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INDUSTRY CORNER

HOW TO SUCCESSFULLY IMPLEMENT LEED: DOCUMENTATION CHALLENGES AND SOLUTIONS

Courtney France, EIT, LEED AP[1]

INTRODUCTION

Market Transformation

The market's attention to environmentally-related issues has drastically increased over the past decade. Concerns over rising fuel costs, urban air quality, national security, and local development impacts have influenced a growing trend for improved environmental responsibility. Residential and commercial building expansion will continue, but balancing needs with resources, and infrastructure demand with capacity, proves to be a challenge for any scope of development.

Awareness and progressive action continue to flourish in communities and regions with a keen understanding of the effects, impacts, and repercussions resultant from absent consideration for the surrounding environment. This market demand is becoming evident as incentive programs for sustainable development are overwhelmed with participation. Tax breaks, density bonus programs, expedited permitting, and fee reductions or waivers are stimulating the interest for "greener" development projects. As marketplace consumers' and businesses' bottom lines drive sustainable movement within the industry, most are discovering going green may only be maintaining common standard practice now.

How can we catch up to the increased demand for environmental responsibility and the associated services? And once caught up, how do we avoid the pitfalls and inefficiencies of first-time users?

Basics of Sustainable Buildings

Before envisioning many of the sustainable technologies often showcased in the premier environmental projects, like photovoltaic panels, grey water reuse, or interior finishes like bamboo and cork, the basics of good building design and construction standards must be realized. Project teams should be knowledgeable of relevant local standards or codes and the relative design scope to achieve improved levels of performance. Often, the fundamental building components should be analyzed to ensure the best design practices have been met in the first place, before proceeding to the often tempting high-performance material technologies that offer increased efficiency over standard baseline comparison products.

Simple principles like "reduce, reuse, recycle" still apply to any building system design component. Avoid common pitfalls like over sizing, failed or lacking performance criteria and owner's expectations, and insufficient details addressing infiltration or system connections.

To demonstrate this simple point, examine a building's shell. The building's envelope system is a dominant design element for a project's first-cost budget estimate, life cycle durability expectancy, energy performance, and value or appeal to the real estate market. With this many influences, the owner's building maintenance staff, construction cost estimator, energy modeler with design team, and real estate investment owner should all have valuable input and consideration to the final design selection for the building's envelope system. Similarly, with this many interests, it's easy to understand how improper systems can be considered, approved, and worse, installed. The conflicting interests, requirements, and performance demands may also be a contributing factor to how the essentials of best design and construction practices can be modified, revised, or even tragically omitted.

Regardless if green, sustainable, or high-performance strategies are considered applicable, every development must meet the project goals by first employing best practices, then creative and innovative application where appropriate. In the case example of an envelope system, before double-clad curtain walls, living walls, or high-performance building-integrated photovoltaic's are integrated for energy optimization, rudiments like

[1]France Sustainable Solutions, Principal; Ms. France may be reached at 303.325.5945 or Courtney@francesustainable.com.

moisture, vapor, thermal, and air control must be considered, evaluated, and optimized.

Green Building Verification Tools

Once the basic elements of resourceful and efficient design and operation are recognized for a project, improved efficiency and environmental responsiveness may additionally be desired, or even mandated. With the increased market interest in environmental sensitivity or improved efficiencies, metrics to measure and verify the claimed performance are escalating in demand.

Leading the industry, the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) sustainable building rating tool has become the most widely-recognized national standard for verifying a project's environmental incorporations. The following report outlines resources to apply the U.S. Green Building Council's (USGBC) LEED Sustainable Building rating metric to your own project. First-time LEED users will benefit from a thorough description of valuable lessons for starting a LEED project successfully, as well as insights and expectations for the certification review and award phase. Experienced LEED practitioners will find the specific credit case examples and sample work problems resourceful in understanding how to alternatively comply with LEED-NCv2.2 credit requirements. This in-depth credit examination assumes basic LEED credit knowledge, and is intended to expand on the LEED rating system fundamentals found at the U.S. Green Building Council's web site, www.usgbc.org.

RESOURCES FOR APPLYING LEED

Kicking-off your LEED Project

The basic concept of any sustainable building metric system involves defining a relative baseline case for comparison to your own development project. The U.S. Green Building Council's LEED Rating systems attempt to facilitate this process for various project types and building life cycle phases. In addition, the LEED rating metric provides the industry with a consistent analysis across sustainable strategies, as well as across projects seeking environmental recognition. Whether the USGBC's LEED Rating system is used for documenting a project's success in achieving sustainable goals, or any other environmental building metric, the following provides an outline of important factors to consider when implementing a sustainable building metric, like LEED:

1. Design Kick-off or Eco-Charette
   - Establish project environmental goals and priorities.
   - Engage all disciplines in consensus on achieving sustainable goals.
   - Involve stakeholders (design, engineering, construction, operations, tenants, real estate, etc.), including specialty consultants like energy modeler, daylighting consultant, commissioning agent, LEED Coordinator, or environmental consultant.
2. Establish Project Baseline
   - Confirm LEED Prerequisite compliance.
   - Establish baseline LEED Scorecard.
   - Indentify scope, schedule, and budget impacts from sustainable strategies selected to investigate.
   - Identify payback, operational cost savings, or life cycle assessment for selected sustainable strategies; include rebates, tax incentives, grant opportunities, donated technologies, etc.
   - Assign Responsible Parties to champion sustainable strategies.
3. Define Project Information
   Many of the assigned LEED credit compliance investigations will require consistent project information. Establish these LEED credit basics early in the project to facilitate credit feasibility analysis and preliminary calculations, which ultimately resolve undetermined credits in a project's baseline LEED scorecard.

   Basic information that would be required for projects seeking LEED certification includes:
   - Occupant Count—Refer to LEED Reference Guides regarding process for calculating a project's Full-Time Equivalent (FTE) occupancy
   - Project Site Area—Defined by your construction work limits, which may exceed your "property area"
   - Project Site Area Breakout:
     —Vegetated Area (native vs. non-native areas)
     —Impervious Area (asphalt vs. concrete vs. colored pavers vs. etc.)
     —Shaded Area
     —Pervious Area

Common MISTAKES when Establishing LEED Information:

- Undefined or incorrect project boundary used for site area calculation
- Utilizing incorrect occupancy default counts for rating system calculations (FTE Occupant Count)
- Double-counting shaded areas on highly reflective impervious surfaces
- Failure to include minor site areas like curb & gutter, service roads, public walks, etc.
- Overhangs or awnings erroneously counted as building footprint area

Implementing LEED on your Project

The USGBC is diligently working to update and continuously improve the LEED rating systems. These future evolutions of LEED may rectify many of the credit compliance challenges outlined below.

Currently, thousands of projects are still applying for certification under the existing LEED-NCv2 rating systems. In addition, many of the best practices established in these earlier LEED versions will continue to be embodied in future iterations and developments of green building metrics. Therefore, it may be resourceful to examine some of the existing documentation tools and insights from experienced practitioners to assist in your own LEED project seeking certification. Even if your project is not seeking formal certification from the USGBC, it may be valuable to analyze the following sustainable strategy approaches in order to comply with various levels of owner or project environmental documentation requirements.

The following LEED select credit analysis is intended to demonstrate opportunities for integrating sustainable metrics and quantitative tools to evaluate how specific sustainable strategies contribute to achieving the project's environmental goals, like sensitivity to site development; indoor air quality; water, energy, or material resource efficiency; or other defined goals by the project team and building users.

Development Density (Sustainable Sites credit 2). LEED provides two options to demonstrate compliance with the credit intent, to channel development in areas with existing urban infrastructure, reduce urban sprawl, and protect and preserve natural habitats.

Documentation Challenge: Unless the project site is part of a single owner campus, obtaining building information like project square footage and property acres can be difficult for buildings not within your scope. Consistency for net versus gross building area, or property area versus public-right-of-way area, can be exacerbating. Figure 1 demonstrates a simple compliance approach for credit submittal documentation, but if this is not available, a project is challenged to document the credit.

Documentation Solution: If a development master plan is not available, investigate aerial photographs or other satellite imaging software (Google Earth) to document credit compliance. Refer to Figure 2 for demonstration of how an aerial photograph helped support the credit submittal.

Alternative Transportation: Bicycle Storage and Changing Rooms (Sustainable Sites credit 4.2). LEED discourages vehicle usage in order to reduce pollution and the associated land development impacts.

Design Challenge: Although bicycle racks, or the necessary covered storage/lockers are not expensive, incorporating sufficient shower facilities may be a costly expense for some project budgets, especially if the number of showering facilities required to meet the LEED calculation threshold would be excessive for the end-use or occupancy type. Often, projects are challenged meeting the shower or changing room criteria due to space, budget, or security/accessibility related issues.

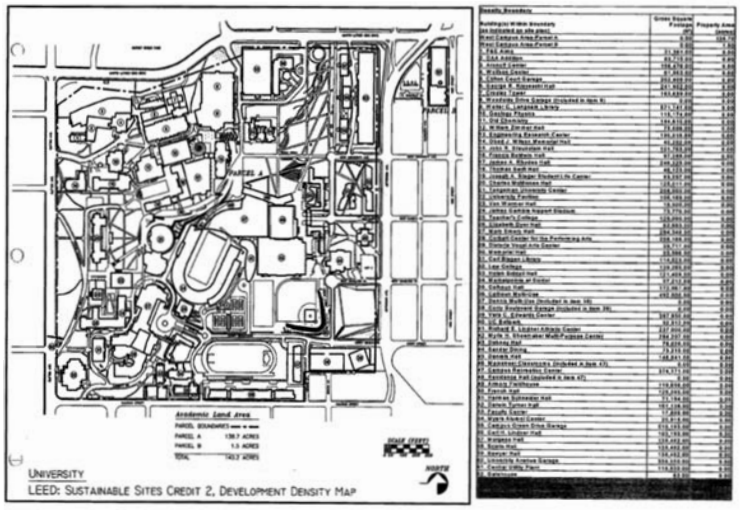


FIGURE 1. Campus Master Plans can facilitate the documentation of SS credit 2 Development Density & Community Connectivity. The main benefit is having a single owner or entity capable of providing all the surrounding building information to document credit compliance; buildings are labeled on the map and listed with gross sf and property acres. (*Image courtesy of GBBN Architects from Cincinnati, Ohio.*)

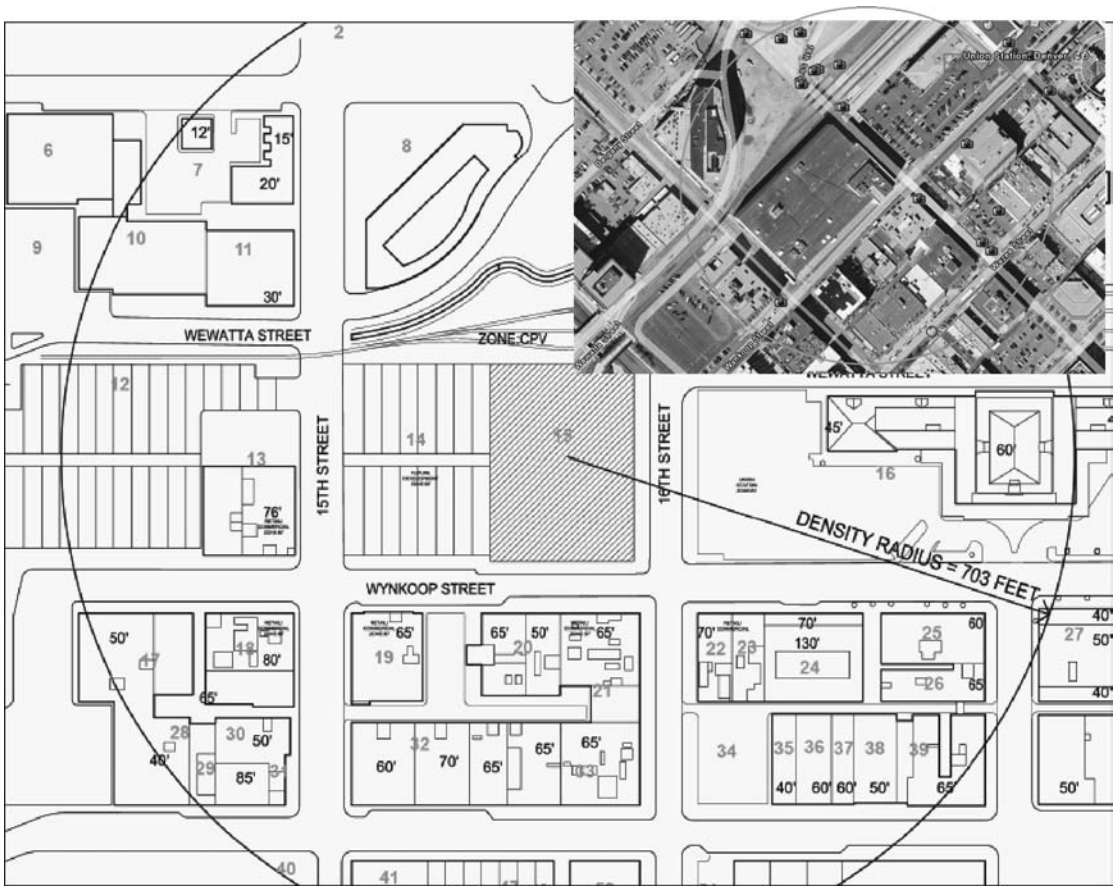
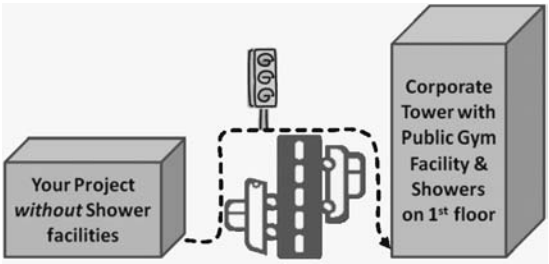


FIGURE 2. Downtown urban aerial photograph demonstrates surrounding development easily achieves the 60,000sf/acre density threshold, approximately 2-stories or greater, for the site. (Image courtesy of Opus Northwest Construction Co. for the EPA Region 8 Headquarters LEED Gold Certified project in Denver, Colorado.)

FIGURE 3. The "walking path" must demonstrate a pedestrian friendly path to the nearest shower, bike rack, or even bus stop location. For example, distance must be measured using cross-walks, not shortest distance across a property.



Design Solution: The LEED criteria allows for bike and shower amenities to be located within 200 yards of the project. Therefore, projects may utilize existing shower and bike facilities to fulfill the credit criteria, provided the team can submit sufficient documentation supporting the accessibility for users. Be certain to confirm the 200-yard distance is measured via the "walking path," refer to Figure 3.

Light Pollution Reduction (Sustainable Sites credit 8). The majority of respected lighting designers and electrical engineers agree with, and design to, the reduced light disturbance criteria intended by the LEED credit, which is to minimize night sky pollution and the negative impacts on nocturnal environments. In addition, minimized light trespass, reduced sky-glow, and glare reduction all contribute to improved nighttime visibility, community relations, and energy efficiency.

Documentation Challenge: The design guidelines are not necessarily challenging, if the designer is following best lighting practices. However, obtaining consistent LEED supporting submittal information throughout design and construction phases can be problematical. Inconsistent LEED submittal information is rarely accepted during the review process and often results in loss of the credit that you are attempting to achieve.

Documentation Solution: Plan for these submittals early in the design process, and reconfirm consistent installation during construction. Light fixtures often change during a project due to schedule or design conflicts in the field. Therefore, be mindful that you may submit this credit to LEED Online at the Design Phase Submittal, and again as a resubmittal during the Construction Phase LEED Online submittal due to changes in the field.

The SS credit 8 Light Pollution Reduction Submittal Challenge – Consistency within Submittal Documentation

- Site / Exterior Lighting Plan
- Interior Lighting Plan & Sections
- Automatic Lighting Controls drawings or plans, if applicable
- Electric Lighting Fixture Schedule (drawings or specifications)
- Site Lumens Calculation table
- Lighting Power Density Tabulation for Exterior Site Areas & for Building Façade / Landscape Lighting
- Light Fixture cut sheets or manufacturer's product information
- Footcandle Plot, if applicable
- Narrative and Alternative Compliance approach explanation, if applicable

Water Use Reduction (Water Efficiency credit 3). The Water Use Reduction credits (3.1 & 3.2) are intended to maximize water efficiency within a building to ultimately reduce the burden on municipally supplied water and other waste systems. Although some arid regions of the country tend to be more cognizant of their individual water use, projects across the country benefit from efficient water fixtures through lower water use fees, lower volumes of sewage to treat, and associated reductions in chemical use for treatment.

Calculation Considerations: The LEED credit threshold is based on relative water use savings compared to a generic worse-case, or minimally compliant, baseline model. When optimizing a project's water efficient design strategies, the LEED Water Use Reduction calculator can be valuable to guide fixture specifications and determine operational cost savings related to the proposed design options.

Key considerations for making fair baseline versus design case LEED calculation comparisons include:

- Only water closets, urinals, lavatory faucets, showers, janitorial sinks, and kitchen sinks are considered for the LEED calculator.
- Process and non-regulated water consuming fixtures are only applicable for Innovation credits.
- One-to-one gender ratio must be used unless a project has specific conditions that warrant an alternative male to female ratio (women's prison, monastery, girl's school or boy's camp, etc.).
- You must consider full-time equivalent occupants as well as transient occupant use (students, visitors, customers, etc.).
- Refer to your specific LEED Reference Guide—NC, CS, CI, NB, etc.—regarding particulars on fixture use by occupancy type and references for baseline fixture flush and flow rates (currently Energy Policy Act 1992 is used for baseline fixture use).

Implementation Challenges:

- Advise facilities representatives and owner's maintenance staff on efficient fixture use and buy-in.
- Confirm with your local code, jurisdiction, or permitting official regarding approval of any waterless or water-reuse strategies planned for the project.
- Projects concerned with effectiveness or reliability of waterless fixtures have included flow fixture replacement plumbing rough-in, or access (water piping capped behind the wall). Although this may relieve occupant concern for resale or future replacement, this strategy eliminates much of the financial benefit associated with reduced piping and drains.

Achievement Thresholds: The existing LEED criteria for Water Reduction is an easily integrated sustainable threshold for projects to achieve in design. Most projects can readily exceed the minimum water savings thresholds through common savings strategies often appropriate for class-A office space baseline design and budget standards.

Materials & Resources: Re..., Re..., Re... (Material & Resources credits 1-6). Recycling, *re*use, *re*cycled, *re*source, *re*gional, *re*lax! There is a commonality in all of these methods—they are all related to material qualities, and they all start with the letters "re-." Beyond that, these strategies are uniquely different, and are very often misinterpreted or confused with one another on LEED projects. Your LEED "re-" credit basics for MR credit 1 thru 6 include:

Prerequisite 1 - Storage & Collection of *Re*cyclables	• Owner/End-user/Tenant ***Re***cycling
Credit 1 - Building *Re*use	• Utilizing existing building stock to ***Re***novate for a new project; ***Re***use a building that is already existing
Credit 2 - Construction Waste Management	• GC/CM construction waste ***Re***cycling on the jobsite
Credit 3 - *Re*source *Re*use	• Use salvaged, ***Re***furbished, or ***Re***used material (materials found onsite but are ***Re***conditioned or installed for a different user in a different location) or (off-site materials that have been previously used)
Credit 4 - *Re*cycled Content	• 'Ingredients' of material or product; materials ***Re***processed into new products
Credit 5 - *Re*gional Materials	• Materials extracted, harvested, and manufactured within a 500 mile radius ('***Re***gional') from the project site
Credit 6 - Rapidly *Re*newable	• Materials and ***Re***sources that ***Re***supply themselves quickly, naturally, ***Re***ducing the burden on finite raw materials

Certified Wood (Materials & Resources credit 7). For wood building components permanently installed in the project, the current referenced standard for certified wood within the USGBC's LEED Rating System is the Forest Stewardship Council's (FSC) Principles and Criteria.

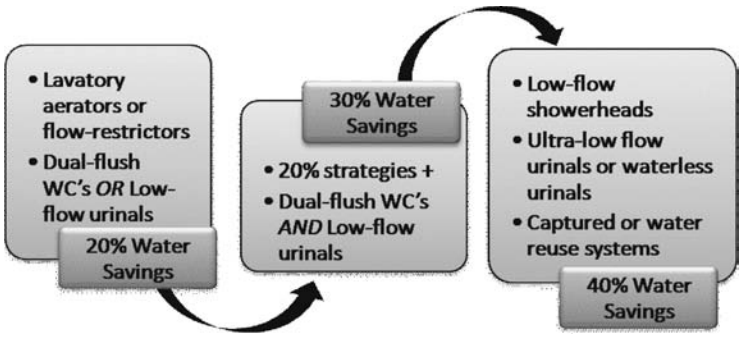


FIGURE 4. Occupancy type, annual work days, transient users, and even building operational schedule can largely influence the total water savings predicted in the LEED WE credit 3 calculator, but *in general*, the above strategies are good starting points for teams considering increased thresholds of water use reduction beyond the EP'Act 1992 consumption standards.

Calculation Challenges: The LEED Online web-based documentation submittal process has added great value and efficiency to the documentation process. One of the many tools embodied within LEED Online is the pre-formatted credit calculators. For this credit, the template spreadsheet will calculate all certified wood value as a percent of all new wood material. The overall percentage of wood components within a product can be based on total weight, volume, or cost. This is important when you consider the different contributions FSC wood veneers may have when calculated based on weight versus cost. To demonstrate this example, compare the total value of FSC resulting from a weight versus cost percentage of wood approach.

Calculation Solution: If presented by a product or assembly with multiple components (wood/non-wood or certified/non-certified), consider what method optimizes the product's certified wood contribution to the project.

Wood Door: Composite FSC-certified Wood Core + Cherry veneer (non-certified)

- Composite FSC Core is 50 lbs/door and cost $50/door
- Cherry non-certified veneer is 10 lbs/door and costs $150/door

Your project budget includes 50 doors and is targeting achievement of LEED MR credit 7 – FSC Certified Wood. How should you calculate your doors—FSC as a percentage of weight or cost (see worked example below)?

VOC Budgets (Indoor Environmental Quality credits 4.1 & 4.2). The USGBC has recognized the challenge in potentially not meeting some of the listed VOC limits. In addition, certain specialty applications, for which no low-emitting product is available, may prevent a project from achieving the LEED credit while still meeting the intent of the point for all other applications on the project.

In these instances, the USGBC has outlined an alternative compliance path to achieve EQ credits

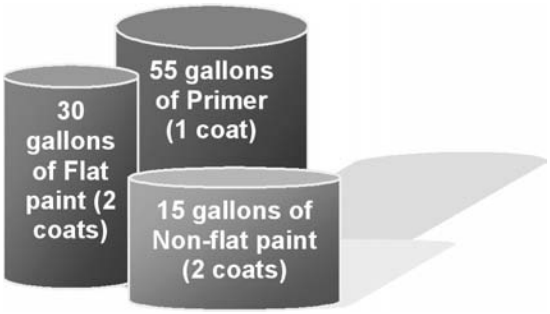
FSC contribution by COST	**FSC contribution by WEIGHT**
Total Wood Cost = $(50_{doors})*(\$50_{core} + \$150_{veneer})$ = $10,000	Total Wood Wght = $(50_{doors})*(50\ lbs_{core} + 10\ lbs_{veneer})$ = 3,000 lbs
FSC Wood Cost = (50 doors)*($\$50_{core}$)	FSC Wood Wght = (50 doors)*($50\ lbs_{core}$)
Value of FSC Wood = $2,500/$10,000 = **25% FSC Contribution**	Value of FSC Wood = 2,500 lbs / 3,000 lbs = **83% FSC Contribution**

For this specific case example, it is recommended to base the project's FSC wood contribution from the 50 doors based on weight.

Design Case VOC Budget		Baseline Case VOC Budget
(Volume of Product Applied)*(VOC_{actual} level)	<	(Volume of Product Applied)*($VOC_{max\ limit}$ level)

To demonstrate with a project case example VOC Budget calculation, refer to the following:

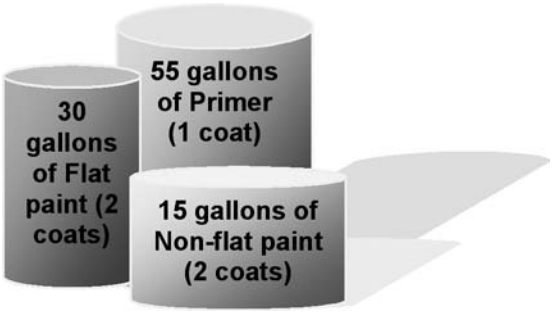
Design Case:



- Flat paint has VOC level of 65g/L** *(NON-COMPLIANT with Limit!!!)*

Non-flat paint has VOC level of 127g/L
Primer has VOC level of 13g/L

Baseline Case:



Flat paint has VOC limit of 50 g/L
Non-flat paint has VOC limit of 150 g/L
Primer (non-flat criteria) has VOC level of 150 g/L

VOC BUDGET CALCULATIONS:

Design Case:

$(30\ gal*2_{coats})*(65\ g/L) + (15\ gal*2_{coats})*(127\ g/L) + (55\ gal)*(13g/L) = 8{,}425\ gal*g/L$

Baseline Case:

$(30\ gal*2_{coats})*(50\ g/L) + (15\ gal*2_{coats})*(150\ g/L) + (55\ gal)*(150\ g/L) = 15{,}750\ gal*g/L$

$8{,}425_{Design\ Case}\ gal*g/L < 15{,}750_{\ Baseline\ Case}\ gal*g/L$

The credit is achieved if the Design Case VOC Budget is less than the Baseline Case VOC Budget.

4.1 & 4.2. This approach is called the **VOC Budget** method.

A project must demonstrate that the overall VOC performance of the design case is less than a standard baseline case.

Innovation: (Innovation in Design credits 1.1–1.4). Although only limited to four "open" credits, the Innovation in Design credits (1.1–1.4) offer exciting and creative opportunities for projects to showcase other sustainable measures integrated throughout the design and construction process. Some keys to success when documenting and submitting Innovation credits to the USGBC for review and approval include:

- **Quantifiable**—Be prepared to clearly quantify the beneficial environmental impacts of a submitted Innovation strategy. For example, *Number* of ridership for employee mass transit programs, *Pounds* of emissions reduced from biodiesel construction equipment, *Gallons* of pesticides diverted from water sources, etc. In addition, using baseline case (worse allowable) comparisons to design case (actual project) is widely accepted by the USGBC reviewers as a means to quantify the environmental benefits.
- **Double Dipping**—Be careful not to submit products, or specific technologies, that contribute to existing LEED credits. Remember, no double-counting sustainable strategies.
- **Repeatable**—Other projects must be able to repeat the same sustainable strategy. In other words, do not submit an Innovation credit for something another project could not attempt and similarly achieve.
- **Innovation CIRs**—Refer to existing Innovation Credit Interpretation Rulings (CIRs) for an easy

"starter's brainstorm list" of favorable rulings and resourceful direction on how to submit your own Innovation credit strategies.

- **Insurance Innovation Points**—Although a project is limited to a certain number of Innovation points within a LEED rating system (NC, CS, EB, CI, etc.) it is recommended that project teams collaborate and identify additional strategies that may be substituted if a particular strategy is cancelled, insufficient, or denied. Generally, it is recommended to consider two additional Innovation strategies for 'safety-insurance' points.

Innovation LEED Online Submittals: The development of LEED Online, the electronic web-based project documentation and certification process, has brought efficiencies and simplicity to LEED rating system users. Pre-formatted templates guide project team members through clear credit submittal documentation, including calculators and formulas where applicable. Since the Innovation credits (1.1–1.4) are open-ended, or dependent upon the project team's submittal, a simple pre-formatted cover sheet exists for these credits on LEED Online.

For additional supporting information for LEED Innovation credits beyond the minimum criteria outlined on the LEED Online template, consider the project's phases for submittal documentation:

- Design Phase: Would drawings and/or specifications be applicable?
- Construction Phase: Would cut sheets, photographs, or site haul tickets be applicable?
- Operations Phase: Would owner's policies or plans, facilities managers' programs, or copies of contracts/warranties be applicable?

LEED Online Innovation Submittals Must Include:

- Innovation Title
- Innovation Intent
- Innovation Requirements
- Project Approach to Innovation
- Sheet Description (supporting drawing sheet titles, or other referenced submittal documentation)

MAINTAINING YOUR SUSTAINABLE LEED SUCCESS

Certification and Award

For projects seeking formal LEED certification, the general process includes providing sufficient documentation to third party USGBC reviewers for notification of submittal status and eventual award, if the project meets the particular rating system minimum thresholds for sustainable design and construction. With the adopted LEED Online electronic submittal and review process, projects are offered the opportunity to submit a project in a two-phase certification process—the Design Phase LEED submittal and the Construction Phase LEED submittal. Details on this process and specifics of project submittals for the rating system in use (EB, CI, CS, etc.) can be found at the USGBC's web site, www.usgbc.org.

Each project certified provides team participants with an abundance of valuable case examples, lessons learned, and resourceful efficiencies for future projects applying similar design strategies or building practices. For projects applying for LEED certification from the USGBC, consider the following during the project planning, budgeting, and scheduling phases:

Certification and Award SCHEDULE Impacts to Consider

- Although the USGBC commits to timely certification and review, it would be sensible to double any stated LEED schedule assumptions to prepare for owner's deadlines for certification award schedule expectations.
- Expedited reviews are available for projects seeking formal award by a specific deadline. Refer to the USGBC web site for information on premium fees required for expedited, or rushed, certification reviews.
- Often, projects achieve Temporary Certificate of Occupancy (T.C.O.) and have completed the necessary IAQ flush-out or testing procedures, or may not be attempting those strategies, and specific service work, like Commissioning, may not be complete. Plan and monitor for LEED credit documentation to be final and complete by project schedule completion to prevent single or limited credits from delaying the entire project's submittal for certification.

Certification and Award BUDGET Impacts to Consider:

- Budget contingency fees for efforts related to resubmittal of credits marked pending during the USGBC's review period. These efforts could include multiple hours of documentation correction, narrative revisions, research for additional information, or even resurrection of archived project submittals.
- Budget contingency fees, or hours, for project sustainable marketing, case study and article submissions, white paper reports, interview time, and presentation or conference efforts.
- Principal team participants, or main LEED submittal responsible parties, should consider budgeting a small contingency for potential credit appeal fees. Refer to the USGBC's web site for specific details on appeal submission and current fees. This is particularly relevant for projects attempting controversial or questionable approaches to LEED strategies.

Certification and Award Project PLANNING Impacts to Consider:

- Be aware of marketing language and project LEED qualifications before formal USGBC award. Projects preemptively claiming certification, or misleading marketing material, are easily identified and severely discouraged.
- For projects without a designated LEED Consultant (for projects with owner or lead architect acting as team LEED coordinator and administrator), ensure a single contact is assigned to correspond and disseminate review and award information to the team. Since award may not occur for months after occupancy, it is vital this assigned person be accessible post-occupancy, and capable of contacting others on the team for follow-up on pending credits requiring action, or for dissemination of project award certificates.
- Account for planning considerations related to the official award certification. Marketing departments from many of the participating project teams should be prepared to manage and prioritize press releases, firm qualification updates, and white paper and case study submissions as the project nears the certification award goal. The formal "hanging of the plaque" can even serve as a great community outreach or public celebration event.
- After award, project team participants should plan for continued educational outreach through conference presentations and speaking or writing opportunities to share project experience. In addition, project owners should consider public environmental outreach programs through building tours, Internet or web postings, and even environmental signage.
- Operations—Continuing the success achieved in your LEED project is important to maintaining the predicted efficiencies and user benefits. The USGBC's LEED for Existing Buildings rating system (LEED-EB), and future developments addressing operational performance, should be evaluated during the project's design phase. Many conservation measures analyzed during a building's operational phase must be incorporated into a project's original system or controls design.

Future Developments in LEED

It is often easy to criticize the USGBC's existing LEED rating systems, but harder to appreciate the speed at which the organization has positively influenced the building industry, and the effort necessary to continually improve the tools and resources available to make better buildings. In allegiance to their diverse membership, the USGBC has outlined a new direction for improved growth within the LEED rating metrics. Their goal to achieve more flexible, adaptive systems is intended to increase LEED's ability to improve the built environment. The hallmark of LEED—a balance of creativity and innovation with technical rigor and consensus-based integrity—will continue to improve as marketplace needs influence the standards for sustainable development.

Future additions and improvements to be expected in developing LEED ratings systems include:

- **Scheduled Updates:** Future developments of the metric systems are expected to include a more regular updating cycle for LEED. Similar to how building codes are revised, the USGBC foresees a more streamlined schedule for new LEED developments and updates. The regular updates are also planned to positively influence the market as more users fully engage and integrate LEED and the predicted evolutions.

- **Life Cycle Assessment:** The incorporation of life cycle costing analysis has been in high demand within the sustainable building industry. Existing costing tools have often been tedious and antiquated. The USGBC hopes to influence the analysis of sustainable building measures through informative, resourceful, and realistic tools—life cycle costing is an inevitable path to future LEED updates. Stay tuned to the USGBC's web site as updates and news are released regarding the development and integration of life cycle costing into the LEED rating systems.
- **Regionalism:** Conflicts between credit strategy requirements and project climate and regional weather influences are planned to be resolved. For example, arid, draught-prone regions of the country may have increased opportunities to be awarded for water efficient strategies employed in the project. Similarly, drastic differences between the north and south will be accounted for as projects seek similar credits with diverse climates.
- **Credit Priority:** Due to increased interest and need to respond to climate change and related reduction of carbon emissions, future developments of LEED are planned to reorganize the rating framework based on priority. This improvement will help eliminate previous complaints that certain credits or strategies should be worth more than others (unfair demands that bike racks should not be equal to renewable PV energy systems). In addition, this approach will emphasize carbon reduction as a critical theme throughout all sustainable building strategies.
- **Committee Structure:** Striving to achieve a more integrated committee structure, the USGBC has developed a revised framework for managing the core elements of LEED. Committee development, function, and details are under development, and are planned to be announced formally at the GreenBuild National Conference in Chicago, November 2007, as well as released throughout 2008. Public comment, inclusion, and collaboration are fundamentals in LEED, and will continue to be in future evolutions (Over 600,000 volunteer hours just to launch LEED![1]).
- **Harmonizing & Aligning:** With multiple rating systems now available to cater to specific building types and lifecycle scopes, credit "drift," inconsistencies, and repetitive maintenance have become unmanageable for the USGBC and frustrating for users. A core system of credits, or sustainable strategies, can apply to all projects, but then specific building type or use specifications would serve as a supplement of credits to the core credits applicable to all projects seeking LEED certification.

CONCLUSION

As the green building industry continues to grow and evolve, we all benefit—as builders, users, and community members. Drivers of green building include government regulations, tax incentives, corporate responsibility influences, and above all concern over increased energy costs. Increased involvement in corporate green building signifies rapid adoption of not only basic sustainable standards, but also higher thresholds for environmental expectations. Projects seeking recognition, and more importantly, third-party validation, are utilizing metric tools to quantify, or measure, the success in achieving a development's environmental goals.

The U.S. Green Building Council's sustainable building rating system continues to lead the market in efficient, resourceful, and quantifiable tools for green developments of all varieties—commercial, interiors, existing building operations, homes, schools, and even neighborhood community planning. It is important to evaluate recommended strategies and LEED project approaches to ensure the most valuable and rewarding application of the USGBC's LEED rating system.

Commitment to verify a project's sustainable achievements is a continuous process, starting with eco-charettes at project inception to detailed analysis and quality review during design and construction, and finally ending with foresight and consideration for all the sustainable operational practices that maintain the environmental performance goals originally targeted for the project.

Although credit applications, calculations, and specific documentation compliance requirements may present challenges on your LEED project, the ultimate goal is achieving a better building. Avoid repeated pitfalls, learn from experienced practitioners, and keep the overall environmental goals in mind for the finish line—it will be the most rewarding project of your career.

[1] The Future of LEED U.S. Green Building Council LEED Steering Committee presentation notes.