



Green Building Program
City of Scottsdale
Planning Systems/Quality Compliance
7447 E. Indian School Rd., Suite 125
Scottsdale, AZ 85251

July-2001

To the Homeowner at:
30600 N Pima Road, Lot 138
Scottsdale, Arizona 85259

RE: Scottsdale Green Building Program

Dear Homeowner,

On behalf of the City of Scottsdale, please accept this letter as confirmation that your home was enrolled in the Scottsdale Green Building Program by its builder **Heller Homes**. The Program is a voluntary, incentive based opportunity for builders to construct homes with an emphasis on energy efficiency, health, and resource conservation. Builders completing projects in accordance with the Program requirements produce a higher quality project through their incorporation of environmentally responsible building methods and materials.

To enroll a project into the Program, builders must execute an *Agreement* with the City to construct their project in accordance with items selected from the Program's *Rating Worksheet*. During construction, projects are routinely visited by the Green Building Inspector to monitor the builder's progress and compliance with the *Rating Worksheet*. This home was constructed during the initial phase of the Program's development when "green" inspections were not mandatory, and non-compliance did not delay construction or jeopardize the issuance of the *Certificate of Occupancy*. In cases where compliance could not be verified by visual inspection, (due to timing on the job site or other obstacles), or by the submittal of approved documentation, the Homeowner must rely on the Builder's intent to comply with the Program requirements as specified in his *Agreement* with the City, or obtain acceptable proof of compliance directly from the Builder.

Please find enclosed the following documents:-

1. Certificate verifying the enrollment of this home into the Program.
2. A copy of the Homeowners Guide indicating items agreed to be incorporated into the home by the builder.
Please note: The items selected by the Builder may or may not have been verified by the City through visual inspections or other documentation. If you would like further information regarding compliance of specific items you may schedule an appointment with the City's Green Building Inspector to review your home's project file.
3. A commemorative Green Building key chain.
4. A copy of the *Energy Savers* handbook.

Keeping it Green...

A Homeowner's lifestyle can greatly impact (for better or for worse) the degree to which their living environment incorporates "green" elements in the future. Virtually all additions, modifications, decorating, even routine maintenance and cleaning tasks, whether inside or outside, can be accomplished in a more environmentally friendly and healthier manner. Please feel free to contact our office for advice and resources for "greening up" your future home projects.

Help Spread the Word...

Most of the basic principles of "green building" and "environmental sustainability" have been with us for decades, even centuries. Yet, they tend to get overshadowed by flourishing economies; limited, if any, knowledge about health risks related to materials and products, an apparent endless supply of natural resources, and the lack of a pending crisis at hand. Increasing the quality of the built environment while preserving the natural environment for current and future generations is just good common sense.

The Scottsdale Green Building Program is a leader in the local, regional, and statewide effort to educate Professionals and Consumers on the merits of environmentally responsible design and construction.

Thank you for your interest and support,

Stephen C. Reed, Architect
Green Building Inspector
City of Scottsdale
Planning Systems/Quality Compliance
7447 E. Indian School Rd., Suite 125
Scottsdale, AZ 85251

PH: 480-312-2641

FX: 480-312-9225

E-Mail:

sreed@ci.scottsdale.az.us

Visit our Web Site at:

www.ci.scottsdale.az.us/greenbuilding

cc: project file

SCOTTDALE GREEN BUILDING PROGRAM HOME OWNER'S GUIDE

#138, 30600 N. PIMA ROAD, SCOTTSDALE, AZ

Green Building Project Address

This Homeowners Guide is an explanatory version of the Program's Rating Worksheet. It describes the benefits of each option contained in your Green Built Home and its contribution to the quality of the building design and the natural environment.

Circled numbers indicate features your Builder agreed to incorporate into your home in order to meet the Program requirements. These items may or may not have been verified by the City through visual inspections or other documentation. If you would like further information regarding compliance of specific items you may schedule an appointment with the City's Green Building Inspector to review your home's Project file.

1. Site Use

- 1 ● **Desert plants and natural features beyond 10 ft. of building footprint and paved areas protected during construction (in addition to any ESLO or NAOS requirements).**
Protecting native plants and natural features during construction maintains the desert ecosystem, the natural look of the lot, and reduces the use of new nursery plants for landscaping.
- 1 ● **Home is oriented so east and south areas are for outdoor use.**
Shading these areas will reduce heat gain, and lower the temperature around the house to promote outdoor living.
- 2 c. **Home is oriented on lot so the longest axial dimension faces within 20° of south.**
This orientation maximizes the potential for controlling solar heat gain, to reduce energy use and utility costs.
- 1 ● **Outdoor structures, decking, and landscaping materials made from recycled content materials (i. e. plastic lumber).**
Substituting recycled material outdoors avoids the use of pressure treated and high mildew-resistant wood, which may be harvested from disappearing old growth or rain forests.
- 1 e. **Covered Outdoor living area at least 25% of indoor area.**
Use of outdoor living areas reduces built space without reducing livability.
- 1 ● **Structures, vegetation and/or water features used to create cool outdoor space.**
Shade providing outdoor structures and vegetation, and water features for evaporative cooling will lower the outside temperature, make outdoor living more enjoyable, and reduce the thermal heat gain of the house.
- 1 ● **No chemical soil sterilants.**
Avoiding the use of chemical soil sterilants prevents ground water contamination, and potential indoor air toxicity.

2. Energy Use: Build Envelope

- 1 ● **Wall assembly rated with a min. U-value of 0.051 (R-19).**
- 1 ● **Ceilings insulated to min. R-30.**

Walls/Ceilings with higher insulation values will reduce thermal migration and keep cooling/heating costs lower than a “normal” wall.

- 1 c. **Perimeter slab or foundation insulation (2 ft. width or depth); R-10 min.**
Insulation in these locations will reduce the absorption of solar ground heat by the slab/foundation keeping cooling costs lower than an uninsulated slab, and prevent loss of heat in areas where heat gain and re-radiation is desired.
- 1 d. **Home has blown-in insulation (cellulose, fiberglass, expanded foam).**
Blown insulation increases thermal efficiency by eliminating voids or uninsulated spaces in turn lowering utility costs.
- 1 e. **Radiant barrier in roof cavity with air space below.**
- 1 f. **Vented roof cavity with continuous ridge and eaves venting, integral roof vents, or insulation on underside of roof deck.**
Controlling thermal migration in roof cavities and attic spaces reduces heating/cooling loads reducing utility costs.
- 1 g. **House is wrapped with an exterior air infiltration barrier to manufacturer’s specifications, or building system with integral air infiltration barrier.**
- 2 h. **Advanced air sealing package in framed construction in addition to basic sealing practices (i. e. adds sealing at top and bottom plates, corners, and penetrations).**
The creation of a tightly sealed building envelope can eliminate unwanted indoor/outdoor air migration and consequent higher utility costs.
- 2 i. **Diagnostic Blower door test with 0.35 ACH or less.**
A blower door test confirms the energy efficiency of the building envelope showing a tight house and a minimal loss of conditioned air through leakage.
- 1 ● **South glass area is between 5-10% of the total conditioned floor area.**
- 1 ● **South glass shaded in May, June, and July at noon.**
- 1 ● **No more than 25% of total glass area is located on east and west walls combined.**
- 2 ● **Total glazed area less than 20% of the total livable floor area.**
These strategies are incorporated to minimize thermal conductivity through glazed areas, (heat loss/heat gain, reducing heating and cooling loads and energy costs.
- 1 ● **Daylighting allows natural light to enter the house from two sides of rooms in at least 50% of total conditioned floor area (excluding skylights).**
Letting natural light into the house will save energy by avoiding the use of artificial lighting during the daylight hours.
- 1 ● **Structures and/or landscaping provide summer sun control/shading on all walls.**
The use of shading strategies on exterior walls and windows will lower the amount of heat absorbed into the house and keep it cooler.

3. Energy Use: Heating and Cooling

- 1 ● **A/C unit cooling efficiency min. 12.0 SEER.**
Having an HVAC unit with a Seasonal Energy Efficiency Rating (SEER) of 12.0 surpasses the federal requirements by 2.0 points, and makes more efficient use of energy when cooling the house.
- 1 b. **Natural gas cooling unit with AFUE rating of 100% or greater.**
Higher AFUE ratings provide greater energy efficiency
- 1 ● **Air handler unit centrally located with no duct runs over 25 ft in length.**
Centrally locating the air handler to minimize duct runs, will save energy lost through duct leaks into unconditioned spaces.
- 3 ● **All air-supply and distribution ducts located within conditioned building envelope.**

Keeping ductwork within conditioned spaces will reduce energy lost in traveling from the air handler to the supply vents.

- 3 **● Air-supply and distribution ducts located in unconditioned spaces shall be insulated to min. R-6 and have a sealed vapor retarder to avoid condensation on the duct. All ductwork joints shall be sealed with low toxic mastic and total duct leakage measured in CFM at 25 Pascal's pressure shall be equal to or less than 3% of the floor area served by each unit, or equal to or less than 5% of the fan flow at high speed for each system installed.**
Insulating ductwork in unconditioned spaces saves energy lost before the air reaches the conditioned space. Sealing the ductwork in a house can reduce air leaks in the distribution system by 20% to 60%.
- 4 f. **Pressure balancing and return air paths: Return air ducts or transfer grills in every enclosed, livable room. Or, test for no pressures with a magnitude greater than 3.0 Pascal's, with reference to outside, existing in a zone of the home.**
Pressure balancing prevents back-drafting of combustion appliance fumes into the home, improving indoor air quality and safety.
- 1 **● Programmable/set back thermostat installed.**
A set back thermostat regulates the heating/cooling system to provide optimum comfort when the house is occupied and conserve energy when it is not.
- 1 h. **Evaporative cooling system with independent air distribution system.**
Evaporative cooling systems can cool the house for a large portion of the year with lower energy consumption and operating costs than air conditioning units.
- 1 **● Minimum of three, reversible, multi-speed ceiling fans installed (to be effective during summer months, thermostat must be set higher).**
Ceiling fans can make a house feel up to 20% cooler with a minimal use of energy.
- 1 j. **Home is designed for passive solar winter heating (greater than 20% of total heating demand). Verification required by load calculations.**
Passive solar heating strategies take advantage of solar heat gain to reduce the use of mechanical heating systems, which lowers utility costs.
- 1 **● Stack and/or cross ventilation for seasonal cooling (paths no greater than 20 ft.).**
Using natural breezes to cool the house lessens the need for mechanical cooling and saves energy.

4. Energy Use: Water Heating and Renewable Energy

- 1 **● Hot water lines insulated to min. R-3 throughout entire home.**
Insulating hot water lines conserves energy by reducing source to fixture heat loss through supply piping.
- 1 b. **Water heater within 20 pipe feet length of bathroom fixtures.**
Minimizing source to fixture distance decreases initial water wasted by delivering hot water faster
- 1 c. **Water heater timer installed (electric water heaters only).**
Water heater timers save money by making hot water in the utility companies' off peak energy hours.
- 1 d. **Gas water heater with energy rating of 250 therms/yr. max. at 50 gal. size.**
- 1 **● Electric water heater with an energy rating of 4700 kwh/yr. max. at 60 gal. size.**
Energy efficient water heaters reduce utility costs.
- 3 f. **Electric heat pump water heater.**
Electric heat pump water heaters save energy because they use surplus heat to heat water at little to no extra cost.
- 1 g. **Provide south (within 20°) roof area designed for future solar collector use (min. 400 sq. ft.).**
Pre-planned south roof area provides easy installation of future solar panels (hot water photovoltaic).

- 1 h. **Rough in for future solar water heating system.**
Installing rough-in plumbing for a future solar hot water system that will reduce energy costs by providing almost free hot water.
- 3 ● **Solar water heating (min. 50% of hot water needs and system to be approved by the SRCC (Solar Rating Certification Council).**
Solar water heating is the most economical way to heat water using the sun's free energy.
- 2 j. **A.P.S. Solar Partner (subscriber of utility photovoltaic power).**
- 3 k. **Photovoltaic power system installed.**
Solar powered generating plants and residential photovoltaic power systems provide electricity with no harmful effects on the environment; and encourage development of technology for reduced costs.

5. Energy Use: Lighting

- 1 ● **Light colored interior walls, ceilings, and soffits.**
- 1 ● **Light colored floor covering.**
Highly reflective surfaces maximize effects of both artificial and free, natural daylighting
- 2 ● **Compact Fluorescent lighting provided for at least 50% of total number of fixtures.**
Compact fluorescents use 75% to 85% less energy than standard incandescent fixtures; neon tubes can be shaped, colored, and last for decades; both reduce heat gain.
- 1 d. **Low-voltage halogen lighting substituted for incandescent down lights**
Saves energy because they run off a 12 volt system instead of standard 110 volt systems.
- 1 ● **Extended-life incandescent bulbs-greater than 2000 hours.**
Saves on frequent changing of bulbs, lowering the amount of waste ending up in landfills.
- 1 ● **No recessed light fixtures in insulated ceilings unless they are air-sealed and I.C. rated.**
Air sealed and I.C. rated fixtures minimize penetration impact and reduce the chance of creating hot spots in the ceiling which can affect cooling loads.
- 1 g. **Photovoltaic power for at least 50% of the exterior lighting.**
Photovoltaic powered exterior lighting systems provide simple outdoor lighting with no utility costs.
- 1 ● **Built in task lighting used in at least 3 separate rooms/areas.**
Built-in task lighting provides specific use lighting in lieu of general purpose lighting, lowering the amount of energy use in the home.

6. Energy Use: Appliances

- 1 ● **Dishwasher with energy saving cycle and energy rating of 620 kwh/yr. max.**
Dishwashers with high efficiency ratings and energy saving cycles, such as non-heated drying and cold water rinse, save energy and water.
- 1 b. **Gas clothes dryer with electronic ignition.**
- 1 c. **Gas range, cook top and/or oven with electronic ignition.**
Gas appliances are more efficient than their electric counterparts, saving on energy costs.
- 1 ● **Refrigerator energy rating of 800 kwh/yr. max.(up to 26 cu. ft. size).**
Refrigerators with lower energy consumption reduce operating costs.
- 1 ● **Clothes washer energy rating of 800 kwh/yr. max.**
Clothes washers with lower energy consumption reduce operating costs.
- 1 f. **Provide a list of energy efficient appliances for those not installed, per above requirements.**
Aids consumer in purchasing the most energy efficient appliances; builds market for better products.

7. Materials: Structural System

- 2 a. **Metal trusses, finger-jointed wood trusses, or wood 'I' joists used for floors.**
- 2 ● **Metal trusses, finger-jointed wood trusses, or wood 'I' joists used for roofs.**
- 2 c. **Engineered lumber products for beams or headers.**
- 1 d. **Finger-jointed top and bottom plate material.**
- 2 e. **Finger-jointed studs or engineered stud material.**
- 1 ● **Recycled content underlayment and/or sheathing or OSB(oriented strand board).**
Saves larger old growth forests by using trees from second generation forests/tree farms and provides a source for recycling wood waste.
- 1 g. **Gypsum board made from recycled paper or recycled cellulose fiber integrated into gypsum.**
Recycled content gypsum board saves resources and energy
- 2 h. **Steel studs used in more than 90% of the interior walls of the structure.**
Steel studs save wood resources and are more dimensionally stable and readily recyclable than their wood counterparts.
- 3 i. **Reinforced Masonry walls w/integral insulation w/min. U-value 0.051 (total wall).**
- 3 ● **Reinforced foam formed concrete walls w/min. U-value 0.051 (total wall).**
High insulation value; saves wood resources, and transportation costs when locally produced.
- 2 ● **Structural insulated panel (SIP) walls and/or roof, w/min. U-value 0.051 (total wall).**
High insulation value; saves wood resources because panels are factory pre-fabricated with high quality standards and the lowest amount of waste.
- 2 l. **Autoclaved, aerated concrete (AAC) block/panels w/min. U-value 0.051 (total wall).**
Autoclaved concrete block is produced by adding aluminum powder to standard cement, resulting in block with more than two times the insulative value of standard block; its lighter weight makes it easier to work with.

8. Materials: Foundation

- 1 a. **Non-asphalt base damp proofing @ basement and/or retaining walls (i. e. bentonite clay 1 ply membrane, liquid acrylic).**
Long term durability of asphalt below grade is questionable and non-use avoids the possibility of ground water contamination from leaching of petroleum and toxins.
- 1 ● **Locally produced block with fly ash content.**
Locally produced block with fly ash content uses as much as 25% less Portland cement, saving on resources, embodied energy, and reducing landfill waste.
- 1 c. **Western coal fly ash concrete.**
Western coal fly ash concrete saves as much as 30% of the Portland cement used in concrete and is 10% to 15% stronger than standard concrete.

9. Materials: Doors and Windows

- 1 ● **No Luan doors (tropical hardwood).**
Luan doors use tropical hardwoods harvested from endangered Rainforests.
- 1 ● **Reconstituted or recycled content doors (hardboard) with least toxic binders.**

Recycled content doors use scrap from lumber factories, conserving wood resources; use of least toxic binders reduces off-gassing from the doors promoting better indoor air quality.

- 1 c. **Exterior door insulated to min. R-2 (must include garage door when garage is part of conditioned space).**

Doors with higher insulation values reduce thermal migration, saving energy.

- 1 ● **Windows with National Fenestration Rating Council (NFRC) rating of: U=0.50 or lower.**

- 2 e. **Windows with NFRC rating of: U=0.35 or lower.**

- 3 f. **Windows with NFRC rating of: U=0.25 or lower.**

20% to 30% of a home's energy loss through the windows can be prevented by providing a more efficient insulated window system.

- 2 ● **NFRC Solar Heat Gain Coefficient of 0.45 or lower.**

- 2 ● **Exterior shading devices/screens with a shading coefficient of 0.45 or lower installed on windows.**

- 1 i. **Interior window treatments with light color and reflective properties, insulation value, or shading coefficient.**

Reduces thermal migration through windows, decreasing heating/cooling loads, energy use, and utility costs.

- 1 j **Skylights with a NFRC rating of U-0.50 or lower and Solar Heat Gain Coefficient of 0.45 or lower. Limited to non-habitable spaces, (bathrooms, toilet compartments, closets, halls, storage and utility space, etc.). Skylight size limited to 5% of floor area of space.**

10. Materials: Finish Floor

- 1 ● **Recycled content carpet pad.**

Uses recycled materials to make new pads, saving fossil fuels used in the manufacturing process while reducing waste at landfills.

- 1 ● **Recycled content carpet or rugs.**

Uses recycled plastic bottles saving fossil fuels used in the manufacturing process while reducing waste at landfills.

- 1 c. **Natural linoleum with low toxic adhesive or backing.**

Natural linoleum made out of renewable materials. The use of a low toxic adhesive or backing will lessen the negative effect on indoor air quality.

- 1 d. **Ceramic tile installed with low toxic mastic and grout.**

Tile is a strong, long lasting floor material; the use of a low toxic mastic and grout will lessen the negative effect on indoor air quality.

- 1 e. **Recycled content flooring.**

Recycled content flooring saves material that would have gone into a landfill, saving natural resources.

- 1 f. **Natural fiber carpet or rugs (domestic cotton, wool, jute, sisal), tacked not glued.**

Natural fiber carpet is good use of renewable resources. It does not off gas like synthetic carpet, and tacking the carpet down will eliminate the use of carpet glue which can have a negative effect on indoor air quality.

- 1 g. **Locally quarried and processed stone (i. e. flagstone).**

Stone is a strong, durable material, and when quarried locally, saves on the transportation cost to the jobsite.

- 1 ● **Finished concrete (colored, stained, textured, or scored).**

Concrete used as a finished floor surface is most durable, provides least impact, and eliminates the cost of additional flooring materials, such as carpet, which can have negative impacts on indoor air

quality.

1 **i. Reclaimed wood flooring.**

Reclaimed wood flooring conserves wood resources from hardwood forests.

1 **j. Low-fire temperature tile (i. e. saltillo).**

Low-fire temperature tile uses the sun's energy to harden the tile, conserving energy in the manufacturing process.

1 **Cork flooring**

1 **Bamboo flooring**

Cork and bamboo are very durable and highly renewable resources. Cork flooring comes from stripping the bark off cork oak, which regenerates itself. The cork tiles are moisture, rot, and mold resistant, providing a floor that can last over 30 years; Bamboo flooring is a good use of natural resources because it is fast growing, strong and flexible.

11. Materials: Exterior Wall Finish

1 **a. Locally produced block or brick.**

1 **b. Locally quarried and processed stone.**

Locally produced materials reduce costs and pollution associated with transportation from production facilities to jobsites, and may use locally recycled materials in processing.

1 **c. Reconstituted, or recycled-content siding.**

1 **d. Reconstituted or recycled-content fascia, soffit or trim, OSB, or w.p. gypsum board.**

Reconstituted or recycled-content materials reduce the amount of new material used in production by gluing up mill scraps into large pieces, which conserves natural resources and reduces landfill waste.

1 **e. Engineered wood sub-fascia, soffit or trim (i. e. fiberboard or laminated strand lumber), or OSB.**

Engineered wood products use a laminating process to make large pieces from smaller strands of lumber. The process saves old growth forests by using trees from farms and second generation forests where the whole tree used, reducing waste.

2 **f. Cementitious, three-coat, integral colored stucco system.**

Because the color is integral to the product, this system provides low maintenance, fade resistant, and durable finish.

1 **g. Cementitious siding with fly ash.**

Fiber cement siding, made with recycled content from sawmill waste and Portland cement, is a strong, long lasting, and fireproof material.

2 **h. No exterior wall finish. Materials left in natural state(i. e. exposed CMU).**

The use of structurally sound, weather-resistant materials in their natural state for finished walls reduces costs of materials and maintenance.

1 **Wall colors have a Light Reflectance Value (LRV) of 40% or less for reduced desert glare.**

Darker colored walls help reduce desert glare by reflecting less light.

12. Materials: Cabinetry and Trim

1 **All exposed particle board containing formaldehyde is sealed with water-based formaldehyde blocking finish (inside cabinets, underside of countertops, edges).**

Properly sealing particle board will prevent toxic out gassing, resulting in better indoor air quality.

- 1 **No formaldehyde used in casework materials and manufacturing.**
Cabinets made from formaldehyde-free particle board or MDF eliminate the Volatile Organic Compounds. (VOC's), that outgass into the home, resulting in healthier indoor air quality.
- 1 c. **Min. 20% Recycled content countertops.**
Recycled content counter tops conserve new resources and reduce waste in landfills.
- 1 d. **All tropical hardwood trim or casework from certified sustainable-managed forests.**
A certified sustainable-managed forest does not use clear cutting practices, and plants new trees for every one used in production.
- 1 e. **Finger-jointed or engineering wood trim.**
Finger-jointed or engineered wood trim comes from small pieces glued together from second generation forests and tree farms, saving old growth forests.
- 1 **Domestic hardwood trim.**
Domestic hardwood uses locally produced species, saving trees in old growth forests around the world, as well as costs and pollution related to transportation from other areas.
- 1 g. **On-site application of cabinet finishes done with least toxic finishes: (50 or less grams of VOC's per liter.)**
On-site application of low toxic finish will lower the amount of VOC's released into the home keeping down the amount of indoor air pollutant.

13. Materials: Roofing

- 1 a. **Min. 20% recycled content roof material.**
Recycled content roof material reduces the use of new resources, and waste in landfills.
- 1 b. **Minimum 30-year roofing material (concrete, slate, clay, composition, metal, or fiberglass).**
A thirty-year roof system saves homeowners money in replacement costs, and reduces waste in landfills as a result of replacing the roof less often.
- 1 c. **Fiber cement roofing material.**
Cement-fiber roofing, made with recycled content from sawmill waste and Portland cement. is a strong, long lasting, and fireproof material.
- 1 **Exposed roof with LRV of 40% or less to reduce desert glare.**
Low LRV roofs reduce desert glare and enhance views.
- 1 **Roofing material weighing less than 350 lbs. Per 100sq. ft. to reduce roof mass.**
Reducing roof mass decreases material, costs, and heat gain which keeps the house cooler.
- 2 f. **Recyclable roofing materials(i. e. metal roofing).**
Recyclable roofing material saves energy resources and reduces waste in landfills upon roof replacement.

14. Materials: Insulation Content

- 1 a. **Min. 20% recycled content insulation.**
Recycled content insulation conserves new material and reduces waste in landfills.
- 1 b. **Cellulose insulation with UL-rated fire retardant.**
Cellulose insulation comes from recycled newspaper, reducing waste in landfills, and conserving wood resources.
- 1 **CFC and HCFC free rigid foam or spray plastic foam insulation.**
Using CFC and HCFC free rigid foam and spray plastic foam insulation avoids the use of ozone harming chemicals.
- 1 d. **Cementitious foam insulation.**

Cementitious foam insulation is the best alternative insulation. It has higher R-value than fiberglass or cellulose, is fire proof, and does not shrink after installation.

- 1 **Non toxic (even when burned) foam insulation.**

15. Materials: Finishes and Adhesives

- 2 **Interior paints and finishes that contain minimal VOC content of no more than 50 grams per liter.**

Interior paints and finishes with low VOC's will reduce their negative effect on indoor air quality.

- 1 **Paints or finishes with recycled contents.**

Paints or finishes made from recycled content are environmentally friendly because recycling paint reduces the hazardous waste in landfills.

- 1 **Only low toxic mastics, sealants and petroleum solvent-free adhesives used throughout home.**

- 1 **Water based urethane finishes used on floors.**

- 1 **Water based lacquer finishes used on woodwork throughout home.**

- 1 **Non-toxic interior wood sealers used throughout home.**

Non-toxic and water based interior finish products reduce toxic out-gassing of VOC's which improves indoor air quality.

- 1 **Carpeting and pad tacked/taped, not glued, throughout home.**

Tacking carpet/taping pad down instead of gluing will avoid the use of toxic glues and eliminate VOC out-gassing, improving indoor air quality.

16. Indoor Air Quality and Ventilation

- 2 a. **Carbon monoxide detector installed in locations where combustion appliances are used.**
Carbon monoxide detectors warn against high levels of toxic carbon monoxide.

- 2 b. **Ventilation system installed per ASHRAE standards: kitchen - 100 CFM; bathroom- 20 CFM continuous or 50 CFM spot; master bedroom - 20 CFM; other bedrooms - 10 CFM.**
A properly installed ventilation system will rid the house of pollutants and VOC's, providing a healthier living space.

- 1 c. **Sealed-combustion or power vented furnace.**

- 1 d. **Sealed-combustion or power vented domestic gas water heater.**

- 1 e. **Sealed-combustion gas fireplace with outside combustion air.**

- 3 **Heat recovery ventilator or air-to-air heat exchanger.**

These units exchange the inside air with outside air to remove indoor air pollutants, and exchange energy from outgoing cool air to incoming hot air which reduces utility costs.

- 1 **Furnace and/or duct-mounted electronic/electrostatic air cleaner.**

Highly efficient filters and air cleaners remove VOC's, allergens, and other indoor air pollutants providing a healthier living environment.

- 2 h. **Central vacuum system with exhaust to outside.**

Venting the vacuum to outside prevents the release of small particles back into the home improving indoor air quality.

- 1 **Mechanical room air sealed from conditioned space.**

An air sealed mechanical room prevents the heat from mechanical equipment from entering the home, keeping cooling bills lower.

- 1 j. **Exhaust fan in garage on timer or wired to door opener.**

Having the garage door wired to an exhaust fan will remove toxic automobile emissions from the garage, preventing them from leaking into the home.

- 1 k. **Detached garage.**

A detached garage will separate and prevent toxic fumes from entering the home.

1 **l. All fans rated for less than 1 sone (noise rating).**

Fans rated for less than 1 sone will keep noise pollution to a minimum and encourage their use.

17. Water

1 **Permeable materials (max. 40% of unbuilt area uses non-permeable materials for walkways uncovered patios and driveways).**

Non-permeable materials used as ground covering absorb and trap the sun's heat, contributing to the increase in the average daily temperature. The use of permeable materials cuts down on the amount of heat absorbed and re-radiated from the surface.

1 **Lower water usage in turf areas(per city approved water budget).**

Using a high drought resistant turf will save water and allow limited turf areas for recreation.

2 **Xeriscape that is more than 90% of non-ESLO/NAOS landscaped area.**

Xeriscaping saves water by using native plants with high drought resistance.

2 **Non-sprinkler irrigation system.**

Non-sprinkler irrigation systems will save water because sprinklers produce a high evaporation rate of water into the air.

1 **Zoned irrigation system with separate valving.**

Zoned irrigation systems with separate valving conserve water by supplying water to different zones at different times.

2 **No lawn.**

Not having a lawn eliminates a large amount of water usage at the home.

1 **g. On demand hot water delivery system installed at furthest location from water heater.**

An on-demand hot water system provides a hot water loop back to the water heater to eliminate waste of water while waiting for it to get hot.

1 **h. Low-flow toilet (less than 1.5 gallons of water per flush, or, two control unit.**

Low-flow toilets conserve water.

1 **i. Front loading, horizontal axis, clothes washer.**

The average washer uses 24,100 gal./year while front loading, horizontal axis washers use about 8,700 gallon per year, in addition to saving energy.

1 **j. No garbage disposal.**

Garbage disposals are a high water use appliance that can be replaced by a natural compost pile that uses no water.

1 **k. Two pipe drain system for future graywater recovery system.**

Graywater systems use dishwasher, washing machine, and bathroom waste water to irrigate the yard resulting in large savings in outdoor water use.

3 **l. Graywater irrigation system per jurisdiction approval.**

A graywater irrigation system can produce 1,650 gallons a week from the average four person family, which is enough water to support 900 square feet of lawn, several mature shade or fruit trees, and 15 large shrubs, making it a high water conservation device.

1 **m. Rainwater harvesting system for irrigation.**

Using a rainwater harvesting system, to collect free rainwater from the roof for irrigation, is another way to conserve water and reduce dependence on the city water system.

2 **n. Whole home water purification system using titanium/copper electrode-granulated activated carbon (GAC) filter or non-electrical GAC system.**

Whole home water purification systems provide healthier water by removing lead, radon, nitrate, and organic chemicals.

1 **o. Under sink water purification system using reverse osmosis or carbon filter.**

Under sink water purification systems using reverse osmosis or carbon filter will provide healthier drinking water for the home.

18. Solid Waste

- 1 **Construction waste reduction/reuse plan written and followed.**
Establishing a construction waste reduction/reuse plan reduces the amount of waste ending up in landfills. Construction debris is 20% of the total volume of landfill waste.
- 1 **Donate excess materials to a non-profit building organization.**
Donating excess materials to non-profit building organizations saves excess material from the landfill and provides a tax deduction incentive.
- 1 **c. Allocated area for City recycling containers directly accessible to pick-up point.**
Proximity to pick-up point promotes good recycling habits and saves waste from landfills.
- 1 **Built-in recycling center with two or more bins in or near the kitchen.**
Providing a built in recycling center in the kitchen makes sorting and storage of recycling easier.
- 1 **e. Composting system installed in yard.**
A composting system will take the place of a garbage disposal and provide free plant mulch.