Existing Buildings

Version 2.0

REFERENCE GUIDE

Second Edition October 2006

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LEED for Existing Buildings Core Committee

Michael Arny (Chair), Leonardo Academy
Stu Carron (Vice-Chair), JohnsonDiversey
Steve Ashkin, The Ashkin Group
Bob Cline, National Geographic
Barry Giles, Moss Landing Marine Laboratories
Don Horn, U.S. General Services Administration
Mike Italiano, Sustainable Products Corporation
Bob Lawler, Kansas City, MO Government
Dirk Meyer, U.S. Department of Interior
Teresa Pohlman, Pentagon Renovation Office
Sheila Sheridan
Mike Spishock, Johnson and Johnson
Paul Walitsky, Phillips Lighting
Craig Williamson, Abacus
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Energy & Atmosphere TAG

Greg Kats (Chair), Capital-E
Marcus Sheffer (Vice-Chair), 7group
Saad Dimachkieh, HOK
Chad Dorgan, Farnsworth Group, Inc.
Jay Enck, Commissioning & Green Building Services
Donald Fournier, Building Research Council
Jonathan Heller, Ecotope Inc.
Tia Heneghan, Sebesta Blomberg
John Hogan, City of Seattle Department of Design, Construction, and Land Use
Bion Howard, Building Environmental Science
Michael Lorenz, Kling
Cheryl Massie, Flack + Kurtz
Brenda Morawa, BVM Engineering, Inc.
Erik Ring, CTG Energetics, Inc.
Mick Schwedler, Trane Company

Indoor Environmental Quality TAG

Bob Thompson (Chair), EPA Indoor Environments Management Branch
Steve Taylor (Vice-Chair), Taylor Engineering
Jude Anders, Johnson Controls, Inc.
Terry Brennan, Camroden Associates
Brian Cloward, Mithun
Larry Dykhuis, Herman Miller, Inc.
Greg Franta, Ensar Group, Inc.
Francis Offerman, Indoor Environmental Engineering
Christopher Schaffner, The Green Engineer
Dennis Stanke, Trane Company
Materials & Resources TAG
Nadav Malin (Chair), BuildingGreen, Inc.
Kirsten Ritchie (Vice-Chair), Scientific Certification Systems
Paul Bertram, PRB Design
Chris Dixon, Mithun
Ann Edminster, Design AVEnues
Lee Gros, Austin Energy Green Building Program
Debra Lombard, RETEC
Nancy Malone, Siegel & Strain Architects
Dana Papke, California Integrated Waste Mgmt. Board
Wayne Trusty, Athena Institute
Denise Van Valkenburg, Steelcase
Melissa Vernon, Interface Flooring Systems
Mark Webster, Simpson Gumpertz & Heger
Gabe Wing, Herman Miller, Inc.

Sustainable Sites TAG

Bryna Dunn (Chair), Moseley Architects
Susan Kaplan (Vice-Chair), Battery Park City Authority
Ann Abel Christensen
Gina Baker, Burt Hill Kosar Rittelmann
Ted Bardacke, Global Green USA
Stephen Benz, Judith Nitsch Engineering, Inc.
Mark Brumbaugh, Brumbaugh & Associates
Meg Calkins, University of Illinois at Urbana-Champaign (and ASLA representative)
Stewart Comstock, Maryland Department of the Environment
Jay Enck, Commissioning & Green Building Services
Jim Frierson, Advanced Transportation Technology Institute
Ron Hand, G&E Environmental
Richard Heinisch, Acuity Lighting Group
Michael Lane, Lighting Design Lab
Mark Loeffler, The RETEC Group, Inc.
Marita Roos, Andropogon Associates
Zolna Russell, Hord Coplan Macht, Inc.
Eva Wong, U.S. EPA Heat Island Reduction Initiative (HIRI)

Water Efficiency TAG

Gunnar Baldwin, TOTO USA, INC
Neal Billetdeaux, JJR
David Carlson, Columbia University
Bill Hoffman, City of Austin - Water Conservation
Heather Kinkade-Levario, ARCADIS
John Koeller (Vice-Chair), Koeller and Company
Geoff Nara, Civil & Environmental Consultants
Shabbir Rawalpindiwala, Kohler Company
David Sheridan (Chair), Aqua Cura
Stephanie Tanner, National Renewable Energy Laboratory
Bill Wall, Clivus New England, Inc.
Bill Wilson, Environmental Planning & Design, LLC

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Trees*	Solid Waste	Liquid Waste	Electricity	Greenhouse Gases	Sulfur & Nitrogen Oxides
35,393 lbs. of virgin wood, equal to 62 trees	5,549 lbs.	52,045 gallons	11,039 kWh	13,777 lbs.	34 lbs.

*One tree = approx. 575 lbs.

Table of Contents

Foreword from USGBC 9

Introduction 11

What Does "Green" Mean? 11
Why Make Your Building Green? 11
I. The LEED® Green Building Rating System 11
II. LEED for Existing Buildings 12
III. LEED for Existing Buildings Reference Guide 18

Sustainable Sites 21

Prerequisite 1 Erosion & Sedimentation Control 23
Prerequisite 2 Age of Building 31
Credit 1 Green Site and Building Exterior Management 35
Credit 2 High Development Density Building and Area 41
Credit 3 Alternative Transportation 47
Credit 4 Reduced Site Disturbance 77
Credit 5 Stormwater Management 83
Credit 6 Heat Island Reduction 93
Credit 7 Light Pollution Reduction 109

Water Efficiency 119

Prerequisite 1 Minimum Water Efficiency 121
Prerequisite 2 Discharge Water Compliance 133
Credit 1 Water Efficient Landscaping 139
Credit 2 Innovative Wastewater Technologies 149
Credit 3 Water Use Reduction 157

Energy & Atmosphere 165

Prerequisite 1 Existing Building Commissioning 167
Prerequisite 2 Minimum Energy Performance 179
Prerequisite 3 Ozone Protection 189
Credit 1 Optimize Energy Performance 195
Credit 2 On-Site and Off-Site Renewable Energy 203
Credit 3 Building Operations & Maintenance 213
Credit 4 Additional Ozone Protection 225
Credit 5 Performance Measurement 231
Credit 6 Documenting Sustainable Building Cost Impacts 245

Materials & Resources 251

Prerequisite 1	Source Reduction and Waste Management	253
Prerequisite 2	Toxic Material Source Reduction	269
Credit 1	Construction, Demolition and Renovation	279
Credit 2	Optimize Use of Alternative Materials	289
Credit 3	Optimize Use of IAQ Compliant Products	303
Credit 4	Sustainable Cleaning Products and Materials	311
Credit 5	Occupant Recycling	319
Credit 6	Additional Toxic Material Reduction	327

Indoor Environmental Quality 333

Prerequisite 1	Outside Air Introduction and Exhaust Systems	335
Prerequisite 2	Environmental Tobacco Smoke (ETS) Control	343
Prerequisite 3	Asbestos Removal or Encapsulation	349
Prerequisite 4	Polychlorinated Biphenyl (PCB) Removal	355
Credit 1	Outdoor Air Delivery Monitoring	359
Credit 2	Increased Ventilation	365
Credit 3	Construction IAQ Management Plan	371
Credit 4	Documenting Productivity Impacts	379
Credit 5	Indoor Chemical and Pollutant Source Control	387
Credit 6	Controllability of Systems	395
Credit 7	Thermal Comfort	409
Credit 8	Daylight & Views	419
Credit 9	Contemporary IAQ Practice	435
Credit 10	Green Cleaning	439

Innovation in Operation & Upgrades 471

Credit 1	Innovation in Upgrades, Operations and Maintenance	473
Credit 2	LEED Accredited Professional	477

Glossary 479

Foreword from the USGBC

The built environment has a profound impact on our natural environment, communities, economy, health and productivity. Breakthroughs in building science, technology and operations are now available to designers, builders, operators, and owners who want to build green and maximize economic and environmental performance, as well as occupant well-being.

The U. S. Green Building Council (USGBC) is leading a national consensus to produce new and existing buildings that deliver high performance inside and out. Council members work together to develop industry standards, design practices and guidelines, operating practices and guidelines, policy positions, and educational tools that support the adoption of environmentally sustainable design and building practices. Members also forge strategic alliances with key industry and research organizations, federal government agencies, and state and local governments to transform the built environment. As the leading organization that represents the entire building industry on environmental building matters, our unique perspective and collective power provides our members with enormous opportunity to affect change in the way buildings are designed, built, operated and maintained.

USGBC Membership

The Council's greatest strength is the diversity of our membership. USGBC is a balanced nonprofit association representing the entire building industry, consisting of companies and organizations in the following member categories:

Architects
Architect/Engineers
Attorneys
Builders/Contractors
Commissioning Providers
Consultants
Corporate & Retail
Engineers
Federal
Finance
Interior Designers
Landscape Architects
Nonprofit Organizations
Planners
Press
Product Manufacturers
Professional Societies
Real Estate
State and Local Governments
Universities
Utilities

Since its inception in 1993, USGBC has played a vital role in providing a leadership forum and a unique, integrating force for the building industry. Council programs are:

- ❑ Committee-Based
  The heart of this effective coalition is our committees in which members design strategies that are implemented by staff and expert consultants. Our committees provide a forum for members to resolve differences, build alliances, and forge cooperative solutions for influencing change in all sectors of the building industry.
- ❑ Member-Driven
  The Council's membership is open and balanced and provides a comprehensive platform for carrying out important programs and activities. We target the issues identified by our members as the highest priority. We conduct an annual review of achievements that allows us to set policy, revise strategies and devise work plans based on members' needs.
- ❑ Consensus-Focused
  We work together to promote green buildings and in doing so, we help foster greater economic vitality and environmental health. The various industry segments bridge ideological gaps to develop balanced policies that benefit the entire industry.

Contact the U.S. Green Building Council

1800 Massachusetts Ave., NW, Suite 300

Washington, DC 20036

202 828-7422 Office

202 828-5110 Fax

www.usgbc.org

Introduction

What Does "Green" Mean?

"Green" has become the shorthand term for the concept of sustainable development as applied to the building industry. Also known as high-performance buildings, green buildings are intended to be environmentally responsible, economically profitable, and healthy places to live and work.

Why Make Your Building Green?

The building sector has a tremendous impact on the environment. Buildings in the United States consume more than 30% of our total energy and 60% of our electricity annually. They consume 5 billion gallons of potable water per day to flush toilets. A typical North American commercial construction project generates up to 2.5 pounds of solid waste per square foot of floor space. The industry appropriates land from other uses such as natural habitats and agriculture. These are just a few examples of the environmental impacts associated with the construction and operation of buildings.

Green building practices can substantially reduce these negative environmental impacts and reverse the trend of unsustainable building activities. As an added benefit, green performance reduces operating costs, enhances building marketability, increases worker productivity, and reduces potential liability resulting from indoor air quality problems. For example, energy efficiency measures have reduced operating expenses of the Denver Dry Goods building by approximately $75,000 per year. Students in day-lit schools in North Carolina consistently scored higher on tests than students in schools using conventional lighting fixtures. Studies of workers in green buildings reported productivity gains of up to 16%, including reductions in absenteeism and improved work quality, based on "people-friendly" green design. At a grocery store in Spokane, Washington, waste management costs were reduced by 56% and 48 tons of waste was recycled during construction. In other words, green performance has environmental, economic, and social elements that benefit all building stakeholders, including owners, occupants, and the general public.

I. The LEED® (Leadership in Energy and Environmental Design) Green Building Rating System™

History of LEED

Following the formation of the U.S. Green Building Council (USGBC) in 1993, the membership quickly realized that a priority for the sustainable building industry was to have a system to define and measure "green buildings." The USGBC began to research existing green building metrics and rating systems. Less than a year after formation, the membership followed up on the initial findings with the establishment of a committee to focus solely on this topic. The diverse initial composition of the committee included architects, realtors, a building owner, a lawyer, an environmentalist, and industry representatives. This cross section of people and professions added a richness and depth both to the process and to the ultimate product.

The LEED Pilot Project Program, also referred to as LEED Version 1.0, was launched at the USGBC Membership Summit in August 1998. After extensive modifications, the LEED Green Building Rating System Version 2.0 was released in March 2000. This rating system is now

called LEED for New Construction and Major Renovations.

As LEED has evolved and matured, the LEED program has undertaken new initiatives to address the many different stages and sectors of the U.S. building market aside from new construction. Owners, tenants, property managers, designers and building teams who wish to certify their buildings should choose the appropriate LEED Rating System for the scope of their project. Currently, the LEED product portfolio is being expanded to include the areas shown in the organization chart on the following page.

Features of LEED

The LEED Green Building Rating System™ is a voluntary, consensus-based, market-driven building rating system based on existing proven technology. It evaluates environmental performance from a whole building perspective over a building's life cycle, providing a definitive standard for what constitutes a "green building." LEED is a measurement system designed for rating new and existing commercial, institutional, and high-rise residential buildings. It is based on accepted energy and environmental principles and strikes a balance between established practices and emerging concepts.

LEED is organized into the five environmental categories of Sustainable Sites, Water Efficiency, Energy & Atmosphere, Indoor Environmental Quality and Materials & Resources. An additional category, Innovation in Upgrades, Operations, and Maintenance addresses building measures not covered under the five environmental categories, as well as sustainable building expertise. It is a performance-oriented system where points are earned for satisfying criteria. Different levels of green building certification are awarded based on the total points earned. The system is designed to be comprehensive in scope, yet simple in operation.

II. LEED for Existing Buildings

LEED for Existing Buildings provides the existing building stock an entry point into the LEED certification process, and is applicable to:

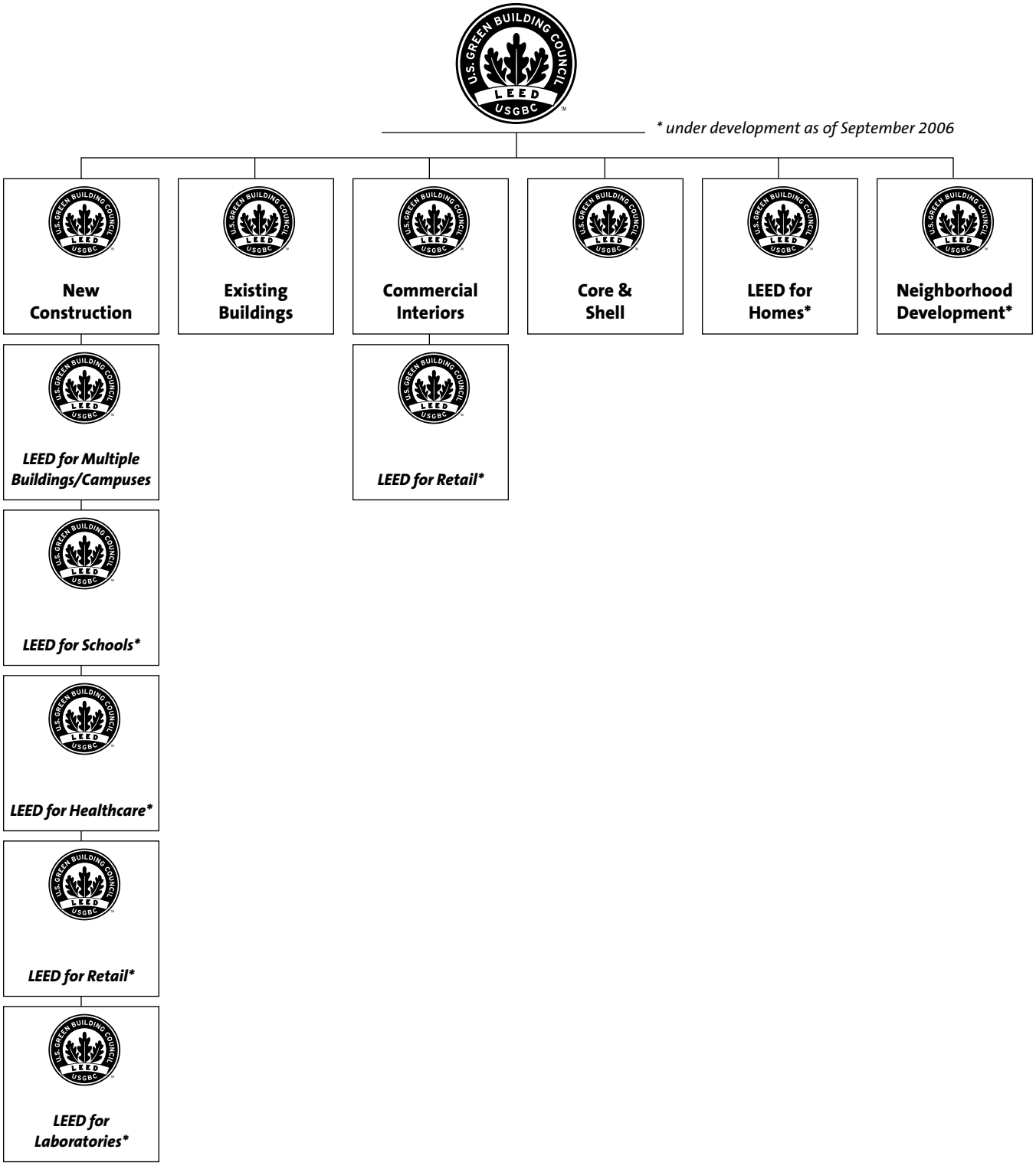
- ❑ Building operations, processes, systems upgrades, and minor space use changes.
- ❑ Buildings new to LEED certification as well as buildings previously certified under LEED for New Construction.

LEED for Existing Buildings is a method for building owners and operators of existing buildings to implement sustainable operations and maintenance practices and reduce the environmental impact of a building over its functional life cycle. Specifically, it addresses exterior building site maintenance programs; water and energy use; environmentally preferred products for cleaning and alterations; waste stream management; and ongoing indoor environmental quality. LEED for Existing Buildings is targeted at single buildings that are 100% owner-occupied as well as multiple-building projects and single, multi-tenant buildings, which can potentially qualify under certain conditions (see the USGBC Web site for more information). LEED for Existing Buildings is a whole-building rating system; individual tenant spaces are ineligible.

LEED for Existing Buildings Registration

Project teams interested in obtaining LEED certification for their projects must first register with USGBC. Registration is an important step that establishes the primary contact between the project and USGBC. This connection allows a project team to receive periodic errata and other updates, access LEED-Online, and access to the LEED for Existing Buildings v2.0 project resource page on the USGBC Web site. The project administrator should also send the project access code to other members of the project team to

Rating System
Product Portfolio



give them access to the online projects resources. The project resources include access to the LEED for Existing Buildings Letter Templates, an electronic document that contains pre-formatted submittal sheets for each prerequisite and credit, and includes integrated calculation tables when necessary. The Letter Templates and Reference Guide are to be used as companion documents.

LEED for Existing Buildings Submittals and the Certification Application

Once a project is registered, the project team begins to collect information and perform calculations to satisfy the prerequisite and credit submittal requirements. It is helpful to identify an individual who will champion LEED goals, facilitate communication, track progress and compile the components of the final LEED submittal for certification. Submittal documentation should be gathered throughout the process.

To earn LEED certification, the applicant project must satisfy all of the prerequisites and a minimum number of points to attain the established LEED for Existing Buildings project ratings as listed below. LEED for Existing Buildings projects will need to comply with the version that is current at the time of project registration.

LEED for Existing Buildings Certification Levels:

- ❑ Certified 32-39 points
- ❑ Silver 40-47 points
- ❑ Gold 48-63 points
- ❑ Platinum 64-85 points

Project teams apply for certification using one of two methods. All projects that registered for LEED after November 2005 are required to use the USGBC's LEED-Online Web-based project management and documentation system. Teams that registered before November 2005 may use the older method, which requires sending USGBC two copies of project documentation either in one three-ring binder with a CD-ROM, or entirely on CD-ROM (note: please check USGBC's Web page describing the certification process for the most up-to-date instructions). Regardless of which method is used, all certification applications must include the following:

- ❑ The completed LEED for Existing Buildings v2.0 spreadsheet Letter Templates (old method) or Submittal Templates (LEED-Online)
- ❑ Overall project narrative including all requirements listed below
- ❑ LEED for Existing Buildings Project Scorecard indicating projected prerequisites and pursued credits and the total desired score for the project
- ❑ Drawings and photos illustrative of the project:
  - Site plan
  - Typical floor plan
  - Typical building section
  - Typical or primary elevation
  - Photo or rendering of project

To begin the certification process, the project team submits a complete application to USGBC for review that includes all of the above items. The review process cannot begin until the application is complete and the project has paid the certification fees.

Project Narrative

LEED for Existing Buildings v2.0 requires the submission of an overall project narrative with the completed Submittal Templates. The outline below is intended as a guide for project teams in compiling this brief description of the organization, building, site, and team. This narrative will assist the LEED for Existing Buildings Review Team in understanding core elements of the project and building

performance, and will also aid USGBC in highlighting aspects of projects in future communications efforts. Project teams must address all the required elements listed below, providing details and clarifications where appropriate, and may include any of the optional elements that are helpful in telling the project's story.

Required Elements

1. LEED:

a. Is this project a LEED for Existing Buildings initial certification or recertification?

b. Does this building have any LEED certifications or registrations other than Existing Buildings (e.g., New Construction, Core & Shell, Commercial Interiors) for the whole building or part of the building? If so, provide the other LEED project name(s) as they appeared in the other LEED registrations.

c. Provide a brief description of key factors motivating LEED for Existing Buildings implementation and certification for this building.

d. Estimate the number of months elapsed from the LEED for Existing Buildings project kickoff meeting until the certification application was completed.

2. Project Scope:

a. Is the LEED for Existing Buildings project a single building, more than one building, or an entire campus/neighborhood?

b. Did any of the building space undergo a major renovation as part of the LEED for Existing Buildings project? If yes, provide the total renovated floor area and specify which spaces were renovated.

c. Briefly describe any major capital purchases, replacements, or equipment upgrades that were performed as part of the LEED for Existing Buildings project.

3. Building & Site:

a. Location, including a brief description of the building context, basic setting, and surrounding area

b. Floor area – footprint, number of floors, total conditioned square feet, total square feet

c. Description of major HVAC equipment & systems

d. Total area of site, and footprint of vehicle parking area, if any

e. If part of a multi-building site or campus, brief description of surrounding buildings and setting

4. Occupancy & Usage:

a. Percentage of total floor area currently occupied or being used.

b. Number of persons who are full-time occupants, part-time occupants, and transient visitors. Provide both design (peak) and typical levels.

c. Major space usage types in the building, and percentage of total floor area for each.

d. Does the owner occupy 100% of building? If not, provide the percentage of total floor area occupied by the owner and tenants and the total number of tenants.

5. Project Highlights:

Describe three or more major accomplishments or highlights of the building's sustainability performance. These highlights should emphasize performance elements that your team would most like to share with both the LEED for Existing Buildings reviewers and the public.

Optional Elements

Applicant Organization

- ❑ Identification, description and general mission/function of ownership organization, institution or firm
- ❑ Organization total employees (all facilities)
- ❑ Organization buildings – number and total floor area
- ❑ Organization buildings previously certified under LEED – number, rating systems, and certification levels

Building History

- ❑ Construction and occupancy dates
- ❑ Building uses over lifetime
- ❑ Brief description of any major upgrades to the building over its life

Applicant Project Team

- ❑ Description of how the certification process was led and managed
- ❑ Description of how personnel involved in the ongoing management of the building, including internal staff and external contractors, were engaged in the LEED for Existing Buildings implementation and documentation process
- ❑ Description of the level of management buy-in and how this buy-in was achieved.

Project Challenges—Describe any notable obstacles that were overcome in the process of preparing for LEED for Existing Buildings certification, the reasons these obstacles arose, and the team's method of overcoming them.

LEED for Existing Buildings Initial Certification vs. Recertification

Any first-time certification application to the LEED for Existing Buildings program is considered an initial LEED for Existing Buildings certification. This includes both applications for buildings never LEED certified and buildings previously certified under LEED for New Construction. Any LEED for Existing Buildings application for a building previously certified using LEED for Existing Buildings is considered a LEED for Existing Buildings recertification. These buildings can apply for recertification as frequently as annually and must file for recertification at least once every 5 years to maintain their LEED for Existing Buildngs status.

Performance Period for LEED for Existing Buildings Applications

Documentation required for LEED for Existing Buildings Certification Applications include performance data for the building and site over the performance period.

The LEED for Existing Buildings Performance Period is the period during which building performance data is collected for inclusion in a LEED for Existing Buildings certification application. The Performance Period may not have any "gaps"; it must be a continuous interval of time.

Requirements for Initial Certifications

Duration

For initial LEED for Existing Buildings certifications the Performance Period must be at least three months long. In some situations, specific prerequisites or credits may require more than three months of data, in which case historical data can be used to supplement the Performance Period data, or the three months of Performance Period data can be extrapolated to annual data following the guidelines in the LEED for Existing Buildings Reference Guide. The maximum Performance Period duration for any prerequisite or credit in an initial LEED for Existing Buildings application is two years.

	Performance Period – Example		
	Start	**End** (all performance periods must end within a common 60-day window)	**Duration** (at least 3 months)
SSp1: Erosion and Sedimentation Control	July 15, 2005	December 15, 2005	5 months
SSc1: Plan for Green Site and Building Exterior Management	May 30, 2005	October 30, 2005	5 months
WEp1: Minimum Water Efficiency	September 30, 2005	December 30, 2005	3 months
WEc1: Water Efficient Landscaping	December 1, 2004	December 1, 2005	12 months

The certification application must be submitted to USGBC within 90 days of the end of the shared 60-day window.

Consistency across Prerequisites and Credits

Consistent start times and durations for the performance periods for each prerequisite and credit are preferred but not strictly necessary. However, all performance periods must end within a shared 60-day window, as illustrated in the example below. For this example, the shared window extends from October 30 to December 30.

The certification application must be submitted to USGBC within 90 days of the end of the shared 60-day window.

Performance Period Best Practices

Duration

Though the performance period can be as short as three months for initial LEED for Existing Buildings applicants, consider a longer performance period, which will provide a more robust picture of the building's performance. A full year of data, for example, will reflect seasonal variations in resource consumption (irrigation rates, heating and cooling loads, etc.) and occupant behavior (commuting choices). In any case, the maximum performance period duration for any prerequisite or credit in an initial LEED for Existing Buildings application is two years.

Timing

Ideally, the performance period should be identical across all prerequisites and credits, and all policy, operations and equipment changes undertaken to meet LEED for Existing Buildings requirements should be fully implemented BEFORE the start of this universal Performance Period, as the building performance data collected should reflect those changes. If major changes to building operating procedures or equipment occur during the Performance Period, it is best to collect at least three months of data after such changes to help identify any new trends in the performance results.

Requirements for Recertifications

- ❑ The performance period for recertification applications runs from the time of the last certification under LEED for Existing Buildings to the date of the time of the filing of the recertification application.
- ❑ As a result the performance period for these recertification applications can be as short as 1 year and as long as 5 years.
- ❑ Performance data for the entire performance period need to be provided with LEED for Existing Buildings applications. Performance data need to be provided for each year of the perfor-

mance period so that ongoing annual performance is demonstrated. If data cannot be provided for a building for the entire performance period, then an application for first-time certification application needs to be submitted instead of a recertification application, and there will be a gap in the building's certification history.

Credit Interpretation Rulings

In some cases, the project team may encounter difficulties in applying a LEED for Existing Buildings prerequisite or credit to their particular project. These problems arise from specific instances where the Reference Guide does not sufficiently address a specific issue or there is a special conflict that requires resolution. To address such problems, USGBC offers technical support through Credit Interpretation Requests and Rulings (CIRs). See the LEED for Existing Buildings Web page for more information.

The Credit Interpretation process is summarized as follows:

1. Project teams should review the Ruling Page to read previously posted Credit Interpretation Requests and USGBC responses. Many problems can be resolved by reviewing existing Credit Interpretation Rulings.
2. If no existing Credit Interpretation Rulings exist, the project team should follow instructions for submitting a CIR posted on the CIR resources page on the USGBC Web site. The problem encountered by the project team should be brief but explicit and should be based on prerequisite or credit information found in the Rating System and Reference Guide, with a special emphasis on the intent of the prerequisite or credit. If possible, the project team should offer potential solutions to the problem, and solicit approval or rejection of their proposed interpretation.
3. For each CIR, USGBC applies a committee and staff review process and posts decisions on the Ruling Page per the posted schedule. All Credit Interpretation Rulings are available on the Ruling Page for the benefit of all registered LEED projects and Ruling Page subscribers.

Updates & Addenda

As LEED for Existing Buildings continues to improve and evolve, errata and addenda may be developed to correct, substitute and augment the current material. Errata and addenda will be accumulated between revisions and will be formally incorporated into the next version. In the interim between major revisions, USGBC may use its consensus process to clarify criteria.

The prerequisites, credits and credit rulings current at the time of project registration will continue to apply to the project throughout its documentation and certification processes. Credit rulings posted after that time may be applied if desired. A newer version of a referenced standard may be used if considered at least as stringent as the version cited herein.

III. LEED for Existing Buildings Reference Guide

The LEED Reference Guide is a supporting document to the LEED for Existing Buildings Green Building Rating System. The guide is intended to help project teams understand LEED for Existing Buildings criteria and the benefits of the requirements. The guide includes examples of strategies that can be used in each category, case studies of buildings that have implemented these strategies successfully, and additional resources that will provide more information. The guide does not provide an exhaustive list of strategies for meeting the criteria. Nor does it provide all of the information that building teams need to determine the applicability of a credit to their project.

Prerequisite and Credit Format

Each prerequisite and credit is organized in a standardized format for simplicity and quick reference. The first section summarizes the key points regarding the green measure and includes the intent, requirements, required submittals for certification, and a summary of any referenced industry standard. The subsequent sections provide supportive information to help interpret the measure and offer links to various resources and examples. The sections for each credit are described in the following paragraphs.

Intent identifies the main goal of the prerequisite or credit.

Requirements & Submittals specify the criteria to satisfy the prerequisite or credit, the number of points available, and the documentation required for the LEED application. The prerequisites ***must*** be achieved. While each credit is optional, it contributes to the overall project score. Some credits are divided into two or more measures with cumulative points. For example, Materials & Resources Credit 4: Recycled Content is divided into Credit 4.1 for achieving 25% (worth one point), and Credit 4.2 for achieving 50% (for an additional point). In contrast, Energy Credit 1: Optimize Energy Performance is divided into five measures and a project can only apply for one of the measures, depending on the degree of energy savings realized. Checkboxes are used to identify required documents for submittal.

Some multiple-point credits (e.g., MRc1 - Construction Waste Management) require that a green operations policy be put in place and also award points based on how much of the associated activity within the building conforms to the policy. The higher the fraction of conformance, the more points are awarded. Note that for these credits, only 1 point will be awarded for a green policy in the absence of any associated activity (e.g., for MRc1, in the absence of any construction waste generation).

Summary of Referenced Industry Standards, where applicable, briefly introduces the required standards used to measure achievement of the credit intent. Users are strongly encouraged to review the standard and not rely solely on the summary.

Green Building Concerns related to the prerequisite or credit are explained in this section and divided into environmental and economic issues.

Environmental Issues address the environmental impacts of the prerequisite or credit and attempt to relate specific goals or concerns with the influence on our natural environment.

Economic Issues address considerations related to first costs, life-cycle costs and estimated savings.

Strategies are specific methods or assemblies that facilitate achievement of the requirements.

Technologies are specific products or systems that can be employed to achieve the measure.

Synergies & Trade-Offs identify areas of significant interaction with other building operations, upgrades, and maintenance issues as well as other LEED credits. Users are advised to carefully evaluate the benefits and disadvantages of pursuing these related credits.

Calculations are sample formulas or computations to assist with the determination of achievement of a particular prerequisite or credit. Some calculations are facilitated by the LEED Letter Templates, which are available to registered projects via the USGBC Web site in order to facilitate the application process.

The **Documentation** section contains additional information for documenting prerequisite and credit achievements and successfully developing the submittals

required for the LEED for Existing Buildings application.

Other Resources are suggested for further research and may include Web sites or print media that provide examples or illustrations, detailed technical information, or other information relevant to the prerequisite or credit.

Web Sites list resources available on the Internet.

Print Media are books and articles related to the prerequisite or credit and may be obtained directly from the organizations listed.

Definitions clarify the meaning of certain terms relevant to the prerequisite or credit. Listed definitions may be general descriptions of terms or have meanings that are specific to LEEDfor Existing Buildings.

Case Studies are provided to present an example of the successful implementation of the goals stated for the prerequisite or credit. As an illustration, the selected project exemplifies one method to achieve the intent of the measure, although there may be other methods.