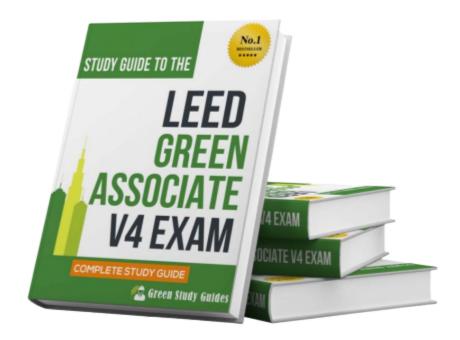


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- 1. A 2,500 SF (233 m2) store pursuing LEED ID+C: Retail is located near a bicycle network. All of the following design decisions would contribute to earning LT Credit Bicycle Network EXCEPT:
- A. 2 short-term bicycle storage spaces located within 100 feet of the employee entrance
- B. 2 long-term bicycle storage spaces located within 100 feet of the main entrance
- C. Bicycle route map posted on the front window for employees and customers
- D. On-site supplies for bicycle repair

**Answer:** A. 2 short-term bicycle storage spaces located within 100 feet (30 meters) of the employee entrance. Short term storage must be located near any main entrance. An employee entrance would not be accessible to customers and is thus not a main entrance.

2. A 6-story office space will be located in an arid region. Installing occupancy sensors would not

impact which credit?

- A. EQ Prerequisite Minimum IAQ Performance
- B. EA Credit Optimize Energy Performance
- C. EQ Credit Enhanced IAQ Strategies
- D. EQ Credit Thermal Comfort

**Answer:** C. EQ Credit Enhanced IAQ Strategies. Occupancy sensors are not part of monitoring outdoor air delivery.

3. A 10,000 SF tenant space is located in a 150,000 SF high-rise building. The project building

includes underground parking and an attached parking deck. The tenant shares the parking with

other building tenants. What would the certification fees be based on?

A. Project gross floor area, excluding parking

ID+C project fees exclude parking areas.

- B. Building gross floor area, excluding parking
- C. Project gross floor area, including parking
- D. Building gross floor area, including parking

Answer: A. Project gross floor area, excluding parking ID+C project fees exclude parking areas.

4. A 10-story office building will have many tenant spaces. A building owner and engineer are reviewing potential building automation systems for advanced energy metering to allow the owner to educate tenants about the energy use their tenant space is using. The team has found a system that uses a wireless network, will store all meter data for at least 36 months, and can be remotely accessible. What else will need to be included for EA Credit Advanced Energy Metering?

- A. Each floor of the building must be submetered separately
- B. Energy meters must record data hourly, daily, monthly, and annually
- C. Each tenant space must be submetered
- D. Each tenant must reduce their energy use by at least 10% for any individual energy end use

Answer: B. Energy meters must record data hourly, daily, monthly, and annually

- The meters must record data at these frequencies at least.
- The meters must also be permanent and record consumption and demand.
- The data must have remote access.
- Data collection must be networked (wireless, wired, cellular).
- Data collection must be stored for at least 36 months.
- 5. A 50,000 SF (4,645 m2) retail project has a baseline parking capacity of 4 parking spaces /

1,000 SF (4.3/100 m2) from the ITE handbook. The project will earn 1 point under LT Credit Surrounding Density and Diverse Uses and 1 point under LT Credit Access to Quality Transit. Which is the maximum number of parking spaces the project can have and still earn LT Credit Reduced Parking Footprint? A. 200 spaces B. 80 spaces C. 40 spaces D. 120 spaces E. 160 spaces Answer: D. 120 spaces - A 20% reduction is required for projects that DO NOT earn points under LT Credit Surrounding Density AND Diverse Uses and LT Credit Access to Quality Transit. - A 40% reduction is required for projects that DO earn points under LT Credit Surrounding Density OR Diverse Uses and LT Credit Access to Quality Transit. 50,000 SF / 1,000 SF = 50 X 4 spaces = 200 space baseline 200 spaces X 40% = 80 space REDUCTION = 120 6. A 50,000 SF (4,645 m2) retail project has a baseline parking capacity of 4 parking spaces / 1,000 SF (4.3/100 m2) from the ITE handbook. The project will earn 1 point under LT Credit Surrounding Density and Diverse Uses but not earn LT Credit Access to Quality Transit. The project includes off-street parking. How many preferred parking spaces for carpools must the project includes for LT Credit Reduced Parking Footprint? A. 3 spaces B. 5 spaces

C. 6 spaces
D. 4 spaces
Answer: C. 6 spaces
50,000 SF / 1,000 SF = 50 X 4 parking spaces = 200 space baseline
200 space baseline from the ITE handbook X 60% (40% reduction)
= 120 total spaces
120 spaces X 0.5% preferred parking = 6 spaces
7. Achieving the greatest effectiveness in cost and environmental performance requires that every issue and every team member be brought into the project at which of the following points?
A. Design and construction
B. Preliminary LEED review
C. Occupancy, operations, and performance feedback
D. Discovery
<b>Answer:</b> D. Discovery. During the Discovery phase is when everyone needs to gather their ideas and consider synergies across LEED credits.
8. Achieving the greatest effectiveness in cost and environmental performance requires that every issue and every team member be brought into the project at which of the following points?
A. Preliminary LEED review
B. Discovery
C. Occupancy, operations, and performance feedback
D. Design and construction
<b>Answer:</b> B. Discovery. During the Discovery phase is when everyone needs to gather their ideas and consider synergies across LEED credits.

- 9. After an office space was completed in June, a project team took daylight measurements in all regularly occupied spaces. Which action must occur for the project to earn EQ Credit Daylight?
- A. The team must submit a list of compliant spaces with their annual summary values for SDA and ASE.
- B. A daylight modeler must be hired to confirm the results of the measurements.
- C. A narrative must be written listing the compliant spaces with their calculated illuminance values.
- D. A second set of measurements must be taken in October to determine compliant floor areas.
- Answer: D. A second set of measurements must be taken in October to determine compliant floor areas.
- 10. After project registration you find a credit the project is attempting is listed as applicable under the 'Applicable credits' section of the Interpretations database. What must the project team do?
- A. Review the Addenda database
- B. Submit a Project CIR
- C. Resubmit the credit
- D. Review the interpretation and apply it if it makes sense to do so

**Answer:** D. Review the interpretation and apply it if it makes sense to do so.

If a credit that a project is attempting is listed as applicable under the 'Applicable credits' section of the interpretation, the team must review the interpretation and apply it if it makes sense to do so. LEED project teams can choose to reference LEED Interpretations that do not list their credit as applicable if the project team believes it is appropriate. A final determination will be made during the certification review.

- 11. After the owner documents their owner's project requirements (OPR), the project team will take that document to create the basis of design (BOD). What would be contained in the BOD?
- A. Energy efficiency goals, number of occupants, building schedule
- B. Systems and assemblies, governing codes and standards, performance criteria and assumptions
- C. Functional testing, training requirements, issue resolution process
- D. Operating mode tests, sustainability goals, occupant functions

Answer: B. Systems and assemblies, governing codes and standards, performance criteria and assumptions 12. All EXCEPT which documentation can be used to report the material ingredients of a product to at least 0.1% (1000 ppm)? A. Health product declarations (HPD) B. Type III EPD C. Manufacturer inventory D. Cradle-to-Cradle analysis Answer: B. Type III EPD. EPDs are not for material ingredient reporting. 13. The architect and other project designers are reviewing material choices for a new office space. Which reused materials will NOT contribute to optimization of MR Credit Building Product Disclosure and Optimization - Sourcing of Raw Materials? A. Furniture that has been leased for 1-year B. Cabinets C. Beams D. Decorative items Answer: A. Furniture that has been leased for 1-year in the case of an owner moving to a new site furniture that is leased must have been in service for 2-years to count in the current project. 14. As an alternative refrigerant to HCFC a project team is considering HFC-410A. What is the trade-off to when using HFC-410A in the HVAC&R system? A. It has a higher GWP than HCFC B. It has a high flammability C. It has a lower refrigerant charge D. May require more energy to achieve the same level of cooling as HCFC

**Answer:** D. May require more energy to achieve the same level of cooling as HCFC. It has a lower GWP but require more energy to achieve the same level of cooling.

- 15. At a minimum what must be analyzed for IP Credit Integrative Process for ID+C projects?
- A. Energy-related and water-related systems only
- B. Energy-related systems only
- C. Site selection and energy-related systems only
- D. Site selection, energy-related systems, and water-related systems

**Answer:** C. Site selection and energy-related systems only Site and energy are required and can earn one point, water earns one additional point.

- 16. At a minimum what must be analyzed for IP Credit Integrative Process for ID+C projects?
- A. Site selection, energy-related systems, and water-related systems
- B. Site selection and energy-related systems only
- C. Energy-related systems only
- D. Energy-related and water-related systems only

**Answer:** B. Site selection and energy-related systems only. Site and energy are required and can earn one point, water earns one additional point.

- 17. At which point during a project schedule is the Basis of Design created?
- A. During pre-design phase
- B. At the Cx kickoff meeting
- C. The same time the Cx report is created
- D. During the schematic-design phase

Answer: D. During the schematic-design phase

18. At which point in a project's schedule must the commissioning authority be engaged?
A. By the end of the design-development phase
B. By the end of the schematic-design phase
C. During the pre-design phase
D. Prior to completion of the Basis of Design (BOD)
Answer: A. By the end of the design-development phase
The prerequisite requires engagement by the end of the design development phase.
19. Before construction documents are written for an office project, the project team makes some design modifications as a result of value engineering. Who will be responsible for updating the Owner's Project Requirements?
A. The owner(s)
B. The design team
C. The architect(s)
D. The CxA
<b>Answer:</b> A. The owner(s). The owner is responsible for updating the OPR throughout the project if changes are made. The design team is responsible for the BOD. The CxA is responsible for the Cx plan.
20. A building contractor with limited space on the project site has one construction and wastemanagement bin that commingles concrete, wood, and drywall, as well as a separate bin for land-clearing debris. A waste hauler
takes the dumpsters and separates the concrete, wood, and drywall off site for recycling. Given this information, which statement is true?
A. The concrete, wood, and drywall are considered one waste stream, and
the land-clearing debris is not counted as one waste stream.
B. The concrete, wood, and drywall are counted as three waste streams, and

the land clearing debris is counted as one waste stream. C. The materials are counted as two waste streams. D. None of the materials are counted as a waste stream. Answer: A. The concrete, wood, and drywall are considered one waste stream, and the land-clearing debris is not counted as one waste stream. ADC and land-clearing debris are not counted as waste streams. For LEED, a waste stream should constitute at least 5% by weight or volume of the project's totaled diverted waste. The waste stream can be a material category that is diverted or a mixture of several material categories that are diverted. The commingled materials count as one stream even though the hauler separates them out later off site. 21. A building has an existing brick enclosure and steel structure with no drywall or interior finish. How many layers would the project team count in reuse calculations? A. 2 B. 3 C. 1 D. O Answer: A. 2 The brick and steel surfaces would count. Up to 3 layers can be counted. For example, if a wall has brick, steel framing, and drywall, the surface area of all 3 layers can be counted. 22.A building owner inquiries about how many LEED Pilot credits the project team can pursue. Which response is correct? A. The project team can pursue up to five Pilot credits and can earn up to three Innovation credits. B. The project team can pursue only as many Pilot credits as there are Innovation credits. C. The project team can pursue an unlimited number of Pilot credits; however, the number of points awarded will be limited by the number of Innovation credits.

D. The project team can pursue an unlimited number of Pilot credits and earn points for every Pilot credit achieved.

**Answer:** C. The project team can pursue an unlimited number of Pilot credits; however, the number of points awarded will be limited by the number of Innovation credits. LEED project teams may pursue an unlimited number of pilot credits; however, the number of points awarded is limited by the number of Innovation credits available (up to 5 for LEED 2009 projects).

23. A chair has the following components, weight percentages, and sustainability criteria:

Cotton fabric 5% certified by Rainforest Alliance

Plastic seat 30% none

Steel frame 65% 40% pre-consumer recycled content

The chair cost \$100. What is the total product value as it applies to Building Product Disclosure and Optimization credit?

A. \$70

B. \$0

C. \$31

D. \$26

**Answer:** C. \$31

The product value is based on the weight of the components that meet the sustainability criteria as a percent of the total product weight.

Total product cost (\$) X % product component by weight X (%) meeting sustainable criteria

\$100 X 5% X 100% = \$5

\$100 X 30% X 0% = \$0

\$100 X 65% X 40% = \$26

= \$31

24. The classification of a sink in a project is unclear. Which action should the LEED AP take when performing the indoor water-use calculations? A. Exclude the sink from the calculations B. Choose the greater of the public or private baselines C. Classify the sink as public D. Classify the sink as private Answer: C. Classify the sink as public If the classification for public or private use is unclear, default to public use flow rates when performing the calculations. 25. Commercial kitchen dishwashers must meet what requirement in a hospitality project to earn additional points for WE Credit Indoor Water Use Reduction? A. Less than or equal to 1.6 gallons per rack (6.0 liters per rack) B. Less than or equal to 8 gallons water use per hour (7.5 liters per hour) C. Maximum 2 gpm (7.6 lpm) water use D. ENERGY STAR or performance equivalent Answer: D. ENERGY STAR or performance equivalent Note the prerequisite and credit have different requirements for dishwashers. For the credit ENERGY STAR ratings are required to earn points. For the prerequisite maximum rates exist. 26. The commissioning authority, with the help of the design team and contractors, is writing functional test scripts for a new school building. Which order will the test scripts typically follow? A. The performance criteria in the Owner's Project Requirements (OPR)

B. The sequence of operations developed by the engineers

C. The design-development guidelines in the Basis of Design (BOD)

D. The startup, programming, and testing done by the contractor

**Answer:** B. The sequence of operations developed by the engineers Test scripts typically follow the sequence of operations created by the engineers.

- 27. A construction waste-management plan must establish diversion goals, target at least how many materials to be diverted, and explain diversion plans for those materials?
- A. Five materials (both structural and nonstructural)
- B. Three materials (structural or nonstructural)
- C. Four materials (nonstructural only)
- D. Five materials (nonstructural only)

Answer: A. Five materials (both structural and nonstructural)

Five (5) material streams (both structural and nonstructural) must be diverted.

- 28. A contractor is planning for an occupied flush-out to reduce IAQ problems from the construction of an office. The contractor introduces 3,500 cubic feet of outdoor air per square foot of floor area 3 hours prior to the first occupants arriving. What will need to be done next to achieve EQ Credit Construction IAQ Assessment?
- A. Conduct a baseline IAQ test
- B. Continue the flushout until a total of 14,000 cubic feet per square foot of outside air has been delivered to the space
- C. Flush out the space with 3,500 cubic feet of outside air per square foot of floor area each day for a period of 7 days
- D. Nothing, the flush-out is complete

Answer: B. Continue the flushout until a total of 14,000 cubic feet per square foot of outside air has been delivered to the space. For an occupied flush-out 3,500 cu. ft. air / sq. ft. must be used prior to occupancy. Ventilation must begin at least 3 hours prior to occupancy until a total of 14,000 cu. ft. air / sq. ft. of air has been introduced. Option 1 Path 2 still requires a total volume of air of 14,000 cu. ft. / SF to earn the credit, after the initial 3,500 has been introduced.

29. A CxA has been selected who is a subcontractor of the general contractor with construction responsibilities. What tasks do not need to be performed for fundamental commissioning?

A. Develop and incorporate commissioning requirements into the construction documents

B. Envelope commissioning
C. Complete a summary commissioning report
D. Review the basis of design
Answer: B. Envelope commissioning
Envelope commissioning is part of Enhanced Commissioning, not Fundamental Commissioning.
30. A CxA is developing an ongoing Cx plan as part of a ten-month review. Which information must be included in the ongoing Cx plan? (pick 3)
A. Blank functional performance tests
B. Trends in building operations
C. Direction on how to test any retrofitted equipment
D. Seasonal testing results
(Seasonal testing is part of the commissioning process)
E. A schedule for recommissioning as-built systems
F. Interviews with occupants
(This is part of the ten-month review)
Answer: A. Blank functional performance tests
C. Direction on how to test any retrofitted equipment
E. A schedule for recommissioning as-built systems
31. The CxA is working with the building owner to outline the requirements of a systems manual for EA Credit Enhanced Commissioning. What should the systems manual include?
A. As-built drawings, equipment operations and maintenance manuals, final commissioning report

B. Equipment preventative maintenance schedules, minimum outside air requirements, construction checklists
C. Recommended schedule for recommissioning, basis of design, issues log
D. As-built sequence of operations, defined roles and responsibilities, blank testing materials
<b>Answer:</b> A. As-built drawings, equipment operations and maintenance manuals, final commissioning report. See Step-by-step guidance for the complete list of what goes into a systems manual.
32. The CxA is working with the building owner to outline the requirements of a systems manual for EA Credit Enhanced Commissioning. What should the systems manual include?
A. Recommended schedule for recommissioning, basis of design, issues log
B. Equipment preventative maintenance schedules, minimum outside air requirements, construction checklists
C. As-built sequence of operations, defined roles and responsibilities, blank testing materials
D. As-built drawings, equipment operations and maintenance manuals, final commissioning report
Answer: C. As-built sequence of operations, defined roles and responsibilities, blank testing materials.
33. The design team in a charrette is discussing an office project that will be located in a hot southern climate. What building attributes best address occupant comfort, reduced cooling loads, and lighting? (pick 2)
A. Light shelves
B. Building fenestration
C. Photovoltaic membranes
D. Glazing
Answer:
B. Building fenestration
D. Glazing

Building fenestration impacts occupant comfort by the quantity of heat let in from these openings. Glazing affects the heat let into the building (occupant

comfort and cooling load) and lighting. Light shelves will help but the building fenestration will make a greater impact and is therefore a better choice.

- 34. A design team is working on water use reduction strategies for a new LEED ID+C: Hospitality project. What could the project team include to help reduce appliance and process water use for WE Prerequisite Indoor Water Use Reduction?
- A. Garbage disposals
- B. Undercounter 1.6 gallon/rack (6.0 liters/rack) dishwasher
- C. Use of municipal supplied recycled water to offset potable water use
- D. ENERGY STAR refrigerator

**Answer:** B. Undercounter 1.6 gallon/rack (6.0 liters/rack) dishwasher. Retail and Hospitality projects have additional requirements for water-consuming appliances, equipment, and processes. Dishwashers, food steamers, and combo ovens must meet the standards for appliances.

- 35. A developer for an office project in an urban area is reviewing potential sites that would reduce vehicle distance traveled. Which site would help with this goal and with achieving LT Credit Bicycle Facilities?
- A. A site within 3 miles bicycling distance to 10 diverse uses on a bicycle network
- B. A site adjacent to an existing 10-mile mountain biking trail
- C. A site adjacent to an existing bicycle network that connects to a jobs center 8-miles away
- D. A site within a 1/4-mile walking distance of a bicycle network that connects to a light rail station within a 1-mile bicycling distance.

Answer: A. A site within 3 miles (4800-meters) bicycling distance to 10 diverse uses on a bicycle network

- 36. A developer for an office project in an urban area is reviewing potential sites that would reduce vehicle distance traveled. Which site would help with this goal and with achieving LT Credit Bicycle Facilities?
- A. A site within a 1/4-mile walking distance of a bicycle network that connects to a light rail station within a 1-mile bicycling distance.

- B. A site adjacent to an existing bicycle network that connects to a jobs center 8-miles away
- C. A site within 3 miles bicycling distance to 10 diverse uses on a bicycle network
- D. A site adjacent to an existing 10-mile mountain biking trail

Answer: C. A site within 3 miles bicycling distance to 10 diverse uses on a bicycle network

Design or locate the project such that a functional entry and/or bicycle storage is within a 200-yard walking distance or bicycling distance from a bicycle network that connects to at least one of the following:

- at least 10 diverse uses
- a school or employment center, if the project total floor area is 50% or more residential or
- a bus rapid transit stop, light or heavy rail station, commuter rail station, or ferry terminal.
- \*All destinations must be within a 3-mile (4800-meter) bicycling distance of the project boundary.
- 37. A developer is considering retail space located in an area with the following uses:

Services Category: 2 restaurants, 1 bank, 1 laundromat Community-Serving Retail Category: 1 pharmacy

Given this information, which statement is true about the project's ability to earn LT Credit Surrounding Density and Diverse Uses?

- A. The project would earn the credit.
- B. The project would earn the credit if another use in any category was within walking distance.
- C. The project would not earn the credit because the supermarket cannot count as a service.
- D. The project could earn the credit if another use in a different category was within walking distance.

**Answer:** D. The project could earn the credit if another use in a different category was within walking distance.

Here are the important points to remember about uses:

- A minimum of 4 uses

- A use type only counts once
- Uses must come from at least 3 of the 5 categories, exclusive of the building's primary use
- No more than two uses of each type
- Uses that are planned count if they are available within one year of LEED occupancy.
- 38. During the construction phase a contractor has painted a wall with high VOC paint. What is the process to use to correct the error or submit information to qualify for EQ Credit Low-Emitting Materials?
- A. Paint over the high VOC paint with an approved low VOC paint
- B. Include the volume of high VOC paint in both the baseline and design case VOC calculations
- C. Subtract the high VOC paint from any calculations
- D. Subtract the high VOC paint from the design case calculations

Answer: B. Include the volume of high VOC paint in both the baseline and design case VOC calculations.

VOC budgets require a baseline and design case.

- 39. Each item would be developed for EA Prerequisite Fundamental Commissioning and Verification except which of the following?
- A. A simple box energy model
- B. Current facilities requirements
- C. An operations and maintenance plan
- D. A commissioning report

Answer: A. A simple box energy model. This is created as part of the Integrative Process credit.

In addition to these documents, the OPR and BOD are created for the prerequisite.

40. Early in a design process what does a project team need to ensure that the tenant space complies with for EA Prerequisite Minimum Energy Performance? (pick 3)

- A. Reduced lighting power density
- B. HVAC efficiency
- C. ASHRAE 90.1-2010 compliance
- D. Glazing systems
- E. ENERGY STAR products

Answer: A. Reduced lighting power density

- C. ASHRAE 90.1-2010 compliance
- E. ENERGY STAR products

The correct choices are the minimum required for certification. The other choices are optional for the credit

.

