

SCOTTSDALE



**GREEN BUILDING
PROGRAM**

City of Scottsdale

Green Multi-Family Rating Checklist

New Construction, Major Remodels & Additions

March 2007 Release

Plan Check # _____ Building Permit # _____ GB Total Points _____

Project or Owner's Name - _____

Project Address - _____

Designer Name - _____

Builder Name - _____

Use this rating worksheet to qualify projects under the Green Building Program for multi-family dwellings (apartments and condominiums) with a shared means of egress (as governed by the International Building Code).

All building system components, materials, and equipment must be installed per code and manufacturer's instructions.

<u>Entry Level</u>	<u>Advanced Level</u>
<ul style="list-style-type: none"> • Meet all mandatory measures and adjust rating for house size (p. 2 – 7). • Accumulate <u>50 - 99 points</u> from the rating checklist (p. 8 –27). 	<ul style="list-style-type: none"> • Meet all mandatory measures and adjust rating for house size (p. 2 – 7). • Accumulate <u>100 or more points</u> from the rating checklist (p. 8 – 27).

<u>Summary of Rating Categories</u>		
1. Site	6. Electrical Power, Lighting, Appliances	11. Interior Doors, Cabinetry, Trim
2. Structural Elements	7. Plumbing System	12. Flooring
3. Energy Rating/Performance	8. Roofing	13. Solid Waste
4. Thermal Envelope	9. Exterior Finishes	14. Innovative Design
5. Heating, Ventilation, & Air Conditioning	10. Interior Finishes	

Category	✓	Mandatory Measures	Verification
Site		<p>1. Protect all exterior entrances from direct summer sun exposures (east, west, south) with recessed or covered elements.</p> <p><i>The use of shading strategies in these areas will reduce heat island effect and maintain a cooler transition between indoors and outside (i.e. overhangs, trellis, perforated materials, trees). For overhang dimensions, see Scottsdale shade sizing table.</i></p>	Plan Review
		<p>2. At least 80% of improved landscape shall be Xeriscape or native planting (unless otherwise dictated by CC & R's).</p> <p><i>Xeriscape landscaping conserves water and protects the environment. Important considerations in creating a xeriscape landscape include planning, soil types, appropriate plant selection, efficient irrigation, use of mulches, and timely maintenance. The City of Scottsdale offers various informative documents regarding Xeriscape.</i></p>	Plan Review & Self-Certify
Energy Rating/Performance		<p>3. Building envelope designed to be at least 15% above IECC (International Energy Conservation Code).</p> <p><i>Conformance to this threshold shall be based on plan analysis using software such as COMcheck for the IECC comparison. For more information, visit www.energycodes.gov</i></p> <p><i>An Energy Performance Analysis is a part of the design process that combines energy considerations with basic architectural issues, yielding buildings that are considerably more energy efficient from a design perspective. It is also possible to analyze more detailed plans before construction begins, therefore allowing any elements that will waste a great deal of energy to be redesigned.</i></p>	Plan Review
Thermal Envelope		<p>4. Building has a continuous air/thermal barrier, which is clearly indicated on drawings/building sections to facilitate proper installation. Air and thermal barrier must align and be contiguous.</p> <p><i>Controlling thermal migration reduces heating/cooling loads, therefore reducing utility costs.</i></p>	Plan Review
		<p>5. Seal all penetrations and connections in building envelope (e.g. top and bottom plates, corners, and any potential points of air infiltration).</p> <p><i>A tightly sealed building envelope can eliminate unwanted indoor/outdoor air migration and reduce utility costs.</i></p>	Insp.

Heating, Ventilation, and Air Conditioning	6. Heating and cooling system/equipment within a single dwelling unit shall be sized according to building heating and cooling loads calculated using ACCA Manual J or equivalent. Central plant and common area heating and cooling systems and equipment shall be sized in accordance with procedures described in the ASHRAE Fundamentals Handbook or other equivalent computation procedure. <i>Manual J is a design tool to ensure that HVAC systems are sized to take into account system components (such as glazing, orientation, insulation, room sizes, occupant habits, etc) for maximum efficiency and comfort. Software recognized by ACCA as being in compliance with Manual J, may be used. For more information, visit www.acca.org</i>	Plan Review
	7. Ducts within dwelling units shall be sized in accordance with ACCA Manual D duct design calculations or other approved methods. Ducts installed within all other spaces shall be sized in accordance with the ASHRAE Fundamentals Handbook or other equivalent computation procedure. Ensure that every room has adequate return air flow through use of either multiple returns or transfer grills (every air supplied room having a door except baths, kitchens, closets, pantries, and laundry rooms). <ul style="list-style-type: none">• Size transfer grills with a minimum .75 sq. inches per cfm of air per room. <i>Careful sizing and layout is essential to ensuring adequate air delivery and comfort. Use Manual D to size and layout supply and return ductwork to each area of the home. Manual D will determine duct size to fit the load in each room taking into account the length of the duct run and the type of duct being used. For more information, visit www.acca.org. Properly sized return air ducts and transfer grills provides for pressure balancing of the air supply system which prevents back drafting of combustion appliance fumes, improving indoor air quality and safety.</i> <u>OR</u> Ductless space conditioning system (e.g., ductless split systems with mini-air handling units, hydronic/radiant floor or ceiling systems)	Plan Review & Insp.
	8. All ductwork joints shall be sealed with water-based mastic. No use of building cavities shall be used as a duct unless sealed. <i>Duct mastic is a preferred flexible sealant that can move with the expansion, contraction, and vibration of the duct system components. A high quality duct system greatly minimizes energy loss from ductwork. Improperly sealed ductwork can contribute 20 to 60 % of the air leakage in a house. The system should be airtight and designed to deliver the correct airflow to each room.</i>	Insp.

	<p>9. All air supply ducts shall be insulated as follows:</p> <ul style="list-style-type: none"> • Where located within <u>conditioned</u> building spaces, ducts shall be min. <u>R-4.2</u> • Where located in <u>unconditioned</u> spaces, ducts shall be min. <u>R-8</u>. <p><i>Insulating ductwork in unconditioned spaces saves energy lost before the air reaches the conditioned space.</i></p>	Plan Review & Insp.
	<p>10. Refrigerant piping shall be insulated to a minimum <u>R-2</u>.</p> <p><i>Insulating HVAC refrigeration lines increases the efficiency of the refrigeration cycle.</i></p>	Plan Review & Insp.
	<p>11. Install Energy Star labeled programmable thermostats.</p> <p><i>Programmable thermostats regulate the heating/cooling system to provide optimum comfort when the house is occupied and to conserve energy when it is not.</i></p>	Insp.
	<p>12. Install a minimum of three junction boxes (structurally mounted & wired) within each dwelling unit for future reversible, multi-speed ceiling fans.</p> <p>Exceptions: 1) For single bedroom units, install at least two junction boxes 2) For studio units, install at least one junction boxes</p> <p><i>Ceiling fans can make a house feel up to 20% cooler with a minimal use of energy.</i></p>	Plan Review & Insp.
Indoor Environmental Quality	<p>13. Install a carbon monoxide (CO) detector at house/garage entry door and in each area where combustion appliances are used (sealed combustion appliances are exempt).</p> <p><i>Carbon monoxide detectors warn against high levels of toxic carbon monoxide.</i></p>	Plan Review & Insp.
	<p>14. Design and install exhaust fan system for kitchen range hood with a minimum intermittent rate of 100 CFM or minimum continuous rate of 25 CFM vented to the outside. Bathrooms shall have an exhaust fan with a minimum intermittent rate of 50 CFM or minimum continuous rate of 20 CFM vented to the outside. Use Energy Star labeled bathroom exhaust fans, except for exhaust fans serving multiple bathrooms.</p> <p><i>Odors, pollutants, and moisture will accumulate in kitchens and baths that have poor exhaust.</i></p>	Plan Review & Insp.
	<p>15. Install air filters with a min. MERV rating of 8. Ensure that air handlers can maintain adequate pressure and air flow <u>unless</u> a ductless space conditioning system is installed.</p> <p><i>Minimum Efficiency Reporting Value [MERV] ratings pertain to the efficiency of HVAC filters. HVAC filters are designed to effectively remove most common particulate pollutants like dust or pollen.</i></p>	Self-Certify

	<p>16. Install gas space heating and water heating equipment in isolated/air sealed mechanical room(s) with an outside source of combustion air (sealed combustion appliances are exempt).</p> <p><i>Combustion appliances can release pollutants including gases or particles that come from burning materials. Air sealed or isolated mechanical rooms help to prevent leakage of these potential toxins into the home therefore maintaining a higher indoor air quality and occupant health.</i></p>	Plan Review & Insp.
	<p>17. No air handling equipment or return air ducts shall be located in private or common garages unless placed in isolated/air sealed mechanical room(s) with an outside source of combustion air (sealed combustion appliances are exempt).</p> <p><i>Occupant health can be adversely affected by car emissions leaking from garage into dwelling through the mechanical ventilation system.</i></p>	Plan Review & Insp.
	<p>18. Seal off ducts during construction <u>OR</u> clean HVAC ducts, coils and blower fan before occupancy.</p> <p><i>This measure protect occupants from exposure to contaminants.</i></p>	Self-Certify
Lighting	<p>19. For all dwelling units and common areas, at least 50% of interior wall surfaces are colored with a minimum Light Reflective Value (LRV) of 40%. At least 50% of interior ceiling and soffit surfaces are colored with a minimum LRV of 70%. (“off white” finish has a 70% LRV).</p> <p><i>Highly reflective/light colored surfaces maximize benefits of both artificial and free, natural daylight.</i></p>	Self-Certify
	<p>20. Use airtight and IC rated recessed lighting fixtures when penetrating the air/thermal barrier at insulated ceilings.</p> <p><i>Air sealed and IC rated fixtures eliminate the negative effects of penetrating the thermal barrier and reduce the likelihood hot spots in the ceiling, which negatively affect cooling loads.</i></p>	Insp.
	<p>21. Design and install individually switched task lighting in at least 3 separate task areas of each dwelling unit (e.g. - bathroom vanity, kitchen counter, laundry).</p> <p>Exceptions: 1) For studio and single bedroom units, install task lighting is at least 2 areas.</p> <p><i>Built-in task lighting provides specific use lighting in lieu of general purpose lighting, lowering the amount of energy used in the home.</i></p>	Plan Review & Insp.

Plumbing	<p>22. Fully insulate hot water lines to min. R-2 throughout entire run from water heater to plumbing fixtures (including trunk lines, branch lines, joints, elbows and lines installed under slab).</p> <p><u>Exception:</u> Branch lines of a central manifold (home-run) distribution systems (see checklist item # 7.6)</p> <p><i>Insulating hot water lines conserves energy by reducing source to fixture heat loss through supply piping.</i></p>	Insp.
	<p>23. Install a hot water recirculation pump for water heaters located more than 20 feet from furthest fixture served. For water heaters located within dwelling units, provide a manual (on-demand) control or occupant sensor switch for operation of the recirculation pump along with an automatic temperature sensor shut-off.</p> <p><u>Exception:</u> Dwelling units designed with a central manifold (home-run) distribution system (see checklist item # 7.6)</p> <p><i>Conventional residential building practice ignores the waste of water while waiting for hot water to get to the point of use. The problem is compounded by the tendency in new homes to spread the bathrooms and kitchen over a wide area, often locating them in different wings. Waiting times are 10 to 30 times longer than they were 30 years ago and hot water distribution systems are generally less efficient. Demand controlled hot water circulation systems can result in a 20-30% reduction in water use and enhance the energy performance of water heaters. The recirculation pump needs to be controlled by the user at the time of use rather than circulating hot water through the piping system continuously. A switch or occupant sensor located near the fixture activates a small pump that begins circulating hot water when there is a demand for it. A temperature sensor at the fixture automatically turns the pump off.</i></p>	Plan review & Insp.
	<p>24. Install toilets that are high-efficiency (1.3 or less gal/flush) or dual-flush operated (average flush of 1.2 gal or less) in at least half of bathrooms (but not less than one) in each dwelling unit and common areas.</p> <p><i>Toilets are the highest users of water in the home, accounting for more than 30% of residential indoor water consumption. High-efficiency/dual flush toilets can conserve an average family of four up to 6,000 gallons a year. Unlike first generation "low-flow" toilets, high-efficiency toilets (HETs) and dual-flush toilets combine high efficiency with high performance. Design advances enable HETs to save water with no trade-off in flushing power. In fact, many perform better than standard toilets in consumer testing.</i></p>	Insp.

Interior Finishes	<p>25. Interior paints, coatings and primers contain maximum 250 g/l (grams/liter) VOC (volatile organic compound) content. Clear wood finishes, floor coatings, stain, sealers, and shellacs shall not exceed the following VOC limits: Clear wood finishes: varnish 350 g/L (grams/liter); lacquer 550 g/L Floor coatings: 100 g/L Sealers: waterproofing sealers 250 g/L; sanding Sealers 275 g/L; all other sealers 200 g/L Stains: 250 g/L Shellacs: clear 730 g/L; pigmented 550 g/L <i>(For further info, see Maricopa County Air Quality Rule 335, Architectural Coatings and South Coast Air Quality Management District Rule 1113, Architectural Coatings)</i> <i>Volatile Organic Compounds [VOC] are a class of chemical compounds that can cause short or long-term health problems. The use of low VOC paints and finishes increases a building's indoor air quality and occupant health.</i></p>	Self-Certify
	<p>26. Use adhesives and grout with a maximum 250 g/l (grams/liter) VOC content for installation of materials (i.e. drywall, paneling, carpet pad, tile, wood flooring, trim). <i>The use of low VOC adhesives and grout improves indoor air quality and occupant health.</i></p>	Self-Certify
Solid Waste	<p>27. Each dwelling unit shall be provided with a built-in recycling pull-out in kitchen cabinets to accommodate two or more 5-gallon (minimum) bins. <i>Providing a built-in recycling area in the kitchen makes sorting and storage of recycling easier.</i></p>	Plan Review & Insp.
Operation & Maintenance	<p>28. For Condominiums, provide a homeowner's manual that includes the following: 1) Green Certificate of Occupancy 2) Copy of signed Green Certificate of Compliance; 3) List of green building features (can include green building rating checklist); 4) Product literature of selected green building materials; 5) Manufacturer's manuals for all installed equipment, fixtures and appliances. For Apartment Dwellers, provide a tenant's manual that includes the following: 1) List of green building features and operational instructions for special energy/water efficient appliances, fixtures, devices and/or equipment.</p>	Self-Certify

✓	<p align="center">Dwelling Unit Size Rating Adjustment Calculate the number of points to be added or deducted for final rating.</p>	<p align="center">Pt. Adjustment (+/-)</p>
	<p><u>When 90% or more dwelling units are under 2000 sq. ft. of total conditioned space.</u> <u>Plus 1 Point</u> for every 100 sq. ft. under 2000 sq. ft. (average size unit under 2000 sq. ft.)</p> <p><i>The construction of a smaller efficiently planned dwelling will conserve energy, water and material resources. Research indicates that as dwelling size increase, so do both material consumption and energy consumption. And although it is possible (within limits) to increase the efficiency of usage of both materials and energy such that a larger dwelling may consume no more than a smaller, less efficient dwelling, the efficient larger dwelling nevertheless consumes more than a similarly efficient smaller dwelling. Thus for a given size family, a larger dwelling uses more materials and energy to meet the same need. And those increases can be shown to be roughly proportional to the increases in the size of the dwelling itself.</i></p>	<p align="center">+ _____</p>
	<p><u>When 10% or more dwelling units are over 3000 sq. ft. of total conditioned space.</u> <u>Minus 1 Point</u> for every 250 sq. ft. over 3000 sq. ft. (average size unit over 3000 sq. ft.)</p> <p><i>Research indicates that as dwelling size increase, so do both material consumption and energy consumption. And although it is possible (within limits) to increase the efficiency of usage of both materials and energy such that a larger dwelling may consume no more than a smaller, less efficient dwelling, the efficient larger dwelling nevertheless consumes more than a similarly efficient smaller dwelling. Thus for a given size family, a larger dwelling uses more materials and energy to meet the same need. And those increases can be shown to be roughly proportional to the increases in the size of the dwelling itself.</i></p> <p><i>This point adjustment reflects that greater consumption and in so doing requires a higher level of performance by way of compensation, in order for the larger dwelling to achieve the same score as its smaller counterpart. Conversely, this adjustment recognizes and rewards the inherent efficiency of smaller dwellings.</i></p>	<p align="center">- _____</p>

<p style="text-align: center;">Rating Options</p> <p style="text-align: center;"><u>Note:</u> All options require <u>90%</u> threshold unless otherwise noted.</p>	<p style="text-align: center;">Circle Points</p>	<p style="text-align: center;">Verification</p>
<p>1. Site</p>		
<p>1.1 Project is an infill development and/or designed with minimum impact on site topography and natural drainage ways.</p> <p style="padding-left: 40px;"><u>Additional Point</u> for a cut/fill analysis that indicates a balance of site cut & fill</p> <p style="padding-left: 40px;"><i>A suitability analysis can determine the optimal placement of site improvements to minimize impact on natural features such as drainage, vegetation, and unique topographical elements. Balancing cuts & fills minimizes energy used to haul material into or out of the site.</i></p>	<p style="text-align: center;">3 1</p>	<p style="text-align: center;">Plan Review</p>
<p>1.2 Minimum 80% of exposed paving (e.g., walkways, patios, playgrounds, recreation courts, driveways, parking) is light colored (light reflectance value of at least 30%) and constructed of permeable materials.</p> <p style="padding-left: 40px;"><i>Light colored and permeable materials reduce local heat island effects (heat absorption and re-radiation) and minimize rain run-off (e.g. - course sand-set pavers/bricks, stabilized decomposed granite, pervious pavement).</i></p>	<p style="text-align: center;">2</p>	<p style="text-align: center;">Plan Review</p>
<p>1.3 Topsoil and/or natural desert granite from the disturbed area is isolated and preserved in a separate location on-site for re-use to avoid or minimize import of material.</p>	<p style="text-align: center;">2</p>	<p style="text-align: center;">Self- Certify</p>
<p>1.4 Building is oriented with the longest building dimension facing south (+/- 15 degrees east or west of due south).</p> <p style="padding-left: 40px;"><i>This orientation reduces energy use and utility costs by maximizing the ability to control solar heat gain.</i></p>	<p style="text-align: center;">3</p>	<p style="text-align: center;">Plan Review</p>
<p>1.5 Ninety percent (90%) of dwelling units have at least two shared common walls.</p> <p style="padding-left: 40px;"><i>Multi-family housing is more compact than single-family housing, thereby creating less land disturbance per unit. Common shared walls equate to less exterior wall exposure per unit thereby reducing cooling and heating loads. Smaller multi-family units use less electricity and water per unit as compared to single-family homes. Multi-family households tend to have fewer cars, drive fewer miles and use public transportation more frequently than residents of single-family housing. Multi-family housing creates efficiencies that make it easier and more affordable to provide basic services including collection of recyclables and trash pick up. Multi-family housing makes it feasible to integrate recreational, commercial and retail uses thereby reducing the need for auto trips for the residents.</i></p>	<p style="text-align: center;">6</p>	<p style="text-align: center;">Plan Review</p>

<p>1.6 Ninety percent (90%) of dwelling units have direct access to shaded outdoor living area (min. 70 sq. ft.) on north, south, and/or east side(s).</p> <p><u>Additional Points</u> for at least 150 sq. ft. of shaded outdoor living area</p> <p><u>Additional Points</u> for at least 300 sq. ft. of shaded outdoor living area</p> <p><i>Shading these areas will reduce heat gain and lower the temperature around the house to promote outdoor living. Outdoor living areas reduce the need for air conditioned indoor space without compromising livability. Shade provided by outdoor structures and vegetation, combined with water features for evaporative cooling will lower the outside temperature and reduce the thermal heat gain of the house, thus making outdoor living more comfortable.</i></p>	<p>4</p> <p>2</p> <p>2</p>	<p>Plan Review</p>
<p>1.7 Total area of shaded outdoor living areas is equal to at least 25% of the total livable floor area served.</p> <p><i>The use of outdoor living areas potentially reduces conditioned interior space without reducing livability. Shading devices can be designed to allow for desired winter solar heat gain to minimize heating costs.</i></p>	<p>4</p>	<p>Plan Review</p>
<p>1.8 Outdoor structures made from salvaged, reclaimed or recycled content materials.</p> <p><i>Substituting these materials outdoors avoids the use of virgin materials.</i></p>	<p>2</p>	<p>Plan Review</p>
<p>1.9 All landscaping is native and/or Xeriscape (no lawn).</p> <p><i>Xeriscape landscaping conserves water and protects the environment. Important considerations in creating a xeriscape landscape include planning, soil types, appropriate plant selection, efficient irrigation, use of mulches, and timely maintenance. The City of Scottsdale offers various informative documents regarding Xeriscape. Eliminating lawns can result in significant water savings and can also eliminate energy that would be used for maintenance.</i></p>	<p>2</p>	<p>Plan Review</p>
<p>1.10 Non-sprinkler or drip, zoned irrigation system is designed with multiple valves to accommodate specific water needs of different types of plants (e.g., ground cover, shrubs and trees on separate valves).</p> <p><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></p>	<p>2</p>	<p>Self-Certify</p>
<p>1.11 The irrigation system is equipped with an automatic rain sensor shut off or weather-based management system.</p> <p><i>A rain sensor shut off prevents unnecessary irrigation during rain, therefore conserving water.</i></p>	<p>2</p>	<p>Self-Certify</p>
<p>1.12 Rainwater channeling methods using gutters, scuppers, downspouts and grading to direct runoff to landscaped areas.</p> <p><i>Rainfall can be diverted naturally to plants via contoured slopes, berms and channels, as well as with gutters, downspouts and scuppers. Basins can be built around particular plants to collect water and allow it to percolate slowly through the soil.</i></p>	<p>2</p>	<p>Insp.</p>
<p>1.13 A rainwater collection and storage system is used to supplement the irrigation system.</p> <p><i>Rainwater collection systems use the roof to collect and divert rainwater through downspouts, into a filter and store it in a cistern for future use.</i></p>	<p>3</p>	<p>Insp.</p>
<p>1.14 Non-toxic pest control (e.g., borate treatment, physical barriers, pest-resistant building materials).</p> <p><i>Using alternatives to chemical treatments prevents groundwater or runoff contamination, and potential indoor air toxicity.</i></p>	<p>2</p>	<p>Self-Certify</p>

Sub-total of points selected:			
2. Structural Elements			
2.1 Non-asphalt based damp proofing is used for basement and/or retaining wall applications (e.g. zero VOC/water based liquid acrylic, 1 ply membrane, bentonite clay, and cement-based waterproof coating). <i>The use of asphalt-based (i.e. petroleum) damp proofing creates the potential for leaching contaminants into our ground water contamination from leaching petroleum and toxins.</i>	1	Self-Certify	
2.2. Western coal fly ash is used in all concrete foundations and slabs with min. 20% substituted volume of cement. <i>Western coal fly ash concrete can use up to 30% less Portland cement. Fly ash is a waste product with no other practical use, so its use in concrete diverts it from the waste stream.</i>	1	Self-Certify	
2.3 At least 75% of roof structure is non-solid sawn lumber (metal, engineered lumber, recycled content materials). This item does not include concrete slabs on grade or conventional wood trusses. <u>Additional Points</u> for at least 75% of floor structure <u>Additional Points</u> for at least 75% of beams, headers and columns <u>Additional Points</u> for at least 75% of interior framing <i>Steel, concrete and other non-wood structural members save wood resources and are more dimensionally stable and more recyclable than their solid sawn wood counterparts. Engineered lumber is composed of smaller pieces of wood and is therefore more resource efficient since it uses more material from a given tree and overall milling operations. Engineered lumber is also more dimensionally stable.</i>	2 2 2 2	Plan Review	
2.4 At least 75% of roof structure lumber is certified by the Forest Stewardship Council (FSC) as a sustainable source. <u>Additional Points</u> for at least 75% of floor structure <u>Additional Points</u> for at least 75% of beams, headers and columns <u>Additional Points</u> for at least 75% of interior framing <i>The use of wood from sustainable managed forests protects regional biodiversity, soil erosion and water quality, and also saves old growth forests by using trees from second-generation forests and tree farms. A sustainable-managed forest prohibits clear cutting practices and plants a new tree for every one used in production.</i>	2 2 2 2	Self-Certify	
2.5 At least 75% of roof structure lumber is certified by the Sustainable Forest Initiative (SFI) as a sustainable source. <u>Additional Points</u> for at least 75% of floor structure <u>Additional Points</u> for at least 75% of beams, headers and columns <u>Additional Points</u> for at least 75% of interior framing <i>The use of wood from sustainable managed forests protects regional biodiversity, soil erosion and water quality, and also saves old growth forests by using trees from second-generation forests and tree farms. A sustainable-managed forest prohibits clear cutting practices and plants a new tree for every one used in production.</i>	1 1 1 1	Self-Certify	

<p>2.6 No false wood beams, non-load bearing columns or double walls. <i>Conventional framing and design effects can use 15 to 30 percent more materials than is structurally needed.</i></p>	2	Plan Review & Insp.
<p>2.7 Interior borate treated lumber used for at least 50% of wood structure, excluding trusses. <i>Borate treated lumber helps preserve lumber while protecting against insects and is harmless to humans.</i></p>	2	Plan Review & Self-Certify
<p>2.8 Low toxic materials with no urea-formaldehyde resin are used for all sub-floor, roof and wall sheathing. <i>Low toxic sub-flooring and sheathing prevent the off gassing that occurs with the use of urea-formaldehyde, thus increasing indoor air quality and occupant health.</i></p>	2	Self-Certify
<p>2.9 An integral wall system is used that combines structural and thermal properties, and/or finish. Options include integral insulated masonry, structural insulated panels (SIP), insulated concrete forms (ICF), autoclaved aerated concrete (AAC), insulated sandwich panel (ISP), and solid foam panels. Natural materials such as cob, straw bale, adobe, pumice, thatch, and rammed earth may also satisfy this requirement.</p> <p><u>Additional Points</u> for regionally extracted or recovered, processed & manufactured within 500 miles <u>Additional Points</u> for regionally extracted or recovered, processed & manufactured within 250 miles <i>Integral wall systems provide many benefits such as resource efficiency, high insulation values and/or thermal mass, preserving wood resources. Utilizing local and natural building materials reduces the energy and emissions to transport materials from outside the regional. Additionally natural regional materials are suitable in the desert climate and when properly installed require minimal maintenance.</i></p>	4 2 4	Plan Review & Insp. Self-Certify
<p>2.10 Structural products (other than those for walls) from regional manufacturers within 250 miles (e.g. beams lintels, headers, columns). This item does not include concrete slabs on grade or conventional wood trusses.</p> <p><u>1 pt. per category</u> (max. 2 pts.) <i>Purchasing regionally manufactured materials and products supports the local economy and reduces transportation costs and impacts.</i></p>		Self-Certify
<p>2.11 Building design is based on modular dimensions and utilizes modular building components. This item includes advanced framing techniques (e.g., 2-stud corners, single top plates, stud spacing greater than 16" o.c., alignment of multistory load bearing modules), panelized wall/roof systems, and modular housing.</p> <p><i>Conventional framing techniques can use 15 to 20 percent more framing material than is structurally needed. Homes designed on a modular grid (e.g. 24" or 48" to match dimensions of standard materials) or constructed from pre-fabricated components result in fewer waste products and require less energy for their assembly. Utilizing materials that do not require on-site assembly optimizes plant manufacturing efficiencies and offers protection from the elements. Less time means reduced site impact and resources.</i></p>	3	Plan Review
Sub-total of points selected:		

3. Energy Rating/Performance		
<p>3.1 Building envelope designed to be at least 25% above IECC (International Energy Conservation Code). <u>Additional Points</u> for at least 35% above IECC <u>Additional Points</u> for at least 45% above IECC</p> <p><i>Conformance to this threshold shall be based on plan analysis using software such as COMcheck for the IECC comparison. For more information, visit www.energycodes.gov.</i></p> <p><i>An Energy Performance Analysis is a part of the design process that combines energy considerations with basic architectural issues, yielding buildings that are considerably more energy efficient from a design perspective. It is also possible to analyze more detailed plans before construction begins, therefore allowing any elements that will waste a great deal of energy to be redesigned.</i></p>	2 2 2	Plan Review
<p>3.2 Participation in a third-party Energy Certification Program such as Energy Star for Buildings or Utility Company Programs. <u>List name of program</u> –</p> <p><i>Participation in an Energy Certification Program ensures that your home will be more energy-efficient than a standard home as a result of following the guidelines outlined in these programs. Participation in these programs include third party inspections and diagnostic testing.</i></p>	3	Plan Review & Self-Certify
<p>3.3 An Energy Usage Guarantee is provided by builder or third-party energy performance provider. <i>Builders who are confident about the construction quality and energy performance of their project can choose to guarantee that the home energy usage will not exceed a set limit over the course of two years.</i></p>	3	Self-Certify
Sub-total of points selected:		
4. Thermal Envelope		
<p><u>Note:</u> All insulation in thermal envelope (wall, ceiling and/or roof which separates the exterior from the indoor environment) shall be installed such that the full R-value is achieved in every location. No voids, partially filled gaps or compression shall be permitted in wall, floor, ceiling, or roof insulation.</p>		
<p>4.1 Insulation is applied at roof sheathing (non-vented attic is within thermal envelope). <i>Sealed and insulated attics create semi-conditioned air space that reduces the heat gradient on the HVAC ductwork.</i></p> <p><u>OR</u></p> <p>Provide a radiant barrier at roof or ceiling assembly (most effective in vented attics). <i>Radiant barrier (i.e. - decking, foil or reflective coating) is applied to the underside of the roof sheathing or as a top layer in the ceiling, creating a barrier to reduce radiant heat flow.</i></p>	2	Plan Review & Insp.
<p>4.2 Roof system qualifies as an Energy Star Roof or Cool Roof Rating Council certified roof. <i>A cool roof significantly reduces radiant heat transfer through the roof.</i></p>	2	Plan Review

<p>4.3 The building wall system provides an integral air and water infiltration barrier or the house is wrapped with a breathable exterior air and water infiltration barrier that allows water vapor to escape. <i>Application of an air and water infiltration barrier prevents air and water from getting into the house, while allowing water vapor to escape, thereby improving the energy efficiency and durability of the home.</i></p>	1	Plan Review & Insp.
<p>4.4 Perform a third-party building envelope air leakage (blower door) test with less than or equal to 0.35 air changes per hour (0.35 CFM at 50 Pascal's pressure per sq. ft. or less). <u>Additional Points</u> for less than or equal to 0.25 air changes per hour <i>Approximately one-third of heating and cooling loads are due to air leakage through the envelope. Substantial reductions in envelope leakage can be obtained using air sealing techniques. A blower door test confirms the energy efficiency of the building envelope, indicating a tight house and a minimal loss of conditioned air through leakage.</i></p>	4 2	Self-Certify/ Third Party Test
<p>4.5 Wood windows or wood clad windows are certified by the Forest Stewardship Council (FSC) or windows made from non-wood materials. <i>The use of wood from sustainable managed forests protects regional biodiversity, soil erosion and water quality, and also saves old growth forests by using trees from second-generation forests and tree farms. A sustainable-managed forest prohibits clear cutting practices and plants a new tree for every one used in production.</i></p>	2	Self-Certify
<p>4.6 Wood windows or wood clad windows are certified by the Sustainable Forest Initiative (SFI). <i>The use of wood from sustainable managed forests protects regional biodiversity, soil erosion and water quality, and also saves old growth forests by using trees from second-generation forests and tree farms. A sustainable-managed forest prohibits clear cutting practices and plants a new tree for every one used in production.</i></p>	1	Self-Certify
<p>4.7 Exterior shading devices / screens with a shading coefficient of 0.45 or lower are installed on windows. <i>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></p>	2	Plan Review
<p>4.8 South glazing has full exterior shading from May through August at noon. <i>The highest levels of solar radiation occur during the months of May, June, July, and August. Exterior shading devices help to reduce the level of radiation that migrates into the building, thus reducing thermal heat gain.</i></p>	2	Plan Review
<p>4.9 No more than 20% of total glazing is located on east and west walls combined. <i>Windows located on east and west walls receive light and heat, but are difficult to shade from the summer sun because of the sun's low aperture in the morning and late afternoon. East windows are more acceptable than west windows, as they allow morning sun to chase off the nighttime chill. West windows receive radiation from the hot afternoon sun, thus increasing heat transfer into the home. Because they are difficult to shade the best solution is to limit east and west windows.</i></p>	2	Plan Review
<p>4.10 Total glazed area (including skylights) does not exceed 20% of gross area of exterior walls. <i>These strategies are incorporated to minimize thermal conductivity through glazed areas, (heat loss/ heat gain) reducing heating and cooling loads and energy costs.</i></p>	3	Plan Review

<p>4.11 Building(s) incorporate exterior sun control/shading strategies for protection from low summer sun angles (structure and/or landscaping) on min. 50% of east and west facing windows. <u>Additional Point</u> for min. 75% of east and west facing windows <u>Additional Point</u> for min. 100% of east and west facing windows <i>The use of shading strategies on exterior walls and windows will reduce the amount of heat absorbed into the house and keep it cooler.</i></p>	<p>2 1 1</p>	<p>Plan Review</p>
<p>4.12 Blown-in insulation (e.g., cellulose, fiberglass) is used at: <u>Walls</u> – 2 pts. <u>Ceilings</u> – 2 pts. <i>Blown-in insulation increases thermal efficiency by eliminating non-insulated voids, in turn lowering utility costs.</i></p>		<p>Plan Review & Insp.</p>
<p>4.13 CFC and HCFC free foam insulation is used at: <u>Foundation/Slab</u> – 1 pt. <u>Basement</u> – 1 pt. <u>Walls</u> – 2 pts. <u>Ceiling/Roof</u> – 2 pts. <i>Using CFC and HCFC free rigid foam and spray foam insulation avoids the use of ozone harming chemicals. Spray foam expands into voids to increase thermal efficiency.</i></p>		<p>Plan Review & Insp.</p>
<p>4.14 Cementitious foam insulation is used at: <u>Walls</u> – 1 pt. <u>Ceiling/Roof</u> – 1 pt. <i>Cementitious foam insulation provides a higher R-value than fiberglass or cellulose, is fire proof, and does not shrink after installation.</i></p>		<p>Plan Review & Insp.</p>
<p>4.15 Insulation has a minimum of 25% recycled content (e.g., cellulose, denim). <i>Recycled content insulation conserves new material and reduces waste in landfills.</i></p>	<p>2</p>	<p>Plan Review & Self-Certify</p>
<p>4.16 Building is insulated with formaldehyde-free insulation. <i>Formaldehyde-free insulation does not contain Volatile Organic Compounds [VOC] that outgas into the building enclosure during the course of construction, thus increasing indoor air quality and decreasing adverse effects to workman and occupant health.</i></p>	<p>2</p>	<p>Self-Certify</p>
<p>4.17 Building is insulated with bio-based or natural insulation such as straw, cork, or cotton products. <i>Natural insulation products eliminate the off gassing of toxic chemicals and also provide a higher R-value than many of the traditional insulation products.</i></p>	<p>2</p>	<p>Plan Review & Insp.</p>
<p>Sub-total of points selected:</p>		
<p>5. Heating, Ventilation, and Air Conditioning (HVAC)</p>		

<p>5.6 HVAC systems located within each dwelling unit incorporate a whole house filtration system with an MERV rating of at least 12.</p> <p><i>Whole house filtration systems effectively improve indoor air quality by filtering particles that are hazardous to occupant health. These particles can include toxic gases, molds, and particulate matter.</i></p>	2	Insp.
<p>5.7 Install a minimum of two reversible, multi-speed, Energy Star rated ceiling fans in each dwelling unit.</p> <p><i>Ceiling fans can make a house feel up to 20% cooler with a minimal use of energy. To be effective during summer months, HVAC thermostat must be set at a higher temperature in conjunction with fan use.</i></p>	2	Plan Review & Insp.
<p>5.8 Dwelling unit windows are configured to allow for stack and/or cross ventilation to take advantage of seasonal cooling. Cross ventilation paths shall not exceed 40 ft.</p> <p><i>Using natural breezes to cool the house lessens the need for mechanical cooling and saves energy.</i></p>	4	Plan Review
<p>5.9 Dwelling units and/or enclosed common areas are provided with an evaporative cooling system with independent air distribution system <u>OR</u> a dual moisture sensor controlled system on a shared air distribution system.</p> <p><i>Evaporative cooling systems can effectively cool a space for a large portion of the year and use less energy and cost less than air conditioning units to operate.</i></p>	3	Plan Review & Insp.
<p>5.10 Indoor and/or outdoor living area utilizes a passive cooling method such as a cool tower or misting system (in a shaded outdoor area).</p> <p><i>Using passive cooling strategies in and around the house lessens the need for mechanical systems and saves energy.</i></p>	3	Plan Review & Insp.
<p>5.11 Furnaces serving dwelling units and common areas are sealed-combustion units.</p> <p><i>A sealed combustion furnace will draw air directly from the outside. A power vented furnace uses an integral motorized vent exhauster to meter the airflow through the system, reducing energy loss. These furnace types do not negatively affect indoor air quality because of efficient ventilation outside of occupied spaces.</i></p>	1	Plan Review & Insp.
<p>5.12 Water heaters serving dwelling units and common areas are sealed-combustion units.</p> <p><i>Sealed-combustion water heaters draw combustion air from the outdoors, which eliminates any chance of back drafting. This feature is especially helpful in tight homes, where appliances compete for less combustion air. In addition, sealed combustion heaters can save energy because they don't steal heated or cooled indoor air from the house. A power vented water heater pushes excess heat outside through vents, therefore conserving energy in the conditioned space. These water heater types do not negatively affect indoor air quality because of efficient ventilation outside of occupied spaces.</i></p>	1	Plan Review & Insp.
<p>5.13 Fireplaces serving dwelling units are sealed-combustion.</p> <p><i>Sealed combustion fireplaces use a specially designed double-walled vent that typically 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 and does not result in energy loss in conditioned spaces.</i></p>	1	Plan Review & Insp.
<p>5.14 Dwelling units are provided with a central vacuum system.</p> <p><i>Venting the vacuum to outside prevents the release of small particles back into the home, thereby improving indoor air quality.</i></p>	2	Insp.

5.15 Individual and/or common garages are provided with a ventilation system that provides a minimum 15 cfm per person (calculated at 1 person per 1000 sq. ft. of garage area). <i>Exhaust system removes toxic automobile emissions from the garage, preventing them from leaking into occupied spaces.</i>	1	Insp.
5.16 No dwelling unit connects directly to a garage except through intervening spaces. <i>A detached garage keeps toxic fumes segregated from the livable portions of the home, thus maintaining a higher quality of indoor air.</i>	2	Plan Review
5.17 Bathroom exhaust fans are operated by an occupant sensor, automatic humidistat controller, or timer for either a timed interval or until humidity level is reduced. <i>Energy Star labeled fans provide more ventilation capacity at a lower wattage and are also quieter than standard bath fans. Installing controllers on fans, especially timers or humidistats that remove residual humidity after a person leaves the bathroom is an effective method for removing interior generated moisture at its source. Timers can also prevent unnecessary fan energy use that occurs when a fan is inadvertently left on.</i>	2	Plan Review & Self-Certify
5.18 Test for radon and if radon level is 2 pCi/L (pico Curies per Liter) or more, install a radon ventilation system per Environmental Protection Agency (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 provide the added benefit of energy conservation.</i>	3	Plan Review & Self-Certify
Sub-total of points selected:		
6. Electrical Power, Lighting, and Appliances		
6.1 Interior floor covering is light in color, with a minimum light reflectance value (LRV) of 25%. <i>Lighter colored surfaces maximize effects of both artificial and free, natural daylight.</i>	1	Self-Certify
6.2 Daylighting enters at least half of habitable spaces in each dwelling unit from two sides (excluding skylights). <i>Letting natural light into the house saves energy by avoiding the use of artificial lighting during the daylight hours.</i>	2	Plan review
6.3 Recessed lights do not penetrate the thermal barrier. <i>Recessed lights can affect a building's cooling load by penetrating the thermal barrier. However, air sealed and I.C. rated fixtures minimize penetration impact and reduce the chance of creating hot spots in the ceiling.</i>	2	Insp.
6.4 At least 50% of lighting fixtures have an efficacy of 40 lumens per watt (l/w) or more. High-efficacy lighting includes compact or tubular fluorescent and light-emitting diodes (LEDs). <i>Compact fluorescent lighting uses 75% to 85% less energy than standard incandescent fixtures. LEDs are available with an efficacy of 40 l/w and can be controlled by a dimmer switch. They are suitable for kitchens, bathrooms, and utility rooms at a density of one per 25 square feet.</i>	2	Plan Review & Self-Certify
6.5 Maximum interior lighting wattage does not exceed 0.5 watts per sq. ft, as determined by aggregate wattage not including plug loads. <i>Lower overall lighting wattage reduces energy consumption and costs.</i>	3	Plan Review

6.6 Smart wiring system is installed for controlling lighting and telecommunications. <i>The installation of a smart wiring system allows new technology to be added to a home without having to rewire, which saves energy and natural resources. Lighting controls can be set for on/off, dimming and staging.</i>	2	Insp.
6.7 Dwelling has Energy Star rated appliances, including refrigerator, freezer, dishwasher and clothes washer (www.energystar.gov/products). 1 pt. for each appliance (max. 3 pts.) <i>Energy star products reduce energy and water consumption, as well as utility bills. Oftentimes, Energy Star rated appliances do not cost more than their less efficient counterparts.</i>		Insp.
6.8 Laundry room has a gas dryer stub-out. <i>Gas dryers are more efficient than electric dryers, thus conserving energy. The provision of a gas dryer stub-out allows for the occupant to easily take advantage of this technology.</i>	1	Insp.
6.9 Laundry room is provided with a permanent drying rack for passive clothes drying. <i>An indoor drying rack in the laundry area can be added as an effective alternative to energy consuming appliance. Natural evaporation and solar exposure is the most efficient and cost-effective method to dry clothes because it uses free and abundant energy.</i>	1	Insp.
6.10 Solar powered (photovoltaic) lighting is provided for at least 50% of the exterior site lighting. <i>Photovoltaic powered exterior lighting systems provide simple, effective outdoor lighting with no utility costs.</i>	2	Insp.
6.11 Building roof is configured to accommodate future solar electric (photovoltaic) panels with electrical rough-in (conduit run from electrical service to roof). The cumulative roof area must be a minimum of 2000 sq. ft. and have a south sloping exposure (unless flat roof with or without a parapet). <i>A pre-planned south roof area provides for the easy installation of future solar electric (photovoltaic) panels.</i>	2	Insp.
6.12 Design and install a solar electric (photovoltaic) power system. 4 pts for each 10 percent of annual electrical load (KWh) of dwelling units and/or common areas met by system <i>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.</i>		Plan Review & Insp.
6.13 Design and install a fuel cell using hydrogen generated by solar energy. 4 pts for each 10 percent of annual electrical load (KWh) of dwelling units and/or common areas met by system <i>Solar energy is used to separate hydrogen and oxygen out of water. The hydrogen gas is fed into the fuel cell to produce electricity and heat. This process is extremely efficient and pollution free.</i>		Plan Review & Insp.
6.14 Design and install a fuel cell using hydrogen generated by natural gas. 3 pts for each 10 percent of annual electrical load (KWh) of dwelling units and/or common areas met by system <i>Natural gas is used to separate hydrogen and oxygen out of water. The hydrogen gas is fed into the fuel cell to produce electricity and heat. This process is extremely efficient and virtually pollution free.</i>		Plan Review & Insp.

<p>6.15 Dwelling units and/or common areas generate enough on-site power to be zero-net energy (carbon neutral).</p> <p><i>A zero-net energy home supplies to the utility grid an annual output of electricity that is equal to or more than the amount of power purchased from the grid. In many cases the entire energy consumption (heating, cooling, and electrical) of a zero-net energy home can be provided by renewable energy sources. A zero-net energy building can offset emissions equivalent to the amount of kilowatt-hours (kWh) produced by the renewable energy on the building. This calculation is often limited to greenhouse gas emissions, which contribute to climate change. In this case a zero-net energy or zero-net emissions building can be called carbon or climate neutral.</i></p>	4	Plan Review												
Sub-total of points selected:														
7. Plumbing System														
<p>7.1 Hot water lines are fully insulated to <u>min. R-4</u> throughout entire run from water heater to plumbing fixtures (including trunk lines, branch lines, joints, elbows and lines installed under slab).</p> <p><i>Insulating hot water lines conserves energy by reducing source to fixture heat loss through supply piping.</i></p>	2	Insp.												
<p>7.2 A gas fueled tankless water heater is provided for plumbing fixtures in dwelling units and/or common areas (must be within 20-pipe feet length of fixtures).</p> <p><i>Tankless water heaters conserve water and energy.</i></p>	2	Plan Review & Insp.												
<p>7.3 Install energy-efficient water heating equipment in all dwelling units and/or common areas meeting one of the following energy factor (EF) ratings:</p> <p><u>Gas Water Heaters</u></p> <table border="0" style="width: 100%;"> <tr> <td style="width: 30%;">EF \geq 0.62</td> <td>Conventional High Efficiency Unit - 2 pts.</td> </tr> <tr> <td>EF \geq 0.8</td> <td>Instantaneous/Tankless - 2 pts.</td> </tr> </table> <p><u>Electric Water Heaters</u></p> <table border="0" style="width: 100%;"> <tr> <td style="width: 30%;">EF \geq 0.92</td> <td>Conventional High Efficiency Unit - 2 pts.</td> </tr> <tr> <td>EF \geq 0.99</td> <td>Instantaneous/Tankless - 2 pts.</td> </tr> <tr> <td>EF \geq 2.0</td> <td>Heat Pump Water Heater - 4 pts.</td> </tr> </table> <p><u>Solar Water Heaters</u></p> <table border="0" style="width: 100%;"> <tr> <td style="width: 30%;"> \geq 60% of Annual Load </td> <td>With back-up heater - 6 pts.</td> </tr> </table> <p><i>Electric heat pump water heaters use surplus heat from A/C condenser coil to heat water at little to no extra cost. Solar water heating is the most economical way to heat water using the sun's free energy.</i></p>	EF \geq 0.62	Conventional High Efficiency Unit - 2 pts.	EF \geq 0.8	Instantaneous/Tankless - 2 pts.	EF \geq 0.92	Conventional High Efficiency Unit - 2 pts.	EF \geq 0.99	Instantaneous/Tankless - 2 pts.	EF \geq 2.0	Heat Pump Water Heater - 4 pts.	\geq 60% of Annual Load	With back-up heater - 6 pts.		Insp.
EF \geq 0.62	Conventional High Efficiency Unit - 2 pts.													
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\geq 60% of Annual Load	With back-up heater - 6 pts.													
<p>7.4 Building roof is configured to accommodate future solar hot water panels with plumbing rough-in (hot water line stub-out at roof). The cumulative roof area must be a minimum of 500 sq. ft. and have a south sloping exposure (unless flat roof with or without parapet).</p> <p><i>A pre-planned south roof area provides for the easy installation of future solar panels (photovoltaic). If installed, a solar heating system will significantly reduce the energy consumption and thus, the costs of heating water.</i></p>	2	Insp.												

<p>7.5 An insulated hot water recirculation loop is provided to supply hot water to each dwelling unit. All branch lines from recirculation loop to fixtures shall not exceed 15 foot.</p> <p><i>Conventional residential building practice ignores the waste of water while waiting for hot water to get to the point of use. The problem is compounded by the tendency in new homes to spread the bathrooms and kitchen over a wide area, often locating them in different wings. Waiting times are 10 to 30 times longer than they were 30 years ago and hot water distribution systems are generally less efficient. Demand controlled hot water circulation systems can result in a 20-30% reduction in water use and enhance the energy performance of water heaters.</i></p>	2	Insp.
<p>7.6 Central manifold (home-run) water distribution system is provided. The trunk line from the water heater to the central manifold shall be a maximum of 10 feet. Branch lines from the manifold to each fixture shall be a maximum of ½” in diameter.</p> <p><i>Manifold distribution systems use hot and cold distribution lines to supply each side of each fixture with its own dedicated line. This minimizes water temperature and pressure changes during simultaneous operation of numerous fixtures. Additional benefits of a properly designed and installed system include: faster hot water delivery, water and energy savings, and few fittings located behind the wall.</i></p>	2	Insp.
<p>7.7 All toilets are high efficiency (1.3 or less gal/flush) and/or dual flush operated (average flush of 1.2 gal or less).</p> <p><i>Toilets are the highest users of water in the home, accounting for more than 30% of residential indoor water consumption. High efficiency/dual flush toilets can conserve an average family of four up to 6,000 gallons a year without sacrificing flushing performance.</i></p>	3	Insp.
<p>7.8 All bathroom faucets and showerheads are high efficiency (2.0 or less GPM).</p> <p><i>Water savings can be achieved with high efficiency bathroom faucets. Water savings from high efficiency kitchen faucets is less likely because these faucets are often used for filling. High efficiency showerheads will reduce hot water demand and energy use for water heating by up to 20 percent.</i></p>	3	Self-Certify
<p>7.9 A <u>Point of Use</u> water treatment system is installed that meets applicable NSF/ANSI Standards (#42, #53, #55) with a treated water recovery rate equal to at least 70% of water intake.</p> <p style="text-align: center;"><u>OR</u></p> <p>A <u>Point of Entry</u> water treatment system is installed that meets applicable NSF/ANSI Standards (#42, #53, #55) with a treated water recovery rate equal to at least 70% of water intake.</p> <p><i>Point of use water treatment system will provide healthier drinking water by removing organic chemicals, treating for esthetics (smell, taste, scaling) and removing lead, radon or nitrates if needed, while adding nothing (e.g., salt) to their discharge.</i></p>	2	Self-Certify
	3	Self-Certify

7.10 A two-pipe drain system is installed in each dwelling unit and/or common area(s) for future graywater recovery system. <u>Additional Points</u> for installing a complete graywater system with or without filtration/storage tank for landscape irrigation and/or toilet flushing in accordance with local codes and regulations. <i>Graywater systems use wastewater from washing machine, showers, tubs, and sinks (excluding kitchen sink and dishwasher) to irrigate landscaping. 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 trees and 15 large shrubs; making it a high water conservation device.</i>	3 5	Insp.
Sub-total of points selected:		
8. Roofing		
8.1 A minimum of 25% of roof area uses recycled or recycled content roof material (e.g. metal, rubber, or salvaged roof tiles). <u>1 point for each additional 25% of roof area</u> <i>Recycled content roof material reduces the use of new resources, and waste in landfills.</i>	2 1-3	Plan Review & Self-Certify
8.2 Roof has a high durability/low maintenance material such as concrete, slate, clay, metal, or fiber-cement. <u>Additional Points</u> if roofing material is recyclable or reuseable. <i>A high durability/low maintenance roof system saves homeowners money in replacement costs, and reduces waste in landfills as a result of replacing the roof less often. Recyclable roofing material saves energy resources and reduces waste in landfills when replacement is necessary.</i>	1 2	Plan Review & Insp.
8.3 Roofing materials have a solar reflectance index (SRI) of 78 or more for a low-sloped roof ($\leq 2:12$) or a SRI of 29 or more for a steep sloped roof ($> 2:12$) for a minimum of 75% of roof surface. <i>Reflective/light colored roof surfaces lower roof surface temperature by up to 100° F, thereby decreasing the amount of heat transferred into a building's interior. This type of roof surface saves money and energy by reducing the amount of air conditioning needed to keep a building comfortable.</i>	3	Plan Review
8.4 Roof material weighs less than 350 lbs/100 sq. ft. <i>Reducing roof mass decreases material, costs, and heat gain which keeps the house cooler.</i>	2	Plan Review
8.5 Dwelling units and/or common areas are provided with a vegetated roof/terrace system. <u>4 points for each 25% of roof/terrace area</u> <i>Often called green- or eco-roof, a vegetated roof consists of earth, soil mix and vegetation. In our desert climate, the earth material provides for insulation and the drought-resistant vegetation provides for a shade and an evaporative cooling effect. Rain is absorbed by the soil and vegetation, reducing and detaining storm water runoff.</i>	4-16	Plan Review & Insp.
8.6 Roof covering has min. 35-year manufacturer's warranty or otherwise uses bitumen underlayment or equivalent material (e.g., 90 lb. underlayment) under concrete, clay, or slate roofing materials. <i>A 35- year roof system saves homeowners money in replacement costs, and reduces waste in landfills as a result of replacing the roof less often.</i>	2	Self-Certify

8.7 For vented attic design, the roof cavity is vented with continuous ridge vent and vented eaves. <i>Continuous ridge vents allow for maximum convective heat air flow to removed heat from the attic.</i>	2	Plan Review & Insp.
Sub-total of points selected:		
9. Exterior Finishes		
9.1 Exterior finishes are derived from regional sources within 500 miles of jobsite. This includes stone or cultured stone veneers that are regionally quarried or processed. <i>Locally produced materials reduce costs and pollution associated with transportation from production facilities to jobsites, and may use locally recycled materials in processing. Stone is a strong, durable material, and when quarried locally, saves on the transportation cost to the jobsite.</i>	1	Self-Certify
9.2 Building has reconstituted or recycled-content siding (minimum 50% pre-or post-consumer). <i>Reconstituted and recycled-content siding materials offer superior longevity over wood siding and don't crack like stucco. The increased density of the materials resists curling, cracking and other deterioration. The minimal maintenance and replacement decreases costs and conserves natural resources and space in landfills. Often these materials offer long warranties and have zero flame spread. Fiber cement siding is often made with recycled content from sawmill waste and cement. It is strong, durable and fireproof.</i>	1	Self-Certify
9.3 Stucco is applied directly to masonry or similar wall systems, without using lath. <i>The elimination of the metal lath reduces the use of unnecessary resources. This is only appropriate for masonry or other cementitious block wall systems.</i>	1	Insp.
9.4 Stucco or siding material is integrally colored. <i>Because the color is integral to the product, this system provides low maintenance, fade resistant, and durable finish.</i>	1	Plan Review & Self-Certify
9.5 Exterior structural materials (e.g. CMU, stabilized adobe, rammed earth, steel) are left exposed and in their natural state without a veneer or finish. <i>The use of structurally sound, weather-resistant materials in their natural state reduces materials cost and maintenance.</i>	2	Insp.
9.6 Fascia, soffit and trim elements are made of recycled-content materials (including metal) or engineered wood products such as finger jointed trim, fiberboard, laminated strand lumber or OSB. <i>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. 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 is used, reducing waste.</i>	1	Self-Certify
Sub-total of points selected:		
10. Interior Finishes		

10.1 Wallboard and/or plasters are made with min. 25% recycled content, such as wheat board with agricultural by-products or gypsum board with industrial by-product gypsum or flue-gas waste product. <i>Recycled content drywall contains recycled gypsum or “synthetic” gypsum, a waste byproduct of flue gas scrubbers, and reduces the demand of virgin gypsum mined from the ocean floor. Other products, such as wheat board, are constructed from agricultural waste.</i>	2	Self-Certify
10.2 All adhesives used for installation of materials (e.g. drywall, paneling, carpet, wood flooring, ceramic or VCT tile, cove base) contain a maximum VOC (volatile organic compound) content of 100 grams/liter. <i>Low toxic interior finish products such as solvent-free adhesives, mastics, and sealants reduce out-gassing of VOCs and other toxic substances, which, in turn, improves indoor air quality.</i>	2	Self-Certify
10.3 Interior paints, coatings and primers contain zero VOC’s or meet Green Seal Standard GS-11 limits of 150 grams/liter for non-flat paints and 50 grams/liter for flat paints past pigment addition. <i>Interior paints and finishes with no VOCs will reduce their negative effect on indoor air quality.</i>	2	Self-Certify
10.4 Interior paints contain no acetone, formaldehyde or ethylene glycol. <i>Ethylene Glycol (EG) is a solvent used in many latex paints and has been listed as a hazardous substance and toxic air contaminant under many federal and state regulations.</i>	2	Self-Certify
10.5 Interior paints and finishes contain a minimum of 20% recycled content. <i>Paints or finishes made from recycled content reduce the hazardous waste in landfills.</i>	2	Self-Certify
Sub-total of points selected:		
11. Interior Doors, Cabinetry, and Trim		
11.1 All solid wood doors are domestic hardwoods or certified by the Forest Stewardship Council (FSC). <i>The use of wood from sustainable managed forests protects regional biodiversity, soil erosion and water quality, and also saves old growth forests by using trees from second-generation forests and tree farms. A sustainable-managed forest prohibits clear cutting practices and plants a new tree for every one used in production.</i>	2	Self-Certify
11.2 All solid wood doors are certified by the Sustainable Forest Initiative (SFI). <i>The use of wood from sustainable managed forests protects regional biodiversity, soil erosion and water quality, and also saves old growth forests by using trees from second-generation forests and tree farms. A sustainable-managed forest prohibits clear cutting practices and plants a new tree for every one used in production.</i>	1	Self-Certify
11.3 Doors are non-composite or made with low-toxic binders containing no added urea-formaldehyde resin. <i>Toxic binders, such as urea-formaldehyde and phenol-formaldehyde off gas chemicals such as VOCs and dramatically reduce indoor air quality. Other composite materials serve the same function without creating toxic health risks.</i>	2	Self-Certify
11.4 Casework for cabinets, counters and other built-in furniture is made from low-toxic binders containing no added urea-formaldehyde resins. <i>Cabinets made from formaldehyde free particleboard or MDF eliminate the Volatile Organic Compounds [VOC] that outgas into the home, resulting in healthier indoor air quality.</i>	2	Self-Certify

11.5 All exposed substrate materials containing formaldehyde, such as the inside of cabinets and the underside and edge of counters, are sealed with a water-based formaldehyde blocking finish. <i>Water based formaldehyde blocking finishes ameliorate indoor air quality by blocking the out-gassing of VOCs and other toxic chemicals.</i>	2	Self-Certify
11.6 Casework is domestic hardwood from a <u>FSC</u> (Forest Stewardship Council) certified sustainable source and/or is a rapidly renewable material (a material that re-generates itself within a ten year period). <i>A certifiable sustainable-managed forest does not use clear cutting practices, and plants new trees for every one used in production.</i>	2	Self-Certify
11.7 Casework is from a <u>SFI</u> (Sustainable Forest Initiative) certified sustainable source. <i>A certifiable sustainable-managed forest does not use clear cutting practices, and plants new trees for every one used in production.</i>	1	Self-Certify
11.8 All interior trim is finger-jointed/engineered wood, domestic hardwood, from an FSC- or SFI- certified sustainable source, is a rapidly renewable material or contains min. 20% recycled content. <i>Finger jointed or engineered wood trim comes from small pieces glued together from second generation forests and tree farms, saving old growth forests.</i>	1	Self-Certify
11.9 Cabinets are pre-finished off-site <u>OR</u> finished on-site with a product that contains a maximum VOC content of 350 grams/liter. <i>Pre-finished cabinets or on-site application of least toxic finish will lower the amount of VOCs released into the home, keeping down the amount of indoor air pollutants.</i>	1	Self-Certify
11.10 Countertops are manufactured from min. 20% recycled content material. <i>Recycled content counter tops conserve new resources and reduce waste in landfills.</i>	1	Self-Certify
11.11 Countertops are made from concrete or regionally quarried or processed stone or tile from within 500 miles of job site. <i>Use of local/regional materials reduces costs and pollution related to transportation from other areas.</i>	1	Self-Certify
11.12 No tropical woods are used. <i>Tropical hardwoods are harvested from endangered rainforests.</i>	1	Self-Certify
11.13 No wood base, cove, crown molding, door or window trim is used, unless it is recycled or salvaged material. <u>1 pt. per category</u> (max. 3 pts.) <i>Wood is a valuable natural resource and is often exploited in the construction industry by inefficient practices. The elimination of wood trim reduces the excessive and unnecessary use of wood.</i>		Self-Certify
Sub-total of points selected:		
12. Flooring <u>Note:</u> In order to receive points in this category, the total area of the selected finish floor material must be at least 25% of total conditioned floor area unless otherwise noted.		

12.1 Carpeting and padding certified under the Carpet and Rug Institute's Green Label Plus program. And/or resilient flooring certified under the Resilient Floor Covering Institute's FloorScore program or the Greenguard Environmental Institute's certification program. <i>Low-emitting materials improve the quality of indoor air by reducing contaminants that are odorous, irritating and/or harmful to the comfort and well-being of installers and occupants.</i>	2	Self-Certify
12.2 Minimum 20% recycled content (e.g., carpet, pad, tile, sound deadening substrate) or salvaged (e.g., reclaimed wood) flooring. <i>Recycled content and salvaged flooring saves material and conserves natural resources.</i>	1	Self-Certify
12.3 Flooring is made from a rapidly renewable material (bamboo, linoleum, cork, wool or other materials that are regenerated within a 10-year cycle). <i>Bamboo flooring is a good use of natural resources because it is fast growing, durable and flexible. Natural linoleum is made from natural and abundant materials and is extremely durable. Cork flooring comes from stripping the bark off of cork oak, which then regenerates itself. Cork tiles are moisture, rot and mold resistant, providing a floor that can last over 30 years.</i>	1	Self-Certify
12.4 Flooring is from a <u>FSC</u> (Forest Stewardship Council) certified sustainable source. <i>The use of wood from sustainable managed forests protects regional biodiversity, soil erosion and water quality, and also saves old growth forests by using trees from second-generation forests and tree farms. A sustainable-managed forest prohibits clear cutting practices and plants a new tree for every one used in production.</i>	2	Self-Certify
12.5 Flooring is from a <u>SFI</u> (Sustainable Forest Initiative) certified sustainable source. <i>The use of wood from sustainable managed forests protects regional biodiversity, soil erosion and water quality, and also saves old growth forests by using trees from second-generation forests and tree farms. A sustainable-managed forest prohibits clear cutting practices and plants a new tree for every one used in production.</i>	1	Self-Certify
12.6 Stone or tile flooring is quarried, processed and/or made within 500 miles of site. <i>Stone is a strong, durable material, and when quarried locally, saves on the transportation cost to the jobsite. Flagstone is an example of a local stone material.</i>	1	Self-Certify
12.7 Sealed concrete used as finish floor surface. <i>Concrete used as a finished floor surface is durable and eliminates the use of additional flooring materials, such as carpet, which can have negative impacts on indoor air quality.</i>	1	Insp.
12.8 Carpeting is used on less than 25% of conditioned floor area. <u>Additional Point</u> for no carpeting used at all. <i>Hard flooring can drastically improve indoor air quality by eliminating the out-gassing that occurs from many synthetic carpets and reducing the growth of molds, dust mites and the entrapment of other contaminants. Hard flooring is easier to maintain and is a cost-effective alternative to carpeted surfaces.</i>	2 1	Self-Certify
Sub-total of points selected:		
13. Solid Waste		

13.1 Provide separate recycling bins during construction for recycling materials including cardboard, wood, drywall, foam, metal, concrete, masonry, tile, and/or asphalt. <u>2 pts. for each item</u> recycled by builder or waste hauler <i>Establishing a construction waste reduction/reuse plan reduces the amount of waste ending up in landfills. Construction debris is 50% of the total volume of landfill waste. See Scottsdale's Construction Waste Recycling Resource List.</i>		Insp. & Self-Certify
13.2 Excess construction materials are donated to a non-profit building organization. <i>Donating excess materials to non-profit building organizations keeps materials out of landfill and provides a tax deduction incentive.</i>	2	Self-Certify
13.3 Project has an allocated area for residents to deposit recyclables with provisions for collection/pick-up. <u>Additional points</u> for centralized recycled chutes in multi-level building <i>Allocating a convenient location for recycling depositories encourages resident recycling.</i>	3 2	Plan Review
Sub-total of points selected:		
14. Innovative Design This section recognizes projects using innovative and emerging technologies, practices, and products that fulfill the intentions of the program, but are not addressed in the checklist. Projects can earn up to <u>8 additional points</u> by submitting a written justification to green building plan review staff for review and determination of awarded points.		
14.1		Plan Review
14.2		Plan Review
14.3		Plan Review
14.4		Plan Review
Sub-total of points selected:		
TOTAL POINTS FOR ALL CATEGORIES		
HOUSE SIZE POINT ADJUSTMENT (+/- Points from Mandatory Section)		
TOTAL POINTS (AS SUBMITTED):		
TOTAL POINTS (AS APPROVED):		