March 13, 2007

Honorable Chairman and Members of the Hermosa Beach Planning Commission

Regular Meeting of March 20, 2007

SUBJECT: SUSTAINABLE DESIGN GUIDELINES FOR DISCRETIONARY RESIDENTIAL PROJECTS

LOCATIONS: CITYWIDE

Recommendation:
To consider adopting sustainable development standards as Conditions of Approval for new residential projects that require discretionary approval.

Background:
On December 16, 2006, the Planning Commission directed Staff to research sustainable development standards for new residential projects that require discretionary approval.

There are a number of southern California municipalities that have initiated sustainable development standards in response to concerns regarding exponentially rising fossil fuel prices and global warming. Southern California cities that have already adopted sustainable development practices for new for new residential and commercial projects included Los Angeles, Calabasas, Santa Monica, and West Hollywood.

The purpose of sustainable development is to conserve energy, water, and material resources. When a home is "sustainably designed" by employing energy efficient systems, the homeowner can reap substantial savings over time, at the same time save precious non-renewable resources.

Analysis:
Sustainable development, or "green design", has primarily been focused on commercial and industrial developments due to the relatively high cost of this new technology. For example, a green designed commercial project of 12,000 square feet or more can cost upwards of 3-5 dollars more per square foot in comparison to a conventionally designed project. However, in recent years, many of these energy efficient technologies have been adapted for smaller, residential developments. Therefore, Staff is recommending that the standards be presented as a "menu" allowing the applicant to choose those which best fit the project needs.

Residential sustainable development is a recent residential trend, thus it is difficult to establish the precise per square foot cost (material, labor, etc.) of certain types of sustainable technology, however Staff has identified a number of sustainable products and practices that are easily implemented, affordable, and will reduce the reliance on non-renewable fossil fuels.

I. Heating and Cooling

A. Insulation

Properly installed, climate-appropriate insulation in floors, walls, and attics ensures a balanced temperature throughout the house, less energy consumption, and increased comfort. Materials such as recycled cotton or newspaper insulation contain up to 80% of post-consumer recycled materials[1].

Benefits

Insulation prevents heat loss in the winter and heat gain in the summer, thereby reducing utility cost; and, improves durability of the building by reducing the potential for condensation that can lead to decay of building materials.

Application
Require greater than minimum amount of insulation in walls and ceilings required by the building code[2].

B. Roofing
Summer heat on conventional roofing materials can quickly warm-up residential units through conduction. To reduce heat, a radiant barrier (cool roof) can be installed to deflect the sun's heat. Cool roof coatings are white liquids with the consistency of thick paint for application over low-sloped roofs.

Benefits
A light-colored, reflective coating roof can reflect about approximately 82% of total sunlight, thus requiring less energy to cool the building resulting in energy saving of 10 – 50% annually. Cool roof coatings may cost between $0.75 to $1.50 per square-foot and have a lifespan of approximately 20 years (depending on climate zone). In addition, reflective tiles that contain pigments that reflect infrared can deflect up to 70% of the sun's energy and can be purchased in more traditional colors of brown, green, and terra cotta.

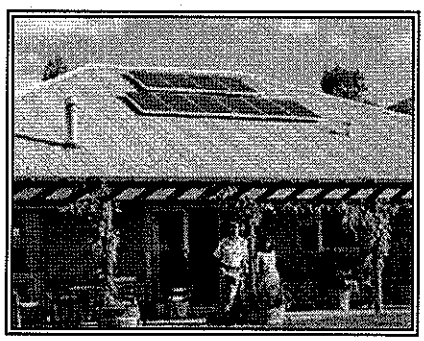
Application
Require light-colored roofing, reflective tiles, or a cool roof application on roof slopes that have a roof slope of less than 3-inches per linear foot (3:12) and note sustainable roof type on discretionary permit roof plan.

C. Themostats
Programmable thermostats are best for individuals and families who are away from home during set periods of time throughout the week, thus use less energy. Unlike older manual thermostats, programmable thermostats do not contain mercury. On average, a programmable thermostat retails between $100-$200 dollars.

Benefit
If properly used, a programmable thermostat can save approximately $100 in energy costs annually.

Application
Install thermostat(s) away from heating or cooling registers, appliances, lighting, doorways, skylights, and windows and areas that receive direct sunlight or drafts and specify location on discretionary permit floor plan.

II. Renewable Energy: Solar/Photovoltaic



Solar energy (photovoltaic) converts sunlight directly into electricity when sunlight strikes the photovoltaic cells. By installing photovoltaic panels on a roof, energy bills can be significantly reduced.

Benefits
The initial cost of a photovoltaic system depends on how much energy cost a homeowner wants to save over time. Typically, the initial cost is approximately $30,000 – $50,000 dollars depending on the kilowatt generation. The State of California and the Federal government offer one-time rebates of $5,000 for every 1-kilowatt photovoltaic system installed. A typical family of 3-5 persons living in a 2,000-square foot house uses approximately 300-kilowatt hours per month. To cover 100% of the utility bill, a 3-kilowatt system is required. With state and federal rebates, the total system cost would be $15,000 dollars.

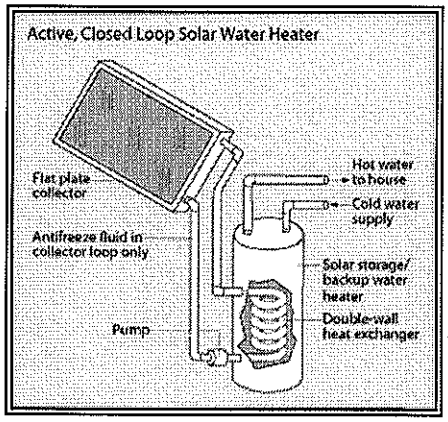
Photovoltaic systems are one of the best alternative energy options for the following reasons:

- Photovoltaic system operates unattended and required minimum periodic maintenance;
- Solar energy is delivered free in comparison to the expensive cost of conventional fuel delivered to the home;
- Most photovoltaic systems has shown little degradation in over 15 years of operation; and,
- Photovoltaic system generate no pollution and create no waste products.

Application
Require a 3 kilowatt photovoltaic system be installed on residential developments of six or more units and note photovoltaic location on discretionary permit site/roof plan(s).

III. Plumbing

A. Water Heaters (Solar)

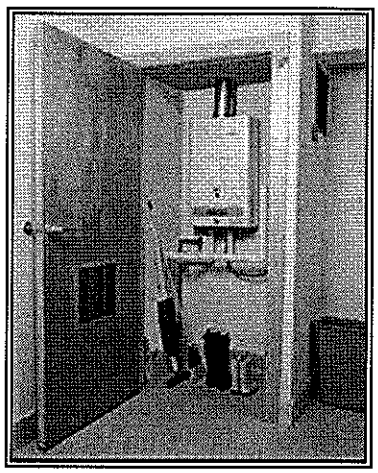


Solar water heating system use solar panels and water storage to collect and store heat from the sun for domestic hot water use. Water preheated by a solar system is typically used to deliver preheated water to a standard water heater.

Benefits
Solar water systems reduce the use of gas or electricity for water heating. Annually, it will save more than 50% of the gas normally used for water heating.

Application
Use solar water heaters that are *Solar Rated* and *Certification Corp* certified. Provide sufficient south-facing roof area for collectors, make sure the roof structure can accommodate the weight of the system, and make provisions near the conventional water heater for any additional mechanical equipment such as storage tanks, pumps, pipes, and controllers. Provide stub out system or necessary piping connectors at the time of construction to lessen the cost for future installation and show on discretionary permit site/roof plan.

B. Water Heaters (Tankless)

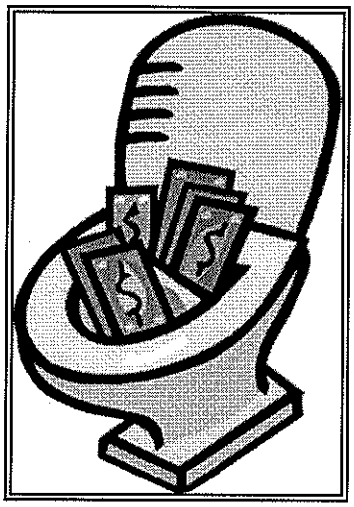


The energy used to heat water can be lost in long piping that runs to remote fixtures. On-demand hot water circulation systems, or tankless water heaters consist of a recirculation loop and a pump with on-demand controls (usually push-button or motion sensor activated). Only one pump is needed to supply hot water to all fixtures. A typical natural gas tankless water heater (4.2 gallons per minute) with a digital display sells for approximately $700 dollars.

Benefits
Saves energy, conserves water, uses less piping materials and speeds hot water delivery.

Applications
Require that tankless water heaters be located close to usage points to reduce heat loss, speed-up hot water delivery, and reduce water waste. Furthermore, insulate hot water pipes to kitchen and bathrooms and note locations on discretionary permit floor plan

C. High-Efficiency Toilets
Toilets that use less than 1.3 gallons per flush are called high-efficiency toilets or low-flow toilets. The price for high-efficiency toilets range between $200-$400 dollars.



Benefits
High-efficiency toilets can reduce water and sewer costs, plus local government agencies benefit from less wastewater to treat.

Application
Require high-efficiency toilets that including dual-flush, 1.0 gallons per flush pressure-assist, and conventional gravity-fed toilets and note on discretionary permit floor plan.

IV. Lighting
Up to 10 incandescent bulbs are replaced during the life of a single compact fluorescent light (CFL) bulb, a savings of both time and money. Installation of CFLs throughout a home can save thousands of dollars over the life of a mortgage and reduce the reliance on non-renewable fossil fuels.

Benefits
Compact fluorescent lights improve the energy efficiency of household lighting and save on utility cost.

Application
Require that residential projects install one or all of the following types of energy efficient lighting and specify on electrical plan(s):

1. Fluorescent tube lights
2. Compact fluorescent bulbs
3. Light emitting diodes (Light emitting diodes (LEDs) have higher efficiency and longer life span in comparison to normal white light)

V. Appliances
Energy Star is a voluntary partnership between the government and more than 8,000 organizations and home buyers to achieve the goal of protecting the environment for future generation by changing to more energy-efficient practices and products. *Energy Star* is the government-approved symbol for energy efficiency; it identifies more than 40 types of products that are energy efficient and meet or exceed the latest national code requirements. Products that can earn the *Energy Star* products include windows, heating and cooling equipments, lighting and appliances.

Benefits
All major brands have *Energy Star* appliance models that reduce energy usage over comparable models while providing equal or superior performance. *Energy Star* refrigerators can reduce the total annual electricity bill by more than 10%. For example, *Energy Star* washing machines use 50% less energy and 45-60% less water while performing as well as a standard washer.

Application
Require that of all new condominium developments install *Energy Star* rated kitchen appliances and note on discretionary permit floor plan.

VI. Landscaping
A. Lawns
Lawn upkeep accounts for approximately half of all residential water use. Using water conservative landscape design and planning can help reduce water. Creating a landscape based on geography and climate helps significantly reduce the need for irrigation.

Benefits
Shading and evaporative cooling from trees can reduce the air temperature around your home three to six degrees. Planting deciduous trees on the northeast-southeast and northwest-southwest sides of the home help decrease cooling cost in summer and allow for solar heating during the winter. Locating shrubs and vines on trellises around a home can also provide shade during the summer.

Application
Require that plants be grouped that have similar water needs together to reduce the need for extensive watering of all areas; emphasize efficient irrigation to provide adequate water and reduce water runoff and waste; minimize the use of grasses, plants, and shrubs that demand heavy watering, and note same on discretionary permit landscape plan(s).

B. Pervious Concrete
Pervious concrete allows water to filter through the surface into the soil below to replenish groundwater.

Benefits
Pervious concrete minimizes storm water runoff and reduces pollutant runoff and increases infiltration. When planted with grass, it can also minimize contributions to the urban heat-island effect while proving a visually appealing outdoor space.

Application
Require that 50% of paved surfaces be pervious concrete (driveways, parking areas, patios, etc.) and note on discretionary permit site plan.

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CONCUR:

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[1] The average price for insulation is approximately 50 cents per square foot of wall area with easy access. The price includes drilling, filling, plugging, and one coat of spackle over plugs. It does not include painting. Mineral fiber blown-in jobs generally cost more because the material costs more.

[2] The minimum insulation levels required for frame walls are R-19 for ceilings, R-13 for walls and R-13 for floors. The R-values measures the thermal resistance or how well it holds back heat. R-value is proportional to the insulation's thickness, but it also depends on the type of material and its density. The more air pockets an insulating product has, the higher the R-value. For example, bare concrete walls are about R-1, while attic insulation in newly-built Midwestern homes usually measures about R-44.