application of any local ordinance, policy, or program to limit residential growth. Second-units must be exempt from growth control measures regardless of whether the growth control has been

enacted by local initiative or the legislative body. Local governments should take steps to address any inconsistency between the second-unit mandate and local initiatives, ordinances, policies, programs or any other regulations to limit residential growth.

What Kind of Environmental Review is Required for Second-Units?

Second-units approved ministerially are statutorily exempt from CEQA pursuant to Section 15268 (Ministerial Projects) of the CEQA guidelines and Section 21080(b)(1) of the Public Resources Code. In addition, second-units can be categorically exempt from CEQA pursuant to Sections 15301 and 15303 of the CEQA guidelines, authority cited under Public Resources Code Section 21083 and 21087.

How Can a Locality Encourage Second-Units?

Local governments can encourage second-unit development through a variety of mechanisms. For example, a locality could develop information packets to market second-unit construction. A packet could include materials for a second-unit application, explain the application process, and describe incentives to promote their development. A locality could also advertise second-unit development opportunities to homeowners on the community's web page, at community and senior centers, in community newsletters, and in local utility bills, etc. Some local governments establish and maintain a second-unit specialist in the current planning division to assist in processing and approving second-units. A local government can also establish flexible zoning requirements, development standards, processing and fee incentives that facilitate the creation of second-units (Government Code Section 65852.2(g)). Incentives include reduced parking requirements near transit nodes, tandem parking requirements, pre-approved building plans or design prototypes, prioritized processing, fee waivers, fee deferrals, reduced impact fees, reduced water and sewer connection fees, setback reductions and streamlined architectural review. For example, the City of Santa Cruz established pre-approved design prototypes to encourage and stimulate the development of second-units.

Localities can also monitor the effectiveness of ordinances, programs and policies encouraging the creation of second-unit development. Some localities monitor implementation of second-unit strategies through the annual general plan progress report (Government Code Section 65400). Evaluating the effectiveness of a second-unit ordinance can assist the local government in determining appropriate measures to improve usefulness and further facilitate the development of housing affordable to lower- and moderate-income families.

See the second-unit bibliography in the Resources section for additional resources on the development of second-units.

Can a Locality Have Occupancy Requirements on Second-Units?

Requirements restricting the occupancy of a second-unit may be susceptible to legal challenge. In a 1984 decision, the Superior Court (*Hubbart vs. County of Fresno*, Superior Ct. No. 309140-2, 10/3/84), voided a Fresno County zoning ordinance which required that occupancy of a second-unit be limited to persons related to the main unit's owner. The Court stated that the ordinance violated the plaintiff's right to privacy guaranteed by Article I, Section 1 of the California Constitution.

In a 2001 decision (*Coalition Advocating Legal Housing Options v. City of Santa Monica*), a second-unit ordinance preventing non-dependent adult children or relatives, as well as unrelated persons while permitting dependents and caregivers, was declared unconstitutional under the right to privacy and equal protection clause of the California Constitution.

A local ordinance could include income restrictions on the occupancy of a second-unit to ensure the creation of housing affordable to low- and moderate-income households. A local ordinance could also require one of the dwellings on the property to be owner-occupied. However, an ordinance with these restrictions and requirements should be developed in a manner that encourages the creation of second-units as opposed to restricting the development of second-units.

Does Second-Unit Law Apply to Charter Cities and Counties?

Yes. Charter cities and counties must particularly give way to State general laws such as second-unit law when there are matters of Statewide concern (*Coalition Advocating Legal Housing Options v. City of Santa Monica* (2001) 105 Cal. Rptr. 2d 802), as stated by the Legislature in Government Code Sections 65580, 65852.150 and 65852.2(i)(2). Further, second-unit law explicitly applies to “local agencies” which are defined as general law or charter (Government Code Section 65852.2(i)(2)).

Does Second-Unit Law Apply to Localities in the Coastal Zone?

Yes. The California Coastal Act was enacted to preserve our natural coastal resources for existing and future Californians. While second-units utilize existing built areas and usually have minimal environmental impact, the need for second-units should be balanced against the need to preserve our unique coastal resources. For these reasons, second-unit law shall not supersede, alter or lessen the effect or application of the California Coastal Act (Division 20 of the Public Resources Code), except that local governments shall not be required to hold public hearings for coastal development permit (CDP) applications for second-units (Government Code 65852.2(j)). As stated in correspondence, dated January 13, 2003 from the California Coastal Commission to all coastal communities, local governments in the coastal zone should amend their Local Coastal Program (LCP) to not require a public hearing in the consideration of second-unit applications. Further, local appeals should be handled in an administrative manner.

Should a Locality Submit Their Second-Unit Ordinances to HCD?

Yes. Government Code Section 65852.2(h) requires submittal of an ordinance adopted pursuant to subsection (a) and (c) to the State Department of Housing and Community Development (Department) within 60 days of adoption. The Department will establish a clearinghouse of local ordinances to assist local governments in developing effective and meaningful ordinances. The Department is also available to provide technical assistance in the preparation of second-unit ordinances. Local governments are encouraged to send electronic copies of their ordinance to the Department at pmcdouga@hcd.ca.gov.

Chapter 1062, Statutes of 2002 **(Assembly Bill 1866)**

B. CHANGES TO GOVERNMENT CODE SECTION 65852.2

Government Code Section 65852.2 was amended by Chapter 1062 (AB 1866) as follows:

Government Code Section 65852.2 (additions or changes in italics/underlined and deletions indicated by asterisks with substantive changes italicized in parentheses)

65852.2.(a) (1) Any local agency may, by ordinance, provide for the creation of second-units in single-family and multifamily residential zones. The ordinance may do any of the following:

***** (A) Designate areas within the jurisdiction of the local agency where second units may be permitted. The designation of areas may be based on criteria, *that* may include, but are not limited to, the adequacy of water and sewer services and the impact of second units on traffic flow.

***** (B) Impose standards on second units *that* include, but are not limited to, parking, height, setback, lot coverage, architectural review, ***** maximum size of a unit, and standards that prevent adverse impacts on any real property that is listed in the California Register of Historic Places.

***** (C) Provide that second units do not exceed the allowable density for the lot upon which the second unit is located, and that second units are a residential use that is consistent with the existing general plan and zoning designation for the lot.

***** *(Provisions to establish a process for the issuance of conditional use permits deleted)*

(2) *The ordinance* shall not be considered in the application of any local ordinance, policy, or program to limit residential growth.

(3) *When a local agency receives its first application on or after July 1, 2003, for a permit pursuant to this subdivision, the application shall be considered ministerially without discretionary review or a hearing, notwithstanding Section 65901 or 65906 or any local ordinance regulating the issuance of variances or special use permits. Nothing in this paragraph may be construed to require a local government to adopt or amend an ordinance for the creation of second units. A local agency may charge a fee to reimburse it for costs that it incurs as a result of amendments to this paragraph enacted during the 2001-02 Regular Session of the Legislature, including the costs of adopting or amending any ordinance that provides for the creation of second units.*

(b) (1) When a local agency which has not adopted an ordinance governing second units in accordance with subdivision (a) or (c) receives its first application on or after July 1, 1983, for a ***** (*conditional use deleted*) permit pursuant to this subdivision, the local agency shall accept the application and approve or disapprove the application ministerially without discretionary review pursuant to this subdivision unless it adopts an ordinance in accordance with subdivision (a) or (c) within 120 days after receiving the application. Notwithstanding Section 65901 or 65906, every local agency shall grant a variance or special use ***** (*conditional use deleted*) permit for the creation of a second unit if the second unit complies with all of the following:

- (A) The unit is not intended for sale and may be rented.
- (B) The lot is zoned for single-family or multifamily use.
- (C) The lot contains an existing single-family dwelling.
- (D) The second unit is either attached to the existing dwelling and located within the living area of the existing dwelling or detached from the existing dwelling and located on the same lot as the existing dwelling.
- (E) The increased floor area of an attached second unit shall not exceed 30 percent of the existing living area.
- (F) The total area of floorspace for a detached second unit shall not exceed 1,200 square feet.
- (G) Requirements relating to height, setback, lot coverage, architectural review, site plan review, fees, charges, and other zoning requirements generally applicable to residential construction in the zone in which the property is located.
- (H) Local building code requirements which apply to detached dwellings, as appropriate.
- (I) Approval by the local health officer where a private sewage disposal system is being used, if required.

(2) No other local ordinance, policy, or regulation shall be the basis for the denial of a building permit or a use permit under this subdivision.

(3) This subdivision establishes the maximum standards that local agencies shall use to evaluate proposed second units on lots zoned for residential use which contain an existing single-family dwelling.

No additional standards, other than those provided in this subdivision or subdivision (a), shall be utilized or imposed, except that a local agency may require an applicant for a permit issued pursuant to this subdivision to be an owner-occupant.

(4) No changes in zoning ordinances or other ordinances or any changes in the general plan shall be required to implement this subdivision. Any local agency may amend its zoning ordinance or general plan to incorporate the policies, procedures, or other provisions applicable to the creation of second units if these provisions are consistent with the limitations of this subdivision.

(5) A second unit which conforms to the requirements of this subdivision shall not be considered to exceed the allowable density for the lot upon which it is located, and shall be deemed to be a residential use which is consistent with the existing general plan and zoning designations for the lot. The second units shall not be considered in the application of any local ordinance, policy, or program to limit residential growth.

(c) No local agency shall adopt an ordinance which totally precludes second units within single-family or multifamily zoned areas unless the ordinance contains findings acknowledging that the ordinance may limit housing opportunities of the region and further contains findings that specific adverse impacts on the public health, safety, and welfare that would result from allowing second units within single-family and multifamily zoned areas justify adopting the ordinance.

(d) A local agency may establish minimum and maximum unit size requirements for both attached and detached second units. No minimum or maximum size for a second unit, or size based upon a percentage of the existing dwelling, shall be established by ordinance for either attached or detached dwellings which does not permit at least an efficiency unit to be constructed in compliance with local development standards.

(e) Parking requirements for second units shall not exceed one parking space per unit or per bedroom. Additional parking may be required provided that a finding is made that the additional parking requirements are directly related to the use of the second unit and are consistent with existing neighborhood standards applicable to existing dwellings. Off-street parking shall be permitted in setback areas in locations determined by the local agency or through tandem parking, unless specific findings are made that parking in setback areas or tandem parking is not feasible based upon specific site or regional topographical or fire and life safety conditions, or that it is not permitted anywhere else in the jurisdiction.

(f) Fees charged for the construction of second units shall be determined in accordance with Chapter 5 (commencing with Section 66000).

(g) This section does not limit the authority of local agencies to adopt less restrictive requirements for the creation of second units.

(h) Local agencies shall submit a copy of the ordinances adopted pursuant to subdivision (a) or (c) to the Department of Housing and Community Development within 60 days after adoption.

(i) As used in this section, the following terms mean:

(1) "Living area," means the interior habitable area of a dwelling unit including basements and attics but does not include a garage or any accessory structure.

(2) "Local agency" means a city, county, or city and county, whether general law or chartered.

(3) For purposes of this section, "neighborhood" has the same meaning as set forth in Section 65589.5.

(4) "Second unit" means an attached or a detached residential dwelling unit which provides complete independent living facilities for one or more persons. It shall include permanent provisions for living, sleeping, eating, cooking, and sanitation on the same parcel as the single-family dwelling is situated. A second unit also includes the following:

(A) An efficiency unit, as defined in Section 17958.1 of Health and Safety Code.

(B) A manufactured home, as defined in Section 18007 of the Health and Safety Code.

(j) Nothing in this section shall be construed to supersede or in any way alter or lessen the effect or application of the California Coastal Act (Division 20 (commencing with Section 30000) of the Public Resources Code), except that the local government shall not be required to hold public hearings for coastal development permit applications for second units.

Chapter 1062, Statutes of 2002 **(Assembly Bill 1866)**

C. OTHER PERTINENT CODE SECTIONS

Government Code Section 65901

(a) The board of zoning adjustment or zoning administrator shall hear and decide applications for conditional uses or other permits when the zoning ordinance provides therefore and establishes criteria for determining those matters, and applications for variances from the terms of the zoning ordinance. The board of zoning adjustment or the zoning administrator may also exercise any other powers granted by local ordinance, and may adopt all rules and procedures necessary or convenient for the conduct of the board's or administrator's business.

(b) In accordance with the requirements for variances specified in Section 65906, the legislative body of the city or county may, by ordinance, authorize the board of zoning adjustment or zoning administrator to decide applications for variance from the terms of the zoning ordinance without a public hearing on the application. That ordinance shall specify the kinds of variances which may be granted by the board of zoning adjustment or zoning administrator, and the extent of variation which the board of zoning adjustment or zoning administrator may allow.

Government Code Section 65906

Variances from the terms of the zoning ordinances shall be granted only when, because of special circumstances applicable to the property, including size, shape, topography, location or surroundings, the strict application of the zoning ordinance deprives such property of privileges enjoyed by other property in the vicinity and under identical zoning classification.

Any variance granted shall be subject to such conditions as will assure that the adjustment thereby authorized shall not constitute a grant of special privileges inconsistent with the limitations upon other properties in the vicinity and zone in which such property is situated.

A variance shall not be granted for a parcel of property which authorizes a use or activity which is not otherwise expressly authorized by the zone regulation governing the parcel of property. The provisions of this section shall not apply to conditional use permits.

CEQA Guidelines: Section 15369 Ministerial

"Ministerial" describes a governmental decision involving little or no personal judgment by the public official as to the wisdom or manner of carrying out the project. The public official merely applies the law to the facts as presented but uses no special discretion or judgment in reaching a decision. A ministerial decision involves only the use of fixed standards or objective measurements, and the public official cannot use personal, subjective judgment in deciding

whether or how the project should be carried out. Common examples of ministerial permits include automobile registrations, dog licenses, and marriage licenses. A building permit is ministerial if the ordinance requiring the permit limits the public official to determining whether the zoning allows the structure to be built in the requested location, the structure would meet the strength requirements in the Uniform Building Code, and the applicant has paid his fee.

Note: Authority cited: Sections 21083 and 21087, Public Resources Code; Reference: Section 21080(b)(1), Public Resources Code; *Johnson v. State of California*, 69 Cal. 2d 782; *Day v. City of Glendale*, 51 Cal. App. 3d 817.

Discussion: This definition draws upon earlier judicial definitions of "ministerial" and discretionary governmental actions and provides examples. Neither term is technically precise.

Chapter 1062, Statutes of 2002 **(Assembly Bill 1866)**

D. RESOURCES AND CONTACTS

Second-Units Resource List (Arranged alphabetically by title)

Accessory Apartments: Are They A Realistic Alternative for Ageing in Place? -- [London, UK]: Taylor & Francis Group. **Housing Studies - Vol. 16, No. 5, p. 637-650 (Sept. 10, 2001)**
Chapman, Nancy J.; Howe, Deborah A (2001)

Abstract: The accessory apartment in North America - defined as the addition of a small, separate living unit within a detached single-family house - has been advocated as a housing alternative allowing older people to 'age in place'. Based on a survey of owners of accessory units built in Seattle, Washington State, that were developed since legalization in 1994 and a literature review, this research explores the extent to which accessory apartments are benefiting the elderly. Although only 14 percent of the owners and 11 percent of the tenants in Seattle were over 65, there is evidence that such apartments serve a higher proportion of older persons over time. Forty-three percent of the apartments were perceived to be accessible to people with disabilities. Advocates of older adults are advised to target middle-aged and young-old to encourage the development of accessory apartments. Age restrictions within zoning ordinances may be counterproductive by prohibiting their development by owners who have the energy and resources to undertake such a task.

Accessory Apartments in Single-Family Housing -- New Brunswick, NJ: Center for Urban Policy Research. *Gellen, Martin (1985)*-Monograph includes bibliographical references and index. Introduction - "This book examines accessory apartment conversions as an emerging trend in American housing. It also assesses their potential as an instrument of local and national housing policy. As the reproduction cost of housing has increased, consumers have begun to make more intensive use of existing dwellings. Accessory apartment conversions represent one form of this response..." (p. xiii)

Accessory Rental Units in the Portland Area: A Guide for Design, Development and Management/Institute of Portland Metropolitan Studies--Portland, OR: Portland State University, School of Urban and Public Affairs. *Seltzer, Ethan; Perry, Theodis (1995)*

Introduction - "...Since we are long past the era when government could be looked to for the provision of large numbers of affordable housing units, we need to collectively explore new or alternative methods that augment the efforts that government bodies will be making. Hence the purpose for this publication. One of the fastest ways to double the housing supply would be to allow every single-family house to serve as a duplex. Surely not all homeowners would be interested. However, for those that are, the rules ought to be clear and the goal of creating an additional unit achievable."

Accessory Units Resource Guide: The State of the Art -- Los Angeles, CA: Hare Planning & Design, 1993. *National Resource and Policy Center on Housing & Long Term Care (1993)*

Full text also available at: <http://www.aoa.gov/Housing/accunits.html>

"What are Accessory Units? The term 'accessory unit' is a general term used to refer to separate units typically created in the surplus space within a single family home. Accessory units include accessory apartments, accessory cottages, and elder cottage housing opportunity housing." - (p. 2)

Aging and Smart Growth: Building Aging Sensitive Communities/Funders' Network for Smart Growth and Livable Communities -- Miami, FL: Collins Center for Public Policy (Funders Network Translation Paper; no. 7). *Howe, Debra (2001)*

Full text also available at: <http://www.publichealthgrandrounds.unc.edu/urban/agingpaper.pdf>

Abstract: This report posits that the sprawling, automobile-dominated landscape so prevalent throughout the United States seriously limits the continued mobility and independence of older people, a reality that is of enormous consequence to the aging experience. In the years ahead, the growing number of seniors, a result of the aging of baby boomers, stands to overwhelm the system of care relied on by most seniors—family members, friends, and the social service system. The report underscores the importance of transforming our communities so that they are aging-sensitive, making it possible for people to maintain their health and independence even as needs change. Leadership is needed to support planning processes and implementation efforts that improve the interface between the aging experience and the built environment. Public education, training, research, and investment are necessary components of the action agenda that must be put into place if elders are to be full participants in—and not cut off from—our society in the coming decades.

Allowing Accessory Apartments: Key Issues for Local Officials / U.S. Dept. of Housing and Urban Development -- Washington, DC: HUD - Office of Policy Development and Research (Report no. HUD-PDR-747). *Hodges, Samuel J.; Goldman, Ellis G. (1983)*

Introduction – "A combination of factors, including smaller households, sharply rising housing costs, and general economic conditions has led to a growing interest in the creation of accessory apartments in single-family homes. Accessory apartments are self-contained dwelling units created from existing space, including separate kitchen and bath facilities and a separate entrance." (p. 3).

Alternative Housing Arrangements: A Selected Information Guide / U.S. Dept. of Housing and Urban Development--Washington, DC: HUD-Office of Policy Development and Research. *Hare, Patrick (1985)*

Introduction - "Alternative living arrangements is the collective name for shared housing, household matching services, accessory apartments, and ECHO housing or granny flats -- a new name for old ideas with new relevance. As the demographics in the United States change, these forms of housing can become attractive options for the growing numbers of single persons, small families, and older persons seeking housing to fit their needs and their budgets..." (p. 1).

A Cottage for Sale: Low-Cost 'Granny Flats' Combine Proximity with Privacy. *The Washington Post* - 118, 330 - Tues. ed., col. 1, p.WH9- *Hamilton, M. (1996 Oct 31)*

Abstract: "This might offer an opportunity for people to take care of their older relatives without huge expenses," said George Gaberlavage, a senior analyst in the American Association of Retired Persons Public Policy Institute. "What if you could put one of these housing units on your land and it was tastefully done and the community was assured that it's going to be for a relative and not for

rental purposes? It might be a great way of helping families." [Marlys] Marshall had a unit installed in her garage that allows her mother and father to live nearby. Her mother became disabled after falling and breaking a hip in 1991. Marshall's father was able to care for his wife until last March, when spinal degeneration left him confined to a wheelchair...

E.C.H.O. Housing: A Review of Zoning Issues and Other Considerations -- Washington, DC: American Association of Retired Persons - Report includes bibliographical references. *Hare, Patrick H.; Hollis, Linda E. (1983)*

Introduction - "This booklet represents a review of the technical zoning issues raised by Elder Cottage Housing Opportunity (ECHO) units, small temporary units placed in side or rear yards to enable adult children to take care of aging parents..." (p. 4).

Everything's Relative. Builder - Vol. 22, no. 13 - p. 200(1) *Weber, C. (1999, October)*

Abstract: Planned community development Amelia Park in Amelia Island, FL, combines conventional land planning and architecture inspired by history. The popularity of the development reflects in the fact that more than 50% of its units have already been sold. All Amelia Park homes including the townhouse models have a standard detached rear-loaded garage. However, the granny flats above are zoned as rental units and can be used for home offices, studios or extra living space.

Great Expectations. Builder - Vol. 23, no. 7 - p. 124-134 *Weber, C. (2000, June)*

Abstract: A booming economy and buyers with more sophisticated tastes have compelled the home building industry to provide innovative plans and design details usually reserved only for custom houses. Demographic shifts are creating new family situations and a need for niched products to accommodate those lifestyles. One solution to maintaining household peace is providing what used to be called a granny flat or in-law suite. Today's updated version of this old-fashioned idea is a flexible bonus space with a separate entrance that can perform multiple functions. Most households now have 2 computers, and people from 8 to 80 need home space to work, surf, and play. In smaller square footages, Internet alcoves are sufficient.

How to Make Housing Affordable: Let People Subdivide Their Homes. U.S. News & World Report - Vol. 121, no. 26 - p. 51-(2) *Maass, P. (1996, Dec 30)*

Abstract: The high cost of housing can drive people to poverty as they pay more than half of their gross income for a roof over their heads. Zoning laws in many cities should be changed to allow people to build accessory apartments to lower costs for themselves as well as others and provide a form of security.

Installations of Accessory Units In Communities Where They Are Legal -- Washington, DC: Hare Planning & Design. *Hare Planning & Design (1990)*

Introduction: Accessory units as used here includes both accessory apartments and accessory cottages. Accessory apartments are complete, separate living units installed in the surplus space in single family homes. The potential of accessory apartments to provide housing stems from the fact that the baby boom has been followed by an empty nester boom, or more technically, by underutilization of single family housing stock.

New Urban and Standard Suburban Subdivisions: Evaluating Psychological and Social Goals / American Planning Association -- Chicago, IL: APA, 2001. Article includes bibliographical references. **Journal of the American Planning Association** - Vol. 67, no.4, Autumn 2001 (p. 402-419) Brown, Barbara B.; Cropper, Vivian L. (2001)

"Residents of both subdivisions were interviewed about their sense of community, neighborliness, neighborhood uses, attitudes toward diverse neighborhoods, and support of distinctive New Urbanist residential design strategies: accessory apartments, reconfigured house/garage siting, and narrow alleys behind homes." - (p. [1]).

Second Units -- Sacramento, CA: The Dept. - Division of Housing Policy Development. June 1995 reprint of December 1990 technical assistance paper. *California. Dept. of Housing and Community Development* (1995)

"Second units, also referred to as 'in-law apartments', 'granny flats', or 'accessory apartments', may offer an additional source of affordable housing to homeowner and the community. By promoting the development of second units, a community may ease a rental housing deficit, enable homeowners with declining incomes to supplement their incomes, and make more economical use of land and existing infrastructure." - (Cover).

Second Units: An Emerging Housing Resource -- San Francisco, CA: People for Open Space (POS Housing/Greenbelt Program technical report; no. 2-E). Report includes bibliographical references. *Verrips, Bert* (1983)

Summary: The conversion of existing single-family dwellings to add secondary units is a potentially effective, environmentally sensitive, and economically feasible response to the Bay Area's serious housing problem. However, because of resident concerns with the impacts of second units on existing neighborhoods, the development of such units is either illegal or severely restricted in most communities. The purpose of this report is to evaluate the costs and benefits of second units, and consider what regulations might be appropriate to respond to the impacts of second units while still encouraging their development.-(p. iii).

Secondary Units (Accessory Apartments and ECHO Housing: A Step-by-step Program Development Guide -- Albany, NY: Rural Aging Services Partnerships (R.A.S.P. Resource manual; no. 6). *Pollak, Patricia B.* (1986)

"Installing an accessory apartment in a single-family home can provide an older homeowner with a source of income. In addition, tenants can often provide assistance with home maintenance and other chores. The presence of a tenant can also add a sense of security for an older homeowner. Yet privacy and independence need not be sacrificed. For the community, accessory apartments represent an increased supply of small apartments created by more intensively using existing housing resources."- (p. 5).

Small Solutions: Second Units as Affordable Housing: The Evaluation of The Double Unit Opportunity Program -- San Francisco, CA: The Fund. *San Francisco Development Fund* (1988)

For many California residents, suitable housing at an affordable level is simply unavailable. One potential source of affordable rental housing is to use under-utilized space in single-family neighborhoods to create second units. These small dwelling units, also known as accessory apartments, in-law apartments, or granny flats, involve no land acquisition costs and minimal new infrastructure." - (p. 1).

Two-By-Two: A Status Report on Accessory Apartments in the Bay Area -- Chicago, IL: American Planning Association. **Planning** - Vol. 54, no. 11 - p. 22-23 *Lawrence, J.; Watson, L. (1988, November)*

"After three years of experience with accessory apartments, or "second units" as they are called in the Bay Area, the San Francisco Development Fund has concluded that this is an innovation that works." - (p. 22).

Your New Neighbor: Mom - Instead of Scattering, More Extended Families are Living in the Same Town... or on the Same Block: June Fletcher Reports on 'Granny Flats,' In-laws Next Door and Big Brother Down The Street. **Wall Street Journal** - (Eastern ed.) Fri. ed., col. 2, W1-Fletcher, J. (2002, Dec 20)

Abstract: Well, sometimes. At first, Jo Ann and John Wydra were delighted when his sister, Betty O'Connor, decided to move in next door to their Huntley, Ill., home. They even put her up for a couple of months, until she got settled. But then she started going through their messy closets and "straightening up" Mrs. Wydra's exuberant cottage-style garden (her own flowers are all lined up in neat rows). "She's a perfectionist; we're not," says Mrs. Wydra, whose husband is now joking about putting in an electric fence. All this togetherness is a big change from the years when generations tended to move farther apart. But with the nation's retired population growing sharply, more older parents started moving into the same neighborhood as the kids. Now these multigenerational communities are moving to a new level as more families pull together in slow times.

Tentative List of Contacts

The Department is in the process of creating a list of organizations and local governments to assist in the implementation of Chapter 1062. The following list consists of a few local governments that have adopted second unit ordinance to meet the intent of Chapter 1062, including submittal to the Department. If you have any suggestions for potential organization or local governments to be added, please contact Paul Mc Dougall at (916) 322-7995.

City of Claremont	City of Healdsburg	City of Livermore
City of Pleasanton	Sacramento County	Town of San Anselmo
City of Santa Ana	City of Santa Rosa	City of Santee
City of Saratoga	City of Larkspur	

ATTACHMENT 2

Government Code Section 65583.1

A Portion of State Housing Element Law

Chapter 1062, Statutes of 2002 **(Assembly Bill 1866)**

A. IMPLEMENTATION DISCUSSION FOR GOVERNMENT CODE SECTION 65583.1

Introduction

Chapter 1062, Statutes of 2002 (AB 1866), clarified how second-units can be counted toward the adequate sites requirements in housing element law.

A housing element must identify adequate sites with zoning and development standards for a variety of housing types to meet a locality's share of the regional housing need in total and by income group (Government Code Section 65583(c)(1)). Local governments employ many techniques to identify adequate sites, including an inventory of vacant and underutilized land with a variety of zoning and development standards, upzoning, rezoning and mixed-use zoning. Chapter 1062 clarifies existing law and practice for local government's to identify the realistic capacity of new second-unit development to meet a portion of the adequate sites requirement.

In essence, local governments may count the *realistic* potential for new second-units *within the planning period of the element* considering the following factors: (1) the number of second units developed in the prior planning period; (2) an estimate of potential increase due to new policies, programs and incentives that encourage the development of second-units; and (3) other relevant factors.

The following is a discussion of the new legislation to assist localities in carrying out the provisions of Chapter 1062 (AB 1866). For an identification of the text of AB 1866 and changes to Government Code Section 65583.1, see the second section of this attachment, titled "Changes to Government Code Section 65583.1".

Resources and Incentives

The statute enables existing and proposed policies and programs, including incentives and regulatory relief, to support a local government's estimate of the realistic capacity of second-unit development in the planning period as part of the adequate sites requirement. Policies and programs encouraging the development of second-units can help to achieve realistic capacity of second-units in the planning period (see Attachment 1 for a discussion of ways to encourage the development of second-units).

The Need for Second-Units

In considering the need for second-units, a local government should evaluate household characteristics such as tenure, family type, household sizes, and other factors in relation to the types of units (i.e., number of bedrooms and minimum unit size requirements) allowed under the second-unit ordinance.

Other Relevant Factors

To demonstrate the realistic capacity for second-units to fulfill a portion of the adequate sites requirement, local governments should discuss and analyze other relevant factors that affect the potential for second-units in the planning period. For example, a housing element should provide an analysis of the anticipated affordability of second-units. The purpose of this analysis is to determine the housing need by income group that could be accommodated through second-unit development. Second-units are not required to be deed restricted for certain income groups.

The anticipated affordability of second-units can be determined in a number of ways. For example, a community could survey existing second-units for their rents and include other factors such as square footage, number of bedrooms, amenities, age of the structure and general location. The survey could be supplemented with analysis that describes the general range of rents and an estimate of rents for new second-units based on the variables within the survey. Another method could examine market rates for reasonably comparable rental properties to determine an average price per square foot in the community. This price can be applied to anticipated sizes for second-units to estimate the anticipated affordability of second-units.

Another relevant factor that should be analyzed is the impact of development standards in the second-unit ordinance (e.g. impact on the cost and supply of second-units). An analysis should address development standards (i.e., heights, setbacks, minimum unit sizes, lot coverage, parking standards, etc.), what zones allow second-units, architectural review standards, fees and exactions, any other components of the ordinance potentially impacting or constraining the development of second-units.

Finally, a community should analyze the extent to which physical and environmental constraints and infrastructure capacity influence its ability to accommodate the proposed capacity for second-units in the planning period.

Tracking Second Units

A community should track second-unit construction to monitor the effectiveness of their efforts to promote second-units and to facilitate the next housing element update. The first step in tracking second-units is to ensure that second-units are being counted as they are constructed. Most localities would count second-units as part of normal functions for building permit data. In any case, a locality should have some function that records the number of second-units built and an estimate of affordability at the time of occupancy, where feasible. Consistently maintained records will reveal trends in second-unit construction that may support a locality's efforts to count realistic capacity for second-units or may identify limitations that should be addressed to better promote additional second unit development.

In addition, a locality could annually summarize the number of second-units built; by which income group they are estimated to be affordable, as part of the annual general plan progress report (Government Code Section 65400). An annual summary will ensure a complete record and facilitate future updates of the housing element.

APPENDIX E: ACCESSORY DWELLING UNIT CONTEST PLANS – SHAUN TAI

B 6

SHAUN TAI
HUMBOLDT ACCESSORY DWELLING UNIT

PRACTICALITY

adapted or designed for actual use

SHAUN TAI

4019 WOODSIDE CT

LALAYETTE, CA 94549

(925) 297-9370

TAI.SHAUNG@GMAIL.COM

designed for:

*Humboldt
 Association
 of Realtors*

SHALUN TAI
4815 WOODSIDE CT.
LAFAYETTE, CA 94543
925.237.8178
HUMBOLDT ASSOCIATION
OF REALTORS

DATE: 10/22
5.15.18 PERMIT SET

PROJECT NAME
HUMBOLDT HOUSE

PROJECT ADDRESS
2000

CLIENT
HUMBOLDT ASSOCIATION
OF REALTORS

DATE
10/22

A1.0

A2.1

A2.2

SHAUN TA
4919 WOODSIDE CT.
LAFAYETTE, CA 94549
925.337.8378
HUMBOLDT ASSOCIATION
OF REALTORS

DATE	NOV 15
PROJECT	PERMIT SET
PROJECT NAME	HUMBOLDT HOUSE
PROJECT ADDRESS	4919 WOODSIDE CT. LAFAYETTE, CA 94549
PROJECT PHONE	925.337.8378
PROJECT FAX	
PROJECT EMAIL	
PROJECT WEBSITE	
PROJECT DESCRIPTION	
PROJECT NOTES	
PROJECT COMMENTS	
PROJECT SPECIFICATIONS	
PROJECT MATERIALS	
PROJECT FINISHES	
PROJECT SCHEDULE	
PROJECT BUDGET	
PROJECT RISK	
PROJECT STATUS	
PROJECT CONTACT	
PROJECT APPROVAL	
PROJECT SIGNATURE	
PROJECT DATE	

A2.3

SHAUN TAI
4019 WOODSIDE CT.
LAFAYETTE, CA 94549
925.297.8379

**MURBOLDT ASSOCIATION
OF REALTORS**

13

کونسا کھانا ہے جو سب سے زیادہ صحت مند ہے؟

FRISCH HOUSE

4. 2014年12月31日

DATE: 11/11/2011

15.30 hrs
24/04/2019 14:30:00
LIGHTING AND POWER PLAN

Proof.

A3.0

- ◆ 120 V POWER CONNECTION FOR DISPOSAL FAULT-HOOD
- ◆ HALF SWITCHED RECEPTABLE FOR GARBAGE DISPOSAL
- ◆ 100 AMP MAIN
- ◆ 120V SMOKE DETECTOR WITH BUILT IN HOOR, BATTERY BACK UP UNIT
- ◆ AFC (ARC FAULT CIRCUIT INTERRUPTERS) RECEPTABLE

SHEET NOTES

- (A) 12" DIAMETER SPALL-OUT DRUM WITH GLASS DIFFUSER, (2) 15W COMPACT FLUORESCENT LAMP, HPS AS MANUF. BY HALO OR PRESCOTE EQUAL.
- (B) SECURITY LIGHT WITH COMPACT FLUORESCENT LAMP, BUILT-IN PHOTOCELL, HPS AS MANUF. BY PRESCOTE OR APPROVED EQUAL.

FIXTURE SCHEDULE

PROCESSED	ENTER ON WALL @ 15' AFF.	COORDINATE IN FUTURE	COORDINATE IN FUTURE
FLOOR BOX	DOWN	LOCATIONS W/ SHOP DRAWINGS	LOCATIONS W/ SHOP DRAWINGS
WALL INTD			
DUPLICATE			
OUTLET			
WALL INTD. TO			
DUPLICATE			
OUTLET			
SWITCH			
ENTER ON WALL @ 15' AFF			
DATA GALT			
TELEPHONE			
OUTLET			
DOORBELL			
15' AFF			
DOORFRAME			
DOORFRAME			
DOORFRAME			
DOORFRAME			

SYMBOL LEGEND

NOTE: ROOMS SHALL EITHER BE HIGH EFFICIENCY OR SHALL BE CONTROLLED BY AN OCCUPANT SENSOR OR DIMMER. CLOSERS THAT ARE LESS THAN 70 S.F. ARE EXEMPT FROM THIS REQUIREMENT.

NOT RECORDED BUT WAS NOT BE CARED FOR EARLY CONDUCT OF
INVESTIGATION AND AT THE RIGHT TO PROSECUTE INVESTIGATION AND TO
CONSIDERED SOON.

A3.2

SHAUN TAI
4819 WOODSIDE CT.
LAFAYETTE, CA 94548
925.337.8378

HUMBOLDT ASSOCIATION
OF REALTORS

DATE: 04-12
5:55 PM PERMIT SET

SCALE: 1/8" = 1'-0"

PROJECT NAME:
HUMBOLDT HOUSE

PROJECT: 18-0000
R1719

DATE: 04-12
5:55 PM
EXTERIOR ELEVATIONS

A4.0

EAST ELEVATION

2

WEST ELEVATION

1

5.15.01 PERMANENT

HUMPHOLDT HOUSE

[illegible]

INTERIOR ELEVATIONS

$$\frac{1}{2} \left(\frac{1}{2} + \frac{1}{2} \right)$$

A4.2

KITCHEN AND BATHROOMS

KITCHEN AND CLOSETS

BEDROOM AND LIVING ROOM

LIVING ROOM AND KITCHEN

HUMBOLDT ASSOCIATION OF REALTORS

5.15.87 PERMIT SET

 

 

WALL SECTIONS

$$\frac{1}{2}(\lambda_1 + \lambda_2)$$

A5.0

4-1-2715

A

WALL SECTION

**HUMBOLDT ASSOCIATION
OF REALTORS**

5.15 BY PERMIT ONLY

1000

HUMBOLDT HOUSE

61070
 1995-1996, 1997-1998, 1999-2000, 2001-2002, 2003-2004, 2005-2006, 2007-2008, 2009-2010, 2011-2012, 2013-2014, 2015-2016, 2017-2018, 2019-2020, 2021-2022, 2023-2024, 2025-2026, 2027-2028, 2029-2030, 2031-2032, 2033-2034, 2035-2036, 2037-2038, 2039-2040, 2041-2042, 2043-2044, 2045-2046, 2047-2048, 2049-2050, 2051-2052, 2053-2054, 2055-2056, 2057-2058, 2059-2060, 2061-2062, 2063-2064, 2065-2066, 2067-2068, 2069-2070, 2071-2072, 2073-2074, 2075-2076, 2077-2078, 2079-2080, 2081-2082, 2083-2084, 2085-2086, 2087-2088, 2089-2090, 2091-2092, 2093-2094, 2095-2096, 2097-2098, 2099-2100, 2101-2102, 2103-2104, 2105-2106, 2107-2108, 2109-2110, 2111-2112, 2113-2114, 2115-2116, 2117-2118, 2119-2120, 2121-2122, 2123-2124, 2125-2126, 2127-2128, 2129-2130, 2131-2132, 2133-2134, 2135-2136, 2137-2138, 2139-2140, 2141-2142, 2143-2144, 2145-2146, 2147-2148, 2149-2150, 2151-2152, 2153-2154, 2155-2156, 2157-2158, 2159-2160, 2161-2162, 2163-2164, 2165-2166, 2167-2168, 2169-2170, 2171-2172, 2173-2174, 2175-2176, 2177-2178, 2179-2180, 2181-2182, 2183-2184, 2185-2186, 2187-2188, 2189-2190, 2191-2192, 2193-2194, 2195-2196, 2197-2198, 2199-2200, 2201-2202, 2203-2204, 2205-2206, 2207-2208, 2209-2210, 2211-2212, 2213-2214, 2215-2216, 2217-2218, 2219-2220, 2221-2222, 2223-2224, 2225-2226, 2227-2228, 2229-2230, 2231-2232, 2233-2234, 2235-2236, 2237-2238, 2239-2240, 2241-2242, 2243-2244, 2245-2246, 2247-2248, 2249-2250, 2251-2252, 2253-2254, 2255-2256, 2257-2258, 2259-2260, 2261-2262, 2263-2264, 2265-2266, 2267-2268, 2269-2270, 2271-2272, 2273-2274, 2275-2276, 2277-2278, 2279-2280, 2281-2282, 2283-2284, 2285-2286, 2287-2288, 2289-2290, 2291-2292, 2293-2294, 2295-2296, 2297-2298, 2299-2300, 2301-2302, 2303-2304, 2305-2306, 2307-2308, 2309-2310, 2311-2312, 2313-2314, 2315-2316, 2317-2318, 2319-2320, 2321-2322, 2323-2324, 2325-2326, 2327-2328, 2329-2330, 2331-2332, 2333-2334, 2335-2336, 2337-2338, 2339-2340, 2341-2342, 2343-2344, 2345-2346, 2347-2348, 2349-2350, 2351-2352, 2353-2354, 2355-2356, 2357-2358, 2359-2360, 2361-2362, 2363-2364, 2365-2366, 2367-2368, 2369-2370, 2371-2372, 2373-2374, 2375-2376, 2377-2378, 2379-2380, 2381-2382, 2383-2384, 2385-2386, 2387-2388, 2389-2390, 2391-2392, 2393-2394, 2395-2396, 2397-2398, 2399-2400, 2401-2402, 2403-2404, 2405-2406, 2407-2408, 2409-2410, 2411-2412, 2413-2414, 2415-2416, 2417-2418, 2419-2420, 2421-2422, 2423-2424, 2425-2426, 2427-2428, 2429-2430, 2431-2432, 2433-2434, 2435-2436, 2437-2438, 2439-2440, 2441-2442, 2443-2444, 2445-2446, 2447-2448, 2449-2450, 2451-2452, 2453-2454, 2455-2456, 2457-2458, 2459-2460, 2461-2462, 2463-2464, 2465-2466, 2467-2468, 2469-2470, 2471-2472, 2473-2474, 2475-2476, 2477-2478, 2479-2480, 2481-2482, 2483-2484, 2485-2486, 2487-2488, 2489-2490, 2491-2492, 2493-2494, 2495-2496, 2497-2498, 2499-2500, 2501-2502, 2503-2504, 2505-2506, 2507-2508, 2509-2510, 2511-2512, 2513-2514, 2515-2516, 2517-2518, 2519-2520, 2521-2522, 2523-2524, 2525-2526, 2527-2528, 2529-2530, 2531-2532, 2533-2534, 2535-2536, 2537-2538, 2539-2540, 2541-2542, 2543-2544, 2545-2546, 2547-2548, 2549-2550, 2551-2552, 2553-2554, 2555-2556, 2557-2558, 2559-2560, 2561-2562, 2563-2564, 2565-2566, 2567-2568, 2569-2570, 2571-2572, 2573-2574, 2575-2576, 2577-2578, 2579-2580, 2581-2582, 2583-2584, 2585-2586, 2587-2588, 2589-2590, 2591-2592, 2593-2594, 2595-2596, 2597-2598, 2599-2600, 2601-2602, 2603-2604, 2605-2606, 2607-2608, 2609-2610, 2611-2612, 2613-2614, 2615-2616, 2617-2618, 2619-2620, 2621-2622, 2623-2624, 2625-2626, 2627-2628, 2629-2630, 2631-2632, 2633-2634, 2635-2636, 2637-2638, 2639-2640, 2641-2642, 2643-2644, 2645-2646, 2647-2648, 2649-2650, 2651-2652, 2653-2654, 2655-2656, 2657-2658, 2659-2660, 2661-2662, 2663-2664, 2665-2666, 2667-2668, 2669-2670, 2671-2672, 2673-2674, 2675-2676, 2677-2678, 2679-2680, 2681-2682, 2683-2684, 2685-2686, 2687-2688, 2689-2690, 2691-2692, 2693-2694, 2695-2696, 2697-2698, 2699-2700, 2701-2702, 2703-2704, 2705-2706, 2707-2708, 2709-2710, 2711-2712, 2713-2714, 2715-2716, 2717-2718, 2719-2720, 2721-2722, 2723-2724, 2725-2726, 2727-2728, 2729-2730, 2731-2732, 2733-2734, 2735-2736

ARCHITECTURAL DETAILS

1957

How

WATER AND SOFT DRINKS

WINDOWN CALLS AND DETAIL

BLAKE FOOTING DETAIL

ROOF RIDGEBE DETAIL.

ATTENTION: DOGS WORKING IN ALLIANCE DETAIL.

METAL BONDING ATTACHMENT DETAIL

ACTIVE COMPENSATION PROGRAMS DETAIL

ROOF DETAIL - COVERED ENTRY

POST DETAIL - COVERED ENTRY

SHAWN TAI
4919 WOODSIDE CT.
LAFAYETTE, CA 94549
925.337.8278
HUMBOLDT ASSOCIATION
OF REALTORS

DATE: 04/06
5:55 PM
PROJECT SET

PROJECT NAME
HUMBOLDT HOUSE

DATE: 04/06

PROJECT: 04/06/06

PROJECT: 04/06/06

DATE: 04/06
PROJECT: 04/06/06
STRUCTURAL DETAILS

DATE: 04/06

A6.1

STRENGTHENED TOP PLATE DETAIL

1

STRENGTHENED WINDOW BUILT DETAIL

2

STRENGTHENED BELL DETAIL

3

SINGLE STORY STRENGTH WALL

4

NO.	DESCRIPTION	QTY	UNIT	PRICE	TOTAL
1	CONCRETE	1.00	CU YD	120.00	120.00
2	REINFORCEMENT BARS	1.00	LB	1.00	1.00
3	FORMWORK	1.00	SQ YD	10.00	10.00
4	PAINT	1.00	GA	1.00	1.00
5	LABOR	1.00	HR	15.00	15.00
6	TRUCK	1.00	HR	10.00	10.00
7	WATER	1.00	CU YD	1.00	1.00
8	CEMENT	1.00	CU YD	1.00	1.00
9	AGGREGATE	1.00	CU YD	1.00	1.00
10	ADDITIONAL	1.00	CU YD	1.00	1.00
11	ADDITIONAL	1.00	CU YD	1.00	1.00
12	ADDITIONAL	1.00	CU YD	1.00	1.00
13	ADDITIONAL	1.00	CU YD	1.00	1.00
14	ADDITIONAL	1.00	CU YD	1.00	1.00
15	ADDITIONAL	1.00	CU YD	1.00	1.00
16	ADDITIONAL	1.00	CU YD	1.00	1.00
17	ADDITIONAL	1.00	CU YD	1.00	1.00
18	ADDITIONAL	1.00	CU YD	1.00	1.00
19	ADDITIONAL	1.00	CU YD	1.00	1.00
20	ADDITIONAL	1.00	CU YD	1.00	1.00
21	ADDITIONAL	1.00	CU YD	1.00	1.00
22	ADDITIONAL	1.00	CU YD	1.00	1.00
23	ADDITIONAL	1.00	CU YD	1.00	1.00
24	ADDITIONAL	1.00	CU YD	1.00	1.00
25	ADDITIONAL	1.00	CU YD	1.00	1.00
26	ADDITIONAL	1.00	CU YD	1.00	1.00
27	ADDITIONAL	1.00	CU YD	1.00	1.00
28	ADDITIONAL	1.00	CU YD	1.00	1.00
29	ADDITIONAL	1.00	CU YD	1.00	1.00
30	ADDITIONAL	1.00	CU YD	1.00	1.00
31	ADDITIONAL	1.00	CU YD	1.00	1.00
32	ADDITIONAL	1.00	CU YD	1.00	1.00
33	ADDITIONAL	1.00	CU YD	1.00	1.00
34	ADDITIONAL	1.00	CU YD	1.00	1.00
35	ADDITIONAL	1.00	CU YD	1.00	1.00
36	ADDITIONAL	1.00	CU YD	1.00	1.00
37	ADDITIONAL	1.00	CU YD	1.00	1.00
38	ADDITIONAL	1.00	CU YD	1.00	1.00
39	ADDITIONAL	1.00	CU YD	1.00	1.00
40	ADDITIONAL	1.00	CU YD	1.00	1.00
41	ADDITIONAL	1.00	CU YD	1.00	1.00
42	ADDITIONAL	1.00	CU YD	1.00	1.00
43	ADDITIONAL	1.00	CU YD	1.00	1.00
44	ADDITIONAL	1.00	CU YD	1.00	1.00
45	ADDITIONAL	1.00	CU YD	1.00	1.00
46	ADDITIONAL	1.00	CU YD	1.00	1.00
47	ADDITIONAL	1.00	CU YD	1.00	1.00
48	ADDITIONAL	1.00	CU YD	1.00	1.00
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50	ADDITIONAL	1.00	CU YD	1.00	1.00
51	ADDITIONAL	1.00	CU YD	1.00	1.00
52	ADDITIONAL	1.00	CU YD	1.00	1.00
53	ADDITIONAL	1.00	CU YD	1.00	1.00
54	ADDITIONAL	1.00	CU YD	1.00	1.00
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56	ADDITIONAL	1.00	CU YD	1.00	1.00
57	ADDITIONAL	1.00	CU YD	1.00	1.00
58	ADDITIONAL	1.00	CU YD	1.00	1.00
59	ADDITIONAL	1.00	CU YD	1.00	1.00
60	ADDITIONAL	1.00	CU YD	1.00	1.00
61	ADDITIONAL	1.00	CU YD	1.00	1.00
62	ADDITIONAL	1.00	CU YD	1.00	1.00
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64	ADDITIONAL	1.00	CU YD	1.00	1.00
65	ADDITIONAL	1.00	CU YD	1.00	1.00
66	ADDITIONAL	1.00	CU YD	1.00	1.00
67	ADDITIONAL	1.00	CU YD	1.00	1.00
68	ADDITIONAL	1.00	CU YD	1.00	1.00
69	ADDITIONAL	1.00	CU YD	1.00	1.00
70	ADDITIONAL	1.00	CU YD	1.00	1.00
71	ADDITIONAL	1.00	CU YD	1.00	1.00
72	ADDITIONAL	1.00	CU YD	1.00	1.00
73	ADDITIONAL	1.00	CU YD	1.00	1.00
74	ADDITIONAL	1.00	CU YD	1.00	1.00
75	ADDITIONAL	1.00	CU YD	1.00	1.00
76	ADDITIONAL	1.00	CU YD	1.00	1.00
77	ADDITIONAL	1.00	CU YD	1.00	1.00
78	ADDITIONAL	1.00	CU YD	1.00	1.00
79	ADDITIONAL	1.00	CU YD	1.00	1.00
80	ADDITIONAL	1.00	CU YD	1.00	1.00
81	ADDITIONAL	1.00	CU YD	1.00	1.00
82	ADDITIONAL	1.00	CU YD	1.00	1.00
83	ADDITIONAL	1.00	CU YD	1.00	1.00
84	ADDITIONAL	1.00	CU YD	1.00	1.00
85	ADDITIONAL	1.00	CU YD	1.00	1.00
86	ADDITIONAL	1.00	CU YD	1.00	1.00
87	ADDITIONAL	1.00	CU YD	1.00	1.00
88	ADDITIONAL	1.00	CU YD	1.00	1.00
89	ADDITIONAL	1.00	CU YD	1.00	1.00
90	ADDITIONAL	1.00	CU YD	1.00	1.00
91	ADDITIONAL	1.00	CU YD	1.00	1.00
92	ADDITIONAL	1.00	CU YD	1.00	1.00
93	ADDITIONAL	1.00	CU YD	1.00	1.00
94	ADDITIONAL	1.00	CU YD	1.00	1.00
95	ADDITIONAL	1.00	CU YD	1.00	1.00
96	ADDITIONAL	1.00	CU YD	1.00	1.00
97	ADDITIONAL	1.00	CU YD	1.00	1.00
98	ADDITIONAL	1.00	CU YD	1.00	1.00
99	ADDITIONAL	1.00	CU YD	1.00	1.00
100	ADDITIONAL	1.00	CU YD	1.00	1.00

STRENGTHENED BELL DETAIL

4

Shaun M. Tai
San Jose State University, Graduate Student
4019 Woodside Ct.
Lafayette, CA 94549
(925) 297-9370

April 13th, 2007

Re-New Wood, Inc.
104 N.W. 8th Street
Wagoner, OK 74467

Dear Kim Torres:

This letter will confirm our recent telephone conversation. I am completing a Masters Degree (Creative Project) at San Jose State University entitled "SMALL, DETACHED, GREEN AND PASSIVE SOLAR DESIGN UNITS: THREE SECOND-UNIT DESIGNS." I would like your permission to reprint in my creative project excerpts (images) from the following:

- Eco-shake brochure (The Wood Shake Alternative), scanned
- Image from <http://www.renewwood.com/colors.html>, Colors
- Eco-shake logo, scanned from brochure

The excerpts to be reproduced are: scanned image of eco-shake logo and picture of eco-shakes on a home (page 3 of brochure) and the image (showing 3 colors) on <http://www.renewwood.com/colors.html>.

The requested permission extends to any future revisions and editions of my creative project, including non-exclusive world rights in all languages, and to the prospective publication of my creative project by UMI. These rights will in no way restrict republication of the material in any other form by you or by others authorized by you. Your signing of this letter will also confirm that your company owns the copyright to the above-described material.

If these arrangements meet with your approval, please sign this letter where indicated below and fax it to (510) 451-7373 as well as (925) 284-2677, as a backup. Thank you very much.

Sincerely,

Shaun Tai

PERMISSION GRANTED FOR THE
USE REQUESTED ABOVE:

Kim Torres of Eco-Shake / Re-New Wood, Inc.

Date: 4/16/07

Shaun M. Tai
San Jose State University, Graduate Student
4019 Woodside Ct.
Lafayette, CA 94549
(925) 297-9370

May 21st, 2007

Department of Planning, Building & Code Enforcement
c/o John Davidson
200 East Santa Clara Street
San Jose, CA 95113-1905

Dear John Davidson:

This letter will confirm our recent meeting. I am completing a Masters Degree (Creative Project) at San Jose State University entitled "SMALL, DETACHED, GREEN AND PASSIVE SOLAR DESIGN UNITS: THREE SECOND-UNIT DESIGNS." I would like your permission to reprint in my creative project excerpts (images) from the following:

- Assessor's parcel map of 1164 Britton Ave (hand drawn), sent via email
- Aerial photograph of 1164 Britton Ave with setbacks indicated, sent via email
- City of San Jose: Secondary Unit Clearance Application Form & Brochure

The excerpts to be reproduced are: (1) Assessor's parcel map & (1) Aerial photograph.

The requested permission extends to any future revisions and editions of my creative project, including non-exclusive world rights in all languages, and to the prospective publication of my creative project by UMI. These rights will in no way restrict republication of the material in any other form by you or by others authorized by you. Your signing of this letter will also confirm that your company (City of San Jose) owns the copyright to the above-described material.

If these arrangements meet with your approval, please sign this letter where indicated below and fax it to (510) 451-7373 as well as (925) 284-2677, as a backup. Thank you very much.

Sincerely,

Shaun Tai

PERMISSION GRANTED FOR THE
USE REQUESTED ABOVE:

John Davidson, City of San Jose Planning Division.

Date: 8/21/07

Image use permission [Inbox](#)

☆ from **Linda Lee** <l_lee@murus.com>
to ● **Shaun Tai** <tai.shaun@gmail.com>
date **Apr 30, 2007 1:16 PM**
subject **Image use permission**

Dear Shaun:

Per our telephone conversation of today, The Murus Company grants you permission to use the attached images in your creative design project entitled, "Small, Detached, Green and Passive Solar Design Units: Three Second-Unit Designs", for which you agree to acknowledge in your document the ownership of any copyrights by The Murus Company pertaining to its products and promotional materials.

All the best to you in your academic endeavors.

Regards,

Linda Lee
Marketing Manager
The Murus Company
PO Box 220
3234 Route 549
Mansfield, PA 16933
(570) 549-2100
www.murus.com

2 attachments — [Download all attachments](#)

Murus PUR Panel Shot.pdf
3160K [View as HTML](#) [Download](#)

Murus EPS Panel Shot.pdf
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Shaun Tai - Graduate Student from San Jose State - Image use

★ ● Shaun Tai Hello Katy - Thanks for allowing me to use the "New Home Green Points Ch

★ Katy Hollbacher to me

st

Dear Shaun,

Per our conversation today, Build It Green grants you permission to use the "New Home Green Points Checklist" in your creative project entitled, "Small, Detached, Green and Passive Solar Design Units", for which you acknowledge ownership and copyrights to Build It Green.

Good luck on your project--take care,

Katy

Katy Hollbacher, PE
Program Manager
CGBP, LEED AP

Build It Green
Phone: 510.845.0472 ext.103
Fax: 510.845.1854
Katy@BuildItGreen.org
www.BuildItGreen.org

Contact the FREE Ask an Expert hotline for answers to your green building questions: www.BuildItGreen.org/askanexpert.cfm
Source green building products through the AccessGreen Directory: www.BuildItGreen.org/guide

The above information is provided for general education and informational purposes only and does not constitute an actual endorsement approval or recommendation. The suitability and