

## RESIDENTIAL CALGREEN MEASURES

*Please select the Elective Measures below that will be incorporated into your project.  
The Mandatory Measures are required by CALGreen.*

MEASURES	Mandatory	Elective
<b>PLANNING AND DESIGN</b>		
<b>Site Selection</b>		
<b>A4.103.1</b> A site which complies with at least one of the following characteristics is selected: <ol style="list-style-type: none"> <li>1. An infill site is selected.</li> <li>2. A greyfield site is selected.</li> <li>3. An EPA recognized Brownfield site is selected.</li> </ol>		
<b>Site Preservation</b>		
<b>A4.104.1</b> An individual with oversight responsibility for the project has participated in an educational program promoting environmentally friendly design or development and has provided training or instruction to appropriate entities.		
<b>Deconstruction and Reuse of Existing Materials</b>		
<b>A4.105.2</b> Existing buildings are disassembled for reuse or recycling of building materials. The proposed structure utilizes at least one of the following materials which can be easily reused: <ol style="list-style-type: none"> <li>1. Light fixtures</li> <li>2. Plumbing fixtures</li> <li>3. Doors and trims</li> <li>4. Masonry</li> <li>5. Electrical devices</li> <li>6. Appliances</li> <li>7. Foundations or portions of foundations</li> </ol>		
<b>Site Development</b>		
<b>4.106.2</b> A plan is developed and implemented to manage storm water drainage during construction.	<b>X</b>	
<b>4.106.3</b> Construction plans shall indicate how site grading or a drainage system will manage all surface water flows to keep water from entering buildings.	<b>X</b>	
<b>A4.106.1</b> Orient buildings to optimize the use of solar energy with the long side of the house oriented within 30° of south.		
<b>A4.106.2.2</b> Soil disturbance and erosion are minimized by at least one of the following: <ol style="list-style-type: none"> <li>1. Natural drainage patterns are evaluated and erosion controls are implemented to minimize erosion during construction and after occupancy.</li> <li>2. Site access is accomplished by minimizing the amount of cut and fill needed to install access roads and driveways.</li> <li>3. Underground construction activities are coordinated to utilize the same trench minimize the amount of time the disturbed soil is exposed and the solid is replaced using accepted compaction methods.</li> </ol>		
<b>A4.106.2.3</b> Topsoil shall be protected or saved for reuse as specified in this section. <p style="margin-left: 40px;">Tier 1. Displaced topsoil shall be stockpiled for reuse in a</p>		

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designated area and covered or protected from erosion. Tier 2. The construction area shall be identified and delineated by fencing or flagging to limit construction activity to the construction area.		
<b>A4.106.3</b> Postconstruction landscape designs accomplish one or more of the following: 1. Areas disrupted during construction are restored to be consistent with native vegetation species and patterns. 2. Limit turf areas to greatest extent possible. a. Not more than 50 percent for Tier 1. b. Not more than 25 percent for Tier 2. 3. Utilize at least 75 percent native California or drought tolerant plant and tree species appropriate for the climate zone region. 4. Hydrozoning irrigation techniques are incorporated into the landscape design.		
<b>A4.106.4</b> Permeable paving is utilized for the parking, walking or patio surfaces in compliance with the following: Tier 1. Not less than 20 percent of the total parking, walking or patio surfaces shall be permeable. Tier 2. Not less than 30 percent of the total parking, walking or patio surfaces shall be permeable.		
<b>A4.106.5</b> Roofing materials shall have a minimum 3-year aged solar reflectance and thermal emittance or a minimum Solar Reflectance Index (SRI) equal to or greater than the value specified in Tables A4.106.5 (1) and A4.106.5 (2). Tier1 roof covering shall meet or exceed the values contained in Table A4.106.5 (1). Tier 2 roof covering shall meet or exceed the values contained in Table A4.106.5 (2).		
<b>A4.106.6 Electric vehicle charging.</b> Provide capability for dedicated electrical vehicle supply equipment in single-family and multifamily structures.		
<b>Energy Efficiency</b>		
<b>4.201.1</b> Low-rise residential buildings shall meet or exceed the minimum standard design required by the California Energy Standards.	<b>X</b>	
<b>Performance Approach</b>		
<b>A4.203.1</b> Exceed the <i>California Energy Code</i> requirements, based on the 2008 Energy Efficiency Standards requirements by 15 percent.		
<b>A4.203.1</b> Exceed the <i>California Energy Code</i> requirements, based on the 2008 Energy Efficiency Standards requirements by 30 percent.		
<b>Building Envelope</b>		
<b>A4.205.1</b> Radiant roof barrier is installed in Climate Zones 2, 4 and 8 through 15.		
<b>A4.205.2</b> Exterior shading at least 18 inches in depth is provided on south and west windows.		
<b>Air Sealing Package</b>		
<b>A4.206.1</b> Third party blower door test is conducted and passed to verify building envelope tightness.		

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<b>HVAC Design, Equipment and Installation</b>		
<b>A4.207.1</b> Radiant, hydronic, ground source and other innovative space heating and cooling systems included in the proposed design shall be designed using generally accepted industry-approved guidelines and design criteria.		
<b>A4.207.2</b> An HVAC system commissioning plan is developed and the following items, as appropriate, pertaining to the heating and cooling systems are inspected and certified by an independent third party agency: <ol style="list-style-type: none"> <li>1. Verify compliance with the manufacturer's recommended start-up procedures.</li> <li>2. Verify refrigerant charge by super-heat other methods specified by the manufacturer.</li> <li>3. Burner is set to fire at the nameplate input rating.</li> <li>4. Temperature drop across the evaporator is within the manufacturer's recommended range.</li> <li>5. Test and verify air flow to be within 10 percent of the initial design air flow.</li> <li>6. Static pressure within the duct system is within the manufacturer's acceptable range.</li> <li>7. Verify that the whole house and exhaust ventilation systems meet Title 24 requirements.</li> <li>8. Verify that the recommended maintenance procedures and schedules are documented and provided to the home owner.</li> </ol>		
<b>A4.207.2.3</b> Results of the commissioning inspection shall be included in the Operation and Maintenance Manual required in Section 4.410.1.		
<b>A4.207.4</b> Install gas-fired (natural or propane) space heating equipment with an Annual Fuel Utilization Ratio (AFUE) of .90 or higher.		
<b>A4.207.5</b> If an electric heat pump must be used, select equipment with a Heating Seasonal Performance Factor (HSPF) of 8.0 or higher.		
<b>A4.207.6</b> When climatic conditions necessitate the installation of cooling equipment with a Seasonal Energy Efficiency Ratio (SEER) higher than 13.0 and an Energy Efficiency Ratio (EER) of at least 11.5.		
<b>A4.207.7</b> Install ductwork to comply with at least one of the following: <ol style="list-style-type: none"> <li>1. Install ducts within the conditioned envelope of the building.</li> <li>2. Install ducts in an underfloor crawl space.</li> <li>3. Use ducts with an R-6 insulation value or higher.</li> <li>4. Install ductwork which is buried in the ceiling insulation.</li> </ol>		
<b>A4.207.8</b> Perform duct leakage testing to verify a total leakage rate of less than 6 percent of the total fan flow.		
<b>A4.207.9</b> In cooling Climate Zones 2, 4 and 8 through 15 install a whole-house fan with insulated louvers or an insulated cover.		
<b>A4.207.10</b> ENERGY STAR ceiling fans are installed in all bedrooms and living areas.		
<b>Water Heating Design, Equipment and Installation</b>		
<b>A4.208.1</b> The Energy Factor (EF) for a gas-fired storage water heater is higher than .60.		
<b>A4.208.2</b> The Energy Factor (EF) for a gas-fired tankless water heater		

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is .80 or higher.		
<b>A4.208.3</b> Where the hot water source is more than 10 feet from a fixture, the potable water distribution system shall convey hot water using a method designed to minimize wait time for hot water to arrive at the fixture.		
<b>Lighting</b>		
<b>A4.209.1</b> Building lighting consists of at least 90 percent ENERGY STAR qualified hard-wired fixtures.		
<b>Appliances</b>		
<b>A4.210.1</b> Each appliance provided by the builder meets ENERGY STAR if an ENERGY STAR designation is applicable for that appliance.		
<p><b>A4.211.1</b> Install a solar photovoltaic (PV) system in compliance with the California Energy Commission New Solar Homes Partnership (NSHP).<sup>1,2,3</sup> Install energy efficiency measures meeting either Tier I or Tier II below.</p> <p style="padding-left: 40px;">Tier 1. Exceed the 2010 <i>California Energy Code</i> requirements by 15 percent.</p> <p style="padding-left: 40px;">Tier 2. Exceed the 2010 <i>California Energy Code</i> requirements by 30 percent.</p> <p>Solar water heating may be used to assist in meeting the energy efficiency requirements of either Tier 1 or Tier II.</p> <p>1. In addition, for either Tier I or II, each appliance provided by the builder must be ENERGY STAR if an ENERGY STAR designation is applicable for that appliance.</p> <p>2. Tier II requires a 30 percent reduction in the building's space cooling (air conditioning) energy compared to the 2010 <i>California Energy Code</i>.</p> <p>3. Information on NSHP incentives available through the California Energy Commission may be obtained at the "Go Solar California" website.</p>		
<b>A4.211.2</b> A solar water heating system is installed.		
<b>A4.211.3</b> Space on the roof surface and penetrations through the roof surface are provided for future solar installation.		
<b>A4.211.4</b> A minimum one-inch conduit is provided from the electrical service equipment for the future installation of a photovoltaic (PV) system.		
<b>WATER EFFICIENCY AND CONSERVATION</b>		
<b>Indoor Water Use</b>		
<b>4.303.1</b> Indoor water use shall be reduced by at least 20 percent using one of the following methods.	<b>X</b>	
<p style="padding-left: 40px;">1. Water saving fixtures or flow restrictors shall be used.</p> <p style="padding-left: 40px;">2. A 20 percent reduction in baseline water use shall be demonstrated.</p>		
<b>4.303.2</b> When using the calculation method specified in Section 4.303.1, multiple showerheads controlled by a single valve shall not exceed maximum flow rates.	<b>X</b>	
<b>4.303.3</b> Plumbing fixtures (water closets and urinals) and fittings		

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(faucets and showerheads) shall comply with specified performance requirements.	<b>X</b>	
<b>A4.303.1</b> Kitchen faucets and dishwashers shall comply with this section. Tier 1. The maximum flow rate at a kitchen sink faucet shall not be greater than 1.5 gallons per minute at 60 psi. Tier 2. In addition to the kitchen faucet requirements for Tier 1, dishwasher in Tier 2 buildings shall be ENERGY STAR qualified and not use more than 5.8 gallons of water per cycle.		
<b>A4.303.2 Nonwater supplied urinals or waterless toilets are installed.</b>		
<b>Outdoor Water Use</b>		
<b>4.304.1</b> Automatic irrigation systems controllers installed at the time of final inspection shall be weathered or soil moisture-based.	<b>X</b>	
<b>A4.304.1</b> Install a low-water consumption irrigation system which minimizes the use of spray type of heads.		
<b>A4.304.2</b> A rainwater capture, storage and re-use system is designed and installed.		
<b>A4.304.3</b> A water budget shall be developed for landscape irrigation.		
<b>A4.304.4</b> Provide water efficient landscape irrigation design that reduces the use of potable water. Tier 1. Does not exceed 65 percent of ETo times the landscape area. Tier 2. Does not exceed 60 percent of ETo times the landscape area.		
<b>A4.305.5</b> A landscape design is installed which does not utilize potable water.		
<b>WATER REUSE SYSTEMS</b>		
<b>A4.305.1</b> Piping is installed to permit future use of a graywater irrigation system served by the clothes washer or other fixtures.		
<b>A4.305.2</b> Recycled water piping is installed.		
<b>A4.305.3</b> Recycled water is used for landscape irrigation.		
<b>MATERIAL CONSERVATION AND RESOURCE EFFICIENCY</b>		
<b>A4.403.1</b> A Frost-Protected Shallow Foundation (FPSF) is designed and constructed.		
<b>A4.403.2</b> Cement use in foundation mix design is reduced. Tier 1. Not less than a 20 percent reduction in cement use. Tier 2. Not less than a 25 percent reduction in cement use.		
<b>Efficient Framing Techniques</b>		
<b>A4.404.1</b> Beams and headers and trimmers are the minimum size to adequately support the load.		
<b>A4.404.2</b> Building dimensions and layouts are designed to minimize waste.		
<b>A4.404.3</b> Use premanufactured building systems to eliminate solid sawn lumber whenever possible.		
<b>A4.404.4</b> Material list are included in the plans which specify material quantity and provide direction for on-site cuts.		
<b>Material Sources</b>		
<b>A4.405.1</b> One or more of the following building materials, that do not require additional resources for finishing are used:		

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<ol style="list-style-type: none"> <li>1. Exterior trim not requiring paint or stain</li> <li>2. Windows not requiring paint or stain</li> <li>3. Siding or exterior wall coverings which do not require paint or stain</li> </ol>		
<b>A4.405.2</b> Floors that do not require additional coverings are used including but not limited to stained, natural or stamped concrete floors.		
<b>A4.405.3</b> Postconsumer or preconsumer recycled content value (RCV) materials are used on the project. Tier 1. Not less than a 10 percent recycled content value. Tier 2. Not less than a 15 percent recycled content value.		
<b>A4.405.4</b> Renewable source building products are used.		
<b>Enhanced Durability and Reduced Maintenance</b>		
<b>4.406.1</b> Annular spaces around pipes, electric cables, conduits or other openings in plates at exterior walls shall be protected against the passage of rodents by closing such openings with cement mortar, concrete masonry or similar method acceptable to the enforcing agency.	X	
<b>Water Resistance and Moisture Management</b>		
<b>A4.407.1</b> Install foundation and landscape drains.		
<b>A4.407.2</b> Install gutter and downspout systems to route water at least 5 feet away from the foundation or connect to landscape drains which discharge to a dry well, sump, bioswale, rainwater capture system or other approved on-site location.		
<b>A4.407.3</b> Provide flashing details on the building plans and comply with accepted industry standards or manufacturer's instructions.		
<b>A4.407.4</b> Protect building materials delivered to the construction site from rain and other sources of moisture.		
<b>A4.407.5</b> In Climate Zone 16 an ice/water barrier is installed at roof valleys, eaves and wall to roof intersections.		
<b>A4.407.6</b> Exterior doors to the dwelling are protected to prevent water intrusion.		
<b>A4.407.7</b> A permanent overhang or awning at least 2 feet in depth is provided.		
<b>Construction Waste Reduction, Disposal and Recycling</b>		
<b>4.408.1</b> Recycle and/or salvage for reuse a minimum of 50 percent of the nonhazardous construction and demolition waste in accordance with one of the following: <ol style="list-style-type: none"> <li>1. Comply with a more stringent local construction and demolition waste management ordinance; or</li> <li>2. A construction waste management plan per Section 4.408.2; or</li> <li>3. A waste management company per Section 4.408.3; or</li> <li>4. The waste stream reduction alternative per Section 4.408.4.</li> </ol>	X	
<b>A4.408.1</b> Construction waste generated at the site is diverted to recycle or salvage in compliance with one of the following: <ol style="list-style-type: none"> <li>1. Tier 1 at least a 65 percent reduction</li> <li>2. Tier 2 at least a 75 percent reduction</li> </ol> <b>Exception:</b> Equivalent waste reduction methods are developed by working with local agencies.	X	

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<b>Building Maintenance and Operation</b>		
<b>4.410.1</b> An operation and maintenance manual shall be provided to the building occupant or owner.	<b>X</b>	
<b>ENVIRONMENTAL QUALITY</b>		
<b>4.503.1</b> Any installed gas fireplace shall be a direct-vent sealed-combustion type. Any installed woodstove or pellet stove shall comply with US EPA Phase II emission limits where applicable. Woodstoves, pellet stoves and fireplaces shall also comply with applicable local ordinances.	<b>X</b>	
<b>Pollutant Control</b>		
<b>4.504.1</b> Duct openings and other related air distribution component openings shall be covered during construction.	<b>X</b>	
<b>4.504.2.1</b> Adhesives, sealants and caulks shall be compliant with VOC and other toxic compound limits.	<b>X</b>	
<b>4.504.2.2</b> Paints, stains and other coatings shall be compliant with VOC limits.	<b>X</b>	
<b>4.504.2.3</b> Aerosol paints and coatings shall be compliant with product weighted MIR limits for ROC and other toxic compounds.	<b>X</b>	
<b>4.504.2.4</b> Documentation shall be provided to verify that compliant VOC limit finish materials have been used.	<b>X</b>	
<b>4.504.3</b> Carpet and carpet systems shall be compliant with VOC limits.	<b>X</b>	
<b>4.504.4</b> 50 percent of floor area receiving resilient flooring shall comply with the VOC-emission limits defined in the Collaborative for High Performance Schools (CHPS) High Performance Products Database or be certified under the Resilient Floor Covering Institute (RFCI) FloorScore program; or meet California Dept. of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers", Version 1.1, February 2010 (also known as Specification 01350.)	<b>X</b>	
<b>4.504.5</b> Particleboard, medium density fiberboard (MDF) and hardwood plywood used in interior finish systems shall comply with low formaldehyde emission standards.	<b>X</b>	
<b>A4.504.1</b> Meet the formaldehyde limits contained in Table 4.504.5 before the mandatory compliance date, or use composite wood products made with either California Air Resources Board approved no-added formaldehyde (NAF) resins or ultra-low emitting formaldehyde (ULEF) resins.		
<b>A4.504.2</b> Install VOC compliant resilient flooring systems. Tier 1. At least 80 percent of the resilient flooring installed shall comply. Tier2. At least 90 percent of the resilient flooring installed shall comply.		
<b>A4.504.3</b> Thermal insulation installed in the building shall meet the following requirements: Tier 1. Install thermal insulation in compliance with the VOC –emission limits defined in Collaborative for High Performance Schools (CHPS) Low-emitting Materials List. Tier 2. Install insulation which contains No-Added Formaldehyde (NAF) and is in compliance with the VOC-emission limits defined in Collaborative for High		
Performance Schools (CHPS) Low-emitting Materials List.		

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<b>Interior Moisture Control</b>		
<b>4.505.2</b> Vapor retarder and capillary break is installed at slab on grade foundations.	<b>X</b>	
<b>4.505.3</b> Moisture content of building materials used in wall and floor framing is checked before enclosure.	<b>X</b>	
<b>Indoor Air Quality and Exhaust</b>		
<b>4.506.1</b> Exhaust fans which terminate outside the building are provided in every bathroom.	<b>X</b>	
<b>A4.506.1</b> Higher than MERV 6 filters are installed on central air or ventilation systems.		
<b>A4.506.2</b> Direct vent appliances are used or isolated from the conditioned space.		
<b>Environmental Comfort</b>		
<b>4.507.1</b> Whole house exhaust fans shall have insulated louvers or covers which close when the fan is off. Covers or louvers shall have a minimum insulation value of R-4.2.	<b>X</b>	
<b>4.507.2</b> Duct systems are sized, designed and equipment is selected using the following methods: <ol style="list-style-type: none"> <li>1. Establish heat loss and heat gain values according to ANSI/ACCA 2 Manual J-2004 or equivalent.</li> <li>2. Size duct systems according to ANSI/ACCA 1 Manual D-2009 or equivalent.</li> <li>3. Select heating and cooling equipment according to ANSI/ACCA 3 Manual S-2004 or equivalent.</li> </ol>	<b>X</b>	
<b>Outdoor Air Quality Reserved</b>		
<b>Installer and Special Inspector Qualifications</b>		
<b>702.1</b> HVAC system installers are trained and certified in the proper installation of HVAC systems.	<b>X</b>	
<b>702.2</b> Special inspectors employed by the enforcing agency must be qualified and able to demonstrate competence in the discipline they are inspecting.	<b>X</b>	
<b>Verifications</b>		
<b>703.1</b> Verification of compliance with this code may include construction documents, plans, specifications builder or installer certification, inspection reports or other methods acceptable to the enforcing agency which show substantial conformance.	<b>X</b>	