

# **New Mexico Mortgage Finance Authority Green Building Criteria 2011**

## **PREFACE**

The New Mexico Mortgage Finance Authority (MFA) Green Building Criteria were originally created in 2005 for the purpose of providing a scoring option for the federal Low Income Housing Tax Credit Program that would be regionally appropriate for New Mexico's climate and for both urban and rural developments. Since their initial inclusion in the LIHTC Project Selection Criterion entitled, "Projects that benefit communities and the environment through more efficient use of resources, smarter planning and sustainable development," MFA's Green Building Criteria have been revised and will be utilized more broadly in other MFA Housing Development finance programs. The intent of these standards is to provide a flexible, dynamic document, which may require case-by-case interpretation and can be amended annually to reflect new ideas, trends and opportunities as the green building market expands and evolves.

There are six (6) categories included in MFA's Green Building Criteria:

- Site Selection and Design (SSD)
- Water Conservation (WC)
- Energy Efficiency (EE)
- Indoor Environmental Quality (IEQ)
- Materials Beneficial to the Environment (MBE)
- Operations and Maintenance (O&M)

To receive the minimum 5 points under MFA's Green Building Criteria, projects must meet all mandatory items. For additional points, up to 15, projects may choose from optional items. Five mandatory items for projects involving new construction include: xeric landscaping plan (1-a); erosion and sedimentation control plan (1-b); waste management plan (5-a); operations and maintenance plan for owners (6-a); and operations and maintenance plan for residents (6-b). Projects involving acquisition and substantial rehabilitation are excused from item 1-b (ESC plan) but must meet all other mandatory items to receive the minimum 5 points.

All committed items must be included in preliminary plans and specifications, in addition to any further documentation that may be required for MFA and its contracted partners to complete its review. The documentation provided may not entirely suffice if inconsistent with plans and specifications.

## MFA Green Building Criteria Checklist 2011

	<b>MFA Green Building Criteria</b>	<b>Scoring</b>	<b>Check if Committed</b>	<b>Check if additional Documentation is Provided</b>	<b>For MFA's Use</b>
<b>1</b>	<b>Site Selection &amp; Design (SSD)</b>				
<b>1-a*</b>	Native, xeric landscaping	Mandatory			
<b>1-b*</b>	Erosion & sedimentation control (ESC) plan	Mandatory (NC only)			
<b>1-c</b>	Site close and connected to goods/ services	1 point			
<b>1-d</b>	Pedestrian friendly development	1 point			
<b>1-e</b>	Community garden	1 point			
<b>1-f</b>	Preserved existing vegetation	1 point			
<b>1-g</b>	Porous, paved surfaces	1 point			
<b>1-h</b>	Shaded paved surfaces	1 point			
<b>1-i</b>	75% passive solar design	3 points			
<b>1-j</b>	100% passive solar design	1 point			
<b>2</b>	<b>Water Conservation (WC)</b>				
<b>2-a</b>	Greywater collection	1 point			
<b>2-b</b>	Rainwater collection	1 point			
<b>3</b>	<b>Energy Efficiency (EE)</b>				
<b>3-a</b>	High performance HVAC system	1 point			
<b>3-b</b>	Energy performance windows and doors	1 point			
<b>3-c</b>	Design for future active solar power	1 point			
<b>3-d</b>	Install solar powered devices	1 point			
<b>3-e</b>	Solar water heaters	1 point			
<b>3-f</b>	Sealed building envelope	1 point			
<b>3-g</b>	High insulation levels – walls, roof & foundation	1 point			
<b>4</b>	<b>Indoor Environmental Quality (IEQ)</b>				
<b>4-a</b>	Hard surfaced flooring	1 point			
<b>4-b</b>	Low VOC materials	1 point			
<b>4-c</b>	Composite wood free of urea-formaldehyde	1 point			
<b>4-d</b>	Non-Smoking Establishment	1 point (NC only)			
<b>5</b>	<b>Materials Beneficial to the Environment (MBE)</b>				

	<b>MFA Green Building Criteria</b>	<b>Scoring</b>	<b>Check if Committed</b>	<b>Check if additional Documentation is Provided</b>	<b>For MFA's Use</b>
<b>5-a*</b>	Construction waste management plan (WMP)	<b>Mandatory</b>			
<b>5-b</b>	Recycled-content Material	1 point			
<b>5-c</b>	Certified, salvaged or engineered wood	1 point			
<b>5-d</b>	Local or regional materials	1 point			
<b>6</b>	<b>Operations &amp; Maintenance (O&amp;M)</b>				
<b>6-a*</b>	Owner Operations and Maintenance (O&M) Plan	<b>Mandatory</b>			
<b>6-b*</b>	Resident Operations and Maintenance (O&M) Plan	<b>Mandatory</b>			

\* Mandatory Criteria

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## **1. Site Selection and Design (SSD)**

### **\*1-a. Native, xeric landscaping**

Standard: Provide a landscaping plan using drought-tolerant species, native plants, and minimal lawn cover.

Intent: Conserve water and reduce the need for fertilizers and pesticides. Lawn cover is only allowed in designated “play areas.”

Documentation: Landscaping plan that shows planting materials to be used and their location to be planted. O&M Plan shall require minimal use of toxic pesticides and fertilizers.

### **\*1-b. Erosion and Sedimentation Control (ESC) plan**

Standard: Create and implement an erosion and sedimentation control (ESC) plan. This is mandatory for new construction only.

Intent: Minimize the loss of topsoil and infiltration of sedimentation into the storm water system during construction. The efficient disposal of materials reduces the environmental impact of building.

Documentation: Provide certification from the developer that an ESC will be completed prior to the start of construction. A copy of the plan will be required at carryover.

### **1-c. Close proximity and connectivity to goods & services**

Standard: Locate development site within ½ mile of areas with a high concentration of commercial activity and reasonable walking distance of community services, such as retail, grocery, healthcare, permanent public transit stops.

Intent: Develop in pedestrian friendly locations that promote healthy life styles and alternate modes of transportation and utilize existing infrastructure.

Documentation: Provide a map that shows goods and services in close proximity to the project. The map shall indicate ¼ mile and ½ mile radii and shall demonstrate connectivity between the project and these goods and services listed above by indicating the alternative transit pathways (bicycle, pedestrian, public transit) between the project and the goods and services.

### **1-d. Secure bike storage, ADA-compliant pathways, & pedestrian links to outside environment**

Standard: Provide secure bicycle storage, in addition to the bulk storage requirement of the MFA Design Guidelines, for at least 25% of all units. Storage should be covered, located in a well lighted area, visible from as many residential units as possible for the proposed building configuration. Ensure that all pathways are compliant with the Americans with Disabilities Act (ADA), and provide a direct pedestrian link from the development to the outside environment.

Intent: Develop infrastructure to ensure pedestrian and cycling options for transportation and recreation.

Documentation: Evidence in Site Plan. Indicate what percentage of units have bicycle storage available.

**1-e. Community Garden**

Standard: Plan a community garden on-site.

Intent: Promote community development and self-sustainment.

Documentation: Provide evidence in landscaping and/or site plans.

**1-f. Preservation of existing trees and vegetation**

Standard: Preserve existing trees and vegetation, except within 30 feet of buildings, driveways, solar access, areas cleared for food production or as required for grading & drainage.

Intent: Preserve mature trees and natural vegetation when possible.

Documentation: Provide pre-development and post-development plans highlighting trees and vegetation to be saved and/or relocated on-site.

**1-g. Porous, paved surfaces**

Standard: Use porous, pavement for at least 15% of all footpaths, patios, parking areas and other paved common areas.

Intent: Reduce the effect of heat islands within the site and assist in storm water infiltration and erosion control. Porous surfaces are well suited to use for footpaths, patios, and other common areas. For example, materials may include permeable concrete/pavement, brick, stone, gravel, or other manufactured products.

Documentation: Product list identifying porous paving product. Evidence on site plan indicating percentage of surfaces to be paved with porous materials (calculated using square footage of porous paved surfaces

divided by total square footage of paved surfaces) and locations where porous paving materials will be used.

#### **1-h. Shaded paved surfaces**

Standard: Shade at least 25% of all hardscape-paved surfaces with vegetation. Areas shaded by carports adjacent to the building will qualify. Shaded carports away from the building will not qualify.

Intent: Reduce the effect of heat islands within the site.

Documentation: Scaled Site Plan with North arrow, and landscaping plan with plant list specifying type of trees to be planted, their locations and total percentage of hardscapes shaded by vegetation.

#### **1-i Passive Solar Design in at least 75% of units<sup>1</sup>**

Standard: Provide at least 75% of all units with passive solar design components specified here.

Intent: A building's orientation and the materials and design of a building's wall systems can determine how effectively solar energy can be employed for energy savings. It is therefore important to choose design elements that utilize solar energy in the most efficient way, in order to maximize solar heating potential in the heating season and minimize solar gains in the cooling season. Such passive solar design elements include the following:

- proper orientation to maximize solar access and cross ventilation;
- optimal window sizing and placement to utilize solar energy for heating and lighting;
- proper shading by means of natural vegetation or calculated roof overhangs or awnings;
- sufficient thermal mass in floors, interior walls and bancos to maximize heat absorption and storing;
- adequate insulation in the walls, roof, and foundation of a building to resist heat loss in the cooler months and heat gain in the warmer months.

According to the New Mexico Solar Energy Association ([www.nmsea.org](http://www.nmsea.org)), a well-designed passive solar home in New Mexico can save about 80% in energy costs compared to an average home that is not designed according to passive solar principles.

Requirements: Utilize the following passive solar design components:

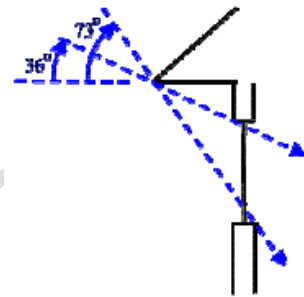
- South-facing windows should be oriented no more than 25 degrees east or 15 degrees west of true south (accounting for declination).

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<sup>1</sup> Projects satisfying Optional Criterion 1-i will receive 3 points.

Orientation within 5 degrees of south is ideal, and orientation within 15 degrees of south is nearly as effective.

- In order to avoid obstructing solar gain, no structures, including fences, should be located within 10 feet, no one-story structures within 17 feet, and no two-story structures within 40 feet of the south wall. Additionally, no significant obstructions should be placed within 25 degrees above south-facing windows (from the bottom of the feature) or within 45 degrees horizontal from the east and west edges of the south-facing window features.
- Provide “extra” thermal mass, exceeding the minimum thickness for mass wall allowance provided in the New Mexico Energy Conservation Code, in floors and/or interior walls that are directly lit by south-facing windows. Thermal mass should be in the form of brick, concrete slab or masonry, tile, or adobe – light-colored on walls and dark-colored on floors. Associated south-facing windows should be at least 7% and no more than 12% of the floor area of the solar heated room. -OR- If no “extra” thermal mass is added, south-facing windows should be larger than 3% and no more than 7% of the floor area of the solar heated room. South-facing windows should account for a total of no more than 20% of the total floor area of the building.
- Provide calculated overhangs for south facing windows, such that the dimensions of the overhang accommodate sun angles of 36 degrees and 73 degrees, as shown to the right.
- Minimize the number and size of north-, east- and west-facing windows, especially those facing southwest (>30 degrees west of south). West windows should be no larger than 2% of the floor area of the room, unless shading is used to prevent overheating. North and East windows should be no larger than 4% of the floor area of the respective rooms. The total of north-, east- and west-facing windows should not exceed 12% of the total heated floor area of the building.
- Provide shading for east- and west- facing windows to prevent summer solar gains. Shading can take the form of trees or other landscaping elements, calculated roof overhangs, or other shading devices, such as awnings, blinds, shutters, or vertical louvers.
- Certified, energy-efficient, thermal pane windows that meet or exceed those required by the New Mexico Energy Conservation Code should be used throughout the building.
- Insulation levels in the roofs, floors, and walls should exceed those required by the New Mexico Energy Conservation Code (<http://www.emnrd.state.nm.us/ecmd/Codes/buildingcodes.htm>).



Documentation: Minimally provide the following documentation:

- Scaled Site Plan with North arrow. For typical units, show various solar orientations with more than one north arrow, as necessary. Indicate proposed solar orientation, window sizing and placement, wall systems (showing materials, massing, and insulation), and shading.
- Landscaping plan with plant list specifying type of tree(s) to be planted, specifying their locations.
- Scaled Building Elevations that evidence the actual size of overhangs.
- Floor Plans of entire unit mix, indicating percentage floor area of south-facing windows and north-, east- and west-facing windows (N+E+W).
- Worksheets provided in the New Mexico Energy Conservation Code for passive solar heating, mass wall allowance, and insulation R-values.

**1-j. Passive Solar Design in 100% of units.**

Standard: Provide 100% of all units with the passive design components specified in 1-i above.

Documentation: Minimally provide the following documentation:

- Scaled Site Plan with North arrow. For typical units, show various solar orientations with more than one north arrow, as necessary. Indicate proposed solar orientation, window sizing and placement, wall systems (showing materials, massing, and insulation), and shading.
- Landscaping plan with plant list specifying type of tree(s) to be planted, specifying their location.
- Scaled Building Elevations that evidence the actual size of overhangs.
- Floor Plans of entire unit mix, indicating percentage floor area of south-facing windows and north-, east- and west-facing windows (N+E+W).
- Worksheets provided in the New Mexico Energy Conservation Code for passive solar heating, mass wall allowance, and insulation R-values.

**2. Water Conservation (WC)**

**2-a. Greywater harvesting**

Standard: Create and implement a greywater recycling system with on-site retention for non-potable water reuse either inside or outside the building.

Intent: Reduce utility costs and conserve water by reducing potable water use.



Documentation: Site plan evidencing greywater collection system, and product list.

## **2-b. Rainwater harvesting**

Standard: Create and implement a rainwater collection system with on-site retention for non-potable water irrigation.

Intent: Reduce utility costs and conserve water by reducing potable water use on outdoor plantings.

Documentation: Landscaping and/or site plan evidencing rainwater collection system, and product list.

## **3. Energy Efficiency (EE)**

### **3-a. HVAC systems**

Standard: Install Energy Star® rated heating and cooling systems. Evaporative cooling systems may be used if they meet the following minimum standards: media saturation effectiveness of 85% or higher, water consumption must not exceed 5 gallons (18.9 L) water per ton-hour of cooling, airflow rating must meet the minimum Industry Standard Rating (ISR) airflow of 2,500 CFM (cubic feet per minute), and the cooler must have a remote dedicated thermostat.

Intent: Conserve energy, reduce utility costs, and enhance comfort.

Documentation: Plans and specification must indicate Energy Star® HVAC systems. If evaporative cooling will be used, plans and specification must contain the above minimum requirements.

### **3-b. Energy-efficient, high performance windows and doors**

Standard: Install windows, skylights, and exterior doors that meet or exceed the 2009 New Mexico Energy Efficiency Building Code (<http://www.rld.state.nm.us/CID/GenBureau/PDFs/ProposedRules/051010/14%207%206%20NMAC%20-%202009%20New%20Mexico%20Energy%20Conservation%20Code%205-10-10.pdf>) and ENERGY STAR's minimum National Fenestration Rating Council (NFRC) ratings for U-Factor and Solar Heat Gain Coefficient (SHGC) for the particular geographic region.<sup>2</sup> New Mexico's counties fall into three of the eight Climate Zones specified by the

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<sup>2</sup> "Residential Windows, Doors, and Skylights Key Product Criteria," ENERGY STAR website, URL: [http://energystar.gov/index.cfm?c=windows\\_doors.pr\\_crit\\_windows](http://energystar.gov/index.cfm?c=windows_doors.pr_crit_windows).

International Energy Conservation Code, on which these standards are based (See 2006 IECC Climate Zone table below).<sup>3</sup>

2006 IECC Climate Zone	New Mexico Counties
CZ3 (South/Central)	Chaves, Dona Ana, Eddy, Hidalgo, Lea, Luna, Otero
CZ4 (North/Central)	Bernalillo, Curry, De Baca, Grant, Guadalupe, Lincoln, Quay, Roosevelt, Sierra, Socorro, Union, Valencia
CZ5 (Northern)	Catron, Cibola, Colfax, Harding, Los Alamos, Mckinley, Mora, Rio Arriba, San Juan, San Miguel, Sandoval, Santa Fe, Taos, Torrance

Intent: Conserve energy, reduce utility costs, and enhance comfort.

Documentation: Provide a scaled site plan with north arrow, indicating location of all windows, exterior doors and skylights, and provide product list identifying compliance with required standards.

### 3-c. Solar-ready design

Standard: Provide building accommodations, including orientation, design, wiring, and unobstructed roof area (200 sf minimum) to allow the installation of active solar energy in the future. Alternatively, photovoltaics may be located on other suitable structures on the property, e.g. parking shade structures.

Intent: Make active use of renewable energies to reduce both utility costs and environmental impacts of energy production.

Documentation: Provide scaled site plan with North arrow, indicating building orientation and detailing both the design elements that would accommodate future active solar use and the products to be used. Provide certification from the structural engineer that future roof-mounted systems are feasible given the load factor of the roof. For non-roof mounted system, provide proof of existing infrastructure on the site plan.

### 3-d. Solar power

Standard: Utilize active solar energy by installing solar powered devices, receive points for both 3d and 3e.

<sup>3</sup> More information on the International Energy Conservation Code Climate Zones can be found at URL: <http://resourcecenter.pnl.gov/cocoon/morf/ResourceCenter/article/1420>.

Intent: Make active use of renewable energies to reduce both utility costs and environmental impacts of energy production.

Documentation: Provide cut sheets highlighting products to be used and scaled site plan indicating building orientation and location(s) where solar devices will be installed.

**3-e. Solar hot water heating**

Standard: Install solar water heating system for common hot water needs.

Intent: Make active use of renewable energies to reduce both utility costs and environmental impacts of energy production.

Documentation: Evidence installation on plans and specifications. Provide product information in specifications.

**3-f. Sealed building envelope**

Standard: Follow ASHRE 62.2 2010 standards for Ventilation and Indoor Air Quality to properly seal the building envelope to reduce air infiltration and leakage. For example, tighten the seals around windows and doors, seal all plumbing and electrical conduit openings, caulk around windows and under headers and sills, seal openings into attics or crawlspaces with taped polyethylene covered with insulation, and other measures.

Intent: Ensure that building envelopes are adequately sealed to reduce air infiltration and leakage.

Documentation: Provide installation instructions evidencing such measures and reference in specifications. Provide documentation that the building meets the ASHRE 62.2 2010.

**3-g. High levels of insulation in walls, roof and foundation**

Standard: Install high levels of insulation in the exterior walls, ceilings/attic/roof, and floors/slab foundation, raising the R-value of the building envelope and helping to minimize heat flow, in the form of heat loss in the winter and heat gain in the summer. Minimum R-value for insulation used will vary depending upon the region of New Mexico (See 2006 IECC Climate Zone table above for regional zone designation).

Element	Specifications
2.3a Ceiling/Attic/ Roof Insulation	<ul style="list-style-type: none"> <li>• CZ3: <math>\geq 30</math> R-value<sup>4</sup></li> <li>• CZ4: <math>\geq 38</math> R-value</li> <li>• CZ5: <math>\geq 38</math> R-value</li> </ul>
2.3b Wood Frame Wall Insulation	<ul style="list-style-type: none"> <li>• CZ3: <math>\geq 13</math> R-value</li> <li>• CZ4: <math>\geq 13</math> R-value</li> <li>• CZ5: <math>\geq 19</math> R-value</li> </ul>
2.3c Slab Foundation Insulation (at 2 feet depth)	<ul style="list-style-type: none"> <li>• CZ3: <math>\geq 0</math></li> <li>• CZ4: <math>\geq 10</math> R-value</li> <li>• CZ5: <math>\geq 10</math> R-value</li> </ul>

Intent: Proper insulation will not only increase comfort in the home but also reduce heating and cooling costs year-round.

Documentation: Provide scaled cross-sections indicating insulation systems used and R-values.

## 4. Indoor Environmental Quality (IEQ)

### 4-a. Hard-surfaced, resilient flooring

Standard: Install *only* low/no-VOC (volatile organic compounds) hard-surfaced, resilient flooring in order to avoid the collection of dust and other allergens that occur in carpet.

Intent: Provide living spaces that enhance resident health and comfort by reducing or eliminating toxic materials and increasing air quality.

Documentation: Provide product list specifying product to be installed. Highlight in specifications.

### 4-b. Low-VOC materials

Standard: Use certified Low-VOC materials such as paints, primers, sealants, and adhesives. Green Seal is an excellent resource.

Intent: Provide living spaces that enhance resident health and comfort by reducing or eliminating toxic materials and increasing air quality.

Documentation: Provide product list and description of materials and location of where the materials are to be used. Include VOC levels.

### 4-c. Composite wood free of urea-formaldehyde

<sup>4</sup> R-values are for insulation only, not whole wall, and are derived from ENERGY STAR Builder Option Package standards for climate zones ([http://www.energystar.gov/index.cfm?c=bop.pt\\_bop\\_newmexico](http://www.energystar.gov/index.cfm?c=bop.pt_bop_newmexico)).

Standard: Use composite wood only if free of urea formaldehyde. Particleboard and medium density fiberboard (MDF) shall be certified compliant with ANSI A208.1 and A208.2, respectively.

Intent: Provide living spaces that enhance resident health and comfort by reducing or eliminating toxic materials and increasing air quality.

Documentation: Documentation that the ANSI standards will be met. Evidence that this requirement is part of the specifications for sub-contractor submittals.

#### **4-d. Non-smoking establishment**

Standard: Provide a NON-Smoking establishment, designate an outdoor smoking area at least twenty feet away from all entryways and communal outdoor spaces.

Intent: Provide living spaces that enhance resident health and comfort by reducing or eliminating toxic materials and increasing air quality.

Documentation: Provide an example of a non-smoking policy tenant agreement that will be part of the lease-up process. Also, show where the designated smoking areas will be located on the site plan. This category is not applicable for rehabilitation projects.

### **5. Materials that Benefit the Environment (MBE)**

#### **\*5-a. Construction waste management plan (WMP)**

Standard: Develop and implement a construction waste management plan (WMP), evidence that the contractor is obligated to follow the plan and will communicate to all persons working on the job site.

Intent: Reduce construction waste material going to landfills.

Documentation: Provide Certification that a WMP will be created and implemented. A copy of the plan will be required at carryover.

#### **5-b. Recycled-content materials**

Standard: Ensure that at least 50% of all construction materials have recycled content.

Intent: Use resources efficiently, and reduce the impact of producing new materials.

Documentation: Provide product information in specifications, and provide calculations evidencing the percentage of recycled content materials of

overall construction materials by weight. Calculations must be made as follows:<sup>5</sup>

- To find the value of recycled content for a given product, multiply the recycled content percentage by weight (post-consumer or post-industrial) by the value of the product.
- Add up the values of recycled content, excluding rebar, for all materials and furnishings.
- Divide this sum by the total value of the materials for the project.

### **5-c. Certified, salvaged or engineered wood**

Standard: Use at least 25% wood products (measured in dollar value) that are certified according to the Forest Stewardship Council (FSC), salvaged from other buildings, or engineered framing materials.

Intent: Use resources efficiently and responsibly.

Documentation: Provide the following calculation: divide the sum of the dollar value of all certified, salvaged or engineered wood products by the dollar value of all wood products. Evidence of products used in specifications.

### **5-d. Local or regional materials**

Standard: Use at least 20% of building materials (measured in dollar value) that are manufactured, extracted, or harvested within a 300-mile radius of the project site.

Intent: Reduce embodied energy of materials by reducing transportation costs.

Documentation: Evidence in product specifications of local or regional materials. Documentation from product manufacturer stating where the product is manufactured, harvested or extracted. Provide the following calculation: divide the sum of the dollar value of all local or regional materials by the dollar value of all construction materials.

## **6. Operations and Maintenance (O&M)**

### **\*6-a. Operations and maintenance plan for use by building-owner**

Standard: Create a building Operations and Maintenance Plan (O&M) for use by owner.

Intent: Ensure proper maintenance of the building.

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<sup>5</sup> This calculation is based on the method used in the Enterprise Green Communities Criteria (v.3.0).

Documentation: Provide certification from the developer that an O&M Plan will be completed prior to building occupancy. A copy of the plan will be required at final allocation.

**\*6-b. Operations and maintenance plan for use by residents**

Standard: Create an Operations and Maintenance (O&M) Plan for use by residents. Provide orientation of residents upon move-in.

Intent: Explain the intent, benefits, use and maintenance of green building features, and encourage additional green activities such as recycling, gardening and use of healthy cleaning materials.

Documentation: Provide certification from the developer that an O&M Plan will be completed prior to building occupancy. A copy of the plan will be required at final allocation. Also, provide certification from the developer that resident orientation will occur upon each new resident upon move-in.

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