



Sustainable Building Program

**Sustainable Building Program
Guidelines and Rating Worksheet**

2009 Edition

Submittal Date: _____

www.coconino.az.gov/sustainablebuilding

Owner: __Jen & Ross Marshall_____ Point Rating: _380__

Project Name: __Passive Solar_Off-Grid Home_____

Project Address: _____

Use this rating worksheet as a guide to sustainable building and/or for tabulating points to certify projects for the Coconino County's Sustainable Building Program (CCSBP). Please contact CCSBP Manager at 928-679-8853 or aacheson@coconino.az.gov with questions or for any additional information.

<u>Entry Level</u>	<u>Intermediate Level</u>	<u>Advanced Level</u>
By qualifying at the entry level you will be meeting the CCSBP's baseline for environmentally responsible building.	The intermediate level is designed to achieve a higher level of environmental building performance.	At the advanced level, the building demonstrates exceptional environmental commitment.
Accumulate a total of <u>125 points</u> from the rating worksheet.	Accumulate a total of <u>225 points</u> from the rating worksheet.	Accumulate a total of <u>325 points</u> from the rating worksheet.

A project which qualifies for any level of certification may earn a Net Zero Energy Distinction if the project meets the Net Zero Energy requirements. This distinction will appear on the project plaque received upon completion of the program. Please see the Net Zero requirements on page 5. Projects must meet all prerequisites to achieve any level of certification.

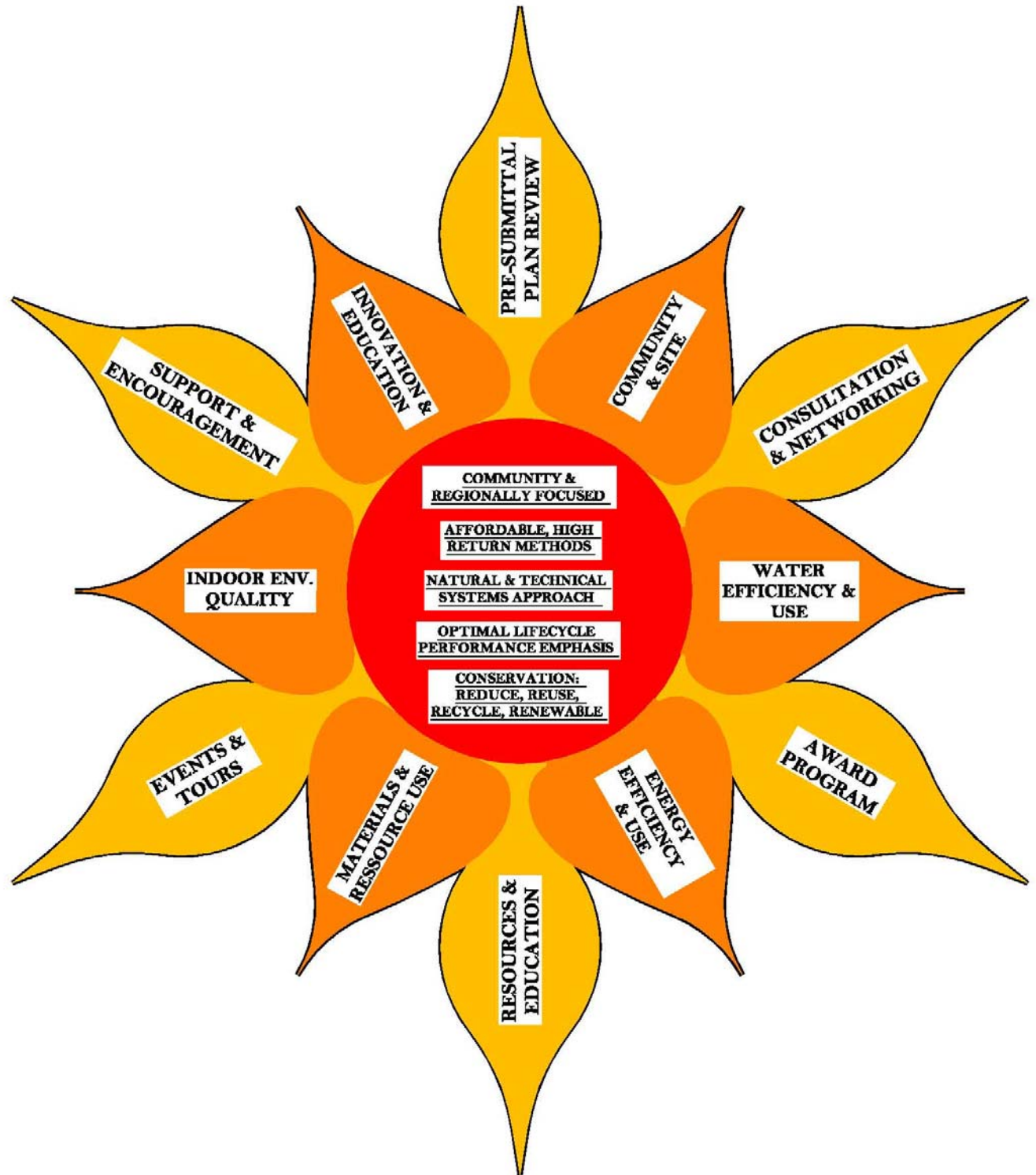
<u>Summary of Rating Categories</u>	
1 Community and Site	4 Materials and Resource Use
2 Water Efficiency and Use	5 Indoor Environmental Quality
3 Energy Efficiency and Use	6 Innovation and Education

The CCSBP's Core Values

This rating worksheet incorporates and reflects values and ideas that are central to sustainable building, incorporating environmental, economic, and social benefits. Furthermore, the CCSBP takes a holistic approach to building design.

The points in this worksheet are weighted to emphasize the items that are most aligned with the core values of the Sustainable Building Program. All of the ideas contained in the checklist are intended to promote sustainability and minimize negative ecological impact in building design, construction, and operation; however, some ideas and processes have a greater long-term impact than others.

The sun illustration shown here is a depiction of the core values and how they shape the Program and the rating worksheet. It also shows that these values support the services the Program provides to the community.



Explanations of the Core Values

Community and Regionally Focused

The community focus should include meeting the needs of Coconino County residents, such as affordable housing and sustainable economic development as it relates to green building. The community character, defined by its design, view sheds, gathering places, historic and cultural resources and environmental characteristics, should be celebrated and preserved. The regional focus involves considering the climate, water and energy resources within the county. The International Energy Conservation Code (IECC) defines Coconino County as having a dry climate with moderate heating requirements and no significant cooling requirements. The availability of water in the county is one of the most critical factors in planning for future growth and development.

Affordable, High-Return Methods

CCSBP emphasizes the use of affordable, high rate-of-return building methods, such as passive solar design and energy and water efficiency solutions. The key to saving energy, money, and other resources is to consider the entire building as a system. For example, an energy efficient furnace will still burn a lot of fuel if the ducts, walls, ceiling, windows, and doors are not well-insulated. Simple techniques, such as using an inexpensive programmable thermostat to automatically reduce the building heating load when the building is vacant, can pay for themselves in less than 6 months through reduced monthly energy costs.

Natural and Technical Systems Approach

The building approach should incorporate both natural and technical design aspects. Natural design means approaching the building holistically as a system itself, operating within other systems. It also includes working with the elements of nature, like the sun, wind, topography of the site, etc. Natural design must be married with technical design aspects that employ the best building science practices to optimize performance and prevent building failures.

Optimal Lifecycle Performance Emphasis

Life cycle performance follows and evaluates a building from its earliest beginnings until its end. Beginning with the extraction and manufacturing of building materials and ending with the structure's demolition, optimal life cycle performance assesses building materials on terms of renewability, durability, locality, and reusability or recyclability. Optimal life cycle performance seeks a construction process that minimizes environmental degradation and pollution while maintaining a high level of efficiency. Consideration is given to the entirety of a building's lifespan, measuring the efficiency of its systems and performance of its components. Optimal life cycle performance values structures that are easily maintained, renovated, and retrofitted.

Conservation: Reduce, Reuse, Recycle, Renewable

Reduce, Reuse, Recycle, Renewable is a holistic value that applies to use of the energy and resources that make up a building, as well as those that it consumes throughout its lifetime. In designing and building a sustainable structure, the greatest environmental impact can be made by the reduction of resource consumption. Reducing, therefore, is the most important of the 4 Rs of conservation. Conservation is emphasized in all categories of the checklist.

The Steps for Project Certification

1. An over-the-counter initial meeting where the builder obtains information about the program including the application and checklist. There is also the option of pre-submitting plans for an initial review and then meeting to go over any suggestions the CCSBP might have.
2. Once the application and checklist are returned to the CCSBP, the builder obtains a yard sign designating their project as part of the Sustainable Building Program.
3. As part of compliance with the program the builder is asked to keep a “homeowner’s manual. In this manual they need to save any product/appliance/material specs, any system information-solar/rainwater/graywater, they are asked to take pictures of key installation steps- insulation/systems/Trombe walls/anything that will be covered but needs to be verified.
4. The builder is asked to keep the program up to date on their progress and to schedule times for the program to visit/inspect their progress with their checklist elements.
5. After the builder receives their Certificate of Occupancy, they contact the CCSBP to schedule a checklist cross-check inspection. The builder needs to be present with their plans and homeowner’s manual at the time of the inspection. Once the project is evaluated with the checklist and meets at least the minimum requirements, the CCSBP awards the builder and their project at a public event and they receive our Sustainable Building Award plaque. The builder posts this plaque on their home/building.

The Benefits of Project Enrollment in the Free Sustainable Building Award Program

Support and Resources Obtain ideas and resources for project design and sustainable building approaches. Acquire assistance with permitting/code compliance questions, and information on available tax incentives and rebates. Use the CCSBP resource directory to find local providers and suppliers for sustainable building products and practices.

Project Recognition Receive recognition through press releases, articles and announcements. Projects are identified as a CCSBP sustainable building project with a yard sign posted at the construction site. Sustainable Building Award Plaques are given at a public award ceremony either on Earth Day (April) or at the Sustainable Living Fair (September). Every enrolled project is invited to participate as a destination on two local tours, The Solar and Wind Energy Tour (October) or the Sustainable Home & Building Tour (May).

Value By receiving the CCSBP Sustainable Building Award, a project is identified as reaching a level of sustainability that meets national, local and regional requirements. Obtain information on other certification programs, such as Energy Star and LEED. National certifications such as these provide value to the project by certifying it as at a level of sustainability that is nationally recognized and supported.

Be a Role Model Your building can be a tool for teaching others about conservation, local history and regional characteristics, as well as energy and water efficiency, sustainable design, recycling, renewable energy and much more! Be a part of the solution!

The Net Zero Energy Distinction

At any level of certification, a home can earn an additional distinction of being Net Zero Energy. This distinction will appear on the project plaque received upon completion of the program. There are many definitions for what is generally called a Net Zero Energy Building or a Zero Energy Building. The distinction in the CCSBP is focused on building operation. Basically, after the building is built, the homeowner can expect to live in a building that has zero net energy consumption and zero carbon emissions annually.

The National Association for Home Builders describes a Zero Energy Building as one that “combines high levels of energy efficiency with renewable energy systems to annually return as much energy to the utility as it takes from the utility, resulting in a net-zero energy consumption for the home.”

Some Notes on Reading the Worksheet

The first section of the worksheet describes the prerequisites. The rating categories as outlined on page 1 will follow the prerequisites. Within each rating category, there are items that give the user a chance to accumulate points by satisfying the requirements of each item. Sometimes an item has properties that could place it in more than one category. For example, this happens frequently with items that deal with the use of hot water as this effects both water consumption and energy use. The CCSBP placed all items in the categories only once and we placed it where one would most likely think of it when designing, constructing, or just contemplating a specific building system.

Each of the line items contains more than just a description of the item. You will also see the item number, the number of possible points that can be earned, the stage at which verification of the item shall take place, and an indication if the item must be in the homeowner’s manual. Both the “Verification Stage” column and the “Homeowner’s Manual” column warrant a bit of explanation, since we are using abbreviations to express what we mean in this columns.

For the “Homeowner’s Manual” column, there is a ‘Y’ for yes, meaning the support documentation for this item must be retained for the manual or an ‘NA’ meaning it is not applicable or not required that documentation is retained.

For the “Verification Stage” column, we have created a legend for the abbreviations used in this column:

PR= Plan Review I=Initial Visit (Committee) US=Under Slab Inspection R=Rough Inspection (Trades)
II= Insulation Inspection F=Final Inspection (Trades) FC=Final Committee Inspection

The amount of inspections may seem intimidating at first, but most coincide with the usual building inspections with some added involvement of some CCSBP Committees members as well. Contact the CCSBP Manager for any questions on what is required at inspections or on how they shall occur.

	Prerequisites for the Coconino County Sustainable Building Program		Verification Phase	Owner's Manual
0.01	Project meets the requirements of IECC as currently adopted by governing jurisdiction (replaced International Building Code and International Residential Code Coconino County model energy code).		PR, II, R, F	NA
0.02	All built-in appliances, such as furnaces, water heaters, etc. are Energy Star qualified. <i>Energy star products reduce energy (they use between 10–50% less energy and water than standard models) and water consumption, as well as occupant utility bills. Energy Star rated appliances often cost slightly more than their counterparts, yet when the payback period is reached in 1-4 years, the occupant begins to make money on these investments quickly.</i>		PR, FC	Y
0.03	If there is a heating system thermostat, it must be a programmable/set-back thermostat. <i>A set back thermostat regulates the heating/cooling system to provide optimum comfort when the house is occupied and to conserve energy when it is not.</i>		FC	Y
0.04	Water heater timer is installed on tanked electric water heaters. <i>Water heater timers save money by producing hot water in the utility companies' off peak energy hours.</i>		PR, FC	Y
0.05	Hot water lines are insulated to min R-3.6 under slab or in crawl spaces, not in conditioned space walls. (e.g 1/2" foam insulation over 1/2" - 3/4" pipe.) <i>Insulating hot water lines conserves energy by reducing source to fixture heat loss through supply piping.</i>		PR,US or II	NA
0.06	Home manual and owner education provided. <i>A homeowner will benefit from knowing how to operate and maintain their own home. See the list of requirements, please visit the Sustainable Building Program website.</i>		FC	Y
0.07	Home owner agrees to provide Coconino County with copies of all utility bills for a period of two years to assess the performance of the home. (If home is builder-built for purpose of resale, this item can be negotiated.) <i>Designing and building a structure is the first step in sustainable building; the remaining steps come in the operations, maintenance, and performance of the structure. By measuring a homes performance, we can constantly educate ourselves on what may improve.</i>		FC	NA
0.08	100% of toilets are either low-flow toilets (1.3 gallons or less/flush - high efficiency), dual control flush toilets, or composting type toilets. <i>Low flow toilets conserve water, which, in Arizona, is an especially valuable resource.</i>		PR, FC	Y
0.09	All tropical woods used anywhere in the project are FSC certified. <i>Currently, there is no international or national certification that can guarantee in a reliable manner that imported tropical wood is legally and sustainably logged. Many European countries have banned tropical wood imports altogether.</i>		PR, FC	Y

0.10	<p>Carbon monoxide (CO) detectors installed per manufacturer's recommendations. At minimum, there is one per floor: 1 detector is within 15 feet of each sleeping area = 4 points. For extra points (2 more points): Place one approximately 15 feet or so from doors to attached garages and from non-sealed combustion appliances.</p> <p><i>Carbon monoxide detectors warn against high levels of carbon monoxide, a poisonous gas produced as a by-product when fossil fuels are burned.</i></p>		FC	Y
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Worksheet Items for Credit			Potential Points	Project Points	Verification Phase	Owner's Manual
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1 Community and Site						
Construction	1.01	Erosion control plan, including topsoil preservation, is implemented (see checklist example). <i>Erosion control prevents soil loss and water pollution by keeping soil on site and preventing it from flowing off site with stormwater runoff. For specific guidelines, please visit the Sustainable Building Program website.</i>	6	0	PR, I, FC	Y
Community	1.02	Project is located within ¼ mile of urban trail.	4	0	FC	NA
Community	1.03	Project is located within ¼ mile of public transportation.	4	0	FC	NA
Community	1.04	Project is located within ¼ mile of open space and/or active recreation areas including parks, community meeting/gathering places.	4	4	FC	NA
Community	1.05	Project is located within ½ mile of basic shopping services (groceries, personal care, convenience items).	4	0	FC	NA
Community & Site	1.06	Project is located within a high density development area (average housing density of 7 or more dwelling per acre).	6	0	FC	NA
Community & Site	1.07	Building is placed on previously developed land.	4	0	FC	NA
Site	1.08	Maximize open and natural space by minimizing the disturbed area on site. Have a "no-disturbance zone" marked on drawings, leaving 40% on lot undisturbed (excluding area under roof). "No-disturbance zone" to be protected flagged and protected during construction. <i>Local ecosystems are the result of many years of evolution and adaptation to particular climatic conditions. Building siting and construction should be considerate of these natural ecosystems as living soil communities and root systems can be critically damaged during construction by trenching, soil compaction, flooding, and vehicles.</i>	6	6	PR, I, FC	NA
Site	1.09	The lot for the project is less than 8,000 sf within city limits, or less than 10,000 sf within county jurisdiction.	6	0	PR	NA

Site	1.10	Building is designed with minimum impact on natural vegetation, site topography, and natural drainage ways. <i>A suitability analysis can determine the best placement of the building envelope on the site so as to offer the least amount of impact on natural features such as drainage, vegetation, and unique topographical elements.</i>	4	4	PR, FC	NA
Site	1.11	Walkways, driveways, and patios are constructed of permeable materials. (50% = 4 points, 90% = 8 points) <i>Permeable materials allow rainwater to drain into the groundwater system rather than leave the property as runoff.</i>	8	8	PR, FC	Y
Site	1.12	Wildfire protection plan implemented when no fire hydrants available. (www.coconino.az.gov/uploadedFiles/Public_Works/CWPPFull.pdf). Note: homeowners' insurance costs can be reduced.	4	4	PR, FC	NA
Site	1.13	No chemical pesticides (includes termite pretreatment) are used on site. <i>Avoiding the use of chemical pesticides prevents groundwater or runoff contamination, and potential indoor air toxicity.</i>	2	2	PR, FC	NA
Site	1.14	No chemical herbicides are used on site. <i>Avoiding the use of chemical herbicides prevents ground water or runoff contamination, and potential indoor air toxicity.</i>	2	2	PR, FC	NA
Site	1.15	Outdoor living space is included (patios, porches, etc). <i>Use of outdoor living areas reduces conditioned built space without reducing livability.</i>	4	4	PR, FC	NA
Site	1.16	Credit awarded for smaller houses (all buildings in project): <1,000 sf =36 points, <1,200 sf =33 points <1,400 sf=30 points, <1,600 sf=27 points, <1,800 sf =24 points, <2,000 sf =18 points, <2,200 sf= 12 points	36	12	PR, FC	NA
Site	1.17	Additional credit for a smaller house size (in addition to credit 01.01.11). The house (all buildings) is (are) < 3,000 sq ft. <i>Homes are becoming increasingly large for no apparent design reason. Comfort is not directly related to the size of a space.</i>	6	6	PR,FC	NA
Site	1.18	Intentional aesthetic enhancement credit: Points are awarded based on 1.Composition and expression 2.Craftsmanship and 3.Response and association with place and context. (Maximum of 6 points per committee review.) <i>For aesthetic guidelines, please visit the Sustainable Building Program website.</i>	6	0	FC	NA
		<i>Total for category</i>	<u>110</u>	<u>52</u>		

2 Water Use and Efficiency						
Appliances/ Fixtures	2.01	Automatic faucet installed in bathroom sinks (battery IR or motion sensors).	2	0		
Appliances/ Fixtures	2.02	Washing machines meet the Energy Star Wash Factor requirement, 6 gallons per cubic foot of washer size, for a normal wash cycle (www.energystar.gov). <i>The wash factor is the water in gallons used per wash cycle divided by the washer's capacity in cubic feet.</i>	8	8		
Appliances/ Fixtures	2.03	Dishwasher uses 6 gallons or less for normal wash cycle (from www.snwa.com). <i>Standard dishwashers use between 9 and 15 gallons per cycle, so the water saving is significant.</i>	8	8		
Appliances/ Fixtures	2.04	Faucets and showerheads are low flow at <2.0 gpm (gallons per minute). (3 points for 50% and 6 points for 100%)	6	6		
Appliances/ Fixtures	2.05	Faucets and showerheads are low flow at <1.7 gpm (gallons per minute). (3 points for 50% and 6 points for 100%.) Points are in addition to 03.01.05.	6	6		
Efficient Design	2.06	Point of entry water or point of use water purification system meets ANSI/NSF standards (does not include reverse osmosis systems). <i>Point of entry/use water purification systems using filters will provide healthier drinking water for the home.</i>	6	6		
Efficient Design	2.07	Efficient hot water system is installed: 2 points for point of use recirculation system, 4 points for whole house tankless system, 6 points for timer activated whole house circulation system.	6	0		
Efficient Design	2.08	Water heater(s) is within 20-pipe feet length of bathroom fixtures. (100% of fixtures= 6 points, 50% of fixtures = 3 points) <i>Minimizing source to fixture distance decreases initial water wasted by delivering hot water faster.</i>	6	0		
Efficient Design	2.09	Electric heat pump water heater installed in lieu of conventional electrical water heater. <i>Electric heat pump water heaters save energy because they use surplus heat to heat water at little to no extra cost.</i>	4	0		
Efficient Design	2.10	Rainwater collection and storage system is installed for use on site. (No distribution system installed.) (www.harvestingrainwater.com) <i>Rainwater collection systems use the roof to collect and divert rainwater through downspouts, into a filter and store it in a cistern. When necessary, the stored rainwater is pumped to the surface for domestic use.</i>	6	6		

Efficient Design	2.11	Rainwater collection system with on-site distribution to vegetation is installed (i. e. gutters, scuppers, downspouts, retention areas, irrigation lines, etc.). Credit awarded is in addition to 2.10. <i>Rainfall that lands on the landscape can be diverted naturally to plants via contoured slopes and berms. Plants needing relatively more water are placed to collect more runoff. Basins can be built around particular plants to collect water and allow it to percolate slowly through the soil.</i>	12	12		
Efficient Design	2.12	Rainwater collection system is installed with collection, storage, and treatment for domestic water use in house. Credit awarded is in addition to 2.10 and 2.11. <i>Properly treated rainwater can supply all domestic uses. For information on code requirements, please visit the Sustainable Building Program website.</i>	12	12		
Efficient Design	2.13	Two pipe drain system for future graywater recovery system is installed. (www.oasisdesign.net) <i>Graywater systems use washing machine, faucet, and showerhead waste water to irrigate the yard, resulting in large savings in outdoor water consumption.</i>	6	6		
Exterior Strategies	2.14	Complete graywater irrigation system is installed. <i>A graywater irrigation system can produce 1,650 gallons of water per week in the average 4-person family. This 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.</i>	8	8		
Efficient Design	2.15	Plumbing drainage capability to eliminate the need to keep house heated in winter during periods of vacancy. <i>Homeowners with plumbing drainage capability save money and energy by not having to maintain a minimum temperature to prevent pipes from freezing while away for long periods of time.</i>	2	2		
Efficient Design	2.16	Hot water lines are fully insulated to min. R-3.6 throughout entire house, including conditioned spaces (including trunk lines, branch lines, joints, elbows, and lines installed under slab). <i>Insulated hot water lines conserve energy by reducing source to fixture heat loss through supply piping.</i>	2	2		
Exterior Strategies	2.17	Landscape is Xeriscape (100% of landscaped areas) excluding vegetable/fruit gardens. (www.rainwaterharvesting.org) <i>Xeriscape is landscaping that conserves water and protects the environment. Important considerations in creating a xeriscape landscape include planning, soil types, appropriate plant selection, efficient irrigation, mulch use,, and maintenance.</i>	6	6		
Exterior Strategies	2.18	Landscape (other than vegetable/fruit gardens) requires no irrigation (other than graywater, stored rain water, and/or natural precipitation).	10	10		
Exterior Strategies	2.19	Irrigation controller has a rain sensor shut off. <i>An irrigation controller with a rain sensor shut off prevents unnecessary irrigation during rain, therefore conserving additional water.</i>	4	0		

Exterior Strategies	2.20	Non-spray, zoned irrigation system has separate valving for vegetation types or zones (i.e. ground cover, shrubs and trees on separate valves). <i>Different types of plants have different watering and maintenance needs. A zoned irrigation system delivers the appropriate amount of water to the appropriate landscaping zone as needed.</i>	4	4		
Exterior Strategies	2.21	Turf (lawn) area is minimized. (15-points for zero, 10-points for <200 sf, 5-points for <400 sf) <i>Lawns require more water and maintenance than any other type of landscaping plants. The elimination of lawns can conserve a great deal of water, as well as conserving energy that would be used for maintenance.</i>	15	15		
		<i>Total for category</i>	<u>139</u>	<u>117</u>		

3 Energy Use and Efficiency						
Passive Efficiency	3.01	Home is oriented on the lot so the longest axial dimension faces within 20 degrees of true south. <i>This orientation maximizes the potential for controlling solar heat gain; which reduces energy use and utility costs.</i>	10	10		
Passive Efficiency	3.02	South glass has proper overhang or other shading feature to afford both summer shading and winter sun. <i>Exterior shading devices help to reduce the level of radiation that migrates into the building, thus reducing thermal heat gain in the summer. When the sun is low in the south during the cold winter months, the sun will heat the building.</i>	6	6		
Passive Efficiency	3.03	Exterior shading devices, screens, or landscaping for windows on the west side of the building, or no west windows installed. <i>Exterior shading serves to block solar radiation in order to reduce heat gain, glare, and localized overheating. A shaded window that allows air circulation between the shading device and the glass will greatly reduce solar heat gain. The lower the shading coefficient, the better the performance.</i>	2	2		
Passive Efficiency	3.04	Air lock vestibule is used to minimize heat loss at main entrance(s). <i>Also known as foyers and mudrooms, these rooms reduce the loss of conditioned air out of the house.</i>	4	0		
Passive Efficiency/ Performance	3.05	Home is designed for passive solar winter heating using solar heat gain analysis: 9-points for 50% heating demand, 18-points for 75% heating demand, 24-points for 100% heating demand. <i>For a user-friendly analysis tool and more information, please visit the Sustainable Building Program website.</i>	24	9		

Renewable	3.06	Clean renewable energy system installed: solar electric (photovoltaic) power system and/or a wind power system. Points are awarded based on percentage of the project's energy needs met: 4 points for every 10% of energy needs met; a maximum of 40 points is awarded for 100%. <i>Homeowners meeting their needs with renewable energy are greatly reducing their carbon footprint; this furthers the effort to strive towards net-zero energy use.</i>	40	40		
Renewable	3.07	Solar electric (photovoltaic) lighting constitutes at least 50% of landscape/site exterior lighting. <i>Photovoltaic powered exterior lighting systems provide simple outdoor lighting with no utility costs.</i>	4	4		
Appliances	3.08	Solar water heating system installed is certified by the Solar Rating Certification Council. (7 points for meeting 50% of annual hot water needs, 14 points for meeting 80%) <i>Solar water heating is the most economical way to heat water using the sun's free energy.</i>	14	14		
Appliances	3.09	Appliances that are not built-in are Energy Star rated. <i>Energy star products reduce energy and water consumption, as well as occupant utility bills.</i>	4	4		
Appliances	3.10	Smart wiring system installed for lighting control and telecommunications.	2	0		
Appliances	3.11	Gas dryer stub-out is installed. <i>Gas dryers are more efficient than electric, thus conserving energy. The provision of a gas dryer stub-out allows for the occupant to explore this technology.</i>	1	1		
Appliances	3.12	Passive clothes drying system is installed. <i>This method is cost-effective because of its use of free and abundant solar energy. An outdoor clothesline can be thoughtfully designed into any outdoor living/landscape area. An interior drying rack in the laundry area can be an effective alternative. Dryers are the second or third biggest consumers of energy among home appliances.</i>	2	2		
Lighting	3.13	At least 75% of interior light fixtures are non-incandescent (compact or tubular fluorescent, LEDs, etc.) or are Energy Star certified. <i>Compact fluorescents use 75% to 80% less energy than standard incandescent fixtures and last 8 to 15 times longer; LEDs and neon are also more efficient and last for decades.</i>	4	4		
Lighting	3.14	100% of incandescent lights are on solid-state dimmer switches. <i>Dimmer switches allow users to reduce the light output as desired, thus reducing energy consumption.</i>	2	0		
Lighting	3.15	Compact fluorescent light bulbs are used in all incandescent lamps. <i>Compact fluorescent light bulbs use 75% to 80% less electricity than incandescent light bulbs.</i>	2	0		
Insulation	3.16	Wall assemblies are rated at a minimum R-21 earns 4 points; wall assemblies with a min R-24 earns 8 points. <i>R-value measures thermal resistance or the insulation quality of a material. Better insulations with higher R-values greatly lower heating/cooling costs, and consequently, energy needs.</i>	8	8		

Insulation	3.17	Ceiling assembly is rated to at a minimum R-49. <i>Walls/ceilings with higher insulation values will reduce thermal migration and keep cooling/heating costs lower.</i>	8	0		
Insulation	3.18	Attic access from conditioned space is sealed and insulated or attic is conditioned space. <i>The attic access is like a window to the attic and needs to be sealed properly to prevent conditioned air from leaking into the unconditioned attic space.</i>	2	2		
Insulation	3.19	All exterior opaque doors are insulated to R-5 for 3 points or to R10 for 6 points. <i>Doors with higher insulation values reduce thermal migration, therefore saving energy.</i>	6	3		
Insulation	3.20	Garage door(s) is insulated to minimum R-10 for attached and/ or conditioned garages. <i>Doors with higher insulation values reduce thermal migration, therefore saving energy.</i>	4	0		
Insulation	3.21	All metal framed windows and doors have a thermal break in both frame and sash. <i>Metal has high heat transfer properties and is effective at transferring heat out of the house. Some new metal windows and doors have been cut in half and a new material with low heat transmittance properties is sandwiched in the middle to prevent the escape of heat from the house.</i>	2	2		
Heating/ Cooling	3.22	Multi-speed ceiling fans (Energy Start Certified) are installed in 50% of rooms. <i>Ceiling fans can make a house feel up to 20% cooler with a minimal use of energy.</i>	2	2		
Heating/ Cooling	3.23	Stack and/or cross ventilation capacity exists for seasonal cooling. (Paths are not greater than 40 ft.) <i>Using natural breezes to cool the house lessens or eliminates the need for mechanical cooling and saves energy.</i>	3	3		
Heating/ Cooling	3.24	No AC unit is installed.	4	4		
Heating/ Cooling	3.25	Heat recovery ventilator or air-to-air heat exchanger is installed. <i>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.</i>	4	0		
Heating/ Cooling	3.27	All bathroom exhaust fans are wired with light, occupant sensor, or on a timer.	2	0		
Performance	3.28	Energy Performance Analysis completed (i.e. - REM Design, Energy 10, Energy Scheming, Energy Plus, HERS).	8	8		
Performance	3.29	Diagnostic Blower Door Test results show 0.35 ACH or less (0.35 CFM at 50 Pascal's pressure per sf or less). <i>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.</i>	10	0		
Performance	3.30	Duct blaster test is performed and results show that total duct leakage \leq 6 cfm/sf to outdoors per 100 sq ft of conditioned floor area. <i>Leaking ductwork equals energy lost. Therefore, designing the system for minimal leakage conserves energy.</i>	10	0		

Construction	3.31	Utility supplied electric power (or solar generation) is on site and used at start of framing. <i>Power generators typically used on construction sites use an excessive amount of energy and are often inefficient, leading to overheating and potential converter failure. These generators also contribute to the noise pollution of the area surrounding the construction site.</i>	1	0		
Other Programs	3.32	Project is also participating in another energy certification program (i.e. LEED, NAHB, Engineered for Life, Certified Plus, Build America, Utility Company Programs, Energy Star, etc.) <i>Participation in an Energy Certification Program means that your home is guaranteed to be more energy-efficient than a standard home as a result of following the guidelines outlined in these programs, which includes third party inspections and diagnostic testing.</i>	2	0		
		<i>Total for category</i>	<u>203</u>	<u>128</u>		

4 Materials and Resource Use						
Design	4.01	Credit will be awarded for designs with extra consideration for durability and resilience to weather damage from these elements: freeze-thaw cycles, moisture, temperature extremes, and UV radiation exposure. (Amount of credit awarded determined by committee evaluation.)	8	4		
Construction	4.02	Removed stumps and tree limbs are ground for mulch for use on site.	2	0		
Construction	4.03	Construction waste reduction / reuse plan written and followed (e.g. recycle wood, cardboard, drywall, foam, metal, concrete, masonry, asphalt). (4 pts for 50% of waste recycled/reused and 8 pts for 90% of waste recycled/reused.)	8	0		
Construction	4.05	Donate excess materials to a non-profit building organization. (Restore, Teen Build, etc)	4	4		
Construction	4.06	Composting system is installed in yard (made on site or manufactured).	2	2		
Materials	4.07	Integral wall system used for envelope walls. Points from 1 to 10 awarded on percentage of integral wall amount compared to total wall amount. This is a multi-functional system which combines structural, thermal properties, and/or finish (e.g. integral insulated masonry, structural insulated panels (SIP), insulated concrete forms (ICF), aerated concrete (AC) block, insulated sandwich panel (ISP), solid foam wall panels, etc.).	10	10		
Materials	4.08	Use of Optimal Value Engineering (OVE) or advanced framing techniques. Must include examples on drawings.	4	4		
Materials	4.09	Use of durable finishes (i.e. warranty or life expectancy of 40+ years) The finish must comprise 90% of total finish used in each category: roofing (4 pts), siding (4 pts), and flooring (4 pts).	12	12		

Materials	4.10	Regional materials: materials used are extracted and manufactured within 500 miles of site. (3 points for each material - see chart for requirements) <i>For reference chart, please visit the Sustainable Building Program website.</i>	24	6		
Materials	4.11	Recycled, salvaged, and/or rapidly renewable materials are used. (3 points for each material - see chart for requirements) <i>For reference chart, please visit the Sustainable Building Program website.</i>	24	3		
Materials	4.12	FSC Certified wood products are used. (4 points for each material - see chart for requirements) (No credit is given for SFI Certified.) <i>For reference chart, please visit the Sustainable Building Program website.</i>	20	4		
		<i>Total for category</i>	<u>110</u>	<u>49</u>		

5 Indoor Environmental Quality						
Ventilation	5.01	Ventilation strategy is implemented to ensure healthy outside air exchange. Home is designed and constructed for ventilation conforming to ASHRAE Standard 62.2-2007. <i>A properly installed ventilation system will rid the house of pollutants and VOCs, providing a healthier living space.</i>	12	0		
Ventilation	5.02	Project has detached garage, no garage, or an exhaust fan in garage on a timer and/or wired to door opener on attached garage (Balance the exhaust / intake air with transfer grill to outside). <i>A detached garage will separate and prevent toxic fumes from entering the home. Having the garage door wired to an exhaust fan will remove toxic automobile emissions from the garage, preventing them from leaking into the home.</i>	6	6		
Ventilation	5.03	Passive radon ventilation system is installed per EPA guidelines. <i>Passive radon-resistant features installed in most houses do not cost anything to run. In fact, sealing the home to prevent radon entry can result in energy conservation.</i>	4	4		
Ventilation	5.04	No HVAC air handling equipment is in the garage.	6	6		
Appliances	5.05	Central vacuum system installed with outside exhaust. <i>Venting the vacuum to outside prevents the release of small particles back into the home improving indoor air quality.</i>	2	0		
Appliances	5.06	100% of fireplaces and woodstoves are sealed-combustion. Also, this credit is awarded for no fireplaces or woodstoves. <i>Sealed-combustion fireplaces involve a type of double-walled special vent supplied by the manufacturer that normally vents through a sidewall in a horizontal position. The inner surface removes the flue gases and the outer container provides for passage of combustion air. This type of fireplace does not negatively affect indoor air quality, nor energy loss in conditioned spaces.</i>	4	4		

Materials	5.07	Low-VOC materials are used: floor coverings, adhesives, sealants, paints and finishes. (3-points for each type used, max 15-points) (See chart for requirements.) <i>Low toxic interior finish products reduce off-gassing of VOCs and other toxic substances, which improves indoor air quality.</i>	15	0		
Materials	5.08	Zero VOC materials are used: flooring, adhesives, sealants, paints and finishes. (4-points for each type used, max 20-points) (See chart for requirements.) <i>Interior paints and finishes with no VOCs will reduce their negative effect on indoor air quality.</i>	20	0		
Materials	5.09	Formaldehyde-free materials are used: sheeting, sub-floors, cabinets, etc. or sealing is done to prevent fumes from escaping from materials with formaldehyde. (3-points for each type used, max 8-points) (See chart for requirements.) <i>Cabinets made from formaldehyde free particleboard or MDF eliminate the Volatile Organic Compounds [VOC] that off-gas into the home, resulting in healthier indoor air quality.</i>	12	0		
Materials	5.10	Formaldehyde-free fiberglass insulation is used for building envelope insulation. <i>Formaldehyde-free fiberglass insulation eliminate Volatile Organic Compounds [VOC] that off-gas into the building enclosure during the course of construction, increasing indoor air quality and decreasing adverse effects to workman and occupant health.</i>	2	2		
Comfort	5.11	Day-lighting strategy is implemented in all conditioned rooms, except storage areas. <i>Letting natural light into the house will save energy by avoiding the use of artificial lighting during the daylight hours.</i>	2	2		
Comfort	5.12	All exhaust fans rated for 1.0 sone (noise rating) or less. <i>Fans with a low noise level will reduce noise pollution.</i>	2	2		
Comfort	5.13	Intentional aesthetic enhancement credit: Points are awarded based on 1.Composition and expression 2.Craftsmanship and 3.Response and association with place and context. (Maximum of 6 points per committee review; can include private outdoor living spaces.) <i>For aesthetic guidelines, please visit the Sustainable Building Program website.</i>	6	0		
Other Programs	5.14	Project meets requirements for Energy Star's Indoor Air Package. (/www.energystar.gov)	5	0	PR, FC	Y
<i>Total for category</i>			<u>98</u>	<u>26</u>		

6 Innovation and Education						

Innovation	6.01	Innovation credit submissions are evaluated by committee. (Maximum of 25 points awarded) Some examples include: net zero energy home, life cycle analysis, net zero water home, lighting design modeling, energy usage guarantee, innovative regional design, radiant in-floor heating, domestic water manifold system, whole house fan, integrated photovoltaic shingle roofing, wood pellet stove heating, aesthetic or community enhancement, etc.	25	5	FC	Y
Education	6.02	Owner agrees to open house for a County Sponsored Home Tour within 2 years of the certificate of occupancy.	3	3	FC	NA
		<i>Total for category</i>	<u>28</u>	<u>8</u>		

TOTAL POINTS FOR ALL CATEGORIES (AS SUBMITTED):	<u>677</u>	<u>380</u>		
TOTAL POINTS FOR ALL CATEGORIES (AS APPROVED):				