



High-Performance Building Certification System Review

Appendices A–C, E–F

Prepared for the U.S. General Services Administration by LMI.

March 2019

Appendix A

High-Performance Building Certification System Review Background Information

Federal Drivers that Shaped 2017–2018 Evaluation Criteria

Multiple federal statutes and mandates specify building performance requirements that agencies must meet. The list below highlights the major mandates and executive orders that informed the evaluation criteria used to assess high-performance building certification systems.

- *Energy Policy and Conservation Act Section (42 U.S.C. 6294) as amended by the Energy Policy Act (EPAAct) of 2005 Section 131* (<https://www.epa.gov/laws-regulations/summary-energy-policy-act>)
- *EISA (42 U.S.C. 17092)* (<https://www.epa.gov/laws-regulations/summary-energy-independence-and-security-act>)
 - *Section 436(h), which specifies the following criteria be evaluated for a high-performance building:*
 - *“(i) efficient and sustainable use of water, energy, and other natural resources; (ii) use of renewable energy sources;*
 - *(iii) improved indoor environmental quality through enhanced indoor air quality, thermal comfort, acoustics, day lighting, pollutant source control, and use of low-emission materials and building system controls;*
 - *(iv) reduced impacts from transportation through building location and site design that promote access by public transportation; and*
 - *(v) such other criteria as the Federal Director determines to be appropriate,”*
- *Green Building Certification Systems Requirement for New Federal Buildings and Major Renovations of Federal Buildings Final Rule* (October 14, 2014) (<https://www.energy.gov/eere/femp/downloads/green-building-certification-systems-requirement-new-federal-buildings-and-major>)
- *Guiding Principles for Sustainable Federal Buildings and Associated Instructions* (February 2016) (<https://www.energy.gov/eere/femp/guiding-principles-sustainable-federal-buildings>).

Certifications and Standards Not Included in GSA’s 2017–2018 Review

Over the past two decades, the number and availability of building certification systems increased significantly. This review identifies whole-building certification systems that promote a sustainable and environmentally sound approach to the certification of high-

performance buildings. GSA did not include product certifications, building standards or codes that lack a specific certification process for achievement, or certification systems that focus on only one aspect of building performance.

- **GSA’s review excluded standards.** The Whole Buildings Design Guide (WBDG) describes a **standard** as “a set of guidelines and criteria against which a product can be judged.”¹ Organizations, such as the American National Standards Institute (ANSI), the American Society for Testing and Materials (ASTM), and ASHRAE, established several common standards related to building practices through consensus-based processes. The International Standards Organization (ISO) acts as the central body for defining and developing worldwide standards adopted into law or industry best practice. ISO defines a standard as a document, established by consensus, “that provides for common and repeated use as rules, guidelines, or characteristics for activities or their results.”²
- **GSA’s review excluded product certifications.** Product certifications signify that a specific product (in this case, used in the construction, renovation, operation, or maintenance of a building) meets a certain standard and provides some environmental benefit. Examples include EPA’s ENERGY STAR, WaterSense, and Green Seal. Building certification systems will often require or suggest the use of certified products as a method of obtaining compliance with a metric or credit of the system.
- **GSA’s review excluded certification systems that only focus on one aspect of building performance,** such as health-promoting building certification systems, including WELL and Fitwel. These systems do not measure high-performance design and operation attributes outside of those that have a potential effect on occupant comfort and health. They focus on attributes, like indoor environmental quality and building design and operation strategies, to address and measure wellness-promoting building features and policies. Despite not including these systems in this review, GSA supports the goals of health-focused certification systems and their roles in furthering a holistic approach to certification of buildings.
- **GSA’s review excluded whole-building certification systems for building types that are not representative of the GSA and federal building portfolio.** Office buildings represent the overwhelming majority of building types within the federal portfolio of buildings; therefore, GSA limited the scope of its review to commercial buildings for new construction or major renovation projects, existing buildings, and commercial building interiors.

Certification System Overviews

GSA reviewed the following certification systems in detail in this review process:

- BOMA BEST® Sustainable Buildings for existing buildings, version 3.0 (<http://www.bomabest.org>)

¹ <https://www.wbdg.org/resources/green-building-standards-and-certification-systems>.

² <https://www.iso.org/deliverables-all.html#IS>.

- BREEAM® USA In-Use for existing buildings, version 2016 (<http://www.breeamusa.com>)
- Green Globes® for existing buildings, building interiors, and new construction or major renovation, version 2013 (<http://www.thegbi.org>)
- LEED® for existing buildings, building interiors, and new construction or major renovation, version 4.0 (<https://new.usgbc.org/leed>)
- Living Building Challenge (LBC™) for existing buildings, building interiors, and new construction or major renovation, version 3.1 (<https://living-future.org/lbc>).

System owners provided the information below on each system to GSA as supplemental information in their completed survey submission.

BOMA BEST® Sustainable Buildings

Building Types: Currently, BOMA BEST® includes certifications for existing buildings.



System Development & Update: BOMA BEST 3.0 was developed through a process of stakeholder review and feedback, during which over 100 stakeholders provided input on the draft assessment questionnaire, including organization, form, scoring, and benchmarking method. After the period of stakeholder feedback, which involved three iterations of the draft assessment, 20 buildings participated in a 2-month pilot of the assessment, providing their own comments.

BOMA BEST 3.0 is the latest of five iterations of the BOMA BEST program. The system is updated every 3 to 4 years to maintain concurrence with industry standards via stakeholder feedback. In addition, all BOMA BEST® users are able to submit suggestions for program modification or areas of clarification through the Technical Clarification Request (TCR) process at any time. All TCRs are posted to BOMA BEST's website and may or may not result in actual modifications to the tool.

Registration & Certification Fees: Fees vary from \$2,400 to \$14,000 for a 3-year certification, depending on the asset class of the property and the square footage of the project. In addition, onsite visits for certification are billed at cost. BOMA BEST also offers a continuous certification program, Portfolio Program, which has reduced annual fees for each property ranging from \$130/year to \$4,670/year, depending on the asset class.

Assessment & Certification: BOMA BEST assessors are independent, third-party individuals who meet BOMA BEST requirements, have received formal training on the BOMA BEST program, and have signed a code of ethics forbidding any conflict of interest. They enter into contractual agreements with a local BOMA association or directly with BOMA Canada (including U.S.-based projects). Only those assessors who have satisfactorily completed the BOMA BEST training may verify a BOMA BEST assessment.

There are currently 80 buildings certified under BOMA BEST® in the United States. To date, no federal buildings have been certified.

BREEAM® USA In-Use

Building Types: Currently, BREEAM® USA In-Use includes certifications for existing buildings.



System Development & Update: BREEAM® is based primarily on scientific research rather than stakeholder consensus. Consultations on sustainability topics set the framework for BREEAM rating systems, with scientific research determining the performance levels for each credit. Industry consultation plays a role in system development, but changes to the technical content must be accompanied with scientific evidence.

Each version of the system is published online for public review, with comment adjudications subsequently published. The current version of BREEAM USA In-Use, 2016, was translated from an existing international system and, thus, did not undergo stakeholder engagement or consultation. System updates are conducted every 3 to 4 years. The next update of BREEAM USA In-Use will take place simultaneously with the update of BREEAM International In-Use to ensure continued alignment.

Registration & Certification Fees: BREEAM USA In-Use certification is divided into three parts—asset, building, and occupier management—with each one assessing a different aspect of a project’s performance. Users can determine the applicable parts to be assessed. System registration costs \$1,000 per asset to be evaluated and includes the question sets for all three parts, regardless of which parts are chosen. The fee for a licensed BREEAM USA In-Use assessor is independent of BREEAM USA and is determined between the client and the assessor. Submitting an asset for certification after assessment requires a \$750 fee per part.

Assessment & Certification: BRE America trains and licenses assessors to conduct BREEAM USA In-Use assessments. All licensed assessors are listed on the BREEAM USA website and clients are able to choose who will conduct their assessment. BRE America is not responsible for arranging or establishing fees for project assessments.

There are currently 12 buildings certified under BREEAM® USA In-Use. To date, no U.S. federal buildings have been certified.

Green Globes®

Building Types: Currently, Green Globes® includes certifications for existing buildings, building interiors, and new construction and major renovation.



System Development & Update: As an approved ANSI Standards Developing Organization (SDO) in 2005, the GBI created the ANSI/GBI 01-2010 Green Building Assessment Protocol for Commercial Buildings, establishing the basis for Green Globes®. A technical committee, or consensus body, with the help of subcommittees comprised of technical experts, used ANSI-approved procedures in developing GBI’s standard. During the development stage, all consensus body and subcommittee meetings were open to the public and public comments and meeting minutes were published on GBI’s website.

GBI conducts annual reviews of its procedures to ensure compliance with ANSI Essential Requirements and ANSI third-party reviews of the standard development process. In addition, GBI undergoes an audit every 5 years to maintain its SDO designation. Formal periodic revisions to GBI standards are completed at least every 5 years, but GBI may also gather technical committees to update the Green Globes® rating system outside of the formal revisions to maintain market alignment. GBI intends to file for approval of continuous maintenance procedures so that proposed changes can occur in a limited fashion within a 2-year period to more immediately incorporate market advances.

As of publication of this report, the GBI standard is under scheduled periodic revision and is expected to be published during FY 2018.

Registration & Certification Fees: Certification fees depend on building size and characteristics, type of certification, and level of assessment services. Project registration costs \$1,500 and is the first step to achieving certification. Assessment and certification fees are determined by square footage and the volume and type of buildings. Fees range from \$7,750 for existing buildings averaging 41,211 square feet to \$13,500 for new construction buildings of 149,000 square feet. There are no fees associated with the interpretations or appeals processes.

Assessment & Certification: Green Globes® third-party assessors complete extensive training in the assessment method, conducting onsite assessments, and creating written reports based on those assessments. GBI sets specific requirements for existing building assessors or new construction and major renovation assessors, including years of experience, licenses, and field of expertise. Once certified, the Green Globes assessors are assigned to a project, serving as a resource to the project team in addition to assessing rating system achievement.

There are currently 1,337 buildings in the United States certified under Green Globes®. Of these, 333 are U.S. federal buildings.

LEED®

Building Types: Currently, LEED v4 includes certifications for existing buildings, building interiors, and new construction and major renovation.



System Development & Update: In developing the LEED certification system, USGBC used a voluntary consensus-based process, as defined in the Office of Management and Budget (OMB) Circular A-119.³ Volunteer-based committees first review the LEED credit categories and draft changes to the rating system. Changes can be submitted by the LEED Steering Committee (LSC), subject matter committees, or by LEED members. All proposed changes are reviewed by the LSC and must be approved before being released for public comment. All comments received during the public comment phases are responded to individually; the development process involves at least two drafts and two public comment periods. After

³ OMB, Executive Office of the President. Circular A-119, *Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities*. Last revised January 27, 2016.

this phase, USGBC members vote on the draft. To be accepted, the draft must receive positive votes from 66 percent of the voting members.

In addition to formal updates to the certification system, LEED may also issue clarifications through credit information requests (CIRs) and LEED interpretations (LIs). CIRs enable project teams to request technical guidance on how LEED criteria are applied to their specific project. Thus, CIRs apply only to that project. LIs address technical inquiries about implementing LEED on a project and are applicable to any project pursuing certification.

Registration & Certification Fees: Fees for LEED certification vary by building project size, membership status, and complexity. For organizational members at the Silver, Gold, and Platinum levels, system fees for registration and certification range from \$4,050 for a building with 50,000 square feet with combined certification review to \$42,500 for a 749,999 square foot building and split review. The certification fees for larger buildings are determined by the Green Business Certification Incorporated (GBCI). Credit appeals vary from \$500 to \$800.

LEED volume certification offers reduced fees for organizations with multiple certain kinds of projects. In the past 3-year period, the average cost was \$5,770 per certification with an average gross floor area of 96,000 feet per building.

Assessment & Certification: LEED projects are certified by GBCI, a separately incorporated entity with its own certified assessors. For every LEED project, three GBCI assessors are assigned to review all submitted documentation. The assessors independently apply LEED's system criteria (prerequisites and credits) to determine the level of certification achieved. The certification process involves a preliminary and final review and lasts 2 to 3 months from the time the documentation is first submitted by the LEED project team to the time when certification is determined by GBCI.

There are currently 23,600 U.S. buildings certified under LEED BD+C and LEED O+M. Of these, 2,100 are U.S. federal buildings.

The Living Building Challenge™

Building Types: Currently, the LBC™ includes certifications for existing buildings, building interiors, and new construction and major renovation.



System Development & Update: The International Living Future Institute (ILFI) developed the LBC standard through a voluntary process that involved soliciting input from stakeholders. No documented consensus process was used during the initial development or for subsequent periodic updates. Stakeholders, including project teams and product manufacturers, may submit requests through the LBC's Dialogue online platform, which are reviewed by ILFI. Changes to the standard are only made after research and industry consultation have been conducted. While there is no set frequency for updates to the standard, the LBC's standard has had three significant evolutionary updates (1.X, 2.X, and 3.X) since its original release in 2006.

Registration & Certification Fees: Certification fees are based on the project type, size, and desired certification. The lowest fixed certification fee is \$1,250 for Zero Energy Certification of single-family residential buildings less than 2,475 square feet. The highest fee is \$20,000 for Full Certification of commercial, institutional, and multi-family residential buildings between 107,640 and 538,194 square feet. Projects greater than 538,195 square feet incur fees of \$0.06/square feet.

Assessment & Certification: The LBC selects auditors based on their familiarity with the certification system and professional expertise in the field. There is no required certification or training; instead, the LBC assesses each auditor's performance at the completion of each audit. New auditors are added to the program by demonstrating equal or better qualifications to existing auditors. Auditors are assigned projects based on geographic proximity and availability. Auditors adhere to the LBC Standard when assessing project certification.

Currently, there are 75 buildings in the United States certified under the LBC.

Appendix B

2017 Market Review Results

In Phase I of this 5-year review, GSA evaluated the market for available high-performance building certification systems, then narrowed the list to systems meeting its screening criteria. The following criteria determined the systems selected by GSA:

1. Currently available for use in the U.S. commercial buildings market and not limited to one climate zone or geographic region
2. Addresses buildings (rather than individual products) with multiple performance and sustainable design attributes in EISA, including energy, water, natural resources, and environmental quality
3. Validated by an independent, third-party assessor
4. Incorporates (where feasible) measurable or calculated metrics to assess building performance as opposed to qualitative metrics that reflect evidence of intent. For example, directly measuring a building's generated waste (quantitative) to baseline and reduce overtime rather than simply developing a waste management plan (qualitative, suggesting only evidence of intent to reduce building waste).

GSA found over 100 systems available in the market. The following six building certification systems met the initial screening criteria for further assessment:

1. BOMA BEST® Sustainable Buildings (<http://www.bomabest.org>).
2. BREEAM® USA (<http://www.breeamusa.com>).
3. EAC Program (<https://www.earthadvantage.org/certifications/earth-advantage-small-commercial-certification.html>).¹
4. Green Globes® (<http://www.thegbi.org>).
5. LEED® (<https://new.usgbc.org/leed>).
6. LBC™ (<https://living-future.org>).

Table B-1 in this appendix details the findings of the market analysis. The tables include a row for each system, followed by a column for the results of each screening criteria (Y, N, or N/A). An “X” in the first column indicates which systems met all screening criteria. Once a system did not meet one of the screening criteria, the reviewer did not assess the system against the remaining criteria, marking the subsequent criteria as “N/A.”

¹ Per the EAC system owner, the lack of third-party assessors with current credentials to review and certify buildings makes this system unavailable in the United States and, therefore, it does not meet the initial screening criteria.

Table B-1. Building Certification Systems Evaluated in Phase I, Market Review, 2017

ID #	Meets All Criteria	Certification System Name	Criteria 1: Availability	Criteria 2: Relevance	Criteria 3: Third-Party Certification	Criteria 4: Measurability
1		"Green" Hotels Association (US)	Y	N	N/A	N/A
2		Alameda County (CA)	N	N/A	N/A	N/A
3		<u>ANSI/GBI 01-2010 Green Building Assessment Protocol for Commercial Buildings</u>	Y	Y	N	N/A
4		<u>ASHRAE 189.1 Standard for the Design of High-Performance, Green Buildings</u>	Y	Y	N	N/A
5		ASHRAE Building Energy Quotient Program	Y	N	N/A	N/A
6		Athena Model (Canada)	N	N/A	N/A	N/A
7		<u>Beam</u>	N	N/A	N/A	N/A
8		BEAT 2000 (Denmark)	N	N/A	N/A	N/A
9		<u>BOMA 360 Performance Program</u>	Y	N	N/A	N/A
10	X	BOMA Best (US)	Y	Y	Y	Y
11	X	<u>BREEAM (Building Research Establishment's Environmental Assessment Method)</u>	Y	Y	Y	Y
12		BREEAM Canada	N	N/A	N/A	N/A
13		BREEAM Green Leaf	N	N/A	N/A	N/A
14		BRI LCA (Japan)	N	N/A	N/A	N/A
15		<u>Calabasas LEED</u>	N	N/A	N/A	N/A
16		California Green Building Standards Code	N	N/A	N/A	N/A
17		CASBEE (Comprehensive Assessment System for Building Environmental Efficiency)	N	N/A	N/A	N/A
18		CEPAS (Comprehensive Environmental Performance Assessment Scheme)	N	N/A	N/A	N/A
19		City of Boulder Green Points (CO)	N	N/A	N/A	N/A
20		City of Frisco (TX) Green Building Program	N	N/A	N/A	N/A
21		City of Santa Monica Green Building & Construction Guidelines	N	N/A	N/A	N/A
22		<u>Class-G - Online Self-Certification</u>	Y	Y	N	N/A
23		Climate Protection Manual for Cities	N	N/A	N/A	N/A
24		<u>Coalition for Environmentally Responsible Economies (CERES) Green Hotel Initiative (US)</u>	Y	N	N/A	N/A
25		<u>Earth Advantage (Pacific Northwest)</u>	N	N/A	N/A	N/A
26	X	<u>Earth Advantage Commercial Program</u>	Y	Y	Y	Y

Table B-1. Building Certification Systems Evaluated in Phase I, Market Review, 2017

ID #	Meets All Criteria	Certification System Name	Criteria 1: Availability	Criteria 2: Relevance	Criteria 3: Third-Party Certification	Criteria 4: Measurability
27		<u>Earth Craft (Southeast)</u>	N	N/A	N/A	N/A
28		ECDG – Japan	N	N/A	N/A	N/A
29		EcoIndicator (Netherlands)	N	N/A	N/A	N/A
30		EcoInstall (Netherlands)	N	N/A	N/A	N/A
31		EcoPro (Germany)	N	N/A	N/A	N/A
32		EcoQuantum (Netherlands)	N	N/A	N/A	N/A
33		EkoProfile (Norway)	N	N/A	N/A	N/A
34		Energy Star Portfolio Manager	Y	N	N/A	N/A
35		Envest 2	N	N/A	N/A	N/A
36		Environmental Classification of Properties (Finland)	N	N/A	N/A	N/A
37		Environmental Profiles of construction materials, components and buildings (UK)	N	N/A	N/A	N/A
38		EP Label	Y	N	N/A	N/A
39		Equer (France)	N	N/A	N/A	N/A
40		Estidama Pearl Rating System	N	N/A	N/A	N/A
41		FirstRate (Australia)	N	N/A	N/A	N/A
42		<u>FitWell Certification</u>	Y	N	N/A	N/A
43		GBTool	N	N/A	N/A	N/A
44		GEM (Global Environmental Method) For Existing Buildings (Green Globes) – UK	N	N/A	N/A	N/A
45		GGHC (Green Guide for Health Care)	Y	N	N/A	N/A
46		<u>Global Reporting Initiative (GRI)</u>	Y	N	N/A	N/A
47		GOBAS (Green Olympic Building Assessment System)	N	N/A	N/A	N/A
48		Green Building Rating System – Korea	N	N/A	N/A	N/A
49		Green Globe 21 (US)	Y	N	N/A	N/A
50	X	<u>Green Globes™ US</u>	Y	Y	Y	Y
51		Green Leaf Eco-Rating Program	Y	N	N/A	N/A
52		<u>Green Mark Scheme</u>	N	N/A	N/A	N/A

Table B-1. Building Certification Systems Evaluated in Phase I, Market Review, 2017

ID #	Meets All Criteria	Certification System Name	Criteria 1: Availability	Criteria 2: Relevance	Criteria 3: Third-Party Certification	Criteria 4: Measurability
53		Green Rating Program (Africa)	N	N/A	N/A	N/A
54		Green Star rating tool (Australia)	N	N/A	N/A	N/A
55		Green Star® (Alaska)	N	N/A	N/A	N/A
56		HK BEAM (Hong Kong Building Environmental Assessment Method)	N	N/A	N/A	N/A
57		HQE (High Environmental Quality)	N	N/A	N/A	N/A
58		HVS International ECOTEL Certification	N	N/A	N/A	N/A
59		iDP (Integrated Design Process)	Y	N	N/A	N/A
60		<u>International Green Construction Code</u>	Y	Y	N	N/A
61		<u>ISO Standards for buildings (including 14001, 50001, 45001)</u>	Y	N	N/A	N/A
62		KCL-ECO	N	N/A	N/A	N/A
63		<u>Labs21</u>	N	N/A	N/A	N/A
64		LCA-House (Finland)	N	N/A	N/A	N/A
65		LCAiT (Sweden)	N	N/A	N/A	N/A
66		LEED Canada	N	N/A	N/A	N/A
67		LEED India	N	N/A	N/A	N/A
68		LEED Italia	N	N/A	N/A	N/A
69		LEED Mexico	N	N/A	N/A	N/A
70	X	<u>LEED® (Leadership in Energy and Environmental Design)</u>	Y	Y	Y	Y
71		Legoe (Germany)	N	N/A	N/A	N/A
72	X	<u>Living Building Challenge</u>	Y	Y	Y	Y
73		<u>Minnesota Sustainable Building Guidelines</u>	N	N/A	N/A	N/A
74		MMG (Netherlands)	N	N/A	N/A	N/A
75		NABERS (National Australian Built Environment Rating System)	N	N/A	N/A	N/A
76		National Packages Sustainable Building (Netherlands)	N	N/A	N/A	N/A
77		<u>NEN 2916:2004 nl</u>	N	N/A	N/A	N/A
78		<u>Net-Zero Energy Building (NZEB)</u>	Y	N	N/A	N/A

Table B-1. Building Certification Systems Evaluated in Phase I, Market Review, 2017

ID #	Meets All Criteria	Certification System Name	Criteria 1: Availability	Criteria 2: Relevance	Criteria 3: Third-Party Certification	Criteria 4: Measurability
79		NYC High Performance Building Guidelines	N	N/A	N/A	N/A
80		OGIP (Switzerland)	N	N/A	N/A	N/A
81		Protocol ITACA	N	N/A	N/A	N/A
82		REGENERS (Finland)	N	N/A	N/A	N/A
83		SBAT (Sustainable Buildings Assessment Tool)	N	N/A	N/A	N/A
84		Scottsdale's Green Building Program	N	N/A	N/A	N/A
85		Seattle Sustainable Building Action Plan and Built Smart (Seattle, WA)	N	N/A	N/A	N/A
86		SIMBAD	N	N/A	N/A	N/A
87		Solution Spaces (Canada)	N	N/A	N/A	N/A
88		SPI Green Firm Certification	Y	N	N/A	N/A
89		SPiRiT (Sustainable Project Rating Tool)	N	N/A	N/A	N/A
90		Sustainable Building (SB) Tool	Y	N	N/A	N/A
91		Sustainable Ecotourism Rating (Costa Rica)	N	N/A	N/A	N/A
92		TAKE-LCA (Finland)	N	N/A	N/A	N/A
93		TEAM (Finland)	N	N/A	N/A	N/A
94		TERI Green Rating for Integrated Habitat Assessment	N	N/A	N/A	N/A
95		The Movement for Innovation (M4i)	N	N/A	N/A	N/A
96		The Sustainability Tracking, Assessment & Rating System™ (STARS®)	Y	N	N/A	N/A
97		The Sustainable Sites Initiative: Guidelines and Performance Benchmarks 2009	Y	N	N/A	N/A
98		Three Star System	N	N/A	N/A	N/A
99		Tokyo Metro Green Building Program	N	N/A	N/A	N/A
100		TQ Building Assessment System (Total Quality Building Assessment System)	N	N/A	N/A	N/A
101		Vermont Green Hotels in the Green Mountain State	N	N/A	N/A	N/A
102		WELL Building Standard®	Y	N	N/A	N/A

Appendix C

GSA High-Performance Building Certification System Review Survey and GSA Q&A Response

This appendix contains the sample survey sent to the five qualifying building certification system owners on December 18, 2017. Building certification system owners had the opportunity to send questions within 4 weeks of receiving the survey. GSA recorded and consolidated the questions and corresponding answers, and supplied this information to each of the five system owners. This appendix also includes the question and answer (Q&A) document. GSA received all completed surveys and supporting documentation by February 2018.

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Appendix C Part 1. Survey to System Owners

General Services Administration (GSA)
Office of Federal High Performance Buildings
(OFHPB)



High Performance Building Certification System (HPBCS) Review

Phase II Survey to Certification System Owners

December 18, 2017

Background

Section 436(h) of the Energy Independence and Security Act (EISA) requires GSA to evaluate high performance building certification systems every 5 years to identify a system and certification level determined “to be the most likely to encourage a comprehensive and environmentally-sound approach to certification of green buildings.” EISA instructs the Director of GSA’s Office of Federal High-Performance Buildings to provide the findings to the Secretary of Energy. Two reviews have been completed: 2006 and 2012. These studies focused on high performance building certification systems available for use in the U.S. commercial buildings market. The Department of Energy (DOE), in consultation with the Department of Defense and GSA, published a [final rule](#) on certification systems on October 10, 2014.

For more information, please see [GSA's website](#).

GSA's Current Review

GSA is undertaking its next 5-year review cycle. The review consists of two phases:

Phase I consists of an initial market analysis screening of building-related certification systems (developed from EISA-cited criteria and the DOE Rule) and;

Phase II consists of a formal review of systems that pass the initial market analysis screening. GSA completed the screening phase of this review in September 2017 and has developed this survey to gather information for its formal review of systems.

This survey is being distributed to owners of certification systems that meet GSA's initial screening criteria for inclusion in the in-depth review process.

Contact for questions and more information: Patrick Dale, GSA Program Manager, patrick.dale@gsa.gov.



General Instructions to System Owners

GSA recognizes that system owners are the most knowledgeable source of information on their systems. Therefore, GSA requests that system owners complete this form (for the specific system[s] identified in the email correspondence) to aid GSA in its assessment. Completion of this form is voluntary, and a summary of the results from an analysis of all survey responses will be made public. All information provided by system owners through this survey is subject to public release. Respondents should not include proprietary or business-sensitive information.

GSA will conduct an independent review of all submitted forms to ensure accuracy and objectivity of its final recommendations to DOE. Following submission of the survey, GSA or third-party assessors supporting this review may contact system owners with requests for clarification on their responses.

This survey consists of three parts:

- Part I: General Information Questions**
- Part II: Effectiveness Criteria Review Questions**
- Part III: Development Criteria Review Questions.**

System owners should respond to the questions in each section within this form and can include, if desired, supporting information as attachments to the questions (attached directly into the PDF form).

This survey will be distributed to certification system owners meeting GSA's screening criteria on **December 18, 2017** via email. Respondents should review the survey in its entirety and compile questions into a single document and send to GSA (patrick.dale@gsa.gov) by **January 15, 2018**. The subject line should contain the text "**GSA HPBCS System Owner Survey: Questions to GSA.**"

GSA will compile all questions into a single table and respond by **January 26, 2018**.

Send final submissions to (patrick.dale@gsa.gov) by February 19, 2018.

How to attach files to this form:

If desired, system owners can attach additional information, in support of the written answers, when appropriate. Adobe forms allows respondents to attach files within the document, in the location(s) of their choice. To attach a file anywhere in this document, [Go to Menu > View > Comment > Annotations. Click the paperclip symbol, then follow the prompts to upload a file.]

How GSA will use the information provided:

GSA will review all information provided by certification system owners and may post survey responses to its website for public review.



High-Performance Building Certification System (HPBCS) Review

Phase II Survey to Certification System Owners

Part I: General Information Questions

Part I Instructions

Part I of this survey is intended to capture general information about each certification system. System owners should answer each question to the best of their ability.

Part I-A: General Information Questions

1) Official Name of Certification System

2) To which type of building(s) do your answers to Part I apply? For more information on the justification for the types of building projects included in this list, please see [GSA's website](#).

System owners may certify multiple types of building projects. GSA is only evaluating certification systems for existing buildings, building interiors, and new construction/major renovation. GSA's review does not include certification systems for residential projects. If respondents select more than one system in Part I, Question 2, they should be prepared to complete Part II for EACH type of building project.

Existing buildings

Building interiors

New construction/major renovation

Core and/or shell

3) Name of System Representative

Please provide the primary POC for this effort. If GSA has any follow up questions, they will contact this individual.

4) Email of System Representative

5) Primary phone number of System Representative

6) URL of Certification System public website

7) Additional web links providing general system information

As GSA reviews the certification systems, it will be helpful to have quick access to the most current public information about each system. Respondents should provide URLs that will link to useful general information about the system. Specific, detailed system information can be provided in Parts II and Parts III of the response.

8a) How many buildings in the U.S. have received certification to date?

8b) Of these, how many are federal buildings?

9) Please describe the cost of attaining certification and briefly describe the product support available to applicants.

High-Performance Building Certification System (HPBCS) Review

Phase II Survey to Certification System Owners

Part II: Effectiveness Criteria Review Questions

Part II Instructions

System owners should complete Part II separately for each building project type listed in Part I, Question 2. In addition, supplemental evidence (beyond the answers provided within the questions boxes in this form) can be included as attachments to the questions (attached directly into the PDF form).

This section provides an opportunity for respondents to describe how the certification system supports GSA's Building Effectiveness Criteria. GSA developed the following list of Building Effectiveness Criteria through analysis of the intent of the Guiding Principles for Sustainable Federal Buildings (for both existing buildings and new construction), EISA, and industry best practices.

2017 GSA Building Effectiveness Criteria:

- A) Healthy, effective environments
- B) Energy efficiency
- C) Water use efficiency and management
- D) Solid waste diversion
- E) Sustainable procurement
- F) Siting.

GSA has developed a list of the building design, operations, and maintenance categories aligning to each criterion. These sample lists are included for each criterion throughout the survey to provide context to respondents, but they are not meant to be all-inclusive. If the system has credits aligning to the Building Effectiveness Criteria, yet not aligning to the elements listed, respondents are encouraged to select "other" and list additional elements in the provided field.

Part II-A: General Information Questions

1) Name of Certification System

Important note about supporting information:

Respondents are encouraged to provide documentation to support answers to this survey. Please attach supporting information directly to the form, in the location of the related question.

How to attach a file to this document: Please refer to page 2 of this document for instructions.

2) Please indicate which type of building project this response addresses:

Reminder, system owners should complete a Part II response for EACH type of project.

Existing buildings

Building interiors

New construction/major renovation

Part II-B: Healthy, Effective Environments Information

In addition to answering the questions below, please provide supporting documentation where applicable.

Respondents are encouraged to provide documentation to support answers to this survey. Please attach supporting information directly to the form, in the location of the related question.

How to attach a file to this document: Please refer to page 2 of this document for instructions.

3) GSA will categorize system credits into broad categories, comparable across systems. Elements of Healthy, Effective Environments may include the following. Please answer "Yes" to all of the elements that are addressed by the system in the box below. Credits not aligning to these elements, yet in alignment with Healthy Effective Environments, should be indicated by answering "Yes" to question 3k.1). Please elaborate on each item answered "Yes" in the text box following each item. Where applicable, please specify formal credit names and identification numbers. In addition, where applicable, please provide supporting documentation.

- a) ventilation and thermal comfort
- b) daylighting and lighting controls
- c) indoor air quality plans
- d) radon detection
- e) moisture control
- f) low-emitting materials
- g) protecting IAQ during construction
- h) environmental smoking control
- i) integrated pest management
- j) occupant health and wellness
- k) other

3a.1) Does your system address ventilation and thermal control?

Yes

No

3a.2) List and describe specific credits in the system addressing ventilation and thermal control. If you answered "No" above, please enter "N/A."

3a.3) If appropriate, please attach supporting information for the previous question here.

3b.1) Does your system address daylighting and lighting controls?

Yes

No

3b.2) List and describe specific credits in the system addressing daylighting and lighting controls. If you answered "No" above, please enter "N/A."

3b.3) If appropriate, please attach supporting information for the previous question here.

3c.1) Does your system address indoor air quality plans?

Yes

No

3c.2) List and describe specific credits in the system addressing indoor air quality plans. If you answered "No" above, please enter "N/A."

3c.3) If appropriate, please attach supporting information for the previous question here.

3d.1) Does your system address radon detection?

Yes

No

3d.2) List and describe specific credits in the system addressing radon detection. If you answered "No" above, please enter "N/A."

3d.3) If appropriate, please attach supporting information for the previous questions here.

3e.1) Does your system address moisture control?

Yes

No

3e.2) List and describe specific credits in the system addressing moisture control. If you answered "No" above, please enter "N/A."

3e.3) If appropriate, please attach supporting information for the previous question here.

3f.1) Does your system address low-emitting materials?

Yes

No

3f.2) List and describe specific credits in the system addressing low-emitting materials. If you answered "No" above, please enter "N/A."

3f.3) If appropriate, please attach supporting information for the previous question here.

3g.1) Does your system address protecting IAQ during construction?

Yes

No

3g.2) List and describe specific credits in the system addressing protecting IAQ during construction. If you answered "No" above, please enter "N/A."

3g.3) If appropriate, please attach supporting information for the previous question here.

3h.1) Does your system address environmental smoking control?

Yes

No

3h.2) List and describe specific credits in the system addressing environmental smoking control. If you answered "No" above, please enter "N/A."

3h.3) If appropriate, please attach supporting information for the previous question here.

3i.1) Does your system address integrated pest management?

Yes

No

3i.2) List and describe specific credits in the system addressing integrated pest management. If you answered "No" above, please enter "N/A."

3i.3) If appropriate, please attach supporting information for the previous question here.

3j.1) Does your system address occupant health and wellness?

Yes

No

3j.2) List and describe specific credits in the system addressing occupant health and wellness. If you answered "No" above, please enter "N/A."

3j.3) If appropriate, please attach supporting information for the previous question here.

3k.1) Does your system address other areas related to Healthy, Effective Environments?

Yes

No

3k.2) List and describe specific credits in the system addressing other areas related to Healthy, Effective Environments. If you answered "No" above, please enter "N/A."

3k.3) If appropriate, please attach supporting information for the previous question here.

Part II-C: Energy Efficiency Information

4) GSA will categorize system credits into broad categories, comparable across systems. Elements of Energy Efficiency may include the following:

- a) predicted/modeled energy use reduction
- b) actual energy use reduction
- c) ENERGY STAR products
- d) renewable energy
- e) clean and alternative energy
- f) metering
- g) benchmarking
- h) other

Please answer "Yes" to all of the elements that are addressed by the system in the box below. Credits not aligning to these elements, yet in alignment with energy efficiency, should be indicated by answering "Yes" to question 4h.1). Please elaborate on each item answered "Yes" in the text box following each item. Where applicable, please specify formal credit names and identification numbers.

4a.1) Does your system address predicted/modeled energy use reduction?

Yes

No

4a.2) List and describe specific credits in the system addressing predicted/modeled energy use reduction. If you answered "No" above, please enter "N/A."

4a.3) If appropriate, please attach supporting information for the previous question here.

4b.1) Does your system address actual energy use reduction?

Yes

No

4b.2) List and describe specific credits in the system addressing actual energy use reduction. If you answered "No" above, please enter "N/A."

4b.3) If appropriate, please attach supporting information for the previous question here.

4c.1) Does your system address ENERGY STAR products?

Yes

No

4c.2) List and describe specific credits in the system addressing ENERGY STAR products. If you answered "No" above, please enter "N/A."

4c.3) If appropriate, please attach supporting information for the previous question here.

4d.1) Does your system address renewable energy?

Renewable energy comes from sources that are either inexhaustible or can be replaced very rapidly through natural processes. Examples include the sun, wind, geothermal energy, small (river-turbine) hydropower, and other hydrokinetic energy (waves and tides).

Yes

No

4d.2) List and describe specific credits in the system addressing renewable energy.

4d.3) If appropriate, please attach supporting information for the previous question here.

4e.1) Does your system address clean and alternative energy?

Alternative energy refers to energy not derived from traditional fossil fuel sources (coal, natural gas, petroleum) through conventional processes.

Yes

No

4e.2) List and describe specific credits in the system addressing clean and alternative energy. If you answered "No" above, please enter "N/A."

4e.3) If appropriate, please attach supporting information for the previous question here.

4f.1) Does your system address metering?

Yes

No

4f.2) List and describe specific credits in the system addressing metering. If you answered "No" above, please enter "N/A."

4f.3) If appropriate, please attach supporting information for the previous question here.

4g.1) Does your system address benchmarking?

Yes

No

4g.2) List and describe specific credits in the system addressing benchmarking. If you answered "No" above, please enter "N/A."

4g.3) If appropriate, please attach supporting information for the previous question here.

4h.1) Does your system address other areas related to Energy Efficiency?

Yes

No

4h) List and describe specific credits in the system addressing other areas related to energy efficiency. If you answered "No" above, please enter "N/A."

4h.3) If appropriate, please attach supporting information for the previous question here.

Part II-D: Water Use Efficiency and Management Information

5) GSA will categorize system credits into broad categories, comparable across systems. Elements of Water Use Efficiency and Management may include the following:

- a) predicted/modeled water use reduction
- b) actual indoor water use reduction
- c) actual outdoor water use reduction
- d) water conserving products
- e) meters
- f) cooling towers
- g) water efficient landscapes
- h) alternative sources of water
- i) stormwater management
- j) other

Please answer "Yes" to all of the elements that are addressed by the system in the box below. Credits not aligning to these elements, yet in alignment with water use efficiency and management, should be indicated by answering "Yes" to question 5j.1). Please elaborate on each item answered "Yes" in the text box following each item. Where applicable, please specify formal credit names and identification numbers.

5a.1) Does your system address predicted/modeled water use reduction?

Yes

No

5a.2) List and describe specific credits in the system addressing predicted/modeled water use reduction. If you answered "No" above, please enter "N/A."

5a.3) If appropriate, please attach supporting information for the previous question here.

5b.1) Does your system address actual indoor water use reduction?

Yes

No

5b.2) List and describe specific credits in the system addressing actual indoor water use reduction. If you answered "No" above, please enter "N/A."

5b.3) If appropriate, please attach supporting information for the previous question here.

5c.1) Does your system address actual outdoor water use reduction?

Yes

No

5c.2) List and describe specific credits in the system addressing actual outdoor water use reduction. If you answered "No" above, please enter "N/A."

5c.3) If appropriate, please attach supporting information for the previous question here.

5d.1) Does your system address water conserving products?

Yes

No

5d.2) List and describe specific credits in the system addressing water conserving products. If you answered "No" above, please enter "N/A."

5d.3) If appropriate, please attach supporting information for the previous question here.

5e.1) Does your system address meters?

Yes

No

5e.2) List and describe specific credits in the system addressing meters. If you answered "No" above, please enter "N/A."

5e.3) If appropriate, please attach supporting information for the previous question here.

5f.1) Does your system address cooling towers?

Yes

No

5f.2) List and describe specific credits in the system addressing cooling towers. If you answered "No" above, please enter "N/A."

5f.3) If appropriate, please attach supporting information for the previous question here.

5g.1) Does your system address water efficient landscapes?

Yes

No

5g.2) List and describe specific credits in the system addressing water efficient landscapes. If you answered "No" above, please enter "N/A."

5g.3) If appropriate, please attach supporting information for the previous question here.

5h.1) Does your system address alternative sources of water?

Yes

No

5h.2) List and describe specific credits in the system addressing alternative sources of water. If you answered "No" above, please enter "N/A."

5h.3) If appropriate, please attach supporting information for the previous question here.

5i.1) Does your system address stormwater management?

Yes

No

5i.2) List and describe specific credits in the system addressing stormwater management. If upi answered "No" above, please enter "N/A."

5i.3) If appropriate, please attach supporting information for the previous question here.

5j.1) Does your system address other areas related to Water Use Efficiency and Management?

Yes

No

5j.2) List and describe specific credits in the system addressing other areas related to Water Use Efficiency and Management. If answered "No" above, please enter "N/A."

5j.3) If appropriate, please attach supporting information for the previous question here.

Part II-E: Solid Waste Diversion Information

6) GSA will categorize system credits into broad categories, comparable across systems. Elements of Solid Waste Diversion may include the following:

- a) space for collection and storage of recyclables
- b) construction waste management
- c) site construction waste management
- d) waste diversion for occupants
- e) other

Please answer "Yes" to all of the elements that are addressed by the system in the box below. Credits not aligning to these elements, yet in alignment with Solid Waste Diversion, should be indicated by answering "Yes" to question 6e.1). Please elaborate on each item answered "Yes" in the text box following each item. Where applicable, please specify formal credit names and identification numbers.

6a.1) Does your system address space for collection and storage of recyclables?

Yes

No

6a.2) List and describe specific credits in the system addressing space for collection and storage of recyclables. If you answered "No" above, please enter "N/A."

6a.3) If appropriate, please attach supporting information for the previous question here.

6b.1) Does your system address construction waste management?

Unlike operational waste, which is made after a building is built, construction waste refers to materials and debris generated during construction, renovation, demolition, or dismantling of structures, buildings and associated infrastructure. Material types in operational and construction waste differ from operational waste, so reduction and diversion strategies also differ.

Yes

No

6b.2) List and describe specific credits in the system addressing construction waste management. If you answered "No" above, please enter "N/A."

6b.3) If appropriate, please attach supporting information for the previous question here.

6c.1) Does your system address site construction waste management?

Site construction waste includes soil, rocks, trees, shrubs and other debris removed from the site for construction.

Yes

No

6c.2) List and describe specific credits in the system addressing site construction waste management. If you answered "No" above, please enter "N/A."

6c.3) If appropriate, please attach supporting information for the previous question here.

6d.1) Does your system address waste diversion for occupants?

Yes

No

6d.2) List and describe specific credits in the system addressing waste diversion for occupants. If you answered "No" above, please enter "N/A."

6d.3) If appropriate, please attach supporting information for the previous question here.

6e.1) Does your system address other areas related to Solid Waste Diversion?

Yes

No

6e.2) List and describe specific credits in the system addressing other areas related to solid waste diversion. If you answered "No" above, please enter "N/A."

6e.3) If appropriate, please attach supporting information for the previous question here.

Part II-F: Sustainable Procurement Information

7) GSA will categorize system credits into broad categories, comparable across systems. Elements of Sustainable Procurement may include the following:

- a) recycled content
- b) biobased content
- c) environmentally preferable products
- d) ozone depleting compounds
- e) other

Please answer "Yes" to all of the elements that are addressed by the system in the box below. Credits not aligning to these elements, yet in alignment with sustainable procurement, should be indicated by answering "Yes" to question 7e.1). Please elaborate on each item answered "Yes" in the text box following each item. Where applicable, please specify formal credit names and identification numbers.

7a.1) Does your system address recycled content?

Yes

No

7a.2) List and describe specific credits in the system addressing recycled content. If you answered "No" above, please enter "N/A."

7a.3) If appropriate, please attach supporting information for the previous question here.

7b.1) Does your system address biobased content?

Yes

No

7b.2) List and describe specific credits in the system addressing biobased content. If you answered "No" above, please enter "N/A."

7b.3) If appropriate, please attach supporting information for the previous question here.

7c.1) Does your system address environmentally preferable products?

Yes

No

7c.2) List and describe specific credits in the system addressing environmentally preferable products. If you answered "No" above, please enter "N/A."

7c.3) If appropriate, please attach supporting information for the previous question here.

7d.1) Does your system address ozone depleting compounds?

Yes

No

7d.2) List and describe specific credits in the system addressing ozone depleting compounds. If you answered "No" above, please enter "N/A."

7d.3) If appropriate, please attach supporting information for the previous question here.

7e.1) Does your system address other areas related to Sustainable Procurement?

Yes

No

7e.2) List and describe specific credits in the system addressing other areas related to sustainable procurement. If you answered "No" above, please enter "N/A."

7e.3) If appropriate, please attach supporting information for the previous question here.

Part II-G: Siting Information

8) GSA will categorize system credits into broad categories, comparable across systems. Elements of Siting may include the following:

- a) access to public transportation
- b) access to amenities/neighborhood assets
- c) floodplain avoidance
- d) consideration of occupant transportation emissions
- e) protection of historic resources
- f) bicycling options
- g) other

Please answer "Yes" to all of the elements that are addressed by the system in the box below. Credits not aligning to these elements, yet in alignment with Siting, should be indicated by answering "Yes" to question 8g.1. Please elaborate on each item answered "Yes" in the text box following each item. Where applicable, please specify formal credit names and identification numbers.

8a.1) Does your system address access to public transportation?

Yes

No

8a.2) List and describe specific credits in the system addressing access to public transportation. If you answered "No" above, please enter "N/A."

8a.3) If appropriate, please attach supporting information for the previous question here.

8b.1) Does your system address access to amenities/neighborhood assets?

Yes

No

8b.2) List and describe specific credits in the system addressing access to amenities/neighborhood assets. If you answered "No" above, please enter "N/A."

8b.3) If appropriate, please attach supporting information for the previous question here.

8c.1) Does your system address floodplain avoidance?

Yes

No

8c.2) List and describe specific credits in the system addressing floodplain avoidance. If you answered "No" above, please enter "N/A."

8c.3) If appropriate, please attach supporting information for the previous question here.

8d.1) Does your system address consideration of occupant transportation emissions?

Yes

No

8d.2) List and describe specific credits in the system addressing consideration of occupant transportation emissions. If you answered "No" above, please enter "N/A."

8d.3) If appropriate, please attach supporting information for the previous question here.

8e.1) Does your system address protection of historic resources?

Yes

No

8e.2) List and describe specific credits in the system addressing protection of historic resources. If you answered "No" above, please enter "N/A."

8e.3) If appropriate, please attach supporting information for the previous question here.

8f.1) Does your system address bicycling options?

Yes

No

8f.2) List and describe specific credits in the system addressing bicycling options. If you answered "No" above, please enter "N/A."

8f.3) If appropriate, please attach supporting information for the previous question here.

8g.1) Does your system address other areas related to siting?

Yes

No

8g.2) List and describe specific credits in the system addressing other areas related to Siting. If you answered "No" above, please enter "N/A."

8g.3) If appropriate, please attach supporting information for the previous question here.



High-Performance Building Certification System (HPBCS) Review

Phase II Survey to Certification System Owners

Part III: Development Criteria Review Questions

Part III Instructions

GSA will evaluate the development of the certification systems based on two primary criteria:

A) Process for developing the certification system: Are the procedures to develop, maintain, and update the certification system transparent? Do they allow for a balance of different stakeholder interests? Is there an appeals process for disputes?

B) Conformity assessment: Are the procedures and practices by which building projects are assessed transparent?

Respondents should complete Part III once for their certification system and organization as a whole. In contrast to Part II, GSA **is not requesting and discourages** the completion of Part III for each building project type, unless it is impractical to answer the following questions broadly.

In addition, system owners can include supporting information as attachments to the questions (attached directly into the PDF form).

Part III-A: Process for developing and administering the certification system

1a) Was the system developed using a consensus-based approach?

This criterion is based on EISA Section 436 (h)(2)(D), "the ability of the standard to be developed and revised through a consensus-based process."

GSA defines a consensus based certification system is a voluntary consensus standard as defined by OMB Circular A-119 or one that incorporates the attributes of a voluntary consensus standards body defined in OMB Circular A-119: openness, balance of interest, due process, an appeal process, and consensus.

Yes

No

1b) If you answered "yes" to question 1a, please describe the consensus-based approach (cite any relevant standards or guidance used during development and/or system revisions). If answered "No" above, please enter "N/A."

Evidence of a consensus-based system may include:

- Publicly accessible draft documents and comment periods,
- Publicly accessible certification system clarifications,
- Instructions for accessing information on key activities, and
- Policy/procedure for ensuring stakeholder input during certification system development

1c) If appropriate, please attach supporting information for the previous question here.

2a) To ensure transparency, what stakeholders or groups of stakeholders were involved in the development and updating of the certification system?

This criterion is based on Public Law 110-140, EISA Section 436 (h)(2)(C), "the ability of the applicable standard-setting organization to collect and reflect public comment. A transparent certification system has a documented approach for the review and consideration of public comments, public comments are collected on a regular basis, and development and updating process of the certification system is documented and publicly available."

Evidence of transparency may include:

- Evidence that review comments are publicly available; for example, website link, publication of document online, or statement that review document/decision is available upon request
- Evidence that public comments are incorporated into the certification system revision process.

2b) What was their role in the development and/or updating of the certification system?

2c) If appropriate, please attach supporting information for the previous question here.

3a) Is there a procedure for differing opinions during system development and/or revision?

This criterion is based on Public Law 110-140, Energy Independence and Security Act (EISA) Section 436 (h)(2) (C): the ability of the applicable standard-setting organization to collect and reflect public comment.

Yes

No

3b) If you answered "Yes," describe the procedure. If you answered "No" above, please enter "N/A."

3c) If appropriate, please attach supporting information for the previous question here.

4a) Is there an independent review and verification process for updating the certification system to ensure system maturity?

This criterion is based on DOE Rule 10 C.F.R. Parts 433, 435, and 436, Green Building Certification Systems for Federal Buildings: "The system under which the building is certified must be subject to periodic evaluation and assessment of the environmental and energy benefits that result under the rating system" (part 433.33(b)(4)).

A mature certification system is effectively linked to latest tools and standards; the certification system has components to track building performance post-occupancy; the certification system is used as a basis for development of other systems; and/or the certification system is consistently updated. As a best practice, the system is revised or reaffirmed every five years at minimum.

Yes

No

4b) If you answered "Yes," provide a description of how the system is revised or reaffirmed regularly to ensure maturity. If you answered "No" above, please enter "N/A."

5a) Are revisions to the system documented and accessible to the public?

Yes

No

5b) If you answered "Yes," provide link to publicly accessible information regarding system revisions. If answered "No" above, please enter "N/A."

Part III-B: Conformity Assessment

6a) Is an assessor/auditor independently assigned/selected?

This criteria is based on EISA Section 436 (h)(2)(B): "the ability and availability of assessors and auditors to independently verify the criteria and measurement of metrics."

The assessor/auditor is defined and is independent from the organization whose product is being assessed for conformity. Assessors/auditors have no stake in whether a building receives certification.

Yes

No

6b) If you answered "Yes," describe the selection or assignment process for auditors. If you answered "No" above, please enter "N/A."

7a) Are the criteria used by the assessors and auditors to evaluate a building project documented, available to applicants, and independent from the organization to whom they are providing their services?

This criteria is based on EISA Section 436 (h)(2)(B): "the ability and availability of assessors and auditors to independently verify the criteria and measurement of metrics."

The conformity assessment body publicly discloses the scoring methodology and levels achieved by products that conform to the standard; and describes how the public can access this information. A documented standard verification method and process should be followed by assessors and auditors

Yes

No

7b) If you answered "Yes," please provide links to the location of the documentation and/or description of the process that is made available to applicants. If you answered "No" above, please enter "N/A."

8a) Is there a documented process for applicants to appeal an auditor's/assessor's certification decision or specific findings?

Yes

No

8b) If you answered "Yes," describe the documented appeal process available to the applicant. If you answered "No" above, please enter "N/A."

Description may include:

- Evidence of a documented appeal process
- Evidence of a documented feedback/comment resolution process

9a) Does the system provide a verification system for post-occupancy evaluation of the certified building?

This criterion is based on DOE Rule 10 C.F.R. Parts 433, 435 and 436, "Green Building Certification Systems for Federal Buildings: The system under which the building is certified must include a verification system for post occupancy assessment of the rated buildings to demonstrate continued energy and water savings at least every four years after initial occupancy." (Part 433.300(b)(5)).

Yes

No

9b) If you answered "Yes," describe the system and/or requirement to perform a post occupancy of the certified building. If you answered "No" above, please enter "N/A."

End of survey. Please provide your completed survey(s) to GSA by January 31, 2017.

Appendix C Part 2. GSA Responses to System Owners Regarding Survey

Q & A: Questions from System Owners Regarding Survey Completion GSA's High-Performance Building Certification System Review 19 January 2018

ID #	Question (System Owners)	Answer (GSA)
1	Will the questions we submit formally be made public?	<p>Our goal is to be as transparent as possible throughout the entire process. We will summarize the submitted questions in our final report.</p> <p>System owners should be aware that in the case of a Freedom of Information Act (FOIA) request, any information related to the review could be made public as per the provisions of FOIA.</p>
2	<p>Types of Building Projects: Is GSA considering systems for Core & Shell?</p>	<p>If you feel a particular building or project type is applicable to federal building real property as identified in the Federal Real Property Profile Management System (www.gsa.gov/frppreports), and meets the initial screening criteria highlighted in our letter to system owners, please include it in the survey.</p>
3	<p>Criteria Is GSA interested in all the credits and options that may apply to a given topic? For example, alternative compliance paths and pilot credits that address the subject and are currently available to projects?</p>	<p>Yes, however, limit responses to any credit or option that is currently available to the public.</p>
4	<p>Criteria Some strategies apply and add value to the entire building project but are not covered explicitly in GSA's topics. Is there a part of the survey in which such credits/prerequisites should be included to avoid redundancy?</p>	<p>We invite system owners to provide additional information related to the effectiveness criteria listed in the survey. Please use the space available at the end of each criteria section to list additional information related to each criteria. For example, question 3k.2 provides an opportunity to list any other areas relating to the criteria, not covered by GSA's specific questions.</p>
5	<p>Supporting documentation What kinds of supporting information/documentation, beyond credit language, would be helpful to GSA in understanding how system credits support GSA's Building</p>	<p>We anticipate that credit language will be self-explanatory. We are looking for evidence of support for the criteria, not the philosophy behind it.</p>

Appendix C

Q & A: Questions from System Owners Regarding Survey Completion

GSA’s High-Performance Building Certification System Review

19 January 2018

	Effectiveness Criteria?	
6	<p>Supporting documentation What types of supporting information/documentation would be helpful to GSA in its independent review of all submitted forms to ensure accuracy and objectivity?</p>	<p>Links to publicly available information will be most valuable. Non-publicly available supporting information that can be shared with the public (since documentation will be shared) will need to be attached to the Adobe Form.</p>
7	<p>Survey Part I: I-A-3-5 System Representative</p> <ul style="list-style-type: none"> • Is it possible to have two contacts? • If so, how should participants submit the second contact name? 	<ul style="list-style-type: none"> • Please include a primary contact. • A secondary contact may be submitted in the email text when transmitting the files to GSA.
8	<p>Form II: Energy Efficiency II-C/4d Renewables</p> <ul style="list-style-type: none"> • How does GSA define renewables? • What are GSA’s criteria for/ documentation requirements for procurement of offsite renewables? 	<ul style="list-style-type: none"> • Executive Order 13693 defines renewable electric energy as “energy produced by solar, wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal, geothermal heat pumps, microturbines, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project.” • EO 13693 defines a renewable energy certificate as “the technology and environmental (non-energy) attributes that represent proof that 1 megawatt-hour of electricity was generated from an eligible renewable energy resource that can be sold separately from the underlying generic electricity.”
9	<p>II-C/4e Clean and Alternative Energy How does GSA define clean and alternative energy (vs. renewables)?</p>	<p>Executive Order 13693 defines clean energy as “renewable electric energy and alternative energy.” Alternative energy is defined as “energy generated from technologies and approaches that advance renewable heat sources, including</p>

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		biomass, solar thermal, geothermal, waste heat, and renewable combined heat and power processes; combined heat and power; small modular nuclear reactor technologies; fuel cell energy systems; and energy generation, where active capture and storage of carbon dioxide emissions associated with that energy generation is verified.”
10	I-C/4f Metering Does GSA have a specific metering tolerance threshold requirements for accuracy of reporting?	Not for the purposes of this evaluation.
11	Water I-D/5h Alternative Sources of Water How does GSA define “alternative sources of water”?	The Federal Energy Management Program defines alternative water sources as “sustainable sources of water, not supplied from fresh surface water or groundwater, that offset the demand for freshwater.” (https://energy.gov/eere/femp/best-management-practice-14-alternative-water-sources)
12	Solid Waste II-E/6b Construction Waste Management Does GSA accept Alternative Daily Cover as a diversion from a landfill?	Diversion from landfill is not defined further for purposes of this evaluation.
13	We don’t have USA specific versions for certain program types. Are we able to submit the International versions for the GSA’s consideration at this time?	GSA’s intent is to evaluate only certification systems that meet our screening criteria as defined in Federal Register, Vol. 82, No. 238, Notice-MG-2017-03; Docket No. 2017-0002; Sequence 24. Further, GSA defines a system “currently available for use in the U.S. commercial buildings market...” as a completely operational system, as of December 18, 2017, that is tailored for use in the U.S. commercial market, with independent assessors currently available for certification.
14	If we were to adapt the international version to release a USA specific version of a rating system after this review concluded, would the GSA consider it before the next five-year review	GSA is committed to maintaining currency with the building certification system industry. In the event that any system meeting GSA’s screening criteria were to become

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	period?	available in the U.S., GSA will consider evaluating it through a supplemental review, depending on available resources and timing of the primary review cycle.
15	If a certification system is available for multiple asset classes, do we submit separate submissions for each asset class?	GSA’s goal is to limit its evaluation to only systems/programs/asset classes with clear applicability to the Federal building sector. If you feel a particular building or project type is applicable to federal building real property as identified in the Federal Real Property Profile Management System (www.gsa.gov/frppreports), please include it in the survey.

A general FEMP reference page - <https://energy.gov/eere/femp/federal-energy-management-laws-and-requirements>

Appendix E

Review Findings

This appendix includes the findings from the system owner surveys, as modified by GSA. Following the independent verification and evaluation of the submitted survey responses, GSA reviewed the findings in detail and made a final determination regarding the alignment of each sub-criterion with the federal building requirement(s).

In the matrix that follows, the system owners initially indicated a ✓ (Yes) or ✗ (No) for all sub-criteria. GSA's review determined that the items shown with a ⚠ (Partially Met) were addressed by the system but were not in full alignment with the federal building requirement(s). Additionally, GSA found some items that system owners marked with a ✓ (Yes) did not meet the federal building requirement(s) and, therefore, changed them to a ✗ (No). A note at the end of each affected item indicates this.

GSA has also summarized these findings in Chapter 3 of the report.

Summary of Findings—New Construction Certification Systems

Effectiveness Criteria: Healthy, Effective Environments				
Sub-criteria	Questions	LEED BD+C	Green Globes NC	LBC NC
Ventilation and thermal control	1) Are there standards referenced in the system to address ventilation and thermal comfort? 2) If yes, which standard(s)?	1) Yes. 2) ASHRAE Standard 55-2010; ISO 7730:2005; CEN Standard EN 15251:2007; ASHRAE Standard 62.1-2010.	1) Yes. 2) (Both ANSI/ASHRAE 62.1-2007 and ANSI/ASHRAE 62.1-2010 are referenced); International Code Council International Mechanical Code (ICC IMC) 2009; IAPMO UMC (2009); Uniform Mechanical Code, ASHRAE 170-2008 (for hospitals or healthcare occupancies), or local codes or standards; ANSI/ASHRAE 55-2010 or ANSI/ASHRAE 55-2004.	1) Partially Met. ASHRAE 55 is not referenced. 2) Current version of ASHRAE 62.
Daylighting and lighting controls	1) Is maximized use of daylighting (including lighting controls) addressed?	1) Yes.	1) Yes.	1) Partially Met. The standard addresses daylighting but does not address daylighting controls.
Indoor air quality plans	1) Is a plan/policy developed? 2) Is there a requirement to implement the plan?	1) Partially Met. The standard provides for a management plan for the construction and preoccupancy phases of the building. Also, the standard provides for prescriptive measures for post construction flushing and air quality testing. While these plans and procedures are related to IAQ they do not entail a plan or policy to ensure continued monitoring and quality of IAQ. 2) No.	1) Partially Met. Requires in the assessment protocol for commercial buildings that "performance and green design goals are established and are regularly assessed", including "thermal comfort" and "air quality", but there is no specific mention of a "plan" nor any metrics on how these items are assessed as compliant. 2) No.	1) Yes. 2) Yes.
Radon detection	1) New Construction ONLY: Does the system address designing for radon mitigation? 2) Is radon testing addressed? 3) If high radon levels recorded, is radon mitigation addressed?	1) No. 2) No. 3) No.	1) Yes. 2) Yes. 3) Yes.	1) No. 2) No. 3) No.
Moisture control	1) Is a plan/policy developed? 2) Is there a requirement to implement the plan?	1) Partially Met. Three LEED v4 BD+C credits address moisture control, although LEED v4 does not require design teams to explicitly develop a plan for potential moisture control issues. 2) No.	1) No. Requires in the assessment protocol for commercial buildings that "performance and green design goals are established and are regularly assessed", including "moisture control", but there is no specific mention of a plan nor any metrics on how these items are assessed as compliant. While the assessment protocol calls for "A moisture control design analysis is performed on walls and ceilings adjacent to spaces of added moisture AND/OR on above-grade portions of the building envelope in accordance with ASHRAE 160-2009 or a steady-state water vapor transmission analysis for the purpose of predicting, mitigating, or reducing moisture damage to the building envelope, materials, components, systems, and furnishings.", it does not indicate what, if anything should be done with that analysis. 2) No. <i>Note: GBI originally responded "yes."</i>	1) Yes. 2) Yes.
Low-emitting materials	1) Is the use of low-emitting materials encouraged?	1) Yes.	1) Yes.	1) Yes.
Protecting IAQ during construction	1) Is a plan/policy developed? 2) Is there a requirement to implement the plan?	1) Yes. 2) Yes. When LEED BD+C EQ Credit 3 requires project teams to "develop and implement" an IAQ plan.	1) Yes. 2) No.	1) Partially Met. The standard addresses IAQ during construction by requiring IAQ testing before occupancy, however the standard does not specify that a plan/policy be developed related to IAQ during construction. 2) No.
Environmental smoking control	1) Is smoking prohibited within 25 feet?	1) Yes.	1) Yes.	1) Yes.
Integrated pest management	1) Is the use of integrated pest management encouraged?	1) Partially Met. Although LEED BD+C does not directly address pest management, projects certifying under this system have the opportunity to earn points for pest management under the Innovation: LEED O+M Starter Kit credit. O+M Starter Kit – Integrated Pest Management: The credits require projects to have in place an integrated pest management plan for the building and grounds within the project boundary.	1) Yes.	1) No.
Occupant health and wellness	1) Are strategies to promote occupant health and wellness addressed?	1) Yes.	1) Yes.	1) Yes.

Summary of Findings—New Construction Certification Systems

Effectiveness Criteria: Energy Efficiency Information				
Sub-criteria	Questions	LEED BD+C	Green Globes NC	LBC NC
Predicted/Modeled energy use reduction	1) Is energy modeling addressed to predict energy performance?	1) Yes.	1) Yes.	1) Partially Met. While energy modeling is not explicitly addressed by the standard, the standard requires that 105% of the project's energy needs must be supplied by onsite renewable energy on a net annual basis, without the use of onsite combustion. This requirement would necessitate the use of energy modeling by the building design team.
Actual energy use reduction	1) Is ASHRAE 90.1 2013 referenced? 2) Is there an option to achieve at least 30% better than 90.1-2013? 3) Is there a requirement to attain an ENERGY STAR Rating?	1) Partially Met. ASHRAE 90.1 2010 is referenced, not 2013. 2) Yes. LEED BD&C contains an energy reduction performance path. 3) No.	1) Partially Met. ASHRAE 90.1 2010 is referenced, however ASHRAE 90.1 2013 is not referenced. 2) Yes. Green Globes NC contains an energy reduction performance path. 3) No. There are no prerequisites that would ensure the 'requirement' is met.	1) No. ASHRAE 90.1 2013 is not referenced. 2) Yes. While the standard does not explicitly reference ASHRAE 90.1 or compare energy use to ASHRAE, the standard requires that 105% of energy use is supplied by onsite renewable energy. LBC contains an energy reduction performance path. 3) No.
ENERGY STAR® products	1) Is the use of ENERGY STAR (or FEMP-designated energy efficient) products referenced? 2) Does the system include prescriptive energy performance measures for building products?	1) Partially Met. Water use products reference ENERGY STAR but ENERGY STAR is not referenced for other products. 2) No.	1) Yes. 2) Yes.	1) No. 2) No. The standard is not prescriptive.
Renewable energy	1) Is the use of renewable energy (onsite and offsite) addressed?	1) Yes.	1) Yes.	1) Yes.
Clean and alternative energy	1) Is the use of clean and alternative energy (onsite and offsite) addressed ?	1) Yes.	1) Yes.	1) Yes.
Metering	1) Is the use of building-level energy meters (standard or advanced) addressed?	1) Yes.	1) Yes.	1) Yes.
Benchmarking	1) Is annual building benchmarking addressed?	1) Partially Met. The standard encourages metering energy use and monitoring on a monthly basis as well as sharing the info with USGBC. The standard does not explicitly encourage annual benchmarking.	1) Partially Met. The standard addresses benchmarking for the first year of operation only, e.g., standard asks, "Is there a program or policy in place to compare actual performance data from the first year of operation with the energy design target." However this component of the standard only addresses one year of data and moreover it does not explicitly encourage annual benchmarking of energy data with energy use data from other similar buildings such as with ENERGY STAR.	1) Partially Met. Benchmarking is only addressed by the standard for projects using the Offsite Renewables Exception in which case project teams must demonstrate best in class energy use intensity.

Summary of Findings—New Construction Certification Systems

Effectiveness Criteria: Water Use Efficiency and Management Information				
Sub-criteria	Questions	LEED BD+C	Green Globes NC	LBC NC
Predicted/Modeled water use reduction	1) Is water modeling or a prescriptive approach addressed to predict water use?	1) Yes. ✓	1) Yes. ✓	1) Partially Met. While water modeling is not explicitly addressed by the standard, the Net Positive Water requirement necessitates that project teams model available water supply sources, cistern size and treatment trains in order to design their project to meet their demand without the use of a municipal connection.
Actual indoor water use reduction	1) Does the system cover any reporting or measurement of actual indoor water use?	1) Yes. ✓	1) Yes. ✓	1) Partially Met. While the standard requires that the team must provide proven performance data over the course of a 12-month performance period to demonstrate that requirements have been met, ongoing water use measurements are not required.
Actual outdoor water use reduction	1) Does the system cover any reporting or measurement of actual outdoor water use?	1) Yes. ✓	1) Yes. ✓	1) Partially Met. While the standard requires that the team must provide proven performance data over the course of a 12-month performance period to demonstrate that requirements have been met, ongoing water use measurements are not required. However, ongoing measurement of water use is not explicitly addressed in the standard.
Water conserving products	1) Is the use of WaterSense products required?	1) Yes. ✓	1) Yes. ✓	1) No. The standard does not explicitly reference WaterSense Products. LBC does not have prescriptive requirements for meeting the reduction goals of the net positive water initiative. They assume these types of products will need to be purchased in order to meet the goal but do not explicitly state that they are required. <i>Note: ILFI originally responded "yes."</i> ✗
Meters	1) Is the use of building-level water meters addressed? 2) Is the use of water meters for irrigation systems addressed?	1) Yes. ✓ 2) Yes. ✓	1) Yes. ✓ 2) Yes. ✓	1) Yes. ✓ 2) No. While the standard encourages an aggressive target of Net Positive Water, the use of water meters for irrigation systems is not explicitly addressed. The Net Positive Water requirement could be met without metering irrigation water.
Cooling towers	1) Is optimization of cooling towers addressed?	1) Yes. ✓	1) Yes. ✓	1) Partially Met. While cooling tower optimization is not explicitly addressed in the standard, the response indicates in relation to the Net Positive Water requirement that, "Cooling towers must be included in all water balance (and energy balance) calculations. The holistic and performance based approach of the LBC pushes teams to create integrated solutions that reduce water use across each project."
Water efficient landscapes	1) Is the use of water efficient landscapes addressed? 2) Are strategies to limit the potable use of water for irrigation to 50% or more below conventional practices addressed?	1) Yes. ✓ 2) Yes. ✓	1) Yes. ✓ 2) Partially Met. The standard encourages methods for reducing irrigation, however the standard does not compare the methods' savings to conventional practices and resulting reductions.	1) Yes. ✓ 2) Yes. ✓
Alternative sources of water	1) Is the use of alternative sources of water addressed?	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓
Stormwater management	1) Are strategies to protect the natural hydrology and watershed health addressed (e.g., reduce stormwater runoff and discharges)?	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓

Summary of Findings—New Construction Certification Systems

Effectiveness Criteria: Solid Waste Diversion Information				
Sub-criteria	Questions	LEED BD+C	Green Globes NC	LBC NC
Space for collection and storage of recyclables	1) Is space for collection and storage of recyclables addressed to facilitate occupant recycling and composting ?	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓
Construction waste management	1) Is construction waste management addressed (i.e., generated during the construction process) ?	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓
Waste diversion for occupants	1) Does the system require diversion of at least 50% of non-hazardous, non construction related materials (e.g., occupant waste) from landfills?	1) No. Storage area for recycle materials is prerequisite, but diversion of 50% of waste is not required. Note: USGBC originally responded "yes." ✗	1) No. The standard addresses recycling and waste diversion, but it does not require a 50% reduction. Requirements are in place to track the amount diverted, but not to set a minimum diversion rate of 50% as required by the Guiding Principles. Note: GBI originally responded "yes." ✗	1) Yes. LBC Imperative 14, Net Positive Waste (Living Building Standard 3.1 p48) requires 90%+ diversion of materials, which must be documented by the team and reviewed by the auditor. ✓

Effectiveness Criteria: Sustainable Procurement Information				
Sub-criteria	Questions	LEED BD+C	Green Globes NC	LBC NC
Recycled content	1) Is procurement of recycled content products addressed?	1) Partially Met. While recycled content is covered in LEED, it isn't required through this credit, and therefor can't be assured to meet the Guiding Principles requirement. ↓	1) Partially Met. While the procurement of recycled content is covered, it is included in combination with other factors defining a "sustainable" product (Pre-consumer recycled content % + Post-consumer recycled content % + Biobased content % + Third Party Sustainable Forestry Certification content %) and therefor can't be assured to meet the Guiding Principles requirement. ↓	1) No. ✗
Biobased content	1) Is procurement of biobased products addressed?	1) Partially Met. While biobased is covered in LEED, it isn't required through this credit, and therefore can't be assured to meet the Guiding Principles requirement. ↓	1) Partially Met. While the procurement of biobased is covered, it is included in combination with other factors defining a "sustainable" product (Pre-consumer recycled content % + Post-consumer recycled content % + Biobased content % + Third Party Sustainable Forestry Certification content %) and therefor can't be assured to meet the Guiding Principles requirement. ↓	1) Yes. ✓
Environmentally preferable products	1) Does the system encourage sustainable procurement of environmentally preferable products using standards and ecolabels?	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓
Ozone depleting compounds	1) Is avoidance of ozone-depleting compounds addressed?	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓

Summary of Findings—New Construction Certification Systems

Effectiveness Criteria: Siting Information					
Sub-criteria	Questions		LEED BD+C	Green Globes NC	LBC NC
Access to public transportation	1) Does the system address siting to promote access to public transportation?	1) Yes.	✓	1) Yes. ✓	1) Yes. ✓
Access to public amenities/neighborhood assets	1) Does the system address siting to promote access to public amenities/neighborhood assets?	1) Yes.	✓	1) Yes. ✓	1) Yes. ✓
Floodplain avoidance	1) Does the system encourage building siting to avoid floodplains?	1) Yes.	✓	1) Yes. ✓	1) Yes. ✓
Occupant transportation emissions	1) Does the system address siting to reduce occupant transportation emissions?	1) Yes.	✓	1) Yes. ✓	1) Yes. ✓
Protection of historic resources	1) Does the system address siting to preserve and protect historic resources?	1) Yes.	✓	1) Partially Met. The standard addresses use of brownfields as well as reuse of existing structures, however the standard does not explicitly address the preservation of historic resources.	1) Partially Met. While the standard has provisions such as Net Positive Waste and Embodied Carbon Footprint which encourage the reuse of materials, the standard does not explicitly address preservation of historic resources.
Bicycling options	1) Does the system address siting to promote bicycle transportation?	1) Yes.	✓	1) Yes. ✓	1) Yes. ✓

New Construction Certification Systems

Other Information Provided Related to Effectiveness Criteria			
Criteria	LEED BD+C	Green Globes NC	LBC NC
Healthy, Effective Environments	<p>The standard also addresses the following: LEED for Neighborhood Development (LT Credit) (1-18pts.): Locate the project within the boundary of a development certified under LEED for Neighborhood Development (Stage 2 or Stage 3 under the Pilot or 2009 rating systems, Certified Plan or Certified Project under the LEED v4 rating system).</p> <p>Integrative Process (IP Credit 1) (1 pt.): This integrative process credit further contributes to healthy, effective environments by supporting a collaborative, integrated planning and design process intended to support high performance and cost effective project outcomes throughout the entire life of the project.</p>	<p>The following are Green Globes New Construction criteria related to Healthy, Effective Environments not previously listed in Part II-B.</p> <p>3.6.3 Janitorial Equipment 3.6.3.1 Are there designated areas for hazardous materials/janitorial supplies with full height, floor-to-floor walls and mechanical ventilation? 3.7.1.1 "Ventilation Air Quantity 3.7.1.1.1 Is the quantity of ventilation air for the building compliant with ANSI/ASHRAE 62.1-2007, ANSI/ASHRAE 62.1-2010, the International Code Council International Mechanical Code (ICC IMC) 2009, IAPMO UMC (2009): Uniform Mechanical Code, ASHRAE 170-2008 (for hospitals or healthcare occupancies), or local codes or standards? 3.7.2.10 Ventilation and Physical Isolation for Specialized Activities 3.7.2.10.1 Is there separate ventilation and/or physical isolation for specialized activities that generate pollutants? 3.7.3.1 Daylighting 3.7.3.1.1 What percent of floor area occupied for critical visual tasks achieves a minimum daylight factor (DF) of 2 (excluding all direct sunlight penetration)? 3.7.3.1.2 What percentage of task areas were designed to have views to the exterior or atria within 25 ft. (7.6 m) from a window? 3.7.5.1 Acoustic Comfort Design 3.7.5.1.1 "Does the building design include the following acoustic design strategies: • Toilets are located remotely from acoustically separated areas? • Acoustically separated areas are located away from noise producing areas such as dance studios, music rooms, cafeterias, indoor swimming pools, mechanical rooms, and gymnasias? • Entry doors to rooms opposite each other on the same corridor are staggered? • Through-wall penetrations comply with Annex B of ANSI/ASA S12.60-2010/Part 1? • Walls separating acoustically separated areas from other areas are constructed full height to underside of the next floor above or the roof deck? • Walls separating quiet areas from other areas have all joints and penetrations sealed with acoustical sealant? • Areas with high floor impact activities (dance studios, shops, gymnasias, etc.) are not located above acoustically separated areas?</p>	<p>The standard also encourages exercise over elevators through building design and layout. The standard also encourages project teams to consider glare issues and the visual relief that results from the perceived distance of a view to the outside. The standard also encourages Universal Access to Nature & Place as well as the celebration of culture, spirit and place. Finally the standard encourages the project team provide information about their project in various formats intended to educate building occupants, visitors, and website viewers.</p>
Energy Efficiency Information	<p>The standard addresses other areas related to energy efficiency. Demand response allows projects to earn points for load shedding or shifting by participating in an existing demand response program or if one is unavailable, to provide the necessary infrastructure to take advantage of a future demand response program. Two additional credits, LEED Accredited Professional and Integrative Process contribute and add value to every projects' overall energy efficiency.</p>	<p>The standard includes a number of additional criteria such as Energy Demand, Passive Demand Reduction, Thermal Resistance and Transmittance, as well as others.</p>	<p>The standard also addresses battery storage as Net Positive Energy requires projects to install battery back-up systems that cover their critical loads, such as 10% of lighting and basic refrigeration, for seven days in order to provide resiliency.</p>
Water Use Efficiency and Management Information	<p>Accredited Professional and Integrative Process, contribute and add value to every projects' overall water use efficiency and management.</p>	<p>The standard includes a number of additional criteria such as Boilers and Water Heaters, Commercial Food Service Equipment, Laboratory and Medical Equipment, as well as others.</p>	<p>The standard's Net Positive Water requires that Living Buildings must treat all of their greywater and blackwater on site. Also, the Net Positive Water requires that that the water supply for the building, including recycled water, must be treated appropriately for its intended use without the use of harmful chemicals.</p>
Solid Waste Diversion Information	<p>Two additional credits, LEED Accredited Professional and Integrative Process, contribute and add value to every projects' overall solid waste diversion.</p>	<p>The standard includes a number of additional criteria such as Minimized Use of Raw Materials and Deconstruction and Disassembly.</p>	<p>The standard requires that the project teams write a Materials Conservation Management Plan that explains how the will reduce or eliminate the production of waste during design, construction, occupancy and end of life phases of the project. This requirement pushes the team to be proactive in their materials selection during design and think about appropriate durability and end of life recyclability and impacts.</p>
Sustainable Procurement Information	<p>Two additional credits, LEED accredited professional and Integrative Process, contribute and add value to every projects' overall sustainable procurement. An additional pilot credit is available for projects that addresses and promotes social equity in the supply chain by integrating strategies that address social and community issues, needs and disparities among those affected by the projects use of materials.</p>	<p>The standard encourages the use of an Operations and Maintenance Manual.</p>	<p>The standard "requires teams to calculate and offset the total embodied carbon impact from the construction scope through a one time carbon offset, encouraging project teams to prioritize both materials with a lower carbon footprint and the use of salvaged products and rehabilitation of structures." Also, the standard "requires projects to incorporate place-based solutions and contribute to the expansion of a regional economy rooted in sustainable practices, products and services."</p>
Siting Information	<p>Seven LEED v4 BD+C credits address other areas related to siting. These credits award points for projects that use low impact – development methods to minimize light pollution and heat island effect and points for building location that encourages interaction with the environment, social interaction and physical activity. Two additional credits, LEED Accredited Professional and Integrative Process contribute and add value other areas related to siting. Additionally, LEED v4 BD+C includes six pilot credits available to projects that address other areas related to siting.</p>	<p>The standard encourages the use of Urban Infill specifically to reduce need for new infrastructure such as utility infrastructure.</p>	<p>The standard also addresses Habitat Protection, the protection of sensitive lands, mandating avoidance of and/ or buffers from those lands, unless the purpose of the project is protection of said sensitive land type. In addition, Imperative 03 Habitat Exchange (PPH p29) requires the permanent protection of an area equal to the project area, or .4 Hectares (1 Acre), whichever is greater.</p>

Summary of Findings—Interiors Certification Systems

Effectiveness Criteria: Healthy, Effective Environments				
Sub-criteria	Questions	LEED ID+C	Green Globes Interiors	LBC Interiors
Ventilation and thermal control	1) Are there standards referenced in the system to address ventilation and thermal comfort? 2) If yes, which standard(s)?	1) Yes. 2) ASHRAE standard 55-2010; ISO 7730:2005; CEN Standard EN 15251:2007; EN 13779-2007; ASHRAE standard 62.1-2010; ASHRAE Standard 62.1-2010; CEN Standard EN 779-2002; ASHRAE Standard 52.2-2007; CIBSE Applications Manual AM10, March 2005; CIBSE Applications Manual 13-2000; National Ambient Air Quality Standards (NAAQS).	1) Yes. 2) ANSI/ASHRAE Standard 62.1-2010; ANSI/ASHRAE/IESNA Standard 90.1-2010; ANSI/ASHRAE Standard 55-2010.	1) Partially Met. ASHRAE 55 is not referenced. 2) Current version of ASHRAE 62.
Daylighting and lighting controls	1) Is maximized use of daylighting (including lighting controls) addressed?	1) Yes.	1) Yes.	1) Partially Met. The standard addresses daylighting but does not address daylighting controls.
Indoor air quality plans	1) Is a plan/policy developed? 2) Is there a requirement to implement the plan?	1) Partially Met. The standard provides for prescriptive measures related to IAQ such as flushing and testing, however the standard does not encourage the use of a plan or policy for IAQ after occupancy. 2) No.	1) Partially Met. While there is no requirement of an IAQ plan, credit 6.1.1.1 addresses IAQ requirements via compliance with ASHRAE 62.1-2010. 2) No.	1) Yes. 2) Yes.
Radon detection	1) Is radon testing addressed? 2) If high radon levels recorded, is radon mitigation addressed?	1) No. 2) No.	1) No. 2) No.	1) No. 2) No.
Moisture control	1) Is a plan/policy developed? 2) Is there a requirement to implement the plan?	1) Partially Met. The standard addresses protecting materials from moisture damage during construction and addresses thermal comfort during occupancy, however the standard does not encourage the explicit use of a plan or policy for moisture control after occupancy. 2) No.	1) Partially Met. IAQ credit calls for continuous monitoring of humidity, and there are several other moisture control strategies indicated. There is no indication of a plan or specific monitoring criteria. 2) No.	1) Yes. 2) Yes.
Low-emitting materials	1) Is the use of low-emitting materials encouraged?	1) Yes.	1) Yes.	1) Yes.
Protecting IAQ during construction	1) Is a plan/policy developed? 2) Is there a requirement to implement the plan?	1) Yes. 2) No.	1) Yes. 2) No.	1) Partially Met. The standard addresses IAQ during construction by requiring IAQ testing before occupancy, however the standard does not specify that a plan/policy be developed related to IAQ during construction. 2) No. There is no plan that is specified for IAQ during construction.
Environmental smoking control	1) Is smoking prohibited within 25 feet?	1) Yes.	1) No. The standard does not prohibit smoking in the building or within 25 ft of the building. <i>Note: GBI originally responded "yes."</i>	1) Yes.
Integrated pest management	1) Is the use of integrated pest management encouraged?	1) Partially Met. The standard does not explicitly encourage use of integrated pest management, however integrated pest management may be addressed through an innovation credit.	1) Yes.	1) No.
Occupant health and wellness	1) Are strategies to promote occupant health and wellness addressed?	1) Yes.	1) No. While acoustic, lighting and ventilation is addressed, occupant physical movement is not addressed. <i>Note: GBI originally responded "yes."</i>	1) Yes.

Summary of Findings—Interiors Certification Systems

Effectiveness Criteria: Energy Efficiency Information				
Sub-criteria	Questions	LEED ID+C	Green Globes Interiors	LBC Interiors
Predicted/Modeled energy use reduction	1) Is energy modeling addressed to predict energy performance?	1) Yes.	1) No.	1) Partially Met. While energy modeling is not explicitly addressed by the standard, the standard requires that 105% of the project's energy needs must be supplied by onsite renewable energy on a net annual basis, without the use of onsite combustion. This requirement would necessitate the use of energy modeling by the building design team.
Actual energy use reduction	1) Is ASHRAE 90.1 2013 referenced?	1) Partially Met. ASHRAE 90.1 2010 is referenced, however ASHRAE 90.1 2013 is not referenced.	1) Partially Met. ANSI/ASHRAE/IESNA Standard 90.1-2010 is referenced, however ASHRAE 90.1 2013 is not referenced.	1) No. ASHRAE 90.1 2013 is not referenced.
	2) Is there an option to achieve at least 30% better than 90.1-2013?	2) Yes. LEED ID+C contains an energy reduction performance path.	2) Yes. Green Globes Interiors contains an energy reduction performance path.	2) Yes. While the standard does not explicitly reference ASHRAE 90.1 or compare energy use to ASHRAE, the standard requires that 105% of energy use is supplied by onsite renewable energy. LBC Interiors contains an energy reduction performance path.
	3) Is there a requirement to attain an ENERGY STAR Rating?	3) No.	3) No.	3) No.
ENERGY STAR® products	1) Is the use of ENERGY STAR (or FEMP-designated energy efficient) products referenced?	1) Yes.	1) Yes.	1) No.
	2) Does the system include prescriptive energy performance measures for building products?	2) Yes.	2) Yes.	2) No. The standard is not prescriptive.
Renewable energy	1) Is the use of renewable energy (onsite and off-site) addressed?	1) Yes.	1) No.	1) Yes.
Clean and alternative energy	1) Is the use of clean and alternative energy (onsite and off-site) addressed ?	1) Yes.	1) No.	1) Yes.
Metering	1) Is the use of building-level energy meters (standard or advanced) addressed?	1) Yes.	1) Yes.	1) Yes.
Benchmarking	1) Is annual building benchmarking addressed?	1) Partially Met. The standard encourages sharing meter data with USGBC for 5 years, however explicit use of the data annually to benchmark energy use against other similar buildings is not addressed.	1) No. While the standard addresses collection of energy use data, there is nothing in the standard that addresses benchmarking energy use against similar buildings on an annual basis.	1) Partially Met. Benchmarking is only addressed by the standard for projects using the Offsite Renewables Exception in which case project teams must demonstrate best in class energy use intensity.

Summary of Findings—Interiors Certification Systems

Effectiveness Criteria: Water Use Efficiency and Management Information				
Sub-criteria	Questions	LEED ID+C	Green Globes Interiors	LBC Interiors
Predicted/Modeled water use reduction	1) Is water modeling or a prescriptive approach addressed to predict water use?	1) Yes. ✓	1) No. ✗	1) Partially Met. While water modeling is not explicitly addressed by the standard, the Net Positive Water requirement necessitates that project teams model available water supply sources, cistern size and treatment trains in order to design their project to meet their demand without the use of a municipal connection. ↓
Actual indoor water use reduction	1) Does the system cover any reporting or measurement of actual indoor water use?	1) No. The standard addresses use of low flow fixtures and appliances, however it does not address actual metering or reporting of water use. <i>Note: USGBC originally responded "yes."</i> ✗	1) Yes. ✓	1) Partially Met. While the standard requires that the team must provide proven performance data over the course of a 12-month performance period to demonstrate that requirements have been met, ongoing water use measurements are not required and ongoing measurement of water use is not explicitly addressed in the standard. ↓
Actual outdoor water use reduction	1) Does the system cover any reporting or measurement of actual outdoor water use?	1) No. The LEED v4 ID+C rating system applies to interior design and construction projects only. Outdoor water is outside the scope of the rating system. ✗	1) No. ✗	1) Partially Met. While the standard requires that the team must provide proven performance data over the course of a 12-month performance period to demonstrate that requirements have been met, ongoing water use measurements are not required. However, ongoing measurement of water use is not explicitly addressed in the standard. ↓
Water conserving products	1) Is the use of WaterSense products required?	1) Yes. ✓	1) Yes. WaterSense and other water reducing products are dictated in this credit. ✓	1) No. The standard does not explicitly reference WaterSense Products. LBC does not have prescriptive requirements for meeting the reduction goals of the net positive water initiative. They assume these types of products will need to be purchased in order to meet the goal but do not explicitly state that they are required. <i>Note: ILFI originally responded "yes."</i> ✗
Meters	1) Is the use of building-level water meters addressed? 2) Is the use of water meters for irrigation systems addressed?	1) No. ✗ 2) No.	1) Yes. ↓ 2) No. Only metering of indoor water use is addressed.	1) Yes. ↓ 2) No. While the standard encourages an aggressive target of Net Positive Water, the use of water meters for irrigation systems is not explicitly addressed. The Net Positive Water requirement could be met without explicitly metering irrigation water. ↓
Cooling towers	1) Is optimization of cooling towers addressed?	1) Yes. ✓	1) Partially Met. The standard encourages Cooling Tower Operating Maintenance for preventative maintenance, however the standard does not address cooling tower optimization. ↓	1) Partially Met. While cooling tower optimization is not explicitly addressed in the standard, the response indicates in relation to the Net Positive Water requirement that, "Cooling towers must be included in all water balance (and energy balance) calculations. The holistic and performance based approach of the LBC pushes teams to create integrated solutions that reduce water use across each project." ↓
Water efficient landscapes	1) Is the use of water efficient landscapes addressed? 2) Are strategies to limit the potable use of water for irrigation to 50% or more below conventional practices addressed?	1) No. ✗ 2) No.	1) Partially Met. While the survey response focuses on use of low impact site development, water efficient landscaping is not addressed in the response. However, the reviewer identified that the standard encourages the use of an O&M manual which may have a site maintenance contract and associated site water budget by a certified or degreed irrigation designer. 2) No. The standard is prescriptive regarding water saving measures but does not provide credits for actual achieved savings nor does the standard correlate prescriptive measures to actual. ↓	1) Yes. ✓ 2) Yes.
Alternative sources of water	1) Is the use of alternative sources of water addressed?	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓
Stormwater management	1) Are strategies to protect the natural hydrology and watershed health addressed (e.g., reduce stormwater runoff and discharges)?	1) Partially Met. The standard does not address actual reduction of stormwater runoff, however it does provide for a pilot credit that encourages restoration through purchasing Water Restoration Certificates. ↓	1) No. ✗	1) Yes. ✓

Summary of Findings—Interiors Certification Systems

Effectiveness Criteria: Solid Waste Diversion Information				
Sub-criteria	Questions	LEED ID+C	Green Globes Interiors	LBC Interiors
Space for collection and storage of recyclables	1) Is space for collection and storage of recyclables addressed to facilitate occupant recycling and composting ?	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓
Construction waste management	1) Is construction waste management addressed (i.e., generated during the construction process) ?	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓
Waste diversion for Occupants	1) Does the system require diversion of at least 50% of non-hazardous, non construction related materials (e.g. occupant waste) from landfills?	1) No. Waste reduction is encouraged, but 50% diversion is not required. <i>Note: USGBC originally responded "yes."</i> ✗	1) No. The standard addresses construction waste, and while Section of the standard, 1.1.2 IDP Performance Goals, encourages targets for waste diversion, the standard does not explicitly require 50% diversion of construction related materials. <i>Note: GBI originally responded "yes."</i> ✗	1) Yes. LBC Imperative 14, Net Positive Waste (Living Building Standard 3.1 p48) requires 90%+ diversion of materials, which must be documented by the team and reviewed by the auditor. ✓

Effectiveness Criteria: Sustainable Procurement Information				
Sub-criteria	Questions	LEED ID+C	Green Globes Interiors	LBC Interiors
Recycled content	1) Is procurement of recycled content products addressed?	1) Partially Met. While recycled content is covered in LEED, it isn't required through this credit, and therefor can't be assured to meet the Guiding Principles requirement. ↓	1) Partially Met. The standard encourages interior fit-outs using lifecycle assessment to minimize the environmental impact of the materials or the use of Environmental Product Declarations (EPDs) , however lifecycle analysis or the designation of EPD does not necessarily relate to recycled content of a product. ↓	1) No. ✗
Biobased content	1) Is procurement of biobased products addressed?	1) Partially Met. While biobased is covered in LEED, it isn't required through this credit, and therefor can't be assured to meet the Guiding Principles requirement. ↓	1) Partially Met. The standard encourages interior fit-outs using lifecycle assessment to minimize the environmental impact of the materials or the use of EPDs , however lifecycle analysis or the designation of EPD does not necessarily relate to use of biobased a product. ↓	1) Yes. ✓
Environmentally preferable products	1) Does the system encourage sustainable procurement of environmentally preferable products using standards and ecolabels?	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓
Ozone depleting compounds	1) Is avoidance of ozone-depleting compounds addressed?	1) Yes. ✓	1) No. ✗	1) Yes. ✓

Summary of Findings—Interiors Certification Systems

Effectiveness Criteria: Siting Information					
Sub-criteria	Questions		LEED ID+C	Green Globes Interiors	LBC Interiors
Access to public transportation	1) Does the system address siting to promote access to public transportation?	1) Yes.	✓	1) No. ✗	1) Yes. ✓
Access to public amenities/neighborhood assets	1) Does the system address siting to promote access to public amenities/neighborhood assets?	1) Yes.	✓	1) No. ✗	1) Yes. ✓
Floodplain avoidance	1) Does the system encourage building siting to avoid floodplains?	1) No.	✗	1) No. ✗	1) Yes. ✓
Occupant transportation emissions	1) Does the system address siting to reduce occupant transportation emissions?	1) Yes.	✓	1) No. ✗	1) Yes. ✓
Protection of historic resources	1) Does the system address siting to preserve and protect historic resources?	1) No.	✗	1) No. ✗	1) Partially Met. While the standard has provisions such as Net Positive Waste and Embodied Carbon Footprint which encourage the reuse of materials, the standard does not explicitly address preservation of historic resources. ↓
Bicycling options	1) Does the system address siting to promote bicycle transportation?	1) Yes.	✓	1) No. ✗	1) Yes. ✓

Interiors Certification Systems

Other Information Provided Related to Effectiveness Criteria			
Criteria	LEED ID+C	Green Globes Interiors	LBC Interiors
Healthy, Effective Environments	LEED v4 ID+C credits address other areas related to healthy, effective environments. LEED for Neighborhood Development Location encourages projects to enhance livability and improve human health by encouraging daily physical activity. Two additional credits, LEED Accredited Professional and Integrative Process, contribute to and add value to every projects' overall effect on healthy and effective environments.	The standard also addresses lighting and whether there is a wayfinding system with artwork, plants, views, and interesting décor.	The standard also encourages exercise over elevators through building design and layout. The standard also encourages project teams to consider glare issues and the visual relief that results from the perceived distance of a view to the outside. The standard also encourages Universal Access to Nature & Place as well as the celebration of culture, spirit and place. Finally the standard encourages the project team provide information about their project in various formats intended to educate building occupants, visitors, and website viewers.
Energy Efficiency Information	Two additional LEED v4 ID+C credits, LEED Accredited Professional and Integrative Process, contribute and add value to every projects' overall energy efficiency.	The standard also addresses specific prescriptive measures relating to lighting as well as HVAC system control.	The standard also addresses battery storage as Net Positive Energy requires projects to install battery back-up systems that cover their critical loads, such as 10% of lighting and basic refrigeration, for 7 days in order to provide resiliency.
Water Use Efficiency and Management Information	Two additional LEED v4 ID+C credits, LEED Accredited Professional and Integrative Process, contribute and add value to every projects' overall Water Use Efficiency.	N/A	The standard's Net Positive Water requires that Living Buildings must treat all of their greywater and blackwater on site. Also, the Net Positive Water requires that that the water supply for the building, including recycled water, must be treated appropriately for its intended use without the use of harmful chemicals.
Solid Waste Diversion Information	The standard also encourages the reuse of furniture, furnishings, and interior nonstructural elements to divert waste from landfills.	The standard also includes section 4.5 Building Service Life Plan, which encourages a maintenance schedule.	The standard requires that the project teams write a Materials Conservation Management Plan that explains how the will reduce or eliminate the production of waste during design, construction, occupancy and end of life phases of the project. This requirement pushes the team to be proactive in their materials selection during design and think about appropriate durability and end of life recyclability and impacts.
Sustainable Procurement Information	Two additional LEED v4 ID+C credits, LEED Accredited Professional and Integrative Process, contribute and add value to every projects' overall sustainable procurement.	The standard also encourages an environmental purchasing plan for construction to include the procurement of energy-saving, high-efficiency equipment.	The standard "requires teams to calculate and offset the total embodied carbon impact from the construction scope through a one time carbon offset, encouraging project teams to prioritize both materials with a lower carbon footprint and the use of salvaged products and rehabilitation of structures." Also, the standard "requires projects to incorporate place-based solutions and contribute to the expansion of a regional economy rooted in sustainable practices, products and services."
Siting Information	Two additional LEED v4 ID+C credits, LEED Accredited Professional and Integrative Process, contribute to and add value to every projects' overall siting effect.	N/A	The standard also addresses Habitat Protection, the protection of sensitive lands, mandating avoidance of and/ or buffers from those lands, unless the purpose of the project is protection of said sensitive land type. In addition, Imperative 03 Habitat Exchange (PPH p29) requires the permanent protection of an area equal to the project area, or .4 Hectares (1 Acre), whichever is greater.

Summary of Findings—Existing Buildings Certification Systems

Effectiveness Criteria: Healthy, Effective Environments						
Sub-criteria	Questions	LEED O&M	Green Globes Existing Buildings	LBC Existing Buildings	BREEAM	BOMA
Ventilation and thermal control	1) Are there standards referenced in the system to address ventilation and thermal comfort? 2) If yes, which standard(s)?	1) Yes. 2) ASHRAE 55-2010; ISO 7730:2005 or ASHRAE Standard 62.1-2010; EN 13779-2007; CEN Standard EN 15251 and EN 13779-2007.	1) Partially Met. There is no mention of ASHRAE 62.1/2. ASHRAE 55 does not indicate the version. 2) ASHRAE 55 (year not specified).	1) Partially Met. Standard does not reference ASHRAE 55. 2) Current version of ASHRAE 62.	1) Partially Met. ASHRAE 55 is not referenced. 2) ASHRAE 62.1-2010.	1) Partially Met. ASHRAE 55 is not specifically referenced and therefore the standard is not in full alignment with requirements. 2) ASHRAE 180; ASHRAE 52.2 (latest edition); ASHRAE 62.1; USEPA I-BEAM.
Daylighting and lighting controls	1) Is maximized use of daylighting (including lighting controls) addressed?	1) Yes.	1) Yes.	1) Partially Met. The standard addresses daylighting but does not address daylighting controls.	1) Yes.	1) Partially Met. The standard includes modules for various building types. While some modules address lighting controls and others address designing for maximum daylighting, there do not appear to be any modules that include provisions for both designing for maximum daylighting as well as incorporating daylighting into building controls.
Indoor air quality plans	1) Is a plan/policy developed? 2) Is there a requirement to implement the plan?	1) Yes. 2) No.	1) Partially Met. Requires in the assessment protocol for commercial buildings that "performance and green design goals are established and are regularly assessed", including "thermal comfort" and "air quality", but there is no specific mention of a "plan" nor any metrics on how these items are assessed as compliant. 2) No.	1) Yes. 2) Yes.	1) Yes. While an IAQ "plan" is not mentioned as part of the standard, all the requisite components of a plan are included in the standard, and it references "procedures", "risk assessments", "service contracts", "methodology." 2) No.	1) Yes. 2) Yes.
Radon detection	1) Is radon testing addressed? 2) If high radon levels recorded, is radon mitigation addressed?	1) No. 2) No.	1) Yes. 2) No. A radon limit is indicated, however mitigation is not addressed should levels be found to be higher than the limit.	1) No. 2) No.	1) No. 2) No.	1) Yes. 2) Yes.
Moisture control	1) Is a plan/policy developed? 2) Is there a requirement to implement the plan?	1) Yes. This is covered under the IAQ credit. "Develop and implement an indoor air quality (IAQ) management program based on the EPA Indoor Air Quality Building Education and Assessment Model (I-BEAM). The I-BEAM audit requires an inspection of indoor spaces, HVAC systems, and the building exterior for IAQ issues (including moisture and mold). The credit also requires the development of a plan for resolving the IAQ issues identified." 2) Yes. This is covered under the IAQ credit. "Develop and implement an indoor air quality (IAQ) management program based on the EPA Indoor Air Quality Building Education and Assessment Model (I-BEAM). The I-BEAM audit requires an inspection of indoor spaces, HVAC systems, and the building exterior for IAQ issues (including moisture and mold). The credit also requires the development of a plan for resolving the IAQ issues identified."	1) No. The standard encourages documenting symptoms of mold or excess moisture, however does not provide for a plan for moisture control. There appears to be text in a version of Green Globes NC that requires in the assessment protocol for commercial buildings that "performance and green design goals are established and are regularly assessed", including "moisture control", but there is no specific mention of a "plan" nor any metrics on how these items are assessed as compliant. While the assessment protocol calls for "A moisture control design analysis is performed on walls and ceilings adjacent to spaces of added moisture AND/OR on above-grade portions of the building envelope in accordance with ASHRAE 160-2009 or a steady-state water vapor transmission analysis for the purpose of predicting, mitigating, or reducing moisture damage to the building envelope, materials, components, systems, and furnishings.", it does not indicate what, if anything should be done with that analysis. 2) No.	1) Yes. 2) Yes.	1) No. A moisture plan/policy is not required or referenced explicitly in the standard. 2) No. <i>Note: BREEAM USA originally responded "yes."</i>	1) Yes. 2) Yes.
Low-emitting materials	1) Is the use of low-emitting materials encouraged?	1) Yes.	1) No. Environmental Purchasing is encouraged, however the standard does not address low emitting materials. <i>Note: GBI originally responded "yes."</i>	1) Yes.	1) Yes.	1) Yes.
Protecting IAQ during construction	1) Is a plan/policy developed? 2) Is there a requirement to implement the plan?	1) Yes. 2) Yes.	1) Yes. 2) No.	1) Partially Met. The standard addresses IAQ during construction by requiring IAQ testing before occupancy, however the standard does not specify that a plan/policy be developed related to IAQ during construction. 2) No.	1) Yes. 2) No.	1) Yes. 2) No.
Environmental smoking control	1) Is smoking prohibited within 25 feet?	1) Yes.	1) No. Smoking is addressed by the standard, i.e., there are credits associated with documentation around smoking areas and whether smoking is permitted, however the standard does not prohibit smoking within the building. <i>Note: GBI originally responded "yes."</i>	1) Yes.	1) No.	1) No. While the standard addresses smoking and encourages prohibiting smoking or providing designated smoking areas, the standard does not ultimately prohibit smoking within the buildings. <i>Note: BOMA Canada originally responded "yes."</i>
Integrated pest management	1) Is the use of integrated pest management encouraged?	1) Yes.	1) Yes.	1) No.	1) Yes.	1) Partially Met. Integrated pest management is addressed in the Health Care and the Residential modules, but it is not addressed or encouraged in the Shopping Center, Industrial and open-air-retail, office, or universal modules. Therefore, the requirement is considered to be Partially Met.
Occupant health and wellness	1) Are strategies to promote occupant health and wellness addressed?	1) Partially Met. While requirements like "daylight and views" are partially meeting the Guiding Principles, LEED O+M does not address the requirement to "Promote opportunities for voluntary increased physical movement of building occupants".	1) Yes.	1) Yes.	1) Yes.	1) Partially Met. Does not address the requirement to "Promote opportunities for voluntary increased physical movement of building occupants."

Summary of Findings—Existing Buildings Certification Systems

Effectiveness Criteria: Energy Efficiency Information						
Sub-criteria	Questions	LEED O&M	Green Globes Existing Buildings	LBC Existing Buildings	BREEAM	BOMA
Actual energy use reduction	<p>1) Is ASHRAE 90.1 2013 referenced?</p> <p>2) Is there an option to achieve at least 30% better than 90.1-2013?</p> <p>3) Is there a requirement to attain an ENERGY STAR Rating?</p>	<p>1) Partially Met. ASHRAE/IESNA Standard 90.1-2010 is referenced not ASHRAE 90.1 2013.</p> <p>2) Yes. LEED O&M contains an energy reduction performance path.</p> <p>3) Yes.</p>	<p>1) No. ASHRAE 90.1 (no year specified) is only referenced in relation to hot water heaters. The standard states, "Note that ASHRAE 90.1B IES tanks are not considered high efficiency for this assessment."</p> <p>2) Yes. The standard does not benchmark energy reductions against ASHRAE 90.1 2013. However, Green Globes Existing Buildings contains an energy reduction performance path.</p> <p>3) No.</p>	<p>1) No. ASHRAE 90.1 2013 is not referenced.</p> <p>2) Yes. While the standard does not explicitly reference ASHRAE 90.1 or compare energy use to ASHRAE, the standard requires that 105% of energy use is supplied by onsite renewable energy. LBC Existing Buildings contains an energy reduction performance path.</p> <p>3) No.</p>	<p>1) No. ASHRAE 90.1 is not referenced at all.</p> <p>2) No. No reference to ASHRAE 90.1. No energy reduction performance path.</p> <p>3) No. Although ENERGY STAR is referenced for data collection, no requirement for use of ENERGY STAR.</p> <p>Note: BREEAM USA originally responded "yes."</p>	<p>1) Partially Met. ASHRAE 90.1 is not referenced in the light industrial-open-air retail, health care, or multi-family residential modules. ASHRAE 90.1 is referenced in the shopping center, office, and universal modules. In the modules where ASHRAE 90.1 is referenced a specific year is not referenced in the standard.</p> <p>2) No. The standard only encourages that "when it comes time to replace equipment, they will be replaced with an energy efficient model compliant with ASHRAE 90.1 or ENERGY STAR." The standard however does not provide for prescriptive measures or for benchmarking energy use against ASHRAE 90.1 at all. No year is specified with regard to the ASHRAE 90.1 standard. No energy reduction performance path.</p> <p>3) No. ENERGY STAR benchmarking is encouraged but not required.</p>
ENERGY STAR® products	<p>1) Is the use of ENERGY STAR (or FEMP-designated energy efficient) products referenced?</p> <p>2) Does the system include prescriptive energy performance measures for building products?</p>	<p>1) Yes.</p> <p>2) Partially Met. The standard includes points for purchasing at least 40%, by cost, electric-powered equipment that have either EPEAT rating or ENERGY STAR rating, however performance measures are not indicated in the standard.</p> <p>2) No.</p>	<p>1) Partially Met. The system requires that "the requirement that any purchases of appliances and HVAC should involve consulting ENERGY STAR," but makes no requirement that ENERGY STAR products are purchased</p> <p>2) No.</p>	<p>1) No.</p> <p>2) No. The standard is not prescriptive.</p>	<p>1) Yes.</p> <p>2) No.</p>	<p>1) Yes.</p> <p>2) No.</p>
Renewable energy	<p>1) Is the use of renewable energy (onsite and offsite) addressed?</p>	<p>1) Yes. ✓</p>	<p>1) Yes. ✓</p>	<p>1) Yes. ✓</p>	<p>1) Partially Met. Only onsite generation is addressed, potential for offsite renewable energy generation is not addressed.</p>	<p>1) Yes. ✓</p>
Clean and alternative energy	<p>1) Is the use of clean and alternative energy (onsite and offsite) addressed ?</p>	<p>1) Yes. ✓</p>	<p>1) Yes. ✓</p>	<p>1) Yes. ✓</p>	<p>1) Partially Met. Only onsite generation is addressed, potential for offsite clean and alternative energy is not addressed.</p>	<p>1) Yes. ✓</p>
Metering	<p>1) Is the use of building-level energy meters (standard or advanced) addressed?</p>	<p>1) Yes. ✓</p>	<p>1) Yes. ✓</p>	<p>1) Yes. ✓</p>	<p>1) Yes. ✓</p>	<p>1) Yes. ✓</p>
Benchmarking	<p>1) Is annual building benchmarking addressed?</p>	<p>1) Yes. ✓</p>	<p>1) Partially Met. The standard provides for benchmarking water use within last three years as well as encourages ENERGY STAR rating, however annual benchmarking is not addressed.</p>	<p>1) Partially Met. Benchmarking is only addressed by the standard for projects using the Offsite Renewables Exception in which case project teams must demonstrate best in class energy use intensity.</p>	<p>1) Yes. ✓</p>	<p>1) Yes. ✓</p>

Summary of Findings—Existing Buildings Certification Systems

Effectiveness Criteria: Water Use Efficiency and Management Information						
Sub-criteria	Questions	LEED O&M	Green Globes Existing Buildings	LBC Existing Buildings	BREEAM	BOMA
Actual indoor water use reduction	1) Does the system cover any reporting or measurement of actual indoor water use?	1) Yes. ✓	1) Partially Met. The standard provides for methods of reducing indoor water consumption, but this is not tied to any measurement or reporting of consumption. Also, monitoring and reporting of total water use is addressed, however the standard does not differentiate between indoor and outdoor water use for reporting purposes. The water audit covers major water use systems which may be useful in differentiating between indoor and outdoor consumption, but this is not explicit in the standard.	1) Partially Met. While the standard requires that the team must provide proven performance data over the course of a 12 month performance period to demonstrate that requirements have been met, ongoing water use measurements are not required and ongoing measurement of water use is not explicitly addressed in the standard.	1) Partially Met. Reporting of annual water consumption is addressed. However, BREEAM In-Use does not differentiate between indoor and outdoor water consumption.	1) Partially Met. The standard addresses actual water use intensity and water use trends for office buildings only, but does not distinguish between indoor and outdoor water use.
Actual outdoor water use reduction	1) Does the system cover any reporting or measurement of actual outdoor water use?	1) Yes. ✓	1) Partially Met. Also, monitoring and reporting of total water use is addressed, however the standard does not differentiate between indoor and outdoor water use for reporting purposes. The water audit covers major water use systems which may be useful in differentiating between indoor and outdoor consumption, but this is not explicit in the standard.	1) Partially Met. While the standard requires that the team must provide proven performance data over the course of a 12 month performance period to demonstrate that requirements have been met, ongoing water use measurements are not required and ongoing measurement of water use is not explicitly addressed in the standard.	1) Partially Met. Reporting of annual water consumption is addressed. However, BREEAM In-Use does not differentiate between indoor and outdoor water consumption.	1) Partially Met. The standard addresses actual water use intensity and water use trends for office buildings only, but does not distinguish between indoor and outdoor water use.
Water conserving products	1) Is the use of WaterSense products required?	1) Yes. ✓	1) Yes. WaterSense and other water reducing products are dictated in this credit.	1) No. The standard does not explicitly reference WaterSense Products <i>Note: ILFI originally responded "yes."</i>	1) Yes. ✓	1) Yes. ✓
Meters	1) Is the use of building-level water meters addressed? 2) Is the use of water meters for irrigation systems addressed?	1) Yes. ✓ 2) Yes. ✓	1) Partially Met. The system mentions the benefits of metering but does not explicitly require building level meters. 2) No.	1) Yes. 2) No. While the standard encourages an aggressive target of Net Positive Water, the use of water meters for irrigation systems is not explicitly addressed. The Net Positive Water requirement could be met without explicitly metering irrigation water.	1) Yes. 2) No.	1) Yes. 2) No. The standard encourages submetering water usage but it does not explicitly address metering irrigation water usage.
Cooling towers	1) Is optimization of cooling towers addressed?	1) Yes. ✓	1) No. There is no mention of water reduction in cooling towers in the system. <i>Note: GBI originally responded "yes."</i>	1) Partially Met. While cooling tower optimization is not explicitly addressed in the standard, the response indicates in relation to the Net Positive Water requirement that, "Cooling towers must be included in all water balance (and energy balance) calculations. The holistic and performance based approach of the LBC pushes teams to create integrated solutions that reduce water use across each project."	1) No. ✗	1) Yes. ✓
Water efficient landscapes	1) Is the use of water efficient landscapes addressed? 2) Are strategies to limit the potable use of water for irrigation to 50% or more below conventional practices addressed?	1) Yes. 2) Partially Met. Outdoor irrigation reduction is addressed and points allotted for up to 40% reduction, strategies for reducing irrigation are addressed as well.	1) Yes. 2) Partially Met. Strategies are addressed and points are given for setting reduction targets, but actual reductions in irrigation consumption are not tied to the strategies or addressed in the standard.	1) Yes. ✓ 2) Yes.	1) Yes. 2) No.	1) Yes. 2) No.
Alternative sources of water	1) Is the use of alternative sources of water addressed?	1) No. ✗	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓
Stormwater management	1) Are strategies to protect the natural hydrology and watershed health addressed (e.g., reduce stormwater runoff and discharges)?	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓

Summary of Findings—Existing Buildings Certification Systems

Effectiveness Criteria: Solid Waste Diversion Information						
Sub-criteria	Questions	LEED O&M	Green Globes Existing Buildings	LBC Existing Buildings	BREEAM	BOMA
Space for collection and storage of recyclables	1) Is space for collection and storage of recyclables addressed to facilitate occupant recycling and composting ?	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓
Construction waste management	1) Is construction waste management addressed (i.e., generated during the construction process) ?	1) Yes. ✓	1) Partially Met. Requirements are in place to track the amount diverted, but not to set a minimum diversion rate of 50% as required by the Guiding Principles.	1) Yes. ✓	1) No. ✗	1) Partially Met. Requirements are in place to track the amount diverted, but not to set a minimum diversion rate of 50% as required by the Guiding Principles.
Waste diversion for Occupants	1) Does the system require diversion of at least 50% of non-hazardous, non construction related materials (e.g., occupant waste) from landfills?	1) Partially Met. The standard addresses reduction of waste by 50% in the Solid Waste Management credit, but it is not required.	1) Partially Met. The construction, renovation, and demolition waste management policy does not explicitly address percent diversion. Requirements are in place, but not to set a minimum diversion rate of 50% as required by the Guiding Principles.	1) Yes. Although the standard requires that a system for waste diversion be put in place, the standard does not specify that 50% of materials be diverted. LBC Imperative 14, Net Positive Waste (Living Building Standard 3.1 p48) requires 90%+ diversion of materials, which must be documented by the team and reviewed by the auditor.	1) Partially Met. The standard does not require at least 50% diversion of non-hazardous, non construction related materials. Requirements are in place, but not to set a minimum diversion rate of 50% as required by the Guiding Principles.	1) Partially Met. The standard encourages diversion of waste materials and provides credit for higher rates of diversion, however there is not a requirement to achieve greater than 50% diversion.

Effectiveness Criteria: Sustainable Procurement Information						
Sub-criteria	Questions	LEED O&M	Green Globes Existing Buildings	LBC Existing Buildings	BREEAM	BOMA
Recycled content	1) Is procurement of recycled content products addressed?	1) Partially Met. While recycled content is covered in LEED, it isn't required through this credit, and therefore can't be assured to meet the Guiding Principles requirement.	1) Partially Met. The standard provides for Environmental Purchasing but does not explicitly reference procurement of recycled content products.	1) No. ✗	1) Partially Met. The standard addresses responsible material procurement but does not explicitly reference a requirement or metric related to recycled content of materials. In the standard, responsible material procurement relates to recyclability of the materials, but this is different than recycled content. Furthermore, regarding the procurement of products the standard states, "Criteria such as working conditions, environmental practices, safety standards, and human rights policies should be factored into the selection process," this does not explicitly address recycled content of the products.	1) Yes. ✓
Biobased content	1) Is procurement of biobased products addressed?	1) Partially Met. While biobased is covered in LEED, it isn't required through this credit, and therefore can't be assured to meet the Guiding Principles requirement.	1) Partially Met. The standard provides for Environmental Purchasing but does not explicitly reference procurement of biobased content products.	1) Yes. ✓	1) Partially Met. The standard addresses responsible material procurement but does not explicitly reference a requirement or metric related to biobased materials. Furthermore, regarding the procurement of products the standard states, "Criteria such as working conditions, environmental practices, safety standards, and human rights policies should be factored into the selection process," this does not explicitly address biobased products.	1) No. The standard addresses environmentally friendly products but does not explicitly address biobased products. <i>Note: BOMA Canada originally responded "yes."</i>
Environmentally preferable products	1) Does the system encourage sustainable procurement of environmentally preferable products using standards and ecolabels?	1) Yes. ✓	1) Partially Met. The standard provides for Environmental Purchasing but only references ENERGY STAR and no other standards.	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓
Ozone depleting compounds	1) Is avoidance of ozone-depleting compounds addressed?	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓	1) Partially Met. The standard addresses responsible material procurement but does not explicitly reference a requirement or metric related to avoidance of ozone-depleting compounds.	1) No. While all of the modules appear to address refrigerant management, none of the modules of the standard actually address avoidance of ozone-depleting compounds. <i>Note: BOMA Canada originally responded "yes."</i>

Summary of Findings—Existing Buildings Certification Systems

Effectiveness Criteria: Siting Information						
Sub-criteria	Questions	LEED O&M	Green Globes Existing Buildings	LBC Existing Buildings	BREEAM	BOMA
Access to public transportation	1) Does the system address siting to promote access to public transportation?	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓
Access to public amenities/neighborhood assets	1) Does the system address siting to promote access to public amenities/neighborhood assets?	1) No. ✗	1) No. Site enhancements are addressed, but proximity to neighborhood amenities and assets is not addressed. <i>Note: GBI originally responded "yes."</i> ✗	1) Yes. ✓	1) Yes. ✓	1) Partially Met. The survey response indicates that only the Multi-Unit Residential Buildings and the Health Care modules include a walkability index. The universal, office, light industrial open air retail, and enclosed shopping center modules do not address access to public amenities. ↓
Floodplain avoidance	1) Does the system encourage building siting to avoid floodplains?	1) No. ✗	1) No. ✗	1) Yes. ✓	1) Yes. ✓	1) No. The survey response addresses impermeable surface but not floodplain. The standard does not address siting the building to avoid floodplains. ✗ <i>Note: BOMA Canada originally responded "yes."</i>
Occupant transportation emissions	1) Does the system address siting to reduce occupant transportation emissions?	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓
Bicycling options	1) Does the system address siting to promote bicycle transportation?	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓

Existing Buildings Certification Systems

Other Information Provided Related to Effectiveness Criteria					
Criteria	LEED O&M	Green Globes Existing Buildings	LBC Existing Buildings	BREEAM	BOMA
Healthy, Effective Environments	LEED Accredited Professional contributes to and adds value to every projects' overall healthy, effective environment. One pilot credit is also available for projects that addresses other areas related to healthy, effective environments.	The standard address other criteria including Health & Safety and Management of Hazardous Products, Hazard Communication Standard education, hazardous materials/waste management, Humidification System, as well as others.	The standard also encourages exercise over elevators through building design and layout. The standard also encourages project teams to consider glare issues and the visual relief that results from the perceived distance of a view to the outside. The standard also encourages Universal Access to Nature & Place as well as the celebration of culture, spirit and place. Finally the standard encourages the project team provide information about their project in various formats intended to educate building occupants, visitors, and website viewers.	The standard also addresses other criterion including the following: Minimizing Legionella contamination risk Illuminance levels (Lux) Inclusive design Condition survey Security advice Intruder alarm system Natural hazards, and Other space temp and IAQ parameters.	The standard includes other criteria such as an Occupant Environmental Communication Program, as well as several other for the multi-unit residential and the health care modules.
Energy Efficiency Information	A demand response credit awards projects for participation in existing demand response programs or preparing for a future program. LEED Accredited Professional contributes to and adds value to every projects' overall energy efficiency. One pilot credit is also available for projects that addresses other areas related to health, and effective environments.	The standard address other criteria including Lighting, Boilers, Hot water, building envelope, as well as others.	The standard also addresses battery storage as Net Positive Energy requires projects to install battery back-up systems that cover their critical loads, such as 10% of lighting and basic refrigeration, for seven days in order to provide resiliency.	Calculator (Part 1 Asset Performance) assess the energy efficiency of the technologies in the building.	The standard includes other criteria such as a Preventative Maintenance Program, a boiler maintenance program, peak shaving, as well as several others.
Water Use Efficiency and Management Information	One additional credit, LEED Accredited Professional, contributes to and adds value to every projects' overall water use efficiency and management. One pilot credit is also available to projects that addresses other areas related to water use efficiency and management.	The standard addresses water consumption and water management.	The standard's Net Positive Water requires that Living Buildings must treat all of their greywater and blackwater on site. Also, the Net Positive Water requires that the water supply for the building, including recycled water, must be treated appropriately for its intended use without the use of harmful chemicals.	The standard also addresses other criterion including the following: Leak detection system Leak prevention Isolation valves Drinking water provision Water system maintenance strategy Environmental management policy Environmental management issues Environmental management implementation Environmental objectives Organizational performance review Sustainability report Water management targets.	The standard includes other criteria such as a Water Assessment, a Water Damage Monitoring and Management Program, a maintenance program in place for interior features requiring water, benchmarking water performance, as well as others.
Solid Waste Diversion Information	One additional credit, LEED Accredited Professional, contributes to and adds value to every projects' overall solid waste diversion. One pilot credit is also available to projects that addresses other areas related to solid waste diversion.	The standard provides for a Waste Reduction Workplan including a waste audit, regular monitoring, diversion rates, and reduction targets.	The standard requires that the project teams write a Materials Conservation Management Plan that explains how the will reduce or eliminate the production of waste during design, construction, occupancy and end of life phases of the project. This requirement pushes the team to be proactive in their materials selection during design and think about appropriate durability and end of life recyclability and impacts.	The standard also addresses other criterion including the following: Environmental management policy Environmental management issues Environmental management implementation Environmental objectives Organizational performance review Sustainability report.	The standard includes other criteria such as a Waste Audit, a Waste Reduction Work Plan, as well as others.
Sustainable Procurement Information	One additional credit, LEED Accredited Professional, contributes to and adds value to every projects' overall sustainable procurement. An additional pilot credit is available for projects that addresses other issues related to sustainable procurement.	The standard encourages financial resources to improve the energy efficiency, Environmental Management System (EMS) Documentation, as well as others.	The standard "requires teams to calculate and offset the total embodied carbon impact from the construction scope through a one time carbon offset, encouraging project teams to prioritize both materials with a lower carbon footprint and the use of salvaged products and rehabilitation of structures." Also, the standard "requires projects to incorporate place-based solutions and contribute to the expansion of a regional economy rooted in sustainable practices, products and services."	The standard also addresses other criterion including the following: Building user guide Building user education Building user information Environmental management policy Environmental management issues Environmental management implementation Environmental objectives Organizational performance review As well as others.	The standard includes other criteria such as engaging independent retailers in an environmental procurement program, updating the environmental procurement program annually, a green cleaning audit conducted annually, as well as others.
Siting Information	The system includes credits aim to minimize the buildings effect on human and wildlife habitats including heat island effect, light pollution, bird collisions, Offsite Financial Support for Habitat Protection, Design Using Triple Bottom Line Analysis, Community Contaminant Prevention Airborne Releases. LEED Accredited Professional is a credit that contributes to and adds value to every projects' overall sitting effect.	The standard encourages site enhancement including measures such as an increase of indigenous species, the re-establishment of vegetation corridors, or the implementation of erosion-control measures.	The standard also addresses Habitat Protection, the protection of sensitive lands, mandating avoidance of and/ or buffers from those lands, unless the purpose of the project is protection of said sensitive land type. In addition, Imperative 03 Habitat Exchange (PPH p29) requires the permanent protection of an area equal to the project area, or 0.4 Hectares (1 Acre), whichever is greater.	The standard also addresses other criterion including the following: Planted area Ecological features of planted area Pollution prevention Ecology Report Biodiversity action plan Night time light pollution.	The standard includes other criteria such as a long-term climate change risk assessment, adaptation plan based on assessed long-term climate risks, short term hazards assessment, as well as others.

*Summary of Findings
Development and Conformance Criteria*

Sub-criteria	Questions	LEED	Green Globes	LBC	BREEAM	BOMA
Consensus-based approach	1) Was the system developed using the ANSI process or another consensus-based process?	1) Yes. ✓	1) Yes. ✓	1) No. The survey response indicates the following: "Although there was not a documented formal consensus process, there was discussion with many outside parties in the development of the Standard as a framework." This process does not however conform to OMB Circular 1-119. <i>Note: ILFI originally responded "yes."</i>	1) No. ✗	1) Yes. ✓
Transparency	1) Does the system have a documented approach for the review and consideration of public comments, are public comments collected on a regular basis, and is the process documented and publicly available? 2) Are revisions to the system documented and publicly available?	1) Yes. ✓ 2) Yes. ✓	1) Yes. ✓ 2) Yes. ✓	1) No. The survey response does not reference or provide documentation of a documented approach. The survey response also states, "Although there is no published public procedure, ILFI does have procedures through which staff consider, discuss and incorporate aspects of differing stakeholder opinions into the Standard and its rule set. ILFI relies on the referenced stakeholder groups to provide technical expertise on the impact and implementation of requested LBC Clarifications and Exceptions." Therefore, the approach is not documented and the process is not documented and publicly available. 2) Yes. ✓	1) Yes. ✓ 2) Yes. ✓	1) Yes. ✓ 2) Yes. ✓
Usability	1) What are the costs of certification?	1) https://new.usgbc.org/cert-guide/fees . ✓	1) For the Federal buildings certified, fees ranged between \$7,750 and \$13,500 with an average of about \$11,500. ✓	1) In general, certification fees are based on the project type, project size, and desired certification. The lowest certification fee is \$1,250 and highest fixed certification fee is \$25,000, with projects greater than 538,195+ square feet incurring 50.06 per square foot in certification fees. ✓	1) Registration = \$1000 Assessor Fee = TBD Submittal = \$750/part x 3 parts. ✓	1) Registration and Certification fees vary from \$2,400 to \$14,000 for a 3-year certification. ✓
Maturity	1) What is the typical frequency of updates to the system?	Updates are periodic without a formal schedule, and have occurred four times prior to the 2013 update to LEED v4 which is the current standard. ✓	ANSI requires periodic maintenance of standards at least every 5 years. More frequent updates are made for example updates included such items as updating ASHRAE Standard references, removing programs that became defunct, and adding criteria related to the Guiding Principles. GBI will file for approval of Continuous Maintenance procedures so that proposed changes can occur in a limited fashion within a two-year period so that market advances or items that need revision can be incorporated more immediately. ✓	There does not appear to be a standard frequency for the updates to the standard. However, according to the response, "The Standard has had three significant evolutionary updates, or versions (1.x, 2.x, 3.x) in the 12 years since its release in 2006." ✓	Every 3 or 4 years. ✓	Updates are put in place every 3-4 years, however it does not appear that the frequency of update is formally set. ✓
Independence	1) Are assessors/auditors independent from the certification system, without any stake in whether a building receives certification?	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓	1) Yes. ✓
Verification	1) Is a documented standard verification method and process followed by assessors and auditors?	1) Yes. ✓	1) Yes. ✓	1) Yes. The review is based on the survey question which differs significantly from the question in the review template. The reviewer believes the response should be "Yes." There is a documented appeal process. ✓	1) Yes. ✓	1) Yes. ✓
Post occupancy evaluation	1) Does the system include a verification system for post occupancy assessment of the rated building? 2) What is the required frequency of the post occupancy assessment?	1) Yes. ✓ 2) O+M projects must apply for recertification at least once every 5 years to maintain their O+M certification (but they can also apply as frequently as every year). If projects don't recertify by the 5 year mark, it's back to the beginning—their next application will be considered an initial certification application. ✓	1) The Green Globes for Existing Buildings is designed as a post occupancy assessment. The new construction standard encourages benchmarking for 1 year after occupancy, and the existing building standard encourages participation in ENERGY STAR for at least 12 months, but year over year, ongoing verification is not addressed by the standards. 2) It appears that the standard does not require post occupancy assessments to maintain certification. However, the new construction standard encourages benchmarking for 1 year after occupancy, and the existing building standard encourages participation in ENERGY STAR for at least 12 months, but year over year, ongoing verification is not addressed by the standards. ✓	1) Yes. ✓ 2) Based on the information provided, the reviewer is unable to determine the required frequency of the post occupancy assessment. ✓	1) Yes. ✓ 2) 3-year certification cycle. ✓	1) Yes. ✓ 2) Based on the information provided, the reviewer is unable to determine the required frequency of the post occupancy assessment. ✓

Appendix F

Abbreviations

ANSI	American National Standards Institute
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
BOMA	Building Owners and Managers Association
BREEAM	Building Research Establishment's Environmental Assessment Method
CFR	Code of Federal Regulations
CIR	credit information request
DOE	Department of Energy
EAC	Earth Advantage Commercial
EISA	Energy Independence and Security Act of 2007
EPA	Environmental Protection Agency
EPD	Environmental Product Declaration
FEMP	Federal Energy Management Program
FY	Fiscal Year
GBCI	Green Business Certification Incorporated
GBI	Green Building Initiative
Green Globes EB	Green Globes for Existing Buildings
Green Globes NC	Green Globes for New Construction
GSA	General Services Administration
HK BEAM	Hong Kong Building Environmental Assessment Method
HQE	High Environmental Quality
IAQ	indoor air quality
I-BEAM	Indoor Air Quality Building Education and Assessment Model
ICC IMC	International Code Council International Mechanical Code
ILFI	International Living Future Institute
ISO	International Standards Organization
LBC	Living Building Challenge
LBC EB	Living Building Challenge for Existing Buildings
LBC NC	Living Building Challenge for New Construction

LEED	Leadership in Energy & Environmental Design
LEED BD+C	LEED v4 for Building Design and Construction
LEED ID+C	LEED v4 for Interior Design and Construction
LEED O+M	LEED v4 for Building Operations and Maintenance
LI	LEED interpretation
LSC	LEED Steering Committee
NABERS	National Australian Built Environment Rating System
OMB	Office of Management and Budget
RMI	Rocky Mountain Institute
SDO	Standards Developing Organization
TCR	Technical Clarification Request
USDA	U.S. Department of Agriculture
USGBC	U.S. Green Building Council