

# Supplemental Verification Guide for the CALGreen Tiers

*Recommended Compliance and  
Verification Procedures for the  
California Green Building Standards  
Code Voluntary Tiers*



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## About this Guide

This Guide was developed by Green Building in Alameda County, a program of StopWaste.Org, to assist Alameda County jurisdictions that decide to adopt a CALGreen Tier as a local green building standard. This Guide is not affiliated with or endorsed by the California Building Standards Commission (BSC) or California Housing and Community Development (HCD). StopWaste.Org is the Alameda County Waste Management Authority and Alameda County Source Reduction & Recycling Board acting as one public agency. The Authority's member jurisdictions include the County of Alameda and all 14 cities within the County.

The purpose of this Guide is to provide detailed verification procedures that 1) minimize ambiguity for builders and local government staff, 2) promote waste diversion and recycled content products, and 3) are compatible with market-based 3<sup>rd</sup> party rating systems. This document only addresses the California Green Building Standards Code (CALGreen) voluntary "Tiers," not CALGreen mandatory code requirements. There are several helpful documents and trainings currently available for verifying mandatory code measures. If followed, the verification procedures in this Guide offer a path for documenting compliance to the CALGreen Tiers that is rigorous and will result in predictable energy, water, and resource savings while also benefitting occupants with better indoor air quality.

To develop these guideline recommendations, we took the following steps:

1. Compile all State published verification and compliance materials available for the Tiers;
2. Review trainings and other guidelines available that address the Tiers (BSC/HCD guidelines or affiliates like Green Technology workshops);
3. Cross-reference each Tier measure with similar credits in LEED-New Construction, LEED for Homes, GreenPoint Rated (GPR), Bay-Friendly Landscaping (BFL), etc.;
4. If no official verification procedures were available and no similar measure was found in other rating systems, use best judgment for determining appropriate verification procedures;
5. Produce an integrated verification procedure that starts with HCD/BSC official materials and adds-in LEED/GPR/BFL materials as necessary to create a more complete standard.

## Policy Recommendations

StopWaste.Org adopted the following recommendations for its member jurisdictions to comply with CALGreen mandatory provisions:

1. Train staff so that they will be able to effectively enforce CALGreen mandatory measures. Consider the use of specialty inspectors for selected measures if in-house resources are insufficient for enforcement.
2. If amending an existing Construction & Demolition (C&D) ordinance, utilize the Agency's updated model C&D ordinance. A revised sample ordinance and model findings based on the new CALGreen minimum requirements can be found at [www.stopwaste.org/C&D](http://www.stopwaste.org/C&D).
3. Use the Green Halo Web Based Tool to implement and enforce C&D ordinances.

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4. Use the Bay-Friendly Version of California Water Efficient Landscaping Ordinance (CA-WELO) for adoption. View a comparison between BFL and WELO at [www.bayfriendly.org](http://www.bayfriendly.org).

When adopting green building policies that go beyond CALGreen mandatory provisions, jurisdictions must take several steps to ensure that the code amendment is legally enforceable. Jurisdictions must make findings in support of any amendments (including using a Tier) and file those with the Building Standards Commission. If the proposed policy includes above-code energy performance, cost effectiveness findings must be submitted to and reviewed by the California Energy Commission. There are several resources available to help with adopting green building standards:

- The California Building Standards Commission has guidance on filing CALGreen amendments and findings, [www.bsc.ca.gov/calgreen](http://www.bsc.ca.gov/calgreen).
- StopWaste.Org's website includes green building policy tools like model ordinances, cost effectiveness studies, and sample findings language: [www.stopwaste.org/greenbuilding](http://www.stopwaste.org/greenbuilding).
- Pacific Gas & Electric has completed model cost-effectiveness findings for every climate zone in California and has developed a manual for adopting energy-efficient ordinances. Contact: Pat Eilert, PG&E Codes & Standards, [ple2@pge.com](mailto:ple2@pge.com), (530) 757-5261.
- Build It Green developed a very comprehensive and detailed *Roadmap for Local Governments* that illustrates the pathway towards adopting green building standards. Contact Bruce Mast, Director of Programs, 510/590-3360, [bruce@builditgreen.org](mailto:bruce@builditgreen.org).

Green Building in Alameda County recommends that local governments continue to use LEED, GreenPoint Rated and Bay-Friendly Rated Landscapes as leadership standards for private-sector policies. For jurisdictions considering adopting a Tier, we offer the following suggestions for implementing a rigorous and high-bar green building standard:

1. If the jurisdiction's policy objective is primarily energy efficiency, consider adopting only this portion of the Tier (energy efficiency 15% above code minimum) instead of the full Tier.
2. Use the recommended compliance and verification procedures in this Guide for enforcement.
3. To aid in verification, require all applicants to include the full Title 24, Part 6 energy efficiency compliance forms within the plan set (not loose or stapled to the plans, which can be lost or removed).
4. Make four amendments to the Tier to facilitate best practices in materials management and support third-party verification. These recommended changes will also minimize the compliance burden for projects that voluntarily pursue a third-party label or certification. The four amendments are highlighted in each applicable Verification Procedures sheet, and are summarized in the following diagram.

## Recommended Tier Amendments

### 1. No Self-Certification

Applications must be submitted to and evaluated by staff or an approved outside third party (no self-certifying for an entire project through sign-off documentation).

### 2. 15-day waiting period for deconstruction

On sites where an existing building is to be demolished, applicants shall be required to wait at least 15-days after demolition permit has been issued to allow time for deconstruction and salvage.

### 3. Alternative recycled content measure (for residential Tier 1 or 2)

Allow a prescriptive compliance path for the Recycled Content Materials measure, A4.405.3.1, as outlined in this document.

### 4. Allow a streamlined path for third-party green building rating systems

Projects that undergo official third-party verification through GreenPoint Rated or LEED shall be deemed "functionally equivalent" to the Tier. Accept the official certification/rating as full proof of compliance for Tiers. For Tier 1, basic GreenPoint Rated or LEED "Certified" should be considered equivalent. Projects will still need to document and verify the mandatory portions of CALGreen minimum code.

## Additional Resources

There are a number of documents available to support design and construction teams in documenting their progress towards meeting CALGreen:

- *A Guide to the California Green Building Standards Code (Low-Rise Residential)*, an educational publication by the California Housing & Community Development, Second Edition, May 2011. The Guide provides guidance on intent of the code, compliance ideas, tables for organizing product submittals, and installation certificate forms. [www.hcd.ca.gov](http://www.hcd.ca.gov).
- *A Guide to the (Non-Residential) California Green Building Standards Code*, an educational publication by the California Building Standards Commission, second edition, issued November 2010. The Guide provides guidance on intent of the code, compliance ideas, commissioning documentation samples, tables for organizing product submittals, and installation certificate forms. [www.bsc.ca.gov](http://www.bsc.ca.gov).
- To help streamline mandatory CALGreen Compliance on non-residential LEED commercial new construction projects, StopWaste.Org developed a detailed manual that outlines how LEED documentation can be leveraged for compliance on many mandatory non-residential measures. View the CALGreen Companion Guide for LEED projects at [www.stopwaste.org/calgreen](http://www.stopwaste.org/calgreen).
- *Bay-Friendly Landscape Guidelines & Rating System*, [www.Bay-Friendly.org](http://www.Bay-Friendly.org), has a wealth of information for pre- and post-construction best practices along with supporting materials for Water Efficient Landscape Ordinance implementation.

## How to Use this Guide

This supplemental guide is intended to suggest verification procedures for Tier measures for which verification methodology is not clearly stated in the CALGreen Residential Green Building Code and associated documents. All CALGreen mandatory and voluntary measures are listed by division in order of code section number, starting with residential and followed by non-residential.

These Verification Procedures are organized into an easy reference table format as shown below. Section headers indicate what is required or recommended at Plan Check phase, Building Inspection phase, and if there are additional Documentation recommendations that help with verification. A “key” indicates the location of key referenced materials. The following annotated illustration highlights the features of this document.

<p>Section Number &amp; Title</p>	<p><b>A4.106.5: SITE DEVELOPMENT: COOL ROOF</b></p> <ul style="list-style-type: none"> <li><b>A4.106.5.1 Solar Reflectance.</b> Roofing materials shall have a minimum 3-year aged solar reflectance <math>\geq</math> the values in Table A4.106.5(1) for Tier 1 and A4.106.5(2) for Tier 2.</li> <li><b>A4.106.5.2 Thermal Emittance.</b> Roofing materials shall have a CRRC initial or 3-year aged thermal emittance <math>\geq</math> the values specified in Table A4.106.5(1) for Tier 1 and Table A4.106.5(2) for Tier 2.</li> <li><b>A4.106.5.3 Solar Reflectance Index Alternative.</b> Solar Reflectance Index (SRI) equal to or greater than the values specified in Table A4.106.5(1) for Tier 1 and Table A4.106.5(2) for Tier 2 may be used as an alternative to compliance with the 3-year aged solar reflectance values and thermal emittance.</li> </ul>	<p><b>Tier 1 &amp; Tier 2 Requirement</b></p> <p>Code Page: 57 HCD Guide Page: 135</p>	<p>The Key indicates whether the Tier measure is required or voluntary (elective) and includes reference page numbers to the Code and official Guidelines</p>							
<p>Summary of the CALGreen Requirement</p>										
<p>Verification Procedures for the Plan Check review stage</p>	<table border="1" style="width: 100%; text-align: center;"> <tr> <td colspan="2"><b>A4.106.5 COOL ROOF</b></td> </tr> <tr> <td colspan="2"><b>Enforcement and Verification Procedures &amp; Tips</b></td> </tr> <tr> <td style="width: 50%; vertical-align: top;"> <p><b>Plan Review:</b></p> <p><b>Tier 1 &amp; Tier 2 Requirement:</b></p> <p>Verify that plans and specifications indicate EITHER:</p> <ul style="list-style-type: none"> <li>Roofing materials will have minimum 3-year aged solar reflectance and thermal emittance values as follows:                             <ul style="list-style-type: none"> <li>Tier 1: <math>\geq</math> values in Table A4.106.5(1)</li> <li>Tier 2: <math>\geq</math> values in Table A4.106.5(2)</li> </ul> </li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>Roofing materials have a Solar Reflectance Index values as follows:                             <ul style="list-style-type: none"> <li>Tier 1: <math>\geq</math> values in Table A4.106.5(1)</li> <li>Tier 2: <math>\geq</math> values in Table A4.106.5(2)</li> </ul> </li> </ul> <p>➤ <i>If roofing materials do not comply with these requirements, verify that roof construction specifies thermal mass over the roof membrane with a weight of at least 25 lb/sf (typically clay or tile roofs).</i></p> </td> <td style="width: 50%; vertical-align: top;"> <p><b>Onsite Verification:</b></p> <p><b>Tier 1 &amp; Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>Visually verify that cool roof materials indicated on plans have been installed in the field.</li> </ul> <p>➤ <i>Since cool roof materials can look similar to standard roofing, verify this measure by visually verifying product labels at site visits.</i></p> </td> </tr> </table>			<b>A4.106.5 COOL ROOF</b>		<b>Enforcement and Verification Procedures &amp; Tips</b>		<p><b>Plan Review:</b></p> <p><b>Tier 1 &amp; Tier 2 Requirement:</b></p> <p>Verify that plans and specifications indicate EITHER:</p> <ul style="list-style-type: none"> <li>Roofing materials will have minimum 3-year aged solar reflectance and thermal emittance values as follows:                             <ul style="list-style-type: none"> <li>Tier 1: <math>\geq</math> values in Table A4.106.5(1)</li> <li>Tier 2: <math>\geq</math> values in Table A4.106.5(2)</li> </ul> </li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>Roofing materials have a Solar Reflectance Index values as follows:                             <ul style="list-style-type: none"> <li>Tier 1: <math>\geq</math> values in Table A4.106.5(1)</li> <li>Tier 2: <math>\geq</math> values in Table A4.106.5(2)</li> </ul> </li> </ul> <p>➤ <i>If roofing materials do not comply with these requirements, verify that roof construction specifies thermal mass over the roof membrane with a weight of at least 25 lb/sf (typically clay or tile roofs).</i></p>	<p><b>Onsite Verification:</b></p> <p><b>Tier 1 &amp; Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>Visually verify that cool roof materials indicated on plans have been installed in the field.</li> </ul> <p>➤ <i>Since cool roof materials can look similar to standard roofing, verify this measure by visually verifying product labels at site visits.</i></p>	<p>Verification Procedures for the Onsite Inspection stage</p>
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<p>Bullets indicate recommended verification procedures; carrots (➤) indicate Tips</p>										
<p>Tips are in italics and bulleted with carrots (➤)</p>										
<p>Additional documentation and Tips are included here</p>	<p><b>Documentation:</b></p> <p><b>Tier 1 &amp; Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>Review roofing cut-sheets from general contractor or roofing subcontractor indicating Solar Reflectance Index value for products used.</li> </ul> <p>➤ <i>If SRI information is not available from manufacturer, calculate SRI using the SRI Calculation Worksheet (SRI-WS) which can be obtained through the Energy Standard Hotline at 1-800-772-3300 or by email at <a href="mailto:Title24@energy.state.ca.us">Title24@energy.state.ca.us</a>.</i></p> <p>➤ <i>Include cool roof product cut sheets in Operations and Maintenance Manual.</i></p>									

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# **VOLUME I: LOW-RISE RESIDENTIAL CALGREEN TIERS VERIFICATION PROCEDURES**

## DIVISION A4.1: PLANNING AND DESIGN

### Division A4.1 Requirements:

- **Code Level:** *Meet all code measures.*
- **Tier 1:** *Meet all code measures, all required Tier 1 measures, and at least 2 additional measures in Division A4.1.*
- **Tier 2:** *Meet all code measures, all required Tier 2 measures, and at least 4 additional measures in Division A4.1.*

**A4.103.1: SITE SELECTION: INFILL, GREYFIELD, OR BROWNFIELD SITES**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **56**  
HCD Guide Page: **130**

Select a site which complies with at least one of the following:

1. An infill site is selected.
2. A greyfield site is selected.
3. An EPA-recognized and remediated Brownfield site is selected.

<b>A4.103.1 SITE SELECTION: INFILL, GREYFIELD, OR BROWNFIELD SITES</b> <b>Verification Procedures &amp; Tips</b>	
<b><u>Plan Review:</u></b> No verification required.	<b><u>Onsite Verification:</u></b> No verification required.
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <p><b>Infill Sites:</b></p> <ul style="list-style-type: none"> <li>• Review aerial map of site (from architect) indicating site borders and calculation showing at least 75% of site borders currently developed land for urban uses and remaining 25% borders previously developed land for urban uses (per the Green Building Standards Code definition of “infill site”)</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>• Review permit history (from tax assessor), series of aerial images of site, or other documentation proving that site has not been developed within last 10 years unless by redevelopment agency (per the Green Building Standards Code definition of “infill site”)</li> </ul> <p><b>Greyfield Sites:</b></p> <ul style="list-style-type: none"> <li>• Review aerial map or photography of site (from architect) indicating that at least 50% of site surface area was previously covered with impervious material (per the Green Building Standards Code definition of “greyfield site”)</li> </ul> <p><b>Brownfield Sites:</b></p> <ul style="list-style-type: none"> <li>• Review documentation of ASTM E1903-97 Phase II Environmental Site Assessment or local voluntary cleanup program and indicating site remediation</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• Review documentation defining site as brownfield by local, state or federal government agency and indicating site remediation strategies.</li> </ul>	

**A4.104.1: SITE PRESERVATION: SUPERVISION AND EDUCATION**

*Prior to beginning the construction activities, all parties involved with the development process shall receive a written guideline and instruction specifying the green goals of the project, prepared by individuals with oversight authority on the project who have been trained in green building construction practices.*

<p><b>Tier 1 &amp; Tier 2 Voluntary Elective</b></p> <p>Code Page: <b>56</b></p> <p>HCD Guide Page: <b>131</b></p>
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<p><b>A4.103.1 SUPERVISION AND EDUCATION</b> <b>Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that project’s green goals are explicitly included in project specifications and documentation as per recommendations below.</li> </ul>	<p><b><u>Onsite Verification:</u></b> Not applicable.</p>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify guidelines with project’s environmental goals and instructions to achieve these goals, written by project team individual(s) with authority and green building knowledge                             <ul style="list-style-type: none"> <li>○ Documentation (meeting minutes, email) must indicate that these guidelines were sent to project team before the beginning of construction</li> </ul> </li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>• Verify documentation (meeting minutes) indicating that at least one training session was provided to design team AND construction team concerning proper implementation of project’s green building measures                             <ul style="list-style-type: none"> <li>○ This training could be included in the kick-off meetings for design and construction phases of a project, or could be separate meetings.</li> </ul> </li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>• Verify documentation (meeting dates and minutes) indicating that regular team meetings were held during design to ensure achievement of green goals .</li> </ul> <p>➤ <i>Documentation of team meetings and correspondence will be available from the project developer or architect managing the project.</i></p> <p>➤ <i>The individual(s) with “authority” and “green building knowledge” should have documented experience in similar green building rating systems and should be accredited by those rating systems (LEED-Accredited Professional, GreenPoint Rater/Advisor, etc.).</i></p> <p>➤ <i>Check to see that realistic team meetings were held for design and pre-construction. For example, a typical pre-construction meeting will take two hours and involves the owner, general contractor, and all relevant subcontractors.</i></p> <p>➤ <i>Recommendation: The landscape contractor should have a separate team meeting prior to landscape construction (usually towards the end of regular construction) to verify the specifications, plant selection, soil amendments, irrigation system, and other aspects of the scope of work.</i></p>	

**A4.105: DECONSTRUCTION AND REUSE OF EXISTING MATERIALS**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **56**

HCD Guide Page: **N/A**

*Existing buildings on the site are deconstructed and the salvaged materials are reused. Reused materials or products that have energy-or water-use impacts must comply with current code minimums for performance and other building standards requirements or be an accepted alternate method or material.*

<b>A4.105 DECONSTRUCTION AND REUSE OF EXISTING MATERIALS</b> <b>Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <ul style="list-style-type: none"> <li>• Verify that Construction Waste Management Plan in Specifications includes a list of materials to be reused</li> <li>• Check if any deconstructed materials/fixtures are to be reused on-site. If so, verify the performance of those materials meet all applicable codes for energy/water performance or structural safety.</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <ul style="list-style-type: none"> <li>• Look for stockpiled materials to be salvaged at early inspection visits.</li> <li>• If materials are not stockpiled, ask for documentation of where the deconstructed materials were sent.</li> <li>• If the project is reusing deconstruction materials/fixtures on-site, verify characteristics of the materials/fixtures are within the published limits of the applicable code (energy, plumbing, electrical, etc.) AND that these materials/fixtures are accounted for in the energy/water budget calculations for code compliance and Tier compliance.</li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Review list of reused materials by number, weight or volume, signed by contractor.</li> <li>• Review documentation indicating that all reused materials and products comply with minimum code requirements AND performance characteristics.</li> <li>➤ <i>Policy Recommendation: Where project scopes include the demolition of existing buildings, consider imposing a 15-day waiting period after issuance of demolition permit to allow time for deconstruction of valuable items.</i></li> <li>➤ <i>The HCD Guideline list the following materials which can be easily reused: Lighting and plumbing fixtures, doors and trim, masonry, electrical devices, appliances, foundations or portions of foundations.</i></li> </ul>	

**A4.106.1: SITE DEVELOPMENT: BUILDING ORIENTATION FOR PASSIVE AND ACTIVE SOLAR**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **56**  
HCD Guide Page: **132**

*Orient buildings to optimize the use of solar energy with the long side of the house oriented within 30° of south. This measure addresses two elements of solar energy: active solar (planning for generation on-site), and passive solar cooling/heating (designing for thermal mass and controlling solar heat gain into the building).*

<b>A4.106.1 BUILDING ORIENTATION FOR PASSIVE AND ACTIVE SOLAR Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b> For active solar planning:</p> <ul style="list-style-type: none"> <li>• Verify that plans indicate that long side of building is within 30 degrees of south.</li> <li>• Verify that clear roof area is provided for future solar installation (if not installed at time of construction).</li> </ul> <p>For passive solar:</p> <ul style="list-style-type: none"> <li>• Review the plan for south-wall shading, thermal mass, and solar aperture.</li> <li>➤ <i>To control solar gain, windows should be oriented south with overhangs and thermal mass to store heat during colder months. Consider requiring that 90% of the glazing on the south-facing wall is completely shaded (using shading, overhangs, etc.) at noon on June 21 and unshaded at noon on December 21. This calculation is usually performed by the architect, or might be performed by a mechanical engineer or specialty consultant.</i></li> <li>➤ <i>Passive solar techniques should be provided by the architect. Consider asking for passive solar energy modeling. Several software packages are available to help designers evaluate passive solar options.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b> No verification required.</p>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b> This measure is documented in the plans and/or specifications.</p>	

**A4.106.2.1: SITE DEVELOPMENT: SOIL ANALYSIS**

*Soil analysis is performed by a licensed design professional and the findings utilized in the structural design of the building.*

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **56**  
HCD Guide Page: **132**

<p><b>A4.106.2.1 SOIL ANALYSIS</b> <b>Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <ul style="list-style-type: none"> <li>• Review soil test documentation from builder or engineer.</li> </ul>	<p><b><u>Onsite Verification:</u></b> None.</p>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b> This measure is documented in the plans and/or specifications.</p> <p>➤ <i>Note: The California Building Code, Chapter 18 and California Residential Code Chapter 4 require soil reports at the subdivision level. This requirement may be waived if enforcing agency already has information on local soil conditions. The CRC also provides a table for determining load-bearing capacity based on class of material in lieu of a soil report (HCD Guide p.133)</i></p>	

**A4.106.2.2: SITE DEVELOPMENT: SOIL PROTECTION**

<p><b>Tier 1 &amp; Tier 2 Voluntary Elective</b></p> <p>Code Page: <b>56</b></p> <p>HCD Guide Page: <b>132</b></p>
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The effect of development on building sites is evaluated and the soil is protected by one or more of the following options:

1. Natural drainage patterns are evaluated and erosion controls are implemented to minimize erosion during construction and after occupancy
2. Site access is accomplished by minimizing the amount of cut and fill needed to install access roads and driveways
3. As allowed by other parts of the California Building Standards Code, underground construction activities are coordinated to utilize the same trench, minimize the amount of time the disturbed soil is exposed and the soil is replaced using accepted compaction methods.

<p><b>A4.106.2.2 SOIL PROTECTION Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <p><b>Option 1.</b></p> <ul style="list-style-type: none"> <li>• Review SWPPP or Erosion Control Plan (as applicable) indicating use of best practices to minimize erosion during construction and after occupancy (see 4.106.2 for list of best practices)</li> </ul> <p><b>Option 2.</b></p> <ul style="list-style-type: none"> <li>• Review civil plan indicating location of access roads and driveways compared to alternatives considered. Plan should be accompanied by diagrams/calculations indicating that location of access roads and driveways minimized cut and fill needed.</li> <li>➤ <i>Have the architect/civil engineer indicate where topsoil is to be stored and protected, highlight the natural drainage patterns, soil protection BMPs, and delineate disturbed areas of the site.</i></li> </ul> <p><b>Option 3.</b></p> <ul style="list-style-type: none"> <li>• Verify that erosion control plan indicates:                             <ul style="list-style-type: none"> <li>○ location of trench</li> <li>○ schedule of extraction and use of soil</li> <li>○ methods and location of erosion control measures</li> </ul> </li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• For all Options, visually verify implementation of best practices in cut and fill and implementation of erosion control measures as indicated in the plans.</li> <li>• For Option 3 only, verify the use of same trench for multiple extraction activities during construction.</li> </ul>
<p><b><u>Documentation:</u></b> This measure is documented on the plans and/or specifications.</p>	

**A4.106.2.3: SITE DEVELOPMENT: TOPSOIL PROTECTION**

Topsoil shall be protected or saved for reuse as follows:

- **Tier 1.** Displaced topsoil shall be stockpiled for reuse in a 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 designated area.

<p><b>Tier 1 &amp; Tier 2 Requirement</b></p> <p>Code Page: <b>56</b></p> <p>HCD Guide Page: <b>133</b></p>
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<p><b>A4.106.2.3 TOPSOIL PROTECTION</b>  <b>Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 Requirement:</b></p> <p>Verify that Erosion Control Plan indicates:</p> <ul style="list-style-type: none"> <li>• Evaluation of topsoil before grading to determine whether it is horticulturally valuable</li> <li>• Stipulation that first 6 inches of horticulturally valuable soil be:                             <ul style="list-style-type: none"> <li>○ removed prior to construction, AND</li> <li>○ covered with an appropriate material during construction not piled higher than 6 feet</li> </ul> </li> </ul> <p>➤ <i>Recommend covering stockpiled soil with tarps and a compost straw waddle around the perimeter. Other acceptable strategies are mulch, compost, or chipped wood.</i></p> <p><b>Tier 2 Requirement:</b></p> <p>Meet all Tier 1 requirements AND verify that Erosion Control Plan indicates:</p> <ul style="list-style-type: none"> <li>• Fencing or clearly flagging topsoil stockpile areas</li> <li>• Heavy equipment/vehicle restriction to areas of construction site to be paved</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 Requirement:</b></p> <p>Visually verify the following:</p> <ul style="list-style-type: none"> <li>• soil covered with tarp, straw, mulch, chipped wood, vegetative cover, or other acceptable means</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>• soil piles not higher than 6 feet.</li> </ul> <p><b>Tier 2 Requirement:</b></p> <p>Meet Tier 1 requirements AND visually verify fencing around topsoil stockpiles and vehicle-restricted areas.</p>
<p><b><u>Documentation:</u></b> This measure is documented on the plans and/or specifications.</p>	

**A4.106.3: SITE DEVELOPMENT: LANDSCAPE DESIGN**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **57**

HCD Guide Page: **134**

Post construction landscape designs comply with at least one of these options:

1. Areas disrupted during construction are restored to be consistent with native vegetation species and patterns.
2. Limit turf areas to ≤50 percent of the total landscaped area for Tier 1, and ≤25 percent of the total landscaped area 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>A4.106.3 LANDSCAPE DESIGN Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <p><b>Option 1.</b> Verify that Planting Plan shows areas disrupted during construction will be restored to native vegetation</p> <p><b>Option 2.</b> Verify that Planting Plan shows turf area is:</p> <ul style="list-style-type: none"> <li>• <b>Tier 1:</b> ≤50% of total landscaped area</li> <li>• <b>Tier 2:</b> ≤25% of total landscaped area</li> </ul> <p><b>Option 3.</b> Verify that Planting Plan shows that ≥75% of plant species are native California or drought tolerant</p> <p><b>Option 4.</b> Verify that Irrigation and Planting plans show use of at least two hydrozones.</p> <p>➤ <i>Verify native plants with one of these sources:</i></p> <ul style="list-style-type: none"> <li>○ <i>East Bay MUD’s Plants and Landscapes for Summer Dry Climates</i></li> <li>○ <i>Sunset Magazine’s Western Garden Book</i></li> <li>○ <i>UC Cooperative Extension’s Guide to Estimating Irrigation Water Needs of Landscape Plantings in California</i></li> <li>○ <i>CA Native Plants for the Garden (Bornstein, Fross and O’Brien)</i></li> <li>○ <i>Sierra Nevada Yard and Garden: A homeowner’s guide to landscaping in the Sierra Nevada (Sierra Nevada Alliance)</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• To extent possible, visually verify that option chosen during design phase has been implemented onsite</li> <li>• For Option 4 only: irrigation system tested onsite, demonstrating use of hydrozoning.</li> </ul>
<p><b><u>Documentation:</u></b> This measure is documented on the plans and/or specifications.</p> <p>➤ <i>Consider including list of plants and care instructions in Operations and Maintenance Manual.</i></p>	

**A4.106.4: SITE DEVELOPMENT: WATER PERMEABLE SURFACES**

**Tier 1 & Tier 2 Requirement**

Permeable paving is utilized for a percentage of parking, walking or patio surfaces:

- Tier 1. ≥20 percent of the total parking, walking or patio surfaces
- Tier 2. ≥30 percent of the total parking, walking or patio surfaces

Code Page: 57

HCD Guide Page: N/A

**A4.106.4 WATER PERMEABLE SURFACES  
Verification Procedures & Tips**

**Plan Review:**

**Tier 1 & Tier 2 Requirement:**

Verify that site or landscape plan indicates permeable paving is used for hardscape surfaces (excluding primary driveway, primary entry walkway, entry porch, and required accessible routes for persons with disabilities):

- **Tier 1.** ≥20 percent of hardscape is permeable
- **Tier 2.** ≥30 percent of hardscape is permeable

- *Examples of permeable paving types include:*
  - Gravel or other loose material
  - Pervious concrete or asphalt
  - Spaced paving blocks
  - Tire spurs

- *If a calculation is required to determine the hardscape percent compliance, the landscape architect generally completes this calculation.*

**Onsite Verification:**

**Tier 1 & Tier 2 Requirement:**

Visually verify that permeable hardscape materials indicated in plans have been installed.

- *Permeable hardscape should be installed by an experienced professional, and should include porous above-ground materials and a minimum 6-inch porous subbase layer designed to drain away from the home or building.*

**Documentation:**

**Tier 1 & Tier 2 Requirement:**

- Review manufacturer’s cut sheet from general contractor or landscape subcontractor for permeable hardscape materials.

- Recommendation for Amendment: the code specifically exempts driveways and entryways from these calculations because of accessibility concerns. However, on some sites those exempted areas can make up a significant amount of overall hardscapes. Therefore, consider amending the Tier requirement to have higher percentages of permeable paving (such as 35% and 50% of all non-exempt hardscapes) in order to increase the effectiveness of this measure.

- *Include permeable hardscape cut sheets in Operations and Maintenance Manual.*

**A4.106.5: SITE DEVELOPMENT: COOL ROOF**

<p><b>Tier 1 &amp; Tier 2 Requirement</b></p> <p>Code Page: <b>57</b></p> <p>HCD Guide Page: <b>135</b></p>
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- **A4.106.5.1 Solar Reflectance.** Roofing materials shall have a minimum 3-year aged solar reflectance  $\geq$  the values in Table A4.106.5(1) for Tier 1 and A4.106.5(2) for Tier 2.
- **A4.106.5.2 Thermal Emittance.** Roofing materials shall have a CRRC initial or 3-year aged thermal emittance  $\geq$  the values specified in Table A4.106.5(1) for Tier 1 and Table A4.106.5(2) for Tier 2.
- **A4.106.5.3 Solar Reflectance Index Alternative.** Solar Reflectance Index (SRI) equal to or greater than the values specified in Table A4.106.5(1) for Tier 1 and Table A4.106.5(2) for Tier 2 may be used as an alternative to compliance with the 3-year aged solar reflectance values and thermal emittance.

<p><b>A4.106.5 COOL ROOF</b>  <b>Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Requirement:</b></p> <p>Verify that plans and specifications indicate EITHER:</p> <ul style="list-style-type: none"> <li>• Roofing materials will have minimum 3-year aged solar reflectance and thermal emittance values as follows:                             <ul style="list-style-type: none"> <li>○ <b>Tier 1:</b> <math>\geq</math> values in Table A4.106.5(1)</li> <li>○ <b>Tier 2:</b> <math>\geq</math> values in Table A4.106.5(2)</li> </ul> </li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• Roofing materials have a Solar Reflectance Index values as follows:                             <ul style="list-style-type: none"> <li>○ <b>Tier 1:</b> <math>\geq</math> values in Table A4.106.5(1)</li> <li>○ <b>Tier 2:</b> <math>\geq</math> values in Table A4.106.5(2)</li> </ul> </li> </ul> <p>➤ <i>If roofing materials do not comply with these requirements, verify that roof construction specifies thermal mass over the roof membrane with a weight of at least 25 lb/sf (typically clay or tile roofs).</i></p>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>• Visually verify that cool roof materials indicated on plans have been installed in the field.</li> </ul> <p>➤ <i>Since cool roof materials can look similar to standard roofing, verify this measure by visually verifying product labels at site visits.</i></p>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>• Review roofing cut-sheets from general contractor or roofing subcontractor indicating Solar Reflectance Index value for products used.</li> </ul> <p>➤ <i>If SRI information is not available from manufacturer, calculate SRI using the SRI Calculation Worksheet (SRI-WS) which can be obtained through the Energy Standard Hotline at 1-800-772-3300 or by email at <a href="mailto:Title24@energy.state.ca.us">Title24@energy.state.ca.us</a>.</i></p> <p>➤ <i>Include cool roof product cut sheets in Operations and Maintenance Manual.</i></p>	

## DIVISION A4.2: ENERGY EFFICIENCY

- **Code Level:** *Meet all code measures*
- **Tier 1:** *Meet all code measures, all required Tier 1 measures, and at least 4 additional measures in Division A4.2*
- **Tier 2:** *Meet all code measures, all required Tier 1 measures, and at least 6 additional measures in Division A4.2*

**A4.201, A4.203: GENERAL: PERFORMANCE APPROACH**

**Code, Tier 1 & Tier 2 Requirement**

Code Page: 59

HCD Guide Page: 138

Using an Alternative Calculation Method (ACM) approved by the California Energy Commission, calculate each building’s energy and CO2 emissions, and compare it to the standard or “budget” building to achieve the following:

**Tier 1.** Exceed the 2008 California Energy Code requirements by 15 percent.

**Tier 2.** Exceed the 2008 California Energy Code requirements by 30 percent.

**A4.201, A4.203 ENERGY EFFICIENCY – PERFORMANCE APPROACH  
Verification Procedures & Tips**

**Plan Review:**

**Tier 1 & Tier 2 Requirement:**

- If not included in the Title 24, Part 6 performance energy report, request the following forms for use in verification: CF-1R, CF-6R-ENV-01, CF-6R-MECH-01, and CF-6R-MECH-20-HERS).
- Review Title 24, Part 6 Report Form CF-1R to determine percentage by which project has exceeded basecase energy use (in TDV).
- Verify that the following aspects of the energy report have been completed correctly:
  - Proposed window types match those in specifications (CF-6R-ENV-01)
  - Proposed insulation types and R-values match plans and specifications (CF-6R-ENV-01)
  - Proposed heating, cooling (CF-6R-MECH-04) and water heating systems (CF-6R-MECH-01) match specifications and mechanical schedule
  - If HERS duct testing credit is taken on Title 24, Part 6 Report (Form F-6R-MECH-20-HERS), verify that a ducted system has been specified, and that specifications indicate that HERS duct-testing will be conducted.
- It is critical that the Title 24, Part 6 Energy Report be complete and accurate by the end of the DD Phase. Otherwise, the project team may be forced to change major project components late in the design phase in order to meet the energy requirements.

**Onsite Verification:**

**Tier 1 & Tier 2 Requirement:**

- Verify that HERS Rater has conducted field verification to reach the desired level of efficiency following the requirements specified in the Title 24, Part 6 Reference Appendices.
- Review HERS results information from the online HERS registry cross check for accuracy and compliance against measures employed on project in the field.
- Note: Verification of energy efficiency measures generally requires multiple site visits, pre- and post-drywall.

**Documentation:**

- For Title 24 measures that cannot be verified in the field, review cut-sheets, calculations and other documentation from general contractor and mechanical subcontractor proving that measures specified in Title 24 report have been implemented in the field.
- Include energy-consuming and energy-saving product cut sheets in Operations and Maintenance Manual.
- Amendment Recommendation: To aid in enforcement and verification, require all applicants to include the energy efficiency compliance forms within the plan set (not loose or stapled to the plans).

**A4.205.1: BUILDING ENVELOPE: RADIANT ROOF BARRIERS**

<p><b>Tier 1 &amp; Tier 2 Requirement</b></p> <p>Code Page: 59</p> <p>HCD Guide Page: 139</p>
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**NOTE: This measure is NOT applicable western Alameda County (Climate Zone 3) but IS applicable to eastern Alameda County (Climate Zone 12).**

Radiant roof barrier is installed in Climate Zones 2, 4 and 8 through 15. The radiant barrier must be tested according to ASTM C-1371-98 or ASTM E 408-71(2002) and must be certified by the Department of Consumer Affairs. Radiant barriers must also meet installation criteria specified in Section 4.2.1 of the California Energy Commission Residential ACM Manual.

<p><b>A4.205.1 RADIANT ROOF BARRIERS</b>  <b>Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>• Verify that plans and specifications indicate the use of one of the following (per HCD Guide):                             <ul style="list-style-type: none"> <li>○ Reflective foil under roof sheathing or to bottom of roof rafters as well as on gable end of attic</li> <li>○ Reflective laminated roof sheathing under roof membrane</li> <li>○ Reflective metal roof shingles</li> <li>○ Reflective insulation systems</li> </ul> </li> <li>➤ Verify that plans and specifications indicate that radiant roof barrier will meet standards and installation requirements from Appendix D, Section RA 4.2.2 of California Energy Commission’s Residential Compliance Manual:                             <ul style="list-style-type: none"> <li>○ Emittance of 0.05 or less.</li> <li>○ Product has been tested per ASTM C-1371-98 or STM E408-71(2002)</li> <li>○ Plan detail matches one of 4 diagrams in Res. Compliance Manual p. 3-35</li> <li>○ Attic vented and air space provided per Residential Compliance Manual Appendix D, Section RA 4.2.2</li> <li>○ Radiant barrier is specified in “Special Features and Modeling Assumptions” on CF-1R</li> </ul> </li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>• Visually verify that radiant roof barrier product indicated in plans and specifications has been installed.</li> <li>• Verify that installation method meets requirements from The Green Building Standards Code Appendix D, Section RA 4.2.2 of California Energy Commission’s Residential Compliance Manual.</li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>• Review radiant roof barrier cut sheet(s), supplied by general contractor, to determine that product meets Green Building Standards Code specified standards from Appendix D, Section RA 4.2.2 or California Energy Commission’s Residential Compliance Manual.</li> <li>➤ Consider including radiant roof barrier product cut sheets in Operations and Maintenance Manual.</li> </ul>	

**A4.205.2: BUILDING ENVELOPE: WINDOW SHADING**

Exterior shading at least 18 inches in depth is provided on south and west windows by at least one of the following methods:

1. Moveable exterior awnings or louvers
2. Porch or patio covers
3. Overhangs

**Tier 1 & Tier 2  
Voluntary Elective**

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HCD Guide Page: 140

<b>A4.205.2 WINDOW SHADING Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify the presence of exterior shading on windows facing within 30 degrees of south and west</li> <li>• Measure exterior shading to determine if shading devices meet minimum 18 inch requirement (24-inch preferred).</li> <li>➤ <i>Verify that shading devices actually shade the windows effectively and do not just shade the siding area above windows.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify that exterior shading indicated in plans has been installed on all appropriate windows in the field.</li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b> This measure is documented on the plans and/or specifications.</p> <p>➤ <i>If used, include awning/louwer/porch cover product cut sheets in Operations and Maintenance Manual.</i></p>	

**A4.206.1: AIR SEALING PACKAGE: REDUCED INFILTRATION**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: 59

HCD Guide Page: 140

*Infiltration is reduced and verified by third party testing to comply with requirements contained in the California Energy Code.*

<b>A4.206.1 REDUCED INFILTRATION Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that plans and specifications include the following:                             <ul style="list-style-type: none"> <li>○ List of elements to be sealed, locations to be sealed, and acceptable methods and materials for sealing</li> <li>○ Air Barrier sheet and accompanying details in plans indicating air barrier continuity through exterior enclosure</li> </ul> </li> <li>• Verify that Title 24 Report indicates that the following HERS testing will be conducted                             <ul style="list-style-type: none"> <li>○ Infiltration testing (blower door test)</li> <li>○ Quality Insulation Installation (QII)</li> </ul> </li> </ul> <p>➤ <i>Examples of compliance methods (from HCD Guide):</i></p> <ul style="list-style-type: none"> <li>○ <i>Install air retarding house wrap.</i></li> <li>○ <i>Seal gaps and holes between the inside conditioned space and the outside.</i></li> <li>○ <i>Interior and exterior wall coverings shall be installed without gaps or large excesses.</i></li> <li>○ <i>Sealant should be installed carefully around sliding glass doors and vinyl windows.</i></li> <li>○ <i>Follow details regarding infiltration and air leakage provided per Residential Compliance Manual, Sections 3.5.2 and 3.5.3</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that the following HERS testing has been conducted:                             <ul style="list-style-type: none"> <li>▪ Quality Insulation Installation (QII) (Title 24, Part 6 form CF-4R-ENV-21 &amp; 22)</li> <li>▪ Building envelope sealing, as verified via infiltration testing (form CF-4R-ENV-20)</li> </ul> </li> </ul> <p>➤ <i>For a project to pass a QII inspection, installed insulation should fit snugly into wall frame on all 6 sides, but should not be compressed.</i></p> <p>➤ <i>QII inspection is stringent and projects typically require multiple site visits in order to pass this inspection.</i></p> <p>➤ <i>Infiltration (blower-door) testing must be conducted by a licensed HERS inspector. During testing, all interior doors should be open and all exterior windows and doors should be closed.</i></p> <p>➤ <i>The target cfm50 value required for the blower door testing will be listed in the HERS Required Verification section on the CF-1R Form.</i></p> <p>➤ <i>Refer to HERS testing guidelines for further information:</i>  <a href="http://www.energy.ca.gov/HERS/index.html">http://www.energy.ca.gov/HERS/index.html</a></p>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b> This measure is documented in the plans and/or specifications.</p>	

**A4.207.1: HVAC DESIGN, EQUIPMENT AND INSTALLATION: INNOVATIVE SYSTEMS**

*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.*

<p><b>Tier 1 &amp; Tier 2 Voluntary Elective</b></p> <p>Code Page: <b>59</b></p> <p>HCD Guide Page: <b>141</b></p>
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<p><b>A4.207.1 INNOVATIVE SYSTEMS Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify in mechanical plans and specifications that innovative heating and cooling system is used. Per HCD Guide, options include radiant floor, wall or ceiling heating systems; geothermal (ground source) conditioned air and water heating systems; or other systems.</li> </ul> <p><i>For best results with hydronic radiant heating systems, specifications should indicate:</i></p> <ul style="list-style-type: none"> <li>➤ <i>Compliance with industry-approved guidelines such as the Radiant Panel Association’s (RPA) Guidelines for the Design and Installation of Radiant Panel Heating and Snow/Ice melting Systems, or the Hydronics Institute’s Heat Loss Guide.</i></li> <li>➤ <i>Heated slab is insulated 4 feet from edge of slab to minimum R-5 (Title 24 Part 6, Table 118-A)</i></li> <li>➤ <i>System is designed/installed by RPA-certified installer</i></li> <li>➤ <i>System is divided into at least one zone every 500 ft</i></li> <li>➤ <i>Variable speed pumping or zoned valving</i></li> <li>➤ <i>Pipes outside conditioned space are insulated</i></li> <li>➤ <i>Outdoor reset thermostat to regulate system based on outdoor conditions</i></li> <li>➤ <i>System is paired with condensing water heater or boiler, not instantaneous water heater</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that specified system is installed.</li> <li>• <i>Some alternative systems, such as radiant hydronic systems, must be field verified pre-drywall.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Review cut sheets for heating equipment, supplied by general contractor or mechanical subcontractor.</li> <li>➤ <i>Include heating system cut sheets in Operations and Maintenance Manual.</i></li> </ul>	

**A4.207.2.1: HVAC DESIGN, EQUIPMENT, AND INSTALLATION: COMMISSIONING OF HVAC SYSTEMS**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: 59  
HCD Guide Page: 142

A commissioning plan shall be developed to document specified building components meet the project design and performance goals. In addition to other items in the commissioning plan the following items, as appropriate, pertaining to the heating, ventilating and cooling systems shall be inspected and certified by an independent third party that is trained or certified to inspect and test building systems as specified in Section 702.2.

1. Verify compliance with the manufacturer’s recommended start-up procedures.
2. Verify refrigerant charge by super-heat or other methods specified by the manufacturer.
3. Burner is set to fire at the nameplate input rating.
4. Temperature drop across the evaporator is within the manufacturer’s recommended range.
5. Test and verify air flow to be within 10 percent of the initial design air flow.
6. Static pressure within the duct system is within the manufacturer’s acceptable range.
7. Verify that the whole house and exhaust ventilation systems meet Title 24 building code requirements.
8. Verify that the recommended maintenance procedures and schedules are documented and provided to the home owner.

<b>A4.207.2.1 COMMISSIONING OF HVAC SYSTEMS Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b> <b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that specifications include a commissioning plan that indicates commissioning of code-required items for HVAC systems by a commissioning agent.</li> <li>➤ <i>Commissioning agent may be a member of the design or construction team, but if the project plans to be certified GreenPoint Rated or LEED, the commissioning agent shall be an independent entity with no financial interest in the materials or the project they are inspecting.</i></li> <li>➤ <i>The following qualifications for commissioning agents are recommended: Minimum 10 years experience with mechanical, electrical and plumbing systems; previous commissioning experience.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p>Field verification to be conducted by a commissioning agent.</p> <ul style="list-style-type: none"> <li>• Review the commissioning test results to ensure adherence to the requirements of this measure.</li> </ul>
<p><b><u>Documentation:</u></b> <b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Review code checklists/forms for commissioning and HERS evaluation checklists/forms and/or commissioning Basis of Design (BOD), commissioning plan, and summary commissioning report to confirm that appropriate testing and field verification has been completed by a commissioning agent to meet HVAC commissioning items listed in specifications.</li> </ul>	

**A4.207.2.3: HVAC DESIGN, EQUIPMENT, AND INSTALLATION:  
COMMISSIONING PROCEDURES & TIPS**

<p><b>Tier 1 &amp; Tier 2 Voluntary Elective</b></p> <p>Code Page: <b>60</b></p> <p>HCD Guide Page: <b>142</b></p>
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*Results of the commissioning inspection shall be included in the Operation and Maintenance Manual required in Section 4.410.1.*

<p><b>A4.207.2.3 COMMISSIONING PROCEDURES &amp; TIPS</b> <b>Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify with the applicant that a commissioning inspection summary is to be included in the O&amp;M manual.</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b> No verification required.</p>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that results of commissioning inspection are included in operation and maintenance manual required in Section 4.410.1 (per HCD Guide).</li> <li>➤ <i>The GreenPoint Rated Multifamily Rating Manual (Version 1.8 and 2.0, pp. 48-50) includes a detailed description of required documentation for completion of residential commissioning.</i></li> </ul>	

**A4.207.4: HVAC DESIGN, EQUIPMENT, AND INSTALLATION:  
GAS-FIRED HEATING EQUIPMENT**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **60**

HCD Guide Page: **143**

*Install gas-fired (natural or propane) space heating equipment with an Annual Fuel Utilization Ratio (AFUE) of 0.90 or higher.*

<b>A4.207.4 GAS-FIRED HEATING EQUIPMENT Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• If natural gas-fired natural or propane space heating equipment is specified, verify that AFUE is specified at 0.90 or higher in mechanical schedule and specifications.</li> <li>➤ <i>Cross reference model number and AFUE with the mechanical schedule AND the energy efficiency report for accuracy in energy modeling (Title 24 Energy Report form CF-6R-MECH-04) .</i></li> <li>➤ <i>Some models with AFUE &gt; 0.90 will be condensing and require condensate neutralization drains or other controls. Check for this on plans and determine if proper installation details are included in the design.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify that specified heating equipment has been installed. Cross-check the model number to the Title 24 Energy Report Form CF-6R-MECH-04.</li> <li>➤ <i>It may be necessary to remove heating equipment cover to verify manufacturer information.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that cut sheets for gas fired heating equipment, supplied by general contractor or mechanical subcontractor, indicate AFUE of 0.90 or higher.</li> <li>➤ <i>Include heating equipment cut sheet in Operations and Maintenance Manual.</i></li> </ul>	

**A4.207.5: HVAC DESIGN, EQUIPMENT, AND INSTALLATION:  
HEAT PUMPS**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **60**  
HCD Guide Page: **143**

*If an electric heat pump must be used, select equipment with a Heating Seasonal Performance Factor (HSPF) of 8.0 or higher.*

<b>A4.207.5 HEAT PUMPS Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• If electric heat pump is specified, verify that HSPF is specified at 8.0 or higher in mechanical schedule and specifications.</li> <li>➤ <i>Cross reference model number and HSPF with the mechanical schedule AND the energy efficiency report for accuracy in energy modeling (Title 24 Energy Report Form CF-6R-MECH-04).</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify that specified heat pump has been installed. Cross-check the model number to the Title 24 Energy Report Form CF-6R-MECH-04.</li> <li>➤ <i>It may be necessary to remove equipment cover to verify manufacturer information.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that cut sheets for electric heat pump, supplied by general contractor or mechanical subcontractor, indicate HSPF of 8.0 or higher.</li> <li>➤ <i>Include heat pump cut sheet in Operations and Maintenance Manual.</i></li> </ul>	

**A4.207.6: HVAC DESIGN, EQUIPMENT, AND INSTALLATION:  
COOLING EQUIPMENT**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **60**  
HCD Guide Page: **143**

*When climatic conditions necessitate the installation of cooling equipment, select 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>A4.207.6 COOLING EQUIPMENT Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• If cooling equipment is specified, verify that SEER is specified at 13.0 or higher and EER is specified at 11.5 or higher in mechanical schedule and specifications.</li> <li>➤ <i>Cross reference model number and SEER/EER with the mechanical schedule AND the energy efficiency report for accuracy in energy modeling (Title 24 Energy Report Form CF-6R-MECH-04).</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify that specified cooling equipment has been installed. Cross-check the model number to the Title 24 Energy Report (Form CF-6R-MECH-04).</li> <li>➤ <i>It may be necessary to remove cooling equipment cover to verify manufacturer information.</i></li> <li>➤ <i>Split systems have cooling equipment information on both inside and outside unit.</i></li> <li>➤ <i>Cross check and verify for accuracy and compliance that the HERS Rater has conducted a Refrigerant Charge Test and a Compliance Certificate has been issued (Title 24 Form CF-4R-MECH-25).</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that cut sheets for cooling equipment, supplied by general contractor or mechanical subcontractor, indicate a SEER higher than 13.0 and an EER higher than 11.5.</li> <li>• Review CF-4R supplied by HERS rater confirming that refrigerant charge has been tested.</li> <li>➤ <i>Include cooling equipment cut sheets in Operations and Maintenance Manual.</i></li> </ul>	

**A4.207.7: HVAC DESIGN, EQUIPMENT, AND INSTALLATION:  
DUCTS LOCATION**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **60**  
HCD Guide Page: **144**

Install ductwork to comply with at least one of the following:

1. Install ducts within the conditioned envelope of the building.
2. Install ducts in an underfloor crawl space.
3. Use ducts with an R-6 insulation value or higher.
4. Install ductwork which is buried in the ceiling insulation.

<b>A4.207.7 DUCTS LOCATION Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify on plans that ductwork is located in either: conditioned envelope, conditioned subfloor crawl space, or buried in the ceiling insulation. If not, verify that specifications and plans indicate R-6 insulation around ducts.</li> <li>➤ <i>If unclear, ask the applicant to provide a marked-up plan showing compliance.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify that ductwork is installed according to the approved plans.</li> <li>➤ <i>Cross check and verify for accuracy and compliance that the HERS Rater has conducted the correct evaluations of ductwork location and R-Value.</i></li> <li>➤ <i>Verify ductwork within conditioned space pre-drywall. Verify attic ductwork after insulation has been installed.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b> This measure is documented in the plans and/or specifications.</p> <ul style="list-style-type: none"> <li>➤ <i>Review marked-up plan (if applicable).</i></li> <li>➤ <i>Review CF-4R supplied by HERS rater confirming that duct location, surface area, and R-value have been verified.</i></li> </ul>	

**A4.207.8: HVAC DESIGN, EQUIPMENT, AND INSTALLATION:  
DUCT LEAKAGE**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **60**  
HCD Guide Page: **144**

*Perform duct leakage testing to verify a total leakage rate of less than 6 percent of the total fan flow.*

<b>A4.207.8 DUCT LEAKAGE Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that specifications indicate that duct leakage will be diagnostically tested by a certified HERS rater.</li> <li>• Verify that energy efficiency report indicates that HERS duct leakage testing will be conducted. If duct leakage testing has been checked off on the Title 24 report, the first page of the CF-1R (Certificate of Compliance) form will indicate that HERS testing is required for the project.</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b> No verification required. Onsite diagnostic testing must be conducted by a certified HERS rater.</p> <ul style="list-style-type: none"> <li>➤ <i>While conducting Duct Leakage Test, all vents must be sealed with duct mastic or other sealing material. If the inspector cannot be present to determine compliance, request photos from the installer that shows the appropriate sealing method.</i></li> <li>➤ <i>Cross check and verify for accuracy and compliance that the HERS Rater has conducted a Duct Leakage Test and that a compliance certificate has been issued</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Review Certificates of Installation for ductwork (Title 24 Energy Report Form CF-6R-MECH-20-HERS for new systems and CF-6R-MECH-21-HERS for existing systems).</li> <li>• Review results of the duct leakage testing, prepared by HERS rater. Leakage rate must be less than 6 percent of total fan flow as shown in the Title 24 Energy Report Form CF-4R-MECH-20 for new systems and CF-4R-MECH-21 for existing systems.</li> </ul> <p>➤ <i>Include the CF-4R-MECH-20/21 Form in the Operations and Maintenance Manual.</i></p>	

**A4.207.9: HVAC DESIGN, EQUIPMENT, AND INSTALLATION:  
WHOLE HOUSE FANS**

<p><b>Tier 1 &amp; Tier 2 Voluntary Elective</b></p> <p>Code Page: <b>60</b></p> <p>HCD Guide Page: <b>144</b></p>
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**NOTE: This measure is NOT applicable in western Alameda County (Climate Zone 3) but IS applicable to eastern Alameda County (Climate Zone 12).**

*In Climate Zones 2, 4 and 8 through 15, install a whole-house fan with insulated louvers or an insulated cover.*

<p><b>A4.207.9 WHOLE HOUSE FANS Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that site is located within Climate Zone 2, 4, or 8-15.</li> <li>• If whole house fan is used, verify that mechanical plans indicate insulated louvers or insulated cover.</li> </ul> <p>➤ <i>Per HCD Guide, The Green Building Standards Code includes references to the California Energy Commission's California Climate Zones. The code user should consult the most current California Climate Zone Map information on the California Energy Commission's website (www.energy.ca.gov). This website provides options for detailed site searches by cities and zip codes as well as instructions for sites on the boundaries or in overlapping climate zones.</i></p>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify that whole house fan has insulated louvers or an insulated cover. Cross-check model number to plans/cut sheets.</li> </ul> <p>➤ <i>It may be easier to verify insulated louvers or insulated cover pre-drywall or pre-insulation.</i></p>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b> This measure is documented in the plans and/or specifications.</p> <p>➤ <i>Include whole house fan cut sheet in Operations and Maintenance Manual.</i></p>	

**A4.207.10: HVAC DESIGN, EQUIPMENT, AND INSTALLATION:  
CEILING FANS**

*ENERGY STAR ceiling fans are installed in all bedrooms and living areas.*

<p><b>Tier 1 &amp; Tier 2 Voluntary Elective</b></p> <p>Code Page: <b>60</b></p> <p>HCD Guide Page: <b>144</b></p>
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<b>A4.207.10 CEILING FANS Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that specifications and mechanical and/or electrical and/or architectural plans indicate ENERGY STAR ceiling fans in all bedrooms and living areas. Cross-check the specified products to the cut sheets and verify the ENERGY STAR label.</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify installation of ceiling fan indicated in plans and specifications. Cross-check model number to plans/cut sheets.</li> <li>➤ <i>If manufacturer information is not visible on installed ceiling fan, verify using ENERGY STAR sticker or homeowner’s product packet.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify cut sheets for ceiling fans, supplied by general contractor or mechanical subcontractor.</li> <li>➤ <i>Include ceiling fan instruction manual in Operations and Maintenance Manual.</i></li> </ul>	

**A4.208.1: WATER HEATING DESIGN, EQUIPMENT, AND INSTALLATION: TANK TYPE WATER HEATER EFFICIENCY**

*The Energy Factor (EF) for a gas-fired storage water heater is higher than 0.60.*

<p><b>Tier 1 &amp; Tier 2 Voluntary Elective</b></p> <p>Code Page: <b>60</b></p> <p>HCD Guide Page: <b>145</b></p>
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<p><b>A4.208.1 TANK TYPE WATER HEATER EFFICIENCY Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• If a gas-fired water heater is specified, verify that an Energy Factor of at least 0.60 is specified in mechanical schedule and specifications.</li> <li>• Cross reference model number and Energy Factor with the schedule AND the energy efficiency report for accuracy in energy modeling (form CF-6R-MECH-01: Installation Certificate, Domestic Hot Water)</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify that specified gas-fired water heater has been installed.</li> <li>• <i>If the Energy Factor is not visible on the installed water heater nameplate, cross-check the model number to the Title 24 Energy Report (form CF-6R-MECH-01).</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that cut sheets for gas-fired water heater, supplied by general contractor or mechanical subcontractor, indicates an Energy Factor of 0.60 or higher.</li> <li>➤ <i>Include water heater cut sheet in Operations and Maintenance Manual.</i></li> </ul>	

**A4.208.2: WATER HEATING DESIGN, EQUIPMENT, AND INSTALLATION: TANKLESS WATER HEATER EFFICIENCY**

*The Energy Factor (EF) for a gas-fired tankless water heater is 0.80 or higher.*

<p><b>Tier 1 &amp; Tier 2 Voluntary Elective</b></p> <p>Code Page: <b>60</b></p> <p>HCD Guide Page: <b>145</b></p>
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<p><b>A4.208.2 TANKLESS WATER HEATER EFFICIENCY</b> <b>Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• If gas-fired tankless water heater is specified, verify that an Energy Factor of at least 0.80 is specified on mechanical schedule and specifications.</li> <li>• Cross reference model number and Energy Factor with the schedule AND the energy efficiency report for accuracy in energy modeling (form CF-6R-MECH-01: Installation Certificate, Domestic Hot Water).</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify that specified gas-fired tankless water heater has been installed. Energy Factor is generally listed on the EnergyGuide label.</li> <li>➤ <i>If the Energy Factor is not visible on installed water heater nameplate, cross-check the model number to the Title 24 Energy Report (form CF-6R-MECH-01).</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that cut sheets for gas-fired tankless water heater, supplied by general contractor or mechanical subcontractor, indicate a Energy Factor of .80 or higher.</li> <li>➤ <i>Include water heater cut sheet in Operations and Maintenance Manual.</i></li> </ul>	

**A4.208.3: WATER HEATING DESIGN, EQUIPMENT, AND INSTALLATION: DISTRIBUTION SYSTEMS**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **60**  
HCD Guide Page: **146**

Where the hot water source is more than 10 feet from a fixture, the potable water distribution system shall convey hot water using one of the following methods:

1. A central manifold plumbing system with parallel piping configuration (“home-run system”) is installed using the smallest diameter piping allowed by the California Plumbing Code or an approved alternate.
2. The plumbing system design incorporates the use of a demand controlled circulation pump.
3. A gravity-based hot water recirculation system is used.
4. A timer-based hot water recirculation system is used.
5. Other methods approved by the enforcing agency.

<b>A4.208.3 DISTRIBUTION SYSTEMS Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that plumbing plan details configuration of central manifold with parallel piping; demand controlled circulation loop; gravity-based hot water recirculation system; timer-based hot water recirculation system; or other approved configuration. Cross-check system components to appropriate cut sheets to determine compliance.</li> <li>➤ For detailed diagrams of common types of plumbing distribution options, please see the <i>GreenPoint Rated Single Family Rating Manual, Version 4.0, Appendix G2: Distribute Domestic Hot Water Efficiently</i>. Note: Timer-based hot water recirculation systems are generally not as energy efficient as other alternatives, nor do they provide as effective water delivery.</li> <li>➤ For best results, all hot water piping should be insulated with minimum R-4 insulation.</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify plumbing distribution configuration as possible in the field.</li> <li>➤ <i>Central manifold plumbing systems: Manifold will be on the wall next to the water heater. Trunk length from water heater to manifold should be maximum 5 feet and insulated with R-6.</i></li> <li>➤ <i>Demand controlled circulation loop: On-demand circulation pump will usually be located at the water heater in new construction, but may also be under the furthest sink on the branch in new or existing homes. Manifold systems should also have an on-demand pump to circulate the water line between the water heater and the main manifold. Verify presence of on-demand pump that circulates water between the water heater and the rest of the trunk line or manifold.</i></li> <li>➤ <i>Gravity-based hot water circulation system: Verify that plumbing plans match field installation. Note that gravity based circulation systems are rare and are typically very hard to see overtly in the field.</i></li> <li>➤ <i>Timer-based hot water recirculation system: Verify presence of time-controlled pump that circulates water between the water heater and the rest of the trunk line or manifold. Note that circulation pump will usually be located next to the water heater.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify cut sheets of pumps and plumbing plans for distribution system design.</li> </ul>	

**A4.209.1: LIGHTING**

*Building lighting consists of at least 90 percent ENERGY STAR qualified hard-wired fixtures.*

<p><b>Tier 1 &amp; Tier 2 Voluntary Elective</b></p> <p>Code Page: <b>60</b></p> <p>HCD Guide Page: <b>N/A</b></p>
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<p><b>A4.209.1 LIGHTING</b> <b>Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that lighting schedule indicates at least 90% ENERGY STAR qualified hard-wired (non-screw) fixtures. Cross-check specified fixtures with cut sheets.</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Walk through the home and record all lighting fixtures, verifying that 90% of lighting fixtures are ENERGY STAR qualified hard-wired fixtures. Cross-check models to cut sheets/plans if labels for ENERGY STAR are not apparent.</li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Review lighting fixture cut sheets, supplied by general contractor or electrical subcontractor.</li> <li>• Verify that lighting order sheet, supplied by contractor or electrical subcontractor, indicates that 90% of fixtures are ENERGY STAR hard-wired fixtures.</li> </ul> <p>➤ <i>Include lighting fixture cut sheets in Operations and Maintenance Manual.</i></p>	

**A4.210.1: APPLIANCE RATING**

*Each appliance provided by the builder meets ENERGY STAR if an ENERGY STAR designation is applicable for that appliance.*

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **60**  
HCD Guide Page: **N/A**

<b>A4.210.1 APPLIANCE RATING Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify (cross-check cut sheets to schedules on plans, if any) that appliance specification indicates at least the following appliances are ENERGY STAR rated:                             <ul style="list-style-type: none"> <li>○ Refrigerator</li> <li>○ Dishwasher</li> <li>○ Clothes Washer</li> </ul> </li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify that installed appliances are ENERGY STAR qualified. If not labeled, cross-check manufacturer and model number to cut sheet or plans.</li> <li>➤ <i>ENERGY STAR label may be on the inside door of the appliance or on the EnergyGuide label.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Review appliance cut sheets supplied by general contractor.</li> <li>➤ <i>Include appliance cut sheets in Operations and Maintenance Manual.</i></li> </ul>	

**A4.211.1: RENEWABLE ENERGY: NEW SOLAR HOMES PARTNERSHIP**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **60**  
HCD Guide Page: **146**

Install a solar photovoltaic (PV) system in compliance with the California Energy Commission New Solar Homes Partnership (NSHP). Install energy efficiency measures meeting either Tier I or Tier II below.

**Tier I.** Exceed the 2008 California Energy Code requirements by 15 percent.

**Tier II.** Exceed the 2008 California Energy Code requirements by 30 percent.

Solar water heating may be used to assist in meeting the energy efficiency requirements of either Tier I or Tier II. 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.

<b>A4.211.1 NEW SOLAR HOMES PARTNERSHIP Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify presence of PV system in plans and specifications.</li> <li>• Review Title 24, Part 6 Energy Report to verify that home energy use (in TDV) exceeds Title 24:                             <ul style="list-style-type: none"> <li>○ <b>Tier 1.</b> Exceed Title 24 by 15 percent</li> <li>○ <b>Tier 2.</b> Exceed Title 24 by 30 percent.</li> </ul> </li> <li>• Verify that all specified appliances are ENERGY STAR.</li> <li>• Verify that specifications note that PV system will be verified by a certified PV HERS inspector upon completion.</li> </ul> <p>➤ <i>Note: PV systems are not included in 2008 Title 24, Part 6 compliance reports. The energy performance level of Tier 1 or Tier 2 (15%/30%) must be in addition to adding photovoltaics on the project.</i></p>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify presence of installed PV system.</li> <li>• Field verify the measures used to reach the desired level of efficiency following the requirements specified in the Title 24 Reference Appendices.</li> <li>• Visually verify that installed appliances are ENERGY STAR qualified.</li> </ul> <p>➤ <i>Verification of Title 24 energy efficiency measures generally requires multiple site visits, pre- and post-drywall.</i></p> <p>➤ <i>A PV HERS inspector must also inspect the installed system. If city inspector is a certified PV HERS inspector, only one post-installation visit is necessary.</i></p> <p>➤ <i>Review plans for the PV system. Count number of panels and verify this count on-site. Verify inverter make and model number(s).</i></p>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Review cut sheets for PV system components, supplied by general contractor or PV subcontractor.</li> <li>• Review CF-4R-PV solar report prepared by HERS inspector and any additional paperwork based on actual post-installation performance.</li> <li>• Verify that team has completed paperwork for NSHP incentive (available at “Go Solar California” website). Team members responsible for this paperwork may include the homeowner, developer, and/or contractor.</li> </ul> <p>➤ <i>Include PV system component cut sheets in Operations and Maintenance Manual.</i></p>	

**A4.211.2: RENEWABLE ENERGY: SOLAR WATER HEATING SYSTEM**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **60**  
HCD Guide Page: **147**

A Solar Rating and Certification Corporation (SRCC) OG 300 solar water heating system is installed. The SRCC Solar Energy Factor (SEF) shall be used to determine the Solar Fraction (SF). The SF shall be at least 0.5.

<b>A4.211.2 SOLAR WATER HEATING SYSTEM</b> <b>Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that mechanical plans and specifications indicate SRCC OG 300 certified solar water heating system.</li> </ul> <p>➤ <i>Note: Solar hot water systems ARE included in Title 24, Part 6 energy analysis reports. However, the Solar Fraction is a different way to calculate solar hot water performance. Therefore, the energy efficiency gains of solar hot water will be evaluated in the energy report, but the SF will be determined via the SRCC calculations.</i></p>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify presence of installed solar hot water system.</li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Review cut sheets for solar hot water system components, supplied by general contractor or solar hot water subcontractor.</li> <li>• Verify that the SRCC Solar Energy Fraction calculator (F-chart) yields a solar fraction of at least 0.5. This calculation should be completed by the solar hot water designer/subcontractor.</li> </ul> <p>➤ <i>As explained in the HCD Guide, The Solar Energy Factor (SEF) is “the energy delivered by the system divided by the electrical or gas energy put into the system. The SEF can then be converted to an equivalent Solar Fraction (SF), which is the portion of the total conventional hot water heating load (delivered energy and tank standby losses) provided by solar energy” (HCD Guide p.148)</i></p> <p>➤ <i>For detailed instructions on using the Solar Fraction Calculator, please see the SRCC website (<a href="http://www.solar-rating.org">www.solar-rating.org</a>) or “Go Solar” website (<a href="http://www.gosolarcalifornia.org/solarwater/nshp/swh_calc_collectors.php">www.gosolarcalifornia.org/solarwater/nshp/swh_calc_collectors.php</a>).</i></p> <p>➤ <i>Include solar hot water equipment cut sheets in Operations and Maintenance Manual.</i></p>	

**A4.211.3: RENEWABLE ENERGY: SPACE FOR FUTURE SOLAR INSTALLATION**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **60**  
HCD Guide Page: **148**

*A minimum of 300 square feet of unobstructed roof area facing within 30° of south is provided for future solar collector or photovoltaic panels. Rough-in penetrations through the roof surface within 24 inches (610 mm) of the boundary of the unobstructed roof area are provided for electrical conduit and water piping.*

<b>A4.211.3 SPACE FOR FUTURE SOLAR INSTALLATION Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that electrical roof plan indicates at least 300 square feet of unobstructed roof area within 30 degrees of south.</li> <li>• Verify that electrical roof plan indicates rough-in penetrations for electrical conduit and water piping within 24 inches of the boundary of the unobstructed roof area.</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visual verification of unobstructed roof area and rough-in as indicated in the plans. Visually inspect roof for adequate clear area (no penetrations or features to obstruct the future addition of solar panels).</li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b> This measure is documented on the plans and/or specifications.</p>	

**A4.211.4: RENEWABLE ENERGY: FUTURE ACCESS FOR SOLAR SYSTEM**

*A minimum one-inch (25.4 mm) electrical conduit is provided from the electrical service equipment to an accessible location in the attic or other location approved by the enforcing agency.*

<p><b>Tier 1 &amp; Tier 2 Voluntary Elective</b></p> <p>Code Page: <b>60</b></p> <p>HCD Guide Page: <b>148</b></p>
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<p><b>A4.211.4 FUTURE ACCESS FOR SOLAR SYSTEM</b> Verification Procedures &amp; Tips</p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that electrical plan indicates electrical conduit from electrical service equipment area to an accessible location in the attic.</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visual verification of conduit as indicated in the plans.</li> <li>➤ <i>This measure is best verified pre-drywall.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Elective:</b> This measure is documented on the plans and/or specifications.</p>	

## DIVISION A4.3: WATER EFFICIENCY AND CONSERVATION

- **Code Level:** *Meet all code measures*
- **Tier 1:** *Meet all code measures, all required Tier 1 measures, and at least 1 additional measure in Division A4.3*
- **Tier 2:** *Meet all code measures, all required Tier 1 measures, and at least 2 additional measures in Division A4.3*

**A4.303.1: INDOOR WATER USE: KITCHEN FAUCETS AND DISHWASHERS**

**Tier 1 & Tier 2 Requirement**

Code Page: **63**

HCD Guide Page: **149**

**Tier 1.** The maximum flowrate 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, dishwashers in Tier 2 buildings shall be ENERGY STAR qualified and not use more than 5.8 gallons of water per cycle.

**A4.303.1 KITCHEN FAUCETS AND DISHWASHERS  
Verification Procedures & Tips**

**Plan Review:**

**Tier 1 Requirement:**

- Verify in plumbing fixture schedule and specifications that kitchen faucets will have a flow rate maximum of 1.5 gpm. Cross-check fixture schedule to cutsheets.

**Tier 2 Requirement:**

- Meet Tier 1 requirement AND verify in specifications that dishwashers are ENERGY STAR and use less than or equal to 5.8 gallons/cycle.

**Onsite Verification:**

**Tier 1 Requirement:**

- Visually verify flow rate of installed fixtures.
- If flow rate is not given on installed fixture and fixture cannot otherwise be verified through installation documentation or manufacturer label, verify flow rate using flow test.
  - In a flow test, fill a large measuring cup for 15 seconds at maximum flow capability. Multiply volume of collected water by four to get installed flow rate per minute.

**Tier 2 Requirement:**

- Meet Tier 1 requirement AND visually verify ENERGY STAR label on dishwasher. Verify that brand installed uses less than or equal to 5.8 gallons/cycle. Cross-check models to cut sheets/plans if labels for ENERGY STAR are not apparent.
- *ENERGY STAR label may be on the inside door of the appliance or on the EnergyGuide label.*

**Documentation:**

**Tier 1 Requirement:**

- Review manufacturer cutsheet for kitchen faucet.
- For flow control devices, review documentation of flow limiters (aerators or other flow restricting devices), supplied by general contractor or plumbing subcontractor.

**Tier 2 Requirement:**

- Meet Tier 1 requirement AND review cut sheet for dishwasher or listing of model on the ENERGY STAR website, supplied by general contractor.
- *Include kitchen faucet fixture and dishwasher cut sheets in Operations and Maintenance Manual.*

**A4.303.2: INDOOR WATER USE: NONWATER SUPPLIED URINALS AND WATERLESS TOILETS**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **63**

HCD Guide Page: **149**

*Urinals or toilets are installed which use zero water for flushing.*

<b>A4.303.2 NONWATER SUPPLIED URINALS AND WATERLESS TOILETS</b> <b>Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that urinals or toilets which do not use water for flushing are indicated in specifications and plumbing fixture schedule.</li> <li>➤ <i>As noted in the HCD Guide, the California Plumbing Code requires water distribution and fixture supply piping to be roughed-in immediately adjacent to each waterless urinal fixture. Verify that rough-in is indicated in plumbing plans.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify presence of waterless urinals or composting toilets.</li> <li>• Verify rough-in of plumbing lines.</li> <li>• Cross-check product cut sheets to installed urinals/toilets if visual inspection is inconclusive.</li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Review equipment literature for nonwater urinals and composting toilets, supplied by general contractor, plumbing subcontractor or composting toilet subcontractor.</li> <li>➤ <i>Nonwater urinals and composting toilets require maintenance activities that homeowners or cleaning staff may not be aware of. It is advised that clear instructions for maintaining waterless fixtures be included in the Operations and Maintenance Manual.</i></li> </ul>	

**A4.304.1: OUTDOOR WATER USE: LOW WATER CONSUMPTION IRRIGATION SYSTEM**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **63**

HCD Guide Page: **N/A**

Install a low-water consumption irrigation system which minimizes the use of spray type heads. Spray type irrigation may only be used at turf areas. The remaining irrigation systems shall use only the following types of low-volume irrigation systems:

1. Drip irrigation
2. Bubblers
3. Drip emitters
4. Soaker hose
5. Stream-rotator spray heads
6. Other systems acceptable to the enforcing agency

<b>A4.304.1 LOW WATER CONSUMPTION IRRIGATION SYSTEM Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that irrigation plan indicates spray type heads in turf areas only</li> <li>➤ <i>Overspray from spray type irrigation is not effective unless turf areas are greater than 8 feet wide, as spray heads tend to discharge to this minimum distance. Therefore, limit turf areas to greater than 8-foot width to reduce unnecessary overspray. Recommendation: do not exceed 100% head to head coverage.</i></li> <li>➤ <i>Overspray from spray type irrigation is often not effective in oddly shaped turf areas are greater than 8 feet wide. Recommendation: design turf areas to match the spray pattern of irrigation heads to reduce unnecessary overspray.</i></li> <li>➤ <i>Standard impact sprinklers or fan spray heads tend to waste water by misting it into the atmosphere. Recommendation: use multi-stream or matched precipitation rotators to generate a thick stream of water that will fully drop to the ground and reduce misting losses.</i></li> <li>➤ <i>Recommendation: limit emitter flow rate to 1gpm for non-turf areas and 1 inch per hour in turf areas.</i></li> <li>➤ <i>Recommendation: require a planting list from the designer. On the plant list, indicate water requirement for the plants and the type of irrigation system serving that plant or hydrozone (drip, spray, micro-spray, etc.).</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Walk the landscape and visually verify that spray type heads are not used in non-turf areas and that drip or other irrigation strategies are used for shrubs and groundcover.</li> <li>➤ <i>In some cases, it may be necessary to operate irrigation system in order to determine that spray-type heads are not used.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b> Landscape plans with planting plan and irrigation details.</p>	

**A4.304.2: OUTDOOR WATER USE: RAINWATER SYSTEMS**

*A rainwater capture, storage and re-use system is designed and installed to use rainwater generated by at least 65 percent of the available roof area.*

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **63**

HCD Guide Page: **150**

<b>A4.304.2 RAINWATER SYSTEMS Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that irrigation, plumbing or other plans indicate a rainwater harvesting system with the following basic components:                             <ul style="list-style-type: none"> <li>○ Catchment area (roof surface area that will flow to cistern(s))</li> <li>○ Conveyance system (gutters, downspouts, diverters between catchment area and tank)</li> <li>○ Storage system (cisterns, which should be opaque and located out of direct sunlight exposure/effect)</li> <li>○ Filtration system (depending on intent of water use, a first flush filter before the cistern and optional sediment or other filters before discharge to end-use)</li> <li>○ Distribution system (piping and/or pumps connecting storage system to end-use fixtures or irrigation system)</li> </ul> </li> <li>• Verify that indicated catchment area is at least 65% of total roof area</li> <li>• Verify that calculation has been completed to determine cistern size based on roof size as follows:                              [Minimum cistern size = 0.62 Gal/ft<sup>2</sup> x catchment area](as per LEED for Homes manual)</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify that rainwater harvesting system has been installed to plan specifications.</li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Review cut sheet or plans for rainwater harvesting system components, supplied by general contractor, irrigation subcontractor, plumbing subcontractor, or rainwater harvesting system subcontractor.</li> <li>➤ <i>Consider including rainwater harvesting system component cut sheets, design, and maintenance requirements in Operations and Maintenance Manual.</i></li> </ul>	

**A4.304.3: OUTDOOR WATER USE: WATER BUDGET**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **63**  
HCD Guide Page: **151**

*When landscaping is provided by the builder, a water budget shall be developed for landscape irrigation use that conforms to the local water efficient landscape ordinance or to the California Department of Water Resources Model Water Efficient Landscape Ordinance where no local ordinance is applicable.*

<b>A4.304.3 WATER BUDGET Enforcement and Verification Procedures</b>	
<p><b><u>Plan Review:</u></b> <b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify calculation of water budget, calculated by landscape architect, in irrigation plans or specifications.                             <ul style="list-style-type: none"> <li>○ Water budget calculation should include Maximum Applied Water Allowance (MAWA) calculation and the Estimated Total Water Use (ETWU) calculation.</li> </ul> </li> <li>➤ <i>Recommend for applicants to include water use calculations within the plans (not as a separate report).</i></li> <li>➤ <i>For more information on the Water Budget calculation, see the following resources:</i> <ul style="list-style-type: none"> <li>○ Department of Water Resources Website: <a href="http://www.water.ca.gov/wateruseefficiency/landscapeordinance">www.water.ca.gov/wateruseefficiency/landscapeordinance</a></li> <li>○ The water efficient landscape model ordinance <a href="http://www.water.ca.gov/wateruseefficiency/docs/MWELO09-10-09.pdf">www.water.ca.gov/wateruseefficiency/docs/MWELO09-10-09.pdf</a> <ul style="list-style-type: none"> <li>▪ <i>ETo rates in the Model Water Efficient Landscape Ordinance, Appendix A, Reference ETo Table.</i></li> </ul> </li> <li>○ Technical guidance: California Irrigation Management Information System: <a href="http://www.cimis.water.ca.gov/cimis/welcome.jsp">www.cimis.water.ca.gov/cimis/welcome.jsp</a></li> </ul> </li> <li>➤ <i>If the landscape area is large, this may be a required measure already. As of January 1, 2010, a Water Efficient Landscape Worksheet with Water Budget Calculation is required for new developer-installed residential landscapes over 2,500 square feet and new homeowner-installed residential landscapes over 5,000 square feet.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b> <b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify that installed landscaping matches the planned landscape. Check for gross errors in the field, such as turf installed where groundcover was specified, or spray type heads installed everywhere.</li> </ul>
<p><b><u>Documentation:</u></b> <b>Tier 1 and Tier 2 Elective:</b> Calculations should be provided, preferably on the irrigation and/or landscape plans.</p>	

**A4.304.4: OUTDOOR WATER USE: POTABLE WATER REDUCTION**

**Tier 1 & Tier 2 Requirement**  
 Code Page: **63**  
 HCD Guide Page: **151**

*When landscaping is provided by the builder, a water efficient landscape irrigation system shall be installed that reduces potable water use. The potable water use reduction shall be calculated beyond the initial requirements for plant installation and establishment. Calculations for the reduction shall be based on the water budget developed pursuant to Section A4.304.3.*

**Tier 1.** Potable water use does not exceed 65 percent of ETo times the landscape area.

**Tier 2.** Potable water use does not exceed 60 percent of ETo times the landscape area.

<b>A4.304.4 POTABLE WATER REDUCTION Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>• Verify that irrigation plans or specifications include a calculation, completed by the landscape architect, demonstrating the applicable potable water use reduction:                             <ul style="list-style-type: none"> <li>▪ <b>Tier 1.</b> 0.65 ETo</li> <li>▪ <b>Tier 2.</b> 0.60 ETo.</li> </ul> </li> <li>○ Water budget calculation should include Maximum Applied Water Allowance (MAWA) calculation and the Estimated Total Water Use (ETWU) calculation.</li> </ul> <p>➤ <i>For more information on the Water Budget calculation, see the resources listed for A4.304.3 (Water Budget).</i></p>	<p><b><u>Onsite Verification:</u></b></p> <p>➤ Visually verify that installed landscaping matches the planned landscape. Check for gross errors in the field, such as turf installed where groundcover was specified, or spray type heads installed everywhere.</p>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <p>➤ <i>This measure is documented on the irrigation and/or landscape plans and/or specifications.</i></p>	

**A4.304.5: OUTDOOR WATER USE: POTABLE WATER ELIMINATION**

<p><b>Tier 1 &amp; Tier 2 Requirement</b></p> <p>Code Page: <b>63</b></p> <p>HCD Guide Page: <b>151</b></p>
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When landscaping is provided by the builder and as allowed by local ordinance, a water efficient landscape irrigation design that eliminates the use of potable water beyond the initial requirements for plant installation and establishment.

<p><b>A4.304.5 POTABLE WATER ELIMINATION</b>  <b>Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>• Verify that irrigation plans or specifications include a calculation by the landscape architect demonstrating that no potable water is used.                             <ul style="list-style-type: none"> <li>○ Water budget calculation should include Maximum Applied Water Allowance (MAWA) calculation and the Estimated Total Water Use (ETWU) calculation.</li> </ul> </li> <li>➤ <i>For more information on the Water Budget calculation, see the resources listed for A4.304.3 (Water Budget).</i></li> <li>➤ <i>Per HCD Guide, methods used to comply with this section must be designed to meet the requirements of the other parts of the California Building Standards Code and may include, but are not limited to, the following:</i> <ol style="list-style-type: none"> <li>1. Plant coefficient</li> <li>2. Irrigation efficiency and distribution uniformity</li> <li>3. Use of captured rainwater</li> <li>4. Use of recycled water</li> <li>5. Water treated for irrigation purposes and conveyed by a water district or public entity</li> <li>6. Use of graywater</li> </ol> </li> <li>➤ <i>In some cases, irrigation may be required to establish vegetation. If this is the case, consider allowing potable water to be used to establish vegetation if establishment period will be ≤ 1 year.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <ul style="list-style-type: none"> <li>• Visually verify that the installed landscaping is either served by non-potable water or is not served by irrigation.</li> </ul>
<p><b><u>Documentation:</u></b> This measure is documented on the irrigation and/or landscape plans and/or specifications.</p>	

**A4.305.1: WATER REUSE SYSTEMS: GRAYWATER**

*Alternative plumbing piping is installed to permit the discharge from the clothes washer or other fixtures to be used for an irrigation system in compliance with Chapter 16A of the California Plumbing Code.*

<p><b>Tier 1 &amp; Tier 2 Voluntary Elective</b></p> <p>Code Page: <b>64</b></p> <p>HCD Guide Page: <b>152</b></p>
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<p><b>A4.305.1 GRAYWATER Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that irrigation and plumbing plans and specifications indicate use of graywater (used water from bathtubs, showers, bathroom wash basins, laundry tubs, or and clothes washers; not kitchen sinks, dishwashers, or toilets/urinals) for irrigation.</li> <li>• Graywater system plans and specifications should include the following components:                             <ul style="list-style-type: none"> <li>○ Plumbing system (piping from graywater source to storage tank and on to irrigation system)</li> <li>○ Surge tank (storage container designed to hold at least one week of graywater {about 100 gallons} with a regulator, overflow pipe and venting system)</li> <li>○ Filtration system (and, if necessary, graywater treatment to minimize odors and bacteria growth)</li> </ul> </li> <li>• Verify that graywater system plans and specifications include calculation of surge tank size: [Surge tank size = sum of fixture flow rates x expected weekly number of uses per fixture]</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify that graywater system components have been installed.</li> <li>• Run water from all connected fixtures simultaneously to verify that system is functional.</li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Review cut sheets for graywater system components.</li> <li>➤ <i>Consider including graywater system components and procedures in Operations and Maintenance Manual.</i></li> </ul>	

**A4.305.2: WATER REUSE SYSTEMS: RECYCLED WATER PIPING**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **64**

HCD Guide Page: **N/A**

Based on projected availability, dual water piping is installed for future use of recycled water at the following locations:

1. Interior piping for the use of recycled water is installed to serve all water closets, urinals and floor drains.
2. Exterior piping is installed to transport recycled water from the point of connection to the structure.

<b>A4.305.2 RECYCLED WATER PIPING Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that plumbing plans include water distribution system separating potable from non-potable, municipal recycled water</li> <li>• Verify that municipal recycled water does not serve fixtures other than water closets, urinals, or floor drains.</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Pre-drywall, visually verify that indoor plumbing distribution system has been installed to separate potable from non-potable water and is clearly labeled.</li> <li>• Visually verify municipal recycled water piping entering the home</li> <li>➤ <i>Municipal recycled water piping is purple, making it easy to identify.</i></li> </ul>
<p><b><u>Documentation:</u></b> This measure is documented on the plans and/or specifications.</p>	

**A4.305.3: WATER REUSE SYSTEMS: RECYCLED WATER FOR LANDSCAPE IRRIGATION**

*Recycled water is used for landscape irrigation.*

<p><b>Tier 1 &amp; Tier 2 Voluntary Elective</b></p> <p>Code Page: <b>64</b></p> <p>HCD Guide Page: <b>N/A</b></p>
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<p><b>A4.305.3 RECYCLED WATER FOR LANDSCAPE IRRIGATION</b> Verification Procedures &amp; Tips</p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that irrigation plans indicate hook-up to municipal recycled water system</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify municipal recycled water piping connected to irrigation distribution system.</li> <li>➤ <i>Municipal recycled water piping is purple, making it easy to identify.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b> This measure is documented on the plans and/or specifications.</p>	

## **DIVISION A4.4: MATERIAL CONSERVATION AND RESOURCE EFFICIENCY**

- **Code Level:** *Meet all code measures*
- **Tier 1:** *Meet all code measures, all required Tier 1 measures, and at least 2 additional measure in Division A4.4*
- **Tier 2:** *Meet all code measures, all required Tier 1 measures, and at least 4 additional measures in Division A4.4*

**A4.403.1: FOUNDATION SYSTEMS: FROST PROTECTED FOUNDATION SYSTEMS**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: 65  
HCD Guide Page: 153

**NOTE: This measure is not applicable to Alameda County.**

*As allowed by local conditions, utilize a Frost-Protected Shallow Foundation (FPSF) in compliance with the California Residential Code (CRC). When an FPSF foundation system is installed, the manual required by Section 4.410.1 shall include instructions to the owner or occupant regarding the necessity for heating the structure as required in Section R403.3 of the California Residential Code.*

<b>A4.403.1 FROST PROTECTED FOUNDATION SYSTEMS Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• If project is located in cold climate, verify that structural plans indicate use of a frost-protected shallow foundation (FPSF). FPSF specifications must indicate that monthly mean temperature of building will be maintained at minimum 64° F (18° C).</li> </ul> <p>➤ <i>For a detailed description of FPSF, see one of the following sources:</i></p> <ul style="list-style-type: none"> <li>○ <i>American Society of Civil Engineers (ASCE) Standard, ASCE/ SEI 32-01, Design and Construction of Frost-Protected Shallow Foundations. <a href="http://www.asce.org">www.asce.org</a></i></li> <li>○ <i>National Association of Home Builders Research Center (NAHBRC) Revised Builder’s Guide to Frost Protected Shallow Foundations (September 2004). <a href="http://www.toolbase.org">www.toolbase.org</a></i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Before framing, visually verify that foundation is 12-16 inches deep and vertical insulation has been applied on exterior side of foundation wall and horizontally extending away from foundation.</li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that Operations and Maintenance Manual includes instructions regarding the necessity for heating the structure as required in Section R403.3 of the California Residential Code as well as avoiding the disturbance of the insulation system.</li> </ul>	

**A4.403.2: FOUNDATION SYSTEMS: REDUCTION IN CEMENT USE**

<p><b>Tier 1 &amp; Tier 2 Requirement</b></p> <p>Code Page: <b>65</b></p> <p>HCD Guide Page: <b>154</b></p>
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*As allowed by the enforcing agency, cement used in foundation mix design shall be reduced as follows:*

**Tier 1.** *Not less than a 20 percent reduction in cement use.*

**Tier 2.** *Not less than a 25 percent reduction in cement use.*

<p><b>A4.403.2 REDUCTION IN CEMENT USE</b>  <b>Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>• Verify that specifications indicate that a percentage of cement will be recycled content (fly ash, slag, or other alternative materials such as silica fume or rice hull ash).                             <ul style="list-style-type: none"> <li>○ <b>Tier 1.</b> ≥20% reduction in cement use</li> <li>○ <b>Tier 2.</b> ≥25% reduction in cement use</li> </ul> </li> <li>➤ <i>For cement with high percentages of flyash (greater than 40% typically), there may be a need for longer curing times as compared to traditional concrete mixes. Specifications must indicate the proper cure time.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b> No verification required.</p>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 and Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>• Review concrete mix receipts, supplied by general contractor, indicating appropriate percentage of flyash, slag, or other alternative material.</li> </ul>	

**A4.404.1: EFFICIENT FRAMING TECHNIQUES: LUMBER SIZE**

*Beams and headers and trimmers are sized and installed as specified in CRC Tables R502.5(1) and R502.5(2). Other calculations acceptable to the enforcing agency which use the minimum size member for the tributary load shall be acceptable.*

<p><b>Tier 1 &amp; Tier 2 Voluntary Elective</b></p> <p>Code Page: <b>65</b></p> <p>HCD Guide Page: <b>N/A</b></p>
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<p><b>A4.404.1 LUMBER SIZE Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that size of beams, headers and trimmers are specified per CRC Tables R502.5(1) and R502.5(2) (2010 California Residential Code pp.169-172). <a href="http://ftp.resource.org/codes.gov/bsc.ca.gov/gov.ca.bsc.2010.02.5.html#p169">http://ftp.resource.org/codes.gov/bsc.ca.gov/gov.ca.bsc.2010.02.5.html#p169</a></li> <li>➤ <i>Per A4.404.4, Consider requiring detailed framing documents that specify the location, spacing and sizing of all framing members. Detailed framing documents should include a detailed scope of work with architectural details and/or floor, roof and ceiling framing plans, and exterior wall and interior wall framing elevations.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually inspect the framing. Look for obvious spots where headers/beams/trimmers are used to see if there are obvious possible violations (such as full-sized beams being used for headers in non-structural walls).</li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify detailed cut list and lumber, supplied by general contractor. Cut list should correspond to framing plans, and lumber order should correspond to cut list.</li> </ul>	

**A4.404.2: EFFICIENT FRAMING TECHNIQUES: BUILDING DIMENSIONS AND LAYOUT**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **65**

HCD Guide Page: **N/A**

*Building dimensions and layouts are designed to minimize waste by one or more of the following measures in at least 80 percent of the structure:*

1. *Building design dimensions in 2-foot increments are used.*
2. *Windows and doors are located at regular 16" or 24" stud positions.*
3. *Other methods acceptable to the enforcing agency.*

<b>A4.404.2 BUILDING DIMENSIONS AND LAYOUT Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Use an architectural scale on structural plans to verify that building dimensions can be divided into 2-foot increments.</li> <li>➤ <i>Recommend using an 80% rule: at least 80% of building dimensions can be divided up into 2-foot increments to comply with this measure.</i></li> <li>• Use an architectural scale to verify that windows and doors are located at regular 16" or 24" intervals, corresponding to stud structure.</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify that windows and doors are spaced at regular 16" or 24" intervals, in line with stud structure.</li> </ul>
<p><b><u>Documentation:</u></b> This measure is documented on the plans and/or specifications.</p>	

**A4.404.3: EFFICIENT FRAMING TECHNIQUES: BUILDING SYSTEMS**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **65**

HCD Guide Page: **N/A**

Use premanufactured building systems to eliminate solid sawn lumber whenever possible. One or more of the following premanufactured building systems is used:

1. Composite floor joist or premanufactured floor truss framing
2. Composite roof rafters or premanufactured roof truss framing
3. Panelized (SIPS, ICF or similar) wall framing system
4. Other methods approved by the enforcing agency

<b>A4.404.3 BUILDING SYSTEMS Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that structural plans and specifications indicate use of composite/premanufactured floor or roof framing, or panelized wall framing system.</li> <li>➤ <i>Recommend using an 80% rule: at least 80% of floor or roof framing systems comply with this measure.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify presence of composite or premanufactured floor/roof framing and/or panelized wall systems.</li> <li>➤ <i>Panelized wall systems are easily identifiable. Premanufactured floor/roof framing systems are easiest to verify during rough framing stage. If it is impossible to determine whether installed roof or floor framing system is premanufactured, determine compliance using lumber order or other means.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Review lumber order, supplied by contractor, indicating composite/premanufactured floor or roof framing, or panelized wall framing system.</li> </ul>	

**A4.404.4: EFFICIENT FRAMING TECHNIQUES: PRE-CUT MATERIALS AND DETAILS**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **65**  
HCD Guide Page: **N/A**

*Material lists are included in the plans which specify the material quantity and provide direction for on-site cuts to be made from the material provided. Material lists and direction shall be provided for the following systems:*

1. Floor framing
2. Wall framing
3. Ceiling and roof framing
4. Structural panels and roof sheathing

<b>A4.404.4 PRE-CUT MATERIALS AND DETAILS</b> <b>Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify detailed framing documents in structural plans that specify the location, spacing and sizing of all framing members. Detailed framing documents should include a detailed scope of work with architectural details and/or floor, roof and ceiling framing plans, and exterior wall and interior wall framing elevations.</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <ul style="list-style-type: none"> <li>• Visually observe the jobsite for end cuts and scrap wood materials (cut piles). If there seems to be an excessive amount of scraps, refer to the plans for verification.</li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify detailed cut list and lumber order, supplied by general contractor. Cut list should correspond to framing plans, and lumber order should correspond to cut list.</li> </ul>	

**A4.405.1: MATERIAL SOURCES: PREFINISHED BUILDING MATERIALS**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **65**  
HCD Guide Page: **N/A**

Utilize prefinished building materials which do not require additional painting or staining when possible. One or more of the following building materials that do not require additional resources for finishing are used:

1. Exterior trim not requiring paint or stain
2. Windows not requiring paint or stain
3. Siding or exterior wall coverings which do not require paint or stain

<b>A4.405.1 PREFINISHED BUILDING MATERIALS Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that specifications indicate one or more building materials will be factory-finished and will not require additional paint or stain.</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• At project completion, visually verify that the specified product(s) have been installed and have not been stained or painted.</li> <li>• Cross-check plans or cut sheets to installed products.</li> <li>•</li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Review cut sheets for finishes that do not require additional paint or stain. Cut sheets should be supplied by general contractor.</li> <li>➤ Consider including cut sheets for these products in the Operations and Maintenance Manual.</li> </ul>	

**A4.405.2: MATERIAL SOURCES: CONCRETE FLOORS**

*Floors that do not require additional coverings are used including but not limited to stained, natural or stamped concrete floors.*

<p><b>Tier 1 &amp; Tier 2 Voluntary Elective</b></p> <p>Code Page: <b>65</b></p> <p>HCD Guide Page: <b>N/A</b></p>
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<p><b>A4.405.2 COCRETE FLOORS Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that finish schedule indicates use of finished concrete floors in a significant amount of the home.</li> <li>➤ <i>Recommend at least 15% of the finish floor does not require additional coverings in order to meet the criteria of this measure.</i></li> <li>➤ <i>Note that unconditioned areas of the home should not be included in this calculation (i.e. slab on grade garage or basement floors).</i></li> <li>➤ <i>If concrete floors will be stained and/or sealed, stains and sealers should comply with VOC limits noted in 4.504.2 (Finish material pollutant control).</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify that concrete floors have been installed.</li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• If concrete floors are sealed, review cut sheet for VOC content of stain or sealant used, supplied by general contractor.</li> <li>➤ <i>Include stain or sealant product information in Operations and Maintenance Manual.</i></li> </ul>	

## **SPECIAL SECTION A4.405.3: RECYCLED CONTENT MATERIALS**

The California Green Building Standards Code includes a Tier 1/Tier2 mandatory requirement for the inclusion of recycled content building materials. This laudable prerequisite is a performance based measure; therefore compliance must be documented via a calculation used to determine the percent of material cost that has recycled content value. The calculations require builders to compile the total cost of all construction materials on a project. They then must calculate the weighted average value of materials that contain recycled content materials as a percent of total material cost.

In the opinion of StopWaste.Org, green building measures that target recycled content products can be achieved just as well via a Prescriptive option for residential construction. Therefore, StopWaste.Org offers a new Prescriptive compliance option for this measure in the Tier. The Prescriptive pathway is offered as an optional alternative method for an applicant to document compliance. One or the other will suffice, but not both.

The new Section A4.405.3 with the Prescriptive option is as follows:

- A4.405.3: Recycled Content Materials Performance Approach
- A4.405.3.1: Recycled Content Materials Prescriptive Approach

**A4.405.3: MATERIAL SOURCES: RECYCLED CONTENT  
(Performance Method)**

<p><b>Tier 1 &amp; Tier 2 Requirement</b></p> <p>Code Page: <b>65</b></p> <p>HCD Guide Page: <b>N/A</b></p>
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**PERFORMANCE PATH**

Use materials, equivalent in performance to virgin materials, with postconsumer Or preconsumer recycled content value (RCV) for a minimum of 10 percent of the total value, based on estimated cost of materials on the project. Provide documentation as to the respective values.

- Tier 1.** Not less than a 10 percent recycled content value.  
**Tier 2.** Not less than a 15 percent recycled content value.

<p><b>A4.405.3 RECYCLED CONTENT Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>• Verify that specifications, materials, and supporting cut sheets indicate target recycled content percentage, and recycled content is specified for particular products.</li> <li>➤ Review calculations for accuracy. If pre-consumer or post-consumer is not specified, assume it is pre-consumer. If a material is listed as containing a significant amount of post-consumer recycled content, ask for backup documentation (generally anything over 50% post-consumer recycled content is difficult to achieve).</li> <li>➤ Building materials that often contain recycled content include:                         <ul style="list-style-type: none"> <li>○ Concrete</li> <li>○ Aggregate</li> <li>○ Metal</li> <li>○ Carpet and flooring</li> <li>○ Countertops</li> <li>○ Trim</li> <li>○ Deck materials</li> </ul> </li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <ul style="list-style-type: none"> <li>• Visually verify installed products meet the materials listed in the plans.</li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 and Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>• Review cut sheets for all recycled content products, supplied by general contractor.</li> <li>• Review calculations listing all products with recycled content, prepared by architect or general contractor.</li> <li>➤ Consider including cut sheets for recycled content products in Operations and Maintenance Manual.</li> </ul>	

### A4.405.3.1 MATERIAL SOURCES: RECYCLED CONTENT (Prescriptive Method)

#### OPTIONAL PRESCRIPTIVE PATH

Use materials, equivalent in performance to virgin materials, with preconsumer or postconsumer recycled content value (RCV). Requirements for the Tiers:

- **Tier 1.** Use building materials or components with post-consumer recycled content value (RCV) and achieve a minimum of **4** RCV points for interior or exterior components/materials from **Table 4.405.3.1.1: Recycled Content Component Thresholds, Level A & B**. To be eligible, chosen materials/components must comprise at least 50% of the total quantity of that material/component category installed per building. *Note: Level A materials/components count for 1 point. Level B components count for an additional point for a total of 2 points.*
- **Tier 2.** Use building materials or components with post-consumer recycled content value (RCV) and achieve a minimum of **8** RCV points for interior or exterior components/materials from **Table 4.405.3.1.1: Recycled Content Component Thresholds, Level A & B**. To be eligible, chosen materials/components must comprise at least 50% of the total quantity of that material/component category installed per building. *Note: Level A materials/components count for 1 point. Level B components count for an additional point for a total of 2 points.*

For reference, **Table 4.405.3.1.1 Recycled Content Component Thresholds, Level A & B** is utilized as a reference table to indicate the type of components eligible for compliance, metrics for calculating compliance, and the minimum prescriptive recycled content values per material/component category. **The Recycled Content Worksheet** (Table 4.405.3.1.2) is designed to be used by the applicant as a submittal document. Table 4.405.3.1.2 guides applicants in documenting the selected RCV building materials/components, units of measure (metric), compliance thresholds for both Tiers, and summarizes documentation information to be reviewed by the enforcement agency. It is assumed that additional documentation (cut sheets, invoices, calculations, etc.) will also be kept and/or submitted by the applicant as back-up.

<b>A4.405.3.1 RECYCLED CONTENT PRESCRIPTIVE PATH Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>• Verify that specifications indicate target recycled content materials and percentages, and recycled content is specified for particular products.</li> </ul> <p>➤ <i>Review the Recycled Content Worksheet (Table 4.405.3.2.1) for accuracy.</i></p>	<p><b><u>Onsite Verification:</u></b></p> <ul style="list-style-type: none"> <li>• Visually verify installed products meet the materials listed in the Recycled Content Worksheet Table 4.405.3.2.1.</li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 and Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>• Review cut sheets for all recycled content products, supplied by general contractor.</li> </ul> <p>➤ <i>Include cut sheets for recycled content finish products in Operations and Maintenance Manual.</i></p>	

**Table A4.405.3.1.1: PRESCRIPTIVE PATH OPTIONS**

**Recycled Content Component Thresholds, Level A & B**

*For Tier 1: Achieve a minimum of 4 RCV points from Level A or B*

*For Tier 2: Achieve a minimum of 8 RCV points from Level A or B*

<b>Material/Component (Metric)</b>	<b>Industry Standard Recycled Content (Base case)</b>	<b>Level A Minimum Recycled Content Value (1 RCV point each)</b>	<b>Level B Minimum Recycled Content Value (2 RCV points each)</b>
<b>Aggregate (weight or volume)</b> -Road/driveway/walkway/patio base, fill around French drains or backfill around foundation, backfill behind retaining walls, etc.	25% post-consumer	50% post-consumer	75% post-consumer
<b>Insulation (volume or area)</b> -Fiberglass, cellulose, denim, rock wool, mineral wool	15% post-consumer	30% post-consumer	50% post-consumer
<b>Sheathing (area)</b> -Gypsum board, fiberglass board, fiberboard, MDF, etc.	Any percentage	25% post-consumer	40% post-consumer
<b>Siding (area)</b>	Any percentage	25% post-consumer	40% post-consumer
<b>Roofing (area)</b>	10% post-consumer	20% post-consumer	35% post-consumer
<b>Window Frames (area or linear feet, excluding glass)</b>	Any percentage	15% post-consumer	30% post-consumer
<b>Carpet &amp; Carpet Pad (floor area)</b> Including carpet pad	10% post-consumer	25% post-consumer	30% post-consumer
<b>Resilient Flooring (floor area)</b>	10% post-consumer	25% post-consumer	50% post-consumer
<b>Tiles (floor/wall area)</b> -Ceramic -Glass	10% post-consumer	25% post-consumer	50% post-consumer
<b>Countertops (area)</b>	10% post-consumer	25% post-consumer	50% post-consumer
<b>Decking/patio (area)</b>	15% post-consumer	25% post-consumer	40% post-consumer
<b>Trim (linear feet or board feet)</b>	10% post-consumer	20% post-consumer	35% post-consumer
<b>Exterior Paint (surface area)</b>	10% post-consumer	25% post-consumer	50% post-consumer
<b>Doors (quantity)</b>	10% post-consumer	20% post-consumer	35% post-consumer

Supplemental Verification Guide for the CALGreen Tiers

**TABLE A4.405.3.1.2: PRESCRIPTIVE PATH SAMPLE COMPLIANCE SHEET**

A	B	C	D	E	F	G	H
Component Information	Component Unit of Measure (Metric)	Total Component Quantity	Quantity of post-consumer RCV Compliant Component	Enter the value of D ÷ C	Recycled Content Value (RCV) Percentage	RCV Points Tier 1 = 1 Point, Tier 2 = 2Points	RCV and Proof of Purchase Documentation
<p>Enter components selected for compliance (Minimum 4 RCV points for Tier-1, 8 RCV points for Tier-2) Enter component type, manufacturer, product line &amp; model number (if applicable).</p>	<p>Enter the unit of measure to be used in this calculation.</p>	<p>Enter total amount of the entire component (RCV or not) that is installed on project</p>	<p>Enter the amount of component installed that meets the post-consumer RCV requirement defined in Table A4.405.3.1.1.</p>	<p>The RCV component quantity must be greater than 50% of all installed component category materials to be eligible.</p>	<p>If E is 50% or greater, enter the post-consumer recycled content value for the material/component. Do not include post-industrial or pre-consumer recycled content in this calculation.</p>	<p>Enter number of Points (1 or 2) for the selected material/component</p>	<p>Enter the type of documentation that will be submitted stating compliant percentage of recycled content as defined in Table A.4.405.3.1.1. -AND- Enter the type of documentation that will be submitted to prove purchase.</p>
<p>Ceramic Tile Nathan's Tiles KONA- #123-ABC</p>	<p>Lbs.</p>	<p>1000</p>	<p>500</p>	<p>50%</p>	<p>25% RCV</p>	<p>1 Point</p>	<p>Party Certificate: Scientific Certification Systems #12345N8; Invoice</p>
<p>fiberglass (batts and blown-in)</p>	<p>Area</p>	<p>2400</p>	<p>2400</p>	<p>100%</p>	<p>30% RCV</p>	<p>1 Point</p>	<p>StopWaste.Org Green Insulation Guide; Invoice 4/25/2011</p>

SAMPLE

**A4.405.4: MATERIAL SOURCES: USE OF BUILDING MATERIALS FROM RENEWABLE SOURCES**

**Tier 1 & Tier 2 Requirement**  
 Code Page: **66**  
 HCD Guide Page: **N/A**

One or more of the following materials are manufactured from rapidly renewable sources or agricultural by-products is used:

1. Insulation
2. Bamboo or cork
3. Engineered wood products\*
4. Agricultural based products
5. Solid wood products\*
6. Other products acceptable to the enforcing agency

\*The intent of this section is to utilize building materials and products which are typically harvested within a 10-year or shorter cycle. Engineered or solid wood must be from a rapidly grown species. Most solid lumber will not meet this requirement.

<b>A4.405.4 USE OF BUILDING MATERIALS FROM RENEWABLE SOURCES</b> <b>Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>• Verify that specifications indicate that at least one of the following products will be used:                             <ul style="list-style-type: none"> <li>○ Cellulose Insulation</li> <li>○ Bamboo (flooring)</li> <li>○ Cork (flooring)</li> <li>○ Agricultural-based products such as wheatboard or sunflower board (finish carpentry)</li> <li>○ Other product with 10-year or shorter harvest cycle</li> </ul> </li> <li>➤ <i>Note: Wood in general will not meet the criteria for rapidly renewable. Eucalyptus flooring is sometimes used as an alternative to old-growth hardwoods. However, the harvest cycle for Eucalyptus is about 15 years, too long to technically qualify as “rapidly renewable.”</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <ul style="list-style-type: none"> <li>• Visually verify installation of specified rapidly renewable material.</li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 and Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>• Review cut sheets for all rapidly renewable products, supplied by general contractor. For products other than the 6 products explicitly listed for this measure, cut sheets or other product documentation must indicate 10-year or shorter harvest cycle.</li> <li>➤ <i>Include cut sheets for rapidly renewable finish products in Operations and Maintenance Manual.</i></li> </ul>	

**A4.407.1: WATER RESISTANCE AND MOISTURE  
MANAGEMENT: DRAINAGE AROUND FOUNDATIONS**

*Install foundation and landscape drains which discharge to a dry well, sump, bioswale or other approved on-site location.*

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **66**  
HCD Guide Page: **N/A**

<b>A4.407.1 DRAINAGE AROUND FOUNDATIONS Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that structural, civil, and/or landscape plans indicate drains discharging into dry well, sump, bioswale or other approved on-site location.</li> <li>➤ <i>Best practices for foundation drainage system include:</i> <ul style="list-style-type: none"> <li>○ <i>Perimeter drain for all footings</i></li> <li>○ <i>Waterproof membrane</i></li> <li>○ <i>Deliberate, ventilated drainage panel on exterior of all foundation walls</i></li> <li>○ <i>Bottom of perforated pipe installed below level of basement floor/crawlspace slab; top of pipe should be no more than 6 inches above top of footing</i></li> <li>○ <i>Pipe should be wrapped with filter fabric and surround by clean gravel, crushed stone or recycled aggregate extending 12 inches beyond edge of footing</i></li> <li>○ <i>Drainage should discharge from this perforated pipe to dry well, sump, bioswale or other drainage system at least 10 feet away from foundation.</i></li> </ul> </li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify presence of perforated pipe running to dry well, sump, bioswale or other approved on-site location.</li> <li>➤ <i>Verification of this measure may require two site visits: one after perforated pipe has been installed, and a second visit at project completion when drainage system has been installed.</i></li> </ul>
<p><b><u>Documentation:</u></b> This measure is documented on the plans and/or specifications.</p>	

**A4.407.2: WATER RESISTANCE AND MOISTURE  
MANAGEMENT: ROOF DRAINAGE**

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.

<p><b>Tier 1 &amp; Tier 2 Voluntary Elective</b></p> <p>Code Page: <b>66</b></p> <p>HCD Guide Page: <b>N/A</b></p>
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<p><b>A4.407.2 ROOF DRAINAGE Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>Verify that architectural and landscape plans indicate gutter and downspout system routing roof runoff at least 5 feet away from foundation to landscape drains discharging in dry well, sump, bioswale, rainwater capture system or other approved on-site location.</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>Visually verify installation of gutter and downspout system extending minimum 5 feet from foundation and connected to dry well, sump, bioswale, rainwater capture system or other approved on-site location.</li> </ul>
<p><b><u>Documentation:</u></b> This measure is documented on the plans and/or specifications.</p>	

**A4.407.3: WATER RESISTANCE AND MOISTURE MANAGEMENT: FLASHING DETAILS**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **66**  
HCD Guide Page: **N/A**

Provide flashing details on the building plans which comply with accepted industry standards or manufacturer’s instructions. Details are shown on house plans at all of the following locations:

1. Around windows and doors
2. Roof valleys
3. Deck connections to the structure
4. Roof-to-wall intersections
5. Chimneys to roof intersections
6. Drip caps above windows and doors with architectural projections

<b>A4.407.3 FLASHING DETAILS Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that architectural plans include flashing details for:                             <ul style="list-style-type: none"> <li>○ Windows and doors</li> <li>○ Roof valleys</li> <li>○ Deck connections to the structure</li> <li>○ Roof-to-wall intersections</li> <li>○ Chimneys to roof intersections</li> <li>○ Drip caps above windows and doors with architectural projections</li> </ul> </li> <li>➤ <i>As noted in the code, reference details may be found in the Residential Sheet Metal Guidelines published by the Sheet Metal and Air Conditioning Contractors’ National Association Inc.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify the presence of effective flashing techniques throughout the exterior envelope. Look for obvious possible violations where flashing is missing, non-contiguous, or is not installed in effective shingle fashion.</li> <li>➤ <i>Complete verification of this measure is sometimes difficult to accomplish within the time and functional capacities typically allotted to building inspectors (especially flashing on roofs). This verification should be conducted as well as is reasonably possible and on multiple site visits.</i></li> </ul>
<p><b><u>Documentation:</u></b> This measure is documented on the plans and/or specifications.</p>	

**A4.407.4: WATER RESISTANCE AND MOISTURE  
MANAGEMENT: MATERIAL PROTECTION**

*Protect building materials delivered to the construction site from rain and other sources of moisture.*

**Tier 1 & Tier 2  
Voluntary Elective**  
  
Code Page: **66**  
HCD Guide Page: **N/A**

<b>A4.407.4 MATERIAL PROTECTION Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>Verify that the “General Requirements” section of the specifications includes stipulation that all construction materials being stored onsite must be covered with plastic (or under equivalent cover) and lifted off the ground to avoid moisture absorption.</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>Visit the site multiple times during the construction process to verify that all materials not currently being installed are covered or indoors, and lifted off the ground.</li> <li><i>If visual inspection does not occur at the correct time, consider requesting photos in order to verify compliance.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>Review proof that construction team has been trained to cover construction materials and lift materials off the ground. This documentation could include meeting minutes, training agenda, or inspector presence at training session, and may be supplied by general contractor or developer.</li> </ul>	

**A4.407.5: WATER RESISTANCE AND MOISTURE MANAGEMENT: ICE AND WATER BARRIERS**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: 66  
HCD Guide Page: N/A

**NOTE: This measure is not applicable to Alameda County (Climate Zones 3 & 12).**

*In Climate Zone 16, an ice and water barrier is installed at valley, eaves and wall to roof intersections. The ice and water barrier shall extend at least 24" inside the exterior wall line or as specified by the manufacturer's installation instructions.*

<b>A4.407.5 ICE AND WATER BARRIERS Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• If project is in Climate Zone 16, verify that ice and water barrier is indicated on architectural roof plan details at valley, eaves and wall to roof intersections. Use an architectural scale to verify that this barrier extends at least 2 feet inside the exterior wall line or as specified in manufacturer instructions.</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify that ice and water barrier has been installed and extends at least 2 feet inside the exterior wall line or as specified in manufacturer instructions.</li> <li>➤ <i>If inspector is not legally allowed to climb a ladder or access the roof, this measure may be verified using photography supplied by the contractor or homeowner.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify cut sheet for ice and water barrier, supplied by general contractor or roofing subcontractor.</li> <li>➤ <i>Consider including ice and water barrier cut sheet in Operations and Maintenance Manual.</i></li> </ul>	

**A4.407.6: WATER RESISTANCE AND MOISTURE MANAGEMENT: DOOR PROTECTION**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **66**

HCD Guide Page: **N/A**

*Exterior doors to the dwelling are covered to prevent water intrusion by one or more of the following:*

- 1. An awning at least 4 feet in depth is installed*
- 2. The door is protected by a roof overhang at least 4 feet in depth*
- 3. The door is recessed at least 4 feet*
- 4. Other methods which provide equivalent protection*

<b>A4.407.6 DOOR PROTECTION Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Use architectural scale to verify that architectural plans indicate that door is protected from moisture by one of the following design solutions:                             <ul style="list-style-type: none"> <li>○ Awning at least 4 feet deep</li> <li>○ Roof overhang at least 4 feet deep</li> <li>○ Door recessed at least 4 feet</li> <li>○ Other method providing equivalent protection</li> </ul> </li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify that door is protected from moisture by being inset or covered by a depth of at least 4 feet.</li> </ul>
<p><b><u>Documentation:</u></b> This measure is documented on the plans and/or specifications.</p>	

**A4.407.7: WATER RESISTANCE AND MOISTURE  
MANAGEMENT: ROOF OVERHANGS**

*A permanent overhang or awning at least 2 feet in depth is provided at all exterior walls.*

**Tier 1 & Tier 2  
Voluntary Elective**  
  
Code Page: **66**  
HCD Guide Page: **N/A**

<b>A4.407.7 ROOF OVERHANGS Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Use architectural scale to verify that architectural plans indicate an overhang or awning at least 2 feet deep around all exterior walls (includes gable ends). Overhang distance is measured horizontally from outer edge of fascia board or rafter tail to finish siding (i.e. not to outer edge of gutter).</li> <li>➤ <i>This measure should only apply to buildings up to a maximum three stories, as the overall effect on the building is dramatically reduced.</i></li> <li>➤ <i>A compliance rate of 90% of the roof perimeter is adequate, to allow for a small amount of unusual architectural details.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify that overhang or awning extends 2 feet around all exterior walls (includes gable ends). Overhang distance is measured horizontally from outer edge of fascia board or rafter tail to finish siding (i.e. not to outer edge of gutter).</li> </ul>
<p><b><u>Documentation:</u></b> This measure is documented on the plans and/or specifications.</p>	

**A4.408.1: COSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING: CONSTRUCTION WASTE REDUCTION**

Recycle and/or salvage for reuse a percentage of the nonhazardous construction and demolition debris:

**Code Compliance:** 50 percent diversion or meet a local construction and demolition waste management ordinance, whichever is more stringent.

**Tier 1:** 65 percent diversion.

**Tier 2:** 75 percent diversion.

**Code, Tier 1 & Tier 2 Requirement**

Code Page: **19, 66**

HCD Guide Page: **29**

**Exceptions for CALGreen (could be different for your jurisdiction; visit [www.stopwaste.org/C&D](http://www.stopwaste.org/C&D) for a list of Alameda County C&D ordinances:**

1. Excavated soil and land-clearing debris.
2. Equivalent or alternate waste reduction methods developed by working with local agencies.

<b>A4.408.1 CONSTRUCTION WASTE REDUCTION Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Code Compliance, Tier 1 and Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>• Verify that specifications in the “General Requirements” section includes a Construction Waste Management Plan that specifies a target diversion percentage by weight or volume:                             <ul style="list-style-type: none"> <li>○ <b>Tier 1:</b> 65% diversion</li> <li>○ <b>Tier 2:</b> 75% diversion</li> </ul> </li> <li>➤ Check that the Waste Management Plan identifies the location of recycling facilities.</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <ul style="list-style-type: none"> <li>• Compare the Waste Management Plan to the waste materials collection/infrastructure seen on site.</li> <li>• If the applicant is using single stream (a single type of debris box that collects mixed materials and is sent to a recycling center), then one bin may be acceptable. If the project is source separating, two or more bins (or piles) should be seen onsite.                             <ul style="list-style-type: none"> <li>➤ Look for suspicious omissions in the final C&amp;D recycling report.</li> <li>➤ Regularly remind contractors to keep track of receipts and documentation of waste recycling.</li> </ul> </li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Code Compliance, Tier 1 and Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>• Request monthly waste management summary reports from the contractor. If a mixed facility is being utilized, reference the StopWaste.Org facility survey to determine if the average recycling rate claimed seems plausible.</li> <li>• Provide for the use of electronic WMP filing and submittal via online service. Contact StopWaste.Org for more information in Alameda County.</li> </ul>	

## DIVISION A4.5: ENVIRONMENTAL QUALITY

- **Code Level:** Meet all code measures
- **Tier 1:** Meet all code measures, all required Tier 1 measures, and at least 1 additional measure in Division A4.5
- **Tier 2:** Meet all code measures, all required Tier 1 measures, and at least 1 additional measure in Division A4.5

**A4.504.1: POLLUTANT CONTROL: COMPOSITE WOOD PRODUCTS**

**Code Requirement  
Tier 1 & Tier 2 Elective**

Code Page: **23, 69**

HCD Guide Page: **43**

**Code Compliance:** *Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the building shall meet the requirements for formaldehyde as specified in ARB’s Air Toxics Control Measure for Composite Wood (17 CCR 93120 et seq.), by or before the dates specified in those sections, as shown in Table 4.504.5.*

**Tier 1 and Tier 2 Elective: Early compliance with formaldehyde limits.** *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>4.504.5, A4.504.1 COMPOSITE WOOD PRODUCTS Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Code Compliance:</b></p> <ul style="list-style-type: none"> <li>• Verify that finish material specifications indicate that composite wood products meet ARB Air Toxics Control Measure for Composite Wood by compliance date as noted in Table 4.504.5.</li> </ul> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that finish material specifications indicate that composite wood products meet ARB Air Toxics Control Measure for Composite Wood BEFORE compliance date as noted in Table 4.504.5.</li> <li>OR</li> <li>• Verify that finish material specifications indicate composite wood products are made with NAF resins or ULEF resins.</li> <li>➤ <i>This rule applies to all composite wood products including hardwood plywood, particleboard, medium density fiberboard, thin medium density fiberboard (thickness ≤ 8mm) typically used indoors. Examples of such products include cabinets, shelving, trim, wainscot, built-in seating, doors, balustrades, and finish flooring (not subfloor), etc. The rule does not include furniture or other finished products made of composite wood.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <ul style="list-style-type: none"> <li>• Cross-check finish materials to product specifications. Look for labels on materials or packaging, if possible.</li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Code Compliance, Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>➤ Review cut sheets, supplied by general contractor, to verify at least one of the following:                             <ul style="list-style-type: none"> <li>○ Product certifications and specifications</li> <li>○ Chain of custody certifications</li> <li>○ Other methods acceptable to the enforcing agency</li> </ul> </li> <li>➤ Review completed HCD Guide Composite Wood Product Worksheets, supplied by general contractor or architect, forms PC-13 thru PC-16 from the HCD Guide pages 115-121.</li> </ul>	

**A4.504.2: POLLUTANT CONTROL: RESILIENT FLOORING SYSTEMS**

**Code, Tier 1 & Tier 2 Requirement**  
 Code Page: **23, 69**  
 HCD Guide Page: **43, 155**

*Resilient flooring systems installed in the building shall meet the percentages Specified in this section and comply with the VOC-emission limits defined in the Collaborative for High Performance Schools (CHPS) Low-emitting Materials List or certified under the Resilient Floor Covering Institute (RFCI) FloorScore program.*

- Tier 1.** ≥80 percent of the total area of resilient flooring installed shall comply.
- Tier 2.** ≥90 percent of the total area of resilient flooring installed shall comply.

<b>A4.504.2 RESILIENT FLOORING SYSTEMS Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Code Compliance, Tier 1 and Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>• Verify that finish schedule and resilient flooring specifications indicate a minimum percentage of resilient flooring will have VOC limits as defined by CHPS Low-emitting Materials List or certified under the RFCI FloorScore Program:                             <ul style="list-style-type: none"> <li>○ <b>Code:</b> 50% of resilient floor area</li> <li>○ <b>Tier 1:</b> 80% of resilient floor area</li> <li>○ <b>Tier 2:</b> 90% of resilient floor area</li> </ul> </li> <li>➤ <i>As indicated in the HCD Guide, information regarding CHPS Low-emitting Materials List may be found at <a href="http://www.chspregistry.com/live">www.chspregistry.com/live</a> or <a href="http://www.chps.net/dev/Drupal/node/381">www.chps.net/dev/Drupal/node/381</a>. Information regarding RFCI certified products may be found at <a href="http://www.rfci.com/int_FS-ProdCert.htm">www.rfci.com/int_FS-ProdCert.htm</a>.</i></li> <li>➤ <i>“Resilient Flooring” does not include tile, hardwood, or exposed concrete flooring and is reserved for vinyl, linoleum, rubber, cork and other nontextile flooring materials which have a relatively firm surface, yet characteristically have “give” and “bounce back” to their original surface profile from the weight of objects that compress its surface..</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Code Compliance, Tier 1 and Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>• Visually verify that installed resilient flooring matches specified flooring. If manufacturer information is not clearly visible, verify using product purchase receipts. Cross-check with manufacturer cut sheets.</li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Code Compliance, Tier 1 and Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>• Review cut sheets for resilient flooring, supplied by general contractor</li> <li>• Review completed HCD Guide worksheets for Finish Flooring, supplied by general contractor or architect:                             <ul style="list-style-type: none"> <li>○ PC – 9: Finish Flooring Materials - Product Information (HCD Guide p.107)</li> <li>○ PC – 10: Finish Flooring Materials - Room/Location Matrix (p.109)</li> <li>○ PC – 11: Finish Flooring Materials - Declaration Statement (p.111)</li> <li>○ PC – 12: Finish Flooring Materials (p.113)</li> </ul> </li> <li>➤ <i>Include resilient flooring and adhesives cut sheets in Operations and Maintenance Manual.</i></li> </ul>	

**A4.504.3: POLLUTANT CONTROL: THERMAL INSULATION**

*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.*

**Tier 1 & Tier 2 Requirement**

Code Page: **69**

HCD Guide Page: **156**

**A4.504.3 THERMAL INSULATION  
Verification Procedures & Tips**

**Plan Review:**

**Tier 1 Requirement:**

- Verify that specifications indicate thermal insulation product will be in compliance with the VOC-emission limits defined in Collaborative for High Performance Schools (CHPS) Low-emitting Materials List. (<http://www.chps.net/dev/Drupal/node/445>)

**Tier 2 Requirement:**

- Meet Tier 1 requirement AND verify that specifications indicate thermal insulation product will contain no added formaldehyde (NAF).

**Onsite Verification:**

**Tier 1 and Tier 2 Requirement:**

- Visually verify that specified thermal insulation product has been installed. Cross-check materials manufacturer and product name to plans and cut sheets.

**Documentation:**

**Tier 1 Requirement:**

- Review cut sheets for thermal insulation from general contractor or insulation subcontractor indicating compliance with CHPS Low-emitting Materials List.

**Tier 2 Requirement:**

- Meet Tier 1 requirement AND review cut sheets for thermal insulation from general contractor or insulation subcontractor indicating no added formaldehyde.

**A4.506.1: INDOOR AIR QUALITY AND EXHAUST: FILTERS**

*Filters with a higher value than MERV 6 are installed on central air or ventilation systems. Pressure drop across the filter shall not exceed .1 inches water column.*

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **69**  
HCD Guide Page: **N/A**

<b>A4.506.1 FILTERS</b> <b>Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Verify that central air or ventilation specifications require MERV 6 filter with pressure drop across filter not to exceed .1 inches per water column.</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify that minimum MERV 6 filter has been installed.</li> <li>➤ <i>Building inspectors should become familiar with the design and look of various filter types and their commonly associated MERV ratings. For example: simple flat fiberglass filters will tend to indicate a MERV rating of less than 6, while pleated filters will tend to indicate a MERV rating of 6 or greater.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Review cut sheet for MERV filter, supplied by general contractor or mechanical subcontractor.</li> <li>• Review calculations performed by mechanical engineer indicating that MERV filter will not cause a pressure drop over 0.1 inches per water column.</li> </ul> <p>➤ <i>Include MERV filter cut sheets and instructions on filter changing schedule in Operations and Maintenance Manual.</i></p>	

**A4.506.2: INDOOR AIR QUALITY AND EXHAUST: DIRECT-VENT APPLIANCES**

**Tier 1 & Tier 2  
Voluntary Elective**

Code Page: **69**  
HCD Guide Page: **N/A**

*Direct-vent heating and cooling equipment is utilized if the equipment will be located in the conditioned space or install the space heating and water heating equipment in an isolated mechanical room.*

<b>A4.506.2 DIRECT-VENT APPLIANCES Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• If heating and cooling equipment is located within conditioned space, verify that either:                             <ul style="list-style-type: none"> <li>○ Direct-vent appliances have been specified</li> <li>OR</li> <li>○ Space and water heating equipment is located in an isolated mechanical room</li> </ul> </li> <li>➤ <i>Recommendation: In order to achieve the same effect as a true sealed combustion unit, qualifying units should comply with one of the following criteria:</i> <ul style="list-style-type: none"> <li>➤ <i>True sealed combustion units (i.e. combustion air ducting from the outside)</i></li> <li>➤ <i>Direct-vent appliances have been specified</i></li> <li>➤ <i>Power vented units (i.e., fan driven exhaust vent) in attached garages, in attics, in exterior recessed boxes, or in exterior closets with manufacturer specified outside air vents</i></li> <li>➤ <i>Passive atmospherically vented or natural draft units outside the building (i.e., carport)</i></li> <li>➤ <i>Water heater or furnace is installed on the roof or on outside of exterior wall outside the building envelope</i></li> </ul> </li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• Visually verify that installed equipment is either direct vent or located in an isolated mechanical room.</li> <li>➤ <i>Sealed combustion units replace conventional natural draft or atmospherically vented furnaces and water heaters. Sealed combustion furnaces and water heaters duct outdoor air directly into a sealed jacket around the combustion chamber and then vent it directly outdoors, eliminating the use of house air for combustion. They tend to be high efficiency, condensing units with PVC or stainless steel pipe for vent ducting, although they may also have metal bi-directional (concentric) pipe for vent ducting.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 and Tier 2 Elective:</b></p> <ul style="list-style-type: none"> <li>• If equipment is not located in isolated mechanical room, verify that heating and cooling equipment is direct-vent using cut sheets supplied by general contractor or mechanical subcontractor.</li> <li>➤ <i>Include direct-vent appliances cut sheets in Operations and Maintenance Manual</i></li> </ul>	

# **VOLUME II: NON-RESIDENTIAL CALGREEN TIERS VERIFICATION PROTOCOLS**

## **DIVISION A5.1: PLANNING AND DESIGN**

- **Code Level:** *Meet all code mandatory measures*
- **Tier 1:** *Meet all code mandatory measures, all required Tier 1 prerequisite measures, and select at least 1 additional voluntary elective measure in Division A5.1*
- **Tier 2:** *Meet all code mandatory measures, all required Tier 2 prerequisite measures, and select at least 3 additional voluntary elective measures in Division A5.1*

**A5.103.1: SITE SELECTION: COMMUNITY CONNECTIVITY**

Locate project on a previously developed site within a ½ mile radius of at least ten basic services, as listed in Section A5.103.1, with pedestrian access.

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>88</b></p> <p>BSC Guide Pages: <b>79</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.103.1- COMMUNITY CONNECTIVITY: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance:</b></p> <ul style="list-style-type: none"> <li>• None Required</li> <li>➤ <i>Community Connectivity and site selection is typically documented by General Contractor, Architect or an equivalent licensed professional.</i></li> <li>➤ <i>Online free mapping software can be helpful in documenting local amenities.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance:</b></p> <ul style="list-style-type: none"> <li>• Visually confirm that each qualifying service and residential area is operating and/or located within the half mile radius of the project location.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review a site vicinity plan/map that highlights the half-mile radius, locations and types of qualifying services and location of residential areas in relation to the project location.</li> </ul>	

**A5.103.2: SITE SELECTION: BROWNFIELD, GREYFIELD OR INFILL**

**A5.103.2- BROWNFIELD OR GREYFIELD SITE REDEVELOPMENT OR INFILL AREA DEVELOPMENT  
A5.103.2.1- BROWNFIELD REDEVELOPMENT**

*The development is located on a Brownfield site as defined in Section A5.102 and in accordance with Section A5.103.2.1 or on a Greyfield or infill site as defined in Section A5.102.*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>88</b></p> <p>BSC Guide Pages: <b>80</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.103.2- BROWNFIELD OR GREYFIELD SITE REDEVELOPMENT OR INFILL AREA DEVELOPMENT, A5.103.2.1- BROWNFIELD REDEVELOPMENT: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review documentation for Brownfield, Greenfield or infill sites.</li> <li>➤ <i>Conditions related to site selection is typically documented by General Contractor, Architect or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• None Required</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Verify compliance with any zoning requirements or specific local, state or federal limitations related to Brownfield or Greyfield project sites.</li> </ul> <p><b><u>Brownfield Sites:</u></b></p> <ul style="list-style-type: none"> <li>• Review documentation of ASTM E1903-97 Phase II Environmental Site Assessment or local voluntary cleanup program and indicating site remediation</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• Review documentation defining site as Brownfield by local, state or federal government agency and indicating site remediation</li> </ul> <p><b><u>Greyfield Sites:</u></b></p> <ul style="list-style-type: none"> <li>• Review aerial map or photography of site indicating that at least 50% of site surface area was covered with impervious material prior to construction (per CALGreen definition of “Greyfield site”)</li> </ul> <p><b><u>Infill Sites:</u></b></p> <ul style="list-style-type: none"> <li>• Review aerial map of site indicating site borders and calculation indicating at least 75% of site borders currently developed land for urban uses and remaining 25% borders previously development land for urban uses (per CALGreen definition of “infill site”)</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>• Review permit history (from tax assessor), series of aerial images of site, or other documentation proving that site has not been developed within last 10 years unless by redevelopment agency (per CALGreen definition of “Infill site”)</li> </ul>	

**A5.104.1: SITE PRESERVATION: OPTIMIZE OPEN SPACE**

**A5.104.1- REDUCE DEVELOPMENT FOOTPRINT AND OPTIMIZE OPEN SPACE**

**A5.104.1.1- LOCAL ZONING REQUIREMENT IN PLACE**

**A5.104.1.2- NO LOCAL ZONING REQUIREMENT IN PLACE**

**A5.104.1.3- NO OPEN SPACE REQUIRED IN ZONING ORDINANCE**

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>88</b></p> <p>BSC Guide Pages: <b>81</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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*Optimize open space on the project site in accordance with Sections A5.104.1.1, A5.104.1.2 or A5.104.1.3.*

<p><b>A5.104.1- REDUCE DEVELOPMENT FOOTPRINT AND OPTIMIZE OPEN SPACE, A5.104.1.1- LOCAL ZONING REQUIREMENT IN PLACE, A5.104.1.2- NO LOCAL ZONING REQUIREMENT IN PLACE, A5.104.1.3- NO OPEN SPACE REQUIRED IN ZONING ORDINANCE: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Verify that the construction documents include calculations for open space areas and in accordance with appropriate local zoning ordinance requirements.</li> <li>➤ <i>Conditions related to site selection is typically documented by General Contractor, Architect or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the permit set of plans to confirm that the open space represented in the construction documents is preserved and planted as specified and verify in the field at the project location.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review a site plan that highlights the qualifying open space in relation to the project site area in compliance with the appropriate zoning requirements.</li> </ul>	

**A5.105.1.1: DECONSTRUCTION AND REUSE OF EXISTING STRUCTURAL ELEMENTS**

*Maintain at least 75 percent of existing building structure (including structural floor and roof decking) and envelope (exterior skin and framing) based on surface area.*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>88</b></p> <p>BSC Guide Pages: <b>82</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.105.1.1- EXISTING BUILDING STRUCTURE: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the plans and calculations performed to establish the 75% minimum requirement for existing building structural components.</li> <li>• Request and review a list of shell attributes; include element ID's and the total area of new, existing, and reused elements. Verify that the list includes an explanation for excluding various building elements.</li> <li>• Request and review a demolition, site or building plan showing calculations performed to establish the 75% minimum requirement.</li> <li>➤ <i>Structural reuse calculations are typically documented by the architect working with the structural engineer.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Confirm that the appropriate building structural elements have been left in place as indicated on the permit set of plans.</li> <li>➤ <i>If the project team plans to salvage materials:</i></li> <li>➤ <i>Look for stockpiled materials to be salvaged at early inspection visits.</i></li> <li>➤ <i>If materials are not stockpiled, ask for documentation of where the deconstructed materials were sent.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• This measure is documented on the plans and/or specifications.</li> <li>➤ <i>Policy Recommendation: Where project scopes include the demolition of existing buildings, consider imposing a 15-day waiting period after issuance of demolition permit to allow time for deconstruction of valuable items.</i></li> </ul>	

**A5.105.1.2: DECONSTRUCTION AND REUSE OF EXISTING NON-STRUCTURAL ELEMENTS**

*Reuse existing interior nonstructural elements (interior walls, doors, floor coverings and ceiling systems) in at least 50 percent of the area of the completed building (including additions).*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>88</b></p> <p>BSC Guide Pages: <b>82</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.105.1.2- EXISTING NON STRUCTURAL ELEMENTS: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Request and review a list of interior nonstructural elements; include element ID's and the total area of new, existing, and reused elements.</li> <li>• Review calculations performed to establish that at least 50% of the area of the completed building integrates the reuse of existing interior nonstructural elements. Cross-check the list of materials used in the calculations to the architectural plans.</li> <li>➤ <i>Reused non-structural building elements are typically documented by the architect and general contractor.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Confirm that the reuse materials have been integrated and reused on the project as shown in the plans.</li> <li>➤ <i>If the project team plans to salvage materials:</i></li> <li>➤ <i>Look for stockpiled materials to be salvaged at early inspection visits.</i></li> <li>➤ <i>If materials are not stockpiled, ask for documentation of where the deconstructed materials were sent.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• This measure is documented on the plans and/or specifications.</li> <li>➤ <i>The following materials are often salvaged for reuse:</i> <ul style="list-style-type: none"> <li>○ <i>Light fixtures</i></li> <li>○ <i>Carpet</i></li> <li>○ <i>Plumbing fixtures</i></li> <li>○ <i>Doors and trim</i></li> <li>○ <i>Masonry</i></li> <li>○ <i>Electrical devices</i></li> <li>○ <i>Appliances</i></li> <li>○ <i>Acoustical ceiling tiles</i></li> </ul> </li> <li>➤ <i>Policy Recommendation: Where project scopes include the demolition of existing buildings, consider imposing a 15-day waiting period after issuance of demolition permit to allow time for deconstruction of valuable items.</i></li> </ul>	

**A5.105.1.3: DECONSTRUCTION AND REUSE OF EXISTING STRUCTURES: SALVAGE ITEMS**

*Salvage additional non-structural items in good condition. Document the weight or number of the items salvaged.*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>88</b></p> <p>BSC Guide Pages: <b>82</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.105.1.3- SALVAGE: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Verify the calculations performed to establish the salvage weight or number of items salvaged for a given project.</li> <li>• Review the permit set of plans and confirm that the salvaged materials have been identified and salvaged properly.</li> <li>➤ <i>Salvaged building elements are typically documented by General Contractor, Architect or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Look for stockpiled materials to be salvaged at early inspection visits.</li> <li>• If materials are not stockpiled, ask for documentation of where the deconstructed materials were sent.</li> <li>➤ <i>If the project is reusing deconstruction materials/fixtures on-site, verify characteristics of the materials/fixtures are within the published limits of the applicable code (energy, plumbing, electrical, etc.) AND that these materials/fixtures are accounted for in the energy/water budget calculations for code compliance and Tier compliance.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review a tracked summary log of salvaged material by type, quantity of each type and amount of each type.</li> <li>• Request and review photo documentation in conjunction with the tracked log for salvaged items.</li> </ul>	

**A5.106.2.1: SITE DEVELOPMENT: STORM WATER RUNOFF RATE AND QUANTITY**

*Implement a storm water management plan resulting in no net increase in rate and quantity of storm water runoff from existing to developed conditions.*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>88-89</b></p> <p>BSC Guide Pages: <b>83</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.106.2.1- STORM WATER RUNOFF RATE AND QUANTITY: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the construction documents for stormwater Best Management Practices (BMP's) to be implemented onsite.</li> <li>• Review the Storm Water Management Plan that complies with local regulations for pre and post development conditions for required storm events and reflects zero net increase in runoff.</li> <li>• Review runoff rate quantity and the amounts that each BMP is designed to handle.</li> </ul> <p>➤ <i>Storm water runoff rate calculations are typically documented by a Civil Engineer.</i></p>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Verify that onsite stormwater treatment controls or strategies meet design criteria as noted in plans.</li> </ul>
<p><b><u>Documentation:</u></b></p> <p>➤ <i>Include maintenance requirements (if any) into the operations and maintenance manual.</i></p>	

**A5.106.2.2: SITE DEVELOPMENT: STORM WATER RUNOFF QUALITY**

*Use post-construction treatment control best management practices (BMPs) to mitigate (infiltrate, filter or treat) storm water runoff from the 85th percentile 24-hour runoff event (for volume-based BMPs) or the runoff produced by a rain event equal to two times the 85th percentile hourly intensity (for flow-based BMPs).*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>88-89</b></p> <p>BSC Guide Pages: <b>83</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.106.2.2- STORM WATER RUNOFF QUALITY: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the construction documents for Best Management Practices/Low Impact Development strategies (BMP's/LID) to control the storm water runoff rate quality and the amounts that each BMP is designed to handle.</li> <li>➤ <i>Storm water runoff quality BMP's are typically documented by Civil Engineer or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the permit set of plans and verify that onsite treatment controls meet design criteria.</li> <li>• Review the operations and maintenance manual for recommendations of ongoing compliance.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review a Storm Water Management Plan that complies with local regulations for pre and post development conditions for required storm events.</li> <li>• Request and review integration into the operations and maintenance manual and review for compliance in accordance with Storm Water Management Plan.</li> <li>• Request photo documentation of BMP's/LID during storm event.</li> </ul>	

**A5.106.3: SITE DEVELOPMENT: LOW IMPACT DEVELOPMENT (LID)**

**TIER 1 & TIER 2 VOLUNTARY ELECTIVE**  
 Code Page: **89**  
 BSC Guide Pages: **84**  
 Reference  
 Tables Code Page: **N/A**

*Reduce peak runoff in compliance with Section 5.106. Employ at least two LID strategies, as noted in Section A5.106.3, or other best management practices to allow rainwater to soak into the ground, evaporate into the air or collect in storage receptacles for irrigation or other beneficial uses.*

<b>A5.106.3- LOW IMPACT DEVELOPMENT (LID): Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Follow verification protocol in conjunction with sections A5.106.2.2 and A5.106.2.1,</li> <li>• Verify that the compliant measures included in the construction documents have been incorporated in the site design.</li> <li>• Verify compliance with EPA and local Regional Water Quality Control Board mitigation measures required for LID.</li> <li>➤ <i>Low impact development (LID) strategies are typically documented by Civil Engineer, General Contractor or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the permit set of plans and verify that on site control measures meet with design criteria noted in the plans.</li> <li>➤ <i>Examples of LID strategies include, but are not limited to:</i> <ul style="list-style-type: none"> <li>○ <i>Bioretention (rain gardens);</i></li> <li>○ <i>Cisterns and rain barrels;</i></li> <li>○ <i>Green roofs meeting the structural requirements of the building code;</i></li> <li>○ <i>Roof leader disconnection;</i></li> <li>○ <i>Permeable and porous paving;</i></li> <li>○ <i>Vegetative swales and filter strips;</i></li> <li>○ <i>tree preservation;</i></li> <li>○ <i>Volume retention suitable for previously developed sites.</i></li> </ul> </li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review a narrative describing the LID strategy employed and the design and operation of each LID strategy.</li> <li>• Verify that the LID strategies are integrated into the operation and control manual.</li> <li>• Request photo documentation of LID strategies integrated on the project.</li> </ul>	

**A5.106.4.3: SITE DEVELOPMENT: CHANGING ROOMS**

Comply only with Section A5.106.4.3. For buildings with over 10 tenant-occupants, provide changing/shower facilities in accordance with Table A5.106.4.3 or document arrangements with nearby changing/shower facilities.

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>89</b></p> <p>BSC Guide Pages: <b>85</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.106.4.3- CHANGING ROOMS: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the construction documents to confirm changing rooms/shower facilities are included in the project. Ask for marked-up copy if changing areas are not clearly labeled.</li> <li>• Review occupancy calculations in conjunction with Section A5.303 to determine the appropriate amount of changing facilities required.</li> <li>➤ <i>Changing rooms should provide privacy for users and preferably will not compete for restroom space, especially in situations where only a single restroom (per gender) is available to occupants.</i></li> <li>➤ <i>Changing rooms are typically documented by the Architect.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Visually verify that changing rooms are adequate and provide enough privacy for effective use.</li> <li>• Verify specifications for the shower equipment in conjunction with requirements for Section A5.303.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review occupancy calculations for each occupant type and verify compliance for quantity in accordance with Table A5.106.4.3</li> </ul>	

**A5.106.5.1: SITE DEVELOPMENT: DESIGNATED PARKING FOR FUEL EFFICIENT VEHICLES**

Provide designated parking with stall markings for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles per section A5.106.5.1 and as shown in Table A5.106.5.1.1 or A5.106.5.1.2. For Tier 1, provide 10 percent of total parking spaces. For Tier 2, provide 12 percent of total parking spaces.

<p><b>TIER 1 &amp; TIER 2 PREREQUISITE</b></p> <p>Code Page: <b>89</b></p> <p>BSC Guide Pages: <b>86</b></p> <p>Reference Tables Code Page: <b>90</b></p>
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<p><b>A5.106.5.1- DESIGNATED PARKING FOR FUEL EFFICIENT VEHICLES: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Code Compliance, Tier 1 &amp; Tier 2</b></p> <ul style="list-style-type: none"> <li>• Count total quantity of parking spaces on plans.</li> <li>• Determine number required for compliant percentage of “clean air vehicle” parking spaces (8 percent (Mandatory Code), 10 percent (Tier 1) or 12 percent (Tier 2) as outlined in tables A5.106.5.1.1 and A5.106.5.1.2.</li> <li>• Determine if project has compliant percentage of “clean air vehicle” stalls.</li> <li>➤ <i>Although not required, locating parking stalls close to the main entrance is a preferable option to help reinforce participation.</i></li> <li>➤ <i>Parking design and calculations are typically documented by Architect or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Code Compliance, Tier 1 &amp; Tier 2</b></p> <ul style="list-style-type: none"> <li>• Review the permit plans to identify locations and quantity of “Clean Air Vehicle” parking stalls.</li> <li>• Review project parking space capacity and determine what minimum amount is required for appropriate Tier as outlined in tables A5.106.5.1.1 and A5.106.5.1.2.</li> <li>• Verify that a compliant number of parking spaces are marked as “Clean Air Vehicle” parking stalls, as outlined in table A5.106.5.1.1 and A5.106.5.1.2. (8 percent (Mandatory Code), 10 percent (Tier 1) or 12 percent (Tier 2)).</li> <li>➤ <i>Check that the stall markings characters are at least 8 inches in height and that the lower edge of the last word aligns with the end of the stall striping and is visible beneath a parked vehicle.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• This measure is documented on the plans and/or specifications.</li> </ul>	

**A5.106.5.3: SITE DEVELOPMENT: ELECTRIC VEHICLE CHARGING**

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>90</b></p> <p>BSC Guide Pages: <b>87</b></p> <p>Reference Tables Code Page: <b>90</b></p>
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**A5.106.5.3- ELECTRIC VEHICLE CHARGING  
A5.106.5.3.1- ELECTRIC VEHICLE SUPPLY WIRING**

*Provide facilities meeting Section 406.7 (Electric Vehicle) of the California Building Code and provide one 120 VAC 20 amp and one 208/240 V 40 amp, grounded AC outlets or panel capacity and conduit installed for future outlets for each space required in Table A5.106.5.3.1.*

<p><b>A5.106.5.3- ELECTRIC VEHICLE CHARGING, A5.106.5.3.1- ELECTRIC VEHICLE SUPPLY WIRING: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Request and review occupancy calculations for each occupant type and verify compliance for charging station quantity requirements.</li> <li>• Review site plan and electrical plans for the number of stalls dedicated to have electric vehicle charging stations and the installation method, including the type of wiring used and the amperage required for that condition in compliance with Title 24, (120 VAC 20 amp and one 208/240 V 40 amp, grounded AC outlets or panel capacity and conduit installed for future outlets).</li> </ul> <p>➤ <i>Electric vehicle charging stations and supplying wiring is typically documented by the Electrical Engineer or Architect.</i></p>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the permit set of plans and verify that onsite electric vehicle charging stations have been installed on the site or parking garage in accordance with design criteria.</li> </ul>
<p><b><u>Documentation:</u></b></p> <p>➤ <i>Request and review charging station manufacturer information and consider integrating information into the Operations and Maintenance Manual.</i></p>	

**A5.106.6: SITE DEVELOPMENT: PARKING CAPACITY**

**A5.106.6- PARKING CAPACITY  
A5.106.6.1- REDUCE PARKING CAPACITY**

*Design parking capacity to meet but not exceed minimum local zoning requirements. With the approval of the enforcement authority, employ strategies to reduce on-site parking area by use of on street parking or compact spaces, illustrated on the site plan or implementation and documentation of programs that encourage occupants to carpool, ride share or use alternate transportation.*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>90</b></p> <p>BSC Guide Pages: <b>88</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.106.6- PARKING CAPACITY, A5.106.6.1- REDUCE PARKING CAPACITY: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Request and review site plans for location and configuration of parking spaces, which could include on street parking, a mix of standard and compact spaces or other approved strategies.</li> <li>• Cross-check local zoning requirements and verify that the project does not exceed minimums.</li> <li>➤ <i>Parking capacity and reduction strategies are typically documented by the Architect.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the permit set of plans and verify that the parking capacity and/or reduction strategies shown in the design have been carried out in construction and integrated into the operation and maintenance manual.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• This measure is documented on the plans and/or specifications along with zoning requirements backup documentation.</li> <li>➤ <i>Consider including the mitigation strategies in the Operations and Maintenance Manual.</i></li> </ul>	

**A5.106.7: SITE DEVELOPMENT: EXTERIOR WALL SHADING**

Meet requirements in the current edition of the California Energy Code and provide vegetative or man-made shading devices for east, south, and west-facing walls with windows or use wall surfacing with minimum SRI 25 (aged), for 75 percent of opaque wall areas.

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>90</b></p> <p>BSC Guide Pages: <b>89</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.106.7- EXTERIOR WALL SHADING Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review landscape design plans and specifications to ensure that the species of plants and man-made shading devices meet the shading requirements for exterior wall surfaces.</li> <li>➤ <i>Exterior wall shading is typically documented by Landscape Architect, General Contractor, Architect, or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the permit set of plans and verify design criteria shown reflects the estimated height and shading percentage of building area for appropriate directional facing walls as implemented on the project.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review manufacturer cutsheets of the products for man-made shading devices and verify their compliance with SRI 25 (aged) value.</li> <li>➤ <i>Some examples of manmade shading devices include: Overhangs, adjustable vertical louvers, awnings and retractable exterior curtains. SRI values can vary and should be determined through manufacturer documentation of the surface application that is utilized.</i></li> <li>• Request and review energy software program compliance forms (if different than the Title 24, Part 6 Energy Report) that may serve as documentation source for the efficacy of exterior shading and/or solar reflectance.</li> </ul>	

**A5.106.9: SITE DEVELOPMENT: BUILDING ORIENTATION**

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>90-91</b></p> <p>BSC Guide Pages: <b>90</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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*Orient the building with the long sides facing north and south; protect the building from thermal loss, drafts and degradation of the building envelope caused by wind and wind-driven materials such as dust, sand, snow and leaves with building orientation and landscape features.*

<p><b>A5.106.9 BUILDING ORIENTATION Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Request and review a narrative describing the strategies taken for the employment of passive solar design principles and appropriate building orientation.</li> <li>• Request and review any model calculations contributing to the passive design strategies implemented on the project for compliance with CALGreen and Title 24.</li> <li>• Verify that the building is oriented with the long sides facing north and south.</li> <li>• Request and review a marked-up copy of the landscape plans that highlights how the design will protect the building from drafts and wind.</li> </ul> <p>➤ <i>For square building shapes, this measure should not be possible.</i></p>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Visually verify that the strategies indicated on the marked-up plans for wind protection are implemented onsite (if applicable).</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• This measure is documented on the plans and/or specifications.</li> </ul>	

**A5.106.11: SITE DEVELOPMENT: HEAT ISLAND & HARDSCAPE ALTERNATIVES**

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>91</b></p> <p>BSC Guide Pages: <b>91-92</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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**A5.106.11- HEAT ISLAND EFFECT  
A5.106.11.1- HARDSCAPE ALTERNATIVES**

*Use one or a combination of strategies to provide shade (mature within 5 years of occupancy), use light colored/ high-albedo materials, use open-grid pavement system) for 50 percent of site hardscape, or put 50 percent of parking underground.*

<p><b>A5.106.11- HEAT ISLAND EFFECT, A5.106.11.1- HARDSCAPE ALTERNATIVES: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review site/landscape plans that show application of hardscape material with a calculation representing at least a 50% area for alternatives to hardscape material.</li> <li>➤ <i>Heat island hardscape alternatives are typically documented by Landscape Architect, General Contractor, Architect, or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the permit set of plans and verify that hardscape alternatives are constructed as calculated.</li> <li>• Check product data sheets for materials contributing to high albedo compliance and verify that such materials are installed on the project.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review documentation of all materials and their SRI values contributing to high albedo.</li> <li>• Request accountability form from builder, developer, architect, etc... stating that a specific product or material specified is actually installed on the project to prove compliance with this measure.</li> </ul>	

**A5.106.11.2: SITE DEVELOPMENT: COOL ROOF**

Use roofing materials that have a minimum 3-year aged solar reflectance and thermal emittance that complies with Sections A5.106.11.2.1 and A5.106.11.2.2 or a minimum aged Solar Reflectance Index (SRI) that complies with Section A5.106.11.2.3 and is compliant with Tables A5.106.11.2.1 or A5.106.11.2.2.

<p><b>TIER 1 &amp; TIER 2 PREREQUISITE</b></p> <p>Code Page: <b>91 &amp; 92</b></p> <p>BSC Guide Pages: <b>91-92</b></p> <p>Reference Tables Code Page: <b>91</b></p>
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<p><b>A5.106.11.2- COOL ROOF: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Code Compliance, Tier 1 &amp; Tier 2</b></p> <ul style="list-style-type: none"> <li>• Verify that plans and specifications indicate Roofing materials will have minimum 3-year aged solar reflectance and thermal emittance values as follows:                             <ul style="list-style-type: none"> <li>○ <b>Tier 1:</b> ≥ the values in Table A5.106.11.2.1</li> <li>○ <b>Tier 2:</b> ≥ the values in Table A5.106.11.2.2</li> </ul> </li> </ul> <p><b><u>OR:</u></b></p> <ul style="list-style-type: none"> <li>• Roofing materials have a Solar Reflectance Index values as follows:                             <ul style="list-style-type: none"> <li>○ <b>Tier 1:</b> ≥ the values in Table A5.106.11.2.1</li> <li>○ <b>Tier 2:</b> ≥ the values in Table A5.106.11.2.2</li> </ul> </li> <li>➤ <i>Although not required, the operation and maintenance manual should incorporate the product manufacturer documentation information for future reference.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Code Compliance, Tier 1 &amp; Tier 2</b></p> <ul style="list-style-type: none"> <li>• Review the plans and product manufacturer documentation to ensure that cool roof materials and strategies indicated have been installed and/or implemented on the project.</li> <li>• Verify that the roof design for slope and SRI values are compliant with the appropriate Tier, as outlined in Tables A5.106.11.2.1 or A5.106.11.2.2.</li> <li>➤ <i>Since cool roof materials can look similar to standard roofing, verify this measure by visually verifying product labels at site visits. During inspection, look for material/product packaging and remaining products that can indicate the actual material/product installed and/or implemented on the project.</i></li> </ul>
<p><b><u>DOCUMENTATION:</u></b></p> <ul style="list-style-type: none"> <li>• Review manufacturer documentation indicating Solar Reflectance Index value for products used.</li> </ul> <p><b><u>Solar Reflectance and Thermal Emittance:</u></b></p> <ul style="list-style-type: none"> <li>• If Cool Roof Rating Council (CRRC) testing for 3-year aged reflectance for roofing products is not available request applicant submits CRRC certified calculation of the 3-year aged value</li> </ul> <p><b><u>Solar Reflectance Index (SRI):</u></b></p> <ul style="list-style-type: none"> <li>• If SRI information is not available from the manufacturer, request that the applicant submit a calculation of SRI using the SRI Calculation Worksheet (SRI-WS) available by contacting the Energy Standard Hotline at 1-800-772-3300 or by email at <a href="mailto:Title24@energy.state.ca.us">Title24@energy.state.ca.us</a>. Verify for compliance with appropriate Tier.</li> <li>➤ <i>Include cool roof product cut sheets in Operations and Maintenance Manual.</i></li> </ul>	

## **DIVISION A5.2: ENERGY EFFICIENCY**

- **Code Level:** *Meet all code mandatory measures*
- **Tier 1:** *Meet all code mandatory measures and required Tier 1 prerequisite Performance Approach measure in Division A5.2*
  - *Any Energy Efficiency Prescriptive Approach voluntary elective measure in Division A5.2 may be selected to comply with Tier 1 requirement to select 1 additional voluntary elective measure from any Division, A5.1 through A5.5.*
- **Tier 2:** *Meet all code mandatory measures and required Tier 2 prerequisite Performance Approach measure in Division A5.2*
  - *Any Energy Efficiency Prescriptive Approach voluntary elective measure in Division A5.2 may be selected to comply with Tier 2 requirement to select 3 additional voluntary elective measure from any Division, A5.1 through A5.5.*

**A5.203.1: PERFORMANCE APPROACH: ENERGY PERFORMANCE**

<b>TIER 1 &amp; TIER 2 PREREQUISITE</b>
Code Page: <b>95</b>
BSC Guide Page: <b>93</b>
Reference Tables Code Page: <b>N/A</b>

Using an Alternative Calculation Method approved by the California Energy Commission to calculate each nonresidential building's TDV energy and CO2 emissions, and compare it to the standard or "budget" building. Exceed California Energy Code requirement (Title 24, Part 6- 2008 Energy Efficiency Standards) by 15 percent (Tier 1) or 30 percent (Tier 2)

<b>A5.203.1- ENERGY PERFORMANCE: Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Code Compliance, Tier 1 &amp; Tier 2</b></p> <ul style="list-style-type: none"> <li>• Verify that the plans and specifications include complete Title 24, Part 6 Energy Reports to prove energy code compliance for appropriate Tier percentage reduction (Tier 1 = 15% reduction; Tier 2 = 30% reduction). Verify in accordance with the associated voluntary elective measures selected.</li> <li>• Ensure that the Energy Report includes actual building components and HVAC systems included in the final building design (simulation off plans at least at 100% CD's). For best results, have applicants integrate the Title 24, Part 6 Energy Report into the plan set (not as a separate document).</li> <li>➤ <i>Energy efficiency compliance calculations are typically documented by Mechanical and Electrical Engineer, Energy Modeler, Commissioning Agent or an equivalent licensed professional and are included in the Permit Set.</i></li> <li>➤ <i>For similar types of compliance verification recommendations and calculations, refer to LEED NC-2009- Energy and Atmosphere Credit 1- Optimize Energy Performance.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Code Compliance, Tier 1 &amp; Tier 2</b></p> <ul style="list-style-type: none"> <li>• Review the permit set of plans and energy compliance documents against the features installed on the project (HVAC, windows, insulation, roofing, lighting, controls, etc...) to ensure that they are specified and compliant.</li> <li>➤ <i>To aid in cross-checking, encourage project teams to integrate the Title 24, Part 6 Energy Report directly into the plan set.</i></li> <li>➤ <i>Confirm that non-residential HERS compliance form (CF-4R-MECH) has been completed and shows verification of regulations and is compliant.</i></li> <li>➤ <i>Review Functional Performance Testing (FPT) load testing sequence to verify actual system performance against the model predictions as noted in the Title 24 Reports. Load testing is not typically included in functional performance testing, so this depends on whether or not the owner/developer outlines testing sequence in the specifications.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Review that the alternative calculation method selected by applicant to compare the Time Dependant Valuation (TDV) Energy and CO2 Emissions against the standard or "budget" building, is an approved method by the California Energy Commission.</li> </ul>	

**A5.204.1: ENERGY EFFICIENCY: PRESCRIPTIVE APPROACH: EQUIPMENT & APPLIANCES**

*All equipment and appliances provided by the builder shall be ENERGY STAR labeled if ENERGY STAR is applicable to that equipment or appliance type.*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>95</b></p> <p>BSC Guide Pages: <b>94</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.204.1- ENERGY STAR EQUIPMENT AND APPLIANCES: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Verify (cross-check cut sheets to schedules on plans, if any) that equipment and appliance specifications indicate at least ENERGY STAR for applicable appliances. Typically ENERGY STAR is applied to:             <ul style="list-style-type: none"> <li>○ Commercial refrigerators, clothes washers, dishwashers, etc...</li> <li>○ Commercial food service equipment</li> <li>○ HVAC equipment</li> <li>○ Lighting</li> <li>○ Computers and Electronics</li> </ul> </li> <li>• ENERGY STAR product lists can be found at <a href="http://www.energystar.gov">www.energystar.gov</a>. Click on “Business &amp; Government” under “find ENERGY STAR products.”</li> <li>• <i>ENERGY STAR equipment and appliances are typically documented by the Owner/Developer, General Contractor, or Architect</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Verify permit set of plans and/or energy compliance documents and make sure the equipment and appliances specified to be ENERGY STAR or their equivalents are installed in the building as noted in the design.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review a narrative describing the quantity and type of ENERGY STAR certified appliances and equipment. For non-ENERGY STAR purchased items, applicants should prove that no ENERGY STAR item exists for such application up to permit issue date.</li> </ul>	

**A5.204: PRESCRIPTIVE APPROACH: ENERGY MONITORING**

**A5.204.2- ENERGY MONITORING**

**A5.204.2.1- DATA STORAGE**

**A5.204.2.2- DATA ACCESS**

*Provide sub-metering or equivalent combinations of sensor measurements and thermodynamic calculations, if appropriate, to record energy use data for each major energy system in the building. The data management system must be capable of electronically storing energy data and creating user reports showing hourly, daily, monthly and annual energy consumption for each major energy system. Hourly energy use data shall be accessible through a central data management system and must be available daily.*

**TIER 1 & TIER 2  
VOLUNTARY ELECTIVE**

Code Page: **96**

BSC Guide Pages: **95**

Reference  
Tables Code Page: **N/A**

**A5.204.2- ENERGY MONITORING;  
A5.204.2.1- DATA STORAGE;  
A5.204.2.2- DATA ACCESS:  
Verification Procedures & Tips**

**Plan Review:**

**Tier 1 & Tier 2 Compliance**

- Verify that the plans and specifications include sub-metering equipment capable of electronic data storage.
- Verify that a centrally accessible data management system is included in the scope of work.
- *Energy monitoring typically includes: chillers, heat pumps, packaged AC systems, fans, pumps, cooling towers, boilers and other heating systems, lighting systems, and process loads (elevators, pumps, etc.).*
- *Energy monitoring is typically documented by the Commissioning Agent or Mechanical Engineer.*
- *For similar types of compliance verification recommendations and design parameters, refer to LEED NC-2009: Energy and Atmosphere Prerequisite 1- Fundamental Commissioning Building Energy Systems; Credit 3- Enhanced Commissioning; and Credit 5.1 & 5.2- Measurement and Verification- Base Building and Tenant Sub-metering*

**Onsite Verification:**

**Tier 1 & Tier 2 Compliance**

- Verify performance through onsite data verification (nameplate data and data logging techniques) for less complex systems.
- Review supporting calculations of calibrated whole-building simulation using the installed monitored parameters and established methodology as outlined for the selected option in the IPMVP.
- *Sub-metering should record energy use data for each major energy system in the building, including: chillers, heat pumps, packaged AC systems, fans, pumps, cooling towers, boilers and other heating systems, lighting systems, and process loads.*

**Documentation:**

- Request, review and verify supporting calculations of calibrated whole-building simulation using the installed monitored parameters and established methodology as outlined for the selected option of the International Performance Measurement and Verification Protocol (IPMVP 2002)
- Request equipment manufacturer cutsheets and verify specifications for performance accuracy.

**A5.204.3: PRESCRIPTIVE APPROACH: DEMAND RESPONSE**

**A5.204.3.1- HVAC**

**A5.204.3.2- LIGHTING**

**A5.204.3.3- SOFTWARE CLIENTS**

*HVAC systems with Direct Digital Control Systems and centralized lighting systems shall include preprogrammed demand response strategies that are automated with either a Demand Response (DR) Automation Internet Software Client or dry contact relays. The preprogrammed demand response strategies should be capable of reducing the peak HVAC demand by cooling temperature set point adjustment AND should be capable of reducing the total lighting load by a minimum 30 percent through dimming control or bi-level switching. The software clients will be capable of communicating with a DR Automation Server*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>96</b></p> <p>BSC Guide Pages: <b>96</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.204.3- DEMAND RESPONSE</b>  <b>A5.204.3.1- HVAC</b>  <b>A5.204.3.2- LIGHTING</b>  <b>A5.204.3.3- SOFTWARE CLIENTS:</b>  <b>Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Verify that plans and specifications include demand response controls. Review control diagrams, circuiting/wiring, and load schedules for the appropriate amounts of controlled power demand reduced for each type of system.</li> <li>➤ <i>Demand response is typically documented by the Commissioning Agent, Mechanical Engineer, or Electrical Engineer.</i></li> <li>➤ <i>For similar types of compliance verification recommendations and design parameters, refer to LEED NC-2009: Energy and Atmosphere Prerequisite 1- Fundamental Commissioning Building Energy Systems; Credit 3- Enhanced Commissioning; and Credit 5.1 &amp; 5.2- Measurement and Verification- Base Building and Tenant Sub-metering</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Verify that demand response controls, as specified in the construction documents, are installed.</li> <li>• Using the Sequence of Operations (SOO), verify demand response equipment has shutdown and specified electrical load has been curtailed via electrical load monitoring. In other words, verify during an event (something that triggers demand response) that the appropriate equipment is still running per the SOO.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>➤ <i>Consider enrollment in local utility or utility sponsored demand response program and provide evidence of enrollment.</i></li> </ul>	

**A5.211.1: RENEWABLE ENERGY: ON-SITE RENEWABLE ENERGY**

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>126</b></p> <p>BSC Guide Pages: <b>97</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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**A5.211.1- ON-SITE RENEWABLE ENERGY  
A5.211.1.1- DOCUMENTATION**

*Use on-site renewable energy for at least 1 percent of the electrical service over-current protection device rating calculated in accordance with the 2007 California Electrical Code or 1KW, whichever is greater, in addition to the electrical demand required to meet 1 percent of natural gas and propane use calculated in accordance with the 2007 California Plumbing Code. Using a calculation method approved by the California energy Commission, calculate the renewable on-site energy system to meet the requirements of Section A5.211.1, expressed in kW.*

<p><b>A5.211.1- ON-SITE RENEWABLE ENERGY A5.211.1.1- DOCUMENTATION Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Verify that the on-site renewable energy system is specified in the construction documents and verify the system sizing calculations and generation for compliance.</li> <li>➤ <i>On-site renewable energy is typically documented by Commissioning Agent, Mechanical Engineer, Electrical Engineer or an equivalent licensed professional.</i></li> <li>➤ <i>For similar types of compliance verification recommendations and design parameters, refer to LEED NC-2009: Energy and Atmosphere Credit 2- On-Site Renewable Energy</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the construction documents and specifications of the on-site renewable energy system for size and generation quantity and verify that system installed is system specified in plans.</li> <li>• Verify that the on-site renewable energy system is functional.</li> <li>➤ <i>System functioning verification should be crossed checked with Commissioning Agent report or by a separate PV meter if system is compatible.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Verify that the output of the on-site renewable energy system is metered with either a standalone performance meter or inverter-integrated meter for measurement of the system’s performance. Verify for compliance against the Title 24 report.</li> <li>• Request a narrative describing the on-site renewable energy system, fuel type, total annual energy generation.</li> <li>• Request and review on-site renewable system calculations to meet the requirements of Section A5.211.1. Verify that net-metering is factored in if offered by local utility on an annual basis</li> <li>➤ <i>Include the on-site renewable energy system manufacturer information in the Operations and Maintenance Manual</i></li> </ul>	

**A5.211.3: RENEWABLE ENERGY: GREEN POWER**

*If offered by local utility provider, participate in a renewable energy portfolio program that provides a minimum of 50% electrical power from renewable sources. Maintain documentation through utility billings.*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>127</b></p> <p>BSC Guide Pages: <b>98</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.211.3- GREEN POWER: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Request and review utility electricity bill documenting enrollment in a renewable energy program that covers 50% of overall power usage.</li> <li>• Request and review purchase agreement or contract with third party qualified utility partner (Green-E certified is the best standard) to show compliance as substitute for utilities renewable portfolio participation.</li> <li>➤ <i>Green Power is typically documented by Owner/Developer/Tenant via Energy Contract Supplier.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• No onsite verification required.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>➤ <i>Consider including recommendations to continue with the Green Power purchasing program in the Operations and Maintenance Manual.</i></li> </ul>	

**A5.211.4: RENEWABLE ENERGY: PRE-WIRING**

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>127</b></p> <p>BSC Guide Pages: <b>99</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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**A5.211.4: PRE-WIRING FOR FUTURE SOLAR**  
**A5.211.4.1: OFF-GRID PREWIRING FOR FUTURE SOLAR**

*Install conduit from the building roof or eave to a location within the building identified as suitable for future installation of a charge controller (regulator) and inverter. If battery storage is anticipated, conduit should run to a location within the building that is stable, weather-proof, insulated against very hot and very cold weather and isolated from occupied spaces.*

<p><b>A5.211.4- PRE-WIRING FOR FUTURE SOLAR, A5.211.4.1- OFF-GRID PREWIRING FOR FUTURE SOLAR: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Verify that the construction documents show the location and specifications for the conduit(s) to be installed for pre-wiring. Consider space allocation for inverters and other ancillary equipment in the mechanical room/electrical panel area on the project.</li> <li>• Verify that sizing parameters of conduit will accommodate future solar systems and cable fill-factor for up to 100% of the buildings energy demand needs.</li> <li>➤ <i>Batteries for storage of electricity should be anticipated in extending conduit to an appropriate location in the building for off grid installation.</i></li> <li>➤ <i>For ease in regular washings of PV panels, recommend applicants to install a pre-plumbed and live hose bib on the roof, or at least provide sleeved chases for future plumbing hookups that would not require roof penetration.</i></li> <li>➤ <i>Pre-wiring for future solar installation is typically documented by the Electrical Engineer or Architect.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Verify that the location of pre-wiring conduit reflects the plans and specifications for the project</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• This measure is documented on the plans and/or specifications.</li> </ul>	

**A5.212.1: ELEVATORS, ESCALATORS AND OTHER EQUIPMENT**

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: 127</p> <p>BSC Guide Pages: 100</p> <p>Reference Tables Code Page: N/A</p>
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**A5.212.1- ELEVATORS AND ESCALATORS**  
**A5.212.1.1- CONTROLS**

*In buildings with more than one elevator or two escalators, provide controls to reduce the energy demand of elevators for part of the day and escalators to reduce speed when no traffic is detected. Document the controls in the project specifications and commissioning plan. Controls that reduce energy demand shall meet requirements of CCR, Title 8, Chapter 4, Subchapter 6 and shall not interrupt emergency operations for elevators required in CCR, Title 24, Part 2, California Building Code*

<b>A5.212.1- ELEVATORS AND ESCALATORS,                      A5.212.1.1- CONTROLS:                      Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the construction documents for elevator and/or escalator specifications that include features for energy-savings (regenerative drive escalators and elevators where traction elevators are specified).</li> <li>• Verify compliance with Title 8 and Title 24, Part 2.</li> <li>➤ <i>Elevators, escalators and controls are typically documented by Mechanical and Electrical Engineer, Architect, or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Verify the elevators, escalators and controls specified are installed on the project as intended and are operating as designed. Cross reference to the permit set of plans and/or deferred approval submittal.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review manufacturer data and specifications for elevators and/or escalator information submitted separately as a deferred approval.</li> </ul>	

**A5.213.1: ENERGY EFFICIENT STEEL FRAMING**

*Design steel framing for maximum energy efficiency. Techniques for avoiding thermal bridging in the envelope include: Exterior rigid insulation; Designing for steel studs with large holes in the stud web ; Spacing the studs as far as possible while maintaining the structural integrity of the structure; Detailed design of intersections of wall openings and building intersections of floors, walls and roofs.*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>127</b></p> <p>BSC Guide Pages: <b>101</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.213.1- STEEL FRAMING: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the plans and specifications for energy efficiency measures taken with the steel framing system and cross check for compliance with Parts 2 and 6 of Title 24.</li> <li>➤ <i>Review the Title 24, Part 6 Energy Report for evidence of external insulation. ENV-1-C report describes in detail the wall assemblies under the Opaque Surfaces section.</i></li> <li>➤ <i>Steel framing is typically documented by the Structural Engineer, General Contractor, or Architect.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Visually verify for steel framing insulation or other energy efficiency techniques in steel framing as outlined in the BSC Guide. Cross-check to the permit set of plans and/or the Title 24, Part 6 Energy Report for actual exterior insulation amounts (if any).</li> <li>➤ <i>A framing inspection may reveal any steel material conservation measures, and an additional inspection to examine envelope and detailing may be advisable.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review a narrative describing the techniques utilized to mitigate thermal bridging in compliance with Parts 2 and 6 of Title 24. Cross-check with structural plans.</li> </ul>	

## **DIVISION A5.3: WATER EFFICIENCY AND CONSERVATION**

- **Code Level:** *Meet all code mandatory measures*
- **Tier 1:** *Meet all code mandatory measures, all required Tier 1 prerequisite measures, and select at least 1 additional voluntary elective measure in Division A5.3*
- **Tier 2:** *Meet all code mandatory measures, all required Tier 2 prerequisite measures, and select at least 3 additional voluntary elective measures in Division A5.3*

**A5.303.2.3: INDOOR WATER USE: PERCENT SAVINGS**

**A5.303.2.3.1- TIER 1 – 30 PERCENT SAVINGS**

**A5.303.2.3.2- TIER 2 – 35 PERCENT SAVINGS**

*Reduce overall use of potable water within the building for toilets, urinals, lavatories, showerheads, kitchen faucets and wash fountains per Section 5.303.2 and as shown in Tables A5.303.2.2 (performance method) and A5.303.2.3.1 (prescriptive method).*

**TIER 1 & TIER 2  
PREREQUISITE**

Code Page: **130**

BSC Guide Pages: **102-103**

Reference  
Tables Code Page: **131**

<b>A5.303.2.3.1- TIER 1 – 30 PERCENT SAVINGS, A5.303.2.3.2- TIER 2 – 35 PERCENT SAVINGS: Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Code Compliance, Tier 1 &amp; Tier 2</b></p> <ul style="list-style-type: none"> <li>• If the <u>prescriptive method</u> is selected, verify <i>fixture</i> compliance in accordance with Table A5.303.3.2.1. Cross-check and verify the specifications of fixtures for the flush and flow rates provided per manufacturer cut-sheets.</li> <li>• If the <u>performance method</u> is selected, verify <i>occupant</i> figures to validate usage rates and verify compliance in accordance with Table A5.303.2.2. Cross-check and verify the specifications of fixtures for the flush and flow rates provided per manufacturer cut-sheets.</li> <li>➤ <i>Indoor plumbing design and calculations are typically documented by Plumbing Engineer or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Code Compliance, Tier 1 &amp; Tier 2</b></p> <ul style="list-style-type: none"> <li>• Visually confirm that fixtures installed have the correct flush and flow rates as specified in construction documents.</li> <li>• If flow rates are not stamped on the fixtures, cross-check to the fixture schedule and cutsheets to verify manufacturer and model number.</li> <li>• If flow rate cannot be verified through installation documentation or manufacturer label, verify flow rate using flow test.</li> <li>• Verify installation and rate reduction for flow control devices. Permanent flow control valves are independent of faucet model, but must be verified by: a) observation under sink for installed reducer and b) manufacturer information stating flow control valve flow rate.</li> <li>• <i>A flow test performed by the inspector may also be used as an acceptable alternative method of verification for installed fixtures and control devices.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Review documentation (manufacturer literature) for plumbing fixtures model, MaP/UNAR testing or certification results and flush and flow rates.</li> <li>• For flow control devices, request and review documentation of flow limiters (aerators or other flow restrictor built into the faucet) with manufacturer data showing flow rates of faucets (cut sheets).</li> <li>• Request and review a narrative or worksheet that calculates the average flow rate for all plumbing fixtures (total quantity, flow rate for each type, and average flush rate calculation) unless zero-water models are selected, at which point only the final in field verification is required. Pre-rinse spray valves need documentation from manufacturer showing flow rate.</li> </ul>	

**A5.303.2.3.3: INDOOR WATER USE: 40 PERCENT SAVINGS**

Reduce the overall use of potable water within the building by 40 percent through plumbing fixtures and fittings. A calculation demonstrating a 40 percent reduction in the building “water use baseline” as established in Table A5.303.2.2 shall be provided.

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>130</b></p> <p>BSC Guide Pages: <b>102-103</b></p> <p>Reference Tables Code Page: <b>131</b></p>
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<p><b>A5.303.2.3.3- 40 PERCENT SAVINGS: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Code Compliance, Tier 1 &amp; Tier 2</b></p> <ul style="list-style-type: none"> <li>• If <u>the prescriptive method</u> is selected, verify fixture compliance in accordance with Table A5.303.3.2.1. Verify the specifications of fixtures for the flush and flow rates provided per manufacturer cut-sheets.</li> <li>• If <u>the performance method</u> is selected, verify occupant figures to validate usage rates and verify compliance in accordance with Table A5.303.2.2. Verify the specifications of fixtures for the flush and flow rates provided per manufacturer cut-sheets.</li> <li>➤ <i>Recommend for applicants to include water use calculations within the plans (not as a separate report) for ease in field verification.</i></li> <li>➤ <i>Indoor plumbing design and calculations are typically documented by the Plumbing Engineer or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Code Compliance, Tier 1 &amp; Tier 2</b></p> <ul style="list-style-type: none"> <li>• Visually confirm that fixtures installed have the correct flush and flow rates as specified in construction documents</li> <li>• If flow rates are not stamped on the fixtures, cross-check to the fixture schedule and cutsheets to verify manufacturer and model number.</li> <li>• For flow control devices, inspector will conduct field compliance verification of installation and rate reduction for control devices. Permanent flow control valves are independent of faucet model, but must be verified by: a) observation under sink for installation of reducer, and b) manufacturer information stating flow rate of flow control valve installed.</li> <li>➤ <i>If other verification is not available, and upon the enforcement agency’s discretion, a flow test performed by the inspector may also be used as an acceptable alternative method of verification for installed fixtures and control devices.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Review documentation (manufacturer literature) for plumbing fixtures model, MaP/UNAR testing or certification results and flush and flow rates.</li> <li>• For flow control devices, request and review documentation of flow limiters (aerators or other flow restrictor built into the faucet) with manufacturer data showing flow rates of faucets (cut sheets).</li> <li>• Request and review a narrative or worksheet that calculates the average flow rate for all plumbing fixtures (total quantity, flow rate for each type, and average flush rate calculation) unless zero-water models are selected, at which point only the final in field verification is required. Pre-rinse spray valves need documentation from manufacturer showing flow rate.</li> </ul>	

**A5.303.3: INDOOR WATER USE: APPLIANCES**

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>131</b></p> <p>BSC Guide Pages: <b>104</b></p> <p>Reference Tables Code Page: <b>131</b></p>
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*Clothes washers shall have a maximum Water Factor (WF) that will reduce the use of water by 10 percent below the California Energy Commissions' WF standards for commercial clothes washers located in Title 20 of the California Code of Regulations. Dishwashers shall meet the water use standards in Table A5.303.3. Ice makers shall be air cooled. Food steamers shall be connection-less or boiler-less. The use and installation of water softeners that discharge to the community sewer system shall be limited or prohibited by local agencies if certain conditions are met.*

<p><b>A5.303.3- APPLIANCES: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the plans and specifications to verify that each appliance type specification meets the compliance criteria:             <ul style="list-style-type: none"> <li>○ Clothes washers</li> <li>○ Dishwashers</li> <li>○ Ice makers</li> <li>○ Food steamers</li> <li>○ Water softeners</li> </ul> </li> <li>➤ <i>Any deferred approvals should be checked for compliance.</i></li> <li>➤ <i>Indoor plumbing design and calculations are typically documented by Plumbing Engineer or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the permit set of plans to verify that the specified water-using appliances are installed on project as noted in the plans.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Review the fixture specifications or approved substitutions to verify compliance or accept self-certification form.</li> <li>• Request and review the manufacturer cutsheets and specifications to verify the installed equipment is noted construction docs and plans.</li> </ul>	

**A5.303.5: INDOOR WATER USE: DUAL PLUMBING**

*New buildings and facilities shall be dual plumbed for potable and recycled water systems for toilet flushing if/when recycled water is available as determined by the enforcement authority.*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>132</b></p> <p>BSC Guide Pages: <b>105</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.303.5- DUAL PLUMBING: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the plans and specifications to verify that the dual plumbing standards in the 2010 California Plumbing Code, Chapter 16A, Division II are used in the design.</li> <li>➤ <i>Dual plumbing design and calculations are typically documented by Plumbing Engineer or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the permit set of plans to verify that the dual piping is installed and labeled as specified and in accordance with the plumbing code.</li> <li>➤ <i>If recycled water is immediately intended for use in the project, and not just pre-plumbed, the inspector (or an approved special inspector) should witness any testing of the system as required by the plumbing code and collect the results of any tests.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review sample testing results of recycled water to verify compliance with local jurisdiction turbidity and sanitation levels.</li> <li>• Request testing results of potable water to verify that no cross contamination has occurred.</li> <li>• Request and review a narrative describing the design and operation of the recycled water system and manufacturer specification information of system.</li> </ul>	

**A5.304.4: OUTDOOR WATER USE: POTABLE WATER REDUCTION**

*Provide water efficient landscape irrigation design that reduces the use of potable water beyond the initial requirements for plant installation and establishment in accordance with Section A5.304.4.1 or A5.304.4.2.*

<p><b>TIER 1 &amp; TIER 2 PREREQUISITE</b></p> <p>Code Page: <b>132</b></p> <p>BSC Guide Pages: <b>107-108</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.304.4- POTABLE WATER REDUCTION: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Code Compliance, Tier 1 &amp; Tier 2</b></p> <ul style="list-style-type: none"> <li>Review landscape irrigation plans for specifications of irrigation design and strategy used to meet reduction target as described for Tier 1 and Tier 2.</li> </ul> <p><b><u>Tier 1:</u></b></p> <ul style="list-style-type: none"> <li>Potable water reduction does not exceed 60% of ETo times the landscape area.</li> </ul> <p><b><u>Tier 2:</u></b></p> <ul style="list-style-type: none"> <li>Potable water reduction does not exceed 55% of ETo times the landscape area</li> <li>Request and review the water budget for accurate calculations against local ordinances and/or MLO and the increased reduction percentages in compliance with associated Tier.</li> <li>Request and review the MLO or local ordinance compliance forms for accurate reduction compliance.</li> <li>➤ <i>Landscape irrigation design and calculations are typically documented by Landscape Architect or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Code Compliance, Tier 1 &amp; Tier 2</b></p> <ul style="list-style-type: none"> <li>Verify that landscape design strategies on the project site are as specified in plans and submitted documentation.</li> <li>➤ <i>Check for gross errors in the field, such as turf installed where groundcover was specified, or spray type heads installed everywhere (instead of drip).</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>Request accountability form signed from landscape architect/irrigator or irrigation plans that specifies the water budget, plant types, alternative reduction strategies (recycled rainwater, rainwater harvesting) and equipment types used to meet reduction target.</li> <li>➤ <i>Include a list of plants and care instructions in Operations and Maintenance Manual</i></li> </ul>	

**A5.304.5: OUTDOOR WATER USE: POTABLE WATER ELIMINATION**

**TIER 1 & TIER 2 VOLUNTARY ELECTIVE**  
 Code Page: **132**  
 BSC Guide Pages: **109**  
 Reference  
 Tables Code Page: **N/A**

*Provide a water efficient landscape irrigation design that eliminates the use of potable water beyond the initial requirements for plant installation and establishment. Methods used to accomplish the requirements of this section must be designed to the requirements of the California Building Standards Code and shall include, but not be limited to: Plant coefficient, Irrigation efficiency and Distribution Uniformity, Use of captured rainwater, Use of recycled water, Water treated for irrigation purposes and conveyed by a water district or public entity, Use of graywater.*

<b>A5.304.5- POTABLE WATER ELIMINATION: Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• If not clearly evident on plans, request and review a narrative describing the landscape design and alternative strategies utilized to eliminate potable water use.</li> <li>• Review the construction documents for landscape plans and specifications for landscape materials that prove potable water elimination.</li> <li>• Verify that any alternate source of water for irrigation meets applicable local, regional or state standards.</li> <li>➤ <i>Strategies for potable water elimination design are typically documented by Landscape Architect or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>➤ Visually verify that installed landscaping matches the planned landscape. Check for gross errors in the field, such as turf installed where groundcover was specified, or spray type heads installed everywhere.</li> <li>• Review the permit set of plans for the landscaping or alternative source of irrigation water and make sure that landscaping materials and/or irrigation sources (or lack thereof) are installed as shown in the plans.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• This measure is typically documented on the plans and/or specifications.</li> </ul>	

**A5.304.6: OUTDOOR WATER USE: RESTORATION OF DISTURBED AREAS**

**A5.304.6 - RESTORATION OF AREAS DISTURBED BY CONSTRUCTION**

*Restore all landscape areas disturbed during construction by planting with local adaptive and/or noninvasive vegetation.*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>132</b></p> <p>BSC Guide Pages: <b>110</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.304.6- RESTORATION OF AREAS DISTURBED BY CONSTRUCTION: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the landscape plans. Identify “disturbed” areas and remediation strategies, if possible.</li> <li>➤ <i>Strategies of outdoor water use for restoration of areas disturbed by construction are typically documented by Landscape Architect or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Visually note disturbed areas of the site which will be vegetated post-construction.</li> <li>• Review the permit set of plans for landscaping and verify that the plants specified are planted in the locations as noted, checking to make sure that disturbed areas are covered.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review a list noting all native plant species selected and planted. Incorporate species information in the operations and maintenance manual including maintenance practices and pests that they could possibly harbor.</li> <li>• Request and review that plants selected are in fact native species and identified as such by the local jurisdiction in which the project site is located.</li> </ul>	

**A5.304.7: OUTDOOR WATER USE: PREVIOUSLY DEVELOPED SITES**

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>132</b></p> <p>BSC Guide Pages: <b>110</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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*On previously developed or graded sites restore or protect at least 50% of the site area with adaptive and/or non-invasive vegetation. Projects complying with Section A5.106.3, Item 3 may apply vegetated roof surface to this calculation if the roof plants meet the definition of adaptive and non-invasive. The building footprint area is excluded from the calculation*

<p><b>A5.304.7- PREVIOUSLY DEVELOPED SITES: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the landscape plans and specifications and verify the calculations for 50% coverage with adaptive/non-invasive plantings.</li> <li>• Request and review a site map noting the boundaries of and planting locations of native plants.</li> <li>• Request and review that plants selected are in fact native species and identified as such by the local jurisdiction in which the project site is located.</li> <li>• Incorporate species information in the operations and maintenance manual including maintenance practices and pests that they could possibly harbor.</li> <li>➤ <i>Strategies and calculations of outdoor water use for previously developed sites design are typically documented by Landscape Architect or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the permit set of plans for the landscaping and verify that the plants specified are planted in the locations identified as previously developed or graded areas.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• This measure is typically documented on the plans and/or specifications.</li> </ul>	

**A5.304.8: OUTDOOR WATER USE: GRAYWATER IRRIGATION SYSTEM**

*Install a graywater collection system for onsite subsurface irrigation using graywater collected from bathtubs, showers, bathroom wash basins and laundry water. See Appendix G, 2010 California Plumbing Code.*

**TIER 1 & TIER 2 VOLUNTARY ELECTIVE**  
 Code Page: 132  
 BSC Guide Pages: 110  
 Reference: **Appendix G, 2010 California Plumbing Code**

<b>A5.304.8- GRAYWATER IRRIGATION SYSTEM: Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Request and review any and all manufacturer information for the graywater irrigation system and verify schematics for capacity and estimated usage needs.</li> <li>• Review the construction documents for the graywater system piping plan and the component specifications.</li> <li>• Verify that the graywater system for irrigation meets applicable local, regional or state standards (California Plumbing Code Appendix G).</li> <li>➤ <i>Graywater irrigation system design and calculations are typically documented by Plumbing Engineer, Landscape Architect or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Cross-check with the plans that the graywater system is installed as shown in the drawings, using the specified components.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Verify that system information is included in the operations and control manual.</li> </ul>	

## **DIVISION A5.4: MATERIAL CONSERVATION**

- **Code Level:** *Meet all code mandatory measures*
- **Tier 1:** *Meet all code mandatory measures, all required Tier 1 prerequisite measures, and select at least 1 additional voluntary elective measure in Division A5.4*
- **Tier 2:** *Meet all code mandatory measures, all required Tier 2 prerequisite measures, and select at least 3 additional voluntary elective measures in Division A5.4*

**A5.404.1: ENERGY EFFICIENT FRAMING: WOOD FRAMING**

*Employ Advanced Wood Framing Techniques, or Optimal Value Engineering (OVE) as recommended by the US Department of Energy's Office of Building Technology, State and Community Programs and as permitted by the enforcing agency. The OVE selected shall not conflict with structural framing methods or fire-rated assemblies.*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>135</b></p> <p>BSC Guide Pages: <b>112-113</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.404.1- WOOD FRAMING: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Request and review detailed drawings, down to the level of individual framing members, in order to verify that any Optimal Value Engineering (OVE) measures are done in accordance with the innovative developing practices employed and other requirements of Title 24.</li> <li>• Verify in specifications that alternative material specifications for OVE Techniques have been identified: such as drywall thickness, insulation thickness, sheathing thickness and nail spacing and size.</li> <li>➤ <i>OVE categories include:</i> <ul style="list-style-type: none"> <li>○ <i>Dimensional design and Layout</i></li> <li>○ <i>Material selection and purchase</i></li> <li>○ <i>Delivery and on-site storage</i></li> <li>○ <i>Framing techniques</i></li> <li>○ <i>Waste and Disposal</i></li> </ul> </li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review and verify that the permit set of plans outlines all measures taken toward this goal and that the strategies employed are succinct as drawn and specified.</li> <li>➤ <i>The level of inspection will likely be in proportion to the level of details specified in the construction documents.</i></li> <li>➤ <i>Advanced Wood Framing or (OVE) Techniques Include:</i> <ul style="list-style-type: none"> <li>○ <i>Building design using 2-foot modules</i></li> <li>○ <i>Spacing wall studs up to 24 inches on center</i></li> <li>○ <i>Spacing floor and roof framing members up to 24 inches on center</i></li> <li>○ <i>Using 2-stud corner framing and drywall clips or scrap lumber for drywall backing</i></li> <li>○ <i>Eliminating solid headers in non-load-bearing walls</i></li> <li>○ <i>Using in-line framing, aligning floor, wall and roof framing members vertically for direct transfer of loads</i></li> <li>○ <i>Using single lumber headers and top plates where appropriate</i></li> </ul> </li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review a narrative describing the OVE strategies utilized throughout the project.</li> </ul>	

**A5.405.1: MATERIAL SOURCES: REGIONAL MATERIALS**

*Compared to other products in a given product category, select building materials or products for permanent installation on the project that have been harvested or manufactured in California or within 500 miles of the project site. For those materials locally manufactured, select materials manufactured using low embodied energy or those that will result in net energy savings over their useful life. Regional materials shall make up at least 10%, based on cost, of total materials value. If regional materials make up only part of a product, their values are calculated as percentages based on weight.*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>135</b></p> <p>BSC Guide Pages: <b>114</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.405.1- REGIONAL MATERIALS: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Request and review documentation of the origin, net projected energy savings, and value of regional materials.</li> <li>• Verify that 10% of total material costs are from a regionally defined source and review cost sheets (receipts or supply orders) for values. <i>(If only part of the product is a regional material, their values are calculated as percentages based on weight.)</i></li> <li>• Request and review manufacturer/harvested material information to verify compliance with regional distance.</li> <li>➤ <i>Regional Materials are typically documented by the Architect or General Contractor Architect.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Cross-check the regional materials calculations to actual installed materials on the project.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• This measure is documented on the plans and specifications.</li> </ul>	

**A5.405.2: MATERIAL SOURCES: BIO-BASED, CERTIFIED WOOD, RAPIDLY RENEWABLE**

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: 136</p> <p>BSC Guide Pages: 115</p> <p>Reference Tables Code Page: <b>N/A</b></p>
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**A5.405.2- BIO-BASED MATERIALS  
A5.405.2.1- CERTIFIED WOOD  
A5.405.2.2- RAPIDLY RENEWABLE MATERIALS**

*Select bio-based building materials and products made from solid wood, engineered wood, bamboo, wool, cotton, cork, straw, natural fibers, products made from crops (soy-based, corn-based) and other bio-based materials with at least 50% bio-based content. For Rapidly renewables, use materials made from plants harvested within a ten-year cycle for at least 2.5% of total materials value, based on estimated cost.*

<p><b>A5.405.2- BIO-BASED MATERIALS; A5.405.2.1- CERTIFIED WOOD, A5.405.2.2- RAPIDLY RENEWABLE MATERIALS: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>Request and review a list that identifies the percentage of certified wood in each purchase.</li> <li>Review the construction documents for the bio-based materials specified and calculations showing that estimated materials values for bio-based materials is at least 2.5% and that materials are composed of at least 50% bio-based content.</li> <li>Request and review a compiled list of rapidly renewable product purchases, the associated manufacturer information, material costs, the percentage of each rapidly renewable product by weight and the compliant value.</li> <li><i>Recommend using Forest Stewardship Council (FSC) Certified Wood as a reference standard equivalent.</i></li> <li><i>Bio-based materials are typically documented by General Contractor, Architect, or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>Verify that materials/products specified in the construction documents are installed on the project.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>Request and review an unbroken chain-of-custody (C-O-C) certification for the all FSC certified wood on the project, per item, and any other third party certificates for bio-based products.</li> </ul>	

**A5.405.3: MATERIAL SOURCES: REUSED MATERIALS**

*Use salvaged, refurbished, refinished, or reused materials (materials that gathered off-site and used on the project) for a minimum of 5% of the total value, based on estimated cost of materials on the project. Provide documentation for the calculated materials value of salvaged products on the project.*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>136</b></p> <p>BSC Guide Pages: <b>116</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.405.3- REUSED MATERIALS: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Request and review a list of actual material costs for “re-used” material, excluding labor and equipment.</li> <li>• Review the construction documents to verify that the reused materials specified and calculated for 5% of estimated materials value is accurate and meets compliance criteria.</li> <li>• <i>Reused materials are typically documented by General Contractor, Architect, or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• If the project is using salvaged/reused materials/fixtures, verify characteristics of the materials/fixtures are within the published limits of the applicable code (energy, plumbing, electrical, etc.) AND that these materials/fixtures are accounted for in the energy/water budget calculations for code compliance and Tier compliance.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review manufacturer specifications for each material identified as “re-used” and verify it meets criteria defined under section A5.405.3.</li> </ul>	

**A5.405.4: MATERIAL USE: RECYCLED CONTENT**

**A5.405.4- TIER 1 RECYCLED CONTENT- 10 PERCENT  
A5.405.4.1- TIER 2 RECYCLED CONTENT- 15 PERCENT**

Use materials, equivalent in performance to virgin materials, with postconsumer or preconsumer recycled content value (RCV), based on estimated cost of materials on the project. Provide documentation as to the respective values. For Tier 1, achieve (RCV) for a minimum of 10 percent of the total value. For Tier 2, achieve (RCV) for a minimum of 15 percent of the total value.

<p><b>TIER 1 &amp; TIER 2 PREREQUISITE</b></p> <p>Code Page: <b>136</b></p> <p>BSC Guide Pages: <b>117</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.405.4- TIER 1 RECYCLED CONTENT- 10 PERCENT A5.405.4.1- TIER 2 RECYCLED CONTENT- 15 PERCENT: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Code Compliance, Tier 1 &amp; Tier 2</b></p> <ul style="list-style-type: none"> <li>• Verify that the construction documents specify the reused materials and show recycled content values (RCV) as indicated by calculations.</li> <li>• Verify that RCV calculations are accurate and comply with appropriate Tier.</li> <li>➤ <i>Review calculations for accuracy. If pre-consumer or post-consumer is not specified, assume it is pre-consumer. If a material is listed as containing a significant amount of post-consumer recycled content, ask for backup documentation (generally anything over 50% post-consumer recycled content is difficult to achieve).</i></li> <li>➤ <i>Building materials that often contain recycled content include:</i> <ul style="list-style-type: none"> <li>○ <i>Concrete and aggregate</i></li> <li>○ <i>Metal</i></li> <li>○ <i>Insulation</i></li> <li>○ <i>Carpet and flooring</i></li> <li>○ <i>Acoustical ceiling tiles</i></li> <li>○ <i>Countertops</i></li> </ul> </li> <li>➤ <i>Materials with recycled content value and calculations are typically documented by the General Contractor.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Code Compliance, Tier 1 &amp; Tier 2</b></p> <ul style="list-style-type: none"> <li>• Verify installation of the recycled content material as specified. Cross-check manufacturer label to specifications/finish schedule for the following items in particular: <ul style="list-style-type: none"> <li>○ <i>Insulation</i></li> <li>○ <i>Carpet and flooring</i></li> <li>○ <i>Countertops</i></li> <li>○ <i>Trim</i></li> <li>○ <i>Acoustical ceiling tile</i></li> </ul> </li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review the manufacturer cutsheets, specifications, supply invoice, or other documentation for recycled content values. Review calculations to ensure the compliance thresholds are met for the appropriate tier percentage.</li> <li>➤ <i>Include cut sheets for recycled content finish products in Operations and Maintenance Manual.</i></li> </ul>	

**A5.405.5: MATERIAL SOURCES: CEMENT & CONCRETE**

**A5.405.5 CEMENT AND CONCRETE**

**A5.405.5.1- CEMENT**

**A5.405.5.2- CONCRETE**

**A5.405.5.2.1- SUPPLEMENTARY CEMENTITIOUS MATERIALS**

**A5.405.5.2.1.1- MIX DESIGN EQUATION**

*Use cement and concrete made with recycled products and complying with Sections A5.405.5.1 through A5.405.5.2.1.1.*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: 136</p> <p>BSC Guide Pages: 118-119</p> <p>Reference Tables Code Page: N/A</p>
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<p><b>A5.405.5- CEMENT AND CONCRETE</b></p> <p style="text-align: center;">:</p> <p><b>Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Verify that cement and calculations of supplementary cementitious materials (SCMs) utilized on the project are noted in the specifications and comply with mix design equation noted in section A5.405.5.2.1.1.</li> <li>• Verify that Portland Cement complies with ASTM C 150 and/or Blended Cement complies with either ASTM C 595 or ASTM 1157.</li> <li>• Verify that at least one of the following (SCMs) are used and comply with respective standard of reference:                         <ul style="list-style-type: none"> <li>○ Fly ash - ASTM C 618,</li> <li>○ Ultra fine fly ash (UFFA) - ASTM C 618</li> <li>○ Metakaolin - ASTM C 618</li> <li>○ Natural pozzolan - ASTM C 618</li> <li>○ Slag cement - ASTM C 989</li> <li>○ Silica fume - ASTM C 1240</li> </ul> </li> <li>➤ <i>Cement and concrete materials are typically documented by General Contractor, Architect or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• No additional verification required.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review manufacturer information for all SCMs used on the project and verify their compliance with standards of reference.</li> </ul>	

**A5.405.3: MATERIAL SOURCES: CEMENT: ADDITIONAL MEANS OF COMPLIANCE**

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>136-137</b></p> <p>BSC Guide Pages: <b>120</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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- A5.405.5.3- ADDITIONAL MEANS OF COMPLIANCE**
- A5.405.5.3.1- CEMENT**
- A5.405.5.3.1.1- ALTERNATIVE FUELS**
- A5.405.5.3.1.2- ALTERNATIVE POWER**
- A5.405.5.3.1.3- ALTERNATIVE INGREDIENTS**
- &**
- A5.405.5.3.2- CONCRETE**
- A5.405.5.3.2.1- ALTERNATIVE ENERGY**
- A5.405.5.3.2.2- RECYCLED AGGREGATES**
- A5.405.5.3.2.3- MIXING WATER**

*Any of the following measures may be employed for the production of cement or concrete, depending on their availability and suitability, in conjunction with Section A5.405.5.2.*

<b>A5.405.5.3- CEMENT: ADDITIONAL MEANS OF COMPLIANCE</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the construction documents for any cement or concrete alternates employed in addition to the provisions in Sections A5.405.5 - A5.405.2.1.1.</li> <li>• Verify that additional/alternative strategies are compliant with standard of reference or local codes.</li> <li>➤ <i>Additional/alternative cement and concrete compliance strategies are typically documented by General Contractor, Architect or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Verify that the additional/alternative cement and concrete strategies are employed on the project as specified in the construction documents.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review all receipts and paperwork to show which alternate methods of compliance were used in manufacture of cement or concrete.</li> <li>• Request and review manufacturer information for alternative ingredients used, sources of fuel, power and energy.</li> </ul>	

**A5.406.1: ENHANCED DURABILITY AND REDUCED MAINTENANCE**

**TIER 1 & TIER 2 VOLUNTARY ELECTIVE**  
 Code Page: 137  
 BSC Guide Pages: 121  
 Reference  
 Tables Code Page: N/A

**A5.406.1- CHOICE OF MATERIALS**  
**A5.406.1.1- SERVICE LIFE**  
**A5.406.1.2- REDUCED MAINTENANCE**

Select materials for longevity, minimal deterioration under conditions of use and require little, if any, finishing. For those with surface protection, choose materials that do not require frequent applications of toxic or malodorous finishes. Select materials that can be reused or recycled at the end of their service life in the project.

<b>A5.406.1- CHOICE OF MATERIALS;                      A5.406.1.1- SERVICE LIFE,                      A5.406.1.2- REDUCED MAINTENANCE,                      Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review and verify that the construction documents specify the materials noted to be included for this measure.</li> <li>➤ <i>Materials should be selected based on longevity and require little if any finishing.</i></li> <li>➤ <i>The enforcement of this voluntary requirement will require life cycle analysis information to evolve to a level which proves the durability of systems have lifespan ratings or warranties in order to evaluate overall building durability. Until that time, the assessed durability will be more subjective. Objectivity is the goal.</i></li> <li>➤ <i>Materials with enhanced service life and reduced maintenance characteristics are typically documented by Owner/Developer, General Contractor, Architect or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Verify documentation of all enhanced materials noted and verify that those materials have been installed according to required standards.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review a narrative that lists and explains a justification to why a specified and installed product/material has enhanced service life or reduced maintenance characteristics when compared to an alternative.</li> <li>• Request and review all receipts, written verification or other documentation that verifies the service life of materials selected from this category.</li> <li>➤ <i>Quantitative and qualitative characteristics should be highlighted in the narrative.</i></li> </ul>	

**A5.408.3.1: CONSTRUCTION WASTE REDUCTION: ENHANCED CONSTRUCTION WASTE REDUCTION**

*Divert to recycle or salvage non-hazardous construction and demolition debris generated at the site beyond the mandatory code requirement of 50 percent in section 5.408.3. For Tier 1, divert at least 65 percent. For Tier 2, divert at least 80 percent.*

<p><b>TIER 1 &amp; TIER 2 PREREQUISITE</b></p> <p>Code Page: <b>137</b></p> <p>BSC Guide Pages: <b>117</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.408.3.1- ENHANCED CONSTRUCTION WASTE REDUCTION: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Code Compliance, Tier 1 &amp; Tier 2</b></p> <ul style="list-style-type: none"> <li>• Verify that the construction documents indicate the level of enhanced construction waste reduction specified by the designer and make sure the construction waste management report reflects the indicated level of reduction.</li> <li>• Request and review photos during construction of the onsite diversion methods to document compliance.</li> <li>➤ <i>Construction waste reduction calculations are typically documented by General Contractor or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Code Compliance, Tier 1 &amp; Tier 2</b></p> <ul style="list-style-type: none"> <li>• Request and review a copy of the completed waste management report with calculations for percentage reduction through recycling or salvage with a breakdown of each material type.</li> <li>• Compare the Waste Management Plan to the waste materials collection/infrastructure seen on site.</li> <li>• If the applicant is using single stream (a single type of debris box that collects mixed materials and is sent to a recycling center), then one bin may be acceptable for collecting construction waste. If the project is source separating, two or more bins (or piles) should be seen onsite.</li> <li>• <i>Look for suspicious omissions in the final C&amp;D recycling report.</i></li> <li>• <i>Regularly remind contractors to keep track of receipts and documentation of waste recycling.</i></li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request monthly waste management summary reports from the contractor. If a mixed facility is being utilized, reference the StopWaste.Org facility survey to determine if the average recycling rate being claimed seems plausible.</li> <li>➤ <i>Provide for the use of electronic WMP filing and submittal forms online. Contact StopWaste.Org for more information.</i></li> </ul>	

**A5.409.1: LIFE CYCLE ASSESSMENT: MATERIALS AND SYSTEM ASSEMBLIES**

Select materials assemblies based on life cycle assessment of their embodied energy and/or green house gas emission potentials.

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>138</b></p> <p>BSC Guide Pages: <b>123</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.409.1 MATERIALS AND SYSTEM ASSEMBLIES: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review and verify that the construction documents specify the materials and system assemblies identified in the life cycle assessment documentation.</li> <li>➤ <i>Software for calculating life cycle costs for materials and assemblies may be found at:</i> <ul style="list-style-type: none"> <li>○ <i>The Athena Institute web site</i></li> <li>○ <i>The NIST BEES web site</i></li> <li>○ <i>Life Cycle assessment may also be done in accordance with ISO Standard 14044</i></li> </ul> </li> <li>➤ <i>Materials and system assemblies using Life Cycle Cost Assessment are typically documented by Owner/Developer, General Contractor, Architect or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Verify documentation of all materials and system assemblies that have been analyzed under Life Cycle Cost Assessment and verify that those materials have been installed according to required standards.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review any information or analysis that has already been conducted by agencies or groups to bench mark the Life Cycle Assessment characteristics of a given material or system assembly.</li> <li>➤ <i>More information on life cycle assessment may be found at the Sustainable Products Purchasers Coalition; at the American Center for Life Cycle Assessment; at U.S. EPA Life Cycle Assessment Research; and at U.S. EPA Environmentally Preferable Products.</i></li> </ul>	

## **DIVISION A5.5: ENVIRONMENTAL QUALITY**

- **Code Level:** *Meet all code mandatory measures*
- **Tier 1:** *Meet all code mandatory measures, all required Tier 1 prerequisite measures, and select at least 1 additional voluntary elective measure in Division A5.5*
- **Tier 2:** *Meet all code mandatory measures, all required Tier 2 prerequisite measures, and select at least 3 additional voluntary elective measures in Division A5.5*

**A5.504.1: POLLUTANT CONTROL: INDOOR AIR QUALITY DURING CONSTRUCTION**

**A5.504.1- INDOOR AIR QUALITY (IAQ) DURING CONSTRUCTION  
A5.504.1.1- TEMPORARY VENTILATION  
A5.504.1.2- ADDITIONAL IAQ MEASURES**

*Provide temporary ventilation during construction in accordance with Section 121 (Requirements for Ventilation) of the California Energy Code, CCR, Title 24, Part 6, and Chapter 4 of CCR, Title 8, and as noted in Sections A5.504.1.1 and A5.504.1.2.*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>141</b></p> <p>BSC Guide Pages: <b>124-125</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.504.1- INDOOR AIR QUALITY (IAQ) DURING CONSTRUCTION Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>Review the plans and specifications for operational directions on ventilation practices followed by the contractor and all subs during the construction process.</li> <li><i>Indoor air quality during construction is typically documented by General Contractor, Mechanical Engineer or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>Review the permit set of plans to verify which air quality practices the contractor used on the project. Visually verify while on-site. Note: this verification may take several site visits staggered for each phase of construction.</li> <li>Review the submitted photo and process/schedule entry log and ask for a demonstration of their employment process to verify implementation familiarity.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>Request and review the project team’s Construction Indoor Air Quality Management Plan for compliance with Section 121 (Requirements for Ventilation) of the California Energy Code, CCR, Title 24, Part 6, and Chapter 4 of CCR, Title 8. And follows the parameters of SMACNA IAQ Guidelines for Occupied Buildings under Construction, 2<sup>nd</sup> Edition, Chapter 3, November 2007.</li> <li>Request and review all manufacturer information and specifications of products/materials used to mitigate poor air quality during the construction process.</li> </ul>	

**A5.504.2: POLLUTANT CONTROL: IAQ POST-CONSTRUCTION**

*Flush out the building per Section A5.504.2 prior to occupancy or if the building is occupied.*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>141-142</b></p> <p>BSC Guide Pages: <b>126</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.504.2 IAQ POST-CONSTRUCTION: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the plans and specifications for flush-out practices and operations followed by the contractor.</li> <li>• <i>Indoor air quality post- construction is typically documented by General Contractor, Mechanical Engineer or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the permit set of plans to verify which flush out practices the contractor used on the project and ask for documentation of their employment.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review the project teams Construction Indoor Air Quality Management Plan for compliance with Section 121 (Requirements for Ventilation) of the California Energy Code, CCR, Title 24, Part 6, and Chapter 4 of CCR, Title 8. And follows the parameters of SMACNA IAQ Guidelines for Occupied Buildings under Construction, 2<sup>nd</sup> Edition, Chapter 3, November 2007.</li> <li>• Request and review an accountability form signed by the Mechanical Engineer and Contractor that states flush-out procedure date range, occupancy, outdoor air delivery rates, internal temperature and humidity, as well as any special circumstances or considerations.</li> <li>• If possible, request and review trending data showing flush out schedules, delivery rates and temperature/humidity readings.</li> </ul>	

**A5.504.2.1: POLLUTANT CONTROL: IAQ TESTING**

**A5.504.2.1- IAQ TESTING**

**A5.504.2.1.1- MAXIMUM LEVELS OF CONTAMINANTS**

**A5.504.2.1.2- TEST PROTOCOLS**

**A5.504.2.1.3- NON-COMPLYING BUILDING AREAS**

*If the mechanical engineer determines that building flushout pursuant to Section A5.504.2 is not feasible, a testing alternative may be employed after all interior finishes have been installed, using testing protocols recognized by the United State Environmental Protection Agency (US EPA) as applicable to the project and outlined in Sections A5.504.2.1.1 through A5.504.2.1.3.*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>142</b></p> <p>BSC Guide Pages: <b>127-128</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.504.2.1- IAQ TESTING; A5.504.2.1.1- MAXIMUM LEVELS OF CONTAMINANTS, A5.504.2.1.2- TEST PROTOCOLS, A5.504.2.1.3- NON-COMPLYING BUILDING AREAS: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• If flush-out is not feasible, review an accountability form signed by the Mechanical Engineer and Contractor that states all required contaminants are accounted for and reported in the correct unit of measure as noted in the IAQ Air Quality Testing Report.</li> <li>• <i>Indoor air quality testing is typically documented by General Contractor, Mechanical Engineer or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the permit set of plans to verify that testing is to be employed on the project.</li> <li>• Review documentation of test methods and results at the conclusion of the construction process.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review the project teams Construction Indoor Air Quality Management Plan for compliance with Section 121 (Requirements for Ventilation) of the California Energy Code, CCR, Title 24, Part 6, and Chapter 4 of CCR, Title 8. And follows the parameters of SMACNA IAQ Guidelines for Occupied Buildings under Construction, 2<sup>nd</sup> Edition, Chapter 3, November 2007 and verify that the Air Testing procedure will follow the U.S. Environmental Protection Agency Compendium of Methods for Determination of Air Pollutants in Indoor Air.</li> <li>• Request and review the plans and specifications for the engineer’s testing alternative to building flush-out and verify that it meets the compliance criteria as defined by the EPA.</li> </ul>	

**A5.504.4.5.1: POLLUTANT CONTROL: EARLY COMPLIANCE WITH FORMALDEHYDE LIMITS**

**TIER 1 & TIER 2 VOLUNTARY ELECTIVE**  
 Code Page: **142**  
 BSC Guide Pages: **129**  
 Reference  
 Tables Code Page: **145**

*Meet or exceed requirements before the compliance dates indicated in Table A5.504.8.5 (Tier 1), or use composite wood products made with either CARB-approved no-added formaldehyde (NAF) resins or CARB-approved ultra-low emitting formaldehyde (ULEF) resins (Tier 2).*

<b>A5.504.4.5.1- EARLY COMPLIANCE WITH FORMALDEHYDE LIMITS: Verification Procedures &amp; Tips</b>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>Request and review plans and specifications to confirm that the composite wood products and/or resins are specified to beat the CARB timetable or meet the ultra-low or no formaldehyde levels.</li> </ul> <p><b>Tier 1:</b></p> <ul style="list-style-type: none"> <li>Review a list noting each composite wood or agrifiber product installed in the building's interior and confirm that each product complies with California Air Resources Board (CARB) formaldehyde limits in Table A5.504.8.5.</li> </ul> <p><b>Tier 2:</b></p> <ul style="list-style-type: none"> <li>Verify compliance with Tier 1 and verify that CARB-approved no-added formaldehyde (NAF) resins or CARB-approved ultra-low emitting formaldehyde (ULEF) resins) are included in the plans and specifications.</li> </ul> <p>➤ <i>Formaldehyde limits are typically documented by General Contractor, Architect, or an equivalent licensed professional.</i></p>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>Verify onsite that composite wood products specified on the approved plans and specifications are installed, or at least stored on site with the ability to be verified.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>Request and review the manufacturer Material Safety Data Sheet information for all products to verify compliance with limits and cross-check that information is included in the operation and maintenance manual.</li> </ul>	

**A5.504.4.7: POLLUTANT CONTROL: RESILIENT FLOORING SYSTEMS**

**A5.504.4.7: RESILIENT FLOORING SYSTEMS  
TIER 1- 80 PERCENT**

**A5.504.4.7.1: RESILIENT FLOORING SYSTEMS  
TIER 2- 90 PERCENT**

<p><b>TIER 1 &amp; TIER 2 PREREQUISITE</b></p> <p>Code Page: <b>142</b></p> <p>BSC Guide Pages: <b>130-131</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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*Install resilient flooring beyond the mandatory code requirement of 50 percent that complies with the VOC-emission limits defined in the 2009 Collaborative for High Performance Schools (CHPS) criteria and listed on its Low-emitting Materials List or certified under the FloorScore program of the Resilient Floor Covering Institute.*

<p><b>A5.504.4.7- RESILIENT FLOORING SYSTEMS, A5.504.4.7.1- RESILIENT FLOORING SYSTEMS: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Code Compliance, Tier 1 &amp; Tier 2</b></p> <ul style="list-style-type: none"> <li>• Review the plans and specifications to confirm that the products are specified to meet VOC emission limits as applicable to FloorScore and CHPS criteria for specific material/product.</li> <li>➤ <i>Resilient flooring with low VOC emissions and calculations are typically documented by General Contractor, Architect or an equivalent licensed professional.</i></li> <li>➤ <i>“Resilient Flooring” does not include tile, hardwood, or exposed concrete flooring and is reserved for vinyl, linoleum, rubber, cork and other non-textile flooring materials which have a relatively firm surface, yet characteristically have “give” and “bounce back” to their original surface profile from the weight of objects that compress its surface.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Code Compliance, Tier 1 &amp; Tier 2</b></p> <ul style="list-style-type: none"> <li>• Visually verify that installed resilient flooring matches specified flooring. If manufacturer information is not clearly visible, verify using product purchase receipts. Cross-check with manufacturer cutsheets.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review documentation verifying that resilient flooring materials meet the pollutant emission limits set forth by CHPS 2009 Low-Emitting Materials List or Floor Score Certification and review for Tier percentage compliance.</li> <li>• Request and review the Third Party Certifications for the product and review product specifications to verify that the products installed are compliant.</li> <li>➤ <i>Include resilient flooring and adhesives cut sheets in Operations and Maintenance Manual.</i></li> </ul>	

**A5.504.4.8: POLLUTANT CONTROL: THERMAL INSULATION**

<p><b>TIER 1 &amp; TIER 2 PREREQUISITE</b></p> <p>Code Page: <b>142-143</b></p> <p>BSC Guide Pages: <b>130-131</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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**A5.504.4.8- THERMAL INSULATION - TIER 1**  
**A5.504.4.8.1- THERMAL INSULATION - TIER 2**

*For Tier 1, install thermal insulation compliant with Chapters 12-13 (Standards for Insulating Material) in Title 24, Part 12, of the California Referenced Standards Code and with the VOC-emission limits defined in 2009 CHPS criteria and listed on its Low-emitting Materials List. For Tier 2, install No-Added Formaldehyde thermal insulation in addition to meeting compliance criteria for Tier 1.*

<p><b>A5.504.4.8- THERMAL INSULATION – TIER 1, A5.504.4.8.1- THERMAL INSULATION – TIER 2: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Code Compliance, Tier 1 &amp; Tier 2</b></p> <p><b>Tier 1:</b></p> <ul style="list-style-type: none"> <li>Verify that specifications indicate thermal insulation product will be in compliance with the VOC-emission limits defined in Collaborative for High Performance Schools (CHPS) Low-emitting Materials List. (<a href="http://www.chps.net/dev/Drupal/node/445">http://www.chps.net/dev/Drupal/node/445</a>)</li> </ul> <p><b>Tier 2 :</b></p> <ul style="list-style-type: none"> <li>Meet Tier 1 requirement AND verify that specifications indicate thermal insulation product will contain no added formaldehyde.</li> <li>➤ <i>Thermal insulation products are typically documented by General Contractor, Architect or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Code Compliance, Tier 1 &amp; Tier 2</b></p> <ul style="list-style-type: none"> <li>Visual verification that specified thermal insulation product has been installed. Cross-check materials manufacturer and product name to plans.</li> </ul>
<p><b><u>Documentation:</u></b></p> <p><b>Tier 1 Requirement:</b></p> <ul style="list-style-type: none"> <li>Review cut sheets for thermal insulation from general contractor or insulation subcontractor indicating compliance with CHPS Low-emitting Materials List.</li> </ul> <p><b>Tier 2 Requirement:</b></p> <ul style="list-style-type: none"> <li>Meet Tier 1 requirement AND review cut sheets for thermal insulation from general contractor or insulation subcontractor indicating no added formaldehyde.</li> </ul>	

**A5.504.9: POLLUTANT CONTROL: ACOUSTICAL CEILINGS AND WALL PANELS**

*Comply with Chapter 8 in Title 24, Part 2, the California Building Code, and with the VOC-emission limits defined in the 2009 CHPS criteria and listed on its Low-emitting Materials List*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>143</b></p> <p>BSC Guide Pages: <b>130-131</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.504.4.9- ACOUSTICAL CEILINGS AND WALL PANELS: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the plans and specifications to confirm that the products and materials are specified to meet VOC emission limits defined in Chapter 8 of Title 24, Part 2, of the California Building Code and with the VOC-emission limits defined in the 2009 CHPS criteria and listed on its Low-emitting Materials List.</li> <li>➤ <i>Acoustical ceilings and wall panels VOCs are typically documented by General Contractor, Architect, or an equivalent licensed professional.</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Verify finishes specified on the approved plans and specifications are installed, or at least stored on site with the ability to be verified. Cross-check product labels to specifications/plans.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review manufacturer information to verify that products selected Comply with Chapter 8 in Title 24, Part 2, of the California Building Code and with the VOC-emission limits defined in the 2009 CHPS criteria and listed on its Low-emitting Materials List.</li> <li>• Request and review the product manufacturer cutsheets, specifications, supply invoice, MSDS, Third Party Product Certification.</li> </ul>	

**A5.504.5: POLLUTANT CONTROL: HAZARDOUS PARTICULATES AND CHEMICAL POLLUTANTS**

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>143</b></p> <p>BSC Guide Pages: <b>132</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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**A5.504.5.1- ENTRYWAY SYSTEMS  
A5.504.5.2- ISOLATION OF POLLUTANT SOURCES  
A5.504.5.3.1- FILTERS**

*Install permanent entryway systems measuring at least six feet in the primary direction of travel to capture dirt and particulates at entryways directly connected to the outdoors as noted in Section A5.504.5.1. Exhaust and isolate rooms where activities produce hazardous fumes or chemicals as noted in Section A5.504.5.2.*

<p><b>A5.504.5- HAZARDOUS PARTICULATES AND CHEMICAL POLLUTANTS Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Request and review a list of all area/rooms that require separation and verify that the calculations for negative pressure are accurate to assure proper depressurization.</li> <li>• Review the plans and specifications to confirm that permanent entryway mats are included at the regular points of entry, extend at least 6 feet in the primary direction of travel, and that a maintenance schedule is also recommended in the specifications.</li> <li>• Review the plans and specifications to confirm areas with source pollutants are closed off from adjacent rooms, exhausted with no circulation (negative pressure) in accordance with ASHRAE 62.1, Table 6-4, have self closing doors with deck to deck partitions and vented range hoods are shown for all cooking appliances, laboratory and chemical mixing areas.</li> </ul> <p>➤ <i>Hazardous particulates and chemical pollutants are typically documented by the Architect or General Contractor.</i></p>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Review the permit set of plans and product data sheets maintained by the contractor to verify mats specified on the approved plans and specifications are installed, or at least stored on site with the ability to be verified.</li> <li>• Review the permit set of plans and specifications of exhaust system to verify that areas with source pollutants have adequate exhaust design.</li> <li>• Verify that all identified areas with source pollutants meet specified criteria for compliance and that cleaning and maintenance guidelines are outlined in the operations and maintenance manual.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Review specifications and maintenance recommendations provided with products or accept self-certification from the contractor and verify that cleaning and maintenance schedules are outlined in the operation and maintenance manual.</li> </ul>	

**A5.507.1: ENVIRONMENTAL COMFORT: LIGHTING AND THERMAL COMFORT CONTROLS**

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>146</b></p> <p>BSC Guide Pages: <b>133</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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**A5.507.1.1- SINGLE-OCCUPANT SPACES  
A5.507.1.1.1- LIGHTING  
A5.507.1.1.2- THERMAL COMFORT**

*Provide individual controls that meet energy use requirements in the California Energy Code in accordance with Sections A5.507.1.1.1 and A5.507.1.1.2. Provide individual task lighting and/or day-lighting controls for at least 90% of the building occupants. Provide individual thermal comfort controls for at least 50% of the building occupants.*

<p><b>A5.507.1- LIGHTING AND THERMAL COMFORT CONTROLS Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Single Occupant Spaces- Lighting Controls</b></p> <ul style="list-style-type: none"> <li>Request and review occupancy calculations.</li> <li>Request and review all manufacturer information and specifications for all lighting control equipment.</li> <li>Request and review a floor plan that includes the furniture layout and individual and shared work areas as well as the location, zoning, and type of lighting controls</li> <li>Review the plans and specifications to verify lighting locations, fixture types and/or access to daylight is available for at least 90% of the occupants. Verify if contract furnishings are specified to attribute to lighting and comfort control factors. Verify energy code compliance is demonstrated in accordance with California Energy Code, CCR, Title 24, Part 6.</li> </ul> <p><b>Single Occupant Spaces- Thermal Comfort Controls</b></p> <ul style="list-style-type: none"> <li>Review the plans and specifications to verify means of thermal control, such as thermostats, directional air registers, and proximity to solar gain for a minimum of 50% of occupants. Contract furnishings or control of heat through windows may need to be verified. Make sure that compliance with the California Energy Code and ASHRAE 55-2004 are maintained. Verify that areas near operable window meet the requirements of Section 121 (Requirement for Ventilation) of the California Energy Code.</li> <li>Request and review mechanical designer's basis of design, diversity of assumptions, HVAC load calculations and information in the operations and maintenance manual that describes set-point recommendations, changeover schedules and operation and maintenance instructions.</li> <li>Request and review all manufacturer information and specifications for all thermal control equipment.</li> <li>Request and review a floor plan that includes the furniture layout, individual and shared work areas and work stations, as well as the location of thermal controls and location of all operable windows.</li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>For similar types of compliance verification recommendations and design parameters, refer to <i>LEED NC-2009: Indoor Environmental Quality Credit 6 &amp; Credit 7- Controllability of System- Lighting/Thermal Comfort; Thermal Comfort- Design and Verification</i></li> </ul> <p><b>Single Occupant Spaces- Lighting Controls</b></p> <ul style="list-style-type: none"> <li>The inspector should review the permit set of plans and/or specifications and verify via field visit that lighting is installed as shown and that the building complies with provisions in the California Energy Code.</li> <li>If contract furnishings are specified to attribute to lighting and comfort control factors, verify that proximity to operable windows, task lighting, shades/partitions and other strategies comply in accordance with Section A5.507.1.</li> </ul> <p><b>Single Occupant Spaces- Thermal Comfort Controls</b></p> <ul style="list-style-type: none"> <li>The inspector should review the permit set of plans and/or specifications and verify via field visit that lighting and thermal comfort controls are installed as shown and that the building complies with provisions in the California Energy Code.</li> </ul>
<p><b><u>Documentation:</u></b> This measure is documented on the plans and/or specifications.</p>	

**A5.507.1.2: ENVIRONMENTAL COMFORT: MULTI-OCCUPANT SPACES**

*Provide individual controls that meet energy use requirements in the California Energy Code in accordance with Sections A5.507.1.1.1 and A5.507.1.1.2. Provide lighting and thermal comfort system controls for all shared multi-occupant spaces, such as classrooms and conference rooms*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>146</b></p> <p>BSC Guide Pages: <b>133</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.507.1- LIGHTING AND THERMAL COMFORT CONTROLS, A5.507.1.2- MULTI-OCCUPANT SPACES: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <p><b>Multi-occupant Spaces- Lighting and Thermal Comfort Controls</b></p> <ul style="list-style-type: none"> <li>• Request and review all manufacturer information and specifications for all lighting and thermal control equipment.</li> <li>• Request and review a floor plan that includes the furniture layout, shared work areas and work stations, as well as the zoning, and type of lighting and thermal controls and location of all operable windows.</li> <li>• Review the plans and specifications to verify means of lighting and thermal control are complied with in relation to sections A5.505.1.1 and A5.505.1.1.2. Verify if contract furnishings are specified to attribute to lighting and comfort control factors.                             <ul style="list-style-type: none"> <li>➤ <i>Lighting and thermal comfort controls are typically documented by General Contractor, Mechanical and Electrical Engineer Architect, or an equivalent licensed professional.</i></li> <li>➤ <i>For similar types of compliance verification recommendations and design parameters, refer to LEED NC-2009: Indoor Environmental Quality Credit 6 &amp; Credit 7- Controllability of System- Lighting/Thermal Comfort; Thermal Comfort- Design and Verification</i></li> </ul> </li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <p><b>Multi-occupant Spaces- Lighting and Thermal Comfort Controls</b></p> <ul style="list-style-type: none"> <li>• The inspector should review the permit set of plans and/or specifications and verify via field visit that lighting and thermal controls are installed as shown and that the building complies with provisions in the California Energy Code and ASHRAE 55-2004.</li> <li>• If contract furnishings are specified to attribute to lighting and comfort control factors, verify that proximity to operable windows, task lighting, shades/partitions and other strategies comply in accordance with Section A5.507.1.2.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Verify that compliance with the California Energy Code and ASHRAE 55-2004 are maintained and that areas near operable window meet the requirements of Section 121 (Requirement for Ventilation) of the California Energy Code</li> </ul>	

**A5.507.2: ENVIRONMENTAL COMFORT: DAYLIGHT**

*Provide day lit spaces as required for top-lighting and side-lighting in the California Energy Code. In constructing a design, consider Items 1 through 4 in Section A5.507.3*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>146</b></p> <p>BSC Guide Pages: <b>134</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.507.2- DAYLIGHT: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Request and review documentation of floor plans, sections and elevations that show the glare control methods implemented and the locations of regularly occupied spaces with qualifying amounts of daylight.</li> <li>• Request and review manufacturer information and specifications for finishes/glazing products and all daylighting control systems.</li> <li>• Review the plans and specifications to verify the daylighting strategies employed on the project. Verify compliance with California Energy Code, CCR, Title 24, Part 6.</li> <li>➤ <i>Daylighting strategies and calculations are typically documented by General Contractor, Architect, or an equivalent licensed professional.</i></li> <li>➤ <i>For similar types of compliance verification recommendations and design parameters, refer to LEED NC-2009: Indoor Environmental Quality Credit 8.1- Daylight and Views- Daylight</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• The inspector should review the permit set of plans and/or specifications and verify that daylighting features are installed as shown and that the building complies with provisions in the California Energy Code.</li> </ul>
<p><b><u>Documentation:</u></b> This measure is documented on the plans and/or specifications.</p>	

**A5.507.3: ENVIRONMENTAL COMFORT: VIEWS**

**A5.507.3.1- INTERIOR OFFICE SPACES  
A5.507.3.2- MULTI-OCCUPANT SPACES**

*Achieve direct line of sight to the outdoor environment via vision glazing between 2'6" and 7'6" above finish floor for building occupants in 90 percent of all regularly occupied areas. Entire areas of interior office spaces may be included in the calculation if at least 75% of each area has direct line of sight to perimeter vision glazing. For multi-occupant spaces, include in the calculation the square footage with direct line of sight to perimeter vision glazing.*

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>146</b></p> <p>BSC Guide Pages: <b>134</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.507.3- VIEWS; A5.507.3.1- INTERIOR OFFICE SPACES, A5.507.3.2- MULTI-OCCUPANT SPACES: Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Request and review the plans and specifications to verify the daylighting strategies and line of sight calculations employed on the project. Verify compliance with California Energy Code, CCR, Title 24, Part 6.</li> <li>➤ <i>Daylighting strategies and calculations are typically documented by the Architect Green Building Consultant or an equivalent licensed professional.</i></li> <li>➤ <i>For similar types of compliance verification recommendations and design parameters, refer to LEED NC-2009: Indoor Environmental Quality Credit 8.2- Daylight and Views- Views</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• The inspector should review the permit set of plans and/or specifications and verify that view access is provided as shown and that the building complies with provisions in the California Energy Code.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review documentation of floor plans, sections and elevations that show direct line of sight to the outdoor environment via vision glazing between 2'6" and 7'6" above finish floor for building occupants in 90 percent of all regularly occupied areas.</li> <li>• Request and review the calculations for interior office spaces and multi occupant spaces direct line of sight to perimeter glazing and verify compliance on detailed floor plan that highlights the locations of work station in proximity to fenestration.</li> </ul>	

**A5.508.1: OUTDOOR AIR QUALITY: HCFCs & HFCs**

**A5.508.1.3- HYDROCHLOROFLUOROCARBONS (HCFCs)  
A5.508.1.4- HYDROFLUOROCARBONS (HFCs)**

Install HVAC and refrigeration equipment that do not contain HCFCs. Install HVAC, refrigeration and fire suppression equipment that does not contain HFCs or that do not contain HFCs with a global warming potential greater than 150, **OR**, install HVAC and refrigeration equipment that limit the use of HFC refrigerant through the use of a secondary heat transfer fluid with a global warming potential no greater than 1.0.

<p><b>TIER 1 &amp; TIER 2 VOLUNTARY ELECTIVE</b></p> <p>Code Page: <b>146</b></p> <p>BSC Guide Pages: <b>135</b></p> <p>Reference Tables Code Page: <b>N/A</b></p>
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<p><b>A5.508.1.3- HYDROCHLOROFLUOROCARBONS (HCFCs), A5.508.1.4- HYDROFLUOROCARBONS (HFCs): Verification Procedures &amp; Tips</b></p>	
<p><b><u>Plan Review:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• Request and review the plans and specifications to verify that the HVAC, refrigeration and fire suppression systems on the project don't operate with HCFC's.</li> <li>• Verify that any HFC's used on the project do not have global warming potentials greater than 150.</li> <li>➤ <i>Hydrochlorofluorocarbon and hydrofluorocarbons are typically documented by General Contractor, Architect, or an equivalent licensed professional.</i></li> <li>➤ <i>For similar types of compliance verification recommendations and design parameters, refer to LEED NC-2009: Indoor Environmental Quality Credit 8.2- Daylight and Views- Views</i></li> </ul>	<p><b><u>Onsite Verification:</u></b></p> <p><b>Tier 1 &amp; Tier 2 Compliance</b></p> <ul style="list-style-type: none"> <li>• The inspector should review the permit set of plans and/or specifications prior to conducting a field visit to verify that specified equipment and refrigerants are indeed installed on the project as specified.</li> </ul>
<p><b><u>Documentation:</u></b></p> <ul style="list-style-type: none"> <li>• Request and review a list of base building systems containing refrigerants and associated types with values of ozone depletion and global warming potential. Verify manufacturer information and specifications of each equipment type for compliance of refrigerant used on the project.</li> <li>• Request and review recommendations in the Operation and Maintenance Manual for replenishment of refrigerants to meet these regulations, since inventory of phased-out refrigerants still exists for maintenance of older equipment that complies with California Mechanical Code, CCR, Title 24, Part 4 and California Fire Code, CCR, Title 24, Part 9.</li> </ul>	



## REFERENCED DOCUMENTS

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These Verification Procedures are based on the following documents which were the most current as of publication:

- *CALGreen Code: 2010 California Green Building Standards Code*, California Code of Regulations, Title 24, Part 11, California Building Standards Commission, Effective Date: January 1, 2011.
- *A Guide to the California Green Building Standards Code (Low-Rise Residential)*, an educational publication by the California Housing & Community Development, Second Edition, May 2011.
- *A Guide to the (Non-Residential) California Green Building Standards Code*, an educational publication by the California Building Standards Commission, second edition, issued November 2010.
- *Bay-Friendly Landscape Guidelines & Rating System*, [www.Bay-Friendly.org](http://www.Bay-Friendly.org), January 2008, Third Edition.

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