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1 INTRODUCTION

1.1 Overview of Metro's Sustainability Program

Since 2008, the Los Angeles County Metropolitan Transportation Authority (Metro) has focused on the design and construction of rail projects in a sustainable manner. This effort has been led by Metro’s Environmental Compliance and Sustainability Department (ECSD) and continues to evolve. This Guidebook highlights the key steps and work products prepared by the project contractors and ECSD staff in the implementation of Metro’s Sustainability Program. This Guidebook includes the following:

> Metro Sustainability Program
> Program Documents
> Regulatory Requirements
> Monthly Process, including Forms and Deliverables
> Annual requirements

The key components of Metro’s Sustainability Program include, but are not limited to, the following:

> Serve as a leader in:
  > Renewable energy
  > Emissions reduction
  > Climate resiliency
  > Reduction of adverse effects on Disadvantaged Communities
> Meeting regional and local standards and regulations and the requirements for compliance;
> Identification and implementation of Federal and State regulatory requirements. Particular attention should be paid to those tied to transportation funding;
> Continually striving to improve the design and construction processes that are both internal and external;
> Coordination with all engineering disciplines during the design and construction phases; and
> Use of third-party sustainability certifications such as Envision and/or LEED.

There are two different project delivery methods currently used by Metro where a Sustainability Plan is required to track the incorporation of sustainable design and construction methods consistent with CALGreen:

> Design-Build (DB)
> Design-Bid-Build (DBB)

Based on the type of project delivery method used by Metro, the approach used to address the CALGreen requirements in the Sustainability Plan is different. To address the differences in the two types of methods, there are different Metro specifications for DB and DBB.

Specification 01 35 63 is for the DB method and can be found in Metro’s Division 1 Specifications. This specification was prepared to address projects that are constructed by contractors based on a project designed by Metro or its consultants. This specification targets the DB contractor.

Specification 01 36 63 is for the DBB method and can also be found in Metro’s Division 1 Specifications. This specification was prepared to address projects where Metro’s engineering and planning departments are taking the lead and/or managing the design of the project. Also, ECSD wants to make sure that most Metro projects incorporate the Sustainability Plan components both during design and construction, therefore, Specification 01 36 63 was written. Both specifications are now part of Metro's Baseline specifications.

The following flow charts outline Sustainability Plan requirements and steps for each of the project delivery methods utilized.

Figures 1 and 2 on the next page present an overview of Metro’s sustainability process for Design-Build projects that is initiated at a project’s conception, incorporated into the project’s design, and addressed during the project’s construction. As shown in Figure 2, at key milestones during design and construction, ECSD and their consultant team present workshops on Metro’s sustainable practices and periodically review the contractor’s progress in the completion of sustainability elements committed to in the project’s Sustainability Plan.

Figure 3 on the next page presents Metro’s sustainability process for Design-Bid-Build projects. During the design phase, ECSD and consultant team works with Metro’s designers, planners and engineers to
1 INTRODUCTION

Figure 1: Metro’s Sustainability Plan Program Process for Design-Build projects up to the Design phase

Figure 2: Metro’s Sustainability Plan Program Process for Design-Build projects from Design phase to Completion

Figure 3: Metro’s Sustainability Plan Program Process for Design-Bid-Build projects
incorporate sustainable items into the project design which is reflected in the project bid documents. The Sustainability Plan process for contractors begins in the pre-construction phase after bid and award and includes development of a Sustainability Plan for implementation of the project design components.

1.2 Metro’s Sustainability Documents and Requirements

Metro has developed several documents, approved by the management team or the Board of Directors, that have led to improved sustainable practices for the entire Agency. Many of these documents are listed below:

> Construction and Demolition Debris Recycling and Reuse Policy
> Green Construction Policy

Further, there are several documents that Metro has developed that are in addition to the Sustainability Plan Specification. These documents are to be referenced during the project’s design and construction activities. These documents include the Sustainability Technical Requirement, Green Construction Policy and Metro Rail Design Criteria (MRDC) Section 2 Environmental Requirements.

Table 1: Sources of Sustainability Requirements

<table>
<thead>
<tr>
<th>JURISDICTION TYPE AND AGENCIES</th>
<th>SUSTAINABILITY REQUIREMENT SOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>Municipal Code</td>
</tr>
</tbody>
</table>
| Cities                        | > General Plan and Zoning Ordinance
|                               | > Other Relevant Ordinances including the local adoption of the California Green Building Standards Code (CALGreen) |
| County of Los Angeles         | South Coast Air Quality Management Plans and Rules |
| Regional                      | Regional Basin Plan(s)           |
| South Coast Air Quality       | California Green Building Standards Code (CALGreen), Title 24, Part 11 |
| Management District (SCAQMD)  | > State Implementation Plan (SIP)
|                               | > California Ambient Air Quality Standards
|                               | > Emission Inventories
|                               | > Regulation of Toxic Air Contaminants |
| Regional Water Quality Control Boards (RWQCBS) | 401 Certification Program |
|                               | > Discharge to Surface Water and Groundwater
|                               | > National Pollutant Discharge Elimination System
|                               | > Stormwater Discharge from Construction, Industrial, and Municipal Activities |
| State                         | State Water Resources Control Board (SWRCB) |
| California Building Standards Commission | > Federal Clean Air Act including Regulation of Greenhouse Gas Emissions
|                               | > Ambient Air Quality Standards for Mobile and Stationary Sources at Federal and State Levels |
| California Air Resources Board (CARB) | > Federal Clean Air Act including Regulation of Greenhouse Gas Emissions
|                               | > Ambient Air Quality Standards for Mobile and Stationary Sources at Federal and State Levels |
| State Water Resources Control Board (SWRCB) | > Ambient Air Quality Standards for Mobile and Stationary Sources at Federal and State Levels |
| Federal                       | U.S. Environmental Protection Agency |
|                               | > Federal Clean Air Act including Regulation of Greenhouse Gas Emissions
|                               | > Ambient Air Quality Standards for Mobile and Stationary Sources at Federal and State Levels |
1.3 Related Regulatory Requirements
The primary requirements and practices incorporated into Metro’s Sustainability Program are provided by the following Local ordinances and municipal codes (City and/or County):
> Regional agency requirements, codes, and standards
> State Agencies
> Federal Agencies

The following table summarizes the key sources of sustainability requirements.

**THINKING BIG AND GOING BEYOND**
Metro realizes that, while there is a need for cost effective transportation infrastructure in the Los Angeles region, there are sustainability opportunities to stretch above and beyond the regulatory requirements of the current laws, codes, and standards for design and construction. For certain projects, there are new technologies, construction techniques, and/or equipment for consideration by Metro, especially if it passes the Life Cycle Cost Analysis (LCCA), is technically sound, and approved by Metro engineers. In certain cases, it benefits both the project contractor and Metro to explore opportunities for design and construction practices potentially above and beyond the original contract bid documents. Metro’s sustainability team is always willing to pursue innovation and new approaches and will work with project contractors to pursue opportunities that are “Thinking Big and Going Beyond.” Examples include:
> Last mile strategies
> The latest in renewables — membranes, walls, and other similar construction techniques
> “Ultra” energy efficient systems
> Enhanced commissioning approaches, such as technology that integrates known concerns or addresses typical pitfalls in the industry, that result in efficiency and implementation rate increased due to approach.
> Resiliency: Planning for climate change impacts that is more than earthquake preparedness
> Commitment to ‘Responsible Construction’
> Net zero
> Energy Positive
> Living Building Challenge
> Buildings that Educate Users
> WELL Building Certification

**SUMMARY**
The Sustainability Program plays an important role and function for Metro. Not only does it provide proof that Metro projects are complying with sustainable practices, but it also demonstrates how effective and reliable the contractors are in working with Metro to meet their sustainability goals and the objectives to the community in which they operate.
2.1 Sustainability Plan Process and Contents

The preparation of the project’s Sustainability Plan (SP) should follow the Sustainability Plan Outline provided in Appendix A to this Guidebook. A preliminary first draft of the project’s Sustainability Plan should be provided to the Metro Sustainability Manager for an “over the shoulder” review (which can include an informal working meeting) rather than submittal through the more formal submittal process. This will allow for the preliminary first draft of the Sustainability Plan to be quickly reviewed and returned to the Contractor, so that the formal process can begin on schedule.

After revisions are made, the contractor can submit the Draft Sustainability Plan to Document Control for distribution to the appropriate Metro staff for review and comment. Comments from Metro staff will be provided to the Metro Sustainability Manager, who will in turn compile the appropriate comments into a Submittal Review Form and have this Form transmitted to the contractor through the Document Control process. The Submittal Review Form (which will also be used for the review of the contractor’s Sustainability Plan monthly progress update) is provided in Appendix F-1 to this Guidebook.

2.2 Sustainability Plan Elements

In addition to the Sustainability Plan Outline, the contractor would be expected to use the following resources in the preparation of the project-specific Sustainability Elements defined in the Sustainability Plan:

- the Project’s contract documents, (including the designs, MRDCs, specifications, and Environmental Documents including the Environmental Impact Report and/or Environmental Impact Statement)
- CALGreen requirements including those defined in the local ordinances for the respective jurisdiction(s) for the project; and
- Agency requirements listed in Table 1 - Sources of Sustainability Requirements in this Guidebook,

The Contractor should be able to ascertain the SP elements for the project. It is recognized that each project is unique and the SP elements will vary accordingly.

2.3 Resources in Appendices

This Guidebook provides the following documents that serve as references for the preparation of the Sustainability Plan:

- Appendix B  CALGreen and Metro Rail Design Criteria Summaries
- Appendix C  Sustainability Plan Monthly Update Supporting Documentation

Appendix C is an important Appendix as the supporting documents that are expected have been identified. Consistent with the Los Angeles County Metropolitan Transportation Authority (Metro) Sustainability Specification, the Monthly Submittal shall include a comprehensive matrix indicating the status of the Project’s sustainability components accompanied by Supporting Documentation that provide evidence of the component’s completion. The purpose of the table in Appendix C is to define the required Supporting Documentation to be provided in response to the California Green Building Standards Code (CALGreen).

The Supporting Documentation shall include, but not limited to, the following:

- Plans consisting of design drawings, details, floor plans, legends, etc. Only submit the specific plan sheet(s) referenced in the Sustainability Plan Monthly Submittals matrix;
- Studies and reports providing alternative analyses, technical studies, narrative summaries;
> Calculations and technical reports addressing specific topics; and
> Correspondence from or plans approved by responsible State, regional or local agencies (only submit signature page and title page of written plans approved by these agencies).

In addition, the following Appendices provide information that may be useful for the Contractor’s team. The Information Sheets were developed to assist in understanding what was required by CALGreen.

> Appendix D  Sustainability Information Sheets
> Appendix E  Local Jurisdictions – Sustainability Requirements

Metro has worked **TO SIMPLIFY** what is required of the Contractor to meet and comply with the SP. **THIS GUIDEBOOK IS AN EXAMPLE ALONG WITH MANY OF THE FORMS.**
3 STAYING ON TRACK: SUSTAINABILITY PLAN REVIEW

This section discusses what is expected related to the monthly and annual review processes during project design and construction, and Metro’s review and approval process.

3.1 The Monthly Review

By the 30th of each month, the project contractor is required to submit their Sustainability Plan Monthly Update report through the Document Control process. The contractor’s submittal shall include the documents and forms that are to be turned in as part of the status review. In addition, based on the type of work completed for that month, there may be supplemental documents that are required as part of the submittal. These supplemental documents are listed in Appendix C which will be reviewed for that month’s submittal.

The Sustainability Plan Monthly Update report will consist, at a minimum, of:

> Monthly Matrix – See Appendix F
> Summary table of the sustainability elements that indicates the elements that are completed for the month addressed and a summary discussion of the supporting documentation that provides evidence that the sustainability element that has been completed (see Appendix F); and
> Supporting documentation in an electronic format that addresses the sustainability element that has been indicated as complete (refer to Appendix C for a list of Supporting Documentation required for the sections in 2013 CALGreen and 2016 CALGreen)- see Appendix C.

CONTRACTOR’S ROLE AND SUBMITTALS

The Contractor is responsible via their Sustainability Designee, to submit all of the required forms and documentation for the previous month. It is expected that there is sufficient time to collect all of the information on what was completed during the previous month, as well as collect and provide copies of all of the supporting documentation for the submittal.

METRO REVIEW AND APPROVAL PROCESS

There is a formal submittal process that has been developed for Metro’s review of the Sustainability Plan Monthly Update report. The key steps of this process are presented in Figure 3.

The first form to be turned in is the Monthly form and it is submitted to Document control which then forwards it to the Metro Sustainability Manager for the project. This form is turned in by the Contractor as part of the monthly submittal and it is this form that is used as the basis for the initial Metro review. Once the initial Metro review is completed, then a Response matrix is sent back to the Contractor. If additional documentation is required and/or explanation, that will be requested of the Contractor in order to finalize the submittal.

Another option that the Contractor always has available is what is called an ‘Over The Shoulder (OTS). It is possible to request an OTS from the Metro Sustainability Manager that does not go through Doc Control.

The Metro Sustainability Manager will compile comments into a Submittal Review Form and this Form would be transmitted to the contractor through the Document Control process. The Submittal Review Form is provided in F-1 to this Guidebook.

If there are comments provided by Metro on the Submittal Review Form (for example a request for additional information, corrections, or missing or alternative supporting documentation) the contractor will be required to provide this information along with responses on the Submittal Review Form in order to finalize the submittal. The return of the Submittal Review Form that responds to the comments shall be submitted to Metro through the Documentation Monthly Report Submittal with Supporting Documentation

Submittal Review

Response on Comments

Approval:
TO Doc Control;
Final Disposition;
Rejected, Reise,
Resubmittal; OTS;
Record Only

Figure 3: Metro’s Review and Approval Process

METRO SUSTAINABILITY PLAN GUIDELINES
Control process for the final review. If needed, an “over the shoulder” review (including an informal working meeting) can be requested by the contractor prior to the return of the Submittal Review Form and requested information through Document Control for final review.

It is important to note that every review will be accompanied by a final disposition. The possible types of disposition that could be given are listed below. The project-specific types of disposition are defined in sustainability specifications for each project.

> Approved
> Approved As Noted (no resubmittal required)
> Rejected - Revise and Resubmit
> Record Only (submittal for information only)

3.2 Annual Board Report

Each year, ECSD provides an update to the Board of Directors related to sustainability-related progress made on Metro projects that are in compliance with and following a Sustainability Plan. Many of those projects are Design/Build projects. The progress is based on calendar year, January – December. The type of data that would be requested from the contractor may change from year to year, but with adequate Sustainability Plan Monthly Updates, sufficient tracking and recordkeeping of project design and construction activities, the contractor should be able to summarize the information. This information that would be requested should only be a matter of pulling the information together at the end of the year. If a project begins mid-year, then the data provided is for the months that the sustainability process was underway.

Per the Sustainability Plan specification, 01 35 63, each year, the Contractor shall submit this data that is requested by Metro. Since all projects will be in different stages of design and construction, some of the requested data may not be possible to obtain. For example, in 2016, it was requested that data on the lbs of waste diverted from the construction site be summarized for the annual year. Those projects that had not yet begun construction, could not complete that request for data and therefore did not complete that section.

The Contractor is responsible via their SUSTAINABILITY DESIGNEE, to submit ALL OF THE REQUIRED FORMS AND DOCUMENTATION for the previous month.
4.1 Calculating the Life-Cycle Costs

The Life Cycle Cost Analysis (LCCA) is a critical component of any project that qualifies as “Sustainable.” It is important that all aspects of the life of equipment, materials used, and durability evaluated, particularly when considering that Metro’s greater Los Angeles area program, and Measure M, will be only completed once. Some of a project’s components designed and constructed are expected to last 100 years.

Thus, completing a life-cycle costs analysis has been made a mandatory requirement in the Sustainability Plan specification, Technical Requirement, and Section 2.0 Environmental MRDC.

Cost Effective Options
Performing a LCCA gives the total cost of a system or piece of equipment, including all expenses incurred over its life. This analysis can be applied when comparing systems and/or equipment to determine the most cost-effective options. There are two reasons to do an LCCA:

> To compare different systems.
> To determine the most cost-effective system or piece of equipment.

For some systems, one of two situations may exist:

> The initial cost may be high but the lifetime energy costs will be low.
> The initial cost to buy a system or a piece of equipment and the energy or the maintenance costs may be low, but the useful life may be short.

In the latter case, we may have to replace the appliance several times to get the same useful life as the other option. Therefore, a LCCA can be helpful for comparing the total costs incurred over the lifetime of a system or a piece of equipment. It is, in essence, calculating all the costs incurred to buy, maintain, and run the system over its lifetime.

All costs associated with acquiring, operating, maintaining, and disposing of a building, building systems and/or equipment are to be determined.

These costs usually fall into the following categories:

> Initial Costs – Purchases, Acquisition, Construction Costs
> Replacement (Repl) Costs
> Residual Values – Resale or Salvage Values or Disposal Costs
> Fuel Costs
> Operation, Maintenance, and Repair (OM&R) Costs
> Finance Charges – Loan Interest Payments
> Non-Monetary Benefits or Costs
> Other (O) Costs

The formula to use includes individually identifying each cost by year and amount and discount using the Net Present Value Method; the sum of present values (PV) for each category is the Life Cycle Cost (LCC). This analysis shall be performed for each proposed alternative:

\[ \text{LCC} = I + \text{Repl} - \text{Res} + E + W + \text{OM&R} + O \]

Where:

\[ \text{LCC} = \text{Total LCC in present-value (PV) dollars of a given alternative} \]

\[ I = \text{Initial Cost} \]

\[ \text{Repl} = \text{PV capital replacement costs} \]

\[ \text{Res} = \text{PV residual value (resale value, salvage value) less disposal costs} \]

\[ E = \text{PV of energy costs} \]

\[ W = \text{PV of water costs} \]

\[ \text{OM&R} = \text{PV of non-fuel operating, maintenance and repair costs} \]

\[ O = \text{PV of other costs (e.g., contract administration costs, financing costs, employee salaries and benefits, etc.)} \]

The LCCA calculation is to be provided in an Excel document, clearly depicting at minimum the calculation inputs, discount rates, and Net Present Value Method. Any assumption made in the calculation shall be explicitly disclosed and supported with reasoning behind said assumption.
4.2 LEED and CALGreen

There are times when projects will require both CALGreen and LEED requirements. It is noted that LEED for Metro projects is only required when there is a building greater than 10,000 SF. This policy, adopted by Metro in June 2007, is titled the Metro Sustainability and Energy Policy.

Relevant tables in Appendix highlight areas where there may be some overlap between CALGreen and LEED. The table serves as a reference guide and may need to be modified based on the project, the project scope of work, and the type of building. To streamline the process and the efforts of the Consulting firm and/or the Contractor, depending on the contract structure, this table can be used for determining what to submit for the Sustainability Plan Monthly Submittal and how that same information can be used for LEED documentation.

In 2017, USGBC announced significant streamlining for all LEED prerequisites and some credits for California projects that are pursuing certification under LEED Version 4 (v4). New projects built to California’s robust energy and green building codes are pre-approved for significant streamlining of fundamental LEED requirements. The 2016 CALGreen (as amended in 2017) indicates that, if LEED (v4) is used, many of the CALGreen requirements are automatically approved. However, this LEED information must still be submitted during the Sustainability Plan Monthly Submittal process for verification by Metro. See the USGBC website for instructions on how to earn specific LEED prerequisites and credits by submitting the CALGreen checklist.

Beginning in July 2017, USGBC substantially expanded streamlining the LEED v4 Building Design and Construction (BD+C) credits and prerequisites on projects built to California’s building codes. Now, projects built to these 2016 California codes can seek certification through additional streamlining of the LEED v4 Interior Design and Construction (ID+C) and rating system. Additionally, commercial projects pursuing points toward certification using the Optimize Energy Performance credit can now benefit from an update that reduces the need to run additional energy models if the project is building to, or exceeding, California’s building code. Of course, each project needs to determine what is best.

4.3 Commissioning

Since its inception in 2010, CALGreen has required some sort of Commissioning (Cx) and/or testing and adjusting for all projects that have energy consuming systems or equipment. The key objective is to verify that energy consuming equipment for a project is installed and operates at the designed efficiency rating to minimize energy consumption. The Commissioning process occurs during both the design and construction phases of a project and requires the cooperation of the owner (Metro), the design team, and the construction team. If full commissioning occurs, it requires verification by an independent third party, known as the Cx Authority or Cx Agent (CxA), which oversees the Cx process and produces most of the Cx documents.

Commissioning follows two separate paths:

> If a new facility or project contains less than 10,000 SF of conditioned space, CALGreen requires “Testing and Adjusting.”

> If a new facility or project contains greater than or equal to 10,000 SF, CALGreen requires “Full Cx.”

To determine the Commissioning requirements, the square footage of conditioned space (the area where either heating or cooling occurs) needs to be defined. This area is not cumulative for a multi-building or facility project, but instead specific to the space in each building or facility. For example, if only office space of 1,000 SF is conditioned in a 15,000 SF warehouse, then it is classified as less than 10,000 SF of conditioned space. However, if the entire warehouse is conditioned from an air conditioning system, then it is classified as equal to or greater than 10,000 SF of conditioned space and Full Cx is required. Alternatively, if there are different conditioned spaces within a single building or facility and they cumulatively amount to at least 10,000 SF, then Full Cx is also required.

The requirements for less than 10,000 SF of conditioned space is presented in Table 2 on the next page.
### Table 2: Commissioning Requirements, less than 10,000 SF

<table>
<thead>
<tr>
<th>Testing &amp; Adjusting Item</th>
<th>Timeframe (% complete of design or construction)</th>
<th>Responsible Party</th>
<th>2016 CALGreen Code Reference</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Testing &amp; Adjusting Plan (Equivalent to Cx Plan)</td>
<td>100% design, prior to permit issuance</td>
<td>Design team or qualified individual</td>
<td>5.410.4.2</td>
<td>See the list following this table for systems that shall be addressed in the Testing &amp; Adjusting Plan</td>
</tr>
<tr>
<td>Implement Testing &amp; Adjusting Plan (Equivalent to functional performance testing)</td>
<td>60-90% construction, after systems install and startup</td>
<td>Qualified individual performing Testing &amp; Adjusting</td>
<td>5.410.4.3</td>
<td>See the list following this table for systems that shall be tested and adjusted</td>
</tr>
<tr>
<td>HVAC Balancing (Equivalent to functional performance testing)</td>
<td>60-90% construction, after systems install and startup</td>
<td>Qualified individual performing Testing &amp; Adjusting</td>
<td>5.410.4.3</td>
<td></td>
</tr>
<tr>
<td>Testing &amp; Adjusting Report (Equivalent to final Cx Report)</td>
<td>60-90% construction, after systems install, startup, and testing, adjusting, and balancing</td>
<td>Qualified individual performing Testing &amp; Adjusting</td>
<td>5.410.4.4</td>
<td>See the list following this table for systems that shall be included in the Testing &amp; Adjusting Report</td>
</tr>
<tr>
<td>Testing &amp; Adjusting Operations &amp; Maintenance Manual (Equivalent to systems manual)</td>
<td>100% construction, prior to occupancy</td>
<td>Qualified individual performing Testing &amp; Adjusting</td>
<td>5.410.4.5, 5.410.4.5.1</td>
<td>See the list following this table for systems that shall be included in the Operations and Maintenance manual; also shall include copy of all inspection verifications and reports</td>
</tr>
</tbody>
</table>

CALGreen requires that the following components be addressed during Testing and Adjusting:

- HVAC systems
- HVAC controls
- Indoor lighting systems
- Indoor lighting controls
- Water heating systems
- Renewable energy systems
- Landscape irrigation systems
- Water reuse systems

In addition to the reporting of these components in the Testing and Adjusting Report, these above items are expected to be included in the following:

- Owner’s Project Requirements (OPR)
- Basis of Design (BoD)
- 100% design drawings
- Cx construction kickoff meeting
- Systems that shall be tested during the functional performance testing
- Systems that shall be addressed in the documentation and training
The requirements for greater than or equal to 10,000 SF of conditioned space is presented in Table 3 below. In addition to the reporting of these components, these items in the table are expected to be included in the following:

- Owner’s Project Requirements (OPR)
- Basis of Design (BoD)

### Table 3: Commissioning Requirements, greater than 10,000 SF

<table>
<thead>
<tr>
<th>Cx item</th>
<th>Timeframe (% complete of design or construction)</th>
<th>Code Equivalent Phase</th>
<th>Responsible Party</th>
<th>2016 CALGreen Code Reference</th>
<th>Additional Code Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cx Agent Hired (3rd party)</td>
<td>30% design</td>
<td>Schematic Design</td>
<td>Owner</td>
<td>5.410.0</td>
<td>Expectation that the CxA has begun Cx Plan that will be due at 100% design</td>
</tr>
<tr>
<td>Owner’s Project Requirements (OPR)</td>
<td>30% design</td>
<td>Schematic Design</td>
<td>Owner with design team</td>
<td>5.410.2.1</td>
<td>2016 Building Energy Efficiency Standards (by CEC) Section 120.8.b</td>
</tr>
<tr>
<td>Basis of Design (BoD)</td>
<td>50% design</td>
<td>Design Development</td>
<td>Design team</td>
<td>5.410.2.2</td>
<td>2016 Building Energy Efficiency Standards (by CEC) Section 120.8.c</td>
</tr>
<tr>
<td>Cx measures in Construction Documents</td>
<td>100% design</td>
<td>Construction Documents</td>
<td>Design team</td>
<td>5.410.2, item 3</td>
<td>2016 Building Energy Efficiency Standards (by CEC) Section 120.8.e</td>
</tr>
<tr>
<td>Cx Plan</td>
<td>100% design, prior to permit issuance</td>
<td>Construction Documents</td>
<td>CxA</td>
<td>5.410.2.3</td>
<td>2016 Building Energy Efficiency Standards (by CEC) Section 120.8.f</td>
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<tr>
<td>Cx construction kickoff meeting</td>
<td>30-60% construction, prior to systems install</td>
<td>N/A</td>
<td>CxA and construction team</td>
<td>5.410.0</td>
<td></td>
</tr>
<tr>
<td>Functional Performance Testing</td>
<td>60-90% construction, after systems install and startup</td>
<td>N/A</td>
<td>CxA</td>
<td>5.410.2.4</td>
<td>2016 Building Energy Efficiency Standards (by CEC) Section 120.8.g</td>
</tr>
<tr>
<td>Documentation &amp; Training Including Systems Manual</td>
<td>100% construction, prior to occupancy</td>
<td>N/A</td>
<td>Construction team with CxA oversight</td>
<td>5.410.2.5, 5.410.2.5.1, 5.410.2.5.2</td>
<td>2016 Building Energy Efficiency Standards (by CEC) Section 120.8.h</td>
</tr>
<tr>
<td>Final Cx Report</td>
<td>100% construction, prior to occupancy</td>
<td>N/A</td>
<td>CxA</td>
<td>5.410.2.6</td>
<td>2016 Building Energy Efficiency Standards (by CEC) Section 120.8.i</td>
</tr>
</tbody>
</table>
CALGreen requires that the following components be addressed during Full Cx:

- HVAC systems
- HVAC controls
- Indoor lighting systems
- Indoor lighting controls
- Water heating systems
- Renewable energy systems
- Landscape irrigation systems
- Water reuse systems

**CONSTRUCTION MONITORING MONTHLY DELIVERABLES**

During design, there are many components that are required to be submitted that indicate compliance with CALGreen and local jurisdictions.

Per CALGreen, during construction there are reporting monitoring items that are required on a monthly basis. These items are presented in Table 3. In addition, there are several requirements that are due on a one-time basis. These items are presented in Table 4 below. The table presents the one-time submittal and at what approximate construction phase they are required.

### Table 4: Required Construction Monitoring

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Sustainable Practice/ Description of Commitment/ Criteria and Basis for Evaluation or Consideration</th>
<th>Action Required</th>
<th>Timeframe for Documentation Submittal</th>
<th>Related Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Planning and Design</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 1        | 5.106.1 Submit documentation that illustrates and/or describes the prevention of soil loss by storm water runoff and/or wind erosion, of sedimentation and/or of dust/particulate matter air pollution | 1.) Submit dates of rain events  
2.) Submit rain event action plans  
3.) Submit corrective actions taken | Prior to initiation of demolition or grading activities. Subsequently, as events occur on a monthly basis | 01 35 35: Water Pollution Control  
01 57 13: Temporary Erosion and Sedimentation Controls  
01 57 19: Temporary Environmental Controls |
|          | **Material Conservation and Resource Efficiency**                                                 |                |                                        |                        |
|          | **Sustainable Materials**                                                                          |                |                                        |                        |
| 2        | A5.405.1, A5.405.2, A5.405.2.1, A5.405.2.2, A5.405.3, A5.405.4 Sustainable construction materials. Submit a monthly reporting of items, based on cost, used in the project in the following categories: regional materials; bio-based materials; FSC-certified wood products; rapidly renewable materials; reused materials; and recycled content. Verify in contract. | 1.) Submit a monthly log | During construction |                        |
## Table 4: Required Construction Monitoring (continued)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Sustainable Practice/ Description of Commitment/ Criteria and Basis for Evaluation or Consideration</th>
<th>Action Required</th>
<th>Timeframe for Documentation Submittal</th>
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</thead>
<tbody>
<tr>
<td><strong>Construction Waste Management</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Excavated soil and land clearing debris. 100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing should be reused or recycled.</td>
<td>1.) Submit accounting and calculations of estimated volume of soil and land clearing debris that was reused or recycled. 2.) Provide a description of what was done with the material.</td>
<td>During construction and as waste is generated and disposed</td>
<td>01 35 43: Environmental Procedures for Contaminated and Hazardous Materials</td>
</tr>
<tr>
<td>4</td>
<td>Construction waste. Attempt to recycle and/or salvage for reuse a minimum of 80 percent of nonhazardous construction and demolition debris or meet local ordinance, whichever is more stringent.</td>
<td>1.) Provide monthly quantities/diversion rates of the all recycled and/or salvaged materials.</td>
<td>During construction and as waste is generated and disposed</td>
<td>01 74 19: Waste Management and Disposal</td>
</tr>
<tr>
<td><strong>Environmental Quality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dust Suppression</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5</td>
<td>Dust suppression. Monitoring METRO Special Provisions SCAQMD Rule 403</td>
<td>1.) Submit a monthly fugitive dust control form.</td>
<td>Prior to initiation of demolition or grading activities.</td>
<td>01 57 19: Temporary Environmental Controls</td>
</tr>
<tr>
<td>6</td>
<td>Dust suppression. Complaint reporting.</td>
<td>1.) Submit a list of any dust-related complaints. 2.) Submit a list of corrective actions taken to address all complaints.</td>
<td>As required and as events occur</td>
<td></td>
</tr>
</tbody>
</table>
**Table 4: Required Construction Monitoring (continued)**

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<td></td>
<td><strong>Indoor Air Quality</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>A5.504.1.1 and 1.2 Indoor air quality (IAQ) during construction. Maintain IAQ as provided in Sections A5.504.1.1 and A5.504.1.2.</td>
<td>1.) Submit a list of IAQ compliance measures implemented.</td>
<td>During construction, as the activity occurs</td>
<td>01 66 00: Product Storage Handling Requirements</td>
</tr>
<tr>
<td>8</td>
<td>5.504.4 Finish material pollutant control. Finish materials shall comply with Sections 5.504.4.1 through 5.504.4.6.</td>
<td>1.) Submit a monthly log of finish materials used. 2.) Confirm that the materials comply with requirements of the referenced CALGreen sections.</td>
<td>During construction, as the activity occurs.</td>
<td></td>
</tr>
<tr>
<td>Item No.</td>
<td>Sustainable Practice/Description of Commitment/Criteria and Basis for Evaluation or Consideration</td>
<td>Action Required</td>
<td>Other forms/docs to be used to satisfy submittal requirement</td>
<td>Timeframe for Documentation Submittal</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>1</td>
<td>5.106.1 Develop a Storm Water Pollution Prevention Plan (SWPPP) that has been designed specific to the site, conforming to the State Stormwater NPDES Construction Permit or local ordinance, whichever is stricter. The plan shall cover prevention of soil loss by stormwater runoff and/or wind erosion, of sedimentation and/or of dust/particulate matter air pollution. National Pollutant Discharge Elimination System (NPDES) General permit for stormwater discharges associated with construction and land disturbance activities order No. 2012-0006-DWQ NPDES NO. CAS000002</td>
<td>1.) Submit a SWPPP to comply with report requirements of and approved via separate project submittal. 2.) For SP deliverable, submit SWPPP cover sheet with approval and/or other form of documentation indicating report has been approved.</td>
<td>Prior to demolition or grading activities starting in the field.</td>
<td>01 35 35: Water Pollution Control 01 57 13: Temporary Erosion and Sedimentation Controls 01 57 19: Temporary Environmental Controls</td>
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<td>Material Conservation and Resource Efficiency</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>5.408.1.1 Construction waste management plan. Submit plan per this section to enforcement authority.</td>
<td>1.) Provide a construction waste management plan. 2.) Identify within the plan the established diversion rate based on the more stringent of CALGreen, LEED goals, or local ordinance.</td>
<td>90 days after Notice to Proceed has been issued.</td>
<td>01 74 19: Waste Management and Disposal</td>
</tr>
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<td>Item No.</td>
<td>Sustainable Practice/ Description of Commitment/Criteria and Basis for Evaluation or Consideration</td>
<td>Action Required</td>
<td>Other forms/docs to be used to satisfy submittal requirement</td>
<td>Timeframe for Documentation Submittal</td>
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</tr>
<tr>
<td>3</td>
<td>5.408.1.2 Waste management company. Utilize a waste management company that can provide verifiable documentation of waste diversion.</td>
<td>Provide a letter from the waste management company that they can comply with the diversion rate goals of the project.</td>
<td></td>
<td>Before grading or demolition</td>
</tr>
<tr>
<td>4</td>
<td>A5.408.3.1.2 Verification of compliance. Provide a copy of the completed waste management report.</td>
<td>Submit completed Waste Management Report as required by Metro. Sustainability Plan</td>
<td>Compile report with summary data from all monthly Waste management plan submittals.</td>
<td>At the end of construction</td>
</tr>
</tbody>
</table>

**Commissioning**

| 5       | 5.410.2. Construction kickoff commissioning meeting. For new facilities greater than 10,000 sf: Participate in a commissioning kickoff meeting, led by the commissioning authority and attended by, at a minimum, the GC, mechanical, electrical, and plumbing contractors. | Submit meeting minutes and attendance record for meeting. | | Prior to construction rough-in, or as determined by the CxA. | |
| 6       | 5.410.2. Commissioning issues log. For new facilities greater than 10,000 sf: Review and respond to the commissioning issues log, compiled by the commissioning authority and distributed at his or her determination. | Submit a copy of the construction-phase issues log compiled by the CxA. | | As issued by the CxA and submitted no less than twice during the construction phase. | |
### Table 5: Construction Submittals (continued)

<table>
<thead>
<tr>
<th>Item No.</th>
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<tbody>
<tr>
<td>7</td>
<td>5.410.2. Pre-functional checklists (PFC). For new facilities greater than 10,000 sf: Develop PFCs or use manufacturer-issued lists for all pieces of equipment subject to commissioning per the commissioning plan described in section 5.410.2.3</td>
<td>Submit a letter from the CxA that PFCs have been submitted and approved.</td>
<td></td>
<td>During equipment installation.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>5.410.2.4. Functional Performance Testing (FPT). For new facilities greater than 10,000 sf: Provide reports that contain information addressing each of the building components tested, the testing methods utilized, and include any readings and adjustments made.</td>
<td>Submit a letter from the CxA that FPTs have been submitted and approved.</td>
<td></td>
<td>During equipment startup</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>5.410.2.5.1 Systems manual. For new facilities greater than 10,000 sf: Provide a systems manual at the end of construction in accordance with the requirements of this section.</td>
<td>Submit the signature or cover page of a completed systems manual.</td>
<td></td>
<td>End of construction</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>5.410.2.5.2 Systems operations training. For new facilities greater than 10,000 sf: Provide systems training at the end of construction in accordance with the requirements of this section.</td>
<td>1.) Submit the sign-in sheet of all attendees to the systems training. 2.) Submit a list of systems addressed in the training.</td>
<td></td>
<td>End of construction 01 79 00: Demonstration and Training</td>
<td></td>
</tr>
</tbody>
</table>
### ONE-TIME CONSTRUCTION SUBMITTALS

<table>
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<tr>
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<th>Related Specs</th>
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<tbody>
<tr>
<td>11</td>
<td>5.410.4.4 Reporting. After completion of testing, adjusting, and balancing (TAB), provide a final report of testing. For new facilities under 10,000 sf or as defined in section 5.410.4</td>
<td>Submit a signed cover sheet of the Testing, Adjusting, and Balancing Report.</td>
<td></td>
<td>End of construction</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>5.410.4.5 Operation and maintenance (O&amp;M) manual. Provide Metro with detailed operating and maintenance instructions in accordance with the requirements of this section. For new facilities under 10,000 sf or as defined in section 5.410.4</td>
<td>At a minimum, submit a cover sheet, signed by the building contractor, of the completed O&amp;M manual.</td>
<td></td>
<td>End of construction</td>
<td>01 79 00: Demonstration and Training</td>
</tr>
</tbody>
</table>

### Environmental Quality

#### Dust Suppression

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Sustainable Practice/Description of Commitment/Criteria and Basis for Evaluation or Consideration</th>
<th>Action Required</th>
<th>Other forms/docs to be used to satisfy submittal requirement</th>
<th>Timeframe for Documentation Submittal</th>
<th>Related Specs</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>3.5.3.1 Dust suppression. Develop a plan for dust suppression purposes during construction to comply with applicable environmental statutes, regulations, and guidelines.</td>
<td>Submit an approved dust suppression plan.</td>
<td></td>
<td></td>
<td>METRO SPECIAL PROVISIONS SCAQMD Rule 403</td>
</tr>
<tr>
<td>Item No.</td>
<td>Sustainable Practice/Description of Commitment/Criteria and Basis for Evaluation or Consideration</td>
<td>Action Required</td>
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<td>-----------------------------------------------------------</td>
<td>--------------------------------------</td>
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</tr>
<tr>
<td>Indoor Air Quality</td>
<td>5.504.3 Covering of duct openings and protection of mechanical equipment during construction. At the time of rough installation and during storage on the construction site until final startup of the heating, cooling and ventilating equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheet metal or other methods acceptable to the enforcing agency to reduce the amount of dust, water and debris which may enter the system.</td>
<td>Submit photos, date stamped, of HVAC ducts and mechanical equipment that have been protected.</td>
<td>Cover duct openings prior to and during construction including at rough installation and during storage on site. Before startup of mechanical equipment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX A

Sustainability Plan Outline
APPENDIX A

Sustainability Plan Outline

1.0 INTRODUCTION AND BASIS
1.1 Overview of Project Location and Components
1.2 Objectives & Purpose of Sustainability Plan (specific to this project)
1.3 Summary of Related Regulatory Requirements
  1.3.1 Metro [Metro goals, policies, and objectives, Metro Rail Design Criteria, Specs]
  1.3.2 State Regulations [California Green Building Standards Code (CALGreen), California Air Resource Board Requirements]
  1.3.3 Regional Requirements [South Coast Air Quality Management District plans and rules, Regional Water Quality Control Board plans and policies]
  1.3.4 Local Requirements [Local Ordinances (review each City), Local CALGreen Requirements]

2.0 GOALS
2.1 Definition of Project’s Metro Sustainability Goals, Policies, Board Objectives, and Steps to Implement (this includes completing a CalGreen Form which checks off the relevant project Calgreen components)
  2.1.1 Design
  2.1.2 Construction
  2.1.3 Commissioning

3.0 SUSTAINABILITY DESIGN AND CONSTRUCTION COMPONENTS
3.1 List of Sustainability Elements [include applicable regulatory requirement(s) including Metro goals, policies, and objectives, State and Local Codes (CALGreen), Metro Rail Design Criteria, Agency rules and regulations, local ordinances; and indicate if Element is above and beyond the regulatory requirement(s) and how the Element addresses Metro sustainability and environmental goals, policies, and objectives]
  3.1.1 Design
  3.1.2 Construction
  3.1.3 Commissioning

4.0 IMPLEMENTATION PROCESS AND RESPONSIBILITIES
4.1 Implementation Process and Procedures [Reference and provide in table format the following information:
  > Sustainability Element (full text of element including all components)
  > Regulatory Requirement(s)
  > Implementation Timeframe
  > Party Responsible for Implementation
  > Monitoring/Reporting Schedule
  > Documentation Required to Prove compliance, monitoring, and/or report

4.2 Responsibilities [Define the project sustainability coordinator’s roles and responsibilities]

5.0 MONITORING IMPLEMENTATION, MEASUREMENT, REPORTING, AND VERIFICATION (PROVIDE BACKUP CALCULATIONS, DOCUMENTATION, APPROVALS FROM LOCAL JURISDICTIONS, FRONT PAGE OF APPROVED REPORT, ETC.)

6.0 REFERENCES (SEE SUSTAINABILITY SPEC 01 35 63)
APPENDIX B

CALGreen and Metro Rail Design Criteria Summaries

B-1  2016 CALGreen and Metro Rail Design Criteria Summary
B-2  2013 CALGreen and Metro Rail Design Criteria Summary
## Appendix B

2016 CALGreen, Planning & Design

Calabasas and Wago Rail Design Criteria Summaries

### Sustainability Plan Guidelines

#### Metro

<table>
<thead>
<tr>
<th>No. 184692 (2016 CALGreen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 183833 (Municipal Separate Storm Sewer [MS4] Permit)</td>
</tr>
<tr>
<td>No. 182849 (2013 CALGreen)</td>
</tr>
<tr>
<td>No. 181899 (Low Impact Development [LID] Strategies)</td>
</tr>
</tbody>
</table>

| Exception: If the site is already greater than 50 percent impervious, implement a storm water management plan resulting in a 25 percent decrease in rate and quantity. [2010 CALGreen] |
| No. 181899 (Low Impact Development [LID] Strategies) |

#### Design Storm Drainage Area

#### Hydrology

#### Drainage, General

#### Storm Drains

#### Flood Control

#### Drainage Structures

#### Surface Drainage

#### Rainfall Intensity

| Best management practices (BMP). Prevent the loss of topsoil through wind or water erosion by implementing an effective combination of erosion and sediment control and good housekeeping BMP. |
| Rule 403 (Fugitive Dust Emissions) |
| Defers to 2016 CALGreen M.M. |
| Defers to 2016 CALGreen M.M. |
| Defers to 2016 CALGreen M.M. |
| Defers to 2016 CALGreen M.M. |

### Good housekeeping BMP to manage construction equipment, materials and wastes that should be considered for implementation as appropriate for each project include, but are not limited to, the following:

- a. Material handling and waste management.
- b. Building materials stockpile management.
- c. Mulching or hydroseeding to stabilize disturbed soils.
- d. Erosion control to protect slopes.
- e. Protection of storm drain outlets (gravel bags or catch basin inserts).
- f. Perimeter sediment control (perimeter silt fence, berms, sediment traps).
- g. Scheduling construction activity.
- h. Sediment trap or sediment basin to retain sediments on site.
- i. Stabilized construction exits.
- j. Wind erosion control.
- k. Other soil loss BMP acceptable to the enforcing agency.
- l. Drainage swales or lined ditches to control water flow.
- m. Control of vehicle/equipment fueling to contractor's staging area.
- n. Other housekeeping BMP acceptable to the enforcing agency.

### Local ordinance. Comply with a lawfully enacted stormwater management and/or erosion control ordinance. [2013 CALGreen]
2.1.3 Metro Sustainability and Energy Policy

- Provide designated parking for any combination of low-emitting, fuel-efficient and carpool/vanpool vehicles as shown in Table A5.106.1.1 or A5.106.1.2.

- Tier 1: Ten percent of total spaces. (BSC-CG) Provide 10 percent of total designated parking spaces for any combination of low-emitting, fuel-efficient, and carpool/vanpool vehicles as follows (in Table A5.106.5.1.2).

Note: Vehicles bearing Cleaning Air Vehicle stickers from expired HOV lane programs may be considered eligible for designated parking spaces. [2016 CALGreen]

Defers to CALGreen 2016 M.M

- No CALGreen M.M required for LAGBC

- No. 184692 (2016 CALGreen)
- No. 182849 (2013 CALGreen)

2.11.2 Hydrology and Water Quality

- Production of rainwater from the 85th percentile 24-hour event (for volume-based BMPs) or the runoff produced by a rain event equal to two times the 85th percentile hourly intensity (for intensity-based BMPs) from the 85th percentile 24-hour event (for volume-based BMPs). [2010 CALGreen]

- In compliance with Section 5.106.1. Employ at least two of the following methods 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. LID strategies include, but are not limited to those listed in Section A5.106.3.

- Municipal Separate Storm Sewer (MS4) Permit

- No. 183833 (Bicycle Parking Requirements)
- No. 182849 (2013 CALGreen)
- No. 184692 (2016 CALGreen)

Division of the State Architect pursuant to Section 105, comply with Section 5.106.4.2.

For buildings within the authority of the Division of the State Architect pursuant to Section 103, comply with Section 5.106.4.1. For buildings within the authority of the South Coast Air Quality Management District (SCAQMD) and the Los Angeles County Air Pollution Control District (LACAPCD) as defined in Section 405, comply with Section 5.106.4.1.
**2.1.3 Metro Sustainability and Energy Policy**

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<tbody>
<tr>
<td>99.05.106.5.3.1</td>
<td>Single charging space requirements. When only a single charging space is required per Table 5.106.5.3.3, a raceway is required to be installed in accordance with the California Electrical Code.</td>
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<tr>
<td>99.05.106.5.3.2</td>
<td>Multiple charging space requirements. When multiple charging spaces are required per Table 5.106.5.3.3, raceways(s) is/are required to be installed at the time of construction and shall be installed in accordance with the California Building Code, the California Electrical Code and as follows:</td>
</tr>
</tbody>
</table>

- **b. California Air Resources Board.**
- **a. California DriveClean.**

- **1. Information on qualifying vehicles, car labeling regulations and DMV CAV decals may be obtained from the following sources:**
  - a. California DriveClean.
  - b. California Air Resources Board.

- **5. The service panel or subpanel shall have sufficient capacity to accommodate the required number of dedicated branch circuit(s).**

- **The raceway(s) shall originate at a service panel or a subpanel(s) serving the area, and shall terminate in close proximity to the proposed location of the charging equipment and into listed suitable box, enclosure or equivalent.**

- **The raceway(s) shall not be less than trade size 1".**

- **The type and location of the EVSE.**

- **The service panel or subpanel circuit directory shall identify the reserved over-current protective device space(s) for future EV chargers as "EV CAPABLE."**

- **The raceway termination shall be permanently and visibly marked as "EV CAPABLE."**

- **2016 CALGreen**

- **Defers to 2016 CALGreen M.M.**

- **2013 CALGreen**

- **Note: Vehicles bearing Clean Air Vehicle stickers from expired HOV lane programs may be considered eligible for designated parking spaces.**

- **Purchasing policy and refueling sites for low emitting vehicles for state employees use can be found at the Department of General Services.**

- **2.1.3 Metro Sustainability and Energy Policy**

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<tr>
<td>99.05.106.5.3.2</td>
<td>Multiple charging space requirements. When multiple charging spaces are required per Table 5.106.5.3.3, raceways(s) is/are required to be installed at the time of construction and shall be installed in accordance with the California Building Code, the California Electrical Code and as follows:</td>
</tr>
</tbody>
</table>

- **b. California Air Resources Board.**
- **a. California DriveClean.**

- **1. Information on qualifying vehicles, car labeling regulations and DMV CAV decals may be obtained from the following sources:**
  - a. California DriveClean.
  - b. California Air Resources Board.
| A5.106.7.1.2 East and west walls. Shading devices shall have 30-percent coverage to a height of 20 feet or to the top of the exterior wall, whichever is less.  | 2013 CALGreen |
| A5.106.7.1.1 Fenestration. Provide vegetative or man-made shading devices for all fenestration on east-, south-, and west-facing walls.  | 2013 CALGreen |
| A5.106.6.1 Reduce parking capacity. With the approval of the enforcement authority, employ strategies to reduce on-site parking area by: | 2013 CALGreen |
| A5.106.5.3 Future charging spaces qualify as designated parking as described in Section 5.106.5.2 Designated parking for clean air vehicles.  | 2013 CALGreen |
| A5.106.5.2 EV charging spaces signage in on-street parking facilities and for use of EV charging spaces.  | 2013 CALGreen |
| A5.105 Designated parking for clean air vehicles.  | 2013 CALGreen |
| A5.104.5 All electric vehicles utilizing infrastructure-based charging stations have access to the electric vehicle charging spaces. All electric vehicles utilizing infrastructure-based charging stations have access to the electric vehicle charging spaces.  | 2013 CALGreen |

**Notes:**

- Strategies for programs may be obtained from local TMAs.  
  [2010 CALGreen]
- Implementation and documentation of programs that encourage occupants to carpool, ride share or use alternate transportation
- Use of on street parking or compact spaces, illustrated on the site plan or
- See Vehicle Code Section 22511 EV charging spaces signage in on-street parking facilities and for use of EV charging spaces.
SUSTAINABILITY PLAN GUIDELINES

and Design

2.10.3 Energy Efficiency Building Features

If no documentation is available, an inspection shall be conducted to ensure compliance. If Cool Roof Rating Council (CRRC) testing for aged solar reflectance is not available for any roof, the CRRC-listed aged solar reflectance used in the SRI-WS may be either the initial value or the aged value listed in the CRRC.

ASTM E 1980-01 as specified in Section 118(i)3. Solar reflectance and thermal emittance values and thermal emittance complying with Sections A5.106.11.2.1 and A5.106.11.2.2 or a minimum solar reflectance index (SRI) equal to or greater than the values specified in Table A5.106.11.2.2 for Tier 1 and Table A5.106.11.2.3 for Tier 2 may be used as an alternative to compliance with the aged solar reflectance.

Exceptions:

2. Roof area covered by building integrated solar photovoltaic and building integrated solar thermal panels.  

3. French drains.

4. Water retention gardens.

5. Swales.

6. Water collection and disposal systems.

1. Stormwater management systems that manage surface water include, but are not limited to, the following:

- Swales.
- Water collection and disposal systems.
- Stormwater management systems.
- French drains.
- Water retention gardens.
- Surface water.
- Swales.
- Drainage system.
- Surface water management systems.
- Stormwater management systems.
- Water collection and disposal systems.
- French drains.
- Water retention gardens.
- Surface water.
- Swales.
- Drainage system.

2. Use open-grid pavement system or pervious pavement system.  

3. Use permeable pavement system.  

4. Use permeable pavement system.  

A5.106.11 Heat island effects

A5.106.11.1 Hardscape alternatives. Use one or a combination of strategies 1 through 2 for 50 percent of site hardscape or put 50 percent of parking underground.

A5.106.11.2 Hardscape alternatives. Use one or a combination of strategies 1 through 2 for 50 percent of site hardscape or put 50 percent of parking underground.

A5.106.11.3 Verify Energy Efficiency Building Features

A5.106.11.3 Verify Energy Efficiency Building Features

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A5.106.11.3 Verify Energy Efficiency Building Features

A5.106.11.3 Verify Energy Efficiency Building Features
No CALGreen M.M required for LAGBC

2.1.3.3. Metro Sustainability and Energy Policy

A5.203.1.1. Tier 1 and Tier 2 prerequisites. Each of the following efficiency shall have an Energy Budget that is no greater than indicated below, depending on the type of energy systems included in the building project. If the newly constructed building or addition does not include indoor lighting or mechanical systems, the Energy Budget can be set equal to the Title 24, Part 6, Energy Budget for the Standard Design Building as calculated by the Energy Commission.

1. For building systems that include indoor lighting or mechanical systems, but not both: No greater than 90 percent of the Title 24, Part 6, Energy Budget for the Standard Design Building as calculated by the Energy Commission.

2. For building projects that include indoor lighting and mechanical systems: No greater than 90 percent of the Title 24, Part 6 Energy Budget for the Standard Design Building as calculated by the Energy Commission.

A5.203.1.1.1 Outdoor lighting. Newly installed outdoor lighting power shall be no greater than 90 percent of the Allowed Outdoor Lighting Power. The Allowed Outdoor Lighting Power calculation is included in the building project. If the newly constructed building or addition does not include indoor lighting or mechanical systems, the Allowed Outdoor Lighting Power can be set equal to the Title 24, Part 6, Energy Budget for the Standard Design Building as calculated by the Energy Commission.

A5.203.1.1.2 Service water heating in restaurants. Newly constructed restaurants 8,000 square feet or greater and with service water heaters rated 75,000 Btu/h or greater installed a solar water-heating system shall have an Energy Budget that is no greater than 90 percent of the Energy Budget for the Standard Design Building as calculated by the Energy Commission.

A5.203.1.2.1 Tier 1. Buildings complying with the first level of advanced energy efficiency standards in this code, the California Energy Commission will continue to adopt mandatory energy standards that are in addition to those set forth in this code. California Energy Code [DSA-SS]. For the purposes of mandatory energy efficiency implementation, these sections shall apply to new buildings, additions, and alterations as well as to those buildings permitted without lighting or mechanical systems, as identified in Sections 6.14.1.6 and 6.14.1.7. Compliance with these sections shall be verified by the use of an energy compliance software certification service approved by the California Energy Commission.

A5.203.1.2.2 Tier 2. Buildings complying with the second level of advanced energy efficiency shall have an Energy Budget that is no greater than indicated below, depending on the type of energy systems included in the building project. If the newly constructed building or addition does not include indoor lighting or mechanical systems, the Energy Budget can be set equal to the Title 24, Part 6, Energy Budget for the Standard Design Building as calculated by the Energy Commission.

1. For building systems that include indoor lighting or mechanical systems, but not both: No greater than 90 percent of the Title 24, Part 6, Energy Budget for the Standard Design Building as calculated by the Energy Commission.

2. For building projects that include indoor lighting and mechanical systems: No greater than 90 percent of the Title 24, Part 6 Energy Budget for the Standard Design Building as calculated by the Energy Commission.
A5.212.1.1 Elevators. Traction elevators shall have a regenerative drive system that feeds electrical power back into the building grid when the elevator is in motion. [2013 CALGreen].

A5.213.1 Steel Framing. Design for and employ techniques to avoid thermal bridging. [2013 CALGreen]
## Sustainability Plan Guidelines

### Metro

**Defers to 2016 CALGreen M.M. No. 184250 (Modify Requirements of 6.8 Toilet and Drainage Systems)**

1. **Water Conservation Plan**
   - **5.303.3.2 Multiple showerheads serving one shower.** When a shower is served by more than one showerhead, the combined flow rate of all showerheads and/or other shower outlets controlled by a single valve shall not exceed 2.0 gallons per minute at 80 psi. Showerheads shall be certified to the performance criteria of the U.S. EPA WaterSense specification for Showerheads. [2016 CALGreen]

2. **5.303.3.3.2 Floor mounted urinals.**
   - The effective flush volume of floor-mounted or other urinals shall not exceed 0.5 gallons per flush. [2016 CALGreen]

3. **5.303.3.3.3 Wall mounted urinals.**
   - The effective flush volume of wall-mounted urinals shall not exceed 0.125 gallons per flush. [2016 CALGreen]

4. **5.303.3.4 Tank-type toilets.**
   - The effective flush volume of all water closets shall not exceed 1.28 gallons per flush. [2016 CALGreen]

5. **5.303.2.3.3–25-percent savings.** A schedule of plumbing fixtures and fittings that will reduce the overall use of potable water within the building by 25 percent shall be provided. A calculation demonstrating the 25-percent reduction in potable water use shall be demonstrated by one of the following:
   - **a. Makeup water for cooling towers where flow through is greater than 500 gpm (30 L/s).**
   - **b. Makeup water for evaporative coolers greater than 6 gpm (0.04 L/s).**

6. **5.303.2.3.4 Nonpotable water systems for indoor use.** Utilizing nonpotable water systems (such as captured rainwater, treated graywater, and recycled water) intended to supply water closets, urinals, and other allowed fixtures and fittings (faucets and showerheads) shall comply with the following: [2016 CALGreen]
   - **5.303.2.3.4.1 Nonpotable water systems.** Nonpotable water systems shall be designed and installed in accordance with the current edition of the California Plumbing Code, Section 635.9. (Note: The design of the nonpotable water storage tank is governed by Sections 635.7 and 635.9 of the California Plumbing Code.) [2016 CALGreen]

7. **5.303.2.3.4.2 Nonpotable water systems for indoor use.** Nonpotable water systems for indoor use, such as captured rainwater, treated graywater, and recycled water, shall be designed and installed in accordance with the current edition of the California Plumbing Code, Section 635.9. [2016 CALGreen]

### Additional Notes

- **A5.303.2.3.3 – 25-percent savings.** A calculation demonstrating a 25-percent reduction in the building “water use baseline” as established in Table A5.303.2.2 shall be provided.  

### Submetering Requirements

- **5.303.1.1 New buildings or additions in excess of 50,000 square feet.** Separate submeters or metering devices shall be installed as follows:
  - **b. Makeup water for evaporative coolers greater than 6 gpm (0.04 L/s).**
  - **a. Makeup water for cooling towers where flow through is greater than 500 gpm (30 L/s).**

- **5.303.1.2 Excess consumption.** A separate submeter or metering device shall be provided for any tenant within a new building or an addition that is projected to consume more than 1,000 gal/day. [2016 CALGreen]

### CSTF and MTRD Curns

**CSTF+MTRD Curns, 2016 Calculated Water Efficiency & Conservation**

**Appendix B**


A5.303.5 Dual plumbing. New buildings and facilities shall be dual plumbed for potable and recycled water systems for toilet fixtures and fittings.

Where approved, hybrid urinals, as defined in Chapter 2, shall be considered waterless urinals. [2016 CALGreen]

5.303.4 Water conserving plumbing fixtures.

5.303.4.1 Nonwater supplied urinals. Nonwater supplied urinals are installed in accordance with the California Plumbing Code.

5.303.4.2 Kitchen faucets. Kitchen faucets shall have a maximum flow rate of not more than 1.8 gallons per minute at 60 psi. Note: Where complying faucets are unavailable, aerators or other means may be used to achieve reduction. [2013 CALGreen]

5.303.4.3 Wash fountains. Wash fountains shall have a maximum flow rate of 1.8 gallons per minute at 60 psi. Note: Where complying faucets are unavailable, aerators or other means may be used to achieve reduction. [2013 CALGreen]

5.303.4.4 Metering faucets. Metering faucets shall not deliver more than 0.20 gallons per cycle. [2013 CALGreen]

5.303.4.5 Metering faucets for wash fountains. Metering faucets for wash fountains shall have a maximum flow rate of not more than 1.8 gallons per minute at 60 psi. [2013 CALGreen]

5.303.3.4.1 Nonresidential Lavatory faucets. Lavatory faucets shall have a maximum flow rate of no more than 1.2 gallons per minute. [2013 CALGreen]

5. The use and installation of water softeners that discharge to the community sewer system may be limited or prohibited by local agencies if certain conditions are met.
No CALGreen M.M. required for LAGBC

5.304.8 Graywater irrigation system. Install graywater collection system for onsite subsurface irrigation using graywater collection system.

6.6.4. Landscaping, Design Criteria

6.6.2. Landscaping, Objectives

5.304.6 Restoration of areas disturbed by construction. Restore all areas disturbed during construction by planting with local native and/or noninvasive vegetation.

5.304.6.2 Rehabilitated landscapes. Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 1,200 square feet.

Exception: Any project with an aggregate landscape area of 2,500 square feet or less may comply with the prescriptive measures contained in Appendix D of the MWELO.

6.6.4.J. Landscaping, Design Criteria, Irrigation

The MWELO prescriptive compliance measure Appendix D may be found at the following link:
http://water.ca.gov/wateruse/landscapeordinance/

A water budget calculator is available at the following link:
http://water.ca.gov/wateruse/landscapeordinance/

1. DWR's Model Water Efficiency/landscape ordinance.

Notes:

Defers to 2016 CALGreen M.M.

Defers to 2016 CALGreen M.M.

Defers to 2016 CALGreen M.M.

Defers to 2016 CALGreen M.M.

5.304.1 Scope. The provisions of Section 5.304, Outdoor Water Use reference the mandatory Model Water Efficiency/landscape ordinance that is, based on evidence in the record, at least as efficient as the updated model ordinance adopted by the Department of Water Resources (DWR) per Appendix B of the 2016 CALGreen M.M. and shall apply to projects commencing construction on or after January 1, 2016.
5.305.1 Graywater Ready. Waste piping shall be arranged to permit the discharge from the clothes washer, bathtub, showers, and bathroom/restroom wash basins to be used for a future graywater irrigation system. The flow from the fixtures shall be piped separately, and shall, at a minimum, be adequate to supply the irrigation demand. The point of connection between the graywater piping and other waste piping shall be accessible (as defined in LAMC Section 99.02.202) and provided with signage that is satisfactory to the Department. [2016 CALGreen/LAMC Language]

*NOTE* This language appears in the LAMC/LAGBC and is adopted as if it is CALGreen, but the language has not yet been officially adopted into the CALGreen code.

M No. 184692 (2016 CALGreen) Defers to 2016 CALGreen M.M - CALGreen code description based on version edited for LAGBC.

5.305.2 Recycled Water Supply to Fixtures. When City-recycled water is available within 200 feet of the property line, 100% of water for water closets, urinals, floor drains, and process cooling and heating in that building shall come from City-recycled water. Recycled water systems shall be designed and installed in accordance with the Los Angeles Plumbing Code. A

5.305.2 Irrigation systems. Irrigation systems regulated by a local water efficient landscape ordinance or by the California Department of Water Resources Model Water Efficient Landscape Ordinance (MWELO) shall use recycled water. [2016 CALGreen]

*NOTE* This language appears in the LAMC/LAGBC and is adopted as if it is CALGreen, but the language has not yet been officially adopted into the CALGreen code.

6.6.2. Landscaping, Objectives

6.6.4. Landscaping, Design Criteria

5.305.3 Cooling Towers. Cooling towers shall comply with one of the following:

1. Cooling towers shall have a minimum of 6 cycles of concentration (blowdown); or

2. A minimum of 50% of makeup water supply shall come from non-potable water sources, including treated backwash. [2016 CALGreen]

*NOTE* This language appears in the LAMC/LAGBC and is adopted as if it is CALGreen, but the language has not yet been officially adopted into the CALGreen code.

TBD M No. 184250 (Modify Requirements of Water Conservation Plan) No. 184692 (2016 CALGreen) Defers to 2016 CALGreen M.M - CALGreen code description based on version edited for LAGBC.

5.305.4 Groundwater Discharge. Where groundwater is being extracted and discharged, a system for onsite reuse of the groundwater, shall be developed and constructed. Alternatively, the groundwater may be discharged to the sewer. [2016 CALGreen]

*NOTE* This language appears in the LAMC/LAGBC and is adopted as if it is CALGreen, but the language has not yet been officially adopted into the CALGreen code.

TBD M No. 184692 (2016 CALGreen) Defers to 2016 CALGreen M.M - CALGreen code description based on version edited for LAGBC.
1. Simplified method. To obtain the total cost of the project, multiply the square footage of the structure by the square foot valuation established by the enforcing agency. The total material cost is 45 percent of the total cost of the project. Use Equations A5.4-3A or A5.4-3B to determine total material costs using the simplified method.

2. Detailed method. To obtain the total cost of the project, add the estimated and/or actual costs of materials used for the project including the structure (steel, concrete, wood or masonry); the enclosure (roof, windows, doors and exterior finishes (gypsum board, ceiling tiles, etc.). The total estimated and/or actual costs shall not include fees, labor and installation costs, overhead, appliances, equipment, furniture or furnishings.

No CALGreen M.M required for LAGBC No. 184692 (2016 CALGreen)

No CALGreen M.M required for LAGBC No. 182849 (2013 CALGreen)

Notes:

- Sources of some reused materials can be found at CalRecycle. See also Appendix A5, Division A5.1, Section A5.105.1 for on-site materials reuse.
- No CALGreen M.M required for LAGBC No. 184692 (2016 CALGreen)
- No CALGreen M.M required for LAGBC No. 182849 (2013 CALGreen)

2. Sources and recycled content of some recycled materials can be obtained from CalRecycle if not provided by the manufacturer.

Material Cost (dollars)

- Total material cost shall be calculated by using one of the methods specified below:
  - A5.405.4.1 Total material cost. Total material cost is the total estimated or actual cost of materials and assembly products used in the project. The required total recycled content value for the project (in dollars) shall be determined by Equation A5.4-2. Total material cost shall be calculated by using one of the methods specified below.

- A5.405.4.2 Rapidly renewable materials. Use materials made from plants harvested within a ten-year cycle for at least 2.5 percent of the total value, based on estimated cost of materials on the project. Provide documentation as to the respective values.

- A5.405.2.2 Bio-based materials. Select bio-based building materials and products made from solid wood, engineered wood, bamboo, wicker, straw, natural fiber, cork, cotton, and recycled agricultural materials. Certifire biobased wood products. Certifire biobased materials are recognized as meeting the requirements of the California Building Code. Advanced framing techniques include the following:
A5.405.3.1 Cement. The following measures may be used in the manufacture of cement. [2010 CALGreen]

- UF = Silica fume, metakaolin or UFFA, as a percent of total cementitious material for concrete on the project. [2016 CALGreen]
- F = Fly ash, natural pozzolan or other approved SCM as a percent of total cementitious material for concrete on the project.

where:

**Exception:** Minimums in mix designs approved by the Engineer of Record may be lower where high early strength is needed. F/25 + SL/50 + UF/12

No. 184692 (2016 CALGreen)
No. 182849 (2013 CALGreen)

A5.4-1. If Class C fly ash is used in the blend, it will be considered to be “SL” for the purposes of satisfying the equation.

A5.405.5.2.1 Supplementary cementitious materials (SCMs). Use concrete made with one or more supplementary cementitious materials (SCM) conforming to the following standards:

- Portland cement shall meet ASTM C 150.
- Blended supplementary cementitious materials conforming to ASTM C1697, Standard Specification for Blended supplementary cementitious materials, shall be permitted. When determining the recycled content value, the percent recycled content shall be multiplied by the cost of the cementitious materials only, not the total cost of the concrete. [2016 CALGreen]
- Ultra-fine cementitious materials, such as class F fly ash, natural pozzolans or other approved SCMs, may also be used with concrete, where F/25 + SL/50 + UF/12

Note: If the manufacturer does not separately identify the pre-consumer and post-consumer recycled content of a material but reports it as a total single percentage, the total amount shall be considered pre-consumer recycled material. [2016 CALGreen]

**Method 1:** Recycled content (Postconsumer and Preconsumer) of each material provided in percentages

**Method 2:** Recycled content (Postconsumer and Preconsumer) provided in pounds

The Proportional Recycled Content (PRCM) of each material in the assembly. RCA shall be determined by Equation A5.4-9. RCA =

Total Recycled Content Value (percent) (Equation A5.4-8)

Total Recycled Content Value (dollars) = (RCVM + RCVA) (Equation A5.4-4)

where:

RCM (percent) = Postconsumer content percentage + (1/2) Preconsumer content percentage (Equation A5.4-7)

Total RCV may be determined either by dollars or percentage as noted below.
5.407.2.2 Entries and openings. Design exterior entries and/or openings subject to foot traffic or wind-driven rain to prevent water intrusion into buildings as follows. [2013 CALGreen]

1. An installed awning at least 4 feet in depth.
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. [2013 CALGreen]

5.407.2.2.1 Exterior door protection. Primary exterior entries shall be covered to prevent water intrusion by using nonabsorbent nishes within at least 2 feet around and perpendicular to such openings plus at least one of the following:

- Devices, manufacturer’s installation instructions or local ordinance, whichever is more stringent. [2013 CALGreen]

5.407.2.1 Sprinklers. Design and maintain landscape irrigation systems to prevent irrigation spray on structures. [2013 CALGreen]

5.407.1 Weather protection. Provide a weather-resistant exterior wall and foundation envelope as required by California Building Code, Section 1403.2 (Weather Protection) and California Energy Code, Section 150 (Mandatory Features and

A5.406.1.1 Choice of materials. Compared to other products in a given product category, choose materials proven to be characterized by one or more of the following.

- Recyclability. Select materials that can be re-used or recycled at the end of their service life. [2013 CALGreen]

- Service life. Select materials for longevity and minimal deterioration under conditions of use. [2013 CALGreen]

- Durability. Select materials that resist attack by physical, chemical, biological, or environmental agents. [2013 CALGreen]

- Aesthetics. Select materials that are visually appealing or that enhance the overall appearance of the building. [2013 CALGreen]

- Cost-effectiveness. Select materials that are economical to install, maintain, and replace over the life of the building. [2013 CALGreen]

- Performance. Select materials that meet or exceed the performance criteria specified in the project documents. [2013 CALGreen]

- Sustainability. Select materials that are sustainable by reducing or eliminating the use of non-renewable resources, minimizing waste, and reducing energy consumption. [2013 CALGreen]

- Health and safety. Select materials that are safe to work with, non-toxic, and non-hazardous. [2013 CALGreen]

- Availability. Select materials that are readily available and accessible to the project team. [2013 CALGreen]

- Innovation. Select materials that are innovative and introduce new products or processes. [2013 CALGreen]

A5.406.1.3 Recyclability. Select materials that can be re-used or recycled at the end of their service life. [2013 CALGreen]

A5.405.5.3.2 Concrete. The following measures may be used in the manufacture of concrete:

- Alternative ingredients. Use inorganic processing additions and limestone meeting ASTM C 150. [2010 CALGreen]

- Alternative power. Use alternate electric power generated at the cement plant and/or green power purchased from the utility meeting the requirements of Section A5.211. [2010 CALGreen]

- Alternative fuels. Where permitted by state or local air quality standards. [2010 CALGreen]

- Recycled aggregates. Concrete made with one or more of the materials listed in Section A5.405.5.3.2.2. [2010 CALGreen]

- High strength concrete. Concrete elements designed to reduce their total size compared to standard 3,000 psi concrete, as approved by the Engineer of Record. [2013 CALGreen]

A5.405.5.3.2.2 Recycled aggregates. Concrete made with one or more of the materials listed in Section A5.405.5.3.2.2. [2010 CALGreen]

A5.405.5.3.2.1 Alternative energy. Renewable or alternative energy meeting the requirements of Section A5.211. [2010 CALGreen]
<table>
<thead>
<tr>
<th>No.</th>
<th>Initiative/Goal</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>174706</td>
<td>Solid Waste Collection by Year 2020</td>
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<td>No. 174706</td>
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<tr>
<td>181519</td>
<td>City-Certified Waste Haulers to Meet AB 939</td>
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<td>184692</td>
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<td>182986</td>
<td>No. 182986 (Solid Waste Services and Demo Waste Facilities)</td>
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### 5.408.1 Construction waste management

Recycle and/or salvage for reuse a minimum of 65 percent of the nonhazardous construction and demolition waste in accordance with Section 5.408.1.1, 5.408.1.2 or 5.408.1.3; or meet a local construction and demolition waste management ordinance, whichever is more stringent. [2016 CALGreen]

### 5.408.2 Universal waste

Additions and alterations to a building or tenant space that meet the scoping provisions in Section 301.3 for nonresidential additions and alterations, shall require verification that Universal Waste items such as fluorescent lamps and ballast and mercury containing thermostats as well as other California prohibited Universal Waste materials are disposed of properly and are diverted from landfills. [2016 CALGreen]

### 5.408.3 Excavated soil and land clearing debris

100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled. For a phased project, such material may be stockpiled on site until the storage site is developed. [2016 CALGreen]

### 5.408.3.1 Enhanced construction waste reduction-Tier 1

Divert to recycle or salvage at least 65% of nonhazardous construction and demolition waste generated at the site. Any mixed recyclables that are sent to mixed-waste recycling facilities shall include a quality assurance system that Universal Waste items such as fluorescent lamps and ballast and mercury containing thermostats as well as other California prohibited Universal Waste materials are disposed of properly and are diverted from landfills. Note: Refer to the Universal Waste Rule link at: http://www.dtsc.ca.gov/LawsRegsPolicies/Regs/upload/OEAR-A_REGS_UWR_FinalText.pdf [2016 CALGreen]

### Exceptions to Sections 5.408.1.1 and 5.408.1.2:

Exceptions to Sections 5.408.1.1 and 5.408.1.2:

- Reuse, either on- or off-site, of construction and demolition waste.
No CALGreen M.M required for LAGBC

Note: A sample ordinance for use by local agencies may be found in Appendix A of this document at the CalRecycle's website. [2013 CALGreen]

5.410.1.2 Sample ordinance. Space allocation for recycling areas shall comply with Chapter 18, Part 3, Division 30 of the Public Resources Code. Chapter 18 is known as the California Solid Waste Reuse and Recycling Access Act of 1991 (Act).

5.410.1 Additions. [A] All additions conducted within a 12-month period under single or multiple permits, resulting in an increase of 30 percent or more in

cardboard, glass, plastics, organic waste, and metals or meet a lawfully enacted local recycling ordinance, if more restrictive.

Exception: Additions within a tenant space resulting in less than a 30-percent increase in the tenant space

Defers to 2016 CALGreen M.M

5.410.0 Recycling by occupants. Provide readily accessible areas that serve the entire building and are identified

A5.409.5 Verification of compliance. Documentation of compliance shall be provided as follows:

A5.409.4 Substitution for prescriptive standards. Performance of a life cycle assessment completed in accordance with Section A5.409.2 may be substituted for other prescriptive provisions of Division A5.4, including those made mandatory

A5.409.3 Materials and system assemblies. If whole building analysis of the project is not elected, select a minimum of 50% of

materials or assemblies based on life cycle assessment of at least three for the impacts listed in Section

2. Interior

1. Software for calculating whole building life cycle assessments includes those found at the Athena Institute website (Impact Estimator software), the PE International website (GaBi software), and the PRe Consultants website (SimaPro

Notes:

1. The project meets the requirements of other parts of Title 24.

2. Interior finishes, if included, may be assessed using the NIST BEES tool. [2016 CALGreen]

Exceptions:

1. Excavated soil and land-clearing debris.

2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.

3. Demolition waste meeting local ordinance or calculated in consideration of local recycling facilities and markets. [2016 CALGreen]

1. City-Registered Waste Haulers to Meet AB 939 and City Goal of 70% Diversion by Year 2020)

2. Voluntary dedication of the waste management company utilized shall be provided.

A5.408.3.1.2 Verification of compliance. A copy of the completed waste management report or documentation of certi

APPENDIX B
SUSTAINABILITY PLAN GUIDELINES

6. A copy of verification data.

5. Site equipment inventory and maintenance notes.

4. Major systems.

3. Basic operations and maintenance, including general site operating procedures, basic troubleshooting, recommended maintenance practices, and immediate response to operational problems.

2. Site contract information.

1. Site information, including facility description, history and current requirements.

Defers to 2016 CALGreen M.M. No. 184692 (2016 CALGreen)

5.410.2.5.1 Systems manual. [N] Documentation of the operational aspects of the building shall be completed within the systems manual and delivered to the building owner or representative. The systems manual shall include the following:

- Measurable criteria for acceptable performance.
- Conditions under which the test shall be performed.
- Functions to be tested.
- Equipment and systems to be tested, including the extent of tests.
- An explanation of the original design intent.
- Basis of Design (BOD). [N] A written explanation of how the design of the building systems meets the OPR shall be completed at the design phase of the building project. The Basis of Design document shall cover the following:

- Owner's Project Requirements (OPR). [N] The expectations and requirements of the building appropriate to its phase shall be documented before the design phase of the project begins. This documentation shall include the following:

- Environmental and sustainability goals.
- Project program, including facility functions and hours of operation, and need for after hours operation.
- Indoor environmental quality requirements.
- Equipment and systems expectations.
- Building occupant and operation and maintenance (O&M) personnel expectations.

- Exception: Open parking garages of any size, or open parking garage areas, of any size, within a structure.

- Tenant improvements less than 10,000 square feet as described in Section 303.1.1.

- Unconditioned warehouses of any size.

- Areas under 10,000 square feet used for indoor use, indoor storage, mechanical ventilation, air conditioning, or other conditioned accessory spaces within unconditioned warehouses.

- Exceptions:

- Regulations as prescribed in California Energy Code Section 120.8. For I-occupancies that are not regulated by OSHPD or I-occupancies and L-occupancies that are not regulated by the enforcing agency or this code.

- User-defined building categories other than I-occupancies and L-occupancies that are not regulated by the enforcing agency or this code.

- Functional performance testing reports shall contain information addressing each of the building components tested, the testing methods utilized, and include any readings and adjustments made. [2013 CALGreen]

- Commissioning process activities, schedules and responsibilities. Plans for the completion of commissioning shall be included. [2013 CALGreen]

- Commissioning goals.

- Commissioning team information.

- Commissioning measures shown in the construction documents.

- Basis of design.

- Commissioning plan.

- Functional performance testing.

- Documentation and training.

- Commissioning report.

Regulated by California Energy Code Section 100.0 Scope, all requirements in Sections 5.410.2 through 5.410.2.6 shall apply.
### APPENDIX B

**METRO SUSTAINABILITY PLAN GUIDELINES**

#### 5.410.2.5 Systems operations training

- **Applicable to:** A program for training of the appropriate maintenance staff for each equipment type and/or system shall be developed and documented in the commissioning report and shall include the following:
  1. System/equipment overview (what it is, what it does and with what other systems and/or equipment it interfaces).
  2. Review and demonstration of servicing/preventive maintenance.
  3. Review of the information in the systems manual.
  4. Review of the record drawings on the system/equipment.  

#### 5.410.2.6 Commissioning report

- **Applicable to:** A report of commissioning process activities undertaken through the design and construction phases of the building project shall be completed and provided to the owner or representative.

**Notes:** Guidance on implementation and enforcement of commissioning requirements, including sample compliance forms and templates, may be found in Appendix A6, Division A6.1, of this code.

#### 5.410.4 Testing and adjusting

- **Applicable to:** Testing and adjusting of systems shall be required for new buildings less than 10,000 square feet or new systems to serve an addition or alteration subject to Section 303.1.

**Subsection 5.410.4.2 Systems**

- Develop a written plan of procedures for testing and adjusting systems. Systems to be included for testing and adjusting systems shall include, as applicable to the project:
  1. HVAC systems and controls.
  2. Indoor and outdoor lighting and controls.
  3. Water heating systems.
  4. Renewable energy systems.
  5. Landscape irrigation systems.
  6. Water reuse systems.

**Subsection 5.410.4.3 Procedures**

- Perform testing and adjusting procedures in accordance with manufacturer’s specifications and applicable standards on each system as determined by the enforcing agency.

**Subsection 5.410.4.3.1 HVAC balancing**

- In addition to testing and adjusting, before a new space-conditioning system serving a building or space is operated for normal use, balance the system in accordance with the procedures defined by the Testing Adjusting and Balancing Bureau National Standards; the National Environmental Balancing Bureau Procedural Standards; Associated Air Balance Council National Standards or as approved by the enforcing agency.

**Subsection 5.410.4.4 Reporting**

- After completion of testing, adjusting and balancing, provide a final report of testing signed by the individual responsible for performing these services.

**Subsection 5.410.4.5 Operation and maintenance (O&M) manual**

- Provide the building owner or representative with detailed operating and maintenance instructions and copies of guaranties/warranties for each system. O&M instructions shall be consistent with OSHA requirements in CCR, Title 8, Section 5142, and other related regulations.

**Subsection 5.410.4.5.1 Inspections and reports**

- Include a copy of all inspection verifications and reports required by the enforcing agency.
5.504.4 Finish material pollutant control. Finish materials shall comply with Sections 5.504.4.1 through 5.504.4.6. [2016 CALGreen]

A5.504.2.1.1 Maximum levels of contaminants. Allowable levels of contaminant concentrations measured by testing shall not exceed the following:

- Carbon Monoxide (CO): 9 parts per million, not to exceed outdoor levels by 2 parts per million;
- Volatile Organic Compounds (VOCs): 5.5 micrograms per cubic meter; and
- Particulates (PM10): 50 micrograms per cubic meter.

A5.504.2 IAQ postconstruction. Flush out the building per Section A5.504.2 prior to occupancy or if the building is occupied during alteration, at the conclusion of construction. [2013 CALGreen]

A5.504.1 Indoor air quality (IAQ) during construction. Maintain IAQ as provided in Sections A5.504.1.1 and A5.504.1.2. [2013 CALGreen]

5.504.1 Temporary ventilation. The permanent HVAC system shall only be used during construction if necessary to condition the building or areas of addition or alteration. If the HVAC system is used during construction, use return air filters immediately prior to occupancy, or, if the building is occupied during alteration, at the conclusion of construction. [2016 CALGreen]

A5.504.3 Covering of duct openings and protection of mechanical equipment during construction. At the time of rough installation and during storage on the construction site and prior to startup of the heating, cooling and ventilating equipment, all duct and other related air distribution components openings shall be covered with tape, plastic, sheetmetal, or, if covered with sheetmetal, the sheetmetal shall be flanged in Section A5.504.2.1.1.

A5.504.2.1 Test protocols. Testing of indoor air quality should include the elements listed in Items 1 through 4.

- Carbon Monoxide (CO): 9 parts per million, not to exceed outdoor levels by 2 parts per million;
- Volatile Organic Compounds (VOCs): 5.5 micrograms per cubic meter;
- Particulates (PM10): 50 micrograms per cubic meter;
- 4-Phenylcyclohexene (4-PCH): 6.5 micrograms per cubic meter;

Reporting Value (MERV) of 8, based on ASHRAE 52.2-1999, or an average efficiency of 30 percent based on ASHRAE 52.1-1992. Replace all return air filters immediately prior to occupancy, or, if the building is occupied during alteration, at the conclusion of construction. [2016 CALGreen]

5.503.1.1 Woodstoves. Woodstoves and pellet stoves shall comply with US EPA New Source Performance Standards (NSPS) emission limits as applicable, and shall have a permanent label indicating they are certified to meet the emission limits. [2016 CALGreen]
5.504.4.1 Insulation. All lightweight insulation systems installed within the building interior shall meet the requirements of Table 5.504.4.1. Insulation shall be installed in accordance with the recommendations of the U.S. Department of Energy and the U.S. Environmental Protection Agency.

5.504.4.2 Glazing. All glazing and glazing systems shall be installed in accordance with the recommendations of the National Fenestration Rating Council (NFRC) and shall meet the requirements specified in Table 5.504.4.2. Glazing shall be installed in a manner that minimizes air leakage and shall be sealed with a non-frangible sealant.

5.504.4.3.1 Ceilings and Walls. All ceilings and walls shall be constructed of materials that meet the requirements specified in Table 5.504.4.3.1. Ceilings and walls shall be installed in accordance with the recommendations of the U.S. Department of Energy and the U.S. Environmental Protection Agency.

5.504.4.3.2 Floor and Ceiling. All floor and ceiling materials shall be installed in accordance with the recommendations of the U.S. Department of Energy and the U.S. Environmental Protection Agency.

5.504.4.4 enrollment. All enrollment systems shall be installed in accordance with the recommendations of the U.S. Department of Education and the U.S. Environmental Protection Agency.

5.504.4.5 HVAC. All HVAC systems shall be installed in accordance with the recommendations of the U.S. Department of Energy and the U.S. Environmental Protection Agency.

5.504.4.6 Lighting. All lighting systems shall be installed in accordance with the recommendations of the U.S. Department of Energy and the U.S. Environmental Protection Agency.

5.504.4.7 Water Use. All water usage shall be minimized through the use of low-flow fixtures and the implementation of water conservation programs.

5.504.4.8 Maintenance. All maintenance shall be performed in accordance with the recommendations of the U.S. Department of Energy and the U.S. Environmental Protection Agency.

5.504.4.9 Operations. All operations shall be conducted in a manner that minimizes energy consumption and waste generation.

5.504.5 Air Quality. All indoor air quality shall be maintained at levels that meet the requirements specified in Table 5.504.5. Indoor air quality shall be monitored and maintained through the use of indoor air quality measurement and control systems.

5.504.6 Noise Control. All noise control shall be performed in accordance with the recommendations of the U.S. Department of Transportation.

5.504.7 Indoor Pollutant Emissions. All indoor pollutant emissions shall be minimized through the use of low-emitting materials and the implementation of indoor air quality management programs.

5.504.8 Energy Performance. All energy performance shall be measured and reported in accordance with the requirements specified in Table 5.504.8. Energy performance shall be monitored and reported through the use of energy monitoring and reporting systems.

5.504.9 Water Savings. All water savings shall be measured and reported in accordance with the requirements specified in Table 5.504.9. Water savings shall be monitored and reported through the use of water monitoring and reporting systems.

5.504.10 Operations and Maintenance. All operations and maintenance shall be conducted in accordance with the recommendations of the U.S. Department of Energy and the U.S. Environmental Protection Agency.

5.504.11 Interior Design. All interior design shall be performed in accordance with the recommendations of the American Society of Interior Designers (ASID) and the Architectural Registration Board (ARB).

5.504.12 Exterior Design. All exterior design shall be performed in accordance with the recommendations of the American Society of Landscape Architects (ASLA) and the Architectural Registration Board (ARB).

5.504.13 Building Code Compliance. All buildings shall comply with the latest edition of the International Building Code (IBC) and the National Fire Protection Association (NFPA) codes relevant to the project.
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.505.1</td>
<td>Indoor moisture control. Buildings shall meet or exceed the provisions of California Building Code, CCR, Title 24, Part 2, Sections 1203 and Chapter 14.1. For additional requirements, defers to 2016 CALGreen.</td>
</tr>
<tr>
<td>5.504.7</td>
<td>Environmental tobacco smoke (ETS) control. Where outdoor areas are provided for smoking, prohibit smoking within 25 feet of building entries, outdoor air intakes, or vent stacks.</td>
</tr>
<tr>
<td>5.504.5.3</td>
<td>Filters. In mechanically ventilated buildings, provide regularly occupied areas of the building with air filters. For Tier 1 requirements, MERV 13 filters are required. For Tier 2 requirements, MERV 11 filters are required.</td>
</tr>
<tr>
<td>5.504.4.9</td>
<td>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 CALGreen.</td>
</tr>
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<td>5.504.4.8</td>
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Note: Products compliant with CHPS criteria certified under the Greenguard Children & Schools program may also be used.
2.8 Noise and Vibration

oor-ceiling assemblies separating tenant spaces and tenant spaces and public places shall have an STC of at least 40. [2013 CALGreen]

5.507.4.3 Interior sound transmission. Wall and roof-ceiling assemblies exposed to the noise source making up the composite STC rating of at least 45 (or OITC 35), with exterior windows of a minimum STC of 30 in the locations described in Items 1 and 2.

Exceptions to Sections A5.507.2 and A5.507.3. Copy/printing rooms, storage areas, mechanical spaces, restrooms, auditoria and other intermittently or infrequently occupied spaces may be included in the calculation if at least 75 percent of each area has direct line of sight to perimeter vision glazing.

A5.507.1.1.2 Lighting. Provide individual task lighting and/or daylighting controls for at least 90 percent of the building occupants.

A5.507.1.2 Multi-occupant spaces. Provide lighting and thermal comfort system controls for all shared multi-occupant spaces, such as classrooms and conference rooms.

A5.507.3 Views. Achieve direct line of sight to the outdoor environment via vision glazing between 2'6" and 7'6" above finished floor level. Exceptions to Sections A5-507.2 and A5.507.3. Copy/printing rooms, storage areas, mechanical spaces, restrooms, auditoria and other intermittently or infrequently occupied spaces may be included in the calculation if at least 75 percent of each area has direct line of sight to perimeter vision glazing.

A5.507.1 Lighting and thermal comfort controls. Provide controls in the workplace as described in Sections A5.507.1.1 and A5.507.1.2.

5.506.1 Outside air delivery. For mechanically or naturally ventilated spaces in buildings, meet the minimum requirements of Section 120.1 (Requirements for Ventilation) of the International Mechanical Code (IMC). Use transparent evidence that the ventilation system is operating as intended.

5.506.2 Carbon dioxide (CO2) monitoring. For buildings or additions equipped with demand control ventilation, CO2 sensors and ventilation controls shall be specified in accordance with the International Code Council (ICC) ventilation code.
Defers to 2016 CALGreen M.M.

Chapter 4

5.508.2.1.1 Threaded pipe. Threaded connections are permitted at the compressor rack. [2013 CALGreen]

Defers to 2016 CALGreen M.M.

Rule 1415 (Reduction of Refrigerant Emissions) No. 182849 (2013 CALGreen) Section 120.1

5.508.2.1.2 Flared tubing connections. Double-flared tubing connections may be used with a multi-ring seal coated with industrial sealant suitable for use with refrigerants and tightened in accordance with manufacturer's recommendations. [2013 CALGreen]

Exception: Single-flared tubing connections may be used for pressure controls, valve pilot lines and oil.

Defers to 2016 CALGreen M.M.

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Defers to 2016 CALGreen M.M.

Rule 1415 (Reduction of Refrigerant Emissions) No. 182849 (2013 CALGreen) Section 120.1

5.508.2.1.4 Elbows. Short radius elbows are only permitted where space limitations prohibit use of long radius elbows. [2013 CALGreen]

Exception: Single-flared tubing connections may be used for pressure controls, valve pilot lines and oil.

Defers to 2016 CALGreen M.M.

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Exception: Single-flared tubing connections may be used for pressure controls, valve pilot lines and oil.
5.508.2.3.1 Coil coating. Consideration shall be given to the heat transfer efficiency of coil coating to maximize energy efficiency. [2013 CALGreen]

5.508.2.6.1 First vacuum. Pull a system vacuum down to at least 1000 microns (+/- 50 microns), and hold for 30 minutes. [2013 CALGreen]

5.508.2.6 Evacuation. The system shall be evacuated after pressure testing and prior to charging. [2013 CALGreen]

5.508.2.5.3 Allowable pressure change. The system shall stand, unaltered, for 24 hours with no more than a +/- one pound pressure change from 300 psig, measured with the

5.508.2.5.2 Leaks. Check the system for leaks, repair any leaks, and retest for pressure using the same gauge. [2013 CALGreen]

5.508.2.4 Refrigerant receivers. The system shall be pressure tested during installation prior to evacuation and charging. [2013 CALGreen]

5.508.2.2.2.1 Valve caps. For systems with a refrigerant charge of 5 pounds or more, valve caps shall be brass or steel and not plastic. [2013 CALGreen]

5.508.2.3.2 Exception: Valves with seal caps that are not removed from the valve during stem operation. Only a screwdriver with a reduced circumference over the stem are required for valves designed to have seal caps.
3.3.2.C. Storm Drains

3.8.1 Drainage, General

Strategies

A5.106.3 Low impact development (LID). Reduce peak runoff volume by 30\% from existing to developed conditions.

Permit

3.8.7 Storm Drains

3.8.6 Drainage Structures

3.8.5 Surface Drainage

3.8.4 Rainfall Intensity

3.8.3 Design Storm Drainage Area

Exception: If the site is already greater than 50 percent impervious, implement a storm water management plan resulting in a 25-percent decrease in rate and quantity.

3.8.8 Flood Control

2.11.2 Hydrology and Water Quality

A5.106.2 Storm water design. Design storm water runoff to protect or improve local water quality by Section A5.106.2.1 and storm water runoff from the construction activities through local storm water management and/or erosion control ordinances.

5.106.1 Storm water pollution prevention. Newly constructed projects and additions which disturb less than one acre of land shall prevent the pollution of storm water runoff or local water bodies through the use of a combination of erosion and sediment control and good housekeeping BMP. Other soil loss BMP acceptable to the enforcing agency.

1. Soil loss BMP that should be considered for implementation as appropriate for each project include, but are not limited to, the following:

- Mulching or hydroseeding to stabilize disturbed soils.
- Erosion control to protect slopes.
- Sediment trap or sediment basin to retain sediments on site.
- Stabilized construction exits.
- Wind erosion control.
- Protection of storm drain outlets (gravel bags or catch basin inserts).
- Control of vehicle/equipment fueling to contractor’s staging area.
- Management of washout areas (concrete, paints, stucco, etc.).
- Building materials stockpile management.
- Material handling and waste management.
- Other soil loss BMP acceptable to the enforcing agency.

2. Good housekeeping BMP to manage construction equipment, materials and wastes that should be considered for implementation as appropriate for each project include, but are not limited to, the following:

- Scheduling construction activity.
- Erosion control to protect slopes.
- Sediment trap or sediment basin to retain sediments on site.
- Wind erosion control.
- Stabilized construction exits.
- Protection of storm drain outlets (gravel bags or catch basin inserts).
- Control of vehicle/equipment fueling to contractor’s staging area.
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- Other soil loss BMP acceptable to the enforcing agency.

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- Management of washout areas (concrete, paints, stucco, etc.).
- Building materials stockpile management.
- Material handling and waste management.
- Other soil loss BMP acceptable to the enforcing agency.
No. 182849 (2013 CALGreen)

2.1.3 Metro Sustainability and Energy Policy

A5.106.5.1.3 Parking stall marking. Paint, in the paint used for stall striping, the following characters such that the lower edge of the last word aligns with the end of the stall striping and is visible beneath a parked vehicle:

CLEAN AIR/

A5.106.5.1.2 Tier 2. Provide 12 percent of total designated parking spaces for any combination of low-emitting, fuel-efficient, and carpool/van pool vehicles as follows [in Table A5.106.5.1.2].

Note: Additional information on recommended bicycle accommodations may be obtained from Sacramento Area Bicycle Advocates.

5.106.4.1.2 Long-term bicycle parking. For buildings with over 10 tenant-occupants or for additions or alterations that add 10 or more tenant vehicular parking spaces, provide secure bicycle parking for 5 percent of tenant-occupied motorized vehicle parking spaces being added, with a minimum of one two-bike capacity rack.

Exception: Additions or alterations which add nine or fewer visitor vehicular parking spaces.

5.106.4.1.1 Short-term bicycle parking. For buildings with over 10 tenant-occupants, provide bicycle parking facilities in accordance with Table A5.106.4.1.1 or document arrangements with nearby bicycle parking facilities.

Note: Vehicles bearing Clean Air Vehicle stickers from expired HOV lane programs may be considered eligible for designated parking spaces.

5.106.4.1 Bicycle parking. [BSC] Comply with Sections 5.106.4.1.1 and 5.106.4.1.2; or meet the applicable local ordinance, whichever is stricter.
### Appendix B

<table>
<thead>
<tr>
<th>Heat Island Emissions Mitigation Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Use light-colored materials with an initial solar reflectance value of at least 0.15 as determined in accordance with ASTM Standards E 1918 or C 1549.</td>
</tr>
<tr>
<td>2. Use open-grid pavement system or pervious or permeable pavement system.</td>
</tr>
<tr>
<td>3. French drains.</td>
</tr>
<tr>
<td>4. Water collection and disposal systems.</td>
</tr>
<tr>
<td>5. Use cool roof for reduction of heat island emissions. [Refer to Table 5.106.8 (N)].</td>
</tr>
</tbody>
</table>

### Design and Construction Measures

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1. The minimum requirements in the California Energy Code for Lighting Zones 1-4 as defined in Chapter 7A (Materials and Construction Methods for Exterior Wildland Urban Interface) of the California Building Code shall meet the requirements of IES TM-15-11; and</td>
</tr>
<tr>
<td>2. Comply with a local ordinance lawfully enacted pursuant to Section 101.7, whichever is more stringent.</td>
</tr>
<tr>
<td>3. Allowable BUG ratings not exceeding those shown in Table 5.106.8, 2.6.2 (40 for Tier 1 and 50 for Tier 2) or Appendix D.</td>
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</tbody>
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### Surface Water-runoff Design Measures

<table>
<thead>
<tr>
<th>Surface Water-runoff Design Measures</th>
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</thead>
<tbody>
<tr>
<td>1. The use of water harvest, retention, and recycling systems that capture stormwater and rainwater from roofs and paved surfaces, and use that water to irrigate site areas and other landscaping.</td>
</tr>
<tr>
<td>2. Emergency lighting. [Refer to Table 5.106.8 (N)].</td>
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### Stormwater Management Measures

<table>
<thead>
<tr>
<th>Stormwater Management Measures</th>
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<tr>
<td>1. Emergency lighting. [Refer to Table 5.106.8 (N)].</td>
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### Tables

<table>
<thead>
<tr>
<th>Table A5.106.11.2.1 Solar Reflectance Coefficients by Product Type</th>
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<tbody>
<tr>
<td><strong>Material Type</strong></td>
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<tr>
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</tr>
<tr>
<td>Glass</td>
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<tr>
<td>Metal</td>
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<td>Wood</td>
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<tr>
<th>Table A5.106.11.2.2 Solar Reflectance Coefficients for Cooling and Heating Systems</th>
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<tr>
<td><strong>System</strong></td>
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<tr>
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<tr>
<td>Roof</td>
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<tr>
<td>Wall</td>
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<tr>
<th>Table A5.106.11.2.3 Solar Reflectance Coefficients for Lighting Zones 1-4</th>
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<tr>
<td><strong>Lighting Zone</strong></td>
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<tr>
<td>3</td>
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<tr>
<td>4</td>
</tr>
</tbody>
</table>

### References

1. CALGreen, Planning & Design
2. ASCE 7-10: Minimum Design Loads for Buildings and Other Structures
4. ASTM Standards E 1918 and C 1549
5. CRRC Testing for Solar Reflectance and Thermal Emittance
6.14.16 Elevators

A5.212.1.4 Controls. 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.

6.14.6 Escalators

A5.212.1.2 Escalators. An escalator shall have a variable voltage variable frequency (VVVF) motor drive system that is fully regenerative when the escalator is in motion.

6.14.16 Elevators

A5.212.1.1 Elevators. Traction elevators shall have a regenerative drive system that feeds electrical power back into the building grid when the elevator is in motion.

A5.212.1.1.1 Car lights and fan. A parked elevator shall turn off its car lights and fan automatically until the elevator is called for use.

2.10.4 Green or Renewable Energy

A5.211.3 Green power. Participate in the local utility's renewable energy portfolio program that provides a minimum of 50-percent electrical power from renewable sources. Maintain documentation through utility billings.

2.1.3.3. Metro Sustainability and Energy Policy

A5.203.1.2.1 Tier 1. For building projects that include indoor lighting or mechanical systems, the Energy Budget is no greater than 95 percent of the Title 24, Part 6, Energy Budget for the Proposed Design Building. For building projects that include lighting and/or mechanical systems shall comply with Section A5.203.1.1 but are not required to comply with Sections A5.203.1.1.2 or A5.203.1.2.

A5.203.1.1.3 Functional areas where compliance with residential lighting standards is required. For newly constructed high-rise residential dwelling units and hotel and motel guest rooms, indoor lighting complies with the applicable requirements in Appendix A4 Residential Voluntary Measures, Division A4.2 - Energy Efficiency. Nonresidential, high-rise residential and hotel/motel buildings that include lighting and/or mechanical systems shall comply with Sections A5.203.1.1 and either A5.203.1.2.1 or A5.203.1.2.2. Newly constructed high-rise residential dwelling units and hotel and motel guest rooms, indoor lighting complies with the applicable requirements in Appendix A4 Residential Voluntary Measures, Division A4.2 - Energy Efficiency. Nonresidential, high-rise residential and hotel/motel buildings that include lighting and/or mechanical systems shall comply with Sections A5.203.1.1 and either A5.203.1.2.1 or A5.203.1.2.2. Newly constructed high-rise residential dwelling units and hotel and motel guest rooms, indoor lighting complies with the applicable requirements in Appendix A4 Residential Voluntary Measures, Division A4.2 - Energy Efficiency. Nonresidential, high-rise residential and hotel/motel buildings that include lighting and/or mechanical systems shall comply with Sections A5.203.1.1 and either A5.203.1.2.1 or A5.203.1.2.2.
5.303.3 Water conserving plumbing fixtures (water closets and urinals) and fittings. Plumbing fixtures and fittings that will reduce the overall use of potable water within the building by 35 percent shall be provided.

5.303.3.1 Water closets. The use and installation of water softeners that discharge to the community sewer system may be limited or prohibited by local agencies if certain conditions are met.

5.303.3.2 Water closets and urinals. The following shall be done:

a. Makeup water for cooling towers where cooling tower through is greater than 500 gpm (30 L/s).

b. Makeup water for laboratory, or beauty salon or barber shop.

c. Steam and hot-water boilers with energy input more than 500,000 Btu/h (147 kW).

5.303.3.3 Single showerhead. Showerheads shall have a maximum water rate of not more than 2.0 gallons per minute at 80 psi. Showerheads shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Showerheads.

5.303.3.4 Nonpotable water systems for indoor use. Utilizing nonpotable water systems (such as captured rainwater, treated graywater, and recycled water) intended to supply water closets, urinals, and other allowed uses, may be used in the building. Plumbing fixtures shall meet the following:

a. Showerheads.

b. Urinal flush.

c. Steam and hot-water boilers with energy input more than 500,000 Btu/h (147 kW).

5.303.3.5 Nonresidential Lavatory faucets. Lavatory faucets shall have a maximum water rate of not more than 0.5 gallons per minute at 60 psi. Showerheads shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Showerheads.

5.303.3.6.1 Nonresidential Lavatory faucets. Lavatory faucets shall have a maximum water rate of not more than 0.5 gallons per minute at 60 psi. Showerheads shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Showerheads.

6. Combination ovens shall not consume more than 10 gph (38 L/h) in the full operational mode.

7. Commercial pre-rinse spray valves manufactured on or after January 1, 2006 shall function at equal to or less than 1.6 gpm (0.10 L/s) at 60 psi (414 kPa) and 30 psi (207 kPa).
6.6.4. Landscaping, Design Criteria

No. 184250 (Modify Requirements of No. 182849 (CALGreen 2013)

6.6.4. Landscaping, Design Criteria

A5.305.2 Irrigation systems. Irrigation systems regulated by a local water efficiency ordinance or by the California Department of Water Resources Model Water Efficiency Ordinance shall be designed to:

- Include efficient landscape irrigation design that eliminates the use of potable water beyond the initial requirements for plant installation and establishment.
- Comply with the requirements of this section.

A5.304.7 Previously developed sites. On previously developed or graded sites, restore or protect at least 50 percent of the site area with native and/or noninvasive vegetation.

A5.304.6 Restoration of areas disturbed by construction. Restore all areas disturbed during construction by planting with local native and/or noninvasive vegetation.

A5.304.5 Potable water elimination. Provide a water efficiency ordinance or to the California Department of Water Resources Model Water Efficiency Ordinance that demonstrates the applicable potable water use reduction required by this section shall be provided.

Note: Methods used to accomplish the requirements of this section shall include, but not be limited to, the items listed in A5.304.4.

A5.304.4.3 Verification.

- Tier 2 - Reduce the use of potable water to a quantity that does not exceed 55 percent of ETo times the landscape area.
- Tier 1 - Reduce the use of potable water to a quantity that does not exceed 60 percent of ETo times the landscape area.

Methods used to accomplish the requirements of this section shall include, but not be limited to, the items listed in A5.304.4.

A5.304.2 Outdoor potable water use. For new water service, separate meters or submeters shall be installed for indoor and outdoor potable water use for landscaped areas of at least 1,000 square feet but not more than 5,000 square feet, separate from all other water uses.

A5.304.1 Water budget. A water budget shall be developed for landscape irrigation use that installed in conjunction with a new building or an addition or alteration conforms to the local water efficiency ordinance or to the California Department of Water Resources Model Water Efficiency Ordinance.

Water budget design shall be based on the following:

- Section 5.304.3.1 Irrigation controllers. Automatic irrigation system controllers installed at the time of installation and in Chapter 6 of this code.
- Section 5.304.3.2 Commercial spaces.

Plumbing Code Table 1401.1

- Sections 5.303.5 Dual plumbing. New buildings and facilities shall be dual plumbed for potable and recycled water systems for toilet fixtures and fittings. Plumbing fixtures (water closets, urinal) meeting the criteria established in Sections 5.303.2 or 5.303.3.

A5.303.4 Wastewater reduction. Each Building shall reduce by 20 percent wastewater by one of the following methods:

- Section 5.303.4.1 A water usage reduction through recycled water (minimum of 20 percent of total water use).
- Section 5.303.4.2 Utilizing nonpotable water systems (captured rainwater, graywater, and municipally treated wastewater (recycled water) complying with the current addition of the California Plumbing Code or other methods described in Section A5.304.8).

5.303.3 Water usage reduction. Each Building shall reduce by 20 percent wastewater by one of the following methods:

- Section 5.303.3.1 A water usage reduction through recycled water (minimum of 20 percent of total water use).
- Section 5.303.3.2 Water usage reduction through recycled water (minimum of 20 percent of total water use).

Kitchen faucets may temporarily increase the flow rate of not more than 2.2 gallons per minute at 60 psi.

Toilet fixtures may temporarily increase the flow rate of not more than 2.2 gallons per minute at 60 psi.

C.7. Rainwater harvesting systems. Rainwater harvesting systems may be used to supply water for irrigation and in combination with recycled water supplies.

2. Weather-based controllers without integral rain sensors or communication systems that account for local rainfall shall have a separate wired or wireless rain sensor which connects or communicates with the controller(s). Soil moisture-based controllers may be used to determine irrigation requirements.

5.407.2.2 Flashing. Install:

1. An installed awning at least 4 feet in depth.
2. A standing seam metal roof with a minimum of 50% overlap and 10 mils per foot (25 mils per foot for an awning).
3. A similar integrated flashing for vertical terminations.
4. Other methods which provide equivalent protection.

5.407.2.1 Exterior door protection. Primary exterior entries shall be covered to prevent water intrusion by using nonabsorbent materials within at least 2 feet around and perpendicular to such openings plus at least one of the following:

- A single layer of roofing membrane and an integrally-backed tray or a tray that is integrally-backed and covered with 25 mils of polyethylene or equivalent.
- A single layer of roof membrane and upturned edges for protection against water intrusion.
- An installed awning or similar vertically integrated flashing.

5.407.1 Weather protection. Provide a weather-resistant exterior wall and foundation envelope as required by California Building Code, Section 1403.2 (Weather Protection) and California Energy Code, Section 150.

A5.406.1.3 Recyclability. Select materials that can be re-used or recycled at the end of their service life.

A5.406.1.1 Service life. Select materials for longevity and minimal deterioration under conditions of use.

A5.405.5.3.2 Concrete. The following measures may be used in the manufacture of concrete, with Section A5.405.5.2.

- Alternative power. Alternate electric power generated at the cement plant and/or green power purchased from the utility meeting the requirements of Section A5.211.
- Supplementary cementitious materials (SCMs). Use concrete made with one or more of the SCMs listed in Section A5.405.5.2.1.
- Recycled aggregates. Concrete made with one or more of the materials listed in Section A5.405.5.3.2.
- High strength concrete. Concrete elements designed to reduce their total size compared to standard 3,000 psi concrete, as approved by the Engineer of Record.
- Recycling water. Water recycled by the local water purveyor or water reclaimed from manufacturing processes and conforming to ASTM C 1602.

A5.405.5.3 Additional means of compliance. Any of the following measures shall be permitted to be employed for the production of cement or concrete, depending on their availability and suitability, in conjunction with Section A5.405.5.2.

- Exception: Minimums in mix designs approved by the Engineer of Record may be lower where high early strength is needed.

A5.405.5.2 Concrete. Unless otherwise directed by the Engineer of Record, use concrete manufactured with cementitious materials in accordance with Sections A5.405.5.2.1 and A5.405.5.2.1.1, as approved by the enforcing agency.

1. Portland cement shall meet ASTM C 150.
2. Blended hydraulic cement shall meet ASTM C 595.
3. Other Hydraulic Cements shall meet ASTM C 1157.

A5.405.5 Cement and concrete. Use cement and concrete made with recycled products and complying with the following sections:

- Tier 1. The RCV shall not be less than 10 percent of the total material cost of the project.
- Tier 2. The RCV shall not be less than 20 percent of the total material cost of the project.

Note: Use the equations in the subsections for calculating total materials cost, recycled content, RCV of materials and assemblies, and total RCV.

A5.405.4 Recycled content. Use materials, equivalent in performance to virgin materials, with a total (combined) recycled content value (RCV) of:

- Tier 1. The RCV shall not be less than 10 percent of the total material cost of the project.
- Tier 2. The RCV shall not be less than 20 percent of the total material cost of the project.

A5.405.2 Bio-based materials. Select bio-based building materials per Section A5.405.2.1 or A5.405.2.2.

A5.405.1 Regional materials. 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, meeting specific performance standards, and have been certified or verified by a third party.

A5.404.1 Wood framing. Employ advanced wood framing techniques or OVE, as permitted by the enforcing agency.

A5.403.3.4 Wood stud wall framing. Use stud wall framing components made of wood materials that meet the requirements of Section A5.404.1.

A5.403.3.1 Wood framing grades. Use wood framing members that meet the grade requirements of Section A5.405.2.

A5.403.3 Wood framing. Use wood framing members that meet the grade requirements of Section A5.405.2.
SUSTAINABILITY PLAN GUIDELINES

METRO impacts listed in Section A5.409.2.2, one of which shall be climate change.

A5.409.3 Materials and system assemblies. If whole building analysis of the project is not elected, select a minimum of 50% of the impacts listed in Section A5.409.2.2, one of which shall be climate change, compared to a reference building.

A5.409.2 Whole building life cycle assessment. Conduct a whole building life assessment, including operating energy, showing that the building project achieves at least a 10-percent improvement for at least three

5.408.1 Construction waste management. Recycle and/or salvage for reuse a minimum of 50% of the non-hazardous construction waste in accordance with Section 5.408.1.1, 5.408.1.2 or 5.408.1.3; or meet a local requirement as approved by the enforcing agency.

5.408.1.1 Construction waste management plan. Where a local jurisdiction does not have a construction and demolition waste management ordinance that is more stringent, submit a construction waste management plan that complies with Items 1 through 4 of this section. Exceptions to Sections 5.408.1.1 and 5.408.1.2:

5.408.1.2 Waste management company. Utilize a waste management company that can provide verifiable documentation that the percentage of construction waste material diverted from the land disposal facility is 70%.

5.408.1.3 Documentation. Provide documentation of the waste management plan that meets the requirements listed in Sections 5.408.1.1 through 5.408.1.3, and the plan is accessible to the enforcement authority.

1. Excavated soil and land-clearing debris

2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.

3. Demolition waste meeting local ordinance or calculated in consideration of local recycling facilities and markets.
Note: Guidance on implementation and enforcement of commissioning requirements, including sample compliance forms and templates, may be found in Appendix A6, Division A6.1, of this code.

No. 182849 (CALGreen 2013)

5.410.2.6 Commissioning report. [N] A report of commissioning process activities undertaken through the design and construction phases of the building project shall be completed and provided to the owner or owner's representative.

3. Review of the information in the systems manual.

2. Review and demonstration of servicing/preventive maintenance.

1. Site information, including facility description, history and current requirements.

Site contract information.

shall include:

5.410.2.5.1 Systems manual. [N] Documentation of the operational aspects of the building shall be completed within the systems manual and delivered to the building owner or representatives. The systems manual shall include:

a. Conditions under which the test shall be performed.

b. Equipment and systems to be tested, including the extent of tests.

c. Functions to be tested.

d. Test results.

5.410.2.4 Commissioning measures shown in the construction documents.

1. Owner's or owner's representative's project treatments.

2. Commissioning goals.

1. General project information.

5.410.2 Commissioning. [N] For new buildings 10,000 square feet and over, building commissioning for all building systems shall be included in the design and construction processes of the building project to verify that the building systems and components meet the owner's or owner representative's project requirements. Commissioning shall be performed in accordance with this section by trained personnel with knowledge of building systems and commissioning practices, as well as an understanding of the design and construction process. The commissioning plan shall be completed in accordance with Title 8, Section 5142, and other related regulations. The commissioning plan shall include:

2. Site contract information.

1. Site information, including facility description, history and current requirements.

Site contract information.

Commissioning plan. [N] Prior to permit issuance, a commissioning plan shall be completed to document how the project will be commissioned. The commissioning shall include the following:

5.410.2.3 Basis of Design (BOD). [N] A written explanation of how the design of the building systems meets the OPR shall be completed at the design phase of the building project to cover the systems listed in Chapter 18, Part 3, Division 30 of the Public Resources Code. The systems shall include:

1. The assessment is performed in accordance with ISO 14044.

A5.409.5 Verification of compliance. Documentation of compliance shall be provided as follows:

A5.409.4 Substitution for prescriptive standards. Performance of a life cycle assessment completed in accordance with Section A5.409.2 may be substituted for other prescriptive provisions of Division A5.4, Title 24, Part 6, as well as process equipment and controls, and renewable energy systems shall be included in the scope of the commissioning requirements for energy systems covered by the 2013 California Energy Code.

3. Tenant improvements under 10,000 square feet as described in Section 303.1.1.

2. Areas under 10,000 square feet used for operations or other conditioned accessory spaces within dry storage warehouses.

1. No. 182849 (CALGreen 2013)
5.410.4 Testing and adjusting. Testing and adjusting of systems shall be required for buildings less than 10,000 square feet or new systems to serve an addition or alteration subject to Section 303.1.

5.410.4.2 Systems. Develop a written plan of procedures for testing and adjusting systems. Systems to be included for testing and adjusting systems shall include, as applicable to the project:

1. HVAC systems and controls.
2. Indoor and outdoor lighting and controls.
3. Water heating systems.
4. Renewable energy systems.
5. Landscape irrigation systems.
6. Water reuse systems.

5.410.4.3.1 HVAC balancing. In addition to testing and adjusting, before a new space-conditioning system serving a building or space is operated for normal use, balance the system in accordance with the procedures defined by the Testing Adjusting and Balancing Bureau National Standards; the National Environmental Balancing Bureau Procedural Standards; Associated Air Balance Council National Standards or as approved by the enforcing agency.

5.410.4.3 Procedures. Perform testing and adjusting procedures in accordance with applicable standards on each system as determined by the enforcing agency.

5.410.4.4 Reporting. After completion of testing, adjusting and balancing, provide a final report of testing signed by the individual responsible for performing these services.

5.410.4.5 Operation and maintenance (O&M) manual. Provide the building owner or representative with detailed operating and maintenance instructions and copies of guarantees/warranties for each system. O&M instructions shall be consistent with OSHA requirements in CCR, Title 8, Section 5142, and other related regulations.

5.410.4.5.1 Inspections and reports. Include a copy of all inspection verifications and reports required by the enforcing agency.
Applications - Adhesive and Sealant (CALGreen 2013)

Rule 1168 (VOC Limits No. 182849)

A5.504.4.5.1 No added formaldehyde, Tier 1. Use composite wood products approved by the ARB as no-added formaldehyde (NAF) based resins or ultra-low emitting formaldehyde (ULEF) resins.

Applications - Adhesive and Sealant (CALGreen 2013)

5.504.4.5 Composite wood products. 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

5.504.4.4 Carpet systems. All carpet installed in the building interior shall meet the testing and product requirements of one of the standards listed in Section 5.504.4.4.

6.7 Materials

5.504.4.3.2 Verification of the use of ozone depleting substances (CCR, Title 17, Section 94520, et seq.).

6.7.3 Materials, Paints and coatings. Architectural paints and coatings shall comply with Table 5.504.4.3 unless more stringent local limits apply.

5.504.4.1 Adhesives, sealants, caulks. Adhesives and sealants used on the project shall meet the requirements of the following standards.

5.504.4.3.1 Aerosol paints and coatings. Aerosol paints and coatings shall meet the Product-Weighted MIR Limits for ROC in Section 94522(a)(3) and other requirements, including prohibitions on use of certain toxic compounds.

5.504.3 Covering of duct openings and protection of mechanical equipment during construction. At the time of rough installation and during storage on the construction site and until the building has been completed, protect all duct openings from the introduction of material debris which may enter the system.

Repeat the procedures until testing demonstrates compliance.

A5.504.2.1.1 IAQ Testing. A testing alternative may be employed after all interior finishes have been installed, using testing protocols recognized by the United State Environmental Protection Agency (U.S. EPA) and in accordance with

A5.504.2.1.2 Test protocols. Testing of indoor air quality should include the elements listed in Items 1 through 4.

1. Carbon Monoxide (CO): 9 parts per million, not to exceed outdoor levels by 2 parts per million;

2. Volatile Organic Compounds (VOCs): 50 micrograms per cubic meter;

3. Particulates (PM10): 50 micrograms per cubic meter;

4. Total Volatile Organic Compounds (TVOC): 300 micrograms per cubic meter.

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

A5.504.1 Indoor air quality (IAQ) during construction. Maintain IAQ as provided in Sections A5.504.1.1 and A5.504.1.2.

A5.504.1.1 Temporary ventilation. Provide temporary ventilation during construction in accordance with Section 121 of the California Energy Code, CCR, Title 24, Part 6 and Chapter 4 of CCR, Title 8 and as listed in Items 1 and 2 in

A5.504.1.2 IAQ monitoring and documentation. Keep a log of all IAQ testing conducted during construction, the results of the testing, and any corrective actions taken.

Woodstoves shall comply with US EPA Phase II emission limits, where applicable.

[Not applicable]
6.10 Signage

5.504.7 Environmental tobacco smoke (ETS) control. Prohibit smoking within 25 feet of building entries, outdoor air intakes and operable windows where outdoor areas are provided for smoking and within the building as already stated in CALGreen 2013 No. 182849.

5.504.5.3.1 Filters, Tier 1. In mechanically ventilated buildings, provide regularly occupied areas of the building with air in filtration media for outside and return air prior to occupancy that provides at least a Minimum Efficiency Reporting Value (MERV) of 13.

5.504.5.3.1 Labeling. Installed filters shall be permitted for an HVAC unit meeting the 2013 California Energy Code having 60,000 Btu/h or less capacity per fan coil, if the energy use of the air delivery system is 0.4 cfm per Btu for interior zones.

A5.504.5.2 Isolation of pollutant sources. In rooms where activities produce hazardous fumes or chemicals, exhaust them and isolate them within the building. This shall be done in accordance with the California Occupational Safety and Health Administration (OSHA) regulations, California Department of Health Services (CDHS) rules and specified in the Health and Safety Code (Title 18, Part 2, Division 8, Chapter 1). The ASHRAE 10-percent to 15-percent efficiency filters of the same value shall be included in the operation and maintenance manual.

5.504.4.9.1 Verification. The building shall be verified to achieve the project credit for the project compliance with the applicable standard. The project documentation shall be provided verifying that thermal insulation materials meet the pollutant emission limits.

5.504.4.8 Thermal insulation, Tier 1 [BSC]. Thermal insulation, No-added Formaldehyde. Install thermal insulation which complies with Tier 1 plus does not contain any added formaldehyde.

5.504.4.7.1 Resilient floor coverings. Resilient floor coverings shall meet at least one of the following:

1. Certifications under the Greenguard Children’s & Schools program may also be used.

2. Compliant with the VOC-emission limits and testing requirements specified in Items 1 through 3.

3. Compliant with the Collaborative for High Performance Schools California (CA-CHPS) Criteria Interpretation for EQ 7.0 and 7.1 (formerly EQ. 2.2) dated July 2012 and listed in the CHPS High Performance Product Database; or

4. Products certified by the Resilient Floor Covering Institute (RFCI) FloorScore program; or

5. Other methods acceptable to the enforcing agency.

5.504.4.6 Resilient floor coverings. Resilient floor coverings, installed resilient floor coverings which meet one of the following:

1. Exterior grade products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269 or European 636 3S standards.5. Other methods acceptable to the enforcing agency.

2. Compliant with the VOC-emission limits and testing requirements specified in Items 1 through 3.

3. Product labeled and invoiced as meeting the Composite Wood Products regulation (see CCR, Title 17, Section 93120, et seq.).

4. Exterior grade products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269 or European 636 3S standards.5. Other methods acceptable to the enforcing agency.
### Sustainability Plan Guidelines

#### Tier 2

<table>
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<tr>
<th>Measure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pressure Relief Valves</strong></td>
<td>For vessels containing high-GWP refrigerants, a rupture disc shall be installed between the outlet of the vessel and the inlet of the pressure relief valve.</td>
</tr>
<tr>
<td><strong>Elbows</strong></td>
<td>Short radius elbows are only permitted where space limitations prohibit use of long radius elbows.</td>
</tr>
<tr>
<td><strong>Flared Tubing Connections</strong></td>
<td>Double-flared tubing connections may be used with multi-ring seal coated with refrigerants with a global warming potential no greater than 1. Exception: Single-flared tubing connections may be used for pressure controls, valve pilot lines and oil.</td>
</tr>
<tr>
<td><strong>Threaded Pipe</strong></td>
<td>Threaded connections are permitted at the compressor rack.</td>
</tr>
</tbody>
</table>

#### Tier 3

- These measures are currently required elsewhere in statute or in regulation.

#### Tier 4

- This application checklist is non-regulatory, intended only as an aid to the user and may not contain complete code language. Refer to Chapter 5 and Appendix Chapter A5 for complete code provisions.
## Table 5.508.2 Requirements for Refrigeration Systems

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Type of System</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.508.2.1</td>
<td>Refrigeration</td>
<td>The system shall be charged with regulated dry nitrogen and appropriate tracer gas to bring system pressure up to 300 psig minimum.</td>
</tr>
<tr>
<td>5.508.2.2</td>
<td>Refrigeration</td>
<td>Refrigerant receivers with capacities greater than 200 pounds shall be marked with a device that indicates the level of refrigerant in the receiver.</td>
</tr>
<tr>
<td>5.508.2.3</td>
<td>Refrigeration</td>
<td>Refrigerated service cases holding food products containing vinegar and salt shall have evaporator coils of corrosion-resistant material, such as stainless steel; or be coated to prevent corrosion.</td>
</tr>
<tr>
<td>5.508.2.4</td>
<td>Refrigeration</td>
<td>Refrigerant receivers shall be designed with corrosion-resistant materials.</td>
</tr>
<tr>
<td>5.508.2.5</td>
<td>Refrigeration</td>
<td>The system shall stand, unaltered, for 24 hours with no more than a +/- one pound pressure change from 300 psig, measured with the same gauge.</td>
</tr>
<tr>
<td>5.508.2.6</td>
<td>Refrigeration</td>
<td>The system shall be designed and tested to withstand a pressure test of 50% of the maximum system pressure setpoint.</td>
</tr>
</tbody>
</table>

### Notes:
- These measures are currently required elsewhere in statute or in regulation.
- Green building measures in this table may be mandatory if adopted by a city, county, or city and county as specified in Section 101.7.
- This application checklist is non-regulatory, intended only as an aid to the user and may not contain complete code language. Refer to Chapter 5 and Appendix Chapter A5 for complete code provisions.
<table>
<thead>
<tr>
<th>Measure</th>
<th>Green Building Measures</th>
<th>Mandatory if adopted by a city, county, or city and county as specified in Section 101.7.</th>
<th>Required Prerequisite for this Tier.</th>
<th>These measures are currently required elsewhere in statute or in regulation.</th>
<th>This application checklist is non-regulatory, intended only as an aid to the user and may not contain complete code language. Refer to Chapter 5 and Appendix Chapter A5 for complete code provisions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Vacuum</td>
<td>Pull a system vacuum down to at least 1000 microns (+/- 50 microns), and hold for 30 minutes.</td>
<td>1. Green building measures in this table may be mandatory if adopted by a city, county, or city and county as specified in Section 101.7.</td>
<td>Required prerequisite for this Tier.</td>
<td>These measures are currently required elsewhere in statute or in regulation.</td>
<td>This application checklist is non-regulatory, intended only as an aid to the user and may not contain complete code language. Refer to Chapter 5 and Appendix Chapter A5 for complete code provisions.</td>
</tr>
<tr>
<td>Second Vacuum</td>
<td>Pull a second system vacuum to a minimum of 500 microns and hold for 30 minutes.</td>
<td>1. Green building measures in this table may be mandatory if adopted by a city, county, or city and county as specified in Section 101.7.</td>
<td>Required prerequisite for this Tier.</td>
<td>These measures are currently required elsewhere in statute or in regulation.</td>
<td>This application checklist is non-regulatory, intended only as an aid to the user and may not contain complete code language. Refer to Chapter 5 and Appendix Chapter A5 for complete code provisions.</td>
</tr>
<tr>
<td>Third Vacuum</td>
<td>Pull a third vacuum down to a minimum of 300 microns, and hold for 24 hours with a maximum drift of 100 microns over a 24-hour period.</td>
<td>1. Green building measures in this table may be mandatory if adopted by a city, county, or city and county as specified in Section 101.7.</td>
<td>Required prerequisite for this Tier.</td>
<td>These measures are currently required elsewhere in statute or in regulation.</td>
<td>This application checklist is non-regulatory, intended only as an aid to the user and may not contain complete code language. Refer to Chapter 5 and Appendix Chapter A5 for complete code provisions.</td>
</tr>
</tbody>
</table>
### 5.106.4.1.1 Short-term bicycle parking

- If the new project or addition or alteration is anticipated to generate 10 or more visitor vehicular parking spaces, provide secure bicycle parking for 5 percent of visitor-occupied parking spaces and the type of facilities that will be provided in accordance with Table A5.106.4.3 or document arrangements with nearby changing/shower facilities.

### 5.106.4.1.2 Long-term bicycle parking

- For buildings with over 10 tenant-occupants or for additions or alterations which add nine or fewer visitor vehicular parking spaces, provide secure bicycle parking for 5 percent of visitor-occupied parking spaces.

### 5.106.4.2 Bicycle parking

1. Covered, lockable enclosures with permanently anchored racks for bicycles;
2. Bicycle Advocates.

Note: Additional information on recommended bicycle accommodations may be obtained from Sacramento Area Bicycle Advocates.

### 5.106.5.1 Designated parking for fuel-efficient and carpool/van pool vehicles

- In new projects or additions or alterations that add 10 or more vehicular parking spaces, provide the calculation of the designated parking spaces to be provided for low-emitting, fuel efficient, and carpool/van pool vehicles as follows:
  1. Tier 1 (10% of total spaces): Provide 10 percent of total designated parking spaces for any fuel-efficient and carpool/van pool vehicles as shown in Table A5.106.5.1.1 or A5.106.5.1.2.
  2. Tier 2 (12% of total spaces): Provide 12 percent of total designated parking spaces for fuel-efficient and carpool/van pool vehicles as shown in Table A5.106.5.1.1 or A5.106.5.1.2.

### 5.106.5.2 Designated parking

- If changing/shower facilities are provided at a nearby location, provide correspondence or other evidence that arrangements have been made at a nearby location.

### 5.106.6.1.1 Designated parking

- Correspondence or other evidence that arrangements have been made at a nearby changing/shower facility.

### 5.106.6.1.2 Location

- Location(s) of the changing/shower facilities.

### 5.106.6.2 Changing/shower facilities

- 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.

### 5.106.7.1 Bicycle parking

- Covered, lockable enclosures with permanently anchored racks for bicycles.
- Bicycle Advocates.

Note: Additional information on recommended bicycle accommodations may be obtained from Sacramento Area Bicycle Advocates.

### 5.106.7.2 Bicycle parking

- Covered, lockable enclosures with permanently anchored racks for bicycles;
- Bicycle Advocates.

Note: Additional information on recommended bicycle accommodations may be obtained from Sacramento Area Bicycle Advocates.
SUSTAINABILITY PLAN GUIDELINES

1. Provide site plan, floor plan, and/or elevation drawings that indicate the exterior walls of buildings meet the requirements of the California Energy Code through:
   - the use of fenestration on the east, south, and west-facing walls; or opaque wall areas.
   - Shading devices shall have 60-percent coverage to a height of 20 feet or to the top of the desired coverage within 5 years of building occupancy.

2. Provide calculations indicating that the parking capacity meets the minimum requirements of the zoning district where the project occurs.

3. Provide calculations of charging spaces required per Table 5.106.5.3.3.

A5.106.7.1 Fenestration. Provide vegetative or man-made shading devices for all fenestration on east-, south-, and west-facing walls.

A5.106.7.2 Opaque wall areas. Use wall surfacing with minimum SRI 25 (aged), for 75-percent of opaque wall areas.

A5.106.6 Parking capacity. Design parking capacity to meet but not exceed minimum local zoning requirements.

1. Provide site plan and/or parking plan sheet(s) that indicate the location and type of facilities provided to facilitate future installation of electric vehicle supply equipment (EVSE). Refer to Section 5.106.5.3.2 for design space requirements.

2. Provide a plan and details of the required raceway consistent with the specifications in Section 5.106.5.3.1.

3. In the event that only a single-charging space is required, provide a plan and details of the required raceway consistent with the specifications in Section 5.106.5.3.2.

4. If multiple charging spaces are required, provide plans and details of the required raceways consistent with the specifications in Section 5.106.5.3.1.

5. The California Department of Transportation adopts and publishes the California Manual on Uniform Transportation Control Devices (California MUTCD) to provide uniform standards and specifications for all transportation.

Notes:
- If multiple charging spaces are required, provide plans and details of the required raceways consistent with the specifications in Section 5.106.5.3.1.
- If multiple charging spaces are required, provide plans and details of the required raceways consistent with the specifications in Section 5.106.5.3.2.
- If multiple charging spaces are required, provide plans and details of the required raceways consistent with the specifications in Section 5.106.5.3.1.
- If multiple charging spaces are required, provide plans and details of the required raceways consistent with the specifications in Section 5.106.5.3.2.

Parking plans for parking area by:
- Provide calculations of charging spaces required per Table 5.106.5.3.3.
- Provide calculations of charging spaces required per Table 5.106.5.3.3.

Devices (California MUTCD) to provide uniform standards and specifications for all transportation.
A5.106.11.3 Verification Index Calculation Worksheet (SRI-WS) is available by contacting the Energy Standard.

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<table>
<thead>
<tr>
<th>Section</th>
<th>Requirement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A5.211.1.1 Documentation</td>
<td>Calculate renewable on-site system to meet the requirements of Section A5.211.1. Factor in net-metering, if applicable.</td>
<td>None</td>
</tr>
<tr>
<td>A5.211.1.2 Energy Budget</td>
<td>For building projects that include indoor lighting or mechanical systems, but not both, the Energy Budget is no greater than 95 percent of the Title 24, Part 6, Energy Budget for the Proposed Design Building. For building projects that include indoor lighting and mechanical systems, the Energy Budget is no greater than 85 percent of the Title 24, Part 6, Energy Budget for the Proposed Design Building.</td>
<td>None</td>
</tr>
<tr>
<td>A5.203.1.1.2 Service water heating in restaurants</td>
<td>Newly constructed restaurants 8,000 square feet or greater and with service water heaters rated 75,000 Btu/h or greater installed a solar water-heating system.</td>
<td>None</td>
</tr>
<tr>
<td>A5.203.1.1.3 Functional areas where compliance with residential lighting standards is required.</td>
<td>For newly constructed high-rise residential dwelling units and hotel and motel guest rooms, indoor lighting complies with the applicable requirements in Appendix A4 Residential Voluntary Measures, Division A4.2 - Energy Efficiency.</td>
<td>Not applicable to Metro projects.</td>
</tr>
<tr>
<td>A5.203.1.2.1 Tier 1.</td>
<td>For building projects that include indoor lighting or mechanical systems, but not both, the Energy Budget is no greater than 95 percent of the Title 24, Part 6, Energy Budget for the Proposed Design Building.</td>
<td>None</td>
</tr>
<tr>
<td>A5.203.1.2.2.</td>
<td>Newly constructed buildings, as well as additions and alterations, are included in the scope of these sections. Buildings permitted without lighting or mechanical systems shall comply with Sections A5.203.1.1 and A5.203.1.2.1 or A5.203.1.2.2.</td>
<td>Evidence that lighting and/or mechanical systems comply with Sections A5.203.1.1 and A5.203.1.2.1 or A5.203.1.2.2.</td>
</tr>
</tbody>
</table>

Supporting calculations

- Evidence that newly installed outdoor lighting power is no greater than 90% of Title 24 requirements.
- Evidence that installed outdoor lighting power is no greater than 90% of Title 24 requirements.
1. Provide schedule of plumbing fixtures and fittings.

2. Provide specification for showerheads.
   - Showerheads shall be specified in Schedule 40 and shall be certified by the WaterSense Program.
   - The flow rate of showerheads shall be no more than 2.0 gallons per minute at 80 psi. Showerheads shall be specified in Schedule 40.

3. Provide specification for urinals.
   - Urinals shall be specified in Schedule 40 and shall be certified by the WaterSense Program.
   - The flow rate of urinals shall be no more than 1.3 gallons per flush.

4. Provide specification for water closets.
   - Water closets shall be specified in Schedule 40 and shall be certified by the WaterSense Program.
   - The flow rate of water closets shall be no more than 1.3 gallons per flush.

5. Multiple showerheads serving one shower.
   - When a shower is served by more than one showerhead, the combined flow rate shall not exceed 2.0 gallons per minute at 80 psi.

6. Support the building with documentation on water conservation.
   - Supporting calculations shall be provided to demonstrate compliance with the following:
     - A5.303.2.3.1 Tier 1 - 30 percent savings. A schedule of plumbing fixtures and fittings that indicate that a reduction in the overall use of potable water within the building will be provided by 30% for Tier 1, 35% Tier 2, and 40% for Tier 3.
     - A5.303.2.3.2 40 percent savings. A schedule of plumbing fixtures and fittings that will reduce the overall use of potable water within the building "water use base-line," as established in Table 5.303.2.2, shall be provided.
     - Exceptions: Buildings that demonstrate 20 percent overall water use reduction. In this case, a calculation demonstrating a 20 percent reduction in service, medical or dental office, laboratory, or beauty salon or barber shop. Service, medical or dental office, laboratory, or beauty salon or barber shop. Restaurant or food services, and landscape irrigation.

7. Provide schedule of plumbing fixtures and fittings to supply water closets, urinals, and other allowed uses. Provide on-site locations of devices for the capture of rainwater. Also indicate that the performance criteria of the U.S. EPA WaterSense Specifications for Showerheads.

8. Provide landscape plan irrigation legend and details that show submeters or metering devices for irrigation plan.

9. Where separate submeters for individual building tenants are unfeasible, for water supplied to the following subsystems:
   - Makeup water for evaporative coolers greater than 6 gpm (0.04 L/s).
   - Subsystems within the building for which separate submeters would result in significant cost to the building contractor.
1. Provide utility plan and landscape plan sheet(s) that show separate submeters for domestic services.

2. Provide landscape plan irrigation legend and details that show submeters or metering devices for irrigation plan.

3. Irrigation design. In new nonresidential projects with at least 1,000 square feet but not more than 2,500 square feet, the following shall be provided:

   a. A landscaped area (the level of landscaping shall meet the standards for landscaping described in the California Plumbing Code).

   b. Adequate irrigation system plumbing, including irrigation lines, sprinklers, and other irrigation equipment.

   c. Selection of appropriate irrigation design and equipment to ensure efficient water use.

5.304.3 Outdoor potable water use. For new water service, separate meters or submeters shall be installed for indoor and outdoor potable water use for the following purposes:

   a. Water for outdoor use, including irrigation, landscaping, and maintenance.

   b. Water for indoor use, including drinking, cooking, and bathing.

5.303.6 Standards for plumbing fixtures (faucets) that demonstrate compliance with the water conservation levels defined in Section A5.304.8.

   a. Lavatory faucets shall have a flow rate of not more than 1.3 gpm (0.08 L/s) or less.

   b. Dishwashers shall meet the criteria in Section A5.303.3(2)(a) and (b).

   c. Dishwashers shall not consume more than 10 gph (38 L/h) in the full operational mode.

   d. Ice makers shall be air cooled.

   e. Combination ovens shall not consume more than 10 gph (38 L/h) in the full operational mode.

   f. Clothes washers shall have a maximum Water Factor (WF) that will reduce the use of water by 10 percent below the California Energy Commission's current addition of the California Plumbing Code or other methods described in Section A5.304.8.

5.303.3.4.5 Metering faucets for wash fountains. Metering faucets for wash fountains shall have a maximum flow rate of not more than 1.8 gallons per minute at 60 psi (207 kPa) and 301

   a. Operate at static pressure of at least 30 psi (207 kPa) when designed for a certain condition.

   b. Be equipped with an integral automatic shutoff system that prevents the flow of water from being turned off without manually resetting it.

   c. Be capable of cleaning 60 plates in an average time of not more than 30 seconds per plate.

   d. Temporarily increase the flow rate of water if information is provided.

   e. Use aerators or other devices to achieve water rate reduction.

   f. Specifications for the faucets from the manufacturer that indicates compliance with the rate of water flow per minute at 60 psi (207 kPa).

   g. Note: Where complying faucets are unavailable, aerators or other means may be used to achieve reduction.
A5.304.5 Potable water elimination. Provide a water efficient landscape design that reduces the use of potable water beyond the initial calculation of compliance. A calculation demonstrating the applicable potable water use reduction required by this section shall be provided.

A5.304.4.1 Tier 1 - Reduce the use of potable water to a quantity that does not exceed 60 percent of ETo times the landscape area.

1. Provide landscape plan sheet(s) with a water efficient landscape irrigation design that reduces the use of potable water beyond the initial calculation of compliance. Include the required documentation in support of the water savings as described in Section A5.304.4.3.

2. Provide calculations that demonstrate the reduction based on the water budget for the Project.

Calculations that demonstrate reduction on water requirements for plant installation and establishment in compliance with Section A5.304.4.1 or A5.304.4.2.

A5.304.4.2 Tier 2 - Reduce the use of potable water to a quantity that does not exceed 55 percent of ETo times the landscape area.

1. Provide landscape plan sheet(s) with a water efficient landscape irrigation design that reduces the use of potable water beyond the initial calculation of compliance. Include the required documents in support of the water savings as described in Section A5.304.4.3.

2. Provide calculations that demonstrate the reduction based on the water budget for the Project.

Calculations that demonstrate reduction on water requirements for plant installation and establishment in compliance with Section A5.304.4.1 or A5.304.4.2. Calculations for the reduction shall be based on the water budget developed pursuant to Section 5.304.1.

A5.304.3.2 Water budget. Provide a water efficient landscape irrigation design that reduces the use of potable water beyond the initial calculation of compliance. Include the required documentation in support of the water savings as described in Section A5.304.4.3.

1. Provide landscape plan sheet(s) with a water efficient landscape irrigation design that reduces the use of potable water beyond the initial calculation of compliance. Include the required documents in support of the water savings as described in Section A5.304.4.3.

2. Provide calculations that demonstrate the reduction based on the water budget for the Project.

Calculations that demonstrate reduction on water requirements for plant installation and establishment in compliance with Section A5.304.4.1 or A5.304.4.2.

A5.304.3.1 Water budget. Provide a water efficient landscape irrigation design that reduces the use of potable water beyond the initial calculation of compliance. Include the required documentation in support of the water savings as described in Section A5.304.4.3.

1. Provide landscape plan sheet(s) with a water efficient landscape irrigation design that reduces the use of potable water beyond the initial calculation of compliance. Include the required documents in support of the water savings as described in Section A5.304.4.3.

2. Provide calculations that demonstrate the reduction based on the water budget for the Project.

Calculations that demonstrate reduction on water requirements for plant installation and establishment in accordance with Section A5.304.4.1 or A5.304.4.2. Calculations for the reduction shall be based on the water budget developed pursuant to Section 5.304.1.

A5.304.2.2 Plumbing, landscape, and irrigation plan.

1. Provide plumbing plan, landscape plan, and irrigation plan sheet(s) that demonstrate nonpotable water systems for indoor and outdoor use.

2. Provide site plan and plumbing plan sheet(s) that demonstrate how this will be accomplished consistent with the California Plumbing Code.

A5.304.2.1 Site plan and plumbing plan.

1. Provide site plan and plumbing plan sheet(s) that demonstrate nonpotable water systems for indoor and outdoor use.

2. Provide plumbing plan, landscape plan, and irrigation plan sheet(s) that demonstrate nonpotable water systems for indoor and outdoor use for indoor and outdoor use.

A5.304.1 Nonpotable water systems. Nonpotable water systems for indoor and outdoor use shall comply with the current edition of the California Plumbing Code.

A5.304.6 Restoration of areas disturbed by construction. Restore all areas disturbed during construction by planting with local native and/or noninvasive vegetation.

1. Provide landscape plan sheet(s), including irrigation, landscape and planting plans, and legends, that demonstrate how areas previously developed or graded can be restored with native and/or noninvasive vegetation.

2. Demonstrate how areas previously developed or graded can be restored with native and/or noninvasive vegetation.

A5.304.7 Previously developed sites. On previously developed or graded sites, restore or protect at least 50 percent of the site area with native and/or noninvasive vegetation.

1. Provide landscape plan sheet(s), including irrigation, landscape and planting plans, and legends, that demonstrate how 50% of areas previously developed or graded can be restored with native and/or noninvasive vegetation.

2. Demonstrate how areas previously developed or graded can be restored with native and/or noninvasive vegetation.

A5.304.8 Graywater irrigation system. Install graywater collection system for onsite subsurface irrigation using graywater collected from showers, bathroom wash basins and laundry water. See California Plumbing Code.

1. Provide landscape plan sheet(s) including irrigation, landscape, and planting plans, that demonstrate the use of graywater collected from showers, bathroom wash basins and laundry water.

2. Demonstrate how areas previously developed or graded can be restored with native and/or noninvasive vegetation.

A5.304.9.4 Verifying success. The project shall verify success by periodically report progress until the vegetation is established consistent with the California Code.

1. Provide site plan and plumbing plan sheet(s) that demonstrate nonpotable water systems for indoor and outdoor use.

2. Demonstrate how areas previously developed or graded can be restored with native and/or noninvasive vegetation.

A5.304.9.3 Verifying success. The project shall verify success by periodically report progress on the vegetation established in accordance with the California Code.

1. Provide site plan and plumbing plan sheet(s) that demonstrate nonpotable water systems for indoor and outdoor use.

2. Demonstrate how areas previously developed or graded can be restored with native and/or noninvasive vegetation.

A5.304.9.2 Verifying success. The project shall verify success by periodically report on the progress until the vegetation is established consistent with the California Code.

1. Provide site plan and plumbing plan sheet(s) that demonstrate nonpotable water systems for indoor and outdoor use.

2. Demonstrate how areas previously developed or graded can be restored with native and/or noninvasive vegetation.

A5.304.9.1 Verifying success. The project shall verify success by periodically report progress on the vegetation established in accordance with the California Code.

1. Provide site plan and plumbing plan sheet(s) that demonstrate nonpotable water systems for indoor and outdoor use.

2. Demonstrate how areas previously developed or graded can be restored with native and/or noninvasive vegetation.
A5.405.5.3.1 Cement. The following measures may be used in the manufacture of cement.

1. Provide evidence of additional means of compliance employed for the production of cement or concrete in conjunction with Sections A5.405.5.3.1 and A5.405.5.3.2, respectively.

2. Blended hydraulic cement shall meet ASTM C 595. Other Hydraulic Cements shall meet ASTM C 1157. Exception: Minimums in mix designs approved by the Engineer of Record may be lower where high early strength is needed.

3. Provide architectural plans and/or structural plans approved by the Engineer of Record that demonstrate use of high strength concrete made with recycled products as described in Section A5.405.5.2.1.

A5.405.5.3 Additional means of compliance. Any of the following measures shall be permitted to be employed for the production of cement or concrete:

1. Provide evidence that cement and concrete made with recycled products comply with the standards described in Sections A5.405.5.2.

2. Use concrete manufactured with cementitious materials that are rapidly renewable materials for at least 2.5 percent of wood products used, including certified wood products and, for 2.5 percent of wood products used, for rapidly renewable materials. The California commissi will continue to develop a standard through the next code cycle.

3. Use materials made from plants harvested within a ten-year cycle for at least 2.5 percent of wood products used. Certified wood products and, for 2.5 percent of wood products used, for rapidly renewable materials.

4. Use building materials that have been harvested or manufactured within California or within 500 miles of the Project site. Evidence that selected building materials or products for permanent installation on the Project has been harvested or manufactured within California or within 500 miles of the Project site.

5. Use building materials that have been harvested within California and/or 500 miles of the Project site. Evidence that selected building materials or products for permanent installation on the Project has been harvested or manufactured within California and/or 500 miles of the Project site.

6. Use salvaged, refurbished, recycled building materials for at least 5 percent of the total value, based on estimated cost. The RCV shall not be lower than 15 percent of the total material cost of the project.

7. Prioritize the use of building materials that are rapidly renewable materials for at least 2.5 percent of wood products used, including certified wood products and, for 2.5 percent of wood products used, for rapidly renewable materials.

8. Use materials made from plants harvested within a ten-year cycle for at least 2.5 percent of wood products used. Certified wood products and, for 2.5 percent of wood products used, for rapidly renewable materials.

9. Use building materials that have been harvested or manufactured within California or within 500 miles of the Project site. Evidence that selected building materials or products for permanent installation on the Project has been harvested or manufactured within California or within 500 miles of the Project site.
The report shall provide the monthly actual recycled tons and the percent recycled.


2. Consistent with the local ordinance or Municipal Code, utilize a certified waste management company that provides the percentage of construction waste diverted from landfills that will serve the Project.

Evidence of approval shall consist of correspondence indicating approval and/or signature page only of the Construction Waste Management Program that meets in accordance with Section 5.408.1.1, 5.408.1.2 or 5.408.1.3; or meet a local construction and demolition waste management ordinance, whichever is more stringent.

1. Provide landscape irrigation plans and details that show prevention of irrigation spray on Project building(s) and other exterior doors with exterior door protection and control.

- An installed awning at least 4 feet in depth.
- Building plan, elevations, and details that show prevention of water intrusion into the building(s) through the entry and openings.
- Such openings plus at least one of the following:
  - Sprinklers. Design and maintain landscape irrigation systems to prevent irrigation spray on structures.
  - Ashings integrated with a drainage plane.
  - Moisture control.

1. Provide documentation, with Metro approval, that demonstrates use of high strength concrete designed to reduce the size of concrete elements.

- Evidence of approval by the Engineer of Record on the use of high strength concrete.
- Architectural plan and/or structural plan approved by the Engineer of Record that demonstrate use of high strength concrete.

3. Provide architectural plans and/or structural plans approved by the Engineer of Record that demonstrate use of high strength concrete.

- A5.405.5.3.2.4 High strength concrete. Concrete elements designed to reduce their total size compared to standard 3,000 psi concrete, as approved in Section A5.405.5.3.2.4.
- Evidence of additional means of compliance employed for the production of cement or concrete in conjunction with cement and concrete components as detailed in Sections A5.405.5.3.1 and A5.405.5.3.2, respectively.
- Documentation with Metro approval for the use of high strength concrete.
- Evidence of additional means of compliance employed for the production of cement or concrete in conjunction with cement and concrete components as detailed in Sections A5.405.5.3.1 and A5.405.5.3.2, respectively.
# Appendix C

## CALGREEN, MATERIAL CONSERVATION & RECYCLING EFFICIENCY

**2013**

### SUSTAINABILITY PLAN GUIDELINES

**METRO** recommendations shall be included in the operation and maintenance manual. See notes for available tools.

1. **A copy of the analysis** shall be made available to the enforcement authority.  
2. A **copy of the analysis and any maintenance or training recommendations** that shall be included in the operation and maintenance manual.

### A5.408.1 Construction waste management plan

#### A5.408.1.1 Construction waste management plan

- Where a local jurisdiction does not have a construction and demolition waste management ordinance that is more stringent, submit a construction waste management plan that complies with Items 1 through 4 of this section.
- Provide documentation that enhanced reduction of nonhazardous construction or demolition waste, consisting of 65% for Tier 1 and 80% for Tier 2, will occur.
- Evidence of approval of the Project’s Construction Waste Management Plan consistent with local requirements (signed by authorized City or County official).
- Provide a Monthly Construction Waste Reduction, Disposal, and Recycling report tabulated monthly for the duration of Project construction.
- Documentation of enhanced reduction of nonhazardous construction or demolition waste, consisting of 65% for Tier 1 and 80% for Tier 2, will occur.
- Evidence of approval of the Project’s Construction Waste Management Plan consistent with local requirements (signed by authorized City or County official).
- Provide a Monthly Construction Waste Reduction, Disposal, and Recycling report tabulated monthly for the duration of Project construction.

#### A5.408.1.2 Waste management company

- Utilize a waste management company that can provide verification that the construction waste diverted from landfills is disposed of or re-used.
- Documentation of enhanced reduction of nonhazardous construction or demolition waste, consisting of 65% for Tier 1 and 80% for Tier 2, will occur.
- Evidence of approval of the Project’s Construction Waste Management Plan consistent with local requirements (signed by authorized City or County official).

### A5.408.2.1 Enhanced construction waste reduction-Tier 1 [BSC]

- Divert to recycle or salvage at least 65% of nonhazardous construction and demolition waste.
- SCAQMD Rules for fugitive dust.
- Consistent with the local ordinance or Municipal Code, utilize a certified waste management company that provides the percentage of construction waste diverted from landfills.
- Documentation of enhanced reduction of nonhazardous construction or demolition waste, consisting of 65% for Tier 1 and 80% for Tier 2, will occur.
- Evidence of approval of the Project’s Construction Waste Management Plan consistent with local requirements (signed by authorized City or County official).

### A5.408.3 Excavated soil and land clearing debris

- 100% of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing may be deemed to meet the 50% minimum requirement as approved by the enforcing agency.
- Evidence of approval of Construction Waste Management Plan (signed by authorized City or County official).

### A5.408.3.1 Enhanced waste reduction

#### A5.408.3.1.1 Verifications

- Evidence of approval of the Project’s Construction Waste Management Plan consistent with the local ordinance and/or Municipal Code.
- Provide signed cover of the completed Construction Waste Management Plan or approval correspondence and/or documentation of the waste management company utilized shall be provided.
- Evidence of approval of Construction Waste Management Plan (signed by authorized City or County official).

### A5.408.3.1.2 Verifications

- Excavated soil and land-clearing debris.
- Nonhazardous construction or demolition waste.
- Consistent with the local ordinance or Municipal Code, utilize a certified waste management company that provides the percentage of construction waste diverted from landfills.
- Documentation of enhanced reduction of nonhazardous construction or demolition waste, consisting of 65% for Tier 1 and 80% for Tier 2, will occur.
- Evidence of approval of the Project’s Construction Waste Management Plan consistent with local requirements (signed by authorized City or County official).

### A5.408.3.4 Documentation

1. Provide documentation that enhanced reduction of nonhazardous construction or demolition waste, consisting of 65% for Tier 1 and 80% for Tier 2, will occur.
2. Consistent with the local ordinance or Municipal Code, utilize a certified waste management company that provides the percentage of construction waste diverted from landfills.
3. Documentation of enhanced reduction of nonhazardous construction or demolition waste, consisting of 65% for Tier 1 and 80% for Tier 2, will occur.
4. Evidence of approval of Construction Waste Management Plan consistent with local requirements (signed by authorized City or County official).

### A5.408.4 Documentation

- Signed cover of Construction Waste Management Plan or approval correspondence and/or documentation of the waste management company utilized shall be provided.
- Evidence of approval of Construction Waste Management Plan (signed by authorized City or County official).

### A5.408.5 Documentation

- Signed cover of Construction Waste Management Plan or approval correspondence and/or documentation of the waste management company utilized shall be provided.
- Evidence of approval of Construction Waste Management Plan (signed by authorized City or County official).

### A5.408.6 Documentation

- Signed cover of Construction Waste Management Plan or approval correspondence and/or documentation of the waste management company utilized shall be provided.
- Evidence of approval of Construction Waste Management Plan (signed by authorized City or County official).
1. Provide copy of the approved Systems Manual (signature page or approval correspondence only). The Systems Manual shall describe the systems to be commissioned.

2. Commissioning process activities, schedules, and responsibilities. Plans for the completion of commissioning shall be included.

3. Commissioning measures shown in the construction documents.

4. Basis of design. Provide applicable plan sheet(s) for the completion of commissioning.

5.410.2.5 Documentation and training. A systems manual and systems operations training are required, including Occupational Safety and Health Administration (OSHA) requirements in California Code of Regulations (CCR), Title 8, Section 5142, and other related regulations.

5.410.2.6 Test parameters. Functional performance testing reports shall contain information on the test parameters, including:

   a. What shall be tested.
   b. Equipment and systems to be tested, including the extent of tests.
   c. When the test shall be performed.
   d. Conditions under which the test shall be performed.

5.410.2.7 Test results. Documentation of test results shall be included and shall demonstrate the system's performance.

5.410.2.8 Commissioning report. For new projects, a commissioning report shall be completed to document the commissioning process.

5.410.2.9 Other documentation. In addition to the above, other applicable resources and documentation may be required by Metro or CALGreen; and (7) other applicable resources and documentation.

5.410.3 Financial and General Requirements

5.410.3.1 Building operating systems. All building operating systems covered by Title 24, Part 6, as well as process equipment and controls, and renewable energy systems shall be included in the scope of the commissioning requirements.

5.410.3.2 Indoor air quality. The indoor air quality of the building shall be consistent with the requirements of Section 5.410.2.3: (1) general project information; (2) commissioning goals; (3) system design; (4) system installation; (5) system operation and maintenance; (6) system testing; (7) system documentation; (8) system monitoring; (9) system performance.

5.410.3.3 Recycling. Provide readily accessible areas that serve the entire building and are identified on the floor plan, and/or detailed plan sheet(s) that indicate recycling areas for depositing, storage, and collection of nonhazardous solid waste.

5.410.3.4 Water conservation. Provide indoor water conservation systems, and control measures, that reduce the consumption of potable water by at least 20%, or as required by the enacted local recycling ordinance, if more restrictive.

5.410.3.5 Material conservation. Provide plans that document the required facilities per the requirements.

5.410.1 Sample ordinance. Space allocation for recycling areas shall comply with Chapter 18, Part 3, Division 30 of the Public Resources Code.

5.410.1.1 Additions. All additions conducted within a 12-month period under single or multiple permits, resulting in an increase of 30 percent or more in the tenant area, provide site plan, floor plan, and/or detailed plan sheet(s) that indicate recycling areas.

5.410.1.2 Sample ordinance. Provide readily accessible areas that serve the tenant space and are identified on the floor plan, and/or detailed plan sheet(s) that indicate recycling areas for depositing, storage, and collection of nonhazardous solid waste.

5.410.1 Recycling by occupants. Provide readily accessible areas that serve the entire building and are identified on the floor plan, and/or detailed plan sheet(s) that indicate recycling areas for depositing, storage, and collection of nonhazardous solid waste.

5.410.2.2 Basis of Design (BOD). A written explanation of how the design of the building systems meets the OPR shall be completed at the design phase of the building project to cover the systems listed in Section 5.410.2.2.

5.410.2.3 Commissioning plan. Prior to permit issuance, a commissioning plan shall be completed to document how the project will be commissioned to meet the OPR.

5.410.2.4 Summary of supporting documents. Submit a summary of supporting documents to the Program administrator for review and approval.

5.410.2.4.1 Authority. The authority for commissioning is Metro or CALGreen, MATERIAL CONSERVATION & RECYCLING EFFICIENCY.
<table>
<thead>
<tr>
<th>Section</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.410.1</td>
<td>The system shall be balanced before final acceptance of the building.</td>
</tr>
<tr>
<td>5.410.2</td>
<td>The plan of procedures for testing and adjusting shall address the following systems: (1) HVAC systems and controls; (2) indoor and outdoor lighting controls; (3) water heating systems; (4) renewable energy systems; (5) landscape irrigation systems; and (6) water reuse systems.</td>
</tr>
<tr>
<td>5.410.3</td>
<td>Testing and adjusting systems (signature page or approval correspondence only) after completion of testing, adjusting and balancing. The plan of procedures for testing and adjusting shall address the following systems: (1) HVAC systems and controls; (2) indoor and outdoor lighting controls; (3) water heating systems; (4) renewable energy systems; (5) landscape irrigation systems; and (6) water reuse systems.</td>
</tr>
<tr>
<td>5.410.4</td>
<td>The plan of procedures for testing and adjusting shall address the following systems: (1) HVAC systems and controls; (2) indoor and outdoor lighting controls; (3) water heating systems; (4) renewable energy systems; (5) landscape irrigation systems; and (6) water reuse systems.</td>
</tr>
<tr>
<td>5.410.5</td>
<td>1. Provide evidence that the testing and adjusting of systems has been completed.</td>
</tr>
<tr>
<td>5.410.6</td>
<td>Approved Systems Manual (signature page or approval correspondence only) after completion of testing, adjusting and balancing. The systems manual shall include: (1) detailed operating and maintenance instruction; (2) copies of guaranties/warranties for each system. O&amp;M instructions shall be consistent with OSHA requirements.</td>
</tr>
<tr>
<td>5.410.7</td>
<td>1. HVAC systems and controls.</td>
</tr>
<tr>
<td>5.410.8</td>
<td>2. Indoor and outdoor lighting controls.</td>
</tr>
<tr>
<td>5.410.9</td>
<td>3. Water heating systems.</td>
</tr>
<tr>
<td>5.410.10</td>
<td>4. Renewable energy systems.</td>
</tr>
<tr>
<td>5.410.11</td>
<td>5. Landscape irrigation systems.</td>
</tr>
<tr>
<td>5.410.13</td>
<td>7. Other resources and documentation, if applicable.</td>
</tr>
<tr>
<td>5.410.14</td>
<td>A report of commissioning process activities undertaken through the design and construction phases of the building shall be developed and documented in the commissioning report and shall include the following: (1) detailed operating and maintenance instruction; (2) copies of guaranties/warranties for each system. O&amp;M instructions shall be consistent with OSHA requirements.</td>
</tr>
<tr>
<td>5.410.15</td>
<td>Support for Section 5.410.2.5 Documentation and Training.</td>
</tr>
<tr>
<td>5.410.16</td>
<td>Review of the information in the systems manual.</td>
</tr>
</tbody>
</table>
Evidence that adhesives, sealants, and caulks shall comply with the following minimum requirements:

1. Provide evidence that indoor air quality (IAQ) post construction has been addressed. This shall include:
   - Carbon Monoxide (CO): 9 parts per million, not to exceed outdoor levels by 2 parts per million;
   - Formaldehyde: 27 parts per billion;
   - Particulates (PM10): 50 micrograms per cubic meter;
   - 4-Phenylcyclohexene (4-PCH): 6.5 micrograms per cubic meter;
   - Total Volatile Organic Compounds (TVOC): Measured by the following:
     - Monoxide [CO]:
     - Formaldehyde:
     - Particulates [PM10]:
     - 4-Phenylcyclohexene [4-PCH]:
     - Total Volatile Organic Compounds [TVOC]:

2. Evidence that indoor air quality (IAQ) shall be maintained during construction through the use of temporary ventilation and/or additional indoor air quality measures as listed in Items 1 through 5 in Section A5.504.1.2.

3. Documentation that duct openings would be maintained in accordance with ASHRAE 52.1-1992 and that filters with a MERV of 8, based on ASHRAE 52.2-2013, would be replaced immediately prior to occupancy. Applies to additions or alterations.

4. Evidence that alterations to existing mechanical systems will be modified to maintain the minimum efficiency of 30 percent based on ASHRAE 52.1-1992. Replace all filters immediately prior to occupancy. Applies to additions or alterations.

5. Evidence that fiberglass insulation will be installed beyond the building envelope, except as noted in Section A5.504.2.1.3 Noncomplying building areas. For each sampling area of the building exceeding the maximum concentrations specified in Section A5.504.2.1.1. The contaminant levels will be tested and retested until testing demonstrates compliance.

6. None

7. Evidence that aerosol adhesives and smaller finishes have been installed, using testing protocols recognized by the contractor.

8. Evidence that indoor air quality (IAQ) post construction has been addressed, including:
   - Architectural plans or other appropriate documents
   - Mechanical plans or other appropriate documents
   - Floor plans, room layouts
   - Dust, water and debris which may enter the system.
   - Minimum efficiency of 30 percent based on ASHRAE 52.1-1992 will be documented.

9. Evidence that indoor air quality (IAQ) post construction has been addressed, including:
   - Architectural plans or other appropriate documents
   - Mechanical plans or other appropriate documents
   - Floor plans, room layouts
   - Dust, water and debris which may enter the system.
   - Minimum efficiency of 30 percent based on ASHRAE 52.1-1992 will be documented.

10. Evidence that indoor air quality (IAQ) post construction has been addressed, including:
    - Architectural plans or other appropriate documents
    - Mechanical plans or other appropriate documents
    - Floor plans, room layouts
    - Dust, water and debris which may enter the system.
    - Minimum efficiency of 30 percent based on ASHRAE 52.1-1992 will be documented.

11. Evidence that indoor air quality (IAQ) post construction has been addressed, including:
    - Architectural plans or other appropriate documents
    - Mechanical plans or other appropriate documents
    - Floor plans, room layouts
    - Dust, water and debris which may enter the system.
    - Minimum efficiency of 30 percent based on ASHRAE 52.1-1992 will be documented.

12. Evidence that indoor air quality (IAQ) post construction has been addressed, including:
    - Architectural plans or other appropriate documents
    - Mechanical plans or other appropriate documents
    - Floor plans, room layouts
    - Dust, water and debris which may enter the system.
    - Minimum efficiency of 30 percent based on ASHRAE 52.1-1992 will be documented.

13. Evidence that indoor air quality (IAQ) post construction has been addressed, including:
    - Architectural plans or other appropriate documents
    - Mechanical plans or other appropriate documents
    - Floor plans, room layouts
    - Dust, water and debris which may enter the system.
    - Minimum efficiency of 30 percent based on ASHRAE 52.1-1992 will be documented.

14. Evidence that indoor air quality (IAQ) post construction has been addressed, including:
    - Architectural plans or other appropriate documents
    - Mechanical plans or other appropriate documents
    - Floor plans, room layouts
    - Dust, water and debris which may enter the system.
    - Minimum efficiency of 30 percent based on ASHRAE 52.1-1992 will be documented.

15. Evidence that indoor air quality (IAQ) post construction has been addressed, including:
    - Architectural plans or other appropriate documents
    - Mechanical plans or other appropriate documents
    - Floor plans, room layouts
    - Dust, water and debris which may enter the system.
    - Minimum efficiency of 30 percent based on ASHRAE 52.1-1992 will be documented.

16. Evidence that indoor air quality (IAQ) post construction has been addressed, including:
    - Architectural plans or other appropriate documents
    - Mechanical plans or other appropriate documents
    - Floor plans, room layouts
    - Dust, water and debris which may enter the system.
    - Minimum efficiency of 30 percent based on ASHRAE 52.1-1992 will be documented.

17. Evidence that indoor air quality (IAQ) post construction has been addressed, including:
    - Architectural plans or other appropriate documents
    - Mechanical plans or other appropriate documents
    - Floor plans, room layouts
    - Dust, water and debris which may enter the system.
    - Minimum efficiency of 30 percent based on ASHRAE 52.1-1992 will be documented.

18. Evidence that indoor air quality (IAQ) post construction has been addressed, including:
    - Architectural plans or other appropriate documents
    - Mechanical plans or other appropriate documents
    - Floor plans, room layouts
    - Dust, water and debris which may enter the system.
    - Minimum efficiency of 30 percent based on ASHRAE 52.1-1992 will be documented.

19. Evidence that indoor air quality (IAQ) post construction has been addressed, including:
    - Architectural plans or other appropriate documents
    - Mechanical plans or other appropriate documents
    - Floor plans, room layouts
    - Dust, water and debris which may enter the system.
    - Minimum efficiency of 30 percent based on ASHRAE 52.1-1992 will be documented.

20. Evidence that indoor air quality (IAQ) post construction has been addressed, including:
    - Architectural plans or other appropriate documents
    - Mechanical plans or other appropriate documents
    - Floor plans, room layouts
    - Dust, water and debris which may enter the system.
    - Minimum efficiency of 30 percent based on ASHRAE 52.1-1992 will be documented.
1. Certifications:
   - UL GREENGUARD Gold (formerly the Greenguard Children's & Schools Program).
   - CHPS High Performance Product Database.
   - CA-CHPS Criteria Interpretation for EQ 7.0 and 7.1 (formerly EQ. 2.2).

2. Provide documentation that percentage of the floor area receiving resilient flooring meets one of the criteria listed in Section 5.504.4.4.6.1

3. Product labeled and invoiced as meeting the Composite Wood Products regulation (see CCR, Title 17, Section 93120, et seq.).

4. Evidence that all carpet adhesive shall meet the requirements of CALGreen Table 5.504.4.1.

5. No added formaldehyde, Tier 1. Use composite wood products approved by the ARB as no-added formaldehyde (NAF) based resins or compounds (ROC) for certain toxic compounds and ozone depleting substances set forth in the California Code of Regulations, Title 17, Section 94520 et seq.

6. Provide evidence that the carpet shall meet at least one of the testing and product requirements listed in Section 5.504.4.4.

7. Evidence that the carpet system shall meet at least one testing and product requirement listed in Section 5.504.4.4.4.4

8. Provide documentation that aerosol paints and coatings shall meet the Product-weighted Maximum Incremental Reactivity (MIR) limits for Reactive Organic Compounds (ROC) for certain toxic compounds and ozone depleting substances set forth in the California Code of Regulations, Title 17, Section 94520, et seq., whichever is more restrictive.

9. Provide evidence that architectural paints and coatings shall comply with Volatile Organic Compound (VOC) limits in CALGreen Table 5.504.4.3 and/or other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances (CCR, Title 17, Section 94507, et seq.).

10. Provide documentation that architectural paints and coatings shall comply with Table 5.504.4.3 unless more stringent local limits apply.

11. Provide evidence that architectural paints and coatings shall meet the requirements for formaldehyde as specified in California Code of Regulations, Title 17, Section 94507 et seq., whichever is more stringent.

12. Provide documentation that the composite wood products shall meet the requirements for formaldehyde as specified in Table 5.504.4.5.

13. Provide evidence that the carpet shall meet at least one of the testing and product requirements listed in Section 5.504.4.4.

14. Provide evidence that the carpet system shall meet at least one of the testing and product requirements listed in Section 5.504.4.4.4.

15. Provide documentation that the composite wood products shall meet the requirements for formaldehyde as specified in Table 5.504.4.5.

16. Provide documentation that architectural paints and coatings shall comply with Volatile Organic Compound (VOC) limits, including compliance with prohibition of dechlorineating adhesives and sealant or caulking compounds (in units of product, less packaging, which do not exceed 1.0 pounds of SCAQMD Rule 1168 VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2).
5.505.1 Indoor moisture control. Buildings shall meet or exceed the provisions of California Building Code, CCR, Title 24, Part 2, Sections 1203 and ordinances, regulations or policies of any city, county, city and county, California Community College, campus of the California State University or campus of the University of California, whichever are more stringent.

Documentation that installation would occur

5.504.5.3 Filters. In mechanically ventilated buildings, provide regularly occupied areas of the building with air filtration media for outside and return air prior to occupancy that provides at least a Minimum Efficiency Reporting Value (MERV) of 13.

Evidence that the installed filters shall be clearly labeled by the manufacturer indicating the MERV rating.

Evidence that the installed filters shall be installed prior to building occupancy.

1. An ASHRAE 10-percent to 15-percent efficiency Reporting Value (MERV) of 13.

4. Provide evidence that the installed filters shall be installed prior to building occupancy, and recommendations for maintenance with the same value shall be included in the operation and maintenance manual.

2. Provide documentation that verifies that the installed filters shall be clearly labeled by the manufacturer indicating the MERV rating.

5.504.4.7.1 Resilient floor coverings, Tier 2 [BSC]. For 100 percent of the floor area receiving resilient floor coverings, Tier 2 [BSC], the resilient floor coverings shall meet the requirements of Section A5.504.4.7.1.

Method for the Testing and Evaluation Chambers, Version 1.1, February 2010; 2. Compliant with the VOC-emission limits and testing requirements specified under the Resilient Floor Covering Institute (RFCI) FloorScore program; ed under the Greenguard Children & Schools program may also be used.

A5.504.4.9.1 Verification of location, installation, and performance. Compliance with this section shall be verified by a certifier.

A5.504.4.9 Acoustical ceilings and wall panels. Comply with Chapter 8 in Title 24, Part 2 and with the VOC-emission limits defined in Sections A5.504.4.8 and A5.504.4.8.1, respectively.

1. Provide documentation that acoustical ceilings and wall panels shall comply with Chapter 8, Title 24, Part 2.

2. Compliant with the VOC-emission limits and testing requirements specified under the Greenguard Children & Schools program; ed under the Resilient Floor Covering Institute (RFCI) FloorScore program; ed under the Children & Schools program may also be used.

5.504.3.2.3.1 Filters. In mechanically ventilated buildings, provide regularly occupied areas of the building with air filtration media for outside and return air that provides at least a MERV of 8.

1. Provide documentation that Tier 1 and Tier 2 thermal insulation complies with the standards defined under the Greenguard Children & Schools program.

2. The documentation shall verify that thermal insulation materials met the pollutant emission limits.
1. Provide approved acoustical analysis (signature page or approval letter only) that indicates wall and floor-ceiling assemblies exposed to the noise source making up the building envelope or addition envelope or altered envelope shall be constructed to provide an interior noise environment that does not exceed an hourly equivalent noise level (Leq-1 Hr) of 50 dBA in occupied areas during any hour of operation.

2. Where noise contours are not available, the acoustical analysis shall use the prescriptive method consistent with Section 5.507.4.1. Where noise contours are not available, an acoustical analysis using a composite STC rating of at least 50 or a composite OITC rating of no less than 40 with exterior windows of a minimum STC of 40 or OITC of 30 in the locations described in Items 1 and 2.

Provide site plans, elevations, or any other information where sound walls or earthen berms are incorporated into the Project to mitigate interior sound exposure greater than 65 dB Leq-1Hr.

A5.507.1 Lighting and thermal comfort controls. Provide controls in the workplace as described in Sections A5.507.1.1 and A5.507.1.2.

1. Provide documentation, including building plans, legend, details, or other information which provides evidence that lighting and thermal comfort systems meet the requirements of the California Energy Code in accordance with Sections A5.507.1.1.1 and A5.507.1.1.2 for single-occupant spaces and Section A5.507.1.2 for multi-occupant spaces.

A5.507.1.1.2 Thermal comfort. Provide individual thermal comfort controls for at least 50 percent of the building occupants by Items 1 and 2 in Section A5.507.1.1.2.

Provide documentation, including building plans, legends, details, or other information, which provides evidence that building mechanical and ventilation systems meet the requirements of the California Energy Code, or the applicable local code, whichever is more stringent, and Division 1, Chapter 4 of Title 24, Part 6 of the California Code of Regulations, or Division 6.2 of Title 24, California Code of Regulations, as applicable, using the most current version of the California Energy Code or the applicable local code, whichever is more stringent.

A5.507.2 Carbon dioxide (CO2) monitoring. For buildings or additions equipped with demand control ventilation, CO2 sensors and ventilation controls consistent with the requirements of the California Energy Code shall be equipped with Carbon Dioxide (CO2) sensors and ventilation controls consistent with the requirements of the California Energy Code, or the applicable local code, whichever is more stringent, in accordance with Sections A5.507.2.1 and A5.507.2.2.

For buildings that are mechanically or naturally ventilated, documentation that mechanically or naturally ventilated spaces in buildings meet the requirements of the California Energy Code, or the applicable local code, whichever is more stringent, and Division 1, Chapter 4 of Title 24, Part 6 of the California Code of Regulations, or Division 6.2 of Title 24, California Code of Regulations, as applicable, using the most current version of the California Energy Code or the applicable local code, whichever is more stringent, shall be provided.
<table>
<thead>
<tr>
<th>Item</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Green building measures in this table may be mandatory if adopted by a city, county, or city and county as specified in Section 101.7.</td>
</tr>
<tr>
<td>2.</td>
<td>Required prerequisite for this Tier.</td>
</tr>
<tr>
<td>3.</td>
<td>These measures are currently required elsewhere in statute or in regulation.</td>
</tr>
<tr>
<td>4.</td>
<td>This application checklist is non-regulatory, intended only as an aid to the user and may not contain complete code language. Refer to Chapter 5 and Appendix Chapter A5 for complete code provisions.</td>
</tr>
</tbody>
</table>

### 5.508.1 Ozone depletion and global warming reductions

- **Installations of HVAC, refrigeration and sprinkler suppression equipment**
  - New commercial refrigeration systems shall comply with the provisions of this section when replacing refrigeration systems in existing facilities.
  - Exception: Refrigeration systems containing low-global warming potential (low-GWP) refrigerant with a GWP value less than 150 are not subject to this section. Low-GWP refrigerants are non-ozone-depleting refrigerants that pose lower environmental impact compared to CFCs, HCFCs, and HFCs. This section is not applicable to Metro projects.

- **Refrigerant leak reduction**
  - New commercial refrigeration systems shall comply with the provisions of this section when replacing refrigeration systems in existing facilities.

- **Piping runs using threaded pipe, copper tubing with an outside diameter (OD) less than 1/4 inch,**
  - Include ammonia, carbon dioxide (CO2), and potentially other refrigerants.
  - Replacement of existing refrigeration systems in existing facilities. Exception: Refrigeration systems containing low-GWP refrigerants are non-ozone-depleting refrigerants and do not fall under this section.

- **Refrigerant leak reduction**
  - New commercial refrigeration systems shall comply with the provisions of this section when replacing refrigeration systems in existing facilities.

- **Sprinkler suppression equipment**
  - Does not contain HFCs or that do not contain HFCs with a global warming potential (GWP) greater than 150.
  - HCFCs are specific refrigerants with intermediate ozone-depleting potential, and their use is restricted.

- **Refrigeration systems containing**
  - HCFCs.
  - Hydrochlorofluorocarbons (HCFCs).
  - Install HVAC and refrigeration equipment that does not contain HCFCs.

- **Refrigeration systems containing**
  - Hydrofluorocarbons (HFCs).
  - Install HVAC and refrigeration equipment that does not contain HFCs.

- **Refrigeration systems containing**
  - Halons.
  - Install HVAC and refrigeration equipment that does not contain Halons.

- **Refrigeration systems containing**
  - Chlorofluorocarbons (CFCs).
  - Install HVAC and refrigeration equipment that does not contain CFCs.

### 5.507.4.1 Interior noise level reductions

- **Documentation of compliance**
  - An acoustical analysis documenting complying interior sound levels shall be prepared by personnel approved by the architect or engineer of record.

- **Sound walls or earthen berms**
  - Install sound walls or earthen berms into the Project to mitigate sound migration to the interior.
  - Must be designed and constructed in accordance with FBI/IA/TIA guidelines for noise suppression.

- **Interior noise environment**
  - Does not exceed an hourly equivalent noise level (Leq-1 Hr) of 50 dBA in occupied areas during any hour of operation.

- **Site plan, elevations**
  - Or any other information where sound walls or earthen berms are incorporated into the Project to mitigate interior noise.
  - Must be incorporated into the Project and approved by the architect or engineer of record.

### 5.507.4.2 Documentation of compliance

- **Documentation**
  - An acoustical analysis documenting complying interior sound levels shall be prepared by personnel approved by the architect or engineer of record.

- **Sound walls or earthen berms**
  - Must be designed and constructed in accordance with FBI/IA/TIA guidelines for noise suppression.

- **Interior noise environment**
  - Does not exceed an hourly equivalent noise level (Leq-1 Hr) of 50 dBA in occupied areas during any hour of operation.

- **Site plan, elevations**
  - Or any other information where sound walls or earthen berms are incorporated into the Project to mitigate interior noise.
  - Must be incorporated into the Project and approved by the architect or engineer of record.

### 5.507.4.3 Site plan, elevations, or any other information where sound walls or earthen berms are incorporated into the Project to mitigate interior noise

- **Documentation**
  - An acoustical analysis documenting complying interior sound levels shall be prepared by personnel approved by the architect or engineer of record.

- **Sound walls or earthen berms**
  - Must be designed and constructed in accordance with FBI/IA/TIA guidelines for noise suppression.

- **Interior noise environment**
  - Does not exceed an hourly equivalent noise level (Leq-1 Hr) of 50 dBA in occupied areas during any hour of operation.

- **Site plan, elevations**
  - Or any other information where sound walls or earthen berms are incorporated into the Project to mitigate interior noise.
  - Must be incorporated into the Project and approved by the architect or engineer of record.

### 5.507.4.4 Interior noise level reductions

- **Documentation**
  - An acoustical analysis documenting complying interior sound levels shall be prepared by personnel approved by the architect or engineer of record.

- **Sound walls or earthen berms**
  - Must be designed and constructed in accordance with FBI/IA/TIA guidelines for noise suppression.

- **Interior noise environment**
  - Does not exceed an hourly equivalent noise level (Leq-1 Hr) of 50 dBA in occupied areas during any hour of operation.

- **Site plan, elevations**
  - Or any other information where sound walls or earthen berms are incorporated into the Project to mitigate interior noise.
  - Must be incorporated into the Project and approved by the architect or engineer of record.

### 5.507.4.5 Interior noise level reductions

- **Documentation**
  - An acoustical analysis documenting complying interior sound levels shall be prepared by personnel approved by the architect or engineer of record.

- **Sound walls or earthen berms**
  - Must be designed and constructed in accordance with FBI/IA/TIA guidelines for noise suppression.

- **Interior noise environment**
  - Does not exceed an hourly equivalent noise level (Leq-1 Hr) of 50 dBA in occupied areas during any hour of operation.

- **Site plan, elevations**
  - Or any other information where sound walls or earthen berms are incorporated into the Project to mitigate interior noise.
  - Must be incorporated into the Project and approved by the architect or engineer of record.

### 5.507.4.6 Interior noise level reductions

- **Documentation**
  - An acoustical analysis documenting complying interior sound levels shall be prepared by personnel approved by the architect or engineer of record.

- **Sound walls or earthen berms**
  - Must be designed and constructed in accordance with FBI/IA/TIA guidelines for noise suppression.

- **Interior noise environment**
  - Does not exceed an hourly equivalent noise level (Leq-1 Hr) of 50 dBA in occupied areas during any hour of operation.

- **Site plan, elevations**
  - Or any other information where sound walls or earthen berms are incorporated into the Project to mitigate interior noise.
  - Must be incorporated into the Project and approved by the architect or engineer of record.
This section is not applicable to Metro projects.

5.508.2.2 Valves. Valves and pipe anchors and supports are permitted to be installed wherever needed to achieve functional integrity.

2. Required prerequisite for this Tier.

1. Green building measures in this table may be mandatory if adopted by a city, county, or city and county as specified in Section 101.7.

3. These measures are currently required elsewhere in statute or in regulation.

4. This application checklist is non-regulatory, intended only as an aid to the user and may not contain complete code language. Refer to Chapter 5 and Appendix Chapter A5 for complete code provisions.

5.508.2.2.1 Pressure relief valves. For vessels containing high-GWP refrigerant, a rupture disc shall be installed between the outlet of the vessel and the inlet of the pressure relief valve.

5.508.2.2.1.1 Pressure detection. A pressure gauge, pressure transducer or other device shall be installed in the space between the rupture disc and the relief valve inlet to indicate a disc rupture or discharge of the relief valve.

5.508.2.2.1.2 Anchorage. Single- or double-wrapped tubing connections may be used for pressure controls, valve pilot lines and oil. Exception:

- When using wrapped tubing connections, the tubing shall be securely clamped to a rigid base to keep vibration levels below 8 mils.

- 1/4 inch OD tubing shall be securely clamped to a rigid base to keep vibration levels below 8 mils.

- Where space limitations prohibit use of long radius elbows, short radius elbows are only permitted.

5.508.2.2.1.3 Flared tubing connections. Double-flare tubing connections shall be used for all branch connections.

5.508.2.2.1.4 Elbows. Short radius elbows are only permitted where space limitations prohibit use of long radius elbows.

5.508.2.2.2 Chain tethers. Chain tethers to provide overload protection shall not be used with flared or swaged fittings as these cannot be tensioned.

This section is not applicable to Metro projects.
<table>
<thead>
<tr>
<th>Document</th>
<th>Supplemental Documentation to Project Code Text</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPENDIX C</td>
<td>Supplemental Documentation to Project Code Text</td>
<td>Additional Information</td>
</tr>
</tbody>
</table>

**Table: Supplemental Documentation to Project Code Text**

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.508.2.1</td>
<td>First vacuum. Pull a system vacuum down to at least 1000 microns (+/- 50 microns), and hold for 30 minutes.</td>
</tr>
<tr>
<td>5.508.2.2</td>
<td>Evacuation. The system shall be evacuated after pressure testing and prior to charging.</td>
</tr>
<tr>
<td>5.508.2.3</td>
<td>Refrigerated service cases. Refrigerated service cases holding food products containing vinegar and salt shall have evaporator coils of efficiency of coil coating to maximize energy efficiency.</td>
</tr>
<tr>
<td>5.508.2.4</td>
<td>Refrigerant receivers. Refrigerant receivers with capacities greater than 200 pounds shall be treated with a device that indicates the level of refrigerant in the receiver.</td>
</tr>
<tr>
<td>5.508.2.5</td>
<td>Allowable pressure change. The system shall stand, unaltered, for 24 hours with no more than a +/- one pound pressure change from refrigerant in the receiver.</td>
</tr>
<tr>
<td>5.508.2.6</td>
<td>Third vacuum. Pull a third vacuum down to a minimum of 300 microns, and hold for 24 hours with a maximum drift of 100 microns.</td>
</tr>
</tbody>
</table>

**Notes:**
- This section is not applicable to Metro projects.
- Green building measures in this table may be mandatory if adopted by a city, county, or city and county as specified in Section 101.7.
- These measures are currently required elsewhere in statute or in regulation.
- Required prerequisite for this Tier.
- This application checklist is non-regulatory, intended only as an aid to the user and may not contain complete code language. Refer to Chapter 5 and Appendix Chapter A5 for complete code provisions.
SUSTAINABILITY PLAN GUIDELINES

Evidence of approval of the SUSMP (signature page or approval correspondence only)

Evidence of approval of the LID Report (signature page or approval correspondence only)

See Supporting Documentation for Section 5.106.1.1 Local ordinance.

See Supporting Documentation for Section 5.106.1.2 Best Management Practices (BMPs).

Consistent with the requirements of the Regional Water Quality Control Board (RWQCB), and documented in the Stormwater Pollution Prevention Plan (SWPPP) approved for the project, the BMPs shall include: advance planning and training to ensure implementation of the BMPs; erosion and sediment control and good housekeeping BMP; pollution prevention BMPs to keep the construction site clean; and regular inspection of the construction site to ensure proper installation and maintenance of BMPs.

Consistent with the requirements of the Regional Water Quality Control Board (RWQCB), and documented in the Stormwater Pollution Prevention Plan (SWPPP) approved for the project, the BMPs shall include: advance planning and training to ensure implementation of the BMPs; erosion and sediment control and good housekeeping BMP; pollution prevention BMPs to keep the construction site clean; and regular inspection of the construction site to ensure proper installation and maintenance of BMPs.
1. Provide the calculation of the designated parking spaces to be provided for low-emitting, fuel-efficient vehicles as shown in Tables A5.106.5.1.1 and A5.106.5.1.2, respectively, for Tier 1 (10% of total spaces) and Tier 2 (12% of total spaces).

2. Provide site plan and/or floor plan with locations and statistical summary of the designated parking spaces.

3. Lockable, permanently anchored bicycle lockers.

Provide plan sheets with details illustrating the dimensions and design of the bicycle parking facilities (i.e., rack, locker).

Plan sheet with details related to the methodology used.

Provide plan sheets for each station or stand alone building(s) indicating the location of the short-term bicycle parking spaces and the type of facilities that will be provided (i.e., rack, locker).

Provide plan sheets for each station or stand alone building(s) indicating the location of the long-term bicycle parking spaces.

Provide Building plan and/or floor plans indicating the location of the changing/shower facilities.

Provide plan sheets with the statistical summary of the long-term bicycle parking.

Provide plan sheets with the statistical summary of the short-term bicycle parking.

Provide plan sheets with details illustrating the dimensions and design of the changing/shower facilities (i.e., stall, room).

Provide plan sheets with the statistical summary of the changing/shower facilities consistent with CALGreen Table A5.106.4.3.

Provide plan sheet(s) with the statistical summary of the changing/shower facilities.

Provide plan sheet(s) with the statistical summary of the long-term bicycle parking.

Provide plan sheet(s) with the statistical summary of the short-term bicycle parking.

For buildings with over 10 tenant-occupants, provide changing/shower facilities for tenant-occupants only in accordance with Table A5.106.4.3.
**Electric Vehicle (EV) Charging**

Section 5.106.5.3

1. **Design Requirements**
   - The California Department of Transportation adopts and publishes the California Manual on Uniform Traffic Control Devices in Operations.

2. **Future Charging Spaces**
   - The service panel or subpanel circuit directory shall identify the reserved over-current protective device(s) for the future charging spaces.
   - The raceway shall originate at a service panel or a subpanel serving the area, and shall terminate in close proximity to the proposed location of the charging equipment and into listed suitable cabinet(s), enclosure(s) or equivalent.

3. **Additional Local Utility Infrastructure**
   - Where there is evidence substantiating that additional local utility infrastructure is not feasible based upon one or more of the following conditions:
     - Limited to, the following:
       - Limited capacity to accommodate the required number of charging spaces.
       - Limited capacity to accommodate a minimum 40-ampere service panel or subpanel circuit directory.
       - Limited capacity to accommodate future charging spaces as described in Section 5.106.5.2.

4. **Site Plan and Details**
   - In the event that only a single-charging space is required, provide a plan and details of the required raceway consistent with the specifications in Section 5.106.5.3.2.
   - If multiple charging spaces are required, provide plans and details of the required raceways consistent with the specifications.

5. **Signage and Pavement Markings**
   - Zero Emission Vehicle Signs and Pavement Markings can be found in the California Manual on Uniform Traffic Control Devices.
   - The California Department of Transportation adopts and publishes the California Manual on Uniform Traffic Control Devices in Operations.

**Table 5.106.5.3.3**

<table>
<thead>
<tr>
<th>Tier 1</th>
<th>Tier 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>4%</td>
<td>6%</td>
</tr>
</tbody>
</table>

**Table 5.106.5.3.2**

- For Tier 1 (approximately 4%):
- For Tier 2 (approximately 6%):
2. Use open-grid pavement system or pervious or permeable pavement system. [2013 CALGreen] with ASTM Standards E 1918 or C 1549.

5. Other water measures which keep surface water away from buildings and aid in groundwater recharge.
   1. Swales.
   2. Water collection and disposal systems.

1. Provide site plans that indicate the location and design feature(s) to reduce nonroof heat islands and roof heat islands.

5.106.11.1 Hardscape alternatives. Use one or a combination of strategies 1 through 2 for 50 percent of site
requirements for parking facilities and walkways. [2016 CALGreen]

Grading and paving. Construction plans shall indicate how site grading or a drainage system will manage all surfac
materials, designs and methods of construction.

2. Emergency lighting. [Refer to Table 5.106.8 (N)]
   Exceptions: [N] 1. Luminaires that qualify as exceptions in Section 140.7 of the California Energy Code.
   2. Allowable BUG ratings not exceeding those shown in Table 5.106.8,
   Comply with a local ordinance lawfully enacted pursuant to Section 101.7, whichever is more stringent.

1. Provide photometric plans and calculations indicating the outdoor lighting systems shall be designed and installed to comply
with the minimum requirement of: the California Commission’s website at www.energy.ca.gov. [2013 CALGreen]

Note: If not available from the manufacturer, aged SRI value calculations may be found at the California Energy
requirements of that chapter.

1. Provide site plan, floor plan, and/or elevations that indicate the exterior walls of buildings meet the requirements of the California Energy Code through: the use of fenestration on the east, south, and west-facing walls; or opaque wall areas.

A5.106.7.1.1 East and west walls. Shading devices shall have 30-percent coverage to a height of 20 feet or to the
top of the exterior wall, whichever is less. [2013 CALGreen]

1. Provide site plan, floor plan, and/or elevations that indicate the exterior walls of buildings meet the requirements of the California Energy Code through: the use of fenestration on the east, south, and west-facing walls. [2013 CALGreen]

A5.106.7.1 Fenestration. Provide vegetative or man-made shading devices for all fenestration on east-, south-, and west-facing walls. [2013 CALGreen]

Note: Strategies for programs may be obtained from local TMAs. [2010 CALGreen]

2. Implementation and documentation of programs that encourage occupants to carpool, ride share or use
parking plans[1]. Use of on street parking or compact spaces, illustrated on the site plan or
ne the methods that shall be used to reduce the area for onsite parking.

1. Provide calculations indicating that the parking capacity meets the minimum requirements of the zoning district where the Pr
Calculation of Compliance: If no documentation is available, an inspection shall be conducted to verify details and elevations. For compliant aged solar reflectance values, see the Solar Reflectance Index Calculation Worksheet (SRI-WS) by the California Energy Commission or in compliance with ASTM E 408 or C 1371. If Cool Roof Rating Council (CRRC) testing is not available, the aged solar reflectance value shall be determined using the CRRC certificate or the equation:

$$\beta = \rho_{\text{initial}} - 0.2$$

where

- $$\beta$$ is the solar reflectance index (SRI) of the roof material
- $$\rho_{\text{initial}}$$ is the initial solar reflectance value used in the SRI-WS

To comply with this section, the aged solar reflectance value of the roof shall meet or exceed the values specified in Table A5.106.11.2.2 for Tier 1 and Table A5.106.11.2.3 for Tier 2. The aged solar reflectance and thermal emittance used in the SRI-WS calculations shall be based on the aged values of solar reflectance and thermal emittance as determined in accordance with ASTM E 1980-01 or ASTM E 1980-11 as specified in Table A5.106.11.2.1.

Exceptions:
- Roof constructions that have a thermal mass over the roof membrane, including areas of vegetated (green) roofs, as determined in accordance with ASTM E 408 or C 1371.
- Building integrated solar photovoltaic and building integrated solar thermal panels, as listed by product type in Table A5.106.11.2.4.
SUSTAINABILITY PLAN GUIDELINES

METRO

Provide notes on architectural plans that include elevators stating controls that reduce system voltage variable frequency (VVF) motor drive (VVVF) motor drive system that is fully regenerative when the escalator is in motion.

Evidence that escalator(s) shall have a variable frequency variable speed (VFVS) drive system that is fully regenerative when the escalator is in motion.

A5.211.1 On-site renewable energy. Use on-site renewable energy sources such as solar, wind, geothermal, low-impact hydro, biomass and bio-gas for at least 1 percent of the electric power calculated as the product of the building service voltage and the amperage specified by the Energy Commission.

2. For building projects that include indoor lighting and mechanical systems: No greater than 90 percent of the Title 24, Part 6 Energy Budget for the Standard Design Building as calculated by compliance software.

1. For building projects that include indoor lighting or mechanical systems, but not both: No greater than 95 percent of the Title 24, Part 6, Energy Budget for the Standard Design Building as calculated by (2016 CALGreen).

5.201.1 Scope [BSC-CG]. California Energy Code [DSA-SS]. For the purposes of mandatory energy efficiency and commissioning plan. [2013 CALGreen].

1. Provide documentation of the Energy Budget for buildings complying with advanced measures. For the purposes of mandatory energy efficiency shall have an Energy Budget that is no greater than indicated below, depending on the type of energy systems included in the building project. If the newly constructed building or addition does not include indoor lighting or mechanical systems, then no additional performance requirements above Title 24, Part 6 are required.

A5.201.1 Energy Budgets. [2016 CALGreen].

A5.203.1.1.1 Car lights and fan. A parked elevator shall turn off when not in use to reduce the energy demand.

A5.211.3 Green power. If used, evidence provided that Project will use onsite renewable energy as specified by the local utility provider, participate a renewable energy portfolio program that provides a minimum of 50-percent electrical power from renewable sources.

Provide evidence of participation in the local utility’s renewable energy portfolio program that has a minimum of 50% electrical power from renewable sources.

Evidence that installed outdoor lighting power is no greater than 90% of Title 24 requirements calculated in accordance with the 2016 California Plumbing Code. [2016 CALGreen].

Provide evidence that newly installed outdoor lighting power is no greater than 90% of Title 24 requirements calculated in accordance with the 2016 California Plumbing Code. [2016 CALGreen].

Documentation of the Energy Budget for buildings complying with advanced measures. For the purposes of mandatory energy efficiency shall have an Energy Budget that is no greater than indicated below, depending on the type of energy systems included in the building project. If the newly constructed building or addition does not include indoor lighting or mechanical systems, then no additional performance requirements above Title 24, Part 6 are required.
SUSTAINABILITY PLAN GUIDELINES

1. Provide schedule of plumbing fixtures and fittings from the manufacturer that indicates compliance with water conservation levels defined in Section 5.303.3.1; or

2. For Tier 3, provide supporting calculations demonstrating a 25% reduction in the building "water baseline use" per CALGreen criteria of the U.S. EPA WaterSense Specification for Tank-Type Toilets.

A5.303.2.3.4 Nonpotable water systems for indoor use. Utilizing nonpotable water systems (such as captured rainwater, treated graywater, and recycled water) intended to consume more than 1,000 gal/day. [2016 CALGreen]

5.303.1.1 New buildings or additions in excess of 50,000 square feet. Separate submeters shall be installed as follows:

a. Makeup water for cooling towers where flow through is greater than 500 gpm (30 L/s).

b. Makeup water for evaporative coolers greater than 6 gpm (0.04 L/s).

c. Steam and hot-water boilers with energy input more than 500,000 Btu/h (147 kW). [2016 CALGreen]

Site plans and plumbing plans that indicate the use of nonpotable water systems (i.e., rainwater, treated graywater, recycled water) intended to supply water closets, urinals, and other allowed uses. Provide on-site locations of devices for the capture of rainwater. Also provide schedule of plumbing fixtures and fittings that indicate that a reduction in the overall use of potable water within the building by 25 percent shall be provided. The reduction shall be based on the maximum allowable water use per plumbing fixture and fitting as specified in Section 5.303.3.2.1; or

For Tier 3, provide supporting calculations demonstrating a 25% reduction in the building "water baseline use" per CALGreen criteria of the U.S. EPA WaterSense Specification for Showerheads. [2016 CALGreen]

Flow rate of all showerheads and/or other fixtures and fittings that demonstrate compliance with the water conservation levels defined in Section 5.303.3.2.2.

Supporting calculations that demonstrate a 12 percent reduction as specified in Section 5.303.3.2.3.1; or

For Tier 3, provide supporting calculations demonstrating a 25% reduction in the building "water baseline use" per CALGreen criteria of the U.S. EPA WaterSense Specification for Urinals.

A5.303.2.3.2 Urinals. The effective flush volume of all water closets shall not exceed 1.28 gallons per flush. Urinals shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Urinals. [2016 CALGreen]

Supporting calculations that demonstrate a 12 percent reduction as specified in Section 5.303.3.2.3.2; or

For Tier 3, provide supporting calculations demonstrating a 25% reduction in the building "water baseline use" per CALGreen criteria of the U.S. EPA WaterSense Specification for Urinals.

5.303.1.2 Excess consumption. A separate submeter or metering device shall be provided for any tenant within a new building or within an addition that is projected to consume more than 1,000 gal/day. [2016 CALGreen]

5.303.2.3.3 Water use by tenant. For each individual leased, rented, or other tenant space within the building projected to consume more than 100 gal/day (380 L/day), including, but not limited to, office, laboratory, or beauty salon or barber shop.

Site plans and plumbing plans that indicate the use of nonpotable water systems (i.e., rainwater, treated graywater, recycled water) intended to supply water closets, urinals, and other allowed uses. Provide on-site locations of devices for the capture of rainwater. Also provide schedule of plumbing fixtures and fittings that indicate that a reduction in the overall use of potable water within the building by 25 percent shall be provided. The reduction shall be based on the maximum allowable water use per plumbing fixture and fitting as specified in Section 5.303.3.2.1; or

For Tier 3, provide supporting calculations demonstrating a 25% reduction in the building "water baseline use" per CALGreen criteria of the U.S. EPA WaterSense Specification for Urinals.

Supporting calculations that demonstrate a 12 percent reduction as specified in Section 5.303.3.2.3.2; or

For Tier 3, provide supporting calculations demonstrating a 25% reduction in the building "water baseline use" per CALGreen criteria of the U.S. EPA WaterSense Specification for Urinals.

5.303.1.1 New buildings or additions in excess of 50,000 square feet. Separate submeters shall be installed as follows:

1. For each individual leased, rented, or other tenant space within the building projected to consume more than 100 gal/day (380 L/day), including, but not limited to, office, laboratory, or beauty salon or barber shop.

Site plans and plumbing plans that indicate the use of nonpotable water systems (i.e., rainwater, treated graywater, recycled water) intended to supply water closets, urinals, and other allowed uses. Provide on-site locations of devices for the capture of rainwater. Also provide schedule of plumbing fixtures and fittings that indicate that a reduction in the overall use of potable water within the building by 25 percent shall be provided. The reduction shall be based on the maximum allowable water use per plumbing fixture and fitting as specified in Section 5.303.3.2.1; or

For Tier 3, provide supporting calculations demonstrating a 25% reduction in the building "water baseline use" per CALGreen criteria of the U.S. EPA WaterSense Specification for Urinals.
4. Food steamers shall be connectionless or boilerless and shall consume no more than 2 gallons of water per pan per hour, including condensate water, for batch type.

5.303.4 Commercial kitchen equipment.

1. Provide plumbing plans and/or plumbing specifications and not provided on plans.

2. Provide site plans and building plans that demonstrate how dual plumbing will occur for the new building or facility.

5.303.3 Standards for plumbing fixtures and fittings.

1. Provide plumbing fixture schedule.

2. Provide specifications for the faucets from the manufacturer that indicates compliance with the rate of flow and other required water conservation levels, as well as the manufacturer's documentation that ice makers, food steamers, combination ovens, food waste pulping systems, etc., comply with the water conservation levels determined by the enforcement authority. [2013 CALGreen]

3. Provide documentation that ice makers, food steamers, combination ovens, food waste pulping systems, etc., comply with the water conservation levels determined by the enforcement authority. [2013 CALGreen]

5.303.4.1 Nonresidential Lavatory faucets. Lavatory faucets shall have a maximum flow rate of not more than 0.5 gallons per minute at 60 psi. [2013 CALGreen]

5.303.4.2 Kitchen faucets. Kitchen faucets shall have a maximum flow rate of not more than 1.8 gallons per minute at 60 psi. Kitchen faucets may temporarily increase flow rate if information is provided on plans. This applies to the use of aerators or other devices to achieve the flow rate reduction.

5.303.4.3 Wash fountains. Wash fountains shall have a maximum flow rate of not more than 0.20 gallons per cycle [2013 CALGreen]. Where complying faucets are unavailable, aerators or other means may be used to achieve reduction. [2013 CALGreen]

5.303.4.4 Metering faucets. Metering faucets shall not deliver more than 0.20 gallons per cycle. [2013 CALGreen]

5.303.4.5 Metering faucets for wash fountains. Metering faucets for wash fountains shall have a maximum flow rate of 1.8 gallons per minute at 60 psi. Note: potable water excludes on-site graywater use, such as dishwasher discharge water. [2016 CALGreen]

5.303.5 Areas of addition or alteration. For those occupancies within the authority of the California Building Standards Commission as specified in Sections 5.303.3 and 5.303.4 shall apply to new areas of addition or alteration.

Food waste pulping systems shall use no more than 2 gpm of potable water.

8.1 Note: potable water excludes on-site graywater use, such as dishwasher discharge water.

Food waste pulping systems shall use no more than 2 gpm of potable water.

2. Dishwashers shall meet the following water use standards:
Exception: Area of the building footprint is excluded from the calculation. [2016 CALGreen]

2. Definition of adaptive and noninvasive. 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 vegetation.

Not applicable to Metro projects.

Landscape, irrigation, planting plan, and detail documents are available at the following link: http://water.ca.gov/wateruseefficiency/efficientlandscape/.

List of the performance requirements that has less than 2,500 square feet of landscape and meets the lot or parcel's landscape water requirement (Estimated Total Water Use) entirely with treated or untreated graywater or rainwater captured on site is subject only to Appendix D Section (5).

Calculations that demonstrate the methods for installation and establishment. Methods used to accomplish the requirements of this section shall include, but not be limited to:

1. Provide utility plan and landscape plan sheet(s) that show separate submeters for domestic services, agricultural services, and lands ready services, and lands available to other services.

2. Provide evidence of approved building or landscape permit, plan check, or design review consistent with Section 5.304.2.

List of the performance requirements of MWELO or conform to the prescriptive compliance measures contained in MWELO's Appendix D. [2016 CALGreen]

5.304.1 Scope. The provisions of Section 5.304, Outdoor Water Use reference the mandatory Model Water Efficiency Landscape Ordinance (MWELO), which ever is more stringent.

5.304.2 Outdoor water use in landscape areas equal to or greater than 500 square feet. When water is used for outdoor irrigation for new construction projects with an aggregate landscape area equal to or greater than 500 square feet requiring a building or landscape permit, plan check, or design review shall comply with the following:

Evidence of approved building or landscape permit, plan check, or design review consistent with Section 5.304.2.

5.304.3 Outdoor water use in rehabilitated landscape projects equal to or greater than 2,500 square feet. Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, or design review shall comply with the following:

1. Provide utility plan and landscape plan sheet(s) that show separate submeters for domestic services, agricultural services, and lands ready services, and lands available to other services.

2. Provide evidence of approved building or landscape permit, plan check, or design review consistent with Section 5.304.2.

List of the performance requirements of MWELO or the prescriptive documents that has less than 2,500 square feet of landscape and meets the lot or parcel's landscape water requirement (Estimated Total Water Use) entirely with treated or untreated graywater or rainwater for reuse in irrigation on the Project site.

5.304.4 Outdoor water use in landscape areas of 2,500 square feet or less. Any project with an aggregate landscape area of 2,500 square feet or less may comply with the following:

Evidence of approved building or landscape permit, plan check, or design review consistent with Section 5.304.2.

5.304.5 Outdoor water use in rehabilitated landscape projects of 2,500 square feet or less. Any project with an aggregate landscape area of 2,500 square feet or less may comply with the following:

Evidence of approved building or landscape permit, plan check, or design review consistent with Section 5.304.2.

5.304.6 Restoration of areas disturbed by construction. Restore all areas disturbed during construction by planting with local native and/or noninvasive vegetation. [2013 CALGreen]

None

Irrigation 0.65 with an additional water allowance for special landscape areas (SLA) of 0.35.

None

APPENDIX C
5.305.2 Irrigation systems. Irrigation systems regulated by a local water efficient landscape ordinance or by the California Department of Water Resources Model Water Efficient Landscape Ordinance (MWELO) shall use recycled water. [2016 CALGreen]

5.305.3 Cooling Towers. Cooling towers shall comply with one of the following:

- Cooling towers shall have a minimum of 6 cycles of concentration (blowdown); or

5.305.4 Groundwater Discharge. Where groundwater is being extracted and discharged, a system for onsite reuse of the groundwater, shall be developed and constructed.

**NOTE** This language appears in the LAMC/LAGBC and is adopted as if it is CALGreen, but the language has not yet been officially established.

5.305.1 Graywater Ready. Waste piping shall be arranged to permit the collection of water from bathroom wash basins and laundry water. See California Plumbing Code. [2013 CALGreen]

1. Provide landscape plan sheet(s) including irrigation, landscape, and planting plans, that demonstrate the use of graywater collected from bathrooms, showers, and restrooms.

2. Provide site plan and plumbing plan sheet(s) that demonstrate how this will be accomplished consistent with the California Plumbing Code.

Provide plumbing plan, landscape plan, and irrigation plan sheet(s) that demonstrate nonpotable water systems for indoor and outdoor use shall comply with the current edition of the California Plumbing Code. [2013 CALGreen]

5.304.8 Graywater irrigation system. Install graywater collection system for onsite subsurface irrigation using graywater collectors connected to the graywater irrigation systems. See also the Los Angeles Plumbing Code. A5.305.2 Recycled Water Supply to Fixtures. When City-recycled water is available within 200 feet of the property line, 100% of water for water closets, urinals, faucets, showers, and wash basins to be used for a future graywater irrigation system. The point of connection between the graywater piping and other waste piping shall be piped separately, and shall, at a minimum, be adequate to supply the irrigation basins to be used for a future graywater irrigation system. The irrigation system shall be accessible (as defined in LAMC Section 99.02.202) and provided with signage that is satisfactory to the Department. [2016 CALGreen/LAMC Language]
Sources and recycled content of some recycled materials can be obtained from CalRecycle if not provided by the manufacturer. (2016 CALGreen)

Calculating recycled content value of materials:

\[ \text{Required Total RCV (dollars)} = \text{Total value of all products in that category in the project.} \times \frac{\text{Recycled content value (RCV)}}{\text{Material Cost (dollars)}} \]

Tier 2. The RCV shall not be less than 15 percent of the total material cost of the project, or use three products which meet the minimum recycled content levels in Table A5.405.4 for at least 75%, by cost.

Tier 1. The RCV shall not be less than 10 percent of the total material cost of the project, or use two products which meet the minimum recycled content levels in Table A5.405.4 for at least 75%, by cost.

Material Cost (dollars)

Provide site plans, architectural plans, interior and exterior sections, room finish schedules, or other plan sheets that identify the use of recycled content consistent with the criteria for the total recycled content percentage.

Provide architectural plans, exterior elevations, room finish schedules, and other sheets that indicate the use of recycled wood products and, for 2.5 percent of wood products, rapidly renewable materials.

A5.405.3 Reused materials. Use salvaged, refurbished, reused wood products and, for 2.5 percent of wood products, rapidly renewable materials.

Bio-based materials. Select bio-based building materials and products made from solid wood, engineered wood, bamboo, w,

A5.405.2 Bio-based materials. Select bio-based building materials and products made from solid wood, engineered wood, bamboo, w,

A5.405.2.1 Certifi ed wood. Use certifi ed wood, certifi ed wood products, and certifi ed wood product systems that meet the requirements of the American Wood Council’s Standards for Forest Stewardship Council International (FSC-I) chain of custody.

A5.405.2.2 Rapidly renewable materials. Use materials made from plants harvested within a ten-year cycle for at least 2.5 percent of the total value into the Project design and construction.

A5.405.1 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 within California or within 500 miles of the Project site.

Evidence that selected building materials or products for permanent installation on the Project site have been harvested or manufactured within California or within 500 miles of the Project site.

A5.404.1 Wood framing. Employ advanced wood framing techniques or OVE, as recommended by the U.S. Department of Building Technology, State and Community Programs and as permitted by the California Building Code. Advanced framing techniques include the following:

1. Spacing wall studs up to 24 inches on center;
2. Spacing wall studs up to 24 inches on center;
3. Spacing wall studs up to 24 inches on center;
4. Spacing wall studs up to 24 inches on center;
5. Eliminating solid headers in non-load-bearing walls;
6. Using in-line framing, aligning floor and roof framing members vertically for direct transfer of loads; and
7. Using single lumber headers and top plates where appropriate.

Advanced framing techniques and other OVE methods are permitted by the California Building Code for residential projects as follows:

1. Spacing wall studs up to 24 inches on center;
2. Spacing wall studs up to 24 inches on center;
3. Spacing wall studs up to 24 inches on center;
4. Spacing wall studs up to 24 inches on center;
5. Eliminating solid headers in non-load-bearing walls;
6. Using in-line framing, aligning floor and roof framing members vertically for direct transfer of loads; and
7. Using single lumber headers and top plates where appropriate.
Provide evidence that cement and concrete made with recycled products comply with the standards defined in Section A5.405.4.

2. Blended hydraulic cement shall meet ASTM C 595.

3. Other Hydraulic Cements shall meet ASTM C 1157.

Portland cement shall meet ASTM C 150.

Evidence that cement and concrete made with recycled products comply with the standards defined in Sections A5.405.5.1, A5.405.5.2, A5.405.5.2.1, and A5.405.5.2.1.1.

Provide site plans, architectural plans, interior and exterior sections, room finish schedules, or other plan sheets that identify the use of recycled content consistent with the criteria for the total recycled content value (RCV) defined in Section A5.405.4.

Total recycled content value for the project (in dollars). This is expressed as a percentage of the total material cost and shall be determined by Equations A5.4-4 and A5.4-5. The result of this calculation may be directly compared to Equations A5.4-6 and A5.4-7.

Total material costs = 0.45 × Project square footage

Total RCV may be determined either by dollars or percentage as noted below.

1. Total recycled content value for the project (in dollars). This shall be determined by Equation A5.4-5. The result of this calculation may be directly compared to Equations A5.4-4 and A5.4-5, or simplified using Equation A5.4-3B:

   Total RCV (dollars) = 
   \[ \frac{\text{Total Preconsumer RCV} + \text{Total Postconsumer RCV}}{\text{Project square footage}} \times 100 \]  

   Total RCV (dollars) = 
   \[ \frac{\text{Total Preconsumer RCV} + \text{Total Postconsumer RCV}}{\text{Project square footage}} \times 100 \]

   Total RCV (dollars) = 
   \[ \frac{\text{Total Preconsumer RCV} + \text{Total Postconsumer RCV}}{\text{Project square footage}} \times 100 \]

2. Total recycled content value for the project (by percentage). This is expressed as a percentage of the total material cost and shall be determined by Equations A5.4-4 and A5.4-5. The result of this calculation may be directly compared to Equations A5.4-6 and A5.4-7.

   Total material costs = 0.45 × Project square footage

   Total RCV (percent) = \[ \frac{\text{Total Preconsumer RCV} + \text{Total Postconsumer RCV}}{\text{Total material costs}} \times 100 \]  

   Total RCV (percent) = \[ \frac{\text{Total Preconsumer RCV} + \text{Total Postconsumer RCV}}{\text{Total material costs}} \times 100 \]  

   Total RCV (percent) = \[ \frac{\text{Total Preconsumer RCV} + \text{Total Postconsumer RCV}}{\text{Total material costs}} \times 100 \]
### A5/405.5.2.1 Supplementary cementitious materials (SCMs). Use concrete made with one or more supplementary cementitious materials (SCM) conforming to the following standards:

1. Fly ash conforming to ASTM C618, Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete, and the chemical and physical requirements found in table A5/405.5.2.1.A.
2. Slag cement (GGBFS) conforming to ASTM C989, Specification for Silica fume, metakaolin or UFFA, as a percent of total cementitious material for concrete on the project.
3. Natural pozzolan conforming to ASTM C618, Specification for Blended Supplementary Cementitious Materials. The amount of each SCM in the blend will be as approved by the Engineer of Record and enforcing authority.

### A5.405.5.3 Additional means of compliance. Any of the following measures shall be permitted to be employed for the production of cement or concrete, depending on their availability and suitability, in conjunction with cement and concrete made with recycled products as described in Sections A5.405.5.1, A5.405.5.2, A5.405.5.2.1, and A5.405.5.2.1.1.

1. Provide evidence of additional means of compliance employed for the production of cement or concrete use of high strength concrete designed to reduce the size of concrete elements.
2. Provide documentation, with Metro approval, that cement and concrete consistent with Sections A5.405.5.3.1 and A5.405.5.3.2, respectively.
3. Provide architectural plans and/or structural plans approved by the Engineer of Record that demonstrate the measures used in the manufacture of cement and concrete made with recycled products as described in Sections A5.405.5.

### A5/405.5.2.1.B Exception: Minimums in mix designs approved by the Engineer of Record may be lower where high early strength is needed.
5.407.2.2 Entries and openings. Design exterior entries and/or openings subject to foot traffic with exterior door protection and other methods of moisture control.

5.407.2.1 Sprinklers. Design and maintain landscape irrigation systems to prevent irrigation spray on structures. (2013 CALGreen)

5.407.2 Moisture Control. Employ moisture control measures by the following methods. (2013 CALGreen)

5.405.5.3.2.2 Recycled aggregates. Concrete made with one or more of the materials listed in Section A5.405.5.3.2.2. (2010 CALGreen)

5.405.5.3.2.4 High strength concrete. Concrete elements designed to reduce their total size compared to standard 3,000 psi concrete, as approved by the Engineer of Record. (2013 CALGreen)

2. Provide documentation, with Metro approval, that demonstrates the measures used in the manufacture of cement and concrete consistent with Sections A5.405.5.3.1 and A5.405.5.3.2, respectively.

2. Provide evidence of approval by the Engineer of Record on the use of high strength concrete designed to reduce the size of concrete elements.

3. Provide architectural plans and/or structural plans approved by the Engineer of Record that demonstrate compliance with the requirements of Section 5.405.5.

Evidence of additional means of compliance with the requirements of Sections 5.405.5.3.1 and 5.405.5.3.2.

1. An installed awning at least 4 feet in depth.

1. Provide landscape irrigation plans and details that show prevention of irrigation spray on Project finishes within at least 2 feet around and perpendicular to building(s) and other methods of moisture control.

1. Provide architectural plans and/or structural plans approved by the Engineer of Record that demonstrate compliance with the requirements of Section 5.405.5.

Evidence of approval of Construction Waste Management Plan (signed by member).

Documentation, with Metro approval, that demonstrates the materials that will be reused or recycled at the Project.

A5.405.5.3.2 High strength concrete (2013 CALGreen)

A5.405.5.3.1 Recycled aggregates (2013 CALGreen)

5.408.1 Construction waste management. Recycle and/or salvage for reuse a minimum of 65 percent of the nonhazardous construction and demolition waste in accordance with Section 5.408.1.1,ashing.

5.408.1.2 or 5.408.1.3; or meet a local construction and demolition waste management ordinance, whichever is more stringent. (2016 CALGreen)

Evidence of approval of Construction Waste Management Plan consistent with local requirements indicating approval and/or signature page only of the Construction Waste Management Plan (signed by member).
1. Provide documentation that enhanced reduction of nonhazardous construction or demolition waste, consisting of 65 percent for Tier 1 and 80 percent for Tier 2, will occur.

2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.

1. Provide documentation that enhanced reduction of nonhazardous construction or demolition waste, consisting of 65 percent for Tier 1 and 80 percent for Tier 2, will occur.

2. For phased development, provide documentation that excavated soil and land clearing debris shall be reused or recycled. For a phased project, such material may be stockpiled on site until the storage site is developed.

3. Provide evidence of approval of the Project’s Construction Waste Management Plan consistent with local ordinance or Municipal Code. The evidence of approval shall consist of correspondence and/or documentation of certification. A copy of the completed waste management report or documentation of certification shall be included in the project documents. 


5. Evidence of waste management company’s local certification, which provides the percentage of construction waste diverted from landfills and disposed of in recycling or recovery facilities.

6. Provide signed cover of the completed Construction Waste Management Plan or approval correspondence and/or documentation of certification. A copy of the completed waste management report or documentation of certification shall be included in the project documents.

7. Provide signed cover of the completed Construction Waste Management Plan or approval correspondence and/or documentation of certification. A copy of the completed waste management report or documentation of certification shall be included in the project documents.

8. Signed cover of Construction Waste Management Plan consistent with the local ordinance and/or Municipal Code. The evidence of approval shall consist of correspondence and/or documentation of certification. A list of prohibited Universal Waste materials shall be included in the construction documents.

9. Provide evidence of approval of the Project’s Construction Waste Management Plan consistent with local ordinance or Municipal Code. The evidence of approval shall consist of correspondence and/or documentation of certification. A copy of the completed waste management report or documentation of certification shall be included in the project documents.

10. Consistent with the local ordinance or Municipal Code, utilize a waste management company that can provide verification of diversion rates. The evidence of approval shall consist of correspondence and/or documentation of certification. A list of prohibited Universal Waste materials shall be included in the construction documents.

11. Utilize a waste management company that can provide verification of diversion rates. The evidence of approval shall consist of correspondence and/or documentation of certification. A list of prohibited Universal Waste materials shall be included in the construction documents.

12. For phased development, provide documentation that excavated soil and land clearing debris shall be reused or recycled. For a phased project, such material may be stockpiled on site until the storage site is developed.

13. Provide evidence of approval of the Project’s Construction Waste Management Plan consistent with local ordinance or Municipal Code. The evidence of approval shall consist of correspondence and/or documentation of certification. A copy of the completed waste management report or documentation of certification shall be included in the project documents.

14. Consistent with the local ordinance or Municipal Code, utilize a waste management company that can provide verification of diversion rates. The evidence of approval shall consist of correspondence and/or documentation of certification. A list of prohibited Universal Waste materials shall be included in the construction documents.
### 5.410.2 Commissioning

For new buildings 10,000 square feet and over, building commissioning shall be included in the design and construction processes of the building project to verify that the building systems and components meet the owner's or owner representative's project requirements. Commissioning shall be performed in accordance with this section by trained personnel with experience in the trade.

#### 5.410.2.1 Owner's Project Requirements (OPR)

The expectations and requirements of the building appropriate to its phase shall be documented before the design phase of the project begins. This document shall include the following:

- Basis of Design document
- Commissioning Plan
- Site plan, floor plan, and/or detail plan sheet(s) that indicate recycling areas for depositing, storage, and collection of nonhazardous materials for recycling.

#### 5.410.2.2 Commissioning goals

The goals of commissioning shall include:

- Activities and responsibilities
- Schedules
- Systems to be commissioned (plans of systems)

#### 5.410.2.3 Commissioning requirements

Commissioning requirements shall include:

- The project meets the requirements of other parts of Title 24.
- Not applicable to Metro projects.
- The building systems and components meet the owner's or owner representative's project requirements.

Commissioning shall be performed in accordance with this section by trained personnel with experience in the trade.

### 5.410.1 Recycling by occupants

Provide readily accessible areas that serve the entire building and are identified in the floor plan for depositing, storage, and collection of nonhazardous materials for recycling, including:

- Plumbing, mechanical and electrical systems and controls;
- Storage, and collection of nonhazardous materials for recycling.

#### 5.410.1.1 Storage and collection

- Storage and collection of nonhazardous materials for recycling, including:
  - Interior and exterior finishes, if included, may be assessed using the NIST BEES tool.
  - Interior finishes shall be considered in the life cycle assessment.

#### 5.410.1.2 Sample ordinance

- Space allocation for recycling areas shall comply with Chapter 18, Part 3, Division 30 of the Public Resources Code. Chapter 18 is known as the California Solid Waste Reuse & Recycling Access Act of 1991 (Act).

#### 5.410.1.3 exceptions

- Additions within a tenant space resulting in less than a 30-percent increase in the tenant space area, provide site plan, floor plan, and/or detail plan sheet(s) that indicate recycling areas for depositing, storage, and collection of nonhazardous materials for recycling.

#### 5.410.4 Substitution for prescriptive standards

Performance of a life cycle assessment completed in accordance with Section A5.409.2 may be substituted for other prescriptive provisions of Division A5.4.

- On a life cycle assessment of at least three (3) impacts listed in Section A5.409.2, one of which addresses recyclable materials or assemblies based on life cycle assessment of at least three for whole building assessment.

### 5.410.3 Documentation

Provide documentation of other prescriptive standards in Division A5.4, including those that are mandatory through local adoption of Tier 1 or Tier 2 in Division A5.6.

#### 5.410.3.1 Documentation of other prescriptive standards

- Documentation shall include the following:
  - Analysis and any maintenance or training recommendations that shall be included in the operation and maintenance manual. See notes for available tools. (2013 CALGreen)
  - A copy of the analysis and any maintenance or training recommendations shall be included in the operation and maintenance manual. See notes for available tools. (2013 CALGreen)
  - A copy of approval analysis (signature page or approval correspondence only); (4) a copy of the list of any materials or assemblies based on life cycle assessment of at least three for whole building assessment.

#### 5.410.3.2 Materials and system assemblies

If whole building analysis of the project is not elected, select a minimum of 50% of system assemblies based on life cycle assessment of at least three for whole building assessment.

### 5.410.4.1 Building components

- The building envelope, structural elements, including footings and foundations, interior ceilings, walls, and finishes, if included, may be assessed using the NIST BEES tool. (2016 CALGreen)

### 5.410.4.2 Plumbing, mechanical and electrical systems and controls

- A software for calculating whole building life cycle assessments includes those found at the Athena Institute website (Impact Estimator software), the PE International website (GaBi software), and the California State University (CaliGreen) website (CaliGreen software). (2016 CALGreen)

### 5.410.4.3 Documentation of other prescriptive standards

- A summary of the documentation of other prescriptive standards and the performance of the life cycle assessment shall be included in the operation and maintenance manual. See notes for available tools. (2013 CALGreen)

### Appendix C

#### 2016 CALGREEN, MATERIAL CONSERVATION & RECYCLING EFFICIENCY

- There is no example of the 2016 CALGREEN, MATERIAL CONSERVATION & RECYCLING EFFICIENCY.
5.410.4 Testing and adjusting. Testing and adjusting of systems shall be required for new buildings less than 10,000 square feet or new systems to serve an addition or alteration subject to Section 303.1. Evidence testing and adjusting of following systems: (1) HVAC systems and controls; (2) indoor and outdoor lighting controls; (3) water heating systems; (4) renewable energy systems; (5) landscape irrigation systems; and (6) water metering systems.

5.410.2.3 Commissioning plan. [N] Prior to permit issuance a commissioning plan shall be completed to document how the project will be commissioned. The commissioning shall include the following:

1. General project information.
2. Commissioning goals.
3. Commissioning process activities, schedules and responsibilities. Plans for the completion of commissioning shall be included.
4. Functional performance testing reports shall contain information addressing each of the building components tested, the testing methods utilized, e. Measurable criteria for acceptable performance.
5. Site equipment inventory and maintenance notes.
6. Other resources and documentation, if applicable. [2013 CALGreen]

5.410.2.6 Commissioning report. [N] A report of commissioning process activities undertaken through the design and construction phases of the building project shall be completed and provided to the

owner or representative. Commissioning Report shall de

1. Provide copy of approved Commissioning Report (signature page or approval correspondence only). The

approved Systems Manual (signature page or approval correspondence only)

See Supporting Documentation for Section 5.410.2.5 Documentation and training.

5.410.2.5.1 Systems manual. [N] Documentation of the operational aspects of the building shall be completed within the systems manual and delivered to the building owner or representative. The

5.410.2.5.2 Systems operations training. [N] A program for training of the appropriate maintenance sta

2. Site contract information.
3. Basic operations and maintenance, including general site operating procedures, basic troubleshooting, recommended maintenanc

5.410.2.2 Basis of Design (BOD). [N] A written explanation of how the design of the building systems meets the OPR shall be completed at the design phase of the building project. The Basis of Design documents

1. Metro shall provide the expectation and requirements of the Project building(s) before the design phase

2. Provide a Basis of Design document, a written explanation of how the design of building systems meets

Basis of Design document

1. Metro shall provide the expectation and requirements of the Project building(s) before the design phase

2. Provide a Basis of Design document, a written explanation of how the design of building systems meets

Basis of Design document

1. Metro shall provide the expectation and requirements of the Project building(s) before the design phase

2. Provide a Basis of Design document, a written explanation of how the design of building systems meets
5.410.4.5 Operation and maintenance (O&M) manual. Provide the building owner or representative with detailed operating and maintenance instructions for the following systems: (1) HVAC systems and controls; (2) indoor and outdoor lighting controls; (3) water heating systems; (4) renewable energy systems; (5) landscape irrigation systems; and (6) water reuse systems. The O&M Manual instructions shall be consistent with OSHA requirements in CCR, Title 8, Section 5142, and other related regulations. [2010 CALGreen]

Approved Operation and Maintenance Manual (signature page or approval correspondence only). The O&M Manual shall include: (1) detailed operating and maintenance instructions; (2) copies of approved written plan of procedures for testing and adjusting; (3) evidence testing and adjusting of systems, if applicable. Copy of approved written plan of procedures for testing and adjusting systems is completed.

5.410.4.4 Reporting. After completion of testing, adjusting, and balancing, provide a final report of testing signed by the individual responsible for performing these services. [2013 CALGreen]

Evidence testing and adjusting of systems is completed after completion of testing, adjusting, and balancing. The report shall be signed by the individual responsible for performing these services.

5.410.4.3 HVAC balancing. In addition to testing and adjusting, before a new space-conditioning system serving a building or space is operated for normal use, balance the system in accordance with the procedures determined by the Testing Adjusting and Balancing Bureau National Standards; the National Environmental Balancing Bureau Procedural Standards; Associated Air Balance Council National Standards or as approved by the enforcing agency. [2013 CALGreen]

Approved Operation and Maintenance Manual (signature page or approval correspondence only). The plan of procedures for testing and adjusting systems shall address the following systems: (1) HVAC systems and controls; (2) indoor and outdoor lighting controls; (3) water heating systems; (4) renewable energy systems; (5) landscape irrigation systems; and (6) water reuse systems. Evidence testing and adjusting of systems is completed after completion of testing, adjusting, and balancing. The report shall be signed by the individual responsible for performing these services.

3. Provide approved final report (signature page or approval correspondence only) after completion of testing, adjusting and balancing. The report shall be signed by the individual responsible for performing these services.

5.410.4.2 Testing and adjusting. (a) System testing and adjusting shall be conducted by a licensed contractor or certified technician.

(b) System testing and adjusting shall be conducted for the following systems: (1) HVAC systems and controls; (2) indoor and outdoor lighting controls; (3) water heating systems; (4) renewable energy systems; (5) landscape irrigation systems; and (6) water reuse systems.

(c) System testing and adjusting shall be conducted in accordance with the procedures determined by the Testing Adjusting and Balancing Bureau National Standards; the National Environmental Balancing Bureau Procedural Standards; Associated Air Balance Council National Standards or as approved by the enforcing agency.

(d) Evidence testing and adjusting of systems is completed after completion of testing, adjusting, and balancing. The report shall be signed by the individual responsible for performing these services.

1. Provide evidence that the testing and adjusting of systems has been completed.

2. Provide copy of approved written plan of procedures for testing and adjusting systems (signature page or approval correspondence only). The plan of procedures for testing and adjusting systems shall address the following systems: (1) HVAC systems and controls; (2) indoor and outdoor lighting controls; (3) water heating systems; (4) renewable energy systems; (5) landscape irrigation systems; and (6) water reuse systems.
5.504.1 Indoor air quality (IAQ) during construction. Maintain IAQ as provided in Sections A5.504.1.1 and A5.504.1.2.

A5.504.2 IAQ testing. A testing alternative may be employed after all interior finish schedules, or other information that lists the location, type, and quantities of adhesives, sealants, and caulks are provided. Provide evidence that indoor air quality (IAQ) post construction has been addressed. This shall include:

1. Provide mechanical plans or other appropriate documentation that show, if the HVAC system is used during construction, return air exhaust fans, returns to the outdoor air, and outside air are maintained as required in Section A5.504.2.1.1. The contaminant levels will be tested and retested until testing demonstrates compliance.

2. Provide mechanical plans or other appropriate documentation that, prior to building or facility occupancy, all mechanical systems are maintained and alterations are performed in accordance with local codes and the building documents. The contaminants (Carbon Monoxide [CO], Formaldehyde, Particulates [PM10], 4-Phenylcyclohexene [4-PCH], and Total Volatile Organic Compounds [TVOC]) measured by testing shall not exceed the allowable limits specified in Section A5.504.2.1.3. Provide documentation that the covering of duct openings and protection of mechanical equipment shall occur during construction as required in Section A5.504.2.1.1. The contaminant levels will be tested and restested of indoor air quality after all interior finish schedules, or other information that lists the location, type, and quantities of adhesives, sealants, and caulks are provided. Provide evidence that indoor air quality shall be maintained during construction through the use of temporary ventilation and/or additional indoor air quality measures.

A5.504.3 IAQ post-construction. For each sampling area of the building exceeding the maximum concentrations specified in Section A5.504.2.1.3:

- Formaldehyde: 1.5 parts per billion;
- Benzene: 10 parts per billion;
- 4-Phenylcyclohexene (4-PCH): 6.5 micrograms per cubic meter; and
- Total Volatile Organic Compounds (TVOC): 250 micrograms per cubic meter.

The contaminant levels will be tested and restested until testing demonstrates compliance with these limits. See Appendix C for additional information on indoor air quality testing.

5.504.4 Finish material pollutant control. Finish materials shall comply with Sections 5.504.4.1 through 5.504.4.6. [2016 CALGreen]

5.504.4.1 Adhesives, sealants, caulks. Adhesives, sealants, and caulks used on the project shall meet the requirements of the following:

- Evidence that aerosol adhesives and smaller unit sizes of adhesives and sealant or caulking compounds (at quantities not weighing more than one pound and not consisting of more than 16 compounds) are in compliance with the SCAQMD Rule 1168 VOC limits and/or the California Air Resource Board (CARB) VOC standards and requirements, including compliance with prohibition of deuterated toxic substances.

- Evidence that indoor air quality (IAQ) post-construction has been addressed.

- Evidence that indoor air quality shall be maintained during construction through the use of temporary ventilation and/or additional indoor air quality measures.

- Provide documentation that the covering of duct openings and protection of mechanical equipment shall occur during construction as required in Section A5.504.2.1.1. The contaminant levels will be tested and restested until testing demonstrates compliance.

- Provide documentation that the indoor air quality post-construction was tested and restested to meet the emission limits. [2016 CALGreen]

5.504.4.2 Such products also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and trichloroethylene), except for aerosol products as specified in subsection 2, below.

5.504.4.3 Such products also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and trichloroethylene), except for aerosol products as specified in subsection 2, below.

5.504.4.4 Evidence adhesives, sealants, and caulks are in compliance with the SCAQMD Rule 1168 VOC limits and/or the California Air Resource Board (CARB) VOC standards and requirements, including compliance with prohibition of deuterated toxic substances.

5.504.4.5 Evidence that indoor air quality (IAQ) post-construction has been addressed.

5.504.4.6 Evidence that indoor air quality shall be maintained during construction through the use of temporary ventilation and/or additional indoor air quality measures.

5.504.4.7 Provide documentation that the covering of duct openings and protection of mechanical equipment shall occur during construction as required in Section A5.504.2.1.1. The contaminant levels will be tested and restested until testing demonstrates compliance.

5.504.4.8 Provide documentation that the indoor air quality post-construction was tested and restested to meet the emission limits. [2016 CALGreen]

5.504.4.9 Such products also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and trichloroethylene), except for aerosol products as specified in subsection 2, below.

5.504.4.10 Such products also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and trichloroethylene), except for aerosol products as specified in subsection 2, below.

Appendix C
5.504.4.5 Composite wood products. Hardwood plywood, particleboard and medium density fiberboard floor systems. For 80 percent of the floor area receiving finishes shall comply with the following:

1. Provide architectural plans, interior or exterior elevations, room finish schedules, or other information that in conjunction with other required Architectural Paint and Coating documents, certifies that all composite wood products used in the building are approved by the California Air Resources Board as no-added formaldehyde (NAF) based or ultra-low emitting formaldehyde (ULEF) resins or meet other requirements for composite wood products as per Sections 5.504.4.5.1 - 5.504.4.5.3.

2. Provide documentation that the composite wood products is approved by the California Air Resources Board as no-formaldehyde based resins (NAF) or low-emitting formaldehyde (ULEF) resins or meet other requirements for composite wood products as per Sections 5.504.4.5.1 - 5.504.4.5.3.

3. Product labeled and invoiced as meeting the Composite Wood Products regulation (see CCR, Title 17, Section 93120, et seq.).

4. Products certified under UL GREENGUARD Gold (formerly the Greenguard Children's & Schools Program). [2013 CALGreen]

5.504.4.4.1 Carpet cushion. All carpet cushion installed in the building interior shall meet the requirements of the Carpet and Rug Institute's Green Label or equivalent program.

5.504.4.4.2 Carpet adhesive. All carpet adhesive shall meet the requirements of Table 5.504.4.1. [2013 CALGreen]

Evidence that the carpet system shall meet at least one testing and product requirement listed in Section 5.504.4.4.1. Evidence that architectural paints and coatings shall comply with Volatile Organic Compound (VOC) limits in CALGreen Table 5.504.4.3 and/or South Coast Air Quality Management District (SCAQMD) Rule 1168 VOC limits.

Documentation that the composite wood products are approved by the California Air Resources Board as no-added formaldehyde (NAF) based or ultra-low emitting formaldehyde (ULEF) resins or meet other requirements for composite wood products as per Sections 5.504.4.5.1 - 5.504.4.5.3.

Aerosol paints and coatings shall meet the Product-Weighted MIR (PWMIR) Limits for ROC in Section 5.504.4.3. The at-High Gloss VOC limit in Table 5.504.4.3 shall apply. [2010 APPENDIX C]

Architectural Paint and Coating documents shall comply with the following:

1. Architectural Paint and Coating documents shall comply with the Paint Use Restrictions of the California Health and Safety Code, Division 23, Section 108360 et seq., 108365, 108370, 108375, 108380, and 108385.

2. Architectural Paint and Coating documents shall comply with the Volatile Organic Compound (VOC) limits in Table 5.504.4.3.

3. Architectural Paint and Coating documents shall comply with all other VOC regulatory requirements as per Title 17, section 94520 et seq., and in areas under the jurisdiction of the Bay Area Air Quality Management District additionally comply with the percent VOC by weight of product limits of Regulation 8 Rule 49.
shall be provided at a MERV of 11 for Tier 1 and a MERV of 13 for Tier 2, respectively.

1. Provide documentation that in mechanically ventilated buildings, regularly occupied areas of the building with air

clearly labeled filters shall be clearly labeled by the manufacturer indicating the MERV rating.

4. Provide evidence that the installed filters shall be included in the Operation and Maintenance (O&M) Manual.

2. Existing mechanical equipment.

1. An ASHRAE 10-percent to 15-percent efficiency Reporting Value (MERV) of 8. MERV 8

designed in Sections A5.504.4.8 and A5.504.4.8.1, respectively.

Exceptions:

2. The documentation shall verify that thermal insulation materials met the pollutant emission limits.

1. Provide documentation that Tier 1 and Tier 2 thermal insulation complies with the standards de

A5.504.4.7.2 Verification of compliance. Documentation shall be provided verifying that resilient

A5.504.4.7.1 Verification of compliance. Documentation shall be provided verifying that resilient

Appendix C
4. Provide site plans, elevations, or any other information where sound walls or earthen berms are incorporated into the Project to mitigate interior sound.

3. Provide evidence in the acoustical analysis that the wall and roof-ceiling assemblies making up the building envelope shall be constructed to provide an interior noise environment that does not exceed an hourly equivalent noise level (Leq-1 Hr) of 50 dBA in occupied areas during any hour of operation.

2. Where noise contours are not available, the acoustical analysis shall use the prescriptive method consistent with Section 5.507.4.1.

1. Provide approved acoustical analysis (signature page or approval letter only) that indicates wall and roof-ceiling assemblies exposed to the noise source making up the building envelope shall have exterior wall and roof assemblies meeting a composite Sound Transmission Class (STC) rating of at least 50.

A5.507.4.2.1 The STC ratings are required to be measured from the face of the building exterior wall or roof-ceiling assembly exposed to the noise source to the face of the wall or roof-ceiling assembly that encloses the interior space(s) that receive the transmitted noise. Where the wall or roof-ceiling assembly includes more than one assembly, the STC rating is the composite of the assemblies. Where the building envelope includes one or more curtain walls, the STC rating is the composite STC rating of the curtain walls and any other exterior walls, roof assemblies, and floor-ceiling assemblies.

A5.507.4.2.2 The project shall provide evidence that the sound transmission class (STC) ratings are no less than 50, by way of a certified acoustical analysis.

A5.507.4.2.3 The STC ratings are required to be measured from the face of the building exterior wall or roof-ceiling assembly exposed to the noise source to the face of the wall or roof-ceiling assembly that encloses the interior space(s) that receive the transmitted noise. Where the wall or roof-ceiling assembly includes more than one assembly, the STC rating is the composite of the assemblies. Where the building envelope includes one or more curtain walls, the STC rating is the composite STC rating of the curtain walls and any other exterior walls, roof assemblies, and floor-ceiling assemblies.

A5.507.4.2.4 The project shall provide evidence that the sound transmission class (STC) ratings are no less than 50, by way of a certified acoustical analysis.

A5.507.4.2.5 The STC ratings are required to be measured from the face of the building exterior wall or roof-ceiling assembly exposed to the noise source to the face of the wall or roof-ceiling assembly that encloses the interior space(s) that receive the transmitted noise. Where the wall or roof-ceiling assembly includes more than one assembly, the STC rating is the composite of the assemblies. Where the building envelope includes one or more curtain walls, the STC rating is the composite STC rating of the curtain walls and any other exterior walls, roof assemblies, and floor-ceiling assemblies.

A5.507.4.2.6 The project shall provide evidence that the sound transmission class (STC) ratings are no less than 50, by way of a certified acoustical analysis.

A5.507.4.2.7 The STC ratings are required to be measured from the face of the building exterior wall or roof-ceiling assembly exposed to the noise source to the face of the wall or roof-ceiling assembly that encloses the interior space(s) that receive the transmitted noise. Where the wall or roof-ceiling assembly includes more than one assembly, the STC rating is the composite of the assemblies. Where the building envelope includes one or more curtain walls, the STC rating is the composite STC rating of the curtain walls and any other exterior walls, roof assemblies, and floor-ceiling assemblies.

A5.507.4.2.8 The project shall provide evidence that the sound transmission class (STC) ratings are no less than 50, by way of a certified acoustical analysis.

A5.507.4.2.9 The STC ratings are required to be measured from the face of the building exterior wall or roof-ceiling assembly exposed to the noise source to the face of the wall or roof-ceiling assembly that encloses the interior space(s) that receive the transmitted noise. Where the wall or roof-ceiling assembly includes more than one assembly, the STC rating is the composite of the assemblies. Where the building envelope includes one or more curtain walls, the STC rating is the composite STC rating of the curtain walls and any other exterior walls, roof assemblies, and floor-ceiling assemblies.

A5.507.4.2.10 The project shall provide evidence that the sound transmission class (STC) ratings are no less than 50, by way of a certified acoustical analysis.

A5.507.4.2.11 The STC ratings are required to be measured from the face of the building exterior wall or roof-ceiling assembly exposed to the noise source to the face of the wall or roof-ceiling assembly that encloses the interior space(s) that receive the transmitted noise. Where the wall or roof-ceiling assembly includes more than one assembly, the STC rating is the composite of the assemblies. Where the building envelope includes one or more curtain walls, the STC rating is the composite STC rating of the curtain walls and any other exterior walls, roof assemblies, and floor-ceiling assemblies.

A5.507.4.2.12 The project shall provide evidence that the sound transmission class (STC) ratings are no less than 50, by way of a certified acoustical analysis.

A5.507.4.2.13 The STC ratings are required to be measured from the face of the building exterior wall or roof-ceiling assembly exposed to the noise source to the face of the wall or roof-ceiling assembly that encloses the interior space(s) that receive the transmitted noise. Where the wall or roof-ceiling assembly includes more than one assembly, the STC rating is the composite of the assemblies. Where the building envelope includes one or more curtain walls, the STC rating is the composite STC rating of the curtain walls and any other exterior walls, roof assemblies, and floor-ceiling assemblies.

A5.507.4.2.14 The project shall provide evidence that the sound transmission class (STC) ratings are no less than 50, by way of a certified acoustical analysis.

A5.507.4.2.15 The STC ratings are required to be measured from the face of the building exterior wall or roof-ceiling assembly exposed to the noise source to the face of the wall or roof-ceiling assembly that encloses the interior space(s) that receive the transmitted noise. Where the wall or roof-ceiling assembly includes more than one assembly, the STC rating is the composite of the assemblies. Where the building envelope includes one or more curtain walls, the STC rating is the composite STC rating of the curtain walls and any other exterior walls, roof assemblies, and floor-ceiling assemblies.

A5.507.4.2.16 The project shall provide evidence that the sound transmission class (STC) ratings are no less than 50, by way of a certified acoustical analysis.

A5.507.4.2.17 The STC ratings are required to be measured from the face of the building exterior wall or roof-ceiling assembly exposed to the noise source to the face of the wall or roof-ceiling assembly that encloses the interior space(s) that receive the transmitted noise. Where the wall or roof-ceiling assembly includes more than one assembly, the STC rating is the composite of the assemblies. Where the building envelope includes one or more curtain walls, the STC rating is the composite STC rating of the curtain walls and any other exterior walls, roof assemblies, and floor-ceiling assemblies.

A5.507.4.2.18 The project shall provide evidence that the sound transmission class (STC) ratings are no less than 50, by way of a certified acoustical analysis.
1. Provide documentation with evidence HVAC systems, refrigeration, and fluorocarbons (HFCs). Install HVAC complying with either of the following:

- Install HVAC, refrigeration and fluorocarbons (CFCs).
- Install HVAC, refrigeration and fluorocarbons (HFCs) with a global warming potential no greater than 1.

2. Provide documentation with evidence HVAC systems and refrigeration equipment will not limit the use of HFC refrigerant through the use of a secondary heat pump with a global warming potential greater than 150.

3. Provide plans that indicate, if wall and floor-ceiling assemblies separating tenant spaces and public places shall comply with Sections 5.508.1.1 and 5.508.1.2. [2010 CALGreen]

4. Provide approved acoustical analysis (signature page or approval letter only) that indicates wall and floor-ceiling assemblies making up the building envelope shall have exterior wall and roof assemblies meeting a composite Sound Transmission Class (STC) rating of at least 50.

5. Where noise contours are not available, the acoustical analysis shall use the prescriptive method consistent with Section 5.507.4.1. Provide site plans, elevations, or any other information where sound walls or earthen berms are incorporated into the Project to mitigate interior sound.

6. Where noise contours are not available, the acoustical analysis shall use the prescriptive method consistent with Section 5.507.4.1. Provide site plans, elevations, or any other information where sound walls or earthen berms are incorporated into the Project to mitigate interior sound.

7. Where noise contours are not available, the acoustical analysis shall use the prescriptive method consistent with Section 5.507.4.1. Provide site plans, elevations, or any other information where sound walls or earthen berms are incorporated into the Project to mitigate interior sound.

8. Where noise contours are not available, the acoustical analysis shall use the prescriptive method consistent with Section 5.507.4.1. Provide site plans, elevations, or any other information where sound walls or earthen berms are incorporated into the Project to mitigate interior sound.

9. Where noise contours are not available, the acoustical analysis shall use the prescriptive method consistent with Section 5.507.4.1. Provide site plans, elevations, or any other information where sound walls or earthen berms are incorporated into the Project to mitigate interior sound.

10. Where noise contours are not available, the acoustical analysis shall use the prescriptive method consistent with Section 5.507.4.1. Provide site plans, elevations, or any other information where sound walls or earthen berms are incorporated into the Project to mitigate interior sound.
5.508.2.6.1 First vacuum. Pull a system vacuum down to at least 1000 microns (+/- 50 microns), and hold for 30 minutes.

5.508.2.6.2 Second vacuum. Pull a second system vacuum to a minimum of 500 microns and hold for 30 minutes.

5.508.2.6.3 Third vacuum. Pull a third vacuum down to a minimum of 300 microns, and hold for 24 hours with a maximum drift of 100 microns over a 24-hour period. [2013 CALGreen]

5.508.2.5 Pressure testing. Refrigerant receivers with capacities greater than 200 pounds shall be pressure tested during installation prior to evacuation and charging.

5.508.2.5.1 Minimum pressure. The system shall be charged with regulated dry nitrogen and appropriate tracer gas to bring system pressure up to 300 psig minimum.

5.508.2.5.2 Leaks. Check the system for leaks, repair any leaks, and retest for pressure using the same gauge.

5.508.2.5.3 Allowable pressure change. The system shall stand, unaltered, for 24 hours with no more than a +/- one pound pressure change from 300 psig, measured with the same gauge.

5.508.2.6 Evacuation. The system shall be evacuated after pressure testing and prior to charging.
APPENDIX D

Sustainability Information Sheets
Sustainability Information Sheet

BICYCLE PARKING SPACE CALCULATION – STAND-ALONE BUILDINGS

REGULATORY REQUIREMENTS
For projects within the City of Los Angeles, refer to Ordinance No. 182386 (replaces 2016 CALGreen Section 5.106.4.1 which requires “meet the applicable local ordinance, which ever is stricter.”)

For projects in the County of Los Angeles or another city, refer to that jurisdictions’ Municipal Code. In the event that no local regulations address bicycle parking, 2016 CALGreen Section 5.106.4.1 would provide the regulatory requirements.

Calculation of Required Short-term and Long-Term Bicycle Parking Per MRDC 6.12.5
Requirements:
Bicycle parking shall be integrated into the stand-alone building site at locations directly accessible to building entrances and visible to passers-by for natural surveillance. Bicycle parking at Metro buildings shall consist of one or a combination of the following:

> Short-Term Bicycle Parking provided at an inverted-U bicycle rack that allows two (2) bicycles to be securely affixed to the rack with a personal bike lock on a first-come-first served basis. The minimum number of short-term bicycle parking spaces shall be no lower than six (6) spaces, even if the calculated number of spaces is less than 6.

> Long-term Bicycle Parking provided through the payment of a fee for bicycle storage in a secure-access, enclosed area. The types of paid-secure bicycle parking include:
(a) Bicycle lockers that allow for the secure-access and storage of one (1) bicycle to a registered user; or
(b) High capacity bicycle parking facility that allows for the storage of multiple bikes locked to bicycle racks (tiered and/or inverted-U) with a personal bicycle lock that is inside an enclosed, but “shared” area, that is securely-accessed by registered users. The minimum number of long-term secured bicycle parking spaces shall be eight (8) lockers, even if the calculated number of lockers is less than 8.

For each stand-alone Metro building, bicycle parking spaces shall be provided to meet current and future demand for both short-term free bicycle parking and long-term bicycle parking based upon the gross floor area calculated as shown in the next page.

CALCULATION OF REQUIRED BICYCLE PARKING SPACES:
To calculate the required number of bicycle parking spaces for each stand-alone Metro building, the following formulas and guidance shall be used:

> To calculate the current demand, use gross floor area.
> To calculate the future demand, use gross floor area.
> To calculate the short-term bicycle parking, use gross floor area.
> To calculate the long-term secure bicycle parking, use gross floor area.

BASED ON 2016 CALGREEN REQUIREMENTS
EXAMPLE CALCULATION FORMAT:

The following provides an example table format that can be used:

<table>
<thead>
<tr>
<th>Total Building (Gross Floor Area)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Building (Gross Floor Area)</td>
<td></td>
</tr>
<tr>
<td>B Occupancy</td>
<td>24,845</td>
</tr>
<tr>
<td>F-1 Occupancy</td>
<td>20,666</td>
</tr>
<tr>
<td>S-1 Occupancy</td>
<td>29,197</td>
</tr>
<tr>
<td>S-2 (***)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>74,708</td>
</tr>
</tbody>
</table>

Notes: (***) S-2 is parking on 3rd level is excluded.

Analysis

| B Occupancy percent               | 33.20% |
| Allowable office for Industrial use | 10%    |
| Excess s.f. to be computed at Office use ratio | 23.20% |

Draft Parking Analysis

| Industrial Use | 76.80% |
| Per code -     |       |
| Short-term bike parking | 1 per 10,000 SF |
| Long-term bike parking  | 1 per 10,000 SF |
| Total Gross SF   | 87,204 SF |
| SF For bike Parking | 66,973 SF |
| Short-term bike spaces | 6.70 (7 spaces) |
| Long-term bike spaces  | 6.70 (7 spaces) |
| Office Use       | 23.20% |
| Per code -       |       |
| Short-term bike parking | 1 per 10,000 SF |
| Long-term bike parking  | 1 per 5,000 SF |
| SF For bike Parking   | 20,231 SF |
| Short-term bike spaces | 2.02 (2 spaces) |
| Long-term bike spaces  | 4.05 (4 spaces) |

Total No. of Spaces

| Short-term spaces | 8.72 | 9 spaces |
| Long-term spaces  | 10.74 | 11 spaces |

BASED ON 2016 CALGREEN REQUIREMENTS
**REQUIRED SUPPORTING DOCUMENTATION FOR SUSTAINABILITY PLAN MONTHLY UPDATE**

The Contractor shall submit the following supporting documentation with the Sustainability Plan Monthly Update once the Bicycle Parking Sustainability Element has been defined as complete. Provide separate calculations and plans for each stand-alone building, with a summary for the total bicycle parking for the Metro project addressed in the approved Sustainability Plan.

> Calculations for the number of required short-term bicycle parking spaces and long-term bicycle parking spaces. Metro projects consisting of stand-alone building(s) shall use the methodology defined in the City of Los Angeles Ordinance No. 182386. The calculations shall include applicable information such as: square footage, land use type, generation factors, sources, and other information related to the methodology used.

> Plan sheet(s) with the statistical summary of the short-term and long-term bicycle parking.

> Plan sheets for each station or stand alone building(s) indicating the location of the short-term and long-term bicycle parking spaces and the type of facilities that will be provided (i.e., rack, locker).

> Plan sheets with details illustrating the dimensions and design of the bicycle parking facilities (i.e., rack, locker).
Sustainability Information Sheet

BICYCLE PARKING SPACE CALCULATION – METRO STATIONS

REGULATORY REQUIREMENTS
Metro Rail Design Criteria 6.12.5 (replaces 2016 CALGreen Section 5.106.4.1 which requires a project to “Comply with Sections 5.106.4.1.1 and 5.106.4.1.2; or meet the applicable local ordinance, which ever is stricter.”)

CALCULATION OF REQUIRED SHORT-TERM AND LONG-TERM BICYCLE PARKING PER MRDC 6.12.5

REQUIREMENTS:
Bicycle parking shall be integrated into the station area site at locations directly accessible to station entrances and visible to passers-by for natural surveillance. Bicycle parking at Metro stations shall consistent of one or a combination of the following:

> Short-Term Free Bicycle Parking provided at an inverted-U bicycle rack that allows two (2) bicycles to be securely affixed to the rack with a personal bike lock on a first-come-first served basis. The minimum number of short-term free bicycle parking spaces shall be six (6) spaces, even if the calculated number of spaces is less than 6.

> Long-term Paid-Secure Bicycle Parking provided through the payment of a fee for bicycle storage in a secure-access, enclosed area. Types of paid-secure bicycle parking consist of:
  (a) Bicycle lockers that allow for the secure-access and storage of one (1) bicycle to a registered user; or
  (b) High capacity bicycle parking facilities that allow for the storage of multiple bikes locked to bicycle racks (tiered and/or inverted-U) with a personal bicycle lock that is inside an enclosed, but “shared” area, that is securely-accessed by registered users. The minimum number of long-term paid-secured bicycle parking spaces shall be eight (8) lockers, even if the calculated number of lockers is less than 8.

For each Metro station, bicycle parking spaces shall be provided to meet current and future demand for both short-term free bicycle parking and long-term paid-secure bicycle parking based upon the projected ridership calculated as shown below.

CALCULATION OF REQUIRED BICYCLE PARKING SPACES:
To calculate the required number of bicycle parking spaces for each Metro station, the following formulas and guidance shall be used:

> Current demand, is 1.25% times the peak ridership.
> Future demand, is 2.5% times the peak ridership.
> Short-term free bicycle parking reflects the number of spaces with racks is equal to 60% the total required number of bicycle parking spaces required for the Metro station.
> Long-term paid-secure bicycle parking reflects the number of spaces with multiple racks and/or in lockers is equal to 40% the total required number of bicycle parking spaces required for the Metro station.

EXAMPLE CALCULATION:
The following provides an example of the table format that can be used for calculations:

<table>
<thead>
<tr>
<th>Metro Stations</th>
<th>Est. Daily Boarding</th>
<th>Est. AM &amp; PM Peak Period Boarding</th>
<th>Est. AM Peak Period Boarding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wilshire/La Brea</td>
<td>3,636</td>
<td>1,818</td>
<td>909</td>
</tr>
<tr>
<td>Wilshire/Fairfax</td>
<td>6,025</td>
<td>3,013</td>
<td>1,506</td>
</tr>
<tr>
<td>Wilshire/La Cienega</td>
<td>10,120</td>
<td>5,060</td>
<td>2,530</td>
</tr>
<tr>
<td>Total</td>
<td>19,781</td>
<td>9,891</td>
<td>4,945</td>
</tr>
</tbody>
</table>

BASED ON 2016 CALGREEN REQUIREMENTS

METRO SUSTAINABILITY PLAN GUIDELINES
**APPENDIX D**

**BICYCLE PARKING SPACE CALCULATION – METRO STATIONS**  
*continued*

---

### BICYCLE PARKING SPACES CURRENT DEMAND - METRO MODEL

<table>
<thead>
<tr>
<th>Metro Stations</th>
<th>Total Spaces Required</th>
<th>Short-Term Free Bicycle Parking Spaces Required</th>
<th>Long-Term Secured-Access Bicycle Parking Spaces Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wilshire/La Brea</td>
<td>23</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td>Wilshire/Fairfax</td>
<td>38</td>
<td>23</td>
<td>15</td>
</tr>
<tr>
<td>Wilshire/La Cienega</td>
<td>63</td>
<td>38</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>124</strong></td>
<td><strong>74</strong></td>
<td><strong>49</strong></td>
</tr>
</tbody>
</table>

---

**REQUIRED SUPPORTING DOCUMENTATION FOR SUSTAINABILITY PLAN MONTHLY UPDATE**

The Contractor shall submit separate calculations and plans for each station with a summary for the total bicycle parking for the Metro project as supporting documentation with the Sustainability Plan Monthly Update where the Bicycle Parking Sustainability Element is defined as complete:

- For both current and future demand, provide a table showing the estimated AM and PM Peak Period Boardings (defined as the estimated total Daily Boarding divided by 2) for each Metro station. The estimated total Daily Boarding data can be obtained from Metro Planning.
- For each Metro station, provide a separate table and summary calculations of the short-term free bicycle parking spaces and long-term secure-access bicycle parking spaces consistent with the requirements of MRDC 6.12.5 summarized above.
- Site and floor plans (consistent with the requirements of Metro Architectural Standard Drawing AS-013) for each Metro station with clear labels that highlight the location and number of short-term free bicycle parking spaces and long-term secure-access bicycle parking spaces. Plans that are 65% or less complete require a signature on the plans or in correspondence.

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*BASED ON 2016 CALGREEN REQUIREMENTS*
Sustainability Information Sheet

MATERIAL CONSERVATION AND RESOURCE EFFICIENCY: COMMISSIONING INCLUDED IN DESIGN AND CONSTRUCTION PROCESSES

REGULATORY REQUIREMENTS

MRDC ________________

2016 CALGreen Section 5.410.2

COMMISSIONING INCLUDED IN DESIGN AND CONSTRUCTION PROCESSES

California's Building Energy Efficiency Standards (Energy Standards), Title 24, Part 6 define commissioning as “a systematic quality assurance process that spans the entire design and construction process, including verifying and documenting that building systems and components are planned, designed, installed, tested, operated and maintained to meet the owner's project requirements.” CALGreen requirements are complementary to Energy Standards requirements. The Metro Rail Design Criteria specifically defines the commissioning process as a requirement of the Contractor.

To address commissioning as a part of project sustainability, 2016 CALGreen states the following requirements for commissioning of projects during the design and construction processes prior to building occupancy.

Section 5.410.2 Commissioning. [N] For new buildings 10,000 square feet and over, building commissioning shall be included in the design and construction processes of the building project to verify that the building systems and components meet the owner's or owner representative's project requirements. Commissioning shall be performed in accordance with this section by trained personnel with experience on projects of comparable size and complexity. All occupancies other than I-occupancies and L-occupancies shall comply with the California Energy Code as prescribed in California Energy Code Section 120.8. For I-occupancies that are not regulated by OSHPD or I-occupancies and L-occupancies that are not regulated by California Energy Code Section 100.0 Scope, all requirements in Sections 5.410.2 through 5.410.2.6 shall apply.

Commissioning requirements shall include:

1. Owner's or owner representative's project treatments.
2. Basis of design.
3. Commissioning measures shown in the construction documents.
5. Functional performance testing.
6. Documentation and training.
7. Commissioning report.

Exceptions:

1. Unconditioned warehouses of any size.
2. Areas under 10,000 square feet used for offices or other conditioned accessory spaces within unconditioned warehouses.
3. Tenant improvements less than 10,000 square feet as described in Section 303.1.1.
4. Open parking garages of any size, or open parking garage areas, of any size, within a structure.

Note: For the purposes of this section, unconditioned shall mean a building, area, or room which does not provide heating or air conditioning. [2016 CALGreen]

Section 5.410.2.1 Owner’s Project Requirements (OPR). [N] The expectations and requirements of the building appropriate to its

BASED ON 2016 CALGREEN REQUIREMENTS
phase shall be documented before the design phase of the project begins. This documentation shall include the following:

1. Environmental and sustainability goals.
2. Energy efficiency goals.
3. Indoor environmental quality requirements.
4. Project program, including facility functions and hours of operation, and need for after hours operation.
5. Equipment and systems expectations.
6. Building occupant and operation and maintenance (O&M) personnel expectations. [2016 CALGreen]

Section 5.410.2.2 Basis of Design (BOD). [N] A written explanation of how the design of the building systems meets the OPR shall be completed at the design phase of the building project. The Basis of Design document shall cover the following systems:

1. Heating, ventilation, air conditioning (HVAC) systems and controls.
2. Indoor lighting system and controls.
3. Water heating system.
4. Renewable energy systems.
5. Landscape irrigation systems.
6. Water reuse systems. [2016 CALGreen]

Section 5.410.2.3 Commissioning Plan. [N] Prior to permit issuance a commissioning plan shall be completed to document how the project will be commissioned. The commissioning shall include the following:

1. General project information.
2. Commissioning goals.
3. Systems to be commissioned. Plans to test systems and components shall include:
   a. An explanation of the original design intent.
   b. Equipment and systems to be tested, including the extent of tests
   c. Functions to be tested.
   d. Conditions under which the test shall be performed.
   e. Measurable criteria for acceptable performance.
4. Commissioning team information.
5. Commissioning process activities, schedules and responsibilities. Plans for the completion of commissioning shall be included. [2013 CALGreen]

Section 5.410.2.4 Functional performance testing. [N] Functional performance tests shall demonstrate the correct installation and operation of each component, system and system-to-system interface in accordance with the approved plans and specifications. Functional performance testing reports shall contain information addressing each of the building components tested, the testing methods utilized, and include any readings and adjustments made. [2013 CALGreen]

Section 5.410.2.5 Documentation and Training. [N] A systems manual and systems operations training are required, including Occupational Safety and Health Act (OSHA) requirements in California Code of Regulations (CCR), Title 8, Section 5142, and other related regulations. [2013 CALGreen]

BASED ON 2016 CALGREEN REQUIREMENTS
APPENDIX D

MATERIAL CONSERVATION AND RESOURCE EFFICIENCY: COMMISSIONING INCLUDED IN DESIGN AND CONSTRUCTION PROCESSES

Section 5.410.2.6 Commissioning Report. [N] A report of commissioning process activities undertaken through the design and construction phases of the building project shall be completed and provided to the owner or representative.

Note: Guidance on implementation and enforcement of commissioning requirements, including sample compliance forms and templates, may be found in Appendix A6, Division A6.1, of this code. [2013 CALGreen]

Section 5.410.4 Testing and adjusting. Testing and adjusting of systems shall be required for new buildings less than 10,000 square feet or new systems to serve an addition or alteration subject to Section 303.1. [2013 CALGreen]

Section 5.410.4.2 Systems. Develop a written plan of procedures for testing and adjusting systems. Systems to be included for testing and adjusting systems shall include, as applicable to the project:

1. HVAC systems and controls.
2. Indoor and outdoor lighting and controls.
3. Water heating systems.
4. Renewable energy systems.
5. Landscape irrigation systems.
6. Water reuse systems. [2013 CALGreen]

Section 5.410.4.3 Procedures. Perform testing and adjusting procedures in accordance with manufacturer’s specifications and applicable standards on each system as determined by the enforcing agency. [2013 CALGreen]

Section 5.410.4.4 Reporting. After completion of testing, adjusting and balancing, provide a final report of testing signed by the individual responsible for performing these services. [2013 CALGreen]

Section 5.410.4.5 Operation and maintenance (O&M) manual. Provide the building owner or representative with detailed operating and maintenance instructions and copies of guarantees/warranties for each system. O&M instructions shall be consistent with OSHA requirements in CCR, Title 8, Section 5142, and other related regulations. [2010 CALGreen]

Section 5.410.4.5.1 Inspections and reports. Include a copy of all inspection verifications and reports required by the enforcing agency. [2010 CALGreen]

REQUIRED SUPPORTING DOCUMENTATION FOR SUSTAINABILITY PLAN MONTHLY UPDATE

The Contractor shall submit the following supporting documentation with the Sustainability Plan Monthly Update when the Commissioning Sustainability Element has been defined as complete. Provide separate plans and manuals for each station addressed in the approved Sustainability Plan:

> Provide a copy of the Commissioning Plan (signature page or approval correspondence only). The Commissioning Plan, consistent with the requirements of Section 5.410.2.3, shall include: (1) general project information; (2) commissioning goals; (3) systems to be commissioned (plans of systems and components to be tested); (4) commissioning team information; and (5) commissioning process activities, schedules, and responsibilities.

> Provide applicable plan sheet(s) for the completion of commissioning.

> Metro shall provide the expectation and requirements of the Project building(s) before the design phase of the Project begins.

> At the completion of the design phase of the Project, provide a Basis of Design document with a written explanation of how the design of building systems meets Metro’s Project requirements that address the following systems: (1) HVAC systems and controls; (2) indoor lighting systems and controls; (3) water heating systems; (4) renewable energy systems; (5) landscape irrigation systems; and (6) water reuse systems.

BASED ON 2016 CALGREEN REQUIREMENTS
> A copy of the signature page or approval correspondence for the approved Systems Manual.

> The approved Systems Manual shall include: (1) site information, facility description, Project history, and current requirements; (2) site contract information; (3) basic operations and maintenance including general operating procedures basic troubleshooting, recommended maintenance requirements, and site events log; (4) major systems; (5) site equipment inventory and maintenance notes; (6) verification required by Metro or CALGreen; (7) definition of systems operations training required per OSHA requirements in the California Code of Regulations, Title 8, Section 5142 and other related regulations; and (8) other applicable resources and documentation.

> A copy of the signature page or approval correspondence for the approved Commissioning Report. The Commissioning Report shall define the commissioning process activities undertaken through the design and construction phases of the building process for the Project.

> Provide evidence that the testing and adjusting of systems has been completed.

> A copy of the signature page or approval correspondence for the approved written plan of procedures for testing and adjusting systems. The plan of procedures for testing and adjusting shall address the following systems: (1) HVAC systems and controls; (2) indoor and outdoor lighting controls; (3) water heating systems; (4) renewable energy systems; (5) landscape irrigation systems; and (6) water reuse systems, if applicable.

> The signature page or approval correspondence for the approved final report after completion of testing, adjusting, and balancing. The report shall be signed by the individual responsible for performing these services.

> The signature page or approval correspondence for the approved Operation and Maintenance (O&M) Manual. The O&M Manual shall include: (1) detailed operating and maintenance instruction; (2) copies of guaranties/warranties for each system. The O&M Manual instructions shall be consistent with OSHA requirements in the Code of California Regulations, Title 8, Section 5142, and other regulations.

> Provide signature pages or approval correspondence for approved inspection verifications and reports required by Metro.
Sustainability Information Sheet

PLANNING AND DESIGN: ELECTRIC VEHICLE (EV) CHARGING

REGULATORY REQUIREMENTS
Metro Rail Design Criteria 2.1.3
2016 CALGreen Section 5.106.5.3 and Sections 5.106.5.3.1 through 5.106.5.3.3

ELECTRIC VEHICLE (EV) CHARGING SPECIFICATIONS
Metro Rail Design Criteria (MRDC) states the following related to EV charging:

Section 2.1.3 Metro Sustainability and Energy Policy. As it applies to this criteria, all Metro rail projects shall at a minimum:

> Aggressively pursue renewable energy sources, take advantage of rebates and subsidies for energy and water conservation, wherever feasible, and implement energy conservation measure where they are feasible and fiscally prudent.

> Construct all new facilities and projects, including new transit corridor projects, using energy-efficiency and conservation strategies. For buildings or structures over 10,000 square feet, projects must be constructed to achieve Leadership in Energy and Environmental Design (LEED®) Silver certification, at a minimum.

2016 CALGreen states the following related to EV charging:

CALGreen Section 5.106.5.3 Electric Vehicle (EV) Charging. [N] Construction shall comply with Section 106.5.3.1 or Section 5.106.5.3.2 to facilitate future installation of electric vehicle supply equipment (EVSE). When EVSE(s) is/are installed, it shall be in accordance with the California Building Code, the California Electrical Code and as [the following subsections].

CALGreen Sections 5.106.5.3.1 through 5.106.5.3.3. Included in these subsections are specifications for single charging space and multiple charging space requirements.

CALCULATIONS OF EV CHARGING SPACES:
For relevant calculations, 2016 CALGreen states the following:

CALGreen 5.106.5.3.3 EV charging space calculation. [N] Table 5.106.5.3.3 shall be used to determine if single or multiple charging space requirements apply for the future installation of EVSE.

<table>
<thead>
<tr>
<th>TOTAL NUMBER OF PARKING SPACES</th>
<th>NUMBER OF REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-9</td>
<td>0</td>
</tr>
<tr>
<td>10-25</td>
<td>1</td>
</tr>
<tr>
<td>26-50</td>
<td>2</td>
</tr>
<tr>
<td>51-75</td>
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<tr>
<td>76-100</td>
<td>5</td>
</tr>
<tr>
<td>101-150</td>
<td>7</td>
</tr>
<tr>
<td>151-200</td>
<td>10</td>
</tr>
<tr>
<td>201 and over</td>
<td>At least 6 percent of total</td>
</tr>
</tbody>
</table>

1. Calculation for spaces shall be rounded up to the nearest whole number.

BASED ON 2016 CALGREEN REQUIREMENTS
APPENDIX D

PLANNING AND DESIGN: ELECTRIC VEHICLE (EV) CHARGING

REQUIRED SUPPORTING DOCUMENTATION FOR SUSTAINABILITY PLAN MONTHLY UPDATE

The Contractor shall submit separate plans and calculations for each station addressed in the approved Sustainability Plan as the supporting documentation as part of the Sustainability Plan Monthly Update when the Electric Vehicle Charging Sustainability Element has been defined as complete:

> A site plan and/or parking plan sheet(s) that indicate the location and type of facilities provided to facilitate future installation of electric vehicle supply equipment (EVSE).

> Calculations of charging spaces required per Table 5.106.5.3.3.

> In the event that only a single-charging space is required, provide a plan and details of the required raceway consistent with the specifications in Section 5.106.5.3.1.

> If multiple charging spaces are required, provide plans and details of the required raceways consistent with the specifications in Section 5.106.5.3.2.

BASED ON 2016 CALGREEN REQUIREMENTS
Sustainability Information Sheet

ENVIRONMENTAL QUALITY: FINISH MATERIAL POLLUTANT CONTROL AND DOCUMENTATION (VOC LIMITS AND OTHER REQUIREMENTS)

REGULATORY REQUIREMENTS
South Coast Air Quality Management District Rule 1168
Metro Rail Design Criteria Sections 6.7 and 6.7.3
2016 CALGreen Sections 5.504.4 and 5.504.4.1 through 5.504.4.6

PROVISIONS FOR CONTROL AND DOCUMENTATION OF FINISH MATERIAL POLLUTANTS
South Coast Air Quality Management District (SCAQMD) Rule 1168 Subsection (c) (http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/rule-1168.pdf) provides the requirements for the purposes of reducing emissions of volatile organic compounds (VOC) as a result of the application of adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers, and any other primers.

Metro Rail Design Criteria (MRDC) Section 6.7 provides basic requirements and criteria established for the finish of Metro Rail System public areas. MRDC Subsections 6.7.3.A through 6.7.3.K provide specific general criteria for finish materials.

2016 CALGreen states the following requirements related to VOC associated with finish material pollutant control and documentation:

Section 5.504.4 Finish material pollutant control. Finish materials shall comply with Sections 5.504.4.1 through 5.504.4.6.

CALGreen Sections 5.504.4.1 through 5.504.4.6 provide specific control methods for adhesives, sealants, caulks, paints and coatings, aerosol paints and coatings, carpet systems, composite wood products, and resilient flooring systems.

REQUIRED SUPPORTING DOCUMENTATION FOR SUSTAINABILITY PLAN MONTHLY UPDATE
The Contractor shall submit separate plans, schedules, and other requested documentation for each station addressed in the approved Sustainability Plan as the supporting documentation with the Sustainability Plan Monthly Update when the Finish Material Pollutant Control and Documentation Sustainability Element is defined as complete.

Adhesives, sealants, and caulks
> Architectural plans, floor plans, room finish schedules, or other information that lists the location, type, and quantities of adhesives, sealants, and caulks to be used on the Project.
> Evidence that adhesives, sealants, and caulks shall comply with the South Coast Air Quality Management District (SCAQMD) Rule 1168 Volatile Organic Compound (VOC) limits, including compliance with prohibition of defined toxic substances.
> Evidence that aerosol adhesives and smaller unit sizes of adhesives and sealant or caulking compounds (at quantities defined in Section 5.504.4.1) shall comply with the SCAQMD Rule 1168 VOC limits and/or the California Air Resource Board (CARB) VOC standards and requirements, including compliance with prohibition of certain toxic compounds as defined in California Code of Regulations, Title 17, Section 94507 et seq., whichever is more restrictive.

Paints and Coatings
> Architectural plans and room finish schedules that list the location, type, and quantities of architectural paints and coatings to be used on the Project.
> Evidence that architectural paints and coatings shall comply with Volatile Organic Compound (VOC) limits in CALGreen Table 5.504.4.3 and/or South Coast Air Quality Management District (SCAQMD) Rule 1168 VOC limits.
Aerosol Paints and Coatings
> Plan sheet(s) and other information that list the location, type, and quantities of aerosol paints and coatings to be used on the Project.
> Evidence that aerosol paints and coatings shall meet the Product-weighted Maximum Incremental Reactivity (MIR) limits for Reactive Organic Compounds (ROC) for certain toxic compounds and ozone depleting substances set forth in the California Code of Regulations, Title 17, Section 94520 et seq.

Carpet Systems
> Architectural plans, floor plans, room finish schedules, or other information that list the location and the characteristics of all carpet installed in the interior of buildings.
> Evidence that the carpet shall meet at least one of the testing and product requirements listed in Section 5.504.4.4.
> Evidence that all carpet cushion installed in the interior of buildings shall meet the requirements of the Carpet and Rug Institute’s Green Label program.
> Evidence that all carpet adhesive shall meet the requirements of CALGreen Table 5.504.4.1.

Composite Wood Products
> Architectural plans, floor plans, interior or exterior elevations, room finish schedules, and/or other information that indicates the location and types of composite wood products used on the interior or exterior of the buildings.
> Documentation verifying that the composite wood products shall meet the requirements for formaldehyde as specified in Section 5.504.4.5. This shall include at least one of the documentation options listed in Section 5.504.4.5.3.

Resilient Flooring Systems
> Architectural plans, floor plans, interior or exterior elevations, room finish schedules, or other information that indicates the location and types of resilient flooring.
> Documentation verifying that percentage of the floor area receiving flooring meets one of the criteria listed in Section 5.504.4.6.
Sustainability Information Sheet

WATER EFFICIENCY AND CONSERVATION:
LANDSCAPING AND IRRIGATION DESIGN

REGULATORY REQUIREMENTS
Metro Rail Design Criteria 2.12 and 6.6
2016 CALGreen Sections 5.304.1, 5.304.2, 5.304.3, and 5.304.4

REQUIREMENTS
Metro Rail Design Criteria (MRDC) describes ornamental landscaping associated with Metro Rail Projects.

MRDC 2.12.1.B. Ornamental Landscape states the following:
As a result of implementing the Metro Rail Projects, it will be necessary to remove some landscaped areas and street trees. In order to mitigate these losses, the following criteria shall apply:

> Where existing vegetation must be removed, new landscaping shall be planted where possible and appropriate, the placement and types of which shall be as specified in an established landscaping plan.
> The selected landscape material shall be drought tolerant and California native, if possible.
> The landscape plan shall be designed to allow plants to attain their ultimate height and spread, and to minimize maintenance requirements.
> The landscaping plan shall include a master plant list, which shall call for new vegetation that is designed to conform with the surrounding environment and enhance its visual appeal.
> The landscape plan shall extend to the system right-of-way, station, parking and public areas, and other areas of fixed system facilities.
> A program shall be developed, as part of the overall operating procedures for the Metro Rail System, which shall provide for the regular maintenance of landscaping owned by Metro.

The design of landscaping shall be prepared as part of the rail facilities’ detailed engineering and included in facilities contract documents. In station areas, landscaping may match the themes of the station adopted by the designer.

MRDC Section 6.6 Landscaping describes in detail the following information for Metro projects:

> Objectives of the landscape design
> Coordination of the design team and local agencies
> Design criteria including plant material that is compatible with the transit system design, maintenance, utilities operation, pedestrian design barriers, and view preservation in right of way
> Site preparation and irrigation
> Selection of plant materials including growth rate, environmental adaptability, and soil types
> Street tree selection and tree protection
> Entry plazas with planting design that encourages separation of vehicles and pedestrians
> Station/Park-and-Ride Lots including planting within parking lots and along borders
> Minimal and simplicity of planting design along Metro Rail At-Grade right of way
> Minimal maintenance requirements

BASED ON 2016 CALGREEN REQUIREMENTS
2016 CALGreen provides the following requirements for landscape irrigation:

**Section 5.304.1 Scope.** The provisions of Section 5.304, Outdoor Water Use reference the mandatory Model Water Efficiency Landscape Ordinance (MWELO) contained within Chapter 2.7, Division 2, Title 23, California Code of Regulations.

**Section 5.304.2 Outdoor water use in rehabilitated landscape projects equal to or greater than 2,500 square feet.** When water is used for outdoor irrigation for new construction projects with an aggregate landscape area equal to or greater than 500 square feet requiring a building or landscape permit, plan check or design review, one of the following shall apply:

1. A local water efficient landscape ordinance that is, based on evidence in the record, at least as effective in conserving water as the updated model ordinance adopted by the Department of Water Resources (DWR) per Government Code Section 65595 (c).

2. The California Department of Water Resources Model Water Efficient Landscape Ordinance (MWELO) commencing with Section 490 of Chapter 2.7, Division 2, Title 23, California Code of Regulations.

**Section 5.304.2.1 Outdoor potable water use.** For new water service not subject to the provisions of Water Code Section 535, separate meters or sub-meters shall be installed for indoor and outdoor potable water use for landscaped areas of at least 500 square feet but not more than 1,000 square feet (the level at which Section 5.304.2 applies).

**Section 5.304.3 Outdoor water use in rehabilitated landscape projects equal to or greater than 2,500 square feet.** Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, or design review shall comply with Section 5.304.2, Items 1 or 2.

**Section 5.304.4 Outdoor water use in landscape areas of 2,500 square feet or less.** Any project with an aggregate landscape area of 2,500 square feet or less may comply with the performance requirements of MWELO or conform to the prescriptive compliance measures contained in MWELO’s Appendix D.

**CALCULATIONS AND TOOLS FOR LANDSCAPING:**
The Contractor shall use the following prescriptive measures to assist in compliance. The following tools can be found at: http://water.ca.gov/wateruseefficiency/landscapeordinance.

> DWR’s Model Water Efficient Landscape Ordinance

> A water budget calculator

> The MWELO prescriptive compliance measure Appendix D

Section 492.4 of the Water Efficient Landscape Worksheet provides the relevant calculations for MWELO at http://water.ca.gov/wateruseefficiency/docs/MWELO09-10-09.pdf.

**REQUIRED SUPPORTING DOCUMENTATION FOR SUSTAINABILITY PLAN MONTHLY UPDATE**
The Contractor shall submit separate plans and calculations for each station or stand-alone building addressed in the approved Sustainability Plan as the following supporting documentation as part of the Sustainability Plan Monthly Update when the Landscape and Irrigation Design Sustainability Element has been defined as complete:

> Landscape plans, irrigation plans, legend, and details that comply with the local water efficient landscape ordinance or the California Department of Water Resources Model Water Efficient Landscape Ordinance (MWELO), whichever is more stringent.

> Evidence of approved building or landscape permit, plan check, or design review consistent with Section 5.304.2.

> Provide landscape plans, irrigation plans, legend, and details that comply with the performance requirements of MWELO or conform to the prescriptive compliance measures contained in MWELO’s Appendix D.

> List of the performance requirements of MWELO or the prescriptive compliance measures contained in MWELO’s Appendix D that are incorporated into the Project

**BASED ON 2016 CALGREEN REQUIREMENTS**
Sustainability Information Sheet

PLANNING AND DESIGN: LIGHT POLLUTION REDUCTION

REGULATORY REQUIREMENTS
Metro Rail Design Criteria 2.7.3, 7.13.1 through 7.13.9, and 7.13.10 (replaces 2016 CALGreen 5.106.8 which requires outdoor lighting system design “comply with a local ordinance lawfully enacted pursuant to Section 101.7, whichever is more stringent.”)

DESIGN AND INSTALLATION OF OUTDOOR LIGHTING SYSTEMS PER MRDC
Requirements:
Per Metro Rail Design Criteria 2.7.3 Light and Glare, outdoor lighting systems shall be designed and installed to comply with the following:

Lights used for construction and for operational lighting can illuminate adjacent properties in undesirable ways. Designs will follow the principle of keeping direct and reflected illumination or glare from the project from striking adjacent properties, where feasible. Design should consider least interference from these elements consistent with safe and efficient Rail System Operations.

Station plazas, parking lots, yard area and guideway lighting fixtures and standards shall incorporate directional shielding where needed, to avoid the intrusion of unwanted light and glare into adjacent sensitive land uses, such as residential.

Additionally, Metro Rail Design Criteria 7.13.1 through 7.13.9 provide requirements for normal and emergency lighting systems. Refer to MRDC 7.13.1 through 7.13.9 for detailed information.

Calculation of Outdoor Illumination Levels:
For relevant calculations, MRDC 7.13.10 states the following:

A. Calculations shall conform to the procedures and recommendations in the applicable IES publications (and their appendixes). Calculated values shall be presented on calculated illuminance/exittance summary form 7-A shown herein.

B. A computer software photometric calculations must be performed for all areas including but not limited to station public areas and egress routes train crossing, etc. to assure competent and thorough lighting design. Photometric drawings with lighting summary and calculations shall be provided.

C. Illumination levels for work areas shall be calculated at the working plane, generally a horizontal plane set at 2'-6” above the finished floor level, except that for task lighting the actual working height shall be used whenever this information is available.

D. Illumination levels for walking surfaces, egress paths and security lighting shall be calculated at the surface being illuminated, except as otherwise required by codes or regulations or as specified herein.

E. An average Light Loss Factor for use in all areas of the transit system lighting other than offices should not exceed 70%.

F. Reflectance values shall be based, whenever possible, on the actual reflectances of the proposed materials. Generally, material used shall meet the reflectance values tabulated in Tables 7.2 and 7.4 (see below). Where specific reflectances are not available, use appropriate value from IES Standard.

EXCERPT FROM TABLE 7.4 IN MRDC 7.13.10
RECOMMENDED PERCENT REFLECTANCE VALUES FOR OUTDOOR AREAS

<table>
<thead>
<tr>
<th>SURFACE</th>
<th>% REFLECTANCE VALUE (MINIMUM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ceiling</td>
<td>10</td>
</tr>
<tr>
<td>2. Wall</td>
<td>50</td>
</tr>
<tr>
<td>3. Floor</td>
<td>10</td>
</tr>
</tbody>
</table>

BASED ON 2016 CALGREEN REQUIREMENTS
Required Supporting Documentation for Sustainability Plan Monthly Update
The Contractor shall submit separate plans and calculations for each station addressed in the approved Sustainability Plan as the supporting documentation as part of the Sustainability Plan Monthly Update where the Light Pollution Sustainability Element is defined as complete:

> Photometric plans and calculations reflecting that the outdoor lighting systems shall be designed and installed to comply with the minimum requirement of:
  - The California Energy Code;
  - The Backlight, Uplight and Glare (BUG) ratings as defined in IES TM-15-11; and
  - The allowable BUG ratings not exceeding those shown in CALGreen Table 5.106.8.
Sustainability Information Sheet

WATER EFFICIENCY & CONSERVATION: METERS, SUBMETERS & METERING DEVICES

REGULATORY REQUIREMENTS
2016 CALGreen Sections 5.303.1, 5.303.1.1, and 5.303.1.2

USE OF WATER METERS, SUBMETERS AND METERING DEVICES FOR WATER CONSERVATION
2013 CALGreen states the following requirements apply to the use of separate meters, sub-meters, or metering devices for conservation of potable water. Metro projects are required to provide separate devices for building utilities, fire protection, and landscaping.

Section 5.303.1. Separate submeters or metering devices shall be installed for the uses described in Sections 5.303.1.1 and 5.303.1.2.

Section 5.303.1.1 New buildings or additions in excess of 50,000 square feet. Separate submeters or metering devices shall be installed as follows:
1. For each individual leased, rented, or other tenant spaces within the building projected to consume more than 100 gal/day (380 L/day), including, but not limited to, spaces used for laundry or cleaners, restaurant or food service, medical or dental office, laboratory, or beauty salon or barber shop.
2. Where separate submeters for individual building tenants are unfeasible, for water supplied to the following subsystems:
   a. Makeup water for cooling towers where flow through is greater than 500 gpm (30 L/s).
   b. Makeup water for evaporative coolers greater than 6 gpm (0.04 L/s).
   c. Steam and hot-water boilers with energy input more than 500,000 Btu/h (147 kW).

Section 5.303.1.2 Excess consumption. A separate submeter or metering device shall be provided for any tenant within a new building or within an addition that is projected to consume more than 1,000 gal/day.

Required Supporting Documentation for Sustainability Plan Monthly Update
The Contractor shall submit separate plans and calculations for each station addressed in the approved Sustainability Plan. The following supporting documentation shall be provided as part of the Sustainability Plan Monthly Update once the water meter, sub-meter and/or metering devices sustainability element has been defined as complete:
> Utility and landscape plans that show separate sub-meters for domestic utility services, fire services, and landscape irrigation.
> Landscape plan irrigation legend and details that show sub-meters or metering devices for the irrigation plan.

BASED ON 2016 CALGREEN REQUIREMENTS
Sustainability Information Sheet

PLANNING AND DESIGN: ON-SITE RENEWABLE ENERGY

REGULATORY REQUIREMENTS
Metro Rail Design Criteria 2.1.3.3, 2.1.3.6, and 2.10.4

2016 CALGREEN A5.211.1 AND A5.211.1
Definition of Renewable Energy Sources Per MRDC and 2016 CALGreen

Metro Rail Design Criteria Requirements:
Metro Rail Design Criteria 2.1.3.3 Codes and Standards – Metro Sustainability and Energy Policy. As it applies to this criteria, all Metro rail projects shall at a minimum:
> Aggressively pursue renewable energy sources, take advantage of rebates and subsidies for energy and water conservation, and implement energy conservation measures where they are feasible and fiscally prudent.
> Construct all new facilities and projects, including new transit corridor projects, using energy-efficiency and conservation strategies. For buildings or structures over 10,000 square feet, projects must be constructed to achieve Leadership in Energy and Environmental Design (LEED®) Silver certification, at minimum.

Metro Rail Design Criteria 2.10.4 Energy – Green or Renewable Energy. This Section states:
To the maximum extent feasible, design and specify the use of on-site non-polluting renewable technologies (such as solar, geothermal, wind, biomass and bio-gas) and/or the purchase of green or renewable energy from an accredited utility program or equivalent to contribute to the total energy requirements of the project.

2016 CALGreen Requirements:
Section A5.211.1 On-site renewable energy. Use on-site renewable energy sources such as solar, wind, geothermal, low-impact hydro, biomass and bio-gas for at least 1 percent of the electric power calculated as the product of the building service voltage and the amperage specified by the electrical service overcurrent protection device rating or 1kW (whichever greater), in addition to the electrical demand required to meet 1 percent of the natural gas and propane use. The building project's electrical service overcurrent protection device rating shall be calculated in accordance with the 2016 California Electrical Code. Natural gas or propane use is calculated in accordance with the 2016 California Plumbing Code.

Section A5.211.1.1 Documentation. Using a 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. Factor in net-metering, if offered by a local utility, on an annual basis.

EVALUATION OF POTENTIAL RENEWABLE ENERGY SOURCES:
Metro shall require, at a minimum, evaluation and comparison of renewable energy technologies that are applicable, feasible, and practicable for use in the project using the following criteria:
> Cost
> Environmental Benefit
> Land Use Efficiency
> Peaking Shaving Benefit
> Hedging Benefit
> Local Content Use

BASED ON 2016 CALGREEN REQUIREMENTS
PLANNING AND DESIGN: ON-SITE RENEWABLE ENERGY continued

METHODOLOGY FOR RENEWABLE ENERGY SCREENING:
For energy screening, Chapter 6 and Appendix E: Renewable Energy Screening Tool (REST) of Metro’s Energy Conservation and Management Plan1 shall be utilized. Chapter 6 and Appendix E provide details for assessment and list resources to be used. REST provides six categories that should be evaluated across one or more metrics that indicate how each project would perform relative to baseline utility electricity (for renewable electricity project) or natural gas (for solar water heating projects that displace natural gas).

The outcomes (e.g., cost savings or emissions reductions) for each screening factor are assigned point values to make the results comparable across each of the categories. The number of points assigned to each outcome reflects the system’s performance relative to a chosen maximum and minimum performance level.

Finally, a weighting was applied to each category’s score based on the assumed importance of that category. The starting category weights are based on the collected experience of large renewable project hosts such as Metro. Metro can adjust these values to reflect its current and future renewable program priorities. A renewable project’s weighted scores for each category are added, giving a final total score. The total score provides a measure of the project’s performance relative to an assumed maximum. An example REST summary for a renewable project is provided below. Appendix E2 shows how the Excel evaluation tool developed to support this screening process, REST, allows the user to compare the system performance metrics and weighted scores for up to 4 potential renewable energy projects side-by-side simultaneously.

Once a renewable energy technology is selected, it shall be compared with baseline energy supply for life-cycle benefits and costs to determine whether to proceed with the renewable energy technology for the project. Metro will use green power when/where available and priced competitively with other energy sources.

REQUIRED SUPPORTING DOCUMENTATION FOR SUSTAINABILITY PLAN MONTHLY UPDATE
The Contractor shall submit separate plans and calculations for each station addressed in the approved Sustainability Plan with the following supporting documentation as part of the Sustainability Plan Monthly Update where the On-site Renewable Energy Sustainability Element is defined as complete:

> Evidence that the Project will use on-site renewable energy as specified in Section A5.211.1.
> Supporting calculations to meet the requirements of A5.211.1.
> Evidence of participation in the local utility’s renewable energy portfolio program that has a minimum of 50% electrical power from renewable sources.

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1 Los Angeles County Metropolitan Transportation Authority, Energy Conservation and Management Plan, Los Angeles, September 2011.  
BASED ON 2016 CALGREEN REQUIREMENTS
Sustainability Information Sheet

MATERIAL CONSERVATION & RESOURCE EFFICIENCY: RECYCLING BY OCCUPANTS

REGULATORY REQUIREMENTS
2016 CALGreen Sections 5.410.1 and 5.10.1.1

PROVISIONS FOR RECYCLING BY OCCUPANTS
2016 CALGreen states the following related to recycling by occupants. Due to the lack of space at the Metro stations to address the on-site recycling waste storage requirements, recycling by occupants typically includes Metro buildings for employees.

Section 5.410.1 Recycling by occupants. Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of nonhazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics, organic waste, and metals or meet a lawfully enacted local recycling ordinance, if more restrictive.

Section 5.410.1.1 Additions. All additions conducted within a 12-month period under single or multiple permits, resulting in an increase of 30 percent or more in floor area, shall provide recycling areas on site.

REQUIRED SUPPORTING DOCUMENTATION FOR SUSTAINABILITY PLAN MONTHLY UPDATE
The Contractor shall submit separate plans and calculations for each station addressed in the approved Sustainability Plan with the following supporting documentation as part of the Sustainability Plan Monthly Update when the Recycling by Occupants Sustainability Element is defined as complete:

> Site plan, floor plan, and/or detail plan sheet(s) that indicate recycling areas for depositing, storage, and collection of nonhazardous materials for recycling.

> If the local ordinance is more restrictive, provide plans that document the required facilities per the requirements.

> For additions to a Project that occurs with a 12-month period, and results in an increase of 30 percent or more of floor area, provide site plan, floor plan, and/or detailed plan sheet(s) that indicate recycling areas.

BASED ON 2016 CALGREEN REQUIREMENTS
Sustainability Information Sheet

ENERGY EFFICIENCY: SOLAR POTENTIAL

REGULATORY REQUIREMENTS
Metro Rail Design Criteria 2.1.3, 2.1.3.3, 2.10.1, 2.10.4, and 2.10.6

CALCULATIONS OF SOLAR POTENTIAL

Requirements:

Metro Design Criteria 2.1.3.1 Metro Environmental Policy requires:

All Metro Rail Projects shall consider, as a minimum, the following strategies to demonstrate its commitment to planning and constructing our projects, operating and maintaining our facilities and vehicles, and procuring products and services consistent with State and Federal laws and regulations and in a manner that protects human health and the environment but not neglecting the efficient delivery of quality public transit services within our financial ability:

> Comply with all environmental, Federal, State, and local laws and regulations;
> Avoid environmental degradation by minimizing releases to air, water, and land;
> Prevent pollution and conserve resources by reducing waste, reusing materials, recycling, and preferentially procuring for environmentally-friendly products and materials;
> Ensure that the planning, design, construction, and operation of our facilities and services consider environmental protection and sustainable features; and
> Consider alternative energy solutions such as promoting and tapping renewable energy sources to address energy and environmental challenges.

Metro Design Criteria 2.1.3.3 Metro Sustainability and Energy Policy requires:

As it applies to this criteria, all Metro rail projects shall at a minimum:

> Aggressively pursue renewable energy sources, take advantage of rebates and subsidies for energy and water conservation, wherever feasible, and implement energy conservation measures where they are feasible and fiscally prudent.
> Construct all new facilities and projects, including new transit corridor projects, using energy-efficiency and conservation strategies. For buildings or structures over 10,000 square feet, projects must be constructed to achieve Leadership in Energy and Environmental Design (LEED®) Silver certification, at minimum.

Metro Design Criteria 2.10.1 Project Planning and Design requires Metro project planning and design:

To the maximum extent feasible, prepare and implement a comprehensive resource management plan for the integrated consideration of energy resources with the goal of identifying, evaluating, and optimizing its use for the project. Incorporate sustainable design measures to maximize the project’s efficient use of energy.

Metro Design Criteria 2.10.4 Green or Renewable Energy requires:

To the maximum extent feasible, design and specify the use of on-site non-polluting renewable technologies (such as solar, geothermal, wind, biomass and biogas) and/or the purchase of green or renewable energy from an accredited utility program or equivalent to contribute to the total energy requirements of the project.

Metro Design Criteria 2.10.6 Energy Conservation requires:

To the maximum extent feasible, conservation features and operating procedures shall be incorporated into the operating systems and subsystems as part of the final design activities to reduce energy consumption. Install an Energy Management System, where applicable.

BASED ON 2016 CALGREEN REQUIREMENTS
APPENDIX D

ENERGY EFFICIENCY: SOLAR POTENTIAL  continued

CALCULATION OF SOLAR POTENTIAL:
ECSD Evaluation: Solar Potential for Stations

> Prepare analysis using LA County Solar Planning Tool http://solarmap.lacounty.gov/
> Sites with “good” solar loading on-site, or on adjacent 1-2 story buildings, are considered “GOOD”.
> Metro requests that station sites considered “GOOD” to be evaluated further by Contractor in accordance with Metro Energy Policy per MRDC 2.10.4 and 2.10.6. The analysis needs to:
  – Provide the roof area of the station canopy and estimate of solar energy generating potential; and consider future development currently designed for surrounding parcels. Station canopies at “GOOD” sites are also required to be “solar ready” per the City of Los Angeles CALGreen Section 5.211.1.
> Metro requests the conclusions of the solar potential analysis be incorporated into the Comprehensive Energy Resource Management Plan required per MRCD 2.10.1. The plan should address all stations, including those not recommended for solar, and include solar maps and other supporting documentation.

REQUIRED SUPPORTING DOCUMENTATION FOR SUSTAINABILITY PLAN AND MONTHLY UPDATE:
Contractor shall submit the following supporting documentation:
> A report that summarizes the evaluation, design, and specification of the use of on-site non-polluting renewable technologies (such as solar, geothermal, wind, biomass and biogas) and/or the purchase of green or renewable energy from an accredited utility program or equivalent. Included in the report are the potential site locations and technologies based on project characteristics. The report shall indicate findings and alternatives for the project, the amount of annual electricity generation, and life-cycle costs analysis (LCCA) data. This report will demonstrate how the total energy requirements of the project as required by Metro’s Renewable Energy Policy and CALGreen.
> Contractor shall provide a report with calculations that present the alternatives and associated life-cycle cost analysis (LCCA), per Section 3.05. The LACMTA recognizes that renewable energy applications may precede energy efficiency retrofits if upfront cost and life-cycle benefits of renewable energy applications significantly outweigh those of energy efficiency retrofits.

BASED ON 2016 CALGREEN REQUIREMENTS
Sustainability Information Sheet

PLANNING AND DESIGN: STORMWATER DRAINAGE

REGULATORY REQUIREMENTS
Metro Rail Design Criteria (MRDC) 3.8
Storm drainage system design shall be in conformance with the requirements of the Agency having jurisdiction.

2016 CALGreen Section 5.106.1
Comply with a lawfully enacted stormwater management and/or erosion control ordinance.

City of Los Angeles Ordinance No. 181899 – Low Impact Development (LID) Strategies:
Many cities and counties in southern California have more stringent requirements than the above mentioned Metro Design Rail Criteria and CALGreen Measures and is therefore the governing regulation. For example, the City of Los Angeles’ Ordinance No. 181899 is more stringent. Drainage systems designs must manage and capture stormwater runoff to the maximum extent feasible through, in order of priority: infiltration, evapotranspiration, capture and use, and treatment with a high removal efficiency biofiltration/biotreatment system.

CALCULATION OF STORMWATER RUNOFF

Hydrology:
Surface hydrology and aerial construction shall be based upon standards and methods of computation used by the LA County Department of Public Works and the City of LA Bureau of Engineering Design Standards.

> Underground Sections in Earth designed to exclude groundwater and shall be based on the formula \( q = a + L \).
  (a) \( q \) = Volume of water, in gal/min
  (b) \( a \) = Horizontal projected area of all subway openings in square feet, i.e., station entrances, fan shafts, etc.
  (c) \( L \) = Linear feet of structure in the drainage system

> Underground Sections in Rock designed to collect groundwater to relieve hydrostatic pressure and shall be based on the formula \( q = a + L \).
  (d) \( q \) = Volume of water, in gal/min

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<thead>
<tr>
<th>DESIGN STORM DRAINAGE AREA</th>
<th>STORM FREQUENCY</th>
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<tr>
<td>All culverts and drainage crossing the rail system where flooding could damage system</td>
<td>50-year</td>
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<tr>
<td>Track Roadbed (to top of subballast)</td>
<td>10-year</td>
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<tr>
<td>Main storm drains</td>
<td>10-year</td>
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<tr>
<td>Parking lots</td>
<td>10-year</td>
</tr>
<tr>
<td>All longitudinal drains or subdrains that could flood the roadbed</td>
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<tr>
<td>All sump condition areas (defined as a low area which prevents the free passage of water with consequent flooding of streets of Private property)</td>
<td>50-year</td>
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<tr>
<td>All other areas</td>
<td>50-years</td>
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BASED ON 2016 CALGREEN REQUIREMENTS
RAINFALL INTENSITY:
For calculation of design flows, Rainfall Intensity (I) shall be determined using procedures outlined in the LA County Department of Public Works Hydrology Manual, where:

\[
\text{Intensity} = \frac{\text{Rain Depth}}{\text{Duration}}
\]

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<th>Storm Time (minutes)</th>
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<td>Duration (in/hr)</td>
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SURFACE DRAINAGE:
MRDC 3.8 provides specifications for the following surface drainage areas:

> Plaza Area Drainage shall have a minimum grade of 0.3 percent and a maximum grade of 2.0 percent in open plaza areas. Maximum water surface over drains shall be 1/2 inch. Maximum water velocity in plaza areas shall be 2 feet per second. Special drains shall be installed where necessary.

> Parking Lot Drainage shall have a minimum grade of 0.3 percent, and shall not run for more than 75 feet before being intercepted by a drainage structure such as a gutter or a drain. The maximum flow (flood width) in a parking area gutter shall not exceed 12 feet before being collected in a drainage system.

> Street Drainage shall be designed such that water surface remains below the top of the curb and does not flow more than 1/2 inch deep in the traveled way (the lane beginning 8 feet away from the curb face).

> Trackway Drainage shall consist of storm drainage systems along all trackways and at all yards. Yard trackwork areas shall be underlain by a minimum 6-inch layer of semi-impervious subballast and graded to a minimum slope of 24:1 to the subdrains. Open surface track and material storage areas shall be covered by an 8-inch layer of semi-impervious compactable material and shall be graded to a minimum slope of 24:1.

(a) Cleanouts shall be provided at the terminus of each subdrain. Mainholes shall be provided at maximum intervals of 300 feet on laterals and main collectors, and at junctions shall be provided on angle points greater than 10 degrees. Individual subdrain runs shall not be longer than 300 feet.

BASED ON 2016 CALGREEN REQUIREMENTS
DRAINAGE STRUCTURES
Drainage structures shall be designed in order to satisfy the conditions. The use of agency standards is permissible.

> Parking Lot Drainage Structures shall be constructed based on the standard storm drains for the jurisdiction in which the parking lot is to be constructed.

> Inlets shall be provided to intercept surface drainage. Inlets on grade shall be designed to intercept 85% or more of the design flow, while inlets in sump areas shall be designed to intercept 100% of the design flow. The amount of flow to be intercepted by individual inlets shall be determined through the procedures outlined in the Federal Highway Administration’s Hydraulic Circular No. 12 HEC-12 and HEC-22.

STORM DRAINS:
Storm drain systems may vary as the circumstances require:

> Closed Conduit drainage systems will consist of a main line with a minimum size of 24 inches and a catch basin connector pipe with a minimum size of 18 inches. Storm drains which run greater than 100 feet shall use, at a minimum, a 24 inch reinforced concrete pipe (RCP).

(a) Hydraulic design specifications are provided in the LA County Flood Control District Hydraulic Design Manual. Materials are provided in MRDC 3.8.7.2.

> Open Channel drainage systems shall be designed based on the Criteria for Hydraulic Design: Open Channels, of the LA County Flood Control District Hydraulic Design Manual.

FLOOD CONTROL:
Design of the transit system shall include an analysis of the potential for flooding near transit facilities. The analysis should consider flood sources such as storm surge river flooding, flood control channels, storm drainage systems, and surface flows. The Designer shall perform the analysis early in the design process and submit the analysis, together with recommendations for protecting the transit facilities from flooding, to Metro for approval.

BASED ON 2016 CALGREEN REQUIREMENTS
Sustainability Information Sheet

MATERIAL CONSERVATION & RESOURCE EFFICIENCY: WEATHER PROTECTION AND MOISTURE CONTROL

REGULATORY REQUIREMENTS
2016 CALGreen Sections 5.407.1, 5.407.2, 5.407.2.1, 5.407.2.2, 5.407.2.2.1, and 5.407.2.2.2

CONTROL MEASURES FOR WEATHER PROTECTION AND MOISTURE CONTROL
2016 CALGreen states the following related to weather protection and moisture control:

Section 5.407.1 Weather protection. Provide a weather-resistant exterior wall and foundation envelope as required by California Building Code, Section 1403.2 (Weather Protection) and California Energy Code, Section 150 (Mandatory Features and Devices), manufacturer’s installation instructions or local ordinance, whichever is more stringent.

Section 5.407.2 Moisture control. Employ moisture control measures by the following methods.

Section 5.407.2.1 Sprinklers. Design and maintain landscape irrigation systems to prevent irrigation spray on structures.

Section 5.407.2.2 Entries and openings. Design exterior entries and/or openings subject to foot traffic or wind-driven rain to prevent water intrusion into buildings as follows.

Section 5.407.2.2.1 Exterior door protection. Primary exterior entries shall be covered to prevent water intrusion by using nonabsorbent floor and wall finishes within at least 2 feet around and perpendicular to such openings plus at least one of the following:
1. An installed awning at least 4 feet in depth.
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.

Section 5.407.2.2.2 Flashing. Install flashings integrated with a drainage plane.

REQUIRED SUPPORTING DOCUMENTATION FOR SUSTAINABILITY PLAN MONTHLY UPDATE
The Contractor shall submit separate plans and details for each station addressed in the approved Sustainability Plan as the supporting documentation as part of the Sustainability Plan Monthly Update where the Weather Protection and Moisture Control Sustainability Element has been defined as complete:

> Building plans and details that indicate the provision of a weather-resistant exterior wall and foundation envelope.
> Landscape irrigation plans and details that show prevention of irrigation spray on Project building(s) and other methods of moisture control.
> Building plans, elevations, and details that show prevention of water intrusion into the building(s) through the entries and openings with exterior door protection and flashing.

BASED ON 2016 CALGREEN REQUIREMENTS
APPENDIX E

Local Jurisdictions – Sustainability Requirements

E-1  City of Los Angeles
E-2  County of Los Angeles
E-3  City of Beverly Hills
Local Jurisdictions – Sustainability Requirements

BEVERLY HILLS DOCUMENTS:
Beverly Hills Sustainable City Plan, February 2009
> Beverly Hills Sustainable City Plan (2009).pdf

INGLEWOOD DOCUMENTS:
Inglewood Energy and Climate Action Plan, March 2013
> Inglewood Energy and Climate Action Plan (ECAP) 2013.pdf
City of Inglewood Energy Efficiency Climate Action Plan, December 2015
Inglewood and Lennox Greening plan 2016

COUNTY OF LOS ANGELES DOCUMENTS:
CCAP Implementation Ordinances 2017 / Project No. 2017-003637-(1-5), RPPL201600293
> February 28, 2017 Draft Ordinance

CITY OF LOS ANGELES DOCUMENTS:
Sustainable City pLAn, 2015
> http://plan.lamayor.org/
South LA Green Alleys Master Plan
> http://www.lastormwater.org/green-la/south-la-green-alley-master-plan/
Green Street & Green Alleys Design Guidelines Standards

CITY OF SANTA MONICA DOCUMENTS:
Sustainable City Plan, City of Santa Monica, Updated 2014
> https://www.smgov.net/uploadedFiles/Departments/OSE/Categories/Sustainability/Sustainable-City-Plan.pdf
City of Santa Monica Urban Watershed Management Program, Working for a Cleaner Bay (user-friendly primer)
Metro Green Places Toolkit, 2016
> https://www.metro.net/interactives/greenplaces/
Metro Complete Streets Policy, 2014
First, Last Mile Strategic Plan, 2014
> http://media.metro.net/docs/First_Last_Mile_Strategic_Plan.pdf

REGIONAL DOCUMENTS:
SCAG Sustainability Program
> http://www.scag.ca.gov/programs/Pages/Programs/Sustainability.aspx
South Coast Air Quality Management Plan, 2016
California Model Water Efficient Landscape Ordinance, 2015 Update
Los Angeles Enhanced Watershed Management Plans
> https://www.waterboards.ca.gov/losangeles/water_issues/programs/stormwater/municipal/watershed_management/
## APPENDIX E

Local Jurisdictions – Sustainability Requirements

CITY OF LOS ANGELES

<table>
<thead>
<tr>
<th>ORDINANCE NO.</th>
<th>ORDINANCE EFFECTIVE DATE</th>
<th>MUNICIPAL CODE SECTION</th>
<th>SUMMARY DESCRIPTION OF ORDINANCE</th>
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<tr>
<td>No. 174706</td>
<td>September 1, 2002</td>
<td>Sections 66.32 through 66.32.8</td>
<td>Added Sections 66.32 through 66.32.8 to the Los Angeles Municipal Code related to the collection of solid waste and the imposition of certain Assembly Bill (AB) 939 compliance fees on private waste haulers. In order to meet AB 939 diversion goals and the City of Los Angeles goal of 70% by the year 2020, private waste haulers are required to register with the City and display a permit decal and number issued by the City through the Department of Public Works, Bureau of Sanitation. Based on gross receipts of solid waste collected, private waste haulers are required to pay an AB 939 compliance fee. This program is intended to maintain an open and competitive market for all companies providing solid waste and disposal services in the City.</td>
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<tr>
<td>No. 181480</td>
<td>December 27, 2010</td>
<td>Article 9, Chapter IX</td>
<td>Added Article 9 to Chapter IX of the Los Angeles Municipal Code to incorporate various provisions of the 2010 California Green Building Standards Code (CALGreen Code). This addition, known as the Los Angeles Green Building Code, adopts by reference the CALGreen Code except as further amended by the Ordinance in Article 9. Article 9 was further amended by Ordinance No. 182849 on January 1, 2014 by incorporating portions of the 2013 Edition of the CALGreen Code as summarized below.</td>
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<tr>
<td>No. 181519</td>
<td>February 12, 2011</td>
<td>Article 6, Chapter VI</td>
<td>Amended Article 6 of Chapter VI of the Los Angeles Municipal Code to require that construction and demolition waste be taken to a certified construction and demolition waste processing facility. The ordinance addresses the requirement for solid waste haulers, contractors, and recyclers to register to obtain a permit to assist the City to reach the Assembly Bill 939 and City of Los Angeles goal of a total of 70% diversion by the year 2013. Article 6 was further amended by Ordinance No. 182986</td>
</tr>
<tr>
<td>No. 181899</td>
<td>October 14, 2011</td>
<td>Article 4.4, Chapter VI</td>
<td>Amended Article 4.4 of Chapter VI of the Los Angeles Municipal Code to expand the applicability of the existing Standard Urban Stormwater Mitigation Plan (SUSMP) requirements by imposing rainwater Low Impact Development (LID) strategies on projects that require building permits. Further amends Article 1 of Chapter IX of the Municipal Code to collect fees to recover Bureau of Sanitation costs of administering provisions of the ordinance. The purpose of the ordinance includes rainwater harvesting and stormwater runoff management, water conversation, and recycled water reuse and grey water use, which are key elements of the City’s “Water Supply Action Plan” and essential to ensuring sustainable development.</td>
</tr>
<tr>
<td>No. 182386</td>
<td>March 13, 2013</td>
<td>Sections 12.03, 12.21, and 12.21.1</td>
<td>Amended Sections 12.03, 12.21, and 12.21.1 of the Los Angeles Municipal Code to extend bicycle parking requirements to some multi-family residential developments; to increase the levels of bicycle parking required under the current code for new developments and additions to commercial, institutional, and industrial uses; to expand bicycle parking requirements to include commercial, industrial, and manufacturing uses of less than 10,000 square feet; to define acceptable locations for bicycle parking; to require that both short-term and long-term bicycle parking be provided; to improve design standards; to amend the amount of bicycle parking that may be substituted for automobile parking; and to provide rules for the installation of bicycle parking within the public right-of-way by private businesses.</td>
</tr>
<tr>
<td>No. 182514</td>
<td>June 3, 2013</td>
<td>Section 85.04, Chapter VIII</td>
<td>Amended Section 85.04 of Chapter VIII of the Los Angeles Municipal Code to authorize the Department of Transportation to establish bicycle infrastructure zones to provide facilities for the parking of bicycles and amenities for a bikeshare operation on public streets. This includes the set aside of space in the public right-of-way for the use of the parking or sharing of bicycles, provided that the installation of such accommodates pedestrians and complies with the Americans with Disabilities Act (ADA).</td>
</tr>
<tr>
<td>No. 182849</td>
<td>January 1, 2014</td>
<td>Amended Article 9, Chapter IX</td>
<td>Amended certain provisions of Article 9 of Chapter IX of the Los Angeles Municipal Code to reflect local administrative changes and incorporate by reference portions of the 2013 edition of the California Green Building Standards Code (CALGreen Code). The ordinance includes Table A5.602 that provides a checklist for nonresidential buildings and reflects mandatory and voluntary (with Tiers 1 and 2) CALGreen Code commitments.</td>
</tr>
<tr>
<td>ORDINANCE NO.</td>
<td>ORDINANCE EFFECTIVE DATE</td>
<td>MUNICIPAL CODE SECTION</td>
<td>SUMMARY DESCRIPTION OF ORDINANCE</td>
</tr>
<tr>
<td>--------------</td>
<td>--------------------------</td>
<td>------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>No. 182986</td>
<td>May 28, 2014</td>
<td>Article 6, Chapter VI</td>
<td>Retitled and amended Article 6 of Chapter VI of the Los Angeles Municipal Code relating to solid waste from commercial uses and multi-family dwellings. The ordinance addresses: solid waste services, collection, and container specifications; solid waste services required; solid waste disposal facility franchises or contracts, operation, franchise fees and provisions; and proof of solid waste collection service. In order to meet the diversion goals of AB 939 and the City of Los Angeles, which is Zero Waste by 2025, solid waste haulers, contractors, and recyclers are required to register with the City to obtain an AB 939 Compliance Permit. The ordinance also discusses the City’s “RENEW LA Plan” in which the City commits to reaching Zero Waste by diverting 70% of the solid waste generated in the City by 2013, diverting 90% by 2025, and becoming a Zero Waste City by 2030. Further, the ordinance defines the exclusive, competitive franchise system for collection, transportation, and processing of commercial and multi-family solid waste to aid the City in meeting its diversion goals.</td>
</tr>
<tr>
<td>No. 183833</td>
<td>October 3, 2015</td>
<td>Article 4.4, Chapter VI</td>
<td>Amends Article 4.4 of Chapter VI of the Los Angeles Municipal Code, entitled “Stormwater and Urban Runoff Pollution Control,” to meet the requirements of the Municipal Separate Storm Sewer (MS4) Permit and to make the Article consistent with other existing ordinances. The Watershed Protection Program (Stormwater Program) for the City of Los Angeles is managed by the Bureau of Sanitation along with all City Flood Protection and Pollution Abatement (Water Quality) Programs including regulatory compliance, implementation, operations, reporting, and funding. The Article, as amended, provides requirements and prohibitions for discharges and places of discharge into the storm drain system and receiving waters necessary to adequately enforce and administer all federal and state laws, legal standards, orders, and/or special orders that provide for the protection, enhancement, and restoration of water quality.</td>
</tr>
<tr>
<td>No. 184248</td>
<td>June 6, 2016</td>
<td>Articles 4 and 9, Chapter IX</td>
<td>Amended certain provisions of Articles 4 and 9 of Chapter IX of the Los Angeles Municipal Code to establish citywide water efficiency standards and require water-saving systems and technologies in buildings and landscapes to conserve water and reduce water usage. The ordinance addresses many sustainability commitments including indoor and outdoor water use and water reuse systems (grey water and recycled water in fixtures).</td>
</tr>
<tr>
<td>No. 184250</td>
<td>May 3, 2016</td>
<td>Article 1, Chapter XII</td>
<td>Amended Article I of Chapter XII of the Los Angeles Municipal Code to clarify prohibited uses and modify certain water conservations requirements of the Water Conservation Plan adopted in 1990 for the the City of Los Angeles. Because of the conditions in the City of Los Angeles, in areas in the State of California, and elsewhere from which the City obtains its water supplies, it is required that the available water resources be put to the maximum beneficial use and that waste and unreasonable use of water be prevented. The Amended Article, known as The Emergency Water Conservation Plan, provides provision to significantly reduce the consumption of water during an extended period of time through the implementation of mandatory water conservation phases.</td>
</tr>
</tbody>
</table>

Source: City of Los Angeles, City Clerk, https://cityclerkconnect/index, October 2106.
# Local Jurisdictions – Sustainability Requirements

## COUNTY OF LOS ANGELES

<table>
<thead>
<tr>
<th>ORDINANCE NO.</th>
<th>ORDINANCE EFFECTIVE DATE</th>
<th>MUNICIPAL CODE SECTION</th>
<th>SUMMARY DESCRIPTION OF ORDINANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ord. 2016-0058 (2016)</td>
<td>January 1, 2017</td>
<td>Title 31 California Green Building Code, Chapter 2 through 8, Appendix A4 and Appendix A5</td>
<td>Adopted the California Green Building Standards Code 2016. Major amendments and changes include: In Section 4, added language to Section 301.1 - 301.3 to include construction of low and high-rise structures. Language was also added to Section 301.3 to include Nonresidential buildings greater than or equal to 25,000 square feet. In addition to the requirements of Section 301.4, any newly constructed nonresidential building greater than or equal to 25,000 square feet, shall comply with Section A5.601.2.4 Tier 1. High-rise residential buildings of seven stories or greater shall comply with Table A4.106.5.7 in lieu of Table A5.106.11.2.2. In Section 7, added Section 5.106.2 Low Impact development (LID) that states: New development or alterations to existing developed sites shall comply with Chapter 12.84 of Title 12 of the Los Angeles County Code. In Section 9, amended Section 5.408 Construction Waste Reduction, Disposal and Recycling to include 5.408.1 Construction waste management which states: Newly-constructed projects and additions and alterations to existing buildings shall recycle and/or salvage for reuse a minimum of 65 percent of the non-hazardous construction and demolition debris or meet local construction and demolition waste management ordinance, whichever is more stringent. Calculate the amount of materials diverted by weight or by the volume, but not by both. The Los Angeles County Code also removed language for 5.408.1.1 through 5.408.3.</td>
</tr>
<tr>
<td>Ord. 2016-0054</td>
<td>January 1, 2017</td>
<td>Title 27, Electrical Code</td>
<td>The provisions of the Los Angeles County Electrical Code shall apply to the installation of electrical systems, including but not limited to, alteration, repair, replacement, equipment, appliances, fixtures and appurtenances.</td>
</tr>
<tr>
<td>Ord. 2016-0055</td>
<td>January 1, 2017</td>
<td>Title 28, Plumbing Code</td>
<td>The provisions of the Los Angeles County Plumbing Code shall apply to the installation, alteration, repair, and replacement of plumbing systems, including equipment, appliances, fittings, and appurtenances to a water or sewage system.</td>
</tr>
<tr>
<td>Ord. 2016-0056</td>
<td>January 1, 2017</td>
<td>Title 29, Mechanical Code</td>
<td>The provisions of the Los Angeles Mechanical Code shall apply to the installation, alteration, repair, and replacement of mechanical systems, including equipment, appliances, fixtures and or appurtenances including ventilating, heating, cooling, air conditioning, and refrigeration systems, incinerators, and other energy related systems.</td>
</tr>
<tr>
<td>Ord. 2016-0059</td>
<td>January 1, 2017</td>
<td>Title 33, Building Code</td>
<td>The provisions of the Los Angeles County Building Code, as applicable, shall apply to the construction, alteration, enlargement, repair, use and occupancy, location, maintenance, removal, and demolition of every structure or any appurtenances connected or attached to such buildings or structures.</td>
</tr>
<tr>
<td>Ord. 2013-0001</td>
<td>2013</td>
<td>Title 22, Division 1, Chapter 22, 22.52.1225</td>
<td>Bicycle requirements.</td>
</tr>
<tr>
<td>Currently being Drafted</td>
<td></td>
<td>Draft Title 22, Cool Roof Ordinance</td>
<td>Currently under development. Estimated to go into effect January 2018.</td>
</tr>
</tbody>
</table>

Source: County of Los Angeles, August 2017 and EW Consulting August 2017.
Local Jurisdictions – Sustainability Requirements

CITY OF BEVERLY HILLS

<table>
<thead>
<tr>
<th>ORDINANCE NO.</th>
<th>ORDINANCE EFFECTIVE DATE</th>
<th>MUNICIPAL CODE SECTION</th>
<th>SUMMARY DESCRIPTION OF ORDINANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ord. 16-0-2719</td>
<td>January 20, 2017</td>
<td>Article 11, 9-1-1101, 9-1-11-2</td>
<td>Adopted the California Green Building Standards Code 2016. Amendments and changes included: City of Beverly Hills added Section 102.1.1 that requires electronic documents submittal. Section 202 was revised to add Sustainability definition. Table 5.106.5.3.3 also amended to increases the number of required cars from 0 to 1 for 0-9 parking spaces. The City of Beverly Hills also added Section 5.106.11 Prewiring for Future Solar and 5.106.12 Off-Grid Prewiring For Future Solar. Other amended new sections include Section 5.304.7 Metering Outdoor Water Use and Section 5.305 Water Systems (including 5.305.1 Cooling Towers, 5.305.1.1 Existing Buildings, and 5.305.1.2 New Buildings).</td>
</tr>
<tr>
<td>Ord. 93-0-2164</td>
<td>March 19, 1993</td>
<td>Article 3, 10-7-301</td>
<td>Provides Transportation Demand and Trip Reduction measures that includes bicycle requirements.</td>
</tr>
</tbody>
</table>

APPENDIX F

Contractor’s Monthly Submittal Forms

F-1  Monthly Submittal Review Form

F-2  Monthly Sustainability Plan Element Checklist
## Contractor's Monthly Submittal Forms

### MONTHLY SUBMITTAL REVIEW FORM

| REVIEWER: | Metro PM |
| CONTRACT NO.: | |
| CONTRACTOR SUB NO.: | |
| TECHNICAL DISCIPLINE: | Sustainability/Environmental |
| METRO SUB NO.: | |
| % DESIGN STAGE: | 10% |
| TITLE: | Sustainability Plan Progress Update - June 2017 |
| DATE: | 6/30/17 |

**Initial Response Code:**
1. Incorporation Planned Next Submittal
2. Discussion/Clarification
3. Not Applicable
4. Input/Direction Req'd from Others

**CRM Response Code:**
1. Incorporation Planned Next Submittal
3. Not Applicable
4. Input/Direction Req'd from Others
5. Under separate submittal

***Critical-Place a CI (Critical in the Crit. Column). This comment may have a significant cost impact.***

---

### SUBMITTAL DOCUMENTS

|-----------------------------|-----------------------------------------------|---------|----------------------|----------|

---

### Actions/Response

**CRM Response Code:**
1. Incorporation Planned Next Submittal
3. Not Applicable
4. Input/Direction Req'd from Others
5. Under separate submittal

**Status Code:**
- C - Complete
- R - Resolved
- U - Unresolved

**Status Date:**

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### Additional Notes

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**SUSTAINABILITY PLAN MONTHLY UPDATE CHECKLIST**

*Purpose* – When the Monthly sustainability documents are submitted, this form alerts the Metro reviewers the sustainable components that were addressed that month; what phase the sustainable component was addressed; and whether the sustainable element is complete.

**Project Name:**
**Submittal Month (Month and Year):**
**Preparer:**

| Item No. | Code or other Requirement Number (i.e. MRDC, CalGreen, City Ordinance, etc.) | Sustainability Element – Short Description | Metro Requirement | Exceeds Requirements | Element Completed or Completed (Date Reported) | Documentation Phase - Design-D, Construction-C, Owner-O | Not Applicable |
|----------|-----------------------------------------------------------------------------|________________________________|-------------------|----------------------|-----------------------------------------------|-----------------------------------------------------|---------------|
|          | Planning and Design                                                         |                                         |                   |                      |                                               |                                                     |               |
|          |                                                                             |                                         |                   |                      |                                               |                                                     |               |
|          |                                                                             |                                         |                   |                      |                                               |                                                     |               |
|          |                                                                             |                                         |                   |                      |                                               |                                                     |               |
|          | Energy Efficiency                                                            |                                         |                   |                      |                                               |                                                     |               |
|          |                                                                             |                                         |                   |                      |                                               |                                                     |               |
|          |                                                                             |                                         |                   |                      |                                               |                                                     |               |
|          |                                                                             |                                         |                   |                      |                                               |                                                     |               |
|          | Water Efficiency and Conservation                                            |                                         |                   |                      |                                               |                                                     |               |
|          |                                                                             |                                         |                   |                      |                                               |                                                     |               |
|          |                                                                             |                                         |                   |                      |                                               |                                                     |               |
|          |                                                                             |                                         |                   |                      |                                               |                                                     |               |
|          | Material Conservation and Resource Efficiency                                |                                         |                   |                      |                                               |                                                     |               |
|          |                                                                             |                                         |                   |                      |                                               |                                                     |               |
|          |                                                                             |                                         |                   |                      |                                               |                                                     |               |
|          |                                                                             |                                         |                   |                      |                                               |                                                     |               |
|          | Environmental Quality                                                        |                                         |                   |                      |                                               |                                                     |               |
APPENDIX G

Annual Reporting to Metro Executive Board

G-1 Annual Report Card

G-2 Contractor’s Self Reporting of Achievements
APPENDIX G

Annual Reporting to Metro Executive Board

ANNUAL REPORT CARD

TO Metro Design Build (D/B) Team
FROM Rick Clark, Metro Program Management
          Cris Liban, Metro Environmental Compliance and Sustainability Section
RE: Sustainability Plan Annual Board Report Data Request
DATE March 24, 2017

PURPOSE
The purpose of this data request is to collect information for each project related to sustainable activities, as defined by Specification 01 35 63. In addition, Metro would like to know if the D/B team has gone above and beyond the CalGreen requirements, local ordinances, and/or their Sustainability Plan commitments. This information will be included in a Board Update this Spring. Below is the information being requested of each team:

I. TOP FIVE SUSTAINABLE ACTIVITIES COMPLETED THIS YEAR
   Please provide details of and/or describe the top five sustainable activities completed by your D/B team for the 2016 year. Indicate why each effort is of significance and a notable accomplishment. Of particular interest are those activities that exceeded contract requirements, which include MRDC and CalGreen requirements. Please submit this information under separate cover.
   1. 
   2. 
   3. 
   4. 
   5. 

II. RENEWABLE ENERGY
   Under separate cover, please provide a description and/or results of the renewable energy analysis. Please indicate what type of renewable energy is planned for the project.

III. CALGREEN COMPLIANCE REPORT CARD
   Attached is a blank CalGreen Report Card that was completed for each project last year. Please work with your ENV PM using last year’s information as a starting point to minimize your effort. If your project is new, your ENV PM will be able to assist in data compilation and input for reporting.

IV. QUANTIFICATION OF SUSTAINABLE EFFORTS
   Please summarize the following with metrics for your project:
   > Number of bicycle spaces. Please include the number of lockers in addition to the spaces ______
   > Alternative Vehicle spaces ______
   > Number of Community meetings related to the project ______
   > Expected project energy consumption savings due to energy efficient design # (kWh) ______
   > Construction site energy savings due to efficient construction activities # (kWh) ______
   > Potable Water demand # (gallons) ______
   > Quantity of recycled water used during construction # (gallons) ______
   > Quantity of dewatered water used during construction. # (gallons) ______
   > Quantity of construction waste diverted from typical landfill # (tons) ______
   > Quantity of construction waste reused or re-purposed # (tons) ______

Please provide these items to your ENV PM by April 14th, 2017 and feel free to contact the Cumming team via your Environmental PM regarding any question on these metrics and/or the CalGreen Report Card.
### APPENDIX G

**Annual Reporting to Metro Executive Board**

**CONTRACTOR’S SELF REPORTING OF ACHIEVEMENTS**

<table>
<thead>
<tr>
<th>CAPITAL PROJECT</th>
<th>PROJECT STATUS [12/31/16]</th>
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</thead>
<tbody>
<tr>
<td>RCC</td>
<td>100 % Design 20 % Construction</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>COMMITMENT</th>
<th>CODE / REFERENCE</th>
<th>CALCAGREEN YEAR</th>
<th>STATE MANDATORY OR VOLUNTARY</th>
<th>LOCAL MANDATORY OR VOLUNTARY</th>
<th>LOCAL MANDATORY OR VOLUNTARY</th>
<th>PROJECT SUSTAINABILITY PLAN COMMITMENTS</th>
<th>COMMENTS</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Community Connectivity</td>
<td>CalGreen A5.103.1</td>
<td>2010 &amp; 2013</td>
<td>V</td>
<td>V</td>
<td>OT</td>
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<tr>
<td>2</td>
<td>Brownfield or Greyfield Redevelopment or Infill</td>
<td>CalGreen A5.103.2</td>
<td>2010 &amp; 2013</td>
<td>V</td>
<td>V</td>
<td>OT</td>
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<td>3</td>
<td>Brownfield Redevelopment</td>
<td>CalGreen A5.103.2.1</td>
<td>2010 &amp; 2013</td>
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<td>4</td>
<td>Reduce Footprint and Optimize Open Space</td>
<td>CalGreen A5.104.1</td>
<td>2010 &amp; 2013</td>
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<td>5</td>
<td>Local Zoning Requirement In Place</td>
<td>CalGreen A5.104.1.1</td>
<td>2010 &amp; 2013</td>
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<td>V</td>
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<td>No Local Zoning Requirement In Place</td>
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<td>2010 &amp; 2013</td>
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<td>No Open Space Required</td>
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<td>2010 &amp; 2013</td>
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<td>8</td>
<td>Deconstruction and Reuse of Existing Structures</td>
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<td>2010 &amp; 2013</td>
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<td>9</td>
<td>Existing Building Structure</td>
<td>CalGreen A5.104.1.5</td>
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<td>Existing Nonstructural Elements</td>
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<td>2010 &amp; 2013</td>
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<td>Storm Water Pollution Prevention</td>
<td>CalGreen 5.105.1</td>
<td>2010 &amp; 2013</td>
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<td>Storm Water Design</td>
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<td>Storm Water Runoff Rate and Quantity</td>
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<td>FA</td>
<td>Negotiations ongoing with BOS - specifically for public ROW</td>
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<td>Bicycle Parking and Charging Rooms</td>
<td>CalGreen 5.106.4</td>
<td>2010</td>
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<td>Short-Term Bicycle Parking</td>
<td>CalGreen 5.106.4.1</td>
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<td>Charging Rooms</td>
<td>CalGreen 5.106.4.5</td>
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<td>26</td>
<td>Designated Parking for Fuel-Efficient Vehicles</td>
<td>CalGreen A5.106.5.1</td>
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<td>27</td>
<td>Tier 1 10% of Spaces</td>
<td>CalGreen A5.106.5.1.1</td>
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<td>Tier 2 15% of Spaces</td>
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<td>29</td>
<td>Designated Parking - Low Emission, Fuel Efficient, Car and Van Pool</td>
<td>CalGreen A5.106.5.2</td>
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<td>Parking Stall Marking</td>
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<td>Electric Vehicle (EV) Charging</td>
<td>CalGreen 5.106.5.3</td>
<td>2015</td>
<td>M</td>
<td>M</td>
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<td>No vehicle parking</td>
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<td>32</td>
<td>Single Charging Space Requirements</td>
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### APPENDIX G

**CONTRACTOR’S SELF REPORTING OF ACHIEVEMENTS continued**

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#### ENERGY EFFICIENCY

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**WATER EFFICIENCY AND CONSERVATION**

| 98         | Meters - Indoor Water Use Separate Meters | CalGreen 5.305.1 | 2010 & 2013 | M | M | C | N/A | Designed per MRDC standards |
| 99         | New Buildings > 50,000 SF | CalGreen 5.305.1 | 2010 & 2013 | M | M | C | N/A | Transit stations do not classify as a commercial building |
| 100        | Each Space Consuming > 100 GPD | CalGreen 5.305.1 | 2010 & 2013 | M | M | C | N/A | Transit stations do not classify as a commercial building |
| 101        | Cooling Towers > 500 gpm | CalGreen 5.305.1 | 2010 & 2013 | M | M | C | N/A | No cooling towers |
| 102        | Evaporative Coolers > 6 gpm | CalGreen 5.305.1 | 2010 & 2013 | M | M | C | N/A | No coolers |
| 103        | Boilers with > 5000 Btu/hr | CalGreen 5.305.1 | 2010 & 2013 | M | M | C | N/A | No boilers |
| 104        | Excess Consumption - Additions > 1,000 GPD | CalGreen 5.305.2 | 2010 & 2013 | M | M | C | N/A | Transit stations do not classify as a commercial building |
| 105        | 20% Savings | CalGreen 5.305.3 | 2010 | M | M | C | N/A | Transit stations do not classify as a commercial building |
| 106        | Multiple Showerheads Serving One Shower | CalGreen 5.305.4 | 2010 & 2013 | M | M | C | N/A | No showerheads |
| 107        | Tier 1: 30% Water Savings | CalGreen A5.302.2 | 2010 | V | V | C | N/A | No showerheads |
| 108        | Tier 2: 35% Water Savings | CalGreen A5.302.3 | 2010 | V | V | C | N/A | No showerheads |
| 109        | 40% Water Savings | CalGreen A5.302.4 | 2010 | V | V | C | N/A | No showerheads |
| 110        | Water Reduction | CalGreen A5.305.5 | 2010 | V | V | C | N/A | No showerheads |
| 111        | Areas of Additions and Alteration | CalGreen A5.305.6 | 2010 | V | V | C | N/A | No showerheads |
| 112        | Tier 1: 10% Savings | CalGreen A5.302.3 | 2010 | V | V | C | N/A | Transit stations do not classify as a commercial building |
| 113        | Tier 2: 20% Savings | CalGreen A5.302.4 | 2010 | V | V | C | N/A | Transit stations do not classify as a commercial building |
| 114        | 25% Savings | CalGreen A5.302.5 | 2010 | V | V | C | N/A | Transit stations do not classify as a commercial building |
| 115        | Nonpotable Water Systems for Indoor Use | CalGreen A5.302.6 | 2010 | V | V | C | N/A | Designed per MRDC standards |
### CONTRACTOR’S SELF REPORTING OF ACHIEVEMENTS

**APPENDIX G**

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**MATERIAL CONSERVATION AND RESOURCE EFFICIENCY**

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### Environmental Quality

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### CONTRACTOR’S SELF REPORTING OF ACHIEVEMENTS

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### MANDATORY STATE

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City of Los Angeles Ordinance No. 182480 incorporated provisions of the 2010 California Green Building Standards Code (CalGreen) as Article 9, Chapter IX of the Municipal Code (LAMC). Ordinance No. 182489 amended Article 9 to incorporate the updated provisions of the 2013 CalGreen into the LAMC.

Provide applicable CalGreen requirements for the other jurisdictions where the Crenshaw/LAX project will occur.