

# LEED AP Exam Primer

S.L.U.G.

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**James Jenkins**  
**Project Manager**  
**O'Brien & Company**



# Accredited or Certified Professional?



**Certified**



**Accredited**

## Purpose of the LEED-AP Exam

- To ensure that a successful candidate has knowledge and skills necessary to participate in the design process, to support and encourage integrated design, and to streamline the application and certification process.
- To test understanding of green building practices and principles, and familiarity with LEED requirements, resources, and processes.

## LEED-AP Capabilities

- Explain LEED credit intents, requirements, technologies, and strategies for a majority of LEED credits.
- Manage the integration of multiple design disciplines to achieve LEED certification.
- Describe the salient characteristics of most LEED Reference Standards.
- Identify credit synergies for integrated design to support LEED certification.
- Verify that credit documentation meets LEED requirements.
- Manage completion of the LEED Letter Templates.
- Identify the conditions under which the LEED prerequisites are met.
- Determine the number of Optimize Energy Performance points achieved by reviewing energy model results.
- Explain the life cycle cost benefits of a LEED project.



## LEED-AP Exam Intended Audience

- Architects
- Engineers
- Interior Designers
- Facility Managers
- Green Building Consultants
- Product Manufacturer Reps
- Specifiers
- Commissioning Authorities
- Landscape Architects
- Building Owners
- Government officials
- Contractors
- Developers
- Construction Managers

## LEED-AP Exam Eligibility

**The following qualifications for the LEED-AP Exam are strongly recommended, but not required:**

- LEED Training Workshop
- Formal training as an architect, engineer, interior designer, facilities manager, or contractor
- Tenure in the building design and construction industry, or as a building management or operations professional, facilities staff, or executive

## LEED-AP Exam: The Details

- **Three tracks are offered.**
  - LEED-NC 2.2
  - LEED-CI 2.0
  - LEED-EB 2.0 (for a while!)
  - Plus LEED-HAP soon!
- **Taking any one track certifies you as a LEED-AP.**
- **2 hours for the exam**
  - (2 hours, 30 minutes = total seat time)
- **80 multiple choice questions**
- **Scaled Scoring**
  - Must receive a 170 on a scale of 200 to pass
  - Scale is 125-200
- **To Register**
  - Visit the Green Building Certification Institute (<http://www.gbci.org/>) and create an accreditation profile
  - Follow the scheduling link to [www.prometric.com/USGBC](http://www.prometric.com/USGBC) and enter your eligibility ID to proceed with scheduling and payment.
  - Offered electronically at 300 sites nationwide
- **Fee: \$300 for members and \$400 for non-members**



# LEED-AP Exam: What to Expect

- **ProMetrics**
  - **Nothing goes into the Exam Room**
  - **Photo ID**
  - **Single Piece of Paper and a Single #2 Pencil**
- **Double Negatives**
- **Tricky Questions**
- **A time check every 30 minutes**
- **Expect questions pertaining to:**
  - **Commissioning**
  - **Exemplary Performance**
  - **Energy**
  - **Heavy in one Category**
- **Story Problems w/ Multiple Answers**
- **ALWAYS choose the BEST answer not necessarily the RIGHT answer**
- **Answer everything, no penalty for wrong answers**
- **Statistically the right answer is “B” or was it “C”?**
- **Math - No Calculators**

## Knowledge Areas

*The following information is based on the current exam. The areas of knowledge will remain the same, but the number of questions per area may change.*

- **Four areas of knowledge:**
  - **Section 1 - Knowledge of LEED credits Intents and Requirements**
  - **Section 2 - Coordinate Project and Team**
  - **Section 3 - Implement LEED Process**
  - **Section 4 - Verify, Participate In and Perform Technical Analysis Required for LEED Credits**

# Knowledge Area 1

## **Knowledge of LEED Credit Intents and Requirements.**

- Apply LEED-NC definitions consistently across all credits.
- Establish level of knowledge of LEED credit intents requirements, submittals, technologies, and strategies for site, water, energy, materials and IEQ credit categories.
- Describe format and process for achieving ID credits.

## Sample Question - Knowledge Area 1

1. Which two of the following are considered sources of potable water in LEED? (Choose two.)
  - A. irrigation wells
  - B. captured rain water
  - C. municipal water system
  - D. municipally supplied reclaimed waste water

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**C. municipal water system**

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## Knowledge Area 2

### Coordinate Project and Team

- Gather all project information and requirements to support the LEED process.
- Manage coordination of multiple disciplines to achieve LEED certification.
- Identify standards that support LEED credits.
- Identify opportunities for integrated design and credit synergies to support LEED certification.
- Identify critical path elements and schedule to implement LEED process.



## Sample Question - Knowledge Area 2

1. A value engineering exercise has proposed that exterior horizontal louvers above south-facing windows will be deleted from the project. The change requires that various project team members review strategies and reconfirm calculations for several credits.

Which three credits would be affected by this decision? (Choose three.)

- A. EA Credit 6, Green Power
- B. SS Credit 7.1, Heat Island Effect: Non-Roof
- C. EA Credit 1, Optimize Energy Performance
- D. EQ Credit 1, Outdoor Air Delivery Monitoring
- E. EQ Credit 8.1, Daylight and Views: Daylight 75% of Spaces



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## Knowledge Area 3

### Implement LEED Process

- Select appropriate LEED product for project scope.
- Register project for LEED certification on-line.
- Demonstrate knowledge of CIR process and resources.
- Manage LEED documentation/certification process and complete letter templates.
- Draft and review innovation credits.

## Sample Question - Knowledge Area 3

A project involves the renovation of an existing commercial office building, which includes 4 of 10 stories and the core and shell. Project scope includes window replacement, HVAC equipment replacement, plumbing replacement and tenant fit-out of the owner occupied space.

Which rating system product(s) should be used for this project?

- A. LEED-NC
- B. LEED-EB and LEED-CI
- C. LEED-CI and LEED-CS
- D. LEED-CS and LEED-EB



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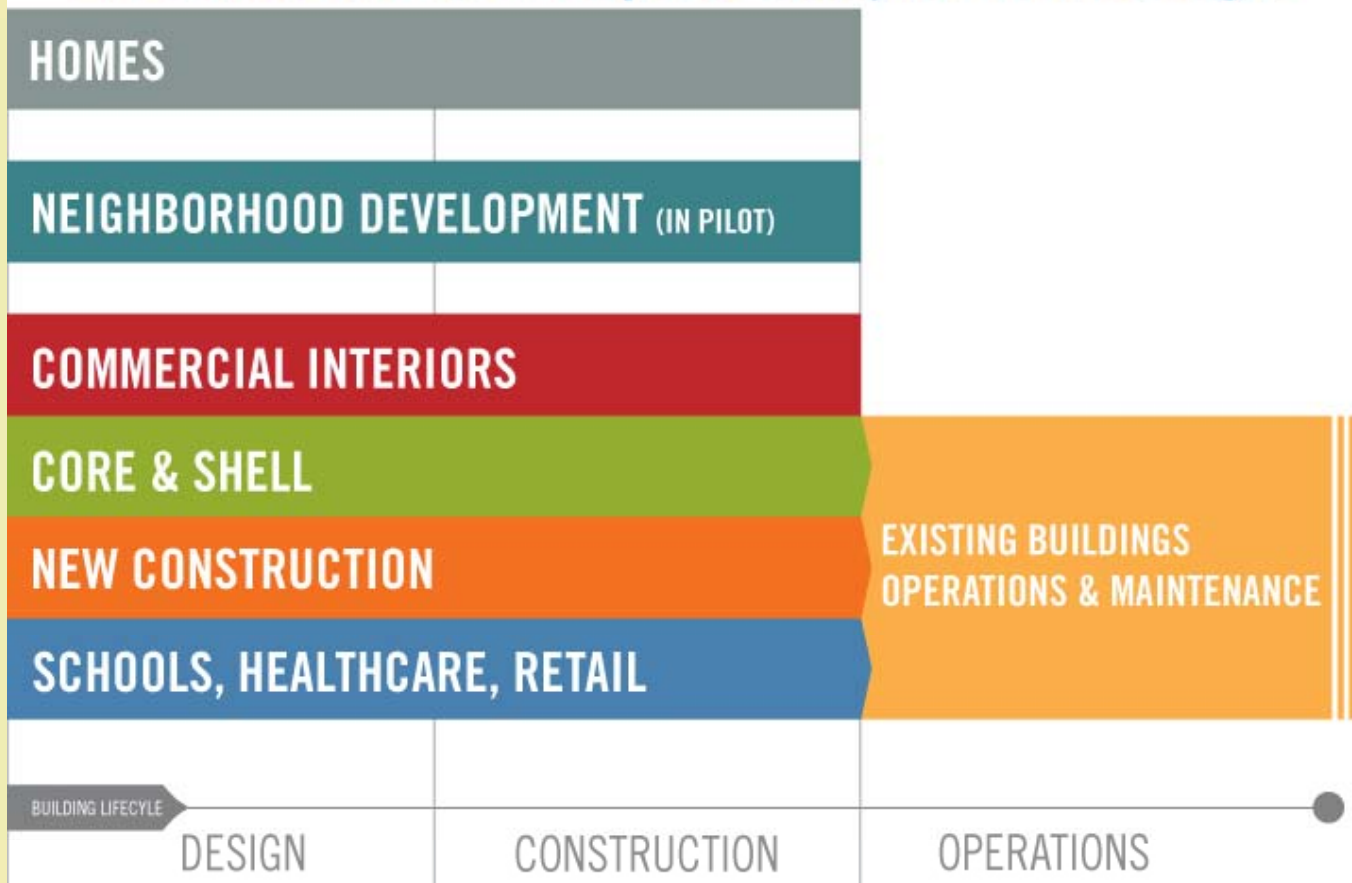
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- C. LEED-CI and LEED-CS**
- D. LEED-CS and LEED-EB



# LEED Rating Systems

**LEED address the complete lifecycle of buildings:**



## Knowledge Area 4

### **Verify, participate in, and perform technical analyses required for LEED credits.**

- Verify compliance of technical work products created by other team members.
- Participate in and guide the development of technical analyses with design professionals.
- Perform technical analyses to verify compliance with LEED requirements.



## Sample Question - Knowledge Area 4

Which three should be included in the specifications to inform the contractors and subcontractors of the requirements for MR Credit 2, Construction Waste Management? (Choose three.)

- A. quantity of waste leaving site
- B. description of waste material
- C. approximate amount of recycled material
- D. requirement to identify haulers and recyclers
- E. description of the requirements for a site logistics plan

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E. description of the requirements for a site logistics plan

## LEED Exam - Study Tips

1. SLUG LEED AP Exam Resources Handout
2. Use the Reference Guide & Rating System
3. For Each Credit know:
  - The intent
  - The Requirements
  - Possible strategies for meeting requirements
  - Documentation Requirements and Who is Responsible
  - Reference Standard
  - Calculation Approach and what you need to know to do the calculation.

# LEED Credit Format & Structure

SS	WE	EA	MR	EQ	ID
Prerequisite 1					
Required					

### Construction Activity Pollution Prevention

**Intent**  
Reduce pollution from construction activities by controlling soil erosion, waterway sedimentation and airborne dust generation.

**Requirements**  
Create and implement an Erosion and Sedimentation Control (ESC) Plan for all construction activities associated with the project. The ESC Plan shall conform to the erosion and sedimentation requirements of the 2003 EPA Construction General Permit OR local erosion and sedimentation control standards and codes, whichever is more stringent. The Plan shall describe the measures implemented to accomplish the following objectives:

- Prevent loss of soil during construction by stormwater runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.
- Prevent sedimentation of storm sewer or receiving streams.
- Prevent polluting the air with dust and particulate matter.

The Construction General Permit (CGP) outlines the provisions necessary to comply with Phase I and Phase II of the National Pollutant Discharge Elimination System (NPDES) program. While the CGP only applies to construction sites greater than 1 acre, the requirements are applied to all projects for the purposes of this prerequisite. Information on the EPA CGP is available at: <http://cfpub.epa.gov/npdes/stormwater/cgp.cfm>.

**Potential Technologies & Strategies**  
Create an Erosion and Sedimentation Control Plan during the design phase of the project. Consider employing strategies such as temporary and permanent seeding, mulching, earth dikes, silt fencing, sediment traps and sediment basins.



# LEED-EB Letter Template



**LEED for Existing Buildings: Operations & Maintenance  
Certification Submittal Template  
EQ Prerequisite 3: Green Cleaning Policy**

(Responsible Individual)

(Company Name)

I, , from

declare that I am the project building Owner.\*\* Furthermore, I oversee and am responsible for the operational elements addressed in the requirements of this prerequisite, I declare that the information provided below is accurate, and that to the best of my knowledge, the project meets the requirements of the prerequisite.

### Prerequisite Compliance

The performance period for this prerequisite began on  and lasted through

*NOTE: the performance period must be between 3 months and 2 years*

- A green cleaning policy or contractual agreement for the building and site was in effect for the project building over the performance period. The policy/contract addresses the requirements for EQ Prerequisite 3.
- The project team has provided a copy of the compliant Green Cleaning policy/contract that covers the project building and includes relevant requirements relating to each of the following *[required upload]*:
  - Purchase of sustainable cleaning and hard floor and carpet care products meeting the sustainability criteria outlined in EQ Credits 3.4 -3.6.
  - Purchase of cleaning equipment meeting the sustainability criteria outlined in EQ Credit 3.7.
  - Establishment of standard operating procedures (SOPs) addressing how an effective cleaning and hard floor and carpet maintenance system will be consistently utilized, managed and audited. Specifically address cleaning to protect vulnerable building occupants.
  - Development of strategies for promoting and improving hand hygiene, including both hand washing and the use of alcohol-based waterless hand sanitizers.



## LEED Vocabulary

- Prerequisite
- Credit/Point
- Intent
- Requirement
- Reference Standard
- Registered
- Certified
- Accredited

## LEED Exam - Study Tips

3. Know the Structure of the LEED Rating System
4. Know the basics of the LEED Certification Process, including:
  - Registration Process
  - Certification Process
  - CIR Process
5. Glossary & Definitions

## LEED Exam - Study Tips

6. Use Study Aids
  - Flashcards
  - Practice Questions
7. Form a Study Group
8. Get Real-Life Experience using LEED Rating System or Simulate it as much as possible

## LEED-NC Categories/Credits

- Prerequisites – 7 prerequisites/No points
  - Sustainable Sites – 8 credits/14 points
  - Water Efficiency – 3 credits/5 point
  - Energy & Atmosphere – 6 credits/17 points
  - Materials & Resources – 7 credits/13 points
  - Indoor Environmental Quality – 8 credits/15 points
  - Innovation in Design – 2 credits/5 points
- TOTAL - 34 Credits/69 points**



## LEED-NC Award Levels

- LEED Certified: 26 – 32 Points
- LEED Silver: 33 – 38 Points
- LEED Gold: 39 – 51 Points
- LEED Platinum: 52+ Points

## Step Four: Certification

- Design and Construction Technical Review(s)

Certification Fees	Less than 50,000 Square Feet	50,000 - 500,000 Square Feet	More than 500,000 Square Feet
<b>LEED-NC, LEED-CI, &amp; LEED-CS</b>	Fixed Rate	Based on Sq. Ft.	Fixed Rate
<b>Design Review</b>			
Members	\$1,250.00	\$0.025/Square Ft.	\$12,500.00
Non-Members	\$1,500.00	\$0.03/Square Ft.	\$15,000.00
<b>Construction Review</b>			
Members	\$500.00	\$0.01/Square Ft.	\$5,000.00
Non-Members	\$750.00	\$0.015/Square Ft.	\$7,500.00
<b>LEED-NC, LEED-CI, &amp; LEED-CS</b>	Fixed Rate	Based on Sq. Ft.	Fixed Rate
<b>Combined Design &amp; Construction Review</b>			
Members	\$1,750.00	\$0.035/Square Ft.	\$17,500.00
Non-Members	\$2,250.00	\$0.045/Square Ft.	\$22,500.00
<b>LEED-EB</b>	Fixed Rate	Based on Sq. Ft.	Fixed Rate
<b>Initial Certification Review</b>			
Members	\$1,250.00	\$0.025/Square Ft.	\$12,500.00
Non-Members	\$1,500.00	\$0.030/Square Ft.	\$15,000.00



## LEED Exam Resources

- Site User Profile on USGBC web-site.
  - Free basic access
  - Additional access if member company, workshop attendee, or member of a LEED registered project
- LEED Reference Manual - \$\$
- LEED Letter Templates
  - Samples at <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1447>
- Info on a couple of projects to practice applying LEED
- LEED Study Sessions



## LEED Exam Resources

- Case Studies/Practice Projects
  - Your own projects
  - LEED Certified Projects List at <http://www.usgbc.org/LEED/Project/CertifiedProjectList.aspx?CMSPageID=244>
  - Cascadia Green Building Council Case Studies at [http://chapters.usgbc.org/cascadiagbc/Case\\_Studies.html](http://chapters.usgbc.org/cascadiagbc/Case_Studies.html)



## LEED Exam Resources

### Cascadia Green Building Council Flash Cards

- Available at:  
[www.cascadiagbc.org](http://www.cascadiagbc.org)



## ID Credit 2: LEED Accredited Professional

- Intent
  - To support and encourage the design integration required by a LEED Green Building project and to streamline the application and certification process.



# LEED AP TEST

# FLASHCARDS



**Name two of the three purposes  
of the construction activity  
pollution prevention  
prerequisite.**

**Prevent loss of soil during construction by storm water and/or wind erosion, including protecting topsoil by stockpiling for reuse.**

**Prevent sedimentation of storm sewer or receiving streams**

**Prevent air pollution with dust and particulate matter.**

**To achieve Alternative Transportation Sustainable Sites Credit 4.1, the project must be situated within \_\_\_\_ mile(s) of two or more public or campus bus lines or within \_\_\_\_ mile(s) of a commuter rail, light rail or subway station.**

To achieve Alternative Transportation Sustainable Sites Credit 4.1, the project must be situated within **1/4** mile(s) of two or more public or campus bus lines or within **1/2** mile(s) of a commuter rail, light rail or subway station.

**How many prerequisites are in the Sustainable Sites and Water Efficiency categories combined?**

**Bonus: Name them!**

**There's only One!**

**SS P1 – Construction Activity and Pollution  
Prevention**

**Water Efficient Credit 3 provides  
2 points for achieving potable  
water use reduction of at  
least\_\_\_\_\_.**

**Water Efficiency Credit 3 provides 2 points for achieving potable water use reduction of at least 30%.**

**Name a strategy for achieving both points available for Water Efficiency Credit 1 - Water Efficient Landscaping.**

**Supply 100% of your irrigation needs from captured rain or recycled site water.**

**Do not install a permanent irrigation system.**

**Name the LEED® credit linked to  
this reference standard:**

**ASTM E1980-01**

## SS 7.2 - Reduce Heat Island Effect (Roof)

**Name the 6 categories in the  
LEED Green Building Rating  
System.**

**Sustainable Sites**  
**Water Efficiency**  
**Energy & Atmosphere**  
**Materials & Resources**  
**Indoor Environmental Quality**  
**Innovation and Design Process**



**In order to earn two points under MR Credit 2 - Construction Waste Management, what % of the total amount of waste needs to be diverted from the landfill?**

**Bonus: What kinds of waste products are to be excluded in the calculation for this credit?**

**Bonus: Is the calculation done by weight or volume?**



**75%**

**Bonus:**

**Hazardous Materials, Excavated Soil,  
and Land Clearing Debris**

**Either Weight or Volume**

**What is the difference between post-consumer and pre-consumer recycled content?**

**Bonus:**

**Which does USGBC favor and why?**

**Post-Consumer = was used in consumer market place**

**Pre-Consumer = waste product or by-product of manufacturing process which is traded or sold to be used in another manufacturing process**

**Bonus :  
Post-Consumer**



**Name the five items that at minimum need to be addressed in MR Prerequisite 1, Storage and Collection of Recyclables.**

**Paper**  
**Corrugated Cardboard**  
**Glass**  
**Plastic**  
**Metal**

**What else is suggested?**

**What does CIR stand for?**

**How many CIR's are included with project registration?**

**What is the fee for each additional CIR?**

# Credit Interpretation Request/Ruling

0

\$220 each

**Name the LEED® credit(s) that most appropriately matches the green building strategy:**

**Hire an independent commissioning agent.**

# EA Credit 3 – Enhanced Commissioning

**Bonus:**

**What are the key differences between  
EA P1 and EA 3**

**Name the LEED® credit(s) that most appropriately matches the green building strategy:**

**Use modulating photoelectric daylight sensors.**

# EA Credit 1 – Optimize Energy Performance

# What is the reference standard for MR Credit 7 - Certified Wood?

# Forest Stewardship Council (FSC) Principles and Criteria



**Name the LEED® credit(s) that most appropriately matches the green building strategy:**

**Keep materials dry during construction.**

# EQ 3.1 - Construction IAQ Management

**Name the Project Team  
Member(s) most commonly  
responsible for the following  
LEED Credits:**

**EQ 4 - Low Emitting Materials**

# Architect and GC

**Name the Project Team  
Member(s) most commonly  
responsible for the following  
LEED Credits:**

**Site 1 - Site Selection**

# Owner

**Indicate if the following is valid  
for innovation credit:**

**35% water use reduction**

No

**Indicate if the following is valid  
for innovation credit:**

**Three LEED APs on the Project  
Team**

No

**Indicate if the following is valid  
for innovation credit:**

**Green Housekeeping Program**

Yes

**Indicate if the following is valid  
for innovation credit:**

**Installing a super efficient HVAC  
system that utilizes nighttime air  
flushing, geothermal wells and  
carbon dioxide monitors.**

No