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# CANDIDATE HANDBOOK

LEED AP<sup>®</sup> OPERATIONS + MAINTENANCE

Updated June 2014

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# REGISTERING FOR YOUR EXAM

## Registering for an Exam

1. Log in to your [Credentials](#) account using your existing USGBC® site user account or creating a new account if you do not have one.
2. Verify that the name you enter in matches the name on the ID you will present at the test center. If it does not match, please update your name in your site user account “settings”. [Contact GBCI](#) if you experience issues updating your name.\*
3. Select the credential exam you wish to apply for and follow the instructions on the screen to complete the application.
4. You will be redirected to [prometric.com/gbci](https://prometric.com/gbci) to schedule your exam date and location.

\* If your native language utilizes non-roman characters, be sure to enter your name in roman characters when you register for the exam. Make sure to bring identification, such as a passport that includes your name in roman characters to the test center.

## Eligibility Requirements

Prior LEED® project experience is strongly recommended. Practitioner experience is critical to the LEED AP® designation and, as such, project proficiency will be tested objectively within the LEED AP exam itself. All candidates must also agree to the [Disciplinary and Exam Appeals Policy](#) and credentialing maintenance requirements, must submit to an application audit, and be 18 years of age or older.

## Audits

GBCI reserves the right to conduct an audit at any time (including prior to application submission and after accreditation) of all current and past exam applications. Any information contained in your [Credentials](#) account may be audited and a request for further documentation of any information or claims submitted by the LEED Professional may be made at any time. GBCI further reserves the right to take disciplinary or legal action—including but not limited to revocation of credential(s)—in the event that any conduct discovered during such an audit violates the LEED Professional [Disciplinary and Exam Appeals Policy](#), GBCI policy, and/or law.

## Special Testing Accommodations

If you have a documented disability that would prevent you from taking a LEED professional exam under normal testing conditions, you may request accommodations. Prometric certifies that it shall comply with the provisions of the Americans with Disabilities Act (ADA). Under the ADA, entities that administer standardized examinations must offer the examinations in a place and manner that is accessible to candidates with disabilities. This may require reasonable modifications to the manner in which the test is administered. Prometric will provide candidates reasonable auxiliary aids and services, except where it may fundamentally alter the validity of the exam results. Available accommodations include, but are not limited to, a reader, a scribe, and extended testing time.

If you require special accommodations, you must indicate this when you register. To request accommodations, you and your health care provider will each need to complete one form, the [Candidate Form](#), and the [Provider Form](#).

There is no additional charge for special accommodations. Each request will be evaluated individually.

GBCI will review this documentation and, if approved, will alert Prometric of the necessary accommodations. Once you have requested special accommodations, you will not be able to schedule an appointment with Prometric until your request is approved. You will be contacted by email regarding the approval status of your special testing accommodations request.

## Exam Registration

Once you register and pay for your exam, you have one year to schedule your exam session. You may [request up to a six month extension](#) of this one-year period by submitting the circumstances and any supporting documentation to GBCI. Exam fees are non refundable. After three unsuccessful attempts, you must wait 90 days before submitting a new registration to GBCI.

## Exam Scheduling

1. Access exam scheduling through your [Credentials](#) account.
2. When the exam appointment is scheduled, you will receive a confirmation number onscreen and from Prometric through an email.
3. Record your confirmation number. You will need this confirmation number to confirm, cancel, or reschedule your appointment through the Prometric website, [prometric.com/gbci](http://prometric.com/gbci).
4. Once you have scheduled an exam, please print your confirmation notice from Prometric.

**Keep your confirmation notice for any communication with Prometric about your exam.**

## Exam Fees

See the [Exam](#) page on the USGBC® website for pricing.

For USGBC members to receive member pricing for your exam, you must have linked your member status to your USGBC account prior to registration.

## Veterans Administration Benefits

The LEED® Professional Exams have been approved by the U.S. Department of Veterans Affairs for reimbursement. The VA, in accordance with the G.I. Bill, has agreed to reimburse veterans, eligible dependents, and reservists for the cost, up to \$2000, of any of the LEED Professional Exams administered by the GBCI since December 3, 2008. [Learn more.](#)

## Rescheduling or Missing a Scheduled Exam

Once you register and pay for your exam, you cannot be refunded if you decide to cancel, however you can reschedule your appointment. If you reschedule within 30 days of the exam appointment, a \$50 fee will apply; you cannot reschedule less than three full days before the exam. This fee can be waived if you acquire an excused absence by contacting [Prometric's customer care](#) up to 10 days past the original exam date. You may be excused and allowed to retest without charge for the following reasons:

- Documented illness, either yourself or immediate family member
- Death in the immediate family
- Disabling traffic accident
- Court appearance or jury duty
- Military duty

Excused absences are determined on a case-by-case basis. GBCI reserves the right to approve or deny any such request.

If you are absent from your exam appointment and you did not reschedule according to the policy, or if you are denied access to an appointment due to a failure to present proper identification as outlined in the Identification Requirements section of this handbook, you must contact GBCI before scheduling another appointment. Candidates who are denied entrance to the appointment or who miss a scheduled exam appointment will forfeit their exam session and fees and will have to register and pay for a new exam session.

## Group Scheduling

To schedule five or more candidates at one time, please [contact customer service](#).

# THE EXAM

## Exam Development

The exams are developed and regularly updated by a global network of Subject Matter Experts and meet the specifications of a job analysis.

The exams assess candidates' abilities at three hierarchical cognitive levels: Recall, Application, and Analysis.

- **Recall Items:** These items assess a candidate's ability to recall factual material that is presented in a similar context to the exam references.
- **Application Items:** These items provide the candidate with a novel problem or scenario that the candidate can solve using familiar principles or procedures described in the exam references.
- **Analysis Items:** These items assess a candidate's ability to break the problem down into its components to create a solution. The candidate must not only recognize the different elements of the problem, but must also evaluate the relationship or interactions of these elements.

## Exam Format

The LEED AP® exam is comprised of two parts, the LEED® Green Associate™ exam and the LEED AP w/ specialty exam. Each part contains 100 randomly delivered multiple choice questions and each part must be completed in 2 hours. Total seat time for the LEED AP exam will be 4 hours and 20 minutes including a tutorial and short satisfaction survey.

Candidates who have already passed the LEED Green Associate Exam can register for the specialty-only portion of the exam, and do not need to sit for the entire composite exam. Please be aware that the option to take the composite exam in one sitting is not available in all languages and at all test centers. If you cannot find the option to register for a combined LEED AP exam, please register for the two core parts separately.

Exams have both scored and unscored items. All items are delivered randomly throughout the exam and candidates are not informed of an item's status, so candidates should respond to all the items on the exam. Unscored items are used to inform whether the item should be scored on future exams.

The Exams are computer-based. Exam questions and answer options are displayed on screen. The computer records your responses and times your exam. You are able to change your answers, skip questions, and flag questions for later review.

While taking your exam, you may come across test items on which you would like to leave comments. Please make sure to add your comments during the exam by clicking on the Comment button at the bottom of the screen. Be sure to [inform GBCI](#) that you have left comments on your exam.

Be prepared to commit 4 hours and 20 minutes to the entire process. Total exam time is broken out as follows: an optional 10 minute tutorial, the 2-hour LEED Green Associate exam, the 2-hour Operations + Maintenance specialty exam, and an optional 10 minute exit survey. Be aware that if a candidate exits the exam session, the exam cannot be restarted and the exam session and fee are forfeited.

## Exam Language

The primary language for the exam is English. In the case of any discrepancies between the original English content and the translated content or challenges made to the exams, the English content will be used as the basis of consideration. Translation is offered solely as an aid to non-native English speakers and is currently provided in French, Spanish, Brazilian Portuguese, Arabic and Chinese for the LEED® Green Associate™, LEED® BD+C and LEED O+M exams. The use of translators or foreign-language dictionaries during the examination will not be permitted. Additional time to complete the exam will not be provided.

# PRE-EXAM CHECKLIST

## Are You Ready?

### One Month Before Your Exam

Ensure that your given name (first name) and surname (last name) in your usgbc.org account matches the given name and surname on the identification you will present at the test center. (See next page.) If the names do not match, you will not be allowed to test and you will forfeit the exam fee.

Review the address listed in your usgbc.org profile so that your certificate is mailed to the most current address. (See Certificates for more information.)

### One Week Before Your Exam

Confirm that the date, time, and location of your exam is correct. If it is not, contact Prometric online at [prometric.com/gbci](https://prometric.com/gbci) with your confirmation number or call Prometric's customer service no less than three full days before the exam.

## Test Security

To ensure the integrity of the LEED® Professional Exams, you will be required to accept a nondisclosure agreement which prohibits any disclosure of exam content:

- Test questions and answers are the exclusive property of GBCI.
- The exam and the items (questions and answers) are protected by copyright law. The exam may not be copied or reproduced in part or in whole, by any means whatsoever, including memorization.
- Future discussion or disclosure of the content of the exam, orally or in writing, or by any other means, is prohibited.
- Theft or attempted theft of exam items is punishable to the fullest extent of the law.
- Failure to comply with the agreement will prevent you from testing.

## What to Expect at the Test Center

It is recommended that you arrive at the test center at least 30 minutes prior to your scheduled exam appointment. Candidates who arrive at the test site after their scheduled exam times will lose their seat.

You will be escorted to a workstation by test center staff. You must remain in your seat during the exam except when authorized to leave by test center staff. Raise your hand to notify test center staff if:

- You experience problems with your computer
- An error message appears on the computer screen (do not clear the message)
- You need to take a break (testing time will NOT be suspended)
- You need the test center staff for any other reason

## Identification Requirements

Candidates must provide valid, unexpired ID with a signature, a photograph that looks like the candidate, and an expiration date. Acceptable examples:

- 1 Non-Expired Government-issued photo ID with signature
- 1 Non-Expired Credit card photo ID with signature
- 1 Non-Expired photo ID without signature plus 1 credit card with signature—first and last names must match on both

Examples of acceptable forms of Non-Expired photo ID include but are not limited to:

- Driver's license
- Passport
- Military ID
- Alien ID/Resident Alien Card\*

\*If the ID has picture but no signature, it must be provided with a form of signature ID (Credit Card) in the same name.

See [Prometric's website](#) for more information.

Unacceptable forms of ID include but are not limited to an expired ID, an ID without an expiration date, and a Social Security Card.

## Test Center Regulations

You must abide by Prometric's security rules while at the test center. See [Prometric's FAQs](#) for more information.

## Grounds for Dismissal from the Test Center

Any candidate who engages in misconduct or does not comply with the test proctor's warning to discontinue inappropriate behavior may be dismissed from the test site, have exam results invalidated, or be subject to other sanctions. Fraud, deceit, dishonesty, or other irregular behavior in connection with taking the exam is strictly prohibited.

GBCI will make a ruling based on the consideration of both the candidate's report and Prometric's report of the incident. To appeal GBCI's ruling, [send an email](#) of your formal appeal to GBCI staff. At this stage, the Credentialing Steering Committee will review and make a final ruling on the case.

# AFTER YOUR EXAM

## Exam Results

All LEED® Professional exams are scored between 125 and 200. **A score of 170 or higher is required to pass.** Your exam score will be displayed on screen at the end of the exam and you will receive a printed report of your results from test center staff. **For the LEED AP® combined exams, you must earn a 170 or higher on both parts within the same application period to earn the credential.**

Within 72 hours of your appointment, your exam results will be processed, your Credentials account will be updated, and, if applicable, your badge will be updated in the usgbc.org People directory.

## Passing the Exam

### Designating Your Credential

As soon as you have passed the exam, you can use the title “LEED AP” followed by your specialty(ies) (BD+C, Homes, ID+C, ND, O+M) and/or the logo.

### Certificates

Once your exam results have been processed, you can request your certificate. Certificates are available in two forms: PDF softcopy (available for download at any time for free) and a hardcopy (see [website](#) for pricing and ordering info). If your certificate arrives damaged or does not arrive at all, please [request a free replacement](#).

### Credential Maintenance Program

LEED APs must complete 30 continuing education (CE) hours biennially. For more information on credential maintenance, see the CMP Guide.

### Earning the LEED AP after the LEED® Green Associate™

If you are a LEED Green Associate when you earn the LEED AP credential, your LEED Green Associate credential expires and is replaced by the LEED AP.

## Exam Content Appeals

Following completion of the exam candidates may submit comments on any question(s) they believe to contain technical errors in content. In your correspondence include your contact information, test date, the specific concerns about the question, as well as an indication of any comments left on the question during the exam. GBCI will review the question and you will be notified of the findings. Because of the need for test security, GBCI will not release exam questions or answers to candidates. GBCI does not respond to complaints or challenges received more than 14 days after the test date and does not respond to complaints sent to organizations other than GBCI.

GBCI does not modify exam scores under any conditions. In the event of a successful exam content appeal, you will be given the opportunity to retest; your score will not be changed. The only way to earn a LEED® Professional credential is to earn a 170 on the required exam(s).

## Candidate Confidentiality

GBCI recognizes your rights to control personal information. GBCI policy is designed to safeguard this information from unauthorized disclosure. You can change your preference to be contacted through your personal preferences in your [usgbc.org](https://www.usgbc.org) account.

To protect your rights to control score distribution, exam scores are released only to you, the test taker and authorized GBCI staff. GBCI does not release test scores except for use in research studies that preserve your anonymity. In addition, GBCI does not release any account details to any third parties without the candidate's written permission.

Official statistics regarding the LEED® Professional exams, including all item performance data, individual data, and demographic data, will be considered confidential unless officially released by GBCI. Candidates' scores will always remain confidential unless released with written consent of a candidate.

# EXAM SPECIFICATIONS

## Specifications

The following outline provides a general description of exam content areas for the LEED AP® O+M exam.

Task Domains reflect the tasks necessary to perform LEED® safely and effectively. These include concepts such as LEED Project and Team Coordination, LEED Certification Process, Analyses Required for LEED Credits, and Advocacy and Education for Adoption for LEED Rating System.

Knowledge Domains reflect the rating systems' credit categories and what one needs to know. These include concepts such as LEED Process, Integrative Strategies, LEED credit categories, and Project Surroundings and Public Outreach.

## Exam Part 1: LEED® Green Associate™ Exam

The first part of your exam is the LEED Green Associate, which tests your general knowledge of green building practices for both commercial and residential spaces and both new construction and existing buildings as well as how to support other professionals working on LEED projects.

### ► Task Domains (LEED Green Associate)

#### LEED Green Associate Tasks (100%)

- Communicate broad and basic green building concepts to team or colleagues
- Research and create a library of sustainable building materials
- Assist others with sustainability goals
- Create project profiles/case studies/press release
- Serve as a green advocate to clients, team members, & general public (e.g. why green building)
- Stay current on any updates to LEED and green strategies in general
- Navigate in LEED Online
- Assist project leader with LEED correspondence to all project team members (consultants, contractors, owner, etc.)
- Assist in managing documentation process
- Assist in managing timeline of LEED certification

## ► Knowledge Domains (LEED® Green Associate™)

### LEED® Process (16 Questions)

- Organization fundamentals (e.g. mission/vision; non-profit; role of USGBC®/GBCI)
- Structure of LEED rating systems (e.g., credit categories, prerequisites, credits and/or Minimum Program Requirements for LEED Certification)
- Scope of each LEED rating system (e.g., rating system selection; rating system families [BD+C, ID+C, O+M, ND, Homes])
- LEED development process (e.g., consensus based; stakeholder and volunteer involvement; rating system updates/evolution)
- Credit categories (e.g., goals and objectives of each [LT, SS, WE, EA, MR, EQ, IN, RP]; synergies)
- Impact categories (e.g. what should a LEED project accomplish?)
- LEED certification process (e.g. certification levels [Certified, Silver, Gold, Platinum]; LEED Scorecard; 3rd party verification; role of documentation submission; LEED Interpretations; Addenda; awareness of different system versions [e.g., LEED Online] Components of LEED Online and Project Registration)
- Other rating systems – (e.g., in general what other rating systems are out there?)

### Integrative Strategies (8 Questions)

- Integrative process (e.g., early analysis of the interrelationships among systems; systems thinking; charrettes)
- Integrative project team members (e.g., architect, engineer, landscape architect, civil engineer, contractor, facility manager, etc.)
- Standards that support LEED (e.g., breadth not depth of American Society of Heating, Refrigeration and Air-conditioning Engineers [ASHRAE]; Sheet Metal and Air Conditioning Contractors National Association [SMACNA] guidelines; Green Seal, ENERGY STAR®, HERs, Reference Standards listed in ACPs, etc.)

### Location and Transportation (7 Questions)

- Site selection (e.g. targeting sites in previously developed and brownfields/high-priority designation area, avoiding sensitive habitat, located in areas with existing infrastructure and nearby uses, reduction in parking footprint)
- Alternative transportation (e.g., type, access, and quality; infrastructure and design)

### Sustainable Sites (7 Questions)

- Site assessment (e.g., environmental assessment, human impact)
- Site design and development (e.g., construction activity pollution prevention; habitat

conservation and restoration; exterior open space; rainwater management; exterior lighting; heat island reduction)

### **Water Efficiency (9 Questions)**

- Outdoor water use (e.g., use of graywater/rainwater in irrigation; use of native and adaptive species)
- Indoor water use (e.g., concepts of low flow/waterless fixtures; water-efficient appliances; types and quality)
- Water performance management (e.g., measurement and monitoring)

### **Energy and Atmosphere (10 Questions)**

- Building loads (e.g., building components, space usage [private office; individual space; shared multi-occupant spaces])
- Energy efficiency (e.g., basic concepts of design, operational energy efficiency, commissioning, energy auditing)
- Alternative and renewable energy practices (e.g., demand response, renewable energy, green power, carbon offsets)
- Energy performance management (e.g., energy use measurement and monitoring; building automation controls/advanced energy metering; operations and management; benchmarking; ENERGY STAR®)
- Environmental concerns (e.g., sources and energy resources; greenhouse gases; global warming potential; resource depletion; ozone depletion)

### **Materials and Resources (9 Questions)**

- Reuse (e.g., building reuse, material reuse, interior reuse, furniture reuse)
- Life-cycle impacts (e.g., concept of life-cycle assessment; material attributes; human and ecological health impacts; design for flexibility)
- Waste (e.g., construction and demolition; maintenance and renovation; operations and ongoing; waste management plan)
- Purchasing and declarations (e.g., purchasing policies and plans; environmental preferable purchasing (EPP); building product disclosure and optimization [i.e., raw materials sourcing; material ingredients; environmental product disclosure])

### **Indoor Environmental Quality (8 Questions)**

- Indoor air quality (e.g., ventilation levels; tobacco smoke control; management of and improvements to indoor air quality; low-emitting materials; green cleaning)
- Lighting (e.g., electric lighting quality, daylight)
- Sound (e.g., acoustics)

- Occupant comfort, health, and satisfaction (e.g., controllability of systems, thermal comfort design, quality of views, assessment/survey)

### **Project Surroundings and Public Outreach (11 Questions)**

- Environmental impacts of the built environment (e.g. energy and resource use in conventional buildings; necessity of green buildings; environmental externalities; triple bottom line)
- Codes (e.g., relationship between LEED® and codes [building, plumbing, electrical, mechanical, fire protection]; green building codes)
- Values of sustainable design (e.g., energy savings over time; healthier occupants; money-saving incentives; costs [hard costs, soft costs]; life-cycle)
- Regional design (e.g., regional green design and construction measures as appropriate, regional emphasis should be placed in Sustainable Sites and Materials & Resources)

## **Exam Part 2: O+M Specialty Exam**

The second part of your exam is the LEED® O+M specialty exam which tests the knowledge and skills necessary to participate in the design process, to support and encourage integrated design, and to streamline the application and certification process.

### **► Task Domains (O+M Specialty)**

#### **LEED Project and Team Coordination (24%)**

- Assess the applicability of a LEED rating system to a project (BD+C, ID+C, O+M; BD+C vs. O+M)
- Gather and interpret client needs and priorities as they affect LEED certification (e.g., efficiency, cost, return on investment; marketability, benchmarking)
- Determine LEED requirements applicable for the project (e.g., provide appropriate strategies to owner with solutions to meet specific needs; develop preliminary scorecard; identify regional priorities)
- Identify project team members, resources and capabilities
- Define roles and responsibilities of project team members
- Build consensus around applicable project parameters (e.g., full time equivalent, project area; performance period dates; occupancy; multiple-building considerations)
- Support and encourage integrative processes (e.g., involve stakeholders early in the process, encourage LEED goals, include specific requirements in building policies)
- Support LEED credit achievement (e.g., provide resources, training, tools, demonstrations of sample credits)

- Develop and/or implement existing tools to manage the LEED® certification process (e.g., spreadsheets, time tables, responsibility matrices; LEED Online)
- Coordinate amongst multiple disciplines when attempting LEED credit achievement
- Monitor and review project and team progress at appropriate intervals (e.g., Establishment and Performance requirements)
- Connect standards that support LEED credits to the appropriate project team member (e.g., ASHRAE, Green Seal)
- Identify opportunities for credit synergies

### **LEED Certification Process (28%)**

- Confirm compliance of minimum program requirements
- Select the appropriate LEED rating system for project scope (retail, warehouse & distribution centers; data centers; schools, hospitality)
- Register the project using LEED Online
- Identify ownership (responsibility) for meeting prerequisites, credits and/or strategies
- Access and complete credit forms through LEED Online
- Review completed LEED forms (e.g., accuracy, completion, quality, related uploads)
- Identify third parties, if necessary, to complete the submittal process (e.g., commissioning agents, housekeeping vendors, utility providers)
- Prepare or obtain supporting documents (e.g., drawings, policies, specifications, contracts, protocols)
- Coordinate and disseminate Addenda and Interpretations
- Submit technical questions and/or LEED Interpretations to USGBC®
- Maintain the LEED scorecard
- Track LEED documentation and submittal status
- Suggest and promote use of innovation credits (e.g., innovation, exemplary, pilot)
- Suggest and promote appropriate alternative compliance paths
- Submit completed documentation and certification payment
- Perform on-site review for LEED compliance
- Advise on the certification review process (e.g. evaluate final certification comments)

**Analyses Required for LEED® Credits (37%)**

- Verify compliance of technical work products of LEED credits created by other team members (e.g., review policies, programs, benchmarking, purchasing logs; reports)
- Identify and prioritize synergistic credits
- Research green operation and maintenance products and strategies
- Identify project-specific strategies
- Coordinate energy auditing and benchmarking
- Coordinate analysis of minimum indoor air quality

**Advocacy and Education for Adoption for LEED Rating System (11%)**

- Identify, communicate and educate the values of sustainable operations and maintenance and benefits of a green building (building performance, staff retention, improved user outcomes, marketing/branding opportunities) to stakeholders (e.g., clients, employees, public)
- Identify incentives for clients to implement sustainable building practices
- Justify initial costs and value of green buildings (e.g., return on investment, triple bottom line)

**The exam contains 15 pretest questions.**

**► Knowledge Domains (O+M Specialty)****LEED Process (12 Questions)**

- LEED interpretations
- LEED system synergies (e.g., energy and IEQ; waste management; building operation plan and ventilation calculations)
- Project boundary; LEED boundary; property boundary, master site boundary
- Prerequisites and/or minimum program requirements for LEED certification
- Occupancy requirements (e.g., existing building--building must be fully occupied for 12 continuous months as described in minimum program requirements; reduced occupancy guidance; 10% exemptions)
- Recertification (e.g., initial vs. recertification; performance period; ongoing performance; data tracking)
- Review process (e.g., Establishment vs. Performance review; credit statuses; credit responses; review report)
- Integrative process (e.g., roles of responsibilities; facilitating collaboration)

- Adaptations (e.g., unique compliance paths and/or separate credits for different project types)
- Ways to earn innovation credits:
  - Innovation option (e.g., criteria for new innovative method, using credit that has been used before)
  - Exemplary performance option (which credits have exemplary performance paths, and what are the thresholds of exemplary performance)
  - Pilot option

### **Location and Transportation (5 Questions)**

- Alternative transportation
  - Access and quality (e.g., accessibility to multimodal transportation choices; quality transit; transportation patterns)
  - Survey methodology (e.g., timing; sample size; sampling vs. extrapolation; alternative transportation programs)

### **Sustainable Sites (9 Questions)**

- Site design and development
  - Habitat conservation and restoration (e.g., on-site restoration or preservation; off-site habitat restoration; off-site habitat conservation; native or adaptive vegetation; disturbed or compacted soils)
  - Site improvement plan (e.g., vegetated outdoor space; maintenance activities, exterior strategies; watershed quality; soil quality)
  - Exterior lighting (e.g., exterior light trespass and uplight; fixture shielding; lighting zone; impact on wildlife and people)
  - Rainwater management (e.g., historical rainfall conditions, natural hydrology, low-impact development; maintenance needs)
  - Heat island reduction (e.g., heat island effect; green roofs; solar reflectance; roof and non-roof strategies)
- Site management practices (e.g., impacts of site management decisions; planning for future site management; site equipment and maintenance materials)

### **Water Efficiency (13 Questions)**

- Outdoor water use reduction: irrigation demand (e.g., landscape water requirement; irrigation system efficiency; calculated water budget; native and adaptive species)
  - Indoor water use reduction
  - Fixture and fittings (e.g., water use reduction through fixtures such as toilets;

urinals; faucets [kitchen, lavatory]; showerhead; determining performance through metering)

- Appliance and process water (e.g., equipment types [e.g., dishwasher, washing machines, vehicle wash bays])
- Cooling tower water use: water conservation techniques (e.g., cycles of concentration, total dissolved solids; potable water treatment; non-potable water use)
- Water performance management
  - Water use measurement (e.g., water meter(s); submeters; types of water sources to measure; data management and analysis)
  - Types and quality of water (e.g., potable, nonpotable, alternative water sources)

### Energy and Atmosphere (21 Questions)

- Building loads
  - Building components (e.g., building orientation, glazing selection, climate appropriate building materials, regional considerations)
  - Space usage (e.g., space types [private office; individual space; shared multi-occupant spaces], equipment and systems, occupant-driven loads [plug loads])
- Energy efficiency
  - Operational energy efficiency (e.g., schedules, set points, interactions between systems; influencing occupant behavior)
  - Commissioning (e.g., commissioning authority (CxA); existing building commissioning; ongoing commissioning; identification of issues; differentiate from energy auditing)
  - Audit (e.g., ASHRAE Level 1 and 2; identification of opportunities and improvements; differentiate from commissioning)
- Alternative and renewable energy practices
  - Renewable energy (e.g., on-site and off-site renewable energy; photovoltaic; solar thermal; wind; low-impact hydroelectricity; wave and tidal energy; non-qualifying sources)
  - Green power and carbon offsets (e.g., off-site generated, renewable energy certificates (RECs), Green-e Energy certified or the equivalent; benefits of RECs; measurement [carbon dioxide-equivalent (CO<sub>2</sub>e)]; Scope 1 and Scope 2 emissions; Green-e Climate certified or the equivalent; benefits of carbon offsets)
- Demand response (e.g., grid efficiency and reliability; demand response programs; load shifting)

- Energy performance management:
  - Energy use measurement (e.g., building-level energy meter(s); submeters; types of energy sources to measure; data management and analysis)
  - Building automation controls/advanced energy metering (e.g., support energy management; data storage; support demand response participation)
  - Operations and management (e.g., training of staff, operations and maintenance plan; current facilities requirements; preventive maintenance plan)
  - Benchmarking (e.g., metrics used; determining baseline building performance; comparing building energy performance against similar buildings or historical data; tools and standards [ASHRAE, CBECS, ENERGY STAR® Portfolio Manager])
- Environmental concerns: upstream and downstream impacts (e.g., sources and energy resources [oil, coal, and natural gas]; renewable and nonrenewable resources; chlorofluorocarbons [CFCs] and other refrigerants; stratospheric ozone layer depletion)

#### **Materials and Resources (10 Questions)**

- Life-cycle impacts
  - Material attributes (e.g., recycled content, material reuse, extended use, sustainable agriculture, local sourcing of food and beverages; bio-based; paper and wood products; electric-powered equipment)
  - Human and ecological health impacts (e.g., mercury in lighting; maintenance and renovation purchasing policy)
- Waste
  - Maintenance and renovation (e.g., maintenance and renovation waste management policy)
  - Operations and ongoing (e.g., waste management policy; waste audit; storage and collection of recyclable materials [mixed paper, corrugated cardboard, glass, plastics, and metals]; safe storage areas for batteries and mercury-containing lamps; durable goods waste)
- Purchasing policies (e.g., environmental preferable purchasing (EPP) policy; ongoing consumables; durable goods; maintenance and renovations; lighting purchases)

#### **Indoor Environmental Quality (15 Questions)**

- Indoor environmental quality
  - Ventilation levels (e.g., natural vs. mechanical, outdoor air, regional climate conditions)
  - Tobacco smoke control (e.g., prohibiting smoking; environmental tobacco smoke transfer)

- Management of and improvements to indoor air quality (e.g., source control, filtration and dilution, air testing, ongoing monitoring; management program/I-BEAM)
- Low-emitting materials (e.g., product categories [paints and coatings; adhesives and sealants; flooring, etc.]; volatile organic compound (VOC) emissions and content; evaluating environmental claims; comparing to published standards)
- Green cleaning (products, materials, and equipment; frequency of cleaning; relationship between cleaning products and ongoing indoor air quality management; effectiveness assessment/APPA audits)
- Lighting: electric lighting quality (e.g., tradeoffs [color, efficiency]; surface reflectance, types of fixtures; project-specific considerations)
- Daylight (e.g., building massing and orientation, glare, illuminance)
- Occupant comfort, health, and satisfaction:
  - Controllability of systems (e.g., thermal, lighting; daylight)
  - Thermal comfort (e.g., permanent monitoring; periodic measurement; responding to thermal comfort issues; strategies to promote occupants' productivity, and comfort)
  - Quality views (e.g., connection to outdoor environment; direct line of sight to outdoors)
  - Integrated pest management (e.g., pest preventive and control measures; nonchemical approaches; communication to building occupants; responsible parties)
  - Assessment/survey (e.g., occupant satisfaction with acoustics, building cleanliness, indoor air quality, lighting, thermal comfort, and overall satisfaction; corrective action plan)

**The exam contains 15 pretest questions.**

## References

The primary sources for the development of the LEED® Professional Exams are the LEED Rating Systems. The following list of references are not meant to be comprehensive. When combined with the test specifications, the candidate has the material from which the exam is based.

### **Exam Part 1: LEED® Green Associate™ Exam**

This exam is designed to test the general knowledge of green building practices and how to support other professionals working on LEED projects.

## References

- U.S. Green Building Council. *Green Building and LEED Core Concepts Guide*. 3rd Edition. U.S. Green Building Council, 2011. [Print and Digital](#) versions available.
- U.S. Green Building Council. Introductory and Overview Sections. *LEED Building Design + Construction Reference Guide*. v4 Edition. U.S. Green Building Council, 2013. [Web](#).  
\*Note that the introductory and overview sections are available to download separately from purchasing the full reference guide.
- U.S. Green Building Council. *LEED v4 Impact Category and Point Allocation Process Overview*. U.S. Green Building Council, 2013. [Web](#).
- U.S. Green Building Council. *LEED v4 User Guide*. U.S. Green Building Council, 2013. [Web](#).
- U.S. Green Building Council. *Guide to LEED Certification: Commercial*. U.S. Green Building Council, 2014. [Web](#).
- “LEED Certification Fees.” U.S. Green Building Council, 2014. [Web](#).
- “Rating System Selection Guidance.” U.S. Green Building Council, 2014. [Web](#).

## Exam Part 2: LEED AP® O+M Specialty Exam

This exam is designed to test the knowledge and skills necessary to participate in the design process, to support and encourage integrated design, and to streamline the application and certification process. You should also be familiar with the content of the U.S. Green Building Council’s Website, [usgbc.org](http://usgbc.org), and GBCI’s website, [gbc.org](http://gbc.org), including but not limited to LEED® Project Registration, LEED Certification content, and the purpose of LEED Online. The U.S. Green Building Council’s website, [usgbc.org/LEED](http://usgbc.org/LEED), also has free access to LEED Rating Systems, LEED Reference guide Introductions, and Checklists beyond those listed above.

## References

- U.S. Green Building Council. *LEED Operations and Maintenance Reference Guide*. v4 Edition. U.S. Green Building Council, 2013. [Print and Digital](#) versions available.
- “Green building incentive strategies.” U. S. Green Building Council, 2014. [Web](#).
- U.S. Green Building Council. *Guide to LEED Certification: Commercial*. U.S. Green Building Council, 2014. [Web](#).
- U.S. Green Building Council. *Foundations of LEED*. U.S. Green Building Council, 2009. [Web](#).
- U.S. Green Building Council. *LEED v4 for Operations and Maintenance Checklist*. U.S. Green Building Council, 2013. [Web](#).
- “LEED Addenda (Corrections + Interpretations).” U. S. Green Building Council, 2014. [Web](#).
- “LEED Online: Register a project.” U.S. Green Building Council, 2014. [Web](#).
- “LEED Certification Fees.” U.S. Green Building Council, 2014. [Web](#).
- “Rating System Selection Guidance.” U.S. Green Building Council, 2014. [Web](#).

## Sample Questions

Disclaimer: The items listed here were discarded in the process of creating items for the new LEED AP® Building Design + Construction exam. The items are provided for your convenience to allow you to better familiarize yourself with the format and general content of items on the exam.

The content of these items, while representative of the type of questions on the LEED AP O+M exam, does not necessarily mirror the content that will appear on the actual exam. Further, your ability to correctly answer these sample items does not in any way predict or guarantee your ability to successfully answer questions on the actual LEED AP O+M exam.

### Exam Part 1: LEED® Green Associate™ Exam Questions

#### 1. When applying for innovation credits, a project team

- (A) Cannot submit any previously awarded innovation credit.
- (B) May receive credit for performance that doubles a credit requirement threshold.**
- (C) May submit a product or strategy that is being used in an existing LEED® credit.
- (D) May receive a credit for each LEED Accredited Professional that is on the project team.

This question represents Knowledge Domain A. LEED Process, credit categories and Task Domain A. LEED Green Associate Tasks

#### 2. A developer wants to make a profit by building a new office that maximizes daylighting and views. What actions might the developer take to fulfill all parts of the triple bottom line?

- (A) Restore habitat onsite
- (B) Purchase ergonomic furniture
- (C) Pursue local grants and incentives
- (D) Provide lighting controllability for occupants**

This question represents Knowledge Domain I. Project Surroundings and Outreach, environmental impacts of the built environment and Task Domain A. LEED Green Associate Tasks, assist others with sustainability goals.

### Exam Part 2: LEED AP w/ Specialty

#### 1. The city is building a new botanical garden and is attempting LEED certification. What could the educational program include to earn an Innovation in Design Credit?

- (A) Present the building's sustainable features at the grand opening
- (B) Present the building's sustainable features at a town hall meeting
- (C) Provide on-going weekly tours highlighting the building's sustainable features**
- (D) Publish a press release to the local newspaper outlining the building's sustainable features

Knowledge Domain: LEED system synergies (e.g., energy and IEQ; waste management)

Task Domain: educate others (and self)

**2. How should athletic fields be treated in the calculations for WE Credit, Outdoor Water Use Reduction?**

(A) Must be calculated using 100% potable water

**(B) May be included or excluded from the calculations**

(C) May be calculated using a standard 20% reduction from baseline

(D) Must be calculated using at least 20% from an alternative water source

Knowledge Domain: Outdoor water use reduction: irrigation demand (e.g., landscape water requirement; irrigation system efficiency; native and adaptive species)

Task Domain(s): be a resource for LEED® credit achievement (e.g., provide resources, training, tools, demonstrations of sample credits), manage LEED template(s)/certification process in LEED Online (e.g., review for completion), identify project-specific strategies, educate others (and self)

# CONTACT

## Prometric

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# Green Building Certification Institute

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USGBC®'s website is available 24 hours per day for exam application and registration, information regarding the LEED Professional Exams, and access to your account.

**Call Center:** 1-800-795-1746 (within the US) or +1-202-828-1145 (outside the US)

GBCI's call center is available Monday through Friday from 9:00 to 19:00 ET for questions regarding exam registration, USGBC or CaGBC member pricing, your [Credentials](#) account, the LEED® Professional Directory, and the LEED Professional Exams.

**Exam Department:** [usgbc.org/help-topic/professional-exams](https://www.usgbc.org/help-topic/professional-exams)

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