The CALGreen Companion Guide for LEED® Projects

Recommendations for Documenting & Verifying CALGreen Non-Residential Mandatory Measures on LEED Projects

GREEN BUILDING
in Alameda County

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This Companion Guide was developed by Green Building in Alameda County, a program of StopWaste.Org, and is intended to support green building policy implementation in Alameda County. StopWaste.Org is the Alameda County Waste Management Authority and Alameda County Source Reduction & Recycling Board acting as one public agency in Alameda County, California.
www.BuildGreenNow.org

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REFERENCED DOCUMENTS

The Companion Guide is based on the following documents which were the most current as of publication:

- *CALGreen Code: 2010 California Green Building Standards Code*, California Code of Regulations, Title 24, Part 11, California Building Standards Commission, Effective Date: January 1, 2011.
- *Guide to the (Non-Residential) California Green Building Standards Code*, An educational publication by the California Building Standards Commission, Second Edition, Issued November 2010, updated 12-16-2010.
- *LEED for New Construction 2009 Rating System,* LEED Version 3, 2009.
- *LEED 2009 Green Building Design & Construction Reference Guide*.
- *LEED-Online Forms,* LEED Version 3 update, 2009.
- *Bay-Friendly Landscape Guidelines & Rating System*, www.Bay-Friendly.org, January 2008, Third Edition.

This document is intended to be a starting point. For further information, visit the following websites.
CALGreen www.bsc.ca.gov/CALGreen | LEED www.usgbc.org | LEED Online www.leedonline.com

Contents

Introducing the CALGreen Companion Guide for LEED Projects

This Companion Guide provides recommendations for reducing the documentation burden on Leadership in Energy & Environmental Design for New Construction (LEED-NC) commercial projects that must meet the California Green Building Standards Code (CALGreen) non-residential mandatory provisions. This Companion Guide does not address the voluntary "Tiers" in CALGreen, nor does it address residential CALGreen mandatory code requirements. The Companion Guide is not affiliated or endorsed by the California Building Standards Commission or the U.S. Green Building Council. It was developed with advice from expert practitioners of LEED, local building officials, and green building advocates in the Bay Area.

Many jurisdictions have amended CALGreen to include more stringent local requirements which will impact the use of this Guide on specific projects, such as construction waste recycling thresholds, storm water pollution control practices, or energy efficiency goals. Check with the appropriate local agencies for amendments to CALGreen and other related code requirements.

Purpose of this Companion Guide

The intent of this Companion Guide is to provide an alternative compliance pathway using LEED documentation submittals as a way to verify CALGreen compliance. While there are some similar green building practices found in both CALGreen mandatory provisions and LEED, the requirements for documenting and verifying those measures differ. These differences can lead to redundant documentation when demonstrating that identical or similar green building measures have been implemented, increasing documentation costs for design teams.

On the enforcement side, building and planning departments reviewing and verifying CALGreen measures can utilize the substantial documentation resources available on LEED projects to help reduce review time and streamline the inspection process. Since LEED is a third-party rating system with oversight from an expert certification body (The Green Building Certification Institute, a separate but associated non-profit from the U.S. Green Building Council which developed LEED), projects achieving LEED certification have strong documentation and verification procedures that can be relied upon by local jurisdictions during CALGreen enforcement.

This Companion Guide is intended to accompany the CALGreen Code document (Title 24, Part 11 of the California Building Standards Code) and the *Guide to the (Non-Residential) California Green Building Standards Code*, an educational publication by the California Building Standards Commission. Both of these documents are referenced throughout this Companion Guide and can be found online at www.bsc.ca.gov/CALGreen.

This unofficial document contains guidelines and recommendations only. Check with your local building department for further clarification and instructions on utilizing LEED documentation submittals to verify CALGreen compliance.

The LEED® Rating System

The Leadership in Energy & Environmental Design (LEED®) rating system, developed by the U.S. Green Building Council (USGBC), is the most sought after non-residential green building certification system in the country. Much of LEED's success relies on its set of rigorous environmental standards which were developed through a consensus-based process and have evolved over more than a decade of use. Because of its reputation and integrity, the LEED rating system provides a consistent definition and meaningful label for green building leadership across America.

The LEED rating systems address multiple building industry sectors: new and existing commercial, institutional, and residential buildings. All LEED rating systems are organized around five main environmental categories: Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials & Resources, and Indoor Environmental Quality. There are also two categories of bonus points: Innovation in Design, for measures not covered under the first five categories or for exemplary performance beyond the typical LEED credits; and Regional Priority credits.

Within LEED, project teams must satisfy a set number of required practices, or prerequisites, in order to be eligible for certification. Additionally, teams must pick-and-choose from a host of optional credits in order to meet point thresholds that equate to certification levels. There are a maximum of 110 points possible for any project: 100 from the 5 main credit categories, and up to ten Innovation and Regional Priority bonus points. For LEED for Building Design and Construction (BD&C), which includes New Construction, certifications are awarded according to the following scale:

Certification Levels in LEED

LEED Certification Level	Point Threshold
Certified	40-49 points
Silver	50-59 points
Gold	60-79 points
Platinum	80 points +

Design & Construction Phase Credits

When submitting projects for certification, design teams have the option of submitting a portion of their credits during the design phase and the balance after construction is complete. Teams can also choose to submit all credits at once upon completion of the project and documentation of the LEED credits. Regardless of the delivery option selected, projects are submitted to the Green Building Certification Institute (GBCI) for certification. Teams may desire to submit LEED documentation in phases (design and construction) in order to get an interim point total before going into construction. This can help focus documentation efforts during the construction phase, or ensure that design team members who have little or no role during construction are given the chance to complete their submittal requirements within their normal scope of work (as opposed to circling-back later after construction if there are questions about the LEED credit). Finally, in jurisdictions that

mandate LEED certification on projects, the design-phase credit can provide confidence that projects are on-track to meet the LEED policy requirements.

This Companion Guide uses the terminology of [Design] and [Construction] to distinguish between Design and Construction phase credits.

> ***Note for enforcement officials:***
> *The use of Design-phase credits to document LEED compliance can be helpful when relying on LEED submittals to verify CALGreen measures. If a Design phase credit has been submitted to GBCI and approved, then unless something changes during construction, the measure is considered reviewed and approved in the LEED rating system. This assumption can add confidence when reviewing LEED documentation that is used to show compliance on CALGreen measures.*

LEED Terminology

In this Companion Guide, the LEED credit categories and point/credit structures are often abbreviated, as shown below in some examples:

- Sustainable Sites Credit 4.3: Low Emitting & Fuel Efficient Vehicles: **SSc4.3 [Design]**
- Energy and Atmosphere Prerequisite 2: Minimum Energy Performance: **EAp2 [Design]**
- Materials and Resources Credit 2: Construction Waste Management: **MRc2 [Construction]**

LEED Online Version 3 (LOv3)

LEED is developed by the USGBC and is verified and administrated by the Green Building Certification Institute (GBCI). Projects must register with the GBCI in order to have their project eligible for review and certification in LEED. The registration and application phase for any project seeking LEED certification is administered through a web-based portal called "LEED Online." For LEED 2009 projects, which this Companion Guide is meant to address, certification is submitted via LEED Online Version 3 (LOv3).

LOv3 allows project teams to register projects, submit documentation for review, perform project management tasks among team members, ask questions of LEED reviewers, and track progress toward certification. At the center of LOv3 are the LEED Online "Forms." These Forms provide a framework by which credits in LEED are documented, calculated, and submitted for calculation. LOv3 Forms are edited by project teams and saved as Adobe PDFs.

This Companion Guide includes many examples and references to LEED Online Forms for use in complying with CALGreen. For more information on LEED Online, visit www.LEEDOnline.com.

LEED Resources

To learn more about the LEED Rating System and certification, points, prerequisites, and requirements for certification, visit www.usgbc.org and www.gbci.org.

To attend classes locally, visit the USGBC-Northern California Chapter's website: www.usgbc-ncc.org.

For in-depth coverage of LEED credits, sample specifications and documentation, and access to LEED industry experts, check out the fee-based website www.LEEDuser.com. LEEDuser is maintained by Building Green, LLC, publishers of the exceptional journal, *Environmental Building News*. www.BuildingGreen.com.

CALGreen: The First Statewide Green Code in America

Early in 2010, the California Building Standards Commission (CBSC) and the Department of Housing and Community Development (HCD) finalized the first statewide mandatory green building code in the country for newly constructed buildings: Title 24, Part 11 of the California Building Standards Code (commonly called "CALGreen"). In developing CALGreen, CBSC and HCD have taken a bold step by significantly raising the minimum environmental standards for construction of new buildings in California. Mandatory provisions in CALGreen will contribute to public health through fundamental green building practices which reduce the use of VOC emitting materials, strengthen water conservation, require construction waste recycling, and extend storm water pollution prevention efforts to most jobsites.

The Division of the State Architect (DSA) and the Office of Statewide Health Planning and Development (OSHPD) have both also adopted CALGreen which means schools and hospitals are also included. See the DSA & OSHPD specific requirements in the full CALGreen code document.
www.bsc.gov/calgreen

CALGreen non-residential mandatory requirements are found in Chapter 5 of Title 24, Part 11. Many of these requirements will entail new review and inspection procedures for planning and building departments in California. Jurisdictions with green building expertise will find most of the mandatory provisions in CALGreen similar to those found in LEED or other green rating systems. Those department staff with familiarity in LEED will be at an advantage in enforcing and implementing CALGreen. But even with familiarity, cities or counties with green building ordinances that reference LEED will be asked for CALGreen guidance from project teams seeking a LEED rating. This Companion Guide specifically addresses the mandatory measures in CALGreen for new non-residential building teams which are also seeking a LEED label.

Residential CALGreen or CALGreen "Tiers" are not covered in this Companion Guide. Resources for Residential Low-Rise CALGreen can be found at the HCD website www.hcd.ca.gov/CALGreen.html. Built It Green has additional resources at www.builditgreen.org/CALGreen.

Residential CALGreen

Although the LEED for Homes rating system has become popular in California for the private sector, the most referenced green rating system for residential green building policies in California is the GreenPoint Rated program (administered by Build It Green). The GreenPoint Rated program, in anticipation of CALGreen taking effect, has incorporated all the CALGreen residential mandatory provisions into its rating system. Therefore, CALGreen documentation and verification will be streamlined on GreenPoint Rated projects and a Companion Guide for residential CALGreen is not necessary at this time. Visit Build It Green's webpage for more information on CALGreen in the GreenPoint Rated program. www.BuildItGreen.org.

CALGreen Tiers

In addition to the mandatory measures in CALGreen, the code also includes two voluntary packages of above-minimum green practices, called "Tiers." The Tiers include all the mandatory CALGreen measures plus additional required practices (prerequisites), with a further requirement to choose a set number of optional measures from lists. For several reasons, this Companion Guide does not attempt to address the CALGreen Tiers.

- The Tiers are a voluntary portion of the code only, and must be amended in order to be enforceable by local jurisdictions. During the amendment process, local governments can modify the Tiers as desired, causing potentially inconsistent codes across jurisdictional boundaries and making any comparisons in a guide like this difficult and potentially not applicable. Therefore, this Companion Guide addresses only the required mandatory provisions in CALGreen which are consistently defined for every new project.
- Consistent with the Bay Area Climate Collaborative (BACC) recommendations on green building policies in light of CALGreen (found at www.baclimate.org), this Companion Guide assumes that any Tier requirement can be met via official certification to the LEED-Certified level (or better). Therefore, this Companion Guide addresses only the required mandatory provisions in CALGreen which must be met on every new project.
- Since the Tiers include a long list of optional measures, creating a Companion Guide that bridges every elective LEED and CALGreen Tier measure would be exceptionally lengthy and difficult.

Comparing CALGreen to LEED

While much of the information included in this guide could be used to compare the merits of CALGreen and LEED for New Construction, this Companion Guide is primarily intended to compare the documentation equivalencies of the two. Other documents exist to compare the standards of CALGreen and LEED in terms of overall stringency, environmental goals, and expected impact.

- The Bay Area Climate Collaborative provides recommendations on addressing CALGreen in green building policies: www.baclimate.org.
- The American Institute of Architects California Council (AIA-CC) collaborated with numerous other organizations to produce checklists for LEED-NC, GreenPoint Rated, and LEED-Homes as compared to CALGreen mandatory measures and CALGreen Tiers. View them at www.aiacc.org.

Where CALGreen & LEED Do Not Overlap

CALGreen non-residential mandatory provisions are made up of many green building practices found in LEED. However, not every measure in CALGreen has overlap with a LEED-related credit or prerequisite. In those instances where a comparison between CALGreen and LEED cannot be made, design teams and enforcement agents will need to develop ways for showing compliance outside of LEED documentation submittals. This measures for which no overlap exists are not addressed in this companion guide.

A LEED project will not have LEED documentation materials on the following CALGreen measures because there is no LEED equivalent standard. Project teams will need to consult the CALGreen Guide and local officials for guidance on complying with these measures.

CALGreen Measures That Will Need to Be Documented Outside of LEED

Measure #	CALGreen Mandatory Measure without Overlap in LEED
5.106.10	Keep surface water from entering building by grading & paving
5.303.1	Water meters for buildings > 50,000 square feet; water meters for excess consumption
5.303.6	Plumbing fixtures and fittings: do not exceed state maximum flow rates per fixture
5.304.2	Outdoor potable water use (separate meters/submeters for landscapes 1,000-5,000sf)
5.407.1	Weather protection (already required by California Building Code Section 1403.2)
5.407.2	Moisture control: prevent intrusion from sprinklers; entries and openings
5.503.1	Fireplace pollution standards
5.505.1	Indoor moisture control (references other parts of the Building Code)
5.507.4	Acoustical control, exterior noise transmission, and interior sound (minimum STCs for walls, roofs, exteriors, tenant partitions)

Building Commissioning in CALGreen & LEED

A few green building strategies now required as part of CALGreen are significant because they will require practices and procedures not typical of the conventional design, construction and building code enforcement processes. The most significant of these strategies relates to new non-residential buildings over 10,000 square feet: building commissioning.

Building commissioning is defined in CALGreen as "a quality assurance process that begins during design and continues to occupancy. Commissioning verifies that the new building operates as the owner intended and that building staff are prepared to operate and maintain its systems and equipment."[1]

Put another way, commissioning is a process to guarantee that building energy and other critical systems perform in operation as was intended in the design phase. Building commissioning is at the core of any non-residential green building standard and is required for all buildings seeking LEED for New Construction (BD+C) certification.

[1] From the *BSC CALGreen Non-Residential Commissioning Guide 11/09/10*, found at www.bsc.ca.gov/CALGreen.

Despite incorporating some elements of code requirements as well as standard industry best practices, commissioning as defined in CALGreen and LEED is ***not*** standard practice on new construction jobs in California. The practice of testing, adjusting and balancing systems (TAB) is considered standard practice and is typically done for all new projects. Some "acceptance tests" are required in the California Energy Code as well. However, TAB and acceptance tests are not commissioning in that it they do not typically involve the Owner's Project Requirements (OPR), Basis of Design (BOD), and, most importantly, comprehensive Functional Performance Testing (FPT).

Functional Performance Testing

Functional Performance Testing (FPT) is the methodology used in commissioning to demonstrate the correct installation and operation of each component or system being commissioned in a building. FPT includes some of the Title 24, Part 6 (Energy Code) "acceptance tests," but goes beyond these tests in depth of procedures and breadth of systems to be tested. Whereas typical building TAB includes some elements of FPT, the requirements of CALGreen commissioning go well above and beyond TAB because commissioning essentially requires the development of "stress test" procedures in addition to normal system balancing. These "stress tests" ensure the commissioned systems operate as intended during normal *and* inclement conditions, such as power failures, system overrides, lockouts, and staging/standby modes.

CALGreen Commissioning vs. Industry Standard Practice & LEED

The commissioning requirements in CALGreen are very similar to the LEED measure with a few exceptions. Also, LEED has two levels of commissioning: 1) fundamental commissioning that is required of all buildings seeking certification, and 2) Enhanced Commissioning which is an optional credit in LEED. In general, CALGreen mandated commissioning may include more building systems and require more commissioning measures (is more stringent) than the prerequisite LEED Fundamental Commissioning, but does not include as many required commissioning measures (is less stringent) than the optional LEED Enhanced Commissioning credit. With some relatively minor modifications, however, LEED fundamental commissioning can equal or exceed CALGreen requirements.

CALGreen mandatory commissioning requirements mostly track to the fundamental LEED prerequisite for commissioning, but add a couple features typically achieved via the optional LEED Enhanced Commissioning credit. These additions include systems documentation manuals and systems training. CALGreen also explicitly requires irrigation systems and water reuse systems to be commissioned, whereas these systems are optional in LEED. Adding the CALGreen additional scope items to the LEED commissioning scope (systems documentation, systems training, and commissioning irrigation/water reuse systems) will allow the LEED commissioning documentation to meet the CALGreen requirements on projects. The additional scope of work to meet CALGreen within the LEED Fundamental commissioning framework is expected to be a modest amount of additional work and should be a low-cost add-on for most projects. Alternatively, project teams may wish to seek the optional Enhanced Commissioning credit, whereby the CALGreen requirements are met and exceeded (so long as water reuse and irrigation systems are included in the commissioning scope).

In a key aspect, LEED required commissioning is more stringent than CALGreen because LEED verification standards require that all individuals who act as the Commissioning Authority (C_xA) have a minimum level of commissioning experience. CALGreen has a less restrictive definition on qualified C_xA's and allows some

flexibility in interpreting qualifications and proper conflict-of-interest distancing from both the owner's side (who they can hire) and by the enforcement agency (the level of C_xA detachment from the project that is acceptable to show compliance). And the LEED C_xA must report all findings directly to the owner - a distinction in LEED that is not explicitly required in CALGreen.

Additionally, LEED has a rigid requirement that the C_xA must be independent of the design team for buildings larger than 50,000 square feet. Having the C_xA as an independent member of the team is beneficial, especially when the C_xA is hired directly by the owner and provides impartial oversight of the building systems design. CALGreen does not have this independent oversight requirement for commissioning.

The following table provides an overview of the similarities and differences between LEED and CALGreen commissioning. Note that smaller buildings in CALGreen need to only comply with the Testing, Adjusting and Balancing requirements, whereas any building seeking LEED certification must at least do fundamental commissioning.

CALGreen Commissioning vs. Industry Standard Practice & LEED

CALGreen Reference No.	CALGreen Non-Residential Commissioning (Cx) Requirements	Industry Standard Practice	CALGreen Non-Residential	Req. in LEED (EAp1)	Achieved via Optional LEED Credit (EAc3)
5.410.2	Commissioning	-	Required for all buildings greater than 10,000sf	✓*	✓
5.410.2.1	Owner's Project Requirements (OPR)	-		✓	✓
5.410.2.2	Basis of Design (BOD)	-		✓*	✓
5.410.2.3	Commissioning plan	-		✓	✓
5.410.2.4	Functional performance testing (FPT)	-		✓	✓
5.410.2.5	Documentation & training	-		**	✓
5.410.2.6	Commissioning report	-		✓	✓
5.410.4.2	Testing and adjusting - Systems	✓	Required for all buildings less than 10,000s.f.	LEED requires commissioning of all buildings undergoing certification, therefore these measures are achieved	
5.410.4.3	Testing and adjusting - Procedures	✓			
5.410.4.3.1	HVAC balancing	✓			
5.410.4.4	Testing, Adjusting & Balancing Reporting	✓			
5.410.4.5	Operation and maintenance manual	✓			

**This criteria is met if LEED projects opt to commission irrigation systems and water reuse systems (which are optional in LEED but required in CALGreen).*

*** Systems manuals and systems training are optional in fundamental LEED commissioning but are required in the optional LEED Enhanced Commissioning Credit.*

For further information on commissioning in CALGreen, see the Building Standard Commissions' CALGreen webpage for sample commissioning documents, forms and templates. www.bsc.ca.gov. Sample documents can be found at the Building Standards Commission website: www.documents.dgs.ca.gov/bsc/CALGreen/FTP-SAMPLE-TEMPLATE.pdf and the California Commissioning Collaborative website: www.cacx.org.

How to Use this Companion Guide

The Companion Guide is made up of the following sections.

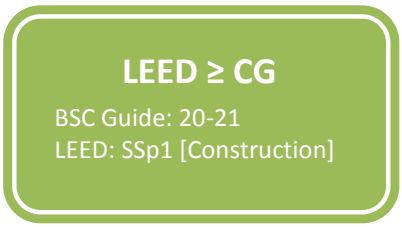
- **Index & Summary**

  The Index provides an at-a-glance summary of how to use LEED documentation for CALGreen compliance. The index is organized by CALGreen code number with LEED documentation equivalency shown in the color-coded boxes in the middle. The Index shows for which measures LEED has lesser (shown in red), equivalent (blue), or more stringent (green) documentation requirements than CALGreen. The index also gives a brief recommendation on how to utilize LEED documentation for CALGreen compliance and verification. For CALGreen Mandatory Measures where no overlap with LEED occurs, the documentation equivalency box is labeled "N/A" for "Not Applicable." Project teams will need to verify compliance with those measures outside of the LEED-Online submittals and backup documentation.

- **Detailed CALGreen Mandatory Measure Recommendations Pages**

  Each Mandatory Measure in CALGreen (or groups of related measures) that has overlap with LEED has been given its own page. The page is made up of the following sections:

  - **Mandatory Measure Title & Code number:** Each page includes the code number for use in referencing the standard language in Title 24, Part 11.
  - **Color-coded label:** These labels match the Index and show the relative documentation equivalency of LEED/CALGreen, the page number where the CALGreen documentation and verification procedures can be found in the BSC's *Guide to the (Non-Residential) California Green Building Standards Code*, the related LEED credit/prerequisite numbers, and whether the LEED credits are design- or construction-phase.

  - **Summary Recommendation:** This is the same recommendation found in the Index.
  - **CALGreen Mandatory Measure Summary:** Provides a condensed version of the CALGreen code requirements.
  - **LEED Related Credit(s) Summary:** Provides a condensed summary of the related LEED credits.
  - **Documentation Recommendations for LEED Projects:** Provides guidance on how to use, modify, or augment LEED-Online submittal forms in order to document compliance with the applicable CALGreen measure.
  - **Recommendations for Enforcement & Verification:** Provides recommendations and tips on how to review LEED submittals for CALGreen compliance.

- **LEED Submittal Samples:**

  Following some of the Detailed Mandatory Measure Recommendations Pages is sample submittal documentation. These samples are generally made up of annotated LEED-Online Forms from real LEED projects. The pages also include resources like VOC tables comparing CALGreen and LEED requirements, sample cut sheets, and other supporting documents.

Index & Summary

Mandatory Measure #	*CALGreen Measure Title*	*Documentation Equivalency*	*Summary of Recommendations*	*Page No.*
PLANNING AND DESIGN				
Site Development				
5.106.1	Storm Water Soil Loss Prevention Plan	LEED ≥ CG	Both the CALGreen and LEED standards for storm water pollution prevention are typically superseded by more stringent local requirements. Where the local standard does not apply to sites less than one acre in size, LEED is more stringent than CALGreen and LEED documentation can be used to show compliance with CALGreen.	4
5.106.4	4.1. Short-Term bicycle parking	LEED = CG	LEED is more stringent than CALGreen except in one instance: the distance from bike parking to building entrance. If LEED projects include the CALGreen requirement for distance (200 feet), then LEED documentation more than satisfies the CALGreen requirement.	5
	4.2. Long-Term bicycle parking			
5.106.5.2	Designated parking	LEED ≤ CG	CALGreen requires more preferred parking (8%) than the LEED credit (5%). In order to meet CALGreen, LEED projects seeking this credit should achieve 8% of preferred parking stalls and label stalls as required by CALGreen.	8
5.106.8	Light pollution reduction	LEED ≥ CG	CALGreen and LEED light pollution reduction requirements have similar elements, but are defined differently. LEED requirements are at least as stringent as CALGreen. Therefore, projects achieving this credit in LEED will exceed the CALGreen requirements.	11
5.106.10	Grading and paving	N/A	No overlap with LEED occurs; verify outside of LEED submittals.	
ENERGY EFFICIENCY				
Performance Requirements				
5.201.1	Meet Title 24, Part 6. California Energy Code	LEED ≥ CG	CALGreen does not require energy efficiency above code minimum. LEED requires at least a 10% improvement, but uses a different baseline. Almost all California projects that comply with the state energy code will meet the LEED threshold; however the documentation and verification requirements for LEED are more stringent than CALGreen.	16
WATER EFFICIENCY AND CONSERVATION				
Indoor Water Use				
5.303.1	1.1. Meters - Buildings >50,000 sf	N/A	No overlap with LEED occurs; verify outside of LEED submittals.	
	1.2. Meters - Excess consumption	N/A	No overlap with LEED occurs; verify outside of LEED submittals.	
5.303.2	2.0. 20% Indoor Water savings	LEED ≥ CG	Both CALGreen and LEED require a 20% reduction in indoor water use. Each system has a slightly different requirement of applicable fixtures and calculation of fixture use. With minor adjustments to the LEED calculator, LEED documentation meets or exceeds CALGreen requirements.	17
	2.1. Multiple showerheads serving one shower	LEED ≤ CG	Though rarely found on commercial projects seeking LEED, should any showers include multiple showerheads, those fixtures must meet the CALGreen requirements.	21
5.303.4	Wastewater reduction	LEED ≥ CG	The LEED threshold reduction (50%) is much more stringent than CALGreen (20%). Therefore if a project obtains this credit in LEED it meets the CALGreen requirements.	22
5.303.6	Plumbing fixtures and fittings	N/A	No overlap with LEED occurs; verify outside of LEED submittals.	
Outdoor Water Use				
5.304.1	Water budget	LEED ≥ CG	LEED requires deeper water conservation than CALGreen, except where local ordinances may be more stringent. CALGreen also requires an audit report to be filed from a certified landscape irrigation auditor.	25
5.304.2	Outdoor potable water use	N/A	No overlap with LEED occurs; verify outside of LEED submittals.	

Mandatory Measure #	*CALGreen Measure Title*	*Documentation Equivalency*	*Summary of Recommendations*	*Page No.*
5.304.3	Irrigation design	LEED ≤ CG	The LEED calculations for irrigation water use do not require controllers, but projects that seek the LEED credit and install a CALGreen compliant controller can meet the CALGreen requirement.	26
MATERIAL CONSERVATION AND RESOURCE EFFICIENCY				
Weather Resistance and Moisture Management				
5.407.1	Weather protection	N/A	No overlap with LEED occurs; verify outside of LEED submittals.	
5.407.2	2.1 Moisture Control - Sprinklers	N/A	No overlap with LEED occurs; verify outside of LEED submittals.	
	2.2 Moisture Control - Entries and openings			
Construction Waste Reduction, Disposal and Recycling				
5.408.1 5.408.2	Construction waste diversion & management plan	LEED = CG	Local recycling requirements are often more stringent than both CALGreen and LEED. LEED documentation is equivalent to CALGreen when an acceptable Waste Management Plan (WMP) is submitted along with the LEED Form.	27
5.408.3	50% Construction waste reduction			
Building Maintenance and Operation				
5.410.1	Recycling by occupants	LEED = CG	CALGreen and LEED have identical requirements. Therefore, LEED documentation will fulfill CALGreen requirements.	29
5.410.2	Commissioning (Cx)	LEED = CG	LEED has more stringent requirements as to who can perform commissioning tasks on large projects (>50,000sf). However, a LEED project will need to add a few aspects of commissioning that are required in CALGreen (but are optional in LEED) in order for documentation to be equivalent. - Add landscape irrigation systems - Add water reuse systems - Add a systems manual and provide training	33
	2.1. Owner's Project Requirements (OPR)			
	2.2. Basis of Design (BOD)			
	2.3. Commissioning plan			
	2.4. Functional performance testing			
	2.5. Documentation and training			
	2.6. Commissioning report			
5.410.3	Testing and adjusting	LEED ≥ CG	Since LEED Commisisoning requirements are more restrictive than CALGreen's Testing and Adjusting measure, as long as the irrigation system is tested and adjusted as CALGreen requires, consider LEED projects compliant under CALGreen.	35
	3.2. Systems			
	3.3.1. HVAC balancing			
	3.4. Reporting			
	3.5. Operation and maintenance manual			
ENVIRONMENTAL QUALITY				
Fireplaces				
5.503.1	Fireplaces	N/A	No overlap with LEED occurs; verify outside of LEED submittals.	
Pollutant Control				
5.504.3	Construction IAQ Management	LEED ≥ CG	Where a LEED project achieves this credit, accept the LEED documentation as equivalent since those projects will have addressed mechanical equipment in addition to pathway interruption, source control, material scheduling and housekeeping practices during construction.	36

Mandatory Measure #	*CALGreen Measure Title*	*Documentation Equivalency*	*Summary of Recommendations*	*Page No.*
5.504.4	Finish material pollutant control	LEED = CG	While the reference standards differ, the actual product requirements are nearly identical between LEED and CALGreen and should be assumed to be equal.	37
	4.1. Adhesives, sealants, caulks			
	4.3. Paints and coatings	LEED ≤ CG	While many of the product specific VOC limits between the various reference standards are the same, the CALGreen Measure addresses many more coatings than the LEED requirements as it is not limited to indoor paints and coatings.	41
	4.3.1 Aerosol Paints and Coatings			
	4.4. Carpet systems	LEED = CG	Due to differing reference standards, not all CALGreen projects will comply with LEED, but any project that achieves this credit in LEED complies with CALGreen.	42
	4.4.1. Carpet cushion			
	4.4.2. Carpet adhesive			
	4.5. Composite wood products	LEED ≥ CG	Since LEED requires that all composite wood products comply as opposed to the limited scope of the CALGreen standard, projects pursuing this optional credit within LEED will exceed the CALGreen requirements.	44
	4.6. Resilient flooring systems	LEED ≥ CG	Since LEED requires 100% of resilient flooring to comply compared with only 50% for CALGreen, all LEED projects that achieve this credit will comply with and surpass the CALGreen Requirements.	45
5.504.5.3	Filters	LEED ≥ CG	The related LEED credit addresses filters in addition to other indoor air quality elements. CALGreen's filtration requirement of MERV 8 will be met and exceeded by LEED projects that achieve this credit.	46
5.504.7	Environmental tobacco smoke control	LEED = CG	The respective LEED and CALGreen measures are nearly identical and should be considered equivalent.	48
Indoor Moisture and Radon Control				
5.505.1	Indoor moisture control	N/A	No overlap with LEED occurs; verify outside of LEED submittals.	
Indoor Air Quality				
5.506.1	Outside air delivery	LEED ≥ CG	LEED projects will almost always comply with CALGreen requirements despite being based on different reference standards. LEED documentation should be accepted as equivalent.	50
5.506.2	Carbon dioxide monitoring	LEED = CG	The respective LEED and CALGreen measures are nearly identical and should be considered equivalent.	53
Environmental Comfort				
5.507.4	Acoustical control	N/A	No overlap with LEED occurs; verify outside of LEED submittals.	
5.507.4.1	Exterior noise transmission	N/A	No overlap with LEED occurs; verify outside of LEED submittals.	
5.507.4.2	Interior sound	N/A	No overlap with LEED occurs; verify outside of LEED submittals.	
Outdoor Air Quality				
5.508.1.1	Chlorofluorocarbons (CFCs)	LEED ≥ CG	Both CALGreen and LEED require that no new CFC based equipment be installed. The prohibition of Halon use is an optional credit within LEED, but that credit also includes limits on other ozone depleting chemicals and greenhouse gases. If a LEED project achieves the optional credit as well as the prerequisite, CALGreen has been met.	54
5.508.1.2	Halons			

5.106.1 STORM WATER SOIL LOSS PREVENTION PLAN

LEED ≥ CG
BSC Guide: 20-21
LEED: SSp1 [Construction]

Both the CALGreen and LEED standards for storm water pollution prevention are typically superseded by more stringent local requirements. Where the local standard does not apply to sites less than one acre in size, LEED is more stringent than CALGreen and LEED documentation can be used to show compliance with CALGreen.

CALGreen Mandatory Measure Summary:
Projects less than one acre must develop a storm water soil loss prevention plan compliant with State Storm Water National Pollutant Discharge Elimination Systems (NPDES) Construction Permit 99-08-DWQ or local ordinance, whichever is more stringent. Sites over one acre must complete a Storm Water Pollution Prevention Plan (SWPPP).

LEED Related Credit(s) Summary:
Relates to Sustainable Sites Prerequisite 1: Construction Activity Pollution Prevention
Create and implement an erosion and sedimentation control plan that conforms to the requirements of the NPDES program or local standards and codes, whichever is more stringent. For jurisdictions without local ordinances, LEED is the more stringent standard.

Documentation Recommendations for LEED Projects

If the project site is less than one acre, provide a storm water soil loss prevention plan that meets or exceeds the NPDES minimum requirements. If the project site is great than one acre, complete a SWPPP as required by California law or other local requirement, whichever is more stringent. In either case, the documentation of LEED SSp1 will be the same or more stringent than CALGreen requirements since LEED requires NPDES as a minimum standard for all project sizes unless the local standard is more stringent.

Recommendations to simplify documentation on LEED projects and to comply with CALGreen (if acceptable to the local enforcement agency):

- If a more restrictive local requirement does not exist than CALGreen for sites under one acre, then submit the LEED Form backup documentation (NPDES) to show compliance with CALGreen.
- For sites over one acre, typically local requirements will supersede LEED. Document to the local agency's satisfaction and use these same documents to show compliance with the LEED requirement.

Recommendations for Enforcement & Verification

If the submitted LEED-compliant erosion and sedimentation control plan is equivalent or greater in scope than CALGreen (or more stringent local requirements) for sites less than one acre, accept the LEED SSp1 documentation as satisfying CALGreen requirements.

For sites greater than one acre, typically local regulations supersede LEED (and CALGreen does not apply), so documentation & verification will have to take place outside of LEED or CALGreen.

5.106.4 BICYCLE PARKING

LEED = CG
BSC Guide: 22-23
LEED: SSc4.2 [Design]

LEED is more stringent than CALGreen except in one instance: the distance from bike parking to building entrance. If LEED projects include the CALGreen requirement for distance (200 feet), then LEED documentation more than satisfies the CALGreen requirement.

CALGreen Mandatory Measure Summary:
Provide bike racks for 5% of projected visitors within 200 **feet** of building entrance and secure (covered) bicycle parking for 5% of motorized parking capacity.

LEED Related Credit(s) Summary:
Related to optional credit Sustainable Site Credit 4.2: Bicycle Storage & Changing Rooms
Provide bike parking for 5% of all building users (visitors plus full-time equivalents) within 200 **yards** of building entrance, plus showers and changing rooms for 0.5% of full-time equivalent staff (FTE).

Documentation Recommendations for LEED Projects

LEED is generally more stringent than CALGreen except in one instance: the distance from bike parking to building entrance. However, CALGreen and LEED also differ in how to calculate the needed bicycle storage capacity (based on provided parking and number of occupants respectively) and whether racks should be covered. Also, the obtainment of this credit in LEED requires showers and changing rooms for occupants who arrive via bikes. Therefore, LEED is assumed to be essentially equivalent to CALGreen overall.

In order to reduce the paperwork burden if attempting this credit in LEED, project teams should make every effort to meet the CALGreen distance from bike racks/storage areas to building entrances. In some cases it will be impossible to meet the CALGreen criteria for 200 feet, so teams should then seek to limit bike parking areas to within 200 yards (the LEED standard).

Recommendations to simplify documentation on LEED projects and to comply with CALGreen (if acceptable to the local enforcement agency):

- Use the LEED Form to document the number of storage areas/racks needed for the project.
- Make every effort to place covered racks or secured areas within 200 feet of building entrances.
- If racks cannot be located within 200 feet, then provide all the accompanying LEED backup documentation to make the case that any and all bicycle racks are within 200 yards.

Recommendations for Enforcement & Verification

This measure requires two areas of verification: first, the correct number of bicycle storage and parking based on the number of visitors to the building. Secondly, the parking or storage areas must be in close proximity to the building.

1. The calculation for the number of projected visitors to the building can be documented with the LEED Form since the calculation is generally more stringent than the CALGreen calculation with respect to the building occupancy (LEED) rather than parking allocation (CALGreen). LEED is especially more stringent when using this metric on sites where new parking is limited or not included (such as for infill projects). Therefore, if acceptable on a case-by-case basis, accept the LEED SSc4.2 Form as satisfying the CALGreen requirement for number of occupants and visitors as equivalent for CALGreen compliance.

2. The CALGreen requirement for bicycle storage proximity is stricter than LEED. However, on some larger sites or on sites with multiple buildings, the CALGreen requirement of 200 feet can be difficult or impossible to meet. Therefore, on a case-by-case basis, consider allowing the LEED referenced maximum proximity of 200 yards when the project size is not conducive to shorter distances, provided the local jurisdiction agrees that this is an acceptable equivalency of compliance.

Sample LEED Form: Bicycle Storage (SSc4.2)

LEED for New Construction: Design

SS CREDIT 4.2: ALTERNATIVE TRANSPORTATION
BICYCLE STORAGE AND CHANGING ROOMS

All fields and uploads are required unless otherwise noted.

THRESHOLD ATTEMPTED

Points Attempted 1

ALL OPTIONS

Select one of the following:

☒ The LEED project serves non-residents.
☐ The LEED project serves residents.

Table. Shower and Changing Facilities

Description of Facility (to correspond with provided plan)	Shower/Changing Facility Capacity (# of occupants)	Distance from building entrance (yards)
office building	1	4
Total capacity (occupants):	1	
FTE (not including transients) (FTE):	90	
Percent of FTE with shower/changing facilites (must be at least 0.5%) (%):	1.11	

Add Row | Delete Row

Not applicable for CALGreen.

Table. Bicycle Storage Non-Residential

Description of Storage Area (to correspond with provided plan)	Secure Storage / Rack Capacity (# of bicycles)	Distance from Building Entrance (yards)	Secure?
11 space bike rack	11	25	Yes
Total secure bicycle storage / rack capacity:	11		
Non-residential FTE:	90		
Peak transient FTE:	30		
Total peak non-residential FTE:	120		
Percent of building users with secure bicycle storage / racks (must be at least 5%) (%):	9.17		

Add Row | Delete Row

For CALGreen, racks must be secure and within 200 feet, unless project site is too large, than limit to 200 yards.

For CALGreen, this number must be for 5% of motorized parking capacity.

For CALGreen, bike racks are need for 5% of this number, which would be (2) in this case.

A site plan identifying the location of any bicycle storage/racks and shower/changing facilities is required to document credit compliance. The site plan below is a linked submittal. (If no document is present, upload a site plan which meets the above requirements.)

Upload the site plan for the LEED building. Upload *Files:* 1

Select one of the following:

◉ The site plan above identifies the location of any bicycle storage and shower/changing facilites.
○ A different site plan is better suited to satisfy this requirement.

Show location, distance, and quantity on plans or other document.

Sample LEED Form: Bicycle Storage (SSc4.2) (Continued)

ADDITIONAL DETAILS

☐ Special circumstances preclude documentation of credit compliance with the submittal requirements outlined in this form.

☐ The project team is using an alternative compliance approach in lieu of standard submittal paths.

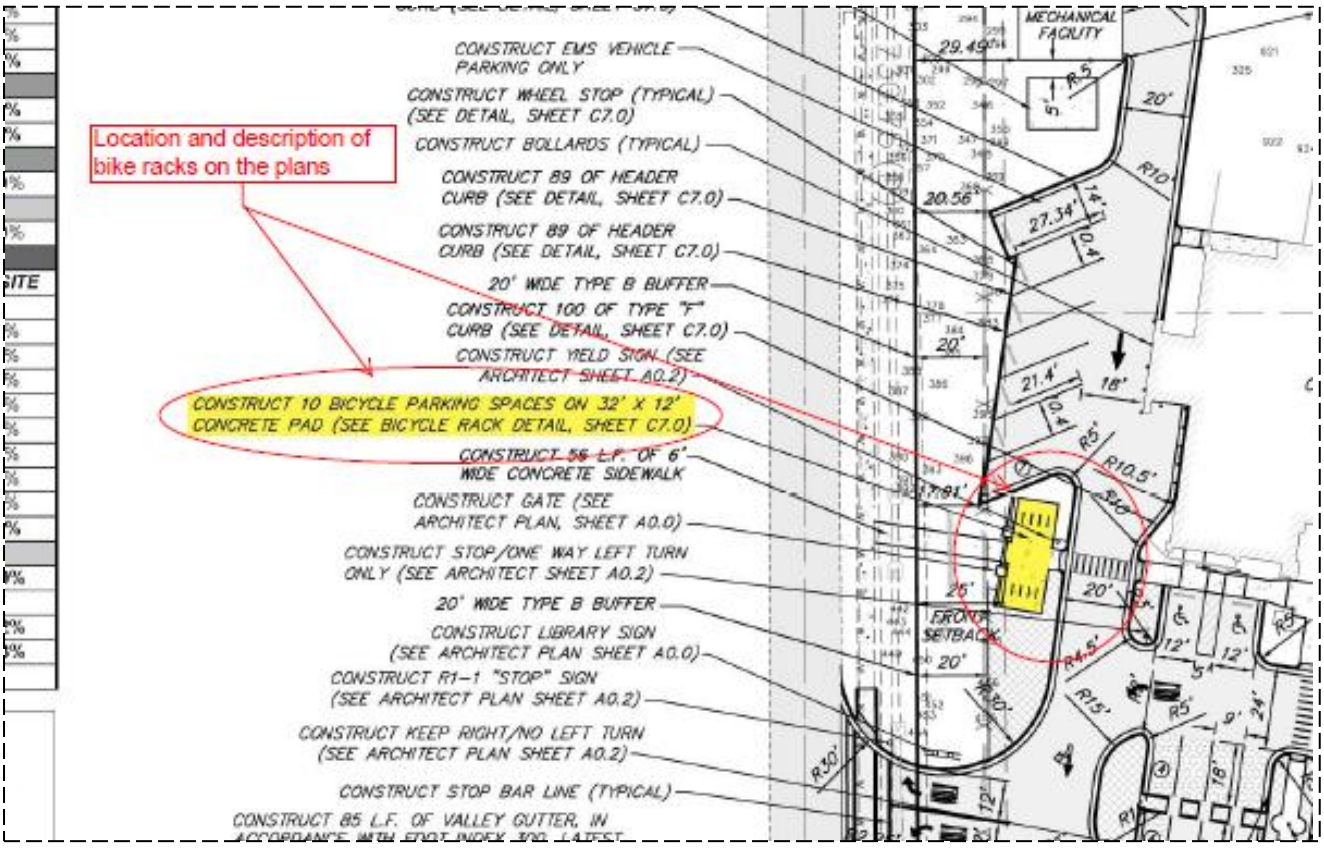
☐ The project team is pursuing exemplary performance of SSc4.1.

SUMMARY

SS Credit 4.2: Alternative Transportation - Bicycle Storage and Changing Rooms Points Documented:	1
SS Credit 4.2: Alternative Transportation - Bicycle Storage and Changing Rooms Exemplary Points Documented:	N

☐ The project team reserves one point in the Innovation in Design credit category for exemplary performance in SSc4.2.

Sample Bicycle Storage Notation on Plans



5.106.5 DESIGNATED PARKING

LEED ≤ CG
BSC Guide: 24
LEED: SSc4.3 [Design]

CALGreen requires more preferred parking (8%) than the LEED credit (5%). In order to meet CALGreen, LEED projects seeking this credit should achieve 8% of preferred parking stalls and label stalls as required by CALGreen.

CALGreen Mandatory Measure Summary:
Provide stall marking for low-emitting, fuel efficient, and carpool/van pool vehicles. Provide space for approximately **8%** of total parking spaces. Label the stalls as "CLEAN AIR VEHICLE".

LEED Related Credit(s) Summary:
Relates to optional credit Sustainable Sites Credit 4.3: Low Emitting & Fuel Efficient Vehicles
Provide preferred parking and signage for low-emitting vehicles for **5%** of spaces; alternately provide alternative-fuel stations, vehicles, or vehicle-sharing.

Documentation Recommendations for LEED Projects

The corresponding LEED credit (SSc4.3) has several pathways for achieving credit. The "Preferred Parking" option is the most similar to this CALGreen measure. However, there are *four main differences between CALGreen and LEED:*

1. The percentage of parking stalls that must be made available for preferred parking (5% LEED; 8% CALGreen).
2. The criteria for low-emitting and fuel efficient vehicles ("clean air vehicles" is not an accepted terminology in LEED).
3. Labeling requirements for preferred parking stalls (LEED requires signs, CALGreen requires painted stalls).
4. LEED requires preferred parking to be located near entrances; CALGreen has no such restrictions.

Recommendations to simplify documentation on LEED projects and to comply with CALGreen (if acceptable to the local enforcement agency):

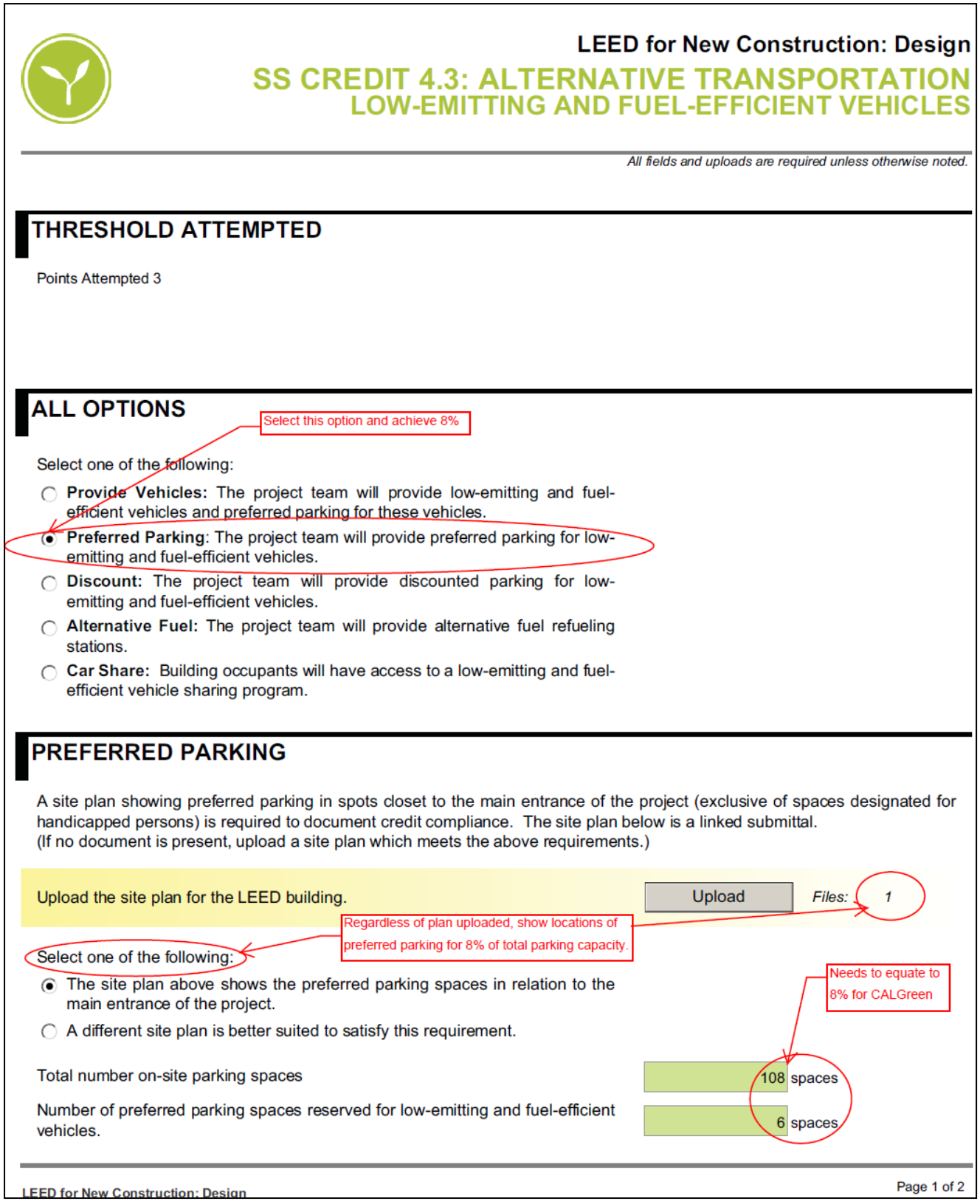
- Select Option 1 "Preferred Parking" or Option 3 "Provide Low-Emitting Vehicles" in the LEED credit form and ensure calculations support preferred parking spaces in at least 8% of total parking spaces.
- In addition to the LEED requirements for signage of preferred parking spaces, paint stalls in accordance with CALGreen requirements for "clear air vehicles".
- If the LEED SSc4.3 Form shows that 8% of parking spaces threshold has been met, use the LEED Online Form for documentation of CALGreen compliance.

Recommendations for Enforcement & Verification

The LEED credit SSc4.3 can be accepted for documenting CALGreen as long as the project team demonstrates preferred parking is provided for at least 8% of total parking capacity. Please note that there is no proximity requirement for preferred parking, only that LEED requires it to be the closest available to the primary entrance for that designated use, after handicap parking. CALGreen has no such requirement for proximity.

On a case-by-case basis, consider alternatives to the CALGreen striping requirement for "clean air vehicles" in situations where the labeling is redundant due to other preferred parking strategies employed on site (such as when project teams seek other options than "preferred parking" in the LEED credit).

Sample LEED Form: Alternative Transportation (SSc4.3)



LEED for New Construction: Design

SS CREDIT 4.3: ALTERNATIVE TRANSPORTATION
LOW-EMITTING AND FUEL-EFFICIENT VEHICLES

All fields and uploads are required unless otherwise noted.

THRESHOLD ATTEMPTED

Points Attempted 3

ALL OPTIONS

Select this option and achieve 8%

Select one of the following:

- ○ **Provide Vehicles:** The project team will provide low-emitting and fuel-efficient vehicles and preferred parking for these vehicles.
- ◉ **Preferred Parking**: The project team will provide preferred parking for low-emitting and fuel-efficient vehicles.
- ○ **Discount:** The project team will provide discounted parking for low-emitting and fuel-efficient vehicles.
- ○ **Alternative Fuel:** The project team will provide alternative fuel refueling stations.
- ○ **Car Share:** Building occupants will have access to a low-emitting and fuel-efficient vehicle sharing program.

PREFERRED PARKING

A site plan showing preferred parking in spots closet to the main entrance of the project (exclusive of spaces designated for handicapped persons) is required to document credit compliance. The site plan below is a linked submittal.
(If no document is present, upload a site plan which meets the above requirements.)

Upload the site plan for the LEED building. [Upload] *Files:* 1

Regardless of plan uploaded, show locations of preferred parking for 8% of total parking capacity.

Select one of the following:

- ◉ The site plan above shows the preferred parking spaces in relation to the main entrance of the project.
- ○ A different site plan is better suited to satisfy this requirement.

Needs to equate to 8% for CALGreen

Total number on-site parking spaces	108 spaces
Number of preferred parking spaces reserved for low-emitting and fuel-efficient vehicles.	6 spaces

LEED for New Construction: Design — Page 1 of 2

Sample LEED Form: Alternative Transportation (SSc4.3) (Continued)

Preferred parking expressed as a percent of total parking:
(must be at least 5%)

5.56 %

Needs to equate to 8% for CALGreen

Spaces reserved for low-emitting and fuel-efficient vehicles will be indicated with parking signage. Additionally, the availability of the preferred parking will be communicated to building occupants (e.g., in an employee handbook, bulletin board, etc).

REQUIRED SIGNATORY
Initial Here : tc
OWNER

Signatory: Tim Coscarelly; February 16, 2010

ADDITIONAL DETAILS

☐ Special circumstances preclude documentation of credit compliance with the submittal requirements outlined in this form.

☐ The project team is using an alternative compliance approach in lieu of standard submittal paths.

EXEMPLARY PERFORMANCE

☐ The project team is pursuing exemplary performance of SSc4.3.

SUMMARY

SS Credit 4.3: Alternative Transportation-Low - Emitting and Fuel-Efficient Vehicles Points Documented:	3
SS Credit 4.3: Alternative Transportation - Low-Emitting and Fuel-Efficient Vehicles Exemplary Points Documented:	0

☒ The project team reserves one point in the Innovation in Design credit category for exemplary performance in SSc4.3.

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5.106.8 LIGHT POLLUTION REDUCTION

LEED ≥ CG
BSC Guide: 25-26
LEED: SSc8 [Design]

CALGreen and LEED light pollution reduction requirements have similar elements, but are defined differently. LEED requirements are at least as stringent as CALGreen. Therefore, projects achieving this credit in LEED will exceed the CALGreen requirements.

CALGreen Mandatory Measure Summary:
Exterior lighting power density limited by exterior lighting zone to California Energy Code limits. Contain interior lighting within each building/structure. No more than 0.01 horizontal footcandles, 15 ft. beyond site.

LEED Related Credit(s) Summary:
Relates to optional credit Sustainable Site Credit 8: Light Pollution Reduction
For Interior Lighting: Non-emergency interior luminaires with direct line of site to envelope openings must have input power reduced by at least 50% between 11pm and 5am, OR a building whose openings in the envelope with a direct line of site to non-emergency luminaires must have shielding controlled by an automatic device between 11pm and 5am.
For Exterior Lighting: Lighting power densities must not exceed ASHRAE 90.1-2007. Check Reference Guide for Lighting Zone classification and calculation requirements.

Documentation Recommendations for LEED Projects

The LEED light pollution credit has several lighting zones based on project location. Of the four (4) lighting zones defined in the LEED rating system the least stringent (lighting zone 4, High: high-activity commercial districts in major metropolitan areas) aligns with the CALGreen light trespass requirement of no more than 0.01 horizontal footcandles, 15 ft. beyond site. LEED goes further to require light trespass to be limited at the site boundary and requires lighting power density calculations as well, but neither is addressed in CALGreen.

Recommendations to simplify documentation on LEED projects and to comply with CALGreen (if acceptable to the local enforcement agency):

- Submit LEED SSc8 Form to demonstrate exterior compliance with Lighting Power Density for Site Area and Building Façade/Landscape, and Site Lumen Calculations based on correct light zone.
- For interior lighting, the same electrical floor plans and lighting schedule used for LEED should be used for CALGreen.

Recommendations for Enforcement & Verification

Provided the local jurisdiction agrees that this is an acceptable equivalency of compliance, accept LEED SSc8 documentation as satisfying CALGreen requirements since the LEED requirements are more stringent than CALGreen.

Sample LEED Form: Light Pollution Reduction (SSc8)

LEED for New Construction: Design

SS CREDIT 8: LIGHT POLLUTION REDUCTION

All fields and uploads are required unless otherwise noted.

THRESHOLD ATTEMPTED

Points Attempted 2

ALL OPTIONS

INTERIOR LIGHTING COMPLIANCE

For CalGreen, ensure that zero direct beam illumination leaves building/structure. May require additional design considerations and photometric measurements for lighting system and fixture orientation.

Select one of the following:

- (●) Option 1: Reduced Input Power. For all nonemergency interior luminaires with a direct line of sight to any openings in the building envelope, input power is reduced by at least 50% between 11pm and 5am via automatic device(s).
- ( ) Option 2: Shielding. All openings in the building envelope with direct line of sight to any nonemergency interior luminaires are shielded between 11pm and 5am, for a resultant transmittance of less than 10%.
- ( ) No non-emergency interior lighting has a direct line of sight to openings in the building envelope.

Any of these options are acceptable

A Licensed Professional Exemption (LPE) is available for Licensed Engineers in lieu of: drawings showing automatic controls AND drawings or specifications detailing the sequence of operation for lighting in the project building.

Select one of the following:

- ( ) Streamlined Path: LPE (PE)
- (●) Full Documentation.

Upload documentation (such as plans or drawings) showing the location of automatic controls. [Upload] *Files:* 1

Upload documentation detailing the sequence of operation for interior lighting at the project building. [Upload] *Files:* 1

Sample LEED Form: Light Pollution Reduction (SSc8) (continued)

EXTERIOR LIGHTING COMPLIANCE

Classify the project under one of the following zones:

- ○ LZ1 - Dark (Developed areas within national parks, state parks forest land and rural areas).
- ○ LZ2 - Low (Areas predominantly consisting of; Residential zoning, Neighborhood business districts, Light industrial with limited nighttime use, Residential mixed use areas).
- ◉ LZ3 - Medium (All other areas not included in LZ1, LZ2 or LZ4 such as Commercial/Industrial, High-Density Residential).
- ○ LZ4 - High (High activity commercial districts in major metropolitan areas. To be LZ4 the area must be so designated by the local jurisdiction such as the local zoning authority).

Any of these options are acceptable as they each meet or exceed the CalGreen requirements.

Select one of the following:

- ○ There are no exterior lighting devices within the LEED project boundary.
- ◉ Exterior lighting devices are present within the LEED project boundary.

A Licensed Professional Exemption (LPE) is available for Licensed Engineers in lieu of the following:

1) Lighting Power Density Exterior Areas Table
2) Lighting Power Density Façade/Landscaping Table
3) Photometric site plan with point-by-point foot candle levels
4) Photometric site plan of the parking areas with a footcandle summary table.

Select one of the following:

- ◉ Streamlined Path: LPE (PE).
- ○ Full Documentation.

If a licensed professional "streamlined path" option is selected, a legal agreement signed by this individual with their current license number needs to be provided.

NOTE: For each Licensed Professional Exemption claimed, the relevant licensed professional must complete the corresponding Exemption Signature on the Licensed Professional Exemptions tab in order to be considered a valid submittal.

Licensed Professional Exemption claimed by: Jane Doe, P.E. *Date license expires*

Table. Lighting Power Density Tabulation Site Areas

For each exterior site area, list the location identification, the units (Watts per square foot, Watts per linear foot, Watts per square meter, or Watts per meter) the Area or Distance for the specified location, the actual lighting power density (LPD), and the ASHRAE allowable LPD for that location.

Exterior site lighting must not exceed 80% of the LPD as defined in ASHRAE/IESNA Standard 90.1-2007.

Location ID	Units	Area or Length	Actual LPD	ASHARE Allowable LPD	LEED Allowable LPD
	(select one)				0
Exterior site lighting actual power (Watts):				0	
Exterior site lighting LEED allowable power (Watts): *(adds 5% unrestricted allowance per ASHRAE 90.1-2004 Table 9.4.5)*				0	

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Sample LEED Form: Light Pollution Reduction (SSc8) (continued)

Add Row | Delete Row

Table. Lighting Power Density Tabulation Building Facade / Landscape Lighting

For each building facade / landscape area, list the location identification, the units (Watts per square foot, Watts per linear foot,Watts per square meter, or Watts per meter) the Area or Distance for the specified location, the actual lighting power density(LPD), and the ASHRAE allowable LPD for that location. Exterior building façade / landscape lighting must not exceed 50% of the LPD as defined in ASHRAE/IESNA Standard 90.1-2007.

Location ID	Units	Area or Length	Actual LPD	ASHARE Allowable LPD	LEED Allowable LPD
	(select one)				0
Exterior building facade / landscape lighting actual power (Watts):				0	
Exterior building facade / landscape lighting LEED allowable power (Watts): *(adds 5% unrestricted allowance per ASHRAE 90.1-2004 Table 9.4.5)*				0	

Add Row | Delete Row

Table. Site Lumen Calculation

For each fixture type used for site lighting, list the luminaire type, the quantity of luminaires installed, the initial lamp lumens perluminaire, and the initial lamp lumens above 90 degrees from Nadir.

Fixture Type	Quantity of Installed Luminaires	Initial Lamp Lumens per Luminaires	Initial Lamp Lumens Above 90 degrees from Nadir	Total Lamp Lumens	Total Lamp Lumens Above 90 degrees
				0	0
Total site lamp lumens:				0	
Total Site Lamp Lumens above 90 degrees from Nadir:				0	
Percentage of Site Lamp Lumens above 90 degrees from Nadir (%):				0	

Add Row | Delete Row

This file should be provided separately to show compliance.

Upload exterior photometric site plans showing the LEED project boundary and point-by-point foot candle levels 15ft past boundary. Upload *Files:* 1

Upload a photometric site plan of the parking areas with a footcandle summary tables for av/max/min light ratios (software output), standard or security use (see RP20). Upload *Files:* 1

LEED for New Construction: Design

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Sample LEED Form: Light Pollution Reduction (SSc8) (continued)

☐ Light trespass requirements are met relative to the curb line instead of the site boundary, as the site boundary abuts a public right-of-way (Optional).

☒ For the illuminance generated from a single luminaire placed at the intersection of a vehicular driveway and public roadway accessing the site, the centerline of the public roadway is used as the site boundary for no more than a length of 2 times the driveway width centered at the centerline of the driveway (Optional).

ADDITIONAL DETAILS

☐ Special circumstances preclude documentation of credit compliance with the submittal requirements outlined in this form.

☐ The project team is using an alternative compliance approach in lieu of standard submittal paths.

SUMMARY

SS Credit 8: Light Pollution Reduction Points Documented:	1
SS Credit 8: Light Pollution Reduction Precertification Compliance Documented:	1

LEED for New Construction: Design

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5.201 ENERGY EFFICIENCY

LEED ≥ CG
BSC Guide: 28
LEED: EAp2 [Design]

CALGreen does not require energy efficiency above code minimum. LEED requires at least a 10% improvement, but uses a different baseline. Almost all California projects that comply with the state energy code will meet the LEED threshold; however the documentation and verification requirements for LEED are more stringent than CALGreen.

CALGreen Mandatory Measure Summary:
Meet California Energy Code (Title 24, Part 6-2008, effective January 1, 2010).

LEED Related Credit(s) Summary:
Relates to Energy and Atmosphere Prerequisite 2: Minimum Energy Performance
Meet the minimum 10% energy cost reduction compared to Title 24, Part 6-2005; Title24, Part 6-2008; or ASHRAE 90.1-2007.

Documentation Recommendations for LEED Projects

The LEED rating system allows for projects to pursue this prerequisite using ASHRAE 90.1-2007 or Title 24, Part 6, but requires that the project exceed whichever baseline is used by at least 10% (on a cost basis) for new construction and 5% for major renovation projects.

Note: *In most cases, exceeding ASHRAE 90.1 by 10% by annual energy cost (the LEED metric), is equivalent to exceeding Title 24-2008 by 10% by energy (kBtu/sf*yr). In some special instances, such as industrial, laboratory or large office buildings, ASHRAE 90.1 could result in not achieving at least a minimum California energy code equivalency. Partly this is due to LEED requiring energy models to include process loads whereas California Title 24, Part 6 does not require process to the same extent. Therefore, projects seeking LEED certification for which ASHRAE and Title 24 energy modeling may be significantly different will need to run a Title 24 energy efficiency model regardless of whether they pursue ASHRAE 90.1 through the LEED submittal process.*

There is a prescriptive compliance path in LEED that allows project to use the ASHRAE Advanced Energy Design Guide for various building types or the Advanced Buildings Core Performance Guide on smaller projects. Regardless of the compliance path pursued, the project must comply with local energy code in order to be granted a building permit.

Recommendations to simplify documentation on LEED projects and to comply with CALGreen (if acceptable to the local enforcement agency):

- Submit LEED EAp2 Form showing compliance with Title 24 minimum energy efficiency requirements.

Recommendations for Enforcement & Verification

Although the calculation methodology can vary within LEED, the LEED Prerequisite “whole building energy simulation” exceeds Title-24 by definition. Therefore, provided the local jurisdiction agrees that this is an acceptable equivalency of compliance, accept LEED EAp2 documentation as equivalent for CALGreen compliance. Review the Title 24 energy report for at least minimal compliance.

If a separate Title 24 report is not already part of the submittal package (i.e. in the case where a project uses ASHRAE instead of T24), on a case-by-case basis consider accepting the ASHRAE model as meeting the CALGreen intent for energy compliance, especially on complicated projects for which additional energy modeling is not cost effective for the design teams.

5.303.2 INDOOR WATER USE: 20% SAVINGS

LEED ≥ CG
BSC Guide: 30
LEED: WEp1 [Design]

Both CALGreen and LEED require a 20% reduction in indoor water use. Each system has a slightly different requirement of applicable fixtures and calculation of fixture use. With minor adjustments to the LEED calculator, LEED documentation meets or exceeds CALGreen requirements.

CALGreen Mandatory Measure Summary:
Reduce overall use of potable water within the building by 20% for toilets, urinals, lavatories, showerheads, kitchen faucets and wash fountains. Allows a prescriptive method (refer to Table 5.303.2.3) or a performance method (503.2.2).

LEED Related Credit(s) Summary:
Relates to Water Efficiency Prerequisite 1: Water Use Reduction 20%
Employ strategies that in aggregate use 20% less water than the water use baseline calculation. Must use the performance method (there is no prescriptive method available for LEED). Requirement applies to toilets, urinals, lavatory faucets, and commercial pre-rinse spray valves (for food service).

Documentation Recommendations for LEED Projects

In order to utilize the LEED Form for CALGreen compliance on indoor water use reduction, the performance method calculation must always be used (there is no prescriptive path for LEED).

The LEED Online Form calculator for water efficiency is slightly different than CALGreen's performance method calculation. CALGreen requires a few plumbing fixtures to be included in the calculations which are not mandatory in the LEED formula (but can be added): showerheads, kitchen faucets, wash fountains. However, the LEED Form calculator for WEp1 includes visitors, residents and full-time equivalents (FTEs), whereas CALGreen only includes occupants based on the occupancy estimates of the California Plumbing Code. Therefore, the LEED calculation is more comprehensive in scope than the CALGreen performance method when equivalent fixtures are included in the calculation.

To simplify documentation on LEED projects and to comply with CALGreen, project teams attempting this LEED credit should:

- Choose the performance path for CALGreen.
- Add showerheads, kitchen faucets and wash fountains in the LEED WEp1 Form when included in projects.
- Submit the LEED WEp1 Form showing at least a 20 percent water reduction for indoor usage.
- Provide all back-up documentation for installed water efficiency technologies (cut-sheets, water saving features on installed measures).

Recommendations for Enforcement & Verification

If a LEED project is seeking to use their water efficiency calculations for CALGreen compliance, they will always use the performance method (not the CALGreen "prescriptive" method). Therefore, the LEED Form calculator for WEp1 can be used in place of the CALGreen calculation *if*:

- All CALGreen covered plumbing fixtures (including showerheads, kitchen faucets and wash fountains) are included in the LEED Form calculator, and
- The LEED WEp1 Form shows a 20% reduction in water use, and
- Plan check and on-site enforcement verify the correct fixtures and flow rates are installed, and
- The local jurisdiction agrees that this is an acceptable equivalency of compliance,

Note that the LEED WEp1 Form allows for varying the male/female ratio of occupants, which can have a significant impact on water savings estimates. Following the LEED guidance, a 50/50 ratio is recommended unless there is compelling evidence based on the building use that a different ratio should be used.

Sample LEED Form: Water Use Reduction (WEp1)

LEED 2009 for New Construction and Major Renovations

WE PREREQUISITE 1: WATER USE REDUCTION
20% REDUCTION

All fields and uploads are required unless otherwise noted.

THRESHOLD ATTEMPTED

Points Attempted 0

ALL OPTIONS

The Table. Daily Occupancy below is a linked submittal from PI Form 3: Occupant and Usage Data to be used for reference only. PI Form 3 must be completed before values will display in WE Prerequisite 1. These values should inform, but not necessarily parallel, the numbers entered in the Table. Fixture Groups Definition.

Table. Daily Occupancy

FTE	Average Transients (Student/ Visitor)	Average Retail Customers	Residents	Total
70	10	30	0	110

Fixture Groups Introduction:
This table allows for project occupants to be organized in a way that best represents fixture usage patterns in the project. Occupants can be grouped together or separated into sub-groups at the option of the project team. The usage groups defined must be derived from daily occupancy data for the project building. Accordingly, all project occupants, as recorded in the Daily Occupancy tables from PI Form 3: Occupant and Usage Data must be represented in the Table. Fixture Groups Definition below. All residential occupants should be represented separately from non-residential occupants. Refer to the additional guidance document in the Credit Resources section.

Table. Fixture Groups Definition

Group Name	Annual Days of Operation	FTE	Transients (Student / Visitor)	Retail Customers	Residents	% Female	% Male
O/P ADA	252	4	0	20	0	50	50
O NON ADA	252	66	0	0	0	50	50
O ONLY	252	70	0	0	0	50	50

Sample LEED Form: Water Use Reduction (WEp1) (Continued)

Add Row | Delete Row

Briefly describe the inputs in the Table. Fixture Groups Definition. Explain the methodology used to define each fixture group, as well as the derivation of data in each row. Additionally, provide a detailed explanation if the default gender ratio is not used.

We have 1.28 GPF and dual flush toilets. We have divided the users into 100% of the visitors using the waiting room toilets and 5% of the office workers using the waiting room 1.28 gpf toilets, while 95% of the office workers will use the dual flush 1.6/0.8 gpf units. We have further estimated that 80% of the time, the"low flush"0.8 gpf will be used in lieu of the 1.6"full flush".

This summary is typically provided to explain any anomalies in the fixture types or assumptions.

Table. Flush Fixture Data

Enter flush fixture data for each fixture group defined in the Table. Fixture Groups Definition.

4 people:
2 female x 3 = 6
2 males x 1 = 2

Fixture Groups						Flush Rate (GPF)		Annual Water Consumption (kGal)	
Select	Display	Fixture ID[1]	Fixture Family	Fixture Type	Total Daily Uses[2]	Base-line	In-stalled[3]	IPC/UPC Baseline	Perfor-mance Case
	O/P ADA	WC-1	Water Closet	HET, Gravity	8	1.6	1.28	4.44	3.55
	O NON ADA	WC-2	Water Closet	HET, Dual Flush	132	1.6	0.96	53.22	31.93
	O ONLY	UR-1	Urinal	Non-Water	70	1	0	17.64	0
	O ONLY	UR-1	Urinal	Non-Water	70	1	0	17.64	0
Total calculated flush fixture water use annual volume, baseline case (kGal)						92.94			
Total calculated flush fixture water use annual volume, performance case (kGal)						35.48			
Percent reduction of water use in flush fixtures (%)						61.82			

66 people:
33 female x 3 = 99
33 males x 1 = 33

Make sure the installed flush rates listed herein match what is specified and/or installed in the field.

Add Row | Delete Row

[1] *Define a reference name or descriptor that can be used to identify each fixture family/type.*

[2] *May be modified for special circumstances. Provide a narrative and upload daily use calculations to justify modifications. Refer to the additional guidance document in the Credit Resources section.*

[3] *To account for dual-flush fixtures, enter a weighted average flush rate.*

Table. Flow Fixture Data

Enter flow fixture data for each fixture group defined in the Table. Fixture Groups Definition.

Sample LEED Form: Water Use Reduction (WEp1) (Continued)

Note that LEED uses seconds, CALGreen references minutes.

Fixture Groups							Flow Rate (GPM / GPC)		Annual Water Consumption (kGal)	
Select	Display	Fixture ID[1]	Fixture Family	Fixture Type	tal Daily Uses[2]	Dura-tion (Secs)[2]	Base-line	In-stalled[3]	IPC/ UPC Base-line	Perfor-mance Case
	O/P ADA	lav-1 and	Public Lavatory Fau	IPC/UPC (Convention	16	15	0.5	0.5	0.5	0.5
	O ONLY	s-1	Kitchen Sink	IPC/UPC (Convention	70	240	2.2	1.5	9.7	6.62
	O NON ADA	lav-1 and	Public Lavatory Fau	IPC/UPC (Convention	198	15	0.5	0.5	6.24	6.24
Total calculated flow fixture water use annual volume, baseline case (kGal)						16.44				
Total calculated flow fixture water use annual volume, performance case (kGal)						13.36				
Percent reduction of water use in flow fixtures (%)						18.73				

Make sure the installed flow rates listed here match what is specified and/or installed on site.

Add Row | Delete Row

[1] *Define a reference name or descriptor that can be used to identify each fixture family/type.*

[2] *May be modified for special circumstances. Also, a reasonable estimate MUST be provided for pre-rinse spray valves when selected in the table above. In either case, provide a narrative and upload calculations to justify modifications. Refer to the additional guidance document in the Credit Resources section.*

[3] *When using the metering lavatory faucet, please convert all flow rates in gallons per minute (GPM) to gallons per cycle (GPC) based on duration from the product specifications. Provide a narrative or calculations to support the installed flow rate. The "Duration" is not applicable and therefore should not be modified.*

Upload WEp1-1. Provide the plumbing fixture and fitting schedule for the project highlighting flush and flow rates for all applicable plumbing fixtures and fittings within the project building. Upload *Files:* 1

Table. Flush & Flow Fixtures Summary Statistics

Total calculated fixture water use annual volume, baseline case (kGal)	109.38
Total calculated fixture water use annual volume, performance case (kGal)	48.84
Percent reduction of water use in all fixtures (%)	55.35

A 20% reduction of water use in fixtures is required to document compliance with WE Prerequisite 1.

If plumbing fixtures are correct and this number is greater than or equal to 20%, the project complies with CALGreen requirements.

ADDITIONAL DETAILS

☐ Special circumstances preclude documentation of credit compliance with the submittal requirements outlined in this form.

☐ The project team is using an alternative compliance approach in lieu of standard submittal paths.

SUMMARY

WE Prerequisite 1: Water Use Reduction - 20% Reduction Compliance Documented:	Y

5.303.2.1 MULTIPLE SHOWERHEADS SERVING ONE SHOWER

LEED ≤ CG
BSC Guide: 31
LEED: WEp1 [Design]

Though rarely found on commercial projects seeking LEED, should any showers include multiple showerheads, those fixtures must meet the CALGreen requirements.

CALGreen Mandatory Measure Summary:
Multiple showerheads in any single shower shall equal the maximum flow rate of a single showerhead.

LEED Related Credit(s) Summary:
Relates to Water Efficiency Prerequisite 1: Water Use Reduction 20%
Employ strategies that in aggregate use 20% less water than the water use baseline calculation. Must use the performance method (there is no prescriptive method available for LEED). This measure includes toilets, urinals, lavatory faucets, and commercial pre-rinse spray valves (for food service).

Documentation Recommendations for LEED Projects

See the previous section for a description of how to document water efficiency compliance with CALGreen via LEED submittals.

To meet the requirement for multiple showerheads serving one shower, make sure that fixtures for showerheads meet the criteria for CALGreen (maximum flow rate of 2.5 gallons per minute per shower). Include showerheads in the LEED WEp1 Form calculator as submitted for verification.

Recommendations for Enforcement & Verification

The LEED Form calculator for WEp1 is possible to be used for verifying showerhead efficiencies if all showers systems are compliant with CALGreen maximum flow rates (and provided this is an acceptable compliance alternative to the local jurisdiction). In addition, a plan check and/or field inspection of said shower systems, if installed, is recommended.

5.303.4 WASTEWATER REDUCTION

LEED ≥ CG
BSC Guide: 32
LEED: WEc2 [Design]

The LEED threshold reduction (50%) is much more stringent than CALGreen (20%). Therefore if a project obtains this credit in LEED it meets the CALGreen requirements.

CALGreen Mandatory Measure Summary:
Reduce generation of wastewater by 20% through installation of water-conserving fixtures meeting the criteria established in 5.303.2 or utilizing non-potable water systems.

LEED Related Credit(s) Summary:
Relates to optional credit Water Efficiency Credit 2: Innovative Wastewater Technologies
Reduce potable water use for building sewage conveyance by 50% using:

- Efficient fixtures (toilets & urinals); or
- Flush with non-potable water; or
- Onsite wastewater treatment to tertiary standards.

Documentation Recommendations for LEED Projects

The LEED WEc2 Form calculator for wastewater reduction is different than CALGreen's water efficiency calculation because the LEED calculator is more stringent. LEED requires higher percentages of wastewater reduction (50%) to earn the credit. Furthermore, LEED does not allow graywater to be used in calculating the wastewater reduction percentage unless graywater is used to flush toilets or urinals. CALGreen, however, requires only a 20% reduction in wastewater overall, and allows several options to meet the requirement including using graywater for landscape irrigation.

Recommendations to simplify documentation on LEED projects and to comply with CALGreen (if acceptable to the local enforcement agency):

- Choose the performance path for CALGreen.
- Submit the LEED WEc2 Form showing at least a 50 percent wastewater reduction (in order to meet the LEED credit requirements).
- Provide cut-sheets showing consumption rates and model for technology installed.
- Provide information related to availability of any non-potable water sources and schematics supporting the design and installation of wastewater treatment, reduction, and recycling systems employed on site.

Recommendations for Enforcement & Verification

The LEED standards for WEc2 are difficult to meet and are therefore rarely achieved on LEED projects. Because the LEED threshold is higher than CALGreen (50% wastewater reduction as compared to 20%) and since the criteria in LEED for wastewater offsets are more stringent than CALGreen, the LEED standard is always more stringent than CALGreen when the credit is achieved. Therefore, provided the local jurisdiction agrees that this is an acceptable equivalency of compliance, LEED documentation can be used to satisfy the CALGreen requirements.

Sample LEED Form: Innovative Wastewater Technologies (WEc2)

LEED 2009 for New Construction and Major Renovations
WE CREDIT 2: INNOVATIVE WASTEWATER TECHNOLOGIES

All fields and uploads are required unless otherwise noted.

The baseline for WE Credit 2 is derived from the flush fixture water usage data provided in the WE Prerequisite 1: Water Use Reduction - 20% Reduction. The WE Prerequisite 1 form must be completed before compliance with WE Credit 2 can be documented. The following summary table is a linked submittal.

Table. Flush Fixture Summary

Total calculated flush fixture water use annual volume, baseline case (kGal)	109.6
Total calculated flush fixture water use annual volume, performance case (kGal)	68.5
Percent reduction of water use in flush fixtures (%)	38

Data is derived from prerequisite performance path option

Select one of the following:

- (●) **Option 1:** In the project building, potable water use for building sewage conveyance is reduced by at least 50% through the use of high-efficiency flush fixtures (water closets, urinals) and/or non-potable water (captured rainwater, recycled greywater, and on-site or municipally treated wastewater).
- ( ) **Option 2:** In the project building, at least 50% of wastewater is treated on-site to tertiary standards. Treated water is infiltrated or used on-site.

OPTION 1

☒ The project building uses non-potable water for sewage conveyance, in addition to or in lieu of using high-efficiency flush fixtures, in the following annual quantities. (Optional)

All strategies are eligible for CALGreen, except "On-Site Treated Wastewater"

Captured rainwater:	28.9	kGal
Recycled greywater:	41.2	kGal
~~On-site treated wastewater:~~	0	kGal
Municipally treated wastewater:		kGal
Other:		kGal

Upload WEc2-1. Provide plumbing drawings and calculations that illustrate nonpotable water systems supporting the quantities entered.

Upload *Files: 1*

LEED 2009 for New Construction and Major Renovations Page 1 of 2

Sample LEED Form: Innovative Wastewater Technologies (WEc2) (Continued)

Table. Potable Water Reduction Summary

Annual volume of nonpotable water used for sewage conveyance (kGal)	70.1
Percent reduction of potable water use for sewage conveyance (%)	101.46

A 50% reduction of potable water use for sewage conveyance is required to document compliance with WE credit 2.

For CALGreen, only 20% reduction is needed

ADDITIONAL DETAILS

☐ Special circumstances preclude documentation of credit compliance with the submittal requirements outlined in this form.

☐ The project team is using an alternative compliance approach in lieu of standard submittal paths.

SUMMARY

WE Credit 2: Innovative Wastewater Technologies Points Documented:	2
WE Credit 2: Innovative Wastewater Technologies Exemplary Performance Documented:	Y

☒ The project team reserves one point in the Innovation in Design credit category for exemplary performance in WEc2.

LEED 2009 for New Construction and Major Renovations
WE Credit 2 : Innovative Wastewater Technologies

Page 2 of 2

5.304.1 OUTDOOR WATER USE: WATER BUDGET

LEED ≥ CG

BSC Guide: 34-36
LEED: Wec1 [Design]

LEED requires deeper water conservation than CALGreen, except where local ordinances may be more stringent. CALGreen also requires an audit report to be filed from a certified landscape irrigation auditor.

CALGreen Mandatory Measure Summary:
Water consumption in landscape irrigation must meet local water efficient landscape ordinance or CA Model Water Efficient Landscape Ordinance (WELO or MLO). Requires at least a 30% reduction in ET_O times landscape area.

LEED Related Credit(s) Summary:
Relates to optional credit Water Efficiency Credit 1: Water Efficient Landscaping
At least 50% reduction compared to average water use for irrigation using a midsummer baseline.

Documentation Recommendations for LEED Projects

LEED is more stringent than WELO/MLO and most local ordinances as it requires a 50% irrigation water reduction. However, WELO/MLO outlines more detailed guidance on implementation and requires an audit to be conducted by a certified landscape irrigation auditor. If a local requirement exists, check to ensure that LEED compliance will meet the CALGreen requirements.

Recommendations to simplify documentation on LEED projects and to comply with CALGreen (if acceptable to the local enforcement agency):

- Provide LEED WEc1 Form showing baseline and design case with a minimum of 50% reduction.
- Provide an audit report from a certified landscape irrigation auditor.
- If applicable, provide documentation that illustrates non-potable water systems and their reduction quantities.

Recommendations for Enforcement & Verification

Unless a local ordinance is more stringent than LEED, assume that achieving the LEED WEc1 credit will meet the CALGreen requirements as long as a report from a certified landscape irrigation auditor is included. Provided the local jurisdiction agrees that this is an acceptable equivalency of compliance, accept the LEED WEc1 calculation Form in lieu of additional CALGreen calculations.

Alameda County Tip

*The **Bay-Friendly Landscaping** program is required on some projects in Alameda County. Check with your local jurisdiction for program specifics.*

The Bay-Friendly Landscaping program maintains a website with helpful information regarding Bay-Friendly's overlap with MLO/WELO, LEED, and other local resources.
www.Bay-Friendly.org

5.304.3 IRRIGATION DESIGN

LEED ≤ CG

BSC Guide: 38
LEED: WEc1 [Design]

The LEED calculations for irrigation water use do not require controllers, but projects that seek the LEED credit and install a CALGreen compliant controller can meet the CALGreen requirement.

CALGreen Mandatory Measure Summary:
For new non-residential construction sites with between 1,000 and 2,500 square feet of landscaped area, provide weather- or soil moisture-based controllers that automatically adjust in response to plants' needs as weather conditions change.

Note: for sites with over 2,500 square feet of landscape area, the Model Water Efficient Landscape Ordinance (WELO, aka MLO) applies. WELO requires that irrigation controllers utilize either evapotranspiration or soil moisture sensor data. Additionally, some local jurisdictions may have adopted more stringent ordinances, including Bay-Friendly Landscaping ordinances.

LEED Related Credit(s) Summary:
Relates to optional credit Water Efficiency Credit 1: Water Efficient Landscaping
WEc1.1: 50% reduction compared to average water use for irrigation using a midsummer baseline. An irrigation controller is not required but can be included and calculated.
WEc1.2: No potable water use or irrigation. An irrigation controller is not required but can be included and calculated (if a permanent irrigation system is installed). This LEED credit requires any non-permanent irrigation system—such as in xeriscaped landscapes—to only be in place for 1 year.

Documentation Recommendations for LEED Projects

Before seeking this credit, check local ordinances for standards more stringent than CALGreen or LEED.

The LEED WEc1.1 Form takes into consideration the integration of controller efficiency. To simplify documentation on LEED projects and to comply with CALGreen, project teams attempting this LEED credit should:

- Submit the WEc1 Form.
- Ensure utilization of weather based controller.
- Provide description of controller type installed.
- For weather based controls, provide description of integral sensor or separate sensor installed (as per CALGreen).

For project sites attempting WEc1.2 (no potable water use), a permanent irrigation system may not be included in the project scope. In that case, to simplify documentation on LEED projects and to comply with CALGreen, project teams attempting this LEED credit should:

- Submit the WEc1 Form showing no potable water use using Option 1 or 2.
- Provide a narrative as to why no irrigation system is being installed.
- Ask for a waiver from this requirement.

Recommendations for Enforcement & Verification

If LEED documentation includes a CALGreen compliant irrigation controller, then accept WEc1 Form(s) and associated documentation as meeting the CALGreen requirement.

Note: for sites that achieve 100% water reduction and thus do not need permanent irrigation:
For WEc1.2 Option 1 & 2, provided the local jurisdiction agrees that this is an acceptable equivalency of compliance, consider waiving this requirement and accept any controller used for temporary landscape irrigation system since the controller only serves to function for plant establishment (1-year). ,.

5.408.1-3 Construction & Demolition (C&D) Waste Management

LEED = CG
NR Guide p. 41-44
LEED: MRc2 [Construction]

Local recycling requirements are often more stringent than both CALGreen and LEED. LEED documentation is equivalent to CALGreen when an acceptable Waste Management Plan (WMP) is submitted along with the LEED Form.

CALGreen Mandatory Measures Summary:
5.408.1 & 5.408.2: Develop a Construction Waste Management Plan (WMP) or meet local ordinance, whichever is more stringent.
5.408.3: Recycle and/or salvage for reuse a minimum of 50% of non-hazardous construction and demolition (C&D) debris, or meet a local C&D waste management ordinance, whichever is more stringent. Exclude excavated soil and land clearing debris from calculations.
5.408.4: 100% of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled.

LEED Related Credit(s) Summary:
Relates to Materials and Resources Credit 2: Construction Waste Management
Develop and implement a C&D WMP that covers construction, deconstruction and demolition. Divert at least 50% of C&D debris, excluding excavated soil and land clearing debris (such as soil, vegetation and rocks).

Alameda County Tips
Many Alameda County jurisdictions require the recycling of 100% of inert materials (concrete, dirt, asphalt, etc.) and at least 50% of the remaining waste.

eC&D WMP
Web-based tools are available for creating electronic Waste Management Plans, permit filing, and summary reports. Check with your building department for details.

To see a list of Alameda County diversion requirements and an overview of eC&D WMPs, visit www.BuildGreenNow.org and click on "Construction & Demolition Recycling" from the left-hand side menu.

Documentation Recommendations for LEED Projects

Although the back-up documentation for CALGreen or LEED will be the same, unlike some other LEED credits, the LEED Form itself may not be suitable for meeting CALGreen documentation requirements. This is because the LEED Form is a summary of a project's C&D WMP and is not necessarily in a suitable format for CALGreen or local ordinance compliance. Therefore, to document compliance with CALGreen on LEED projects, utilize an acceptable C&D WMP report format. The C&D WMP will be used to fill out the LEED Form in most cases and serve as back-up documentation.

Tips to comply with CALGreen and simplify documentation on LEED projects:

- Separate and recycle 100% of trees, stumps, rocks, soils, and vegetation from the jobsite.
- Obtain and use the local jurisdiction's C&D WMP forms. If none exist, utilize the sample form found on StopWaste.Org's website, so long as it is acceptable to the enforcement agency.
- Use the results of this C&D WMP for inputting into the LEED MRc2 Form showing a minimum of 50% waste recycling (or other local requirement if more stringent).
- Keep records of all material types, quantities and diversion efforts.
- If materials are sent to mixed materials recycling centers, apply average recycling rates to the total amount of materials sent to the facility during the time of construction/demolition. Utilize third-party audited recycling rates if available. See the next page for a list of Alameda County mixed material recycling facilities and average recycling rates. Use the recycling percentages that include Alternative Daily Cover (ADC).

Recommendations for Enforcement & Verification

Review the LEED Form (if submitted) for overall recycling percentage. Request and review the C&D WMP to ensure that 100% of trees, stumps, rocks, soils, and vegetation (and other local requirements) are accounted appropriately in these calculations. Double-check facility recycling rates for any loads sent to mixed-material recycling centers.

Diversion/Recycling Rates for Local Mixed C&D Processing Facilities

GREEN BUILDING
in Alameda County

DIVERSION/RECYCLING RATES FOR LOCAL MIXED C&D PROCESSING FACILITIES

StopWaste.Org does not endorse the use of any one facility over another. Diversion rate information is provided by the processing facilities and is not third party verified. StopWaste.Org conducted site tours of each facility to ensure that equipment and procedures were in place to process materials as identified in their diversion reporting and documentation .

StopWaste.Org selected facilities based on requests from Alameda County city representatives who identified facilities as processing C&D materials from Alameda County projects.

FACILITY	MATERIALS	Alternative Daily Cover (ADC) %	Diversion w/out ADC	Diversion including ADC	LEED / GPR Diversion Rate
1. BERKELEY TRANSFER STATION	Mixed C&D [1]	12%	68%	80%	80%
2. BLUE LINE TRANSFER INC	Mixed C&D	10%	80%	90%	90%
3. DAVIS STREET TRANSFER STATION	Mixed C&D [2]	12%	59%	71%	71%
4. GREENWASTE MATERIAL RECOVERY FACILITY	Mixed C&D	0%	73%	73%	73%
5. NEWBY ISLAND SANITARY LANDFILL	Mixed C&D	21%	64%	84%	84%
6. PLEASANTON GARBAGE SERVICE	Mixed C&D	0%	51%	51%	51%
7. PREMIER RECYCLING COMPANY	Mixed C&D	0%	74%	74%	74%
8. SF RECYCLING & DISPOSAL iMRF	Mixed C&D	30%	38%	67%	67%
9. SRDC RECYCLING/FERMA	Mixed C&D	26%	67%	93%	93%
10. ZANKER MATERIALS PROCESSING	Total for facility	18%	58%	76%	76%
FACILITY AND ZANKER ROAD LANDFILL	Mixed C&D (C&D sortline)	33%	46%	79%	
	Mixed Demolotion (Demo plant)	0	72%	72%	

1 Berkeley Transfer Station processes a portion of their C&D materials on-site and sends other materials off-site for processing, diversion rate based on 3 separate periodic "audit" sorts

[2] Davis Street Transfer Station processess multiple materials streams, C&D diversion rates based on 5 separate periodic "audit"

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5.410.1 RECYCLING BY OCCUPANTS

LEED = CG
BSC Guide p. 45
LEED: MRp1 [Design]

CALGreen and LEED have identical requirements. Therefore, LEED documentation will fulfill CALGreen requirements.

CALGreen Mandatory Measures Summary:
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 and metals. Refer to local requirements for size and/or placement of recycling areas (if any such requirements exist).

LEED Related Credit(s) Summary:
Relates to Material and Resources Prerequisite 1: Storage Collection of Recyclables
Provide areas for the depositing, storage, and collection of non-hazardous materials for recycling. Materials must include at a minimum paper, corrugated cardboard, glass, plastic, and metals.

Documentation Recommendations for LEED Projects

CALGreen and LEED have identical requirements for mandatory recycling collection. If local requirements are more stringent than CALGreen or LEED, then both CALGreen and LEED must meet or exceed those local requirements. Therefore, LEED documentation will fulfill CALGreen requirements.

In California, new buildings have been required to provide adequate space for recycling since 1993 when a recycling ordinance was required by law in every jurisdiction (the CALGreen referenced state model ordinance of 1993 is found online at: www.calrecycle.ca.gov/LGCentral/Library/LocalDocs/Policy.htm). Some jurisdictions have amended the state law and have stricter recycling requirements, which may include minimum recycling area size, bin location guidelines, or differing collection material types. Check local requirements for specific requirements.

Neither LEED nor CALGreen stipulate the size of adequate recycling areas for buildings. The LEED Reference Guide lists guidelines for minimum recycling area in office buildings, duplicated from the City of Seattle's recycling ordinance (shown at right).

LEED Reference Guide 2009
Recycling Area Guidelines

Commercial Building (sf)	Minimum Recycling Area (sf)
0 to 5,000	82
5,001 to 15,000	125
15,001 to 50,000	175
50,001 to 100,000	225
100,001 to 200,000	275
200,001 or greater	500

Recommendations to simplify documentation on LEED projects and to comply with CALGreen (if acceptable to the local enforcement agency):

- Comply with local ordinance if more stringent. Otherwise, comply with the CALGreen/LEED list of recycling materials necessary for collection.
- Show readily accessible recycling areas on the plans (site and/or floor plans) and indicate signage.
- Submit the LEED-Online MRp1 Form and site plan or photos showing the location of storage area and materials included.

Recommendations for Enforcement & Verification

Provided the local jurisdiction agrees that this is an acceptable equivalency of compliance, accept LEED submittals to meet this CALGreen requirement.

If the recycling area(s) on the plans seem inadequate, or if no local requirements or guidelines exist, use the size ranges found in the LEED Reference Guide as a proxy for adequate recycling areas.

Sample LEED Form: Storage & Collection of Recyclables (MRp1)

LEED for New Construction: Design

MR PREREQUISITE 1: STORAGE AND COLLECTION OF RECYCLABLES

All fields and uploads are required unless otherwise noted.

THRESHOLD ATTEMPTED

Points Attempted 0

Describe the size, accessibility and dedication of recycling storage areas in the project building. Include the expected volume for the entire space as well as pick-up frequencies. Demonstrate that recycling storage areas are adequately sized and located.

Example-

(Max 2500 Characters)

Description should correspond with documentation shown in site plan or other drawing.

The recycled area is sized for the following material types (check all that apply):

- ☒ Paper
- ☒ Corrugated cardboard
- ☒ Glass
- ☒ Plastics
- ☒ Metals

A floorplan highlighting recycling storage areas is required to document credit compliance. The floorplan below is a linked submittal. (If no document is present, you may upload one now.)

Upload representative floorplans for the project building. Upload *Files:* 2

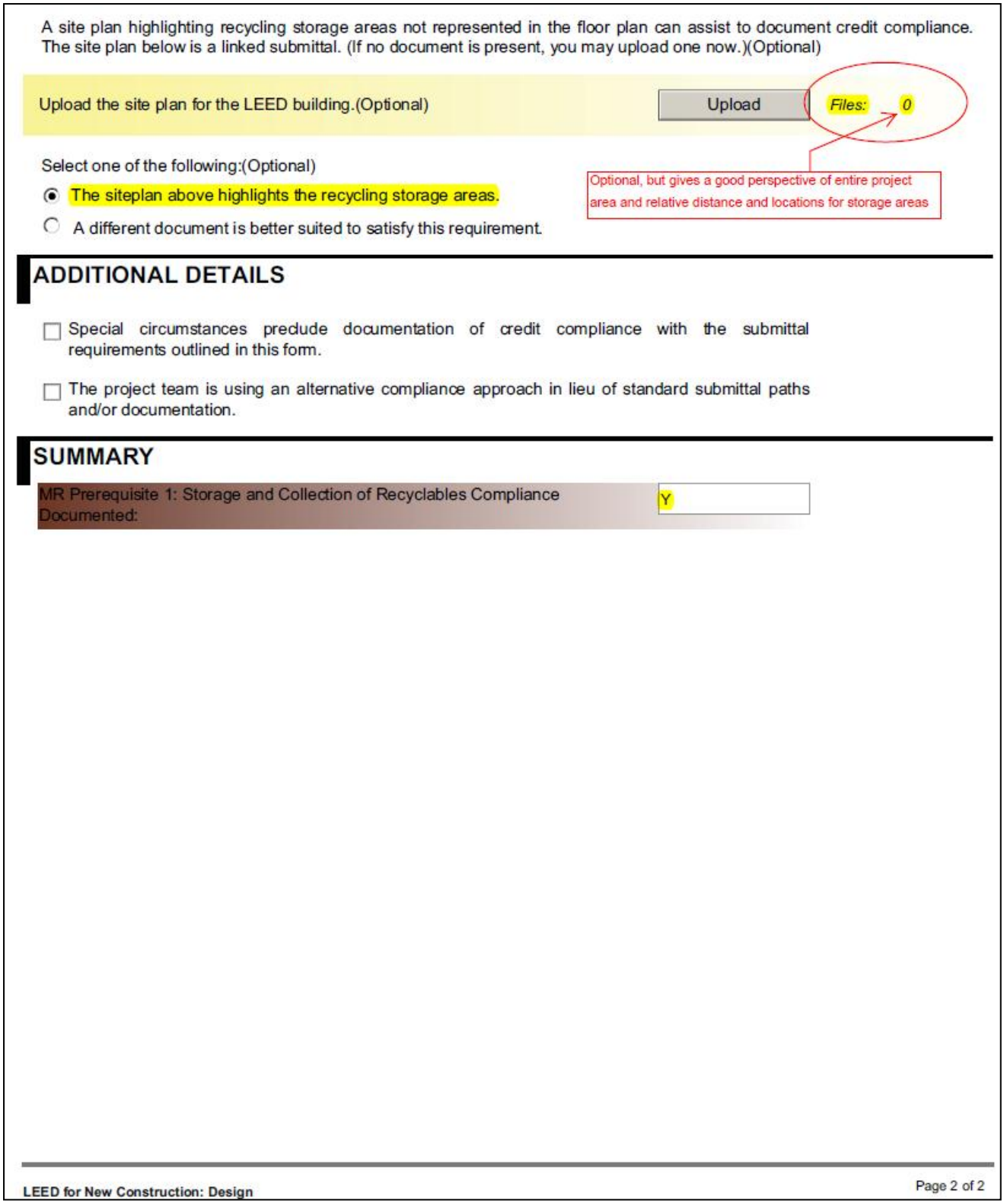
Floor plans need to highlight recycling storage areas for each material.

Select one of the following:

- ◉ The floorplan above shows the recycling storage areas.
- ○ A different document is better suited to satisfy this requirement.

LEED for New Construction: Design Page 1 of 2

Sample LEED Form: Storage & Collection of Recyclables (MRp1) (Continued)



A site plan highlighting recycling storage areas not represented in the floor plan can assist to document credit compliance. The site plan below is a linked submittal. (If no document is present, you may upload one now.)(Optional)

Upload the site plan for the LEED building.(Optional) Upload Files: 0

Optional, but gives a good perspective of entire project area and relative distance and locations for storage areas

Select one of the following:(Optional)

- (•) The siteplan above highlights the recycling storage areas.
- ( ) A different document is better suited to satisfy this requirement.

ADDITIONAL DETAILS

- [ ] Special circumstances preclude documentation of credit compliance with the submittal requirements outlined in this form.
- [ ] The project team is using an alternative compliance approach in lieu of standard submittal paths and/or documentation.

SUMMARY

MR Prerequisite 1: Storage and Collection of Recyclables Compliance Documented:	Y

LEED for New Construction: Design

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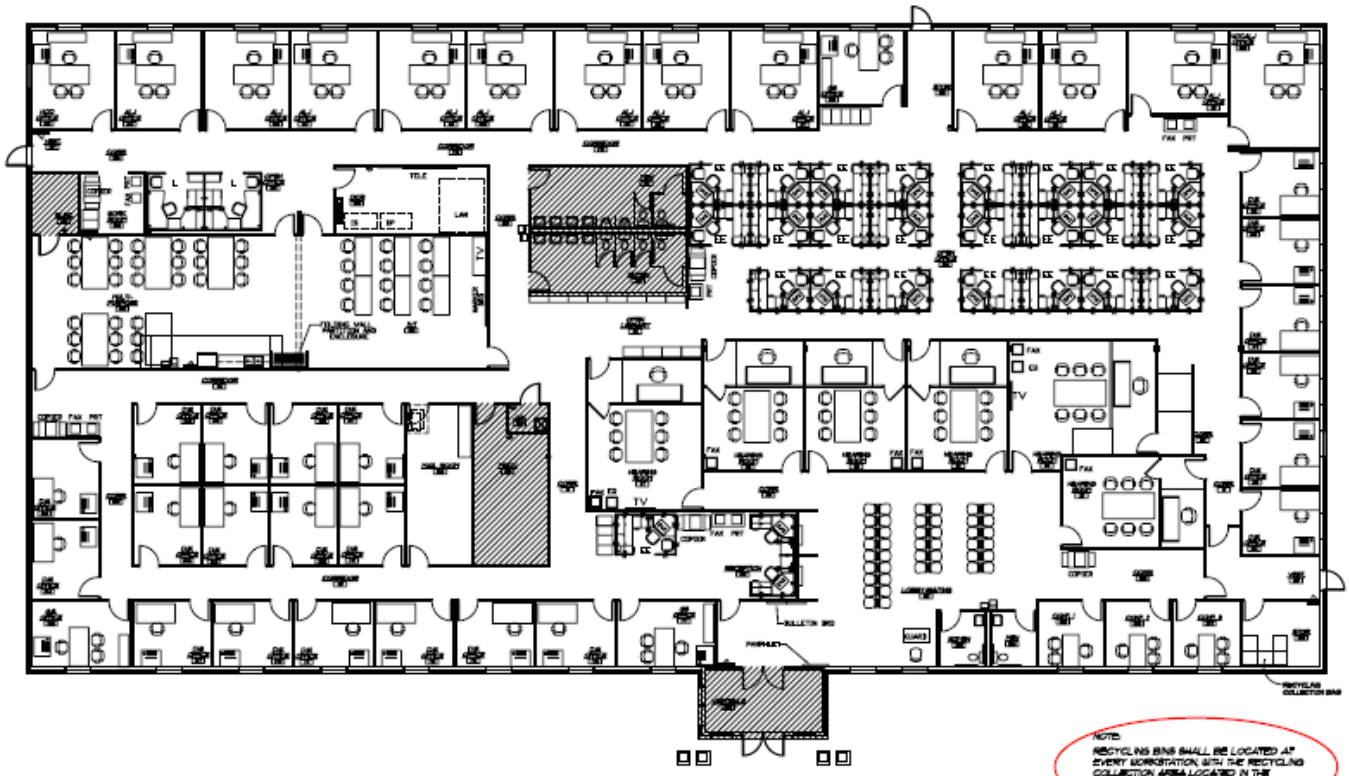
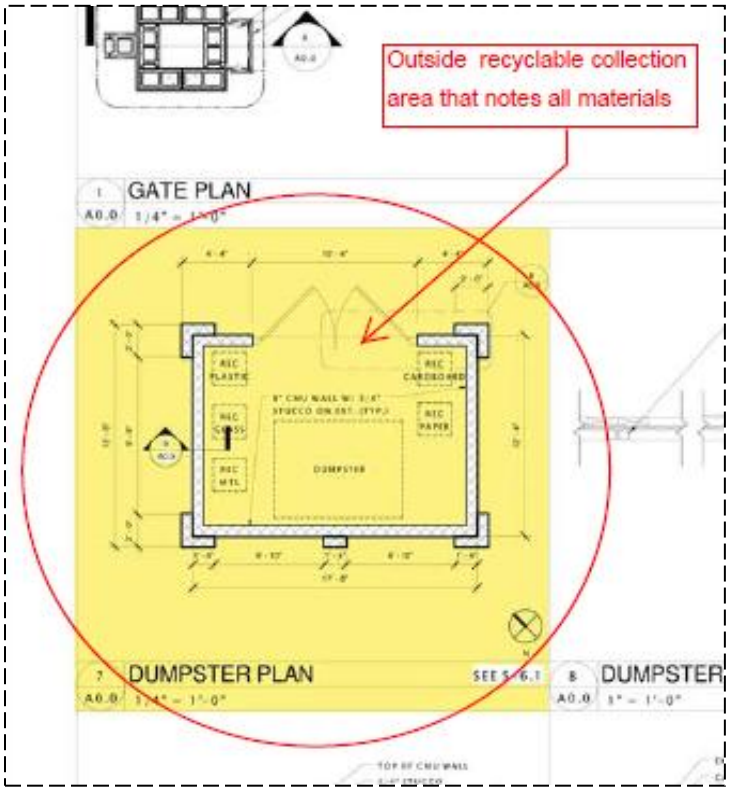
Sample Recycling Collection Plans





5.410.2 COMMISSIONING

LEED = CG

BSC Guide: 46 - 63
LEED: EAp1 & EAc3 [Constr.]

LEED has more stringent requirements as to who can perform commissioning tasks on large projects (>50,000sf). However, a LEED project will need to add a few aspects of commissioning that are required in CALGreen (but are optional in LEED) in order for documentation to be equivalent.

CALGreen Mandatory Measure Summary:
For new buildings 10,000 square feet and over, building commissioning (Cx) is required.

LEED Related Credit(s) Summary:
Relates to Energy and Atmosphere Prerequisite 1: Fundamental Commissioning
Verify that the project's energy-related systems are installed, calibrated, and performing according to the owner's project requirements, basis of design, and construction documents. Commissioning agent must be independent of design team on projects >50,000sf.

Relates to Energy and Atmosphere Credit 3: Enhanced Commissioning
Conduct design peer reviews of owner's project requirements, basis of design, and design documents prior to 50% Construction Documents; review contractor's submittals, develop a systems manual, verify that training of operating personnel and building occupants are completed; and pre-warranty systems review.

A note on commissioning activities post construction:
Some aspects of commissioning in CALGreen and LEED will take place after building permits are typically issued, such as systems training. LEED has a process framework for guaranteeing this work is completed that can be relied upon by enforcement agencies. Further, LEED certified projects will not be certified until after commissioning is proven to have taken place, adding another level of assurance for LEED projects.

Documentation Recommendations for LEED Projects

Both CALGreen and LEED require commissioning of all energy-related systems. CALGreen also requires three additional requirements beyond LEED minimums: 1) a systems manual, 2) commissioning of irrigation systems, and 3) training on systems being commissioned. So long as these three requirements are included in the LEED project commissioning scope of work, CALGreen requirements have been met. Additionally, LEED specifies that the Commissioning Agent (C_xA) be well qualified, and, for larger LEED projects, the C_xA must be independent of the design team. CALGreen has more relaxed requirements for qualified commissioning agents and does not require independence on large projects.

Recommendations to simplify documentation on LEED projects and to comply with CALGreen (if acceptable to the local enforcement agency):

- For projects that only pursue LEED Fundamental Commissioning (EAp1):
  - Ensure that all energy-related systems plus water irrigation and water reuse systems are included in the commissioning scope
  - Include scopes of work for a systems manual and systems training in accordance with CALGreen requirements.
- For projects that pursue the LEED prerequisite plus Enhanced Commissioning (EAp1 + EAc3):
  - The systems manual and training aspects of CALGreen commissioning will have been met. Ensure that irrigation and water reuse systems are included in the commissioning activities.

Recommendations for Enforcement & Verification

Provided the local jurisdiction agrees that this is an acceptable equivalency of compliance, commissioning for LEED projects with the modifications noted above are equivalent to CALGreen. Accept LEED documentation as fulfilling CALGreen.

CALGreen Commissioning vs. Industry Standard Practice & LEED

(Copied from the Introductory Section)

CALGreen Reference No.	CALGreen Non-Residential Commissioning (Cx) Requirements	Industry Standard Practice	CALGreen Non-Residential	Req. in LEED (EAp1)	Achieved via Optional LEED Credit (EAc3)
5.410.2	Commissioning	-	Required for all buildings greater than 10,000sf	✓*	✓
5.410.2.1	Owner's Project Requirements (OPR)	-		✓	✓
5.410.2.2	Basis of Design (BOD)	-		✓*	✓
5.410.2.3	Commissioning plan	-		✓	✓
5.410.2.4	Functional performance testing (FPT)	-		✓	✓
5.410.2.5	Documentation & training	-		**	✓
5.410.2.6	Commissioning report	-		✓	✓
5.410.4.2	Testing and adjusting - Systems	✓	Required for all buildings less than 10,000s.f.	LEED requires commissioning of all buildings undergoing certification, therefore these measures are achieved	
5.410.4.3	Testing and adjusting - Procedures	✓			
5.410.4.3.1	HVAC balancing	✓			
5.410.4.4	Testing, Adjusting & Balancing Reporting	✓			
5.410.4.5	Operation and maintenance manual	✓			

**This criteria is met if LEED projects opt to commission irrigation systems and water reuse systems (which are optional in LEED but required in CALGreen).*

*** Systems manuals and systems training are optional in fundamental LEED commissioning but are required in the optional LEED Enhanced Commissioning Credit*

For further information on commissioning in CALGreen, see the Building Standard Commissions' CALGreen webpage for sample commissioning documents, forms and templates. www.bsc.ca.gov.

Sample documents can be found at the Building Standards Commission website: www.documents.dgs.ca.gov/bsc/CALGreen/FTP-SAMPLE-TEMPLATE.pdf and the California Commissioning Collaborative website: www.cacx.org.

5.410.3 TESTING AND ADJUSTING

LEED ≥ CG

BSC Guide: 64-65
LEED: EAp1 & EAc3 [Constr.]

Since LEED Commissioning requirements are more restrictive than CALGreen's Testing and Adjusting measure, as long as the irrigation system is tested and adjusted as CALGreen requires, consider LEED projects compliant under CALGreen.

CALGreen Mandatory Measure Summary:
Testing and adjusting of systems shall be required for buildings less than 10,000 square feet.

LEED Related Credit(s) Summary:
Relates to Energy and Atmosphere Prerequisite 1: Fundamental Commissioning
Verify that the project's energy-related systems are installed, calibrated, and perform according to the owner's project requirements, basis of design, and construction documents. Commissioning agent must be independent of design team.

Documentation Recommendations for LEED Projects

LEED requires commissioning of all energy-related systems in all projects regardless of size, therefore is more stringent than CALGreen's testing and adjusting measure requirements with the exception of irrigation systems.

Recommendations to simplify documentation on LEED projects and to comply with CALGreen (if acceptable to the local enforcement agency):

- For projects that pursue LEED Fundamental Commissioning (EAp1) and/or the Enhanced Commissioning (EAc3):
  - Ensure that all energy-related systems plus water irrigation and water reuse systems are included in the commissioning scope.

Recommendations for Enforcement & Verification

To simplify enforcement and verification for LEED projects under CALGreen, enforcement agencies should:

- Accept all LEED EAp1 and EAc3 documentation as equivalent for CALGreen compliance.
- Ensure that landscape irrigation systems are included in the commissioning scope.

5.504.3 Covering of Duct Openings & Protection of Mechanical Equipment During Construction

LEED ≥ CG

BSC Guide: 67
LEED: IEQc3.1 [Constr.]

Where a LEED project achieves this credit, accept the LEED documentation as equivalent since those projects will have addressed mechanical equipment in addition to pathway interruption, source control, material scheduling and housekeeping practices during construction.

CALGreen Mandatory Measure Summary:
While being stored on the construction site and until final startup of the heating and cooling 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 or debris which may collect in the system.

LEED Related Credit(s) Summary:
Relates to optional credit Indoor Environmental Quality Credit 3.1: Construction Indoor Air Quality Management Plan-During Construction
Protect materials from moisture damage and protect return air grills. Meet Sheet Metal and Air Conditioning Contractors National Association (SMACNA) guidelines for Occupied Buildings Under Construction. The referenced SMACNA standards addresses control measures for HVAC Protection, Source Control, Pathway Interruption, Housekeeping and Scheduling.

Documentation Recommendations for LEED Projects

CALGreen's requirement is limited to protection of ducts and air distribution equipment, which is included in LEED's multiple requirements; therefore LEED's requirements are more stringent for projects where this measure is pursued.

Recommendations to simplify documentation on LEED projects and to comply with CALGreen (if acceptable to the local enforcement agency):

- Provide IEQc3.1 Construction Indoor Air Quality Management Plan
- Provide photos with date stamps, narrative, or report describing efforts made to safeguard mechanical equipment and duct openings throughout construction process

Recommendations for Enforcement & Verification

To simplify enforcement and verification for LEED projects under CALGreen, enforcement agencies should:

- Review documentation for compliant efforts and ensure they correspond with dates of construction activity.
- Accept all LEED EAc3.1 documentation as equivalent for CALGreen compliance

5.504.4.1 FINISHED MATERIAL POLLUTANT CONTROL: ADHESIVES, SEALANTS, AND CAULKS

LEED = CG
BSC Guide: 68
LEED: IEQc4.1 [Constr.]

While the reference standards differ, the actual product requirements are nearly identical between LEED and CALGreen and should be assumed equal.

CALGreen Mandatory Measure Summary:
Comply with VOC limits in SCAQMD Rule 1168 VOC limits and California Code of Regulations Title 17 for aerosol adhesives.

LEED Related Credit(s) Summary:
Relates to optional credit Indoor Environmental Quality Credit 4.1: Low-Emitting Materials: Adhesives and Sealants
Adhesives and Sealants must meet SCAQMD Rule 1168 VOC limits and aerosol adhesives must meet Green Seal standard GS-36.

Documentation Recommendations for LEED Projects

The requirements of CALGreen and LEED are nearly identical for all products covered by this measure. There is one case where CALGreen is more stringent: special purpose aerosol "Polyolefin and Laminate Repair /Edgebanding Adhesive."

Recommendations to simplify documentation on LEED projects and to comply with CALGreen (if acceptable to the local enforcement agency):

- Ensure that, if used, "Polyolefin and Laminate Repair/Edgebanding Adhesives" are within the CALGreen VOC limit.
- Submit IEQc4.1 Form listing all adhesives, sealants, and caulks.
- Provide cutsheets noting product VOC levels.

Recommendations for Enforcement & Verification

To simplify enforcement and verification for LEED projects under CALGreen, enforcement agencies should:

- Verify that any "Polyolefin and Laminate Repair/Edgebanding Adhesives" are within the CALGreen VOC limit.
- Accept all LEED IEQc4.1 documentation as equivalent for CALGreen compliance so long as VOC limits are within allowable ranges.

Low-Emitting (VOC) Material Limits & Standards for CALGreen 2010

Finished Material- Adhesives and Sealants

Classification of Material	VOC Limit [g/L less water]	Applicable Standard
Adhesives		
Indoor Carpet Adhesives	50	SCAQMD Rule #1168
Carpet Pad Adhesives	50	SCAQMD Rule #1168
Outdoor Carpet Adhesives	150	SCAQMD Rule #1168
Wood Flooring Adhesive	100	SCAQMD Rule #1168
Rubber Floor Adhesives	60	SCAQMD Rule #1168
Subfloor Adhesives	50	SCAQMD Rule #1168
Ceramic Tile Adhesives	65	SCAQMD Rule #1168
VCT & Asphalt Tile Adhesives	50	SCAQMD Rule #1168
Drywall and Panel Adhesives	50	SCAQMD Rule #1168
Cove Base Adhesives	50	SCAQMD Rule #1168
Multipurpose Construction Adhesives	70	SCAQMD Rule #1168
Structural Glazing Adhesives	100	SCAQMD Rule #1168
Single-Ply Adhesives	250	SCAQMD Rule #1168
Other Adhesives Not Listed	50	SCAQMD Rule #1168
Specialty Applications		
PVC Welding	510	SCAQMD Rule #1168
CPVC Welding	490	SCAQMD Rule #1168
ABS Welding	325	SCAQMD Rule #1168
Plastic Cement Welding	250	SCAQMD Rule #1168
Adhesive Primer for Plastic	550	SCAQMD Rule #1168
Contact Adhesive	80	SCAQMD Rule #1168
Special Purpose Contact Adhesive	250	SCAQMD Rule #1168
Structural Wood Member Adhesive	140	SCAQMD Rule #1168
Top & Trim Adhesive	250	SCAQMD Rule #1168
Substrate Specific Applications		
Metal to Metal	30	SCAQMD Rule #1168
Plastic Foams	50	SCAQMD Rule #1168
Porous Material	50	SCAQMD Rule #1168
Wood	30	SCAQMD Rule #1168
Fiberglass	80	SCAQMD Rule #1168
Sealants & Caulks		
Architectural	250	SCAQMD Rule #1168
Marine Deck	760	SCAQMD Rule #1168
Non-membrane Roof	300	SCAQMD Rule #1168
Roadway	250	SCAQMD Rule #1168
Single-Ply Roof Membrane	450	SCAQMD Rule #1168
Other	420	SCAQMD Rule #1168
Sealant Primers		
Architectural Non Porous	250	SCAQMD Rule #1168
Architectural Porous	775	SCAQMD Rule #1168
Modified Bituminous	500	SCAQMD Rule #1168
Marine Deck	760	SCAQMD Rule #1168
Other	750	SCAQMD Rule #1168

Finished Material- Architectural Coatings

Classification of Material	VOC Limit	Applicable Standard
Paints & Coatings		
Flat Coatings	50	Green Seal GS-11, 1993
Non-Flat Coatings	100	Green Seal GS-11, 1993
Non-Flat High Gloss Coatings	150	Green Seal GS-11, 1993
Specialty Coatings		
Aluminum Roof Coatings	400	CARB SCM 2007
Basement Specialty Coatings	400	CARB SCM 2007
Bituminous Roof Coatings	50	CARB SCM 2007
Bituminous Roof Primers	350	CARB SCM 2007
Bond Breakers	350	CARB SCM 2007
Concrete Curing Compounds	350	CARB SCM 2007
Concrete/Masonry Sealers	100	CARB SCM 2007
Driveway Sealers	50	CARB SCM 2007
Dry Fog Coatings	150	CARB SCM 2007
Faux Finishing Coatings	350	CARB SCM 2007
Fire Resistive Coatings	350	CARB SCM 2007
Floor Coverings	100	CARB SCM 2007
Form-Release Compounds	250	CARB SCM 2007
Graphic Arts Coatings (Sign Paints)	500	CARB SCM 2007
High-Temperature Coatings	420	CARB SCM 2007
Industrial Maintenance Coatings	250	CARB SCM 2007
Low Solids Coatings	120	CARB SCM 2007
Magnesite Cement Coatings	450	CARB SCM 2007
Mastic Texture Coatings	100	CARB SCM 2007
Metallic Pigmented Coatings	500	CARB SCM 2007
Multicolor Coatings	250	CARB SCM 2007
Pretreatment Wash Primers	420	CARB SCM 2007
Primers, Sealers And Undercoats	100	CARB SCM 2007
Reactive Penetrating Sealers	350	CARB SCM 2007
Recycled Coatings	250	CARB SCM 2007
Roof Coatings	50	CARB SCM 2007
Rust Preventative Coatings	400/250[3]	CARB SCM 2007
Shellac: Clear	730	CARB SCM 2007
Shellac: Opaque	550	CARB SCM 2007
Specialty Primers, Sealers, Undercoats	350/100[3]	CARB SCM 2007
Stains	250	CARB SCM 2007
Stone Consolidants	450	CARB SCM 2007
Swimming Pool Coatings	340	CARB SCM 2007
Traffic Marking Coatings	100	CARB SCM 2007
Tub And Tile Refinish Coatings	420	CARB SCM 2007
Waterproofing Membranes	250	CARB SCM 2007
Wood Coatings	275	CARB SCM 2007
Wood Preservatives	350	CARB SCM 2007
Zinc-Rich Primers	340	CARB SCM 2007

Low-Emitting (VOC) Material Limits & Standards for CALGreen 2010

Finished Material- Aerosol Adhesives and Coatings

Classification	Percent VOC by Weight	Applicable Standard
Aerosol Adhesives	75	California Code of Regulations, Title 17
Adhesives less than 16 ounces		
Mist Spray Adhesive	65	California Code of Regulations, Title 17
Web Spray Adhesive	55	California Code of Regulations, Title 17
Polyolefin and Laminate Repair /Edgebanding Adhesive	60	California Code of Regulations, Title 17
Construction, Panel, and Floor Covering	7	California Code of Regulations, Title 17
Contact Adhesive – General Purpose	55	California Code of Regulations, Title 17
Contact Adhesive – Special Purpose	80	California Code of Regulations, Title 17
General Purpose	10	California Code of Regulations, Title 17

This is the only case where CALGreen is more stringent than LEED

Finished Material- Composite Wood Products

Classification	Formaldehyde Limits (Parts / Million)
Composite Wood	
Hardwood Plywood Veneer Core	0.05
Hardwood Plywood Composite Core	0.08
Particleboard	0.09
Medium density fiberboard (MDF)	0.11
Thin-Medium density fiberboard (MDF)	0.21

Finished Materials- Flooring (Carpet, Carpet Cushion & Resilient)

Classification	Applicable Standard
Flooring	
Carpet	Carpet & Rug Institute- Green Label Plus Program
	Specification 01350
	NSF/ANSI 140- Gold
	SCS- Sustainable Choice
Carpet Cushion	Carpet & Rug Institute- Green Label Plus Program
Resilient Flooring	CHPS Product Registry
	Resilient Floor Covering Institute - Floor Score
	Greenguard - Children & Schools

IEQ Credit 4: Low-Emitting Materials Limits for LEED-NC 2009

IEQc4.1: Adhesives and Sealants

Used on the interior of the building (inside the weatherproofing system) and applied on site

Classification of Material	VOC Limit [g/L less water]	Applicable Standard
Architectural Applications		
Indoor Carpet Adhesives	50	SCAQMD Rule #1168
Carpet Pad Adhesives	50	SCAQMD Rule #1168
Wood Flooring Adhesive	100	SCAQMD Rule #1168
Rubber Floor Adhesives	60	SCAQMD Rule #1168
Subfloor Adhesives	50	SCAQMD Rule #1168
Ceramic Tile Adhesives	65	SCAQMD Rule #1168
VCT & Asphalt Adhesives	50	SCAQMD Rule #1168
Drywall and Panel Adhesives	50	SCAQMD Rule #1168
Cove Base Adhesives	50	SCAQMD Rule #1168
Multipurpose Construction Adhesives	70	SCAQMD Rule #1168
Structural Glazing Adhesives	100	SCAQMD Rule #1168
Specialty Applications		
PVC Welding	510	SCAQMD Rule #1168
CPVC Welding	490	SCAQMD Rule #1168
ABS Welding	325	SCAQMD Rule #1168
Plastic Cement Welding	250	SCAQMD Rule #1168
Adhesive Primer for Plastic	550	SCAQMD Rule #1168
Contact Adhesive	80	SCAQMD Rule #1168
Special Purpose Contact Adhesive	250	SCAQMD Rule #1168
Structural Wood Member Adhesive	140	SCAQMD Rule #1168
Sheet Applied Rubber Lining Operations	850	SCAQMD Rule #1168
Top & Trim Adhesive	250	SCAQMD Rule #1168
Substrate Specific Applications		
Metal to Metal	30	SCAQMD Rule #1168
Plastic Foams	50	SCAQMD Rule #1168
Porous Material (except wood)	50	SCAQMD Rule #1168
Wood	30	SCAQMD Rule #1168
Fiberglass	80	SCAQMD Rule #1168
Sealants		
Architectural	250	SCAQMD Rule #1168
Nonmembrane Roof	300	SCAQMD Rule #1168
Roadway	250	SCAQMD Rule #1168
Single-Ply Roof Membrane	450	SCAQMD Rule #1168
Other	420	SCAQMD Rule #1168
Sealant Primers		
Architectural Non Porous	250	SCAQMD Rule #1168
Architectural Porous	775	SCAQMD Rule #1168
Other	750	SCAQMD Rule #1168
Aerosol Adhesives		
General purpose mist spray	65% VOCs by weight	Green Seal GS-36
General purpose web spray	55% VOCs by weight	Green Seal GS-36
Special purpose aerosol adhesives (all types)	70% VOCs by weight	Green Seal GS-36

KEMA Prepared by KEMA

EQc4.2: Paints and Coatings

Used on the interior of the building (inside the weatherproofing system) and applied on site

Classification of Material	VOC Limit	Applicable Standard
Interior Flat Coating or Primer	50	Green Seal GS-11, 1993
Interior Non-Flat Coating or Primer	150	Green Seal GS-11, 1993
Anti-Corrosive/Anti-Rust Paint	250	Green Seal GC-03, 2nd Edition, 1997
Clear Wood Finish: Lacquer	550	SCAQMD Rule 1113, 2004
Clear Wood Finish: Sanding Sealer	350	SCAQMD Rule 1113, 2004
Clear Wood Finish: Varnish	350	SCAQMD Rule 1113, 2004
Clear Brushing Lacquer	680	SCAQMD Rule 1113, 2004
Floor Coatings	100	SCAQMD Rule 1113, 2004
Sealers and Undercoaters	200	SCAQMD Rule 1113, 2004
Shellac: Clear	730	SCAQMD Rule 1113, 2004
Shellac: Pigmented	550	SCAQMD Rule 1113, 2004
Stain	250	SCAQMD Rule 1113, 2004
Concrete Curing Compound	350	SCAQMD Rule 1113, 2004
Japans/Faux Finishing Coatings	350	SCAQMD Rule 1113, 2004
Magnesite Cement Coatings	450	SCAQMD Rule 1113, 2004
Pigmented Lacquer	550	SCAQMD Rule 1113, 2004
Waterproofing Sealers	250	SCAQMD Rule 1113, 2004
Waterproofing Concrete/Masonry Sealers	400	SCAQMD Rule 1113, 2004
Wood Preservatives	350	SCAQMD Rule 1113, 2004
Low-Solids Coatings	120	SCAQMD Rule 1113, 2004

IEQc4.3: Flooring Systems

Installed in the building interior

Classification	Requirement	Applicable Standard
Carpet	CRI Green Label Plus	Carpet & Rug Institute
Carpet cushion	CRI Green Label	Carpet & Rug Institute
Carpet adhesive	VOC limit of 50 g/L	SCAQMD Rule #1168
Hard surface flooring	FloorScore certified	Resilient Floor Covering Institute
Floor finishes	See EQc4.2	SCAQMD Rule #1113
Tile adhesives and grout	See EQc4.1	SCAQMD Rule #1168

IEQc4.4: Composite Wood and Agrifiber Products

Used on the interior of the building (inside the weatherproofing system) – applied on or off site (including in the factory)

Classification	Requirement
Particleboard	contain no added urea-formaldehyde resins
Medium density fiberboard (MDF)	contain no added urea-formaldehyde resins
Plywood	contain no added urea-formaldehyde resins
Wheatboard	contain no added urea-formaldehyde resins
Strawboard	contain no added urea-formaldehyde resins
Panel substrates	contain no added urea-formaldehyde resins
Door cores	contain no added urea-formaldehyde resins
Other composite wood products	contain no added urea-formaldehyde resins
Other agrifiber products	contain no added urea-formaldehyde resins
Laminating adhesives	contain no added urea-formaldehyde resins

5.504.4.3 FINISHED MATERIAL POLLUTANT CONTROL: PAINTS AND COATINGS

LEED ≤ CG

BSC Guide: 68
LEED: IEQc4.2 [Constr.]

While many of the product specific VOC limits between the various reference standards are the same, the CALGreen Measure addresses many more coatings than the LEED requirements as it is not limited to indoor paints and coatings.

CALGreen Mandatory Measure Summary:
Comply with VOC (volatile organic compound) limits in the Air Resources Board Architectural Coatings Suggested Control Measure and California Code of Regulations Title 17 for aerosol paints, or stringent local limits.

LEED Related Credit(s) Summary:
Relates to optional credit Indoor Environmental Quality Credit 4.2: Low-Emitting Materials: Paints and Coatings
Architectural paints and coatings must meet Green Seal standard GS-11 (flat and non-flat paints), anti-corrosive paints must meet Green Seal standard GC-03, and all other coatings must meet VOC limits in SCAQMD Rule 1113.

Documentation Recommendations for LEED Projects

The various reference standards in both CALGreen and LEED differ. To ensure cross compliance, use whichever VOC limit is the lesser of the two. See the attached VOC Reference Chart (on the previous pages; following section 5.504.4.1 in this Companion Guide) for a summary of these requirements.

Recommendations to simplify documentation on LEED projects and to comply with CALGreen (if acceptable to the local enforcement agency):

- Submit IEQc4.2 Form listing all paints and coatings. Make sure that all coatings required by CALGreen (for both interior and exterior applications) are included.
- Provide cutsheets noting product VOC levels.

Recommendations for Enforcement & Verification

To simplify enforcement and verification for LEED projects under CALGreen, enforcement agencies should:

- Accept all LEED IEQc4.2 documentation as equivalent for CALGreen compliance so long as all required coatings are listed and their VOC quantities are within allowable ranges.

5.504.4.4 FINISHED MATERIAL POLLUTANT CONTROL: CARPET SYSTEMS

LEED = CG
BSC Guide: 68
LEED: IEQc4.3 [Constr.]

Due to differing reference standards, not all CALGreen projects will comply with LEED, but any project that achieves this credit in LEED complies with CALGreen.

CALGreen Mandatory Measure Summary:
Carpet shall meet the requirements of one of the following:

1. Carpet and Rug Institute's Green Label Plus Program
2. California Department of Public Health Standard Practice, testing of VOC's (Spec. 01350)
3. NSF/ANSI 140 at the Gold level
4. Scientific Certifications Systems Sustainable Choice

Carpet cushion shall be CRI Green Label and carpet adhesive shall meet a VOC limit of 50 g/L.

LEED Related Credit(s) Summary:
Relates to optional credit Indoor Environmental Quality Credit 4.3: Low-Emitting Materials: Flooring Systems.
All carpet installed must meet Carpet and Rug Institute's Green Label Plus program. Carpet cushion shall meet the requirements of the Carpet and Rug Institute Green Label program. Carpet adhesive shall meet the requirements of EQc4.1.

Documentation Recommendations for LEED Projects

While CALGreen allows for multiple compliant certifications, the acceptable certification for LEED is one of the CALGreen criteria. Therefore all LEED projects achieving this credit will comply with CALGreen.

Recommendations to simplify documentation on LEED projects and to comply with CALGreen (if acceptable to the local enforcement agency):

- Submit IEQc4.4 Form listing all resilient flooring material.

Recommendations for Enforcement & Verification

To simplify enforcement and verification for LEED projects under CALGreen, enforcement agencies should:

- Accept all LEED IEQc4.3 documentation as equivalent for CALGreen compliance.

Sample LEED Form: Low-Emitting Flooring Materials (IEQc4.3)

LEED 2009 for New Construction and Major Renovations

IEQ CREDIT 4.3: LOW-EMITTING MATERIALS FLOORING SYSTEMS

All fields and uploads are required unless otherwise noted.

ALL OPTIONS

Select all that apply:

☒ **Option 1.** Combination of Carpet and Rug Institute, South Coast Air Quality Management District, and FloorScore referenced standards.

☐ **Option 2.** California Department of Heath Services standard.

COMBINATION OF REFERENCED STANDARDS

The project team is attempting IEQc4.1 and has selected "One or more of the adhesives or sealants used on the interior of the building exceeds the allowable VOC limit". — No

Note: This field is read only. The yes/no is derived from the All Options selection in IEQc4.1. If IEQc4.1 has not been attempted, or the VOC budget option is not selected, No will be displayed.

Table L-5. Flooring Adhesives and Sealants

Product Type	Product Manufacturer	Product Name / Model	Product VOC Content	Allowable VOC Content	Source of VOC Data (letter, cutsheet, MSDS sheet, etc.)	Source of VOC Data Provided
Indoor Carpet Adhesives	Nobody	No Name	45	50	MSDS	☒
Carpet Pad Adhesives	Nobody	No Name	45	50	MSDS	☒
		All products meet allowable VOC content				Yes

Add Row | Delete Row

Percentage of Source of VOC Data provided for items listed in the table above: 100
(Must be at least 20% of total items)

Refer to CALGreen Code Section 5.504.4 for referenced standards applicable to each material entered into the tables

Table IEQc4.3-1. Flooring Materials and Finishes

Product Type[2]	Product Manufacturer	Product Name / Model	Referenced Standard	Meets Referenced Standard	Source of Compliance or Certification Data	Doc Prov
Carpet, Indoor	Nobody	No Name	CRI Green Label Plu	☒	No Source	☒
Cushion: Carpet, Indoor	Nobody	No Name	CRI Green Label	☒	No Source	☒

For CALGreen Section 5.504.4.4, all carpet shall comply with CRI Green Label Plus criteria and other eligable programs referenced in the CALGreen Code

For CALGreen Section 5.504.4.6, all resilient flooring should comply with VOC limits established under the CHPS or RFCI FloorScore criteria for VOC limits

Save Form

5.504.4.5 COMPOSITE WOOD PRODUCTS

LEED ≥ CG

BSC Guide: 68-69
LEED: IEQc4.4 [Constr.]

Since LEED requires that all composite wood products comply as opposed to the limited scope of the CALGreen standard, projects pursuing this optional credit within LEED will exceed the CALGreen requirements.

CALGreen Mandatory Measure Summary:
Hardwood plywood, particleboard, and medium density fiberboard composite wood products used on the interior or exterior of the building shall meet the requirements for formaldehyde as specified in ARB's Air Toxics Control Measure for Composite Wood (17 CCR 93120 et seq.), by or before the dates specified in those sections, as shown in Table 5.504.4.5.

LEED Related Credit(s) Summary:
Relates to optional credit Indoor Environmental Quality Credit 4.4: Low-Emitting Materials: Composite Wood and Agrifiber Products
Composite wood and agrifiber products must contain no added urea-formaldehyde resins.

Documentation Recommendations for LEED Projects

The ARB standard referenced by CALGreen places a cap on formaldehyde levels in hardwood plywood, particleboard and medium density fiberboard. LEED's requirement is more rigorous as it extends to all composite wood products and bans resins with added urea-formaldehyde.

Recommendations to simplify documentation on LEED projects and to comply with CALGreen (if acceptable to the local enforcement agency):

- Submit cutsheets or chain of custody certifications for hardwood plywood, particleboard and medium density fiberboard products.
- Submit IEQc4.4 Form listing all resilient flooring material.

Recommendations for Enforcement & Verification

To simplify enforcement and verification for LEED projects under CALGreen, enforcement agencies should:

- Review cut-sheets for all installed products to ensure formaldehyde resins quantities are within the allowable range.
- Accept all LEED IEQc4.4 documentation as equivalent for CALGreen compliance.

5.504.4.6 FINISHED MATERIAL POLLUTANT CONTROL: RESILIENT FLOORING SYSTEMS

LEED ≥ CG
BSC Guide: 69
LEED: IEQc4.3 [Constr.]

Since LEED requires 100% of resilient flooring to comply compared with only 50% for CALGreen, all LEED projects that achieve this credit will comply with and surpass the CALGreen Requirements.

CALGreen Mandatory Measure Summary:
For 50% of floor area receiving resilient flooring, install resilient flooring complying with the VOC-emission limits defined in the 2009 Collaborative for High Performance Schools (CHPS) criteria or certified under the Resilient Floor Covering Institute (RFCI) FloorScore program.

LEED Related Credit(s) Summary:
Relates to optional credit Indoor Environmental Quality Credit 4.3: Low-Emitting Materials: Flooring Systems.
100% of hard surface flooring (vinyl, linoleum, laminate, wood, ceramic, and/or rubber) must be FloorScore certified.

Documentation Recommendations for LEED Projects

Despite CALGreen allowing multiple VOC emission standards to comply, the LEED requirement for FloorScore, and the higher quantity of flooring needed for LEED, LEED projects that meet this credit easily qualify for the CALGreen measure.

Recommendations to simplify documentation on LEED projects and to comply with CALGreen (if acceptable to the local enforcement agency):

- Submit IEQc4.3 Form listing all resilient flooring material.

Recommendations for Enforcement & Verification

To simplify enforcement and verification for LEED projects under CALGreen, enforcement agencies should:

- Ensure cut-sheets reflect FloorScore certified products.
- Accept LEED IEQc4.3 documentation related to resilient flooring as equivalent for CALGreen compliance.

5.504.5.3 FILTERS

LEED ≥ CG
BSC Guide: 70
LEED: IEQc5 [Design]

The related LEED credit addresses filters in addition to other indoor air quality elements. CALGreen's filtration requirement of MERV 8 will be met and exceeded by LEED projects that achieve this credit.

CALGreen Mandatory Measure Summary:
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 8.

LEED Related Credit(s) Summary:
Relates to optional credit Indoor Environmental Quality Credit 5: Indoor Chemical and Pollutant Source Control
In mechanically ventilated buildings, provide MERV 13 filters; employ walk-off mats or grills at least ten feet long at regularly used building entrances; exhaust spaces where hazardous gases or chemicals may be present; provide containment where chemical concentrate mixing occurs.

Documentation Recommendations for LEED Projects

LEED not only exceeds CALGreen's MERV requirement, but also addresses other ways in which potential indoor air contaminants enter a building. LEED projects that achieve this credit comply with the CALGreen requirement for filter efficiency.

Recommendations to simplify documentation on LEED projects and to comply with CALGreen (if acceptable to the local enforcement agency):

- Provide mechanical schedules highlighting the use of MERV 13 filters
- Submit IEQc5 Form listing all filtration media and MERV values.

Recommendations for Enforcement & Verification

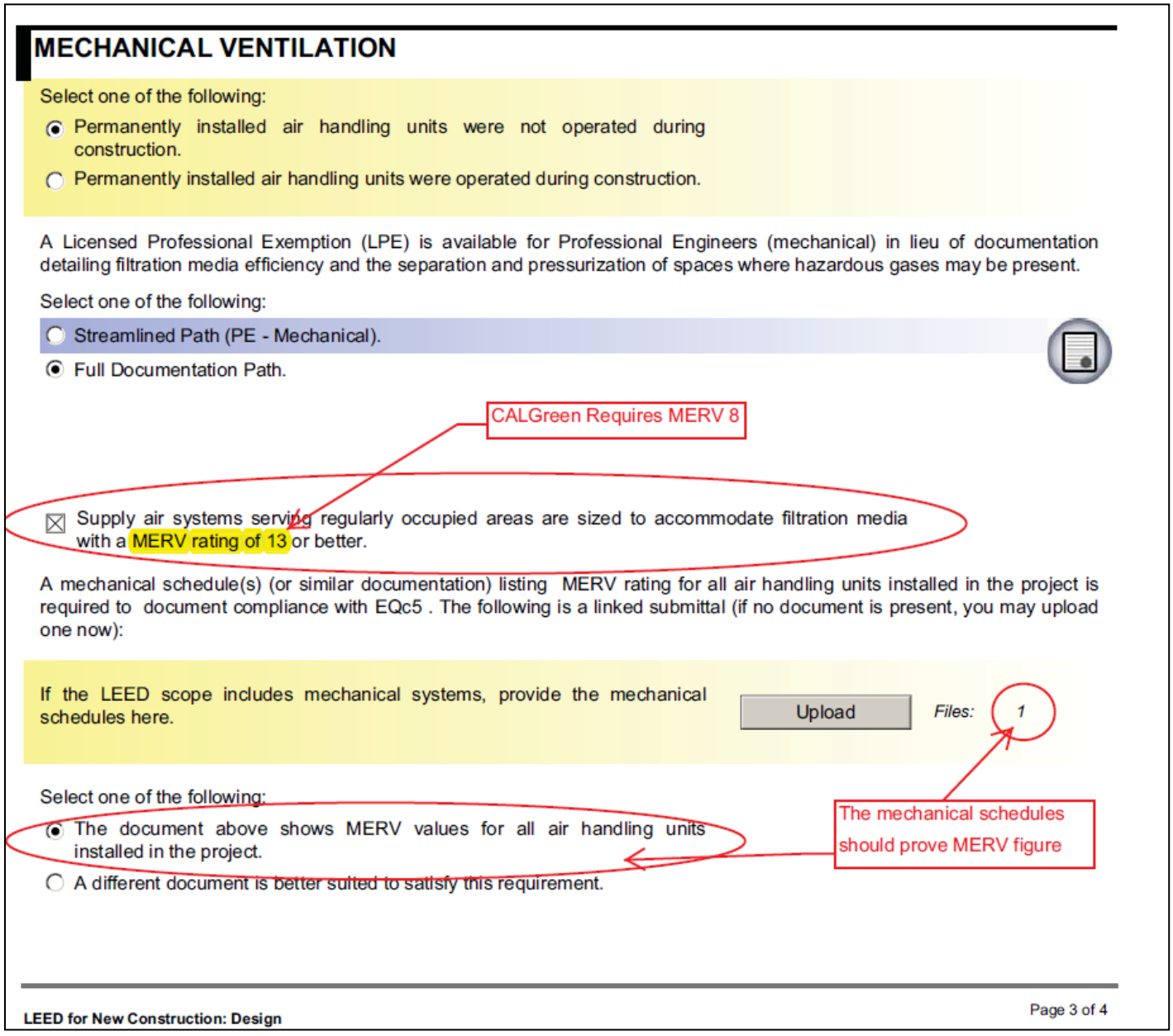
To simplify enforcement and verification for LEED projects under CALGreen, enforcement agencies should:

- Review applicable plans, drawings and schedules to ensure the utilization of minimum MERV 8+ filters.
- Accept all LEED IEQc5 documentation as equivalent for CALGreen compliance.

MERV:
Minimum Efficiency Reporting Value

MERV values increase as the efficiency of collection increases. Therefore, in terms of trapping and containing pollutants in air, higher MERV values indicate cleaner air and potentially better indoor air quality.

Sample LEED Form: IEQc5 (Showing Filters)



MECHANICAL VENTILATION

Select one of the following:

- (•) Permanently installed air handling units were not operated during construction.
- ( ) Permanently installed air handling units were operated during construction.

A Licensed Professional Exemption (LPE) is available for Professional Engineers (mechanical) in lieu of documentation detailing filtration media efficiency and the separation and pressurization of spaces where hazardous gases may be present.

Select one of the following:

- ( ) Streamlined Path (PE - Mechanical).
- (•) Full Documentation Path.

CALGreen Requires MERV 8

- [x] Supply air systems serving regularly occupied areas are sized to accommodate filtration media with a MERV rating of 13 or better.

A mechanical schedule(s) (or similar documentation) listing MERV rating for all air handling units installed in the project is required to document compliance with EQc5 . The following is a linked submittal (if no document is present, you may upload one now):

If the LEED scope includes mechanical systems, provide the mechanical schedules here. Upload *Files:* 1

Select one of the following:

- (•) The document above shows MERV values for all air handling units installed in the project.
- ( ) A different document is better suited to satisfy this requirement.

The mechanical schedules should prove MERV figure

LEED for New Construction: Design

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5.504.7 Environmental Tobacco Smoke (ETS) Control

LEED = CG
BSC Guide: 71
LEED: IEQp2 [Design]

The respective LEED and CALGreen measures are nearly identical and should be considered equivalent.

CALGreen Mandatory Measure Summary:
Where outdoor areas are provided for smoking, prohibit smoking within 25 feet of building entries, outdoor air intakes and operable windows. Smoking indoors in prohibited.

LEED Related Credit(s) Summary:
Relates to Indoor Environmental Quality Prerequisite 2: Environmental Tobacco Smoke (ETS) Control
Prohibit on-property smoking within 25 feet of entries, outdoor air intakes and operable windows. All buildings must be non-smoking or provided designated smoking areas.

Documentation Recommendations for LEED Projects

There are not any notable differences between LEED and CALGreen for this measure.

Recommendations to simplify documentation on LEED projects and to comply with CALGreen (if acceptable to the local enforcement agency):

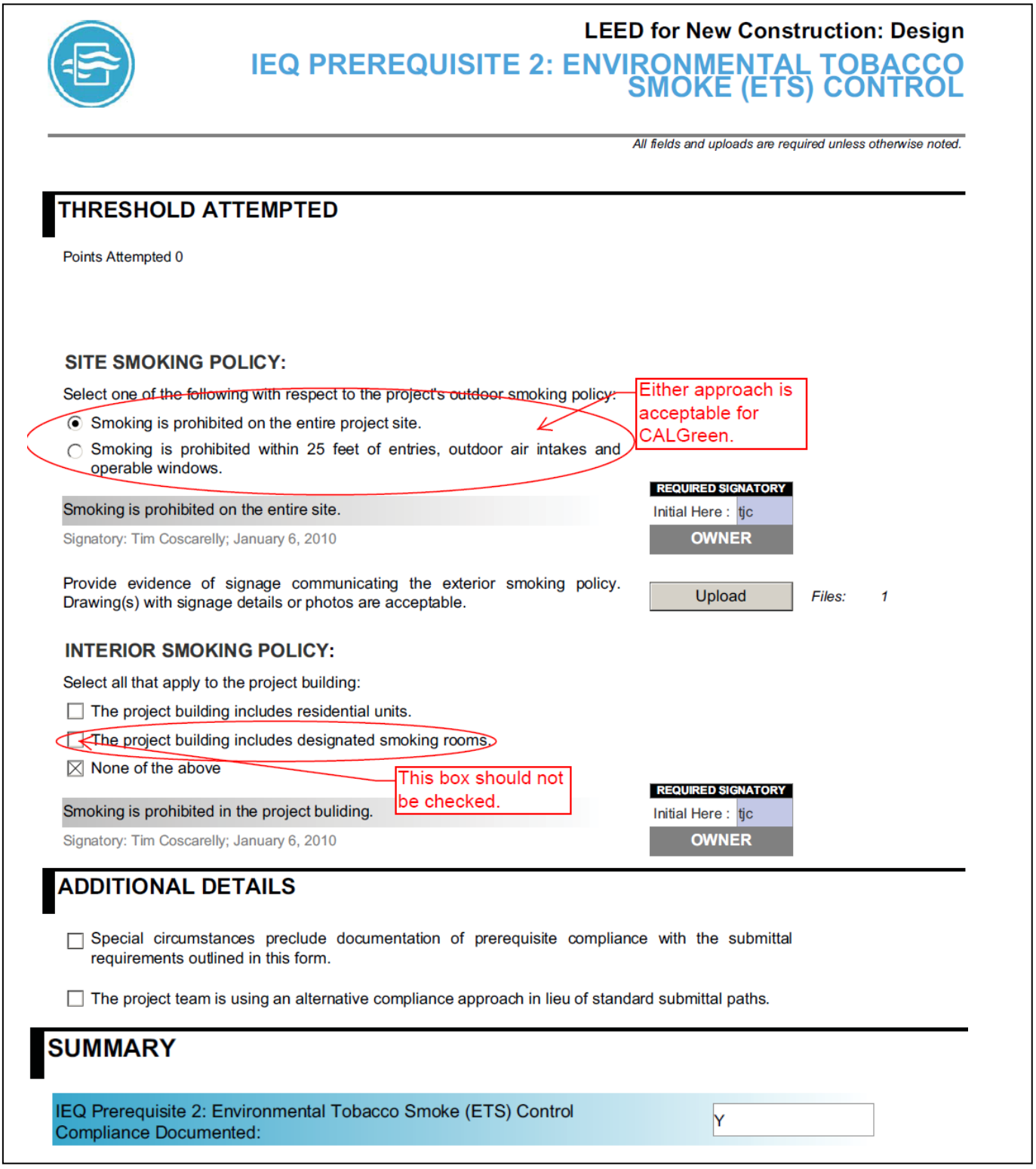
- Provide pictures of posted signs that prohibit smoking for an outdoor smoking area within 25 feet of building entries, outdoor air intakes and operable windows
  - OR -
- Highlight signage location on the Site Plan, Floor Plan, Elevations and/or Detail Sheet.

Recommendations for Enforcement & Verification

To simplify enforcement and verification for LEED projects under CALGreen, enforcement agencies should:

- Accept all LEED IEQp2 documentation as equivalent for CALGreen compliance

Sample LEED Form: Environmental Tobacco Smoke Control (IEQp1)



LEED for New Construction: Design

IEQ PREREQUISITE 2: ENVIRONMENTAL TOBACCO SMOKE (ETS) CONTROL

All fields and uploads are required unless otherwise noted.

THRESHOLD ATTEMPTED

Points Attempted 0

SITE SMOKING POLICY:

Select one of the following with respect to the project's outdoor smoking policy:

Either approach is acceptable for CALGreen.

- (•) Smoking is prohibited on the entire project site.
- ( ) Smoking is prohibited within 25 feet of entries, outdoor air intakes and operable windows.

Smoking is prohibited on the entire site.

REQUIRED SIGNATORY
Initial Here : tjc
OWNER

Signatory: Tim Coscarelly; January 6, 2010

Provide evidence of signage communicating the exterior smoking policy. Drawing(s) with signage details or photos are acceptable.

Upload Files: 1

INTERIOR SMOKING POLICY:

Select all that apply to the project building:

- [ ] The project building includes residential units.
- [ ] The project building includes designated smoking rooms.
- [x] None of the above

This box should not be checked.

Smoking is prohibited in the project buliding.

REQUIRED SIGNATORY
Initial Here : tjc
OWNER

Signatory: Tim Coscarelly; January 6, 2010

ADDITIONAL DETAILS

- [ ] Special circumstances preclude documentation of prerequisite compliance with the submittal requirements outlined in this form.
- [ ] The project team is using an alternative compliance approach in lieu of standard submittal paths.

SUMMARY

IEQ Prerequisite 2: Environmental Tobacco Smoke (ETS) Control Compliance Documented:	Y

5.506.1 OUTSIDE AIR DELIVERY

LEED ≥ CG
BSC Guide: 73
LEED: IEQp1 [Design]

LEED projects will almost always comply with CALGreen requirements despite being based on different reference standards. LEED documentation should be accepted as equivalent.

CALGreen Mandatory Measure Summary:
For mechanically or naturally ventilated spaces in buildings, meet the minimum requirements of Section 121 (Requirements For Ventilation) of the California Energy Code, CCR, Title 24, Part 6, or the applicable local code, whichever is more stringent, and Chapter 4 of CCR, Title 8.

LEED Related Credit(s) Summary:
Relates to Indoor Environmental Quality Prerequisite 1: Minimum Indoor Air Quality Performance
Meet mechanically and/or naturally ventilated spaces requirements of ASHRAE standard 62.1-2007, Ventilation for Acceptable Indoor Air the Quality.

Documentation Recommendations for LEED Projects

While the reference standard within LEED (ASHRAE) and CALGreen (Title 24) differ, they are largely similar and have the same intent. For most projects the LEED requirements are slightly more restrictive because the ASHRAE 62.1 Ventilation Rate Procedure takes into account air distribution effectiveness and ventilation efficiency. Both calculations are performed on a space-by-space basis and not universally consistent; however for a majority of space types the ASHRAE ventilation requirements are more stringent and therefore LEED compliance in this case should be seen as equivalent to CALGreen.

Recommendations to simplify documentation on LEED projects and to comply with CALGreen (if acceptable to the local enforcement agency):

- Provide a copy of LEED calculations showing compliance with minimum standards
- Provide a copy of the mechanical systems and schedules

Recommendations for Enforcement & Verification

To simplify enforcement and verification for LEED projects under CALGreen, enforcement agencies should:

- Accept all LEED IEQp1 calculations as equivalent for CALGreen compliance

Sample LEED Form: Minimum Indoor Air Quality Perf. (IEQp1)

LEED 2009 for New Construction and Major Renovations

IEQ PREREQUISITE 1: MINIMUM INDOOR AIR QUALITY PERFORMANCE

All fields and uploads are required unless otherwise noted.

THRESHOLD ATTEMPTED

Points Attempted 0

ALL OPTIONS

Select all that apply to the project building:

- ☒ The project building is mechanically ventilated, in part or in whole.
- ☐ The project building is naturally ventilated, in part or in whole.
- ☐ The project building is mechanically conditioned, in part or in whole.
- ☐ The project building is naturally conditioned, in part or in whole.

The project meets Sections 4 through 7 of ASHRAE 62.1-2007, Ventilation for Acceptable Indoor Air Quality.

REQUIRED SIGNATORY
Initial Here :
VENTILATION SYSTEMS DESIGNER

MECHANICAL VENTILATION

☐ Mechanical ventilation systems are designed using local code, which is more stringent than the ASHRAE Standard 62.1-2007 Ventilation Rate Procedure. (Optional)

Complete the following table for each mechanically ventilated space in the project building.

Table. Ventilation Rate Procedure

AHU	Zone	Occupancy Category	Rp (cfm / person)	Ra (cfm/sf)	Occupant Density		Az (sf)	Vbz (cfm)	Ez	Voz (cfm)	Ev	Vot (cfm)
					Default	#/1000sf						
F-1	1	Conference / meeting	5	0.06	☐ Yes	0.00468	1,708	102.519	1	102.52	1	102.52
F-2	2	Conference / meeting	5	0.06	☐ Yes	0.0176	2,500	150.22	1	150.22	1	150.22
F-3	3A	Office Space	5	0.06	☐ Yes	0.00769	1,040	62.4399	1	62.44	1	62.44
F-3	3B	Corridors	0	0.06	☐ Yes		350	21	1	21	1	21
F-4	4	Office Space	5	0.06	☐ Yes	0.00542	1,662	99.7650	1	99.77	1	99.77

LEED 2009 for New Construction and Major Renovations

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Sample LEED Form: Minimum Indoor Air Quality Perf. (IEQp1) (Continued)

AHU	Zone	Occupancy Category	Rp (cfm / person)	Ra (cfm/sf)	Occupant Density		Az (sf)	Vbz (cfm)	Ez	Voz (cfm)	Ev	Vot (cfm)
					Default	#/1000sf						
F-5	5A	Office Space	5	0.06	☐ Yes	0.0125	1,835	110.214	1	110.21	1	110.21
F-5	5B	Rest Rms.&Corr.		0.06	☐ Yes		1,966	117.96	1	117.96	1	117.96
F-6	6	Conference / meeting	5	0.06	☐ Yes	0.025	1,680	101.01	1	101.01	1	101.01
F-7	7	Lobbies / prefunction	7.5	0.06	☐ Yes	0.01826	2,300	138.314	1	138.31	1	138.31
F-8	8A	Office Space	5	0.06	☐ Yes	0.0068	1,025	61.5348	1	61.53	1	61.53
F-8	8B	Corridors	0	0.06	☐ Yes		200	12	1	12	1	12
F-9	9	Office Space	5	0.06	☐ Yes	0.0053	1,316	78.9948	1	78.99	1	78.99

Add Row Delete Row

Note: *Refer to ASHRAE Standard 62.1-2007 Ventilation Rate Procedure and ASHRAE 62MZCalc spreadsheet for detailed definitions and calculation procedures.*

Table. Outdoor Air Flow

AHU	Zone	Occupancy Category	Vot (cfm)	Design OA Intake Flow (cfm)	Zone Complies with IEQp1	Zone Complies with IEQc2
F-1	1	Conference / meeting	102.52	154	Yes	Yes
F-2	2	Conference / meeting	150.22	440	Yes	Yes
F-3	3A	Office Space	62.44	100	Yes	Yes
F-3	3B	Corridors	21	40	Yes	Yes
F-4	4	Office Space	99.77	160	Yes	Yes
F-5	5A	Office Space	110.21	169	Yes	Yes
F-5	5B	Rest Rms.&Corr.	117.96	300	Yes	Yes
F-6	6	Conference / meeting	101.01	362	Yes	Yes
F-7	7	Lobbies / prefunction	138.31	428	Yes	Yes
F-8	8A	Office Space	61.53	100	Yes	Yes
F-8	8B	Corridors	12	20	Yes	Yes
F-9	9	Office Space	78.99	125	Yes	Yes
Compliance with IEQ Prerequisite 1: **Note:** The design outdoor air intake flow for all zones must be equal to or greater than the outdoor air ventilation rate required by ASHRAE Standard 62.1-2007, ventilation rate procedure.						Yes
Compliance with IEQ Credit 2: **Note:** The design outdoor air intake flow for all zones must be 30% greater than the minimum outdoor air ventilation rate required by ASHRAE Standard 62.1-2007, ventilation rate procedure.						Yes

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5.506.2 CARBON DIOXIDE (CO2) MONITORING

LEED = CG
BSC Guide: 74
LEED: IEQc1 [Design]

The respective LEED and CALGreen measures are nearly identical and should be considered equivalent.

CALGreen Mandatory Measure Summary:
For buildings equipped with demand control ventilation, CO2 sensors and ventilation controls shall be specified and installed in accordance with the requirements of the current edition of the California Energy Code, CCR, Title 24, Part 6, Section 121(c).

LEED Related Credit(s) Summary:
Relates to Indoor Environmental Quality Credit 1: Outdoor Air Delivery Monitoring
Monitor CO2 concentrations within all densely occupied spaces and provide a direct airflow measurement device for mechanical ventilation systems serving non-densely occupied spaces.

Documentation Recommendations for LEED Projects

The LEED requirements are slightly more restrictive when it comes to placement of the sensors in the building and the occupancy density of the space, but the requirements are largely the same.

Recommendations to simplify documentation on LEED projects and to comply with CALGreen (if acceptable to the local enforcement agency):

- Provide a copy of construction documents highlighting calculations and locations for CO2 sensors
- Provide cut-sheets of sensors

Recommendations for Enforcement & Verification

To simplify enforcement and verification for LEED projects under CALGreen, enforcement agencies should:

- Accept all LEED IEQc1 documentation as equivalent for CALGreen compliance

CO_2 Sensor Placement:

Although not required by CALGreen, projects are encouraged to install sensors between 3 and 6 feet in height, where occupant density is greatest (required in LEED).

5.508.1 Ozone Depletion and Greenhouse Gas Reductions

LEED ≥ CG

BSC Guide: 76
LEED: EAp3 & EAc4 [Design]

Both CALGreen and LEED require that no new CFC based equipment be installed. The prohibition of Halon use is an optional credit within LEED, but that credit also includes limits on other ozone depleting chemicals and greenhouse gases. If a LEED project achieves the prerequisite as well as the optional credit, CALGreen has been met.

CALGreen Mandatory Measure Summary:
Do not install equipment that contains CFCs or Halons.

LEED Related Credit(s) Summary:
Relates to Energy and Atmosphere Prerequisite 3: Fundamental Refrigerant Management
Do not install equipment with CFCs.

Relates to optional credit Energy and Atmosphere Credit 4: Enhanced Refrigerant Management
Do not install equipment that contains refrigerants such as Halons, HFCs & HCFCs based on combined ozone-depletion and global-warming potential.

Documentation Recommendations for LEED Projects

The CALGreen measure and LEED credits are very similar, although the LEED calculation methodology under Enhanced Refrigerant Management weighs the refrigerants' global warming potential with the total ozone depletion potential and therefore is much more intensive to document. LEED also allows for a phase-out plan for major renovation projects where CFC equipment is not being replaced as a part of the project scope, but this should not affect CALGreen since phase-outs typically apply to renovations and not new construction.

Recommendations to simplify documentation on LEED projects and to comply with CALGreen (if acceptable to the local enforcement agency):

- Submit a mechanical schedule highlighting the refrigerants used.
- Submit EAp3 and EAc4 Credit Forms in addition to the above documentation

Recommendations for Enforcement & Verification

Ensure that no CFCs and Halons are used by reviewing the LEED submittals (provided the local jurisdiction agrees that this is an acceptable equivalency of compliance):

- Review mechanical schedule highlighting the refrigerants used.
- Review EAp3 and EAc4 Credit Forms (if available) to verify no CFCs or Halons are used. If EAc4 is not available, request verification that Halons are not used in the project.