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LEED-AP-Homes

LEED AP Homes (Residential) Exam

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Question: 1

For a site in a town with a population of 10,000 to qualify under Location and Transportation Credit, Site Selection, Option 2: Infill Development, what portion of the site's perimeter must border previously disturbed land?

A. 25%
B. 50%
C. 75%
D. 100%

Answer: C

Explanation:
The LEED for Homes Rating System (v4) outlines the requirements for the Location and Transportation (LT) Credit: Site Selection, which includes Option 2: Infill Development. This credit encourages development on sites that minimize environmental impact by utilizing previously disturbed or developed land. For a site to qualify as infill development, a specific portion of its perimeter must border land that has been previously disturbed.
According to the LEED Reference Guide for Homes Design and Construction (v4), the requirement for Option 2: Infill Development is as follows:
Option 2. Infill Development (1 point)
Select a lot such that at least 75% of the perimeter of the project site immediately borders parcels that are previously developed or that have been graded or otherwise altered by direct human activities.
Source: LEED Reference Guide for Homes Design and Construction, v4, Location and Transportation Credit: Site Selection, p. 54.
This means that 75% of the site's perimeter must border previously disturbed land to meet the infill development criteria. The population of the town (10,000 in this case) does not directly affect the infill development requirement but may be relevant for other LT credits, such as Access to Quality Transit or Neighborhood Pattern and Design, which consider community size or density. However, for Site Selection, Option 2, the focus is solely on the perimeter bordering previously disturbed land.
The LEED v4.1 for Homes rating system aligns with this requirement, as it maintains the same infill development criteria for residential projects under the LT category:
LT Credit: Site Selection, Option 2. Infill Development
At least 75% of the project site's perimeter must border previously developed or disturbed parcels.
Source: LEED v4.1 Residential BD+C, Credit Library, accessed via USGBC LEED Online.
The LEED AP Homes Candidate Handbook confirms that the exam tests knowledge of the LEED v4 rating system, including the LT credits, and references the LEED Reference Guide for Homes Design and Construction as a primary study resource. The handbook does not alter the technical requirements but emphasizes understanding credit intent and compliance paths, such as the infill development perimeter rule.
Why not the other options?

A . 25%: This is too low and does not meet the minimum threshold for infill development, which requires significant adjacency to previously disturbed land to ensure compact, sustainable development.
B . 50%: While closer, 50% still falls short of the 75% requirement, which is designed to prioritize sites fully integrated into existing developed areas.
D . 100%: Requiring 100% of the perimeter to border previously disturbed land is overly restrictive and not specified in the LEED v4 or v4.1 requirements.
References:
LEED Reference Guide for Homes Design and Construction, v4, USGBC, Location and Transportation Credit: Site Selection, p. 54.
LEED v4.1 Residential BD+C, USGBC LEED Credit Library, accessed via LEED Online (https://www.usgbc.org/credits).
LEED AP Homes Candidate Handbook, GBCI, October 2024, p. 12 (references study resources and exam scope based on LEED v4).
USGBC LEED for Homes Rating System (v4), available via USGBC website (https://www.usgbc.org/resources/leed-homes-design-and-construction-v4).
LEED v4.1 for Homes, USGBC, accessed via LEED Online, confirming alignment with v4 infill requirements.

Question: 2

Envelope leakage is minimized by:

A. Installing a drainage plane.
B. Conducting a blower door test.
C. Installing a continuous air barrier.
D. Specifying HERS Grade II Insulation.

Answer: C

Explanation:
Minimizing envelope leakage is a critical component of improving energy efficiency in homes, as it reduces unintended air infiltration and exfiltration through the building envelope. This concept is addressed in the LEED for Homes Rating System (v4) under the Energy and Atmosphere (EA) category, specifically in credits related to Air Infiltration and Building Envelope Performance.
According to the LEED Reference Guide for Homes Design and Construction (v4), the primary method to minimize envelope leakage is to install a continuous air barrier:
EA Prerequisite: Minimum Energy Performance
To reduce air infiltration, projects must include a continuous air barrier system that is sealed at all penetrations, joints, and interfaces to prevent air leakage. The air barrier must be installed around the entire building envelope, including walls, roofs, and floors.
Source: LEED Reference Guide for Homes Design and Construction, v4, Energy and Atmosphere Prerequisite: Minimum Energy Performance, p. 112.
Additionally, the LEED v4.1 Residential BD+C rating system reinforces this requirement:
EA Credit: Air Infiltration
Install a continuous air barrier system to control air leakage through the building envelope. The air barrier must be airtight, durable, and continuous, with all seams, penetrations, and transitions sealed.

Source: LEED v4.1 Residential BD+C, Credit Library, accessed via USGBC LEED Online.
A continuous air barrier is a system of materials (e.g., house wraps, sealed drywall, or spray foam) that forms a complete barrier to air movement, significantly reducing energy losses due to leakage. This is a proactive design and construction strategy to achieve energy efficiency goals.
Why not the other options?
A . Installing a drainage plane: A drainage plane (e.g., house wrap or rainscreen) is designed to manage water infiltration and protect the building from moisture damage, not to control air leakage. While it may contribute to overall building durability, it does not address envelope air tightness.
Reference: LEED Reference Guide for Homes Design and Construction, v4, Sustainable Sites Credit: Rainwater Management, p. 76, which discusses drainage planes in the context of moisture control.
B . Conducting a blower door test: A blower door test is a diagnostic tool used to measure air leakage in a building, not to minimize it. It quantifies the air tightness of the envelope (in air changes per hour, ACH) but does not physically reduce leakage. It is required for verification in LEED v4 (EA Credit: Air Infiltration) but is not a solution for minimizing leakage.
Reference: LEED Reference Guide for Homes Design and Construction, v4, EA Credit: Air Infiltration, p. 124.
D . Specifying HERS Grade II Insulation: HERS (Home Energy Rating System) insulation grades refer to the quality of insulation installation, with Grade II indicating moderate defects. While proper insulation reduces conductive heat loss, it does not directly address air leakage, which is managed by the air barrier system.
Reference: LEED Reference Guide for Homes Design and Construction, v4, EA Credit: Insulation, p. 120, which discusses HERS insulation grades but not air leakage.
The LEED AP Homes Candidate Handbook emphasizes the importance of understanding EA credits, including air infiltration, for the exam, referencing the LEED Reference Guide for Homes Design and Construction as a key study resource. The handbook confirms that the exam is based on LEED v4, ensuring the relevance of the continuous air barrier requirement.
References:
LEED Reference Guide for Homes Design and Construction, v4, USGBC, Energy and Atmosphere Prerequisite: Minimum Energy Performance, p. 112, and EA Credit: Air Infiltration, p. 124.
LEED v4.1 Residential BD+C, USGBC LEED Credit Library, accessed via LEED Online (https://www.usgbc.org/credits).
LEED AP Homes Candidate Handbook, GBCI, October 2024, p. 12 (references study resources and exam scope based on LEED v4).
USGBC LEED for Homes Rating System (v4), available via USGBC website (https://www.usgbc.org/resources/leed-homes-design-and-construction-v4).
LEED v4.1 for Homes, USGBC, accessed via LEED Online, confirming air barrier requirements.

Question: 3

Energy losses due to supply duct leakage are most likely to occur when:

A. Interior wall cavities are used to conduct return air.
B. Duct layout includes multiple 90-degree bends on a single branch.
C. Ducts are located within conditioned envelope but joints are unsealed.
D. Ducts are located in unconditioned attics, basements, or exterior walls.

Answer: D

Explanation:
Duct leakage in HVAC systems can significantly increase energy losses, particularly when ducts are poorly sealed or located in areas that exacerbate the impact of leakage. This issue is addressed in the LEED for
Homes Rating System (v4) under the Energy and Atmosphere (EA) category, specifically in credits related to Heating and Cooling Distribution Systems.
According to the LEED Reference Guide for Homes Design and Construction (v4), the location of ducts plays a critical role in energy losses due to leakage:
EA Credit: Heating and Cooling Distribution Systems
To minimize energy losses, locate all heating and cooling ducts and air handlers within the conditioned envelope of the building. Ducts located in unconditioned spaces, such as attics, basements, or exterior walls, are more likely to lose energy due to leakage, as air escaping from ducts in these areas is lost to the outside or unconditioned zones, increasing heating and cooling loads.
Source: LEED Reference Guide for Homes Design and Construction, v4, Energy and Atmosphere Credit: Heating and Cooling Distribution Systems, p. 126.
The LEED v4.1 Residential BD+C rating system further clarifies this:
EA Credit: Optimize Energy Performance
Ducts located in unconditioned spaces (e.g., attics, unconditioned basements, or exterior walls) contribute to significant energy losses when leakage occurs, as conditioned air escapes to areas outside the thermal envelope. Sealing ducts and locating them within conditioned spaces are best practices to minimize losses.
Source: LEED v4.1 Residential BD+C, Credit Library, accessed via USGBC LEED Online.
Ducts in unconditioned attics, basements, or exterior walls are particularly problematic because any leakage results in conditioned air being lost to spaces that are not temperature-controlled, requiring the HVAC system to work harder to maintain indoor comfort. This scenario maximizes energy losses compared to ducts within the conditioned envelope.
Why not the other options?
A . Interior wall cavities are used to conduct return air: Using interior wall cavities for return air is not a best practice and may cause pressure imbalances or air quality issues, but it is less likely to cause significant energy losses due to supply duct leakage. Return air systems are typically within conditioned spaces, and the primary concern is airflow efficiency, not energy loss to unconditioned areas.
Reference: LEED Reference Guide for Homes Design and Construction, v4, EA Credit: Heating and Cooling
Distribution Systems, p. 127, which discusses return air strategies but not as a primary leakage concern.
B . Duct layout includes multiple 90-degree bends on a single branch: Multiple 90-degree bends increase airflow resistance, reducing system efficiency, but they do not directly cause duct leakage. Leakage is related to unsealed joints or poor duct construction, not the geometry of the duct layout.
Reference: LEED Reference Guide for Homes Design and Construction, v4, EA Credit: Heating and Cooling
Distribution Systems, p. 126, which prioritizes duct sealing over layout.
C . Ducts are located within conditioned envelope but joints are unsealed: While unsealed joints cause leakage, ducts within the conditioned envelope leak into spaces that are already temperaturecontrolled. This reduces the energy impact compared to leakage in unconditioned spaces, as the conditioned air remains within the thermal envelope.

Reference: LEED Reference Guide for Homes Design and Construction, v4, EA Credit: Heating and Cooling
Distribution Systems, p. 126, which notes that ducts in conditioned spaces minimize energy loss from leakage.
The LEED AP Homes Candidate Handbook confirms that the exam tests knowledge of EA credits, including duct system design and energy performance, referencing the LEED Reference Guide for Homes Design and Construction as a primary resource. The handbook ensures that the exam is based on LEED v4, aligning with the focus on duct location and sealing.
References:
LEED Reference Guide for Homes Design and Construction, v4, USGBC, Energy and Atmosphere Credit: Heating and Cooling Distribution Systems, p. 126–127.
LEED v4.1 Residential BD+C, USGBC LEED Credit Library, accessed via LEED Online (https://www.usgbc.org/credits).
LEED AP Homes Candidate Handbook, GBCI, October 2024, p. 12 (references study resources and exam scope based on LEED v4).
USGBC LEED for Homes Rating System (v4), available via USGBC website (https://www.usgbc.org/resources/leed-homes-design-and-construction-v4).
LEED v4.1 for Homes, USGBC, accessed via LEED Online, confirming duct location impacts.

Question: 4

An existing home in a gut rehab LEED for Homes project reclaims all of the original framing. An addition is built with 90% FSC-certified wood. Which credit, if any, under Materials and Resources, will be earned?

A. Construction Waste Management
B. No credit will be awarded
C. Material-Efficient Framing
D. Environmentally Preferable Products

Answer: D

Explanation:
The LEED for Homes Rating System (v4) includes several credits under the Materials and Resources (MR) category that encourage sustainable material use, including reclaimed materials and certified wood. The scenario describes a gut rehab project that reclaims all original framing and builds an addition with 90% FSC-certified wood. We need to determine which MR credit applies.
According to the LEED Reference Guide for Homes Design and Construction (v4), the MR Credit: Environmentally Preferable Products rewards the use of materials that have environmentally beneficial attributes, such as reclaimed materials and FSC (Forest Stewardship Council)-certified wood:
MR Credit: Environmentally Preferable Products (1–4 points)
Use products that meet one or more of the following criteria for at least 25%, 50%, or 90% (by cost) of the total materials in the project:
Reused or salvaged materials: Materials that are reclaimed from the same or another project.
FSC-certified wood: Wood products certified by the Forest Stewardship Council for sustainable forestry practices.

For gut rehab projects, reclaimed framing materials and FSC-certified wood in additions contribute to the percentage of environmentally preferable products.
Source: LEED Reference Guide for Homes Design and Construction, v4, Materials and Resources Credit: Environmentally Preferable Products, p. 160.
In this case:
Reclaimed framing: The gut rehab reclaims 100% of the original framing, which qualifies as reused or salvaged materials under the credit.
FSC-certified wood: The addition uses 90% FSC-certified wood, which also qualifies as an environmentally preferable product.
The LEED v4.1 Residential BD+C rating system aligns with this approach:
MR Credit: Environmentally Preferable Products
Projects earn points by using products that are salvaged, recycled, or FSC-certified for at least 25%, 50%, or 90% of the material cost. For renovations, salvaged framing and certified wood in additions are eligible.
Source: LEED v4.1 Residential BD+C, Credit Library, accessed via USGBC LEED Online.
Since the project uses both reclaimed framing (100% of the original) and 90% FSC-certified wood in the addition, it meets the criteria for Environmentally Preferable Products, provided the combined material cost meets the 25%, 50%, or 90% thresholds. The high percentage of FSC-certified wood and full reclamation of framing make it likely to achieve at least one point.
Why not the other options?
A . Construction Waste Management: This credit focuses on diverting construction and demolition waste from landfills through recycling or reuse (e.g., 50% or 75% diversion rates). While reclaimed framing reduces waste, the credit is about waste management processes, not the use of reclaimed materials in the building.
Reference: LEED Reference Guide for Homes Design and Construction, v4, MR Credit: Construction Waste Management, p. 164.
B . No credit will be awarded: This is incorrect, as the use of reclaimed framing and FSC-certified wood directly contributes to the Environmentally Preferable Products credit.
C . Material-Efficient Framing: This credit rewards practices that reduce framing material use, such as advanced framing techniques (e.g., 24-inch on-center stud spacing) or minimizing waste during design. Reclaiming framing or using FSC-certified wood does not address framing efficiency.
Reference: LEED Reference Guide for Homes Design and Construction, v4, MR Credit: Material-Efficient Framing, p. 158.
The LEED AP Homes Candidate Handbook confirms that the exam tests MR credits, including Environmentally Preferable Products, and references the LEED Reference Guide for Homes Design and Construction as a primary resource. The exam is based on LEED v4, ensuring the relevance of this credit.
References:
LEED Reference Guide for Homes Design and Construction, v4, USGBC, Materials and Resources Credit: Environmentally Preferable Products, p. 160.
LEED v4.1 Residential BD+C, USGBC LEED Credit Library, accessed via LEED Online (https://www.usgbc.org/credits).
LEED AP Homes Candidate Handbook, GBCI, October 2024, p. 12 (references study resources and exam scope based on LEED v4).
USGBC LEED for Homes Rating System (v4), available via USGBC website (https://www.usgbc.org/resources/leed-homes-design-and-construction-v4).
LEED v4.1 for Homes, USGBC, accessed via LEED Online, confirming environmentally preferable product criteria.

Question: 5

Points can be earned for Energy and Atmosphere Credit: Efficient Hot Water Distribution System, Option 1 through which of the following measures?

A. Limiting branch line length
B. Installing central manifold distribution
C. Installing demand-controlled recirculation
D. Insulating all domestic hot water piping to R-4

Answer: A

Explanation:
The LEED for Homes Rating System (v4) includes the Energy and Atmosphere (EA) Credit: Efficient Hot Water Distribution System, which aims to reduce energy and water waste in hot water delivery. Option 1:
Length of Piping focuses on minimizing the length of hot water piping to reduce heat loss and delivery time.
According to the LEED Reference Guide for Homes Design and Construction (v4):
EA Credit: Efficient Hot Water Distribution System, Option 1. Length of Piping (1–2 points)
Design and install the hot water distribution system to meet one of the following requirements:
Maximum branch line length: The length of any branch line from the water heater or hot water source to
any fixture must not exceed 20 feet (6 meters) for 1 point, or 10 feet (3 meters) for 2 points.
This reduces the volume of water that must be purged before hot water reaches the fixture, saving energy and water.
Source: LEED Reference Guide for Homes Design and Construction, v4, Energy and Atmosphere Credit: Efficient Hot Water Distribution System, p. 132.
The LEED v4.1 Residential BD+C rating system maintains this requirement:
EA Credit: Efficient Hot Water Distribution
Option 1: Limit the length of branch lines from the water heater to fixtures to 20 feet (6 meters) for 1 point or 10 feet (3 meters) for 2 points.
Source: LEED v4.1 Residential BD+C, Credit Library, accessed via USGBC LEED Online.
Limiting branch line length (Option A) directly aligns with Option 1 of this credit, as it reduces the distance hot water must travel, minimizing heat loss and water waste.
Why not the other options?
B . Installing central manifold distribution: This is part of Option 2: Central Manifold System in the LEED v4 credit, where a manifold distributes hot water to fixtures with short branch lines (e.g., 1/2-inch diameter pipes). It is a separate compliance path, not part of Option 1.
Reference: LEED Reference Guide for Homes Design and Construction, v4, EA Credit: Efficient Hot Water Distribution System, p. 133.
C . Installing demand-controlled recirculation: This is part of Option 3: Demand-Controlled Recirculation in LEED v4, where recirculation systems are activated only when hot water is needed (e.g., via a button or motion sensor). It is not part of Option 1.
Reference: LEED Reference Guide for Homes Design and Construction, v4, EA Credit: Efficient Hot Water Distribution System, p. 133.

D . Insulating all domestic hot water piping to R-4: While pipe insulation is a best practice and may be required in some EA credits (e.g., EA Prerequisite: Minimum Energy Performance), it is not a specific requirement for Option 1 of the Efficient Hot Water Distribution System credit. Insulation reduces heat loss but does not address branch line length.
Reference: LEED Reference Guide for Homes Design and Construction, v4, EA Prerequisite: Minimum Energy Performance, p. 112.
The LEED AP Homes Candidate Handbook emphasizes EA credits, including hot water distribution, and references the LEED Reference Guide for Homes Design and Construction as a key resource. The exam is based on LEED v4, ensuring the relevance of Option 1's focus on branch line length.
References:
LEED Reference Guide for Homes Design and Construction, v4, USGBC, Energy and Atmosphere Credit: Efficient Hot Water Distribution System, p. 132–133.
LEED v4.1 Residential BD+C, USGBC LEED Credit Library, accessed via LEED Online (https://www.usgbc.org/credits).
LEED AP Homes Candidate Handbook, GBCI, October 2024, p. 12 (references study resources and exam scope based on LEED v4).
USGBC LEED for Homes Rating System (v4), available via USGBC website (https://www.usgbc.org/resources/leed-homes-design-and-construction-v4).
LEED v4.1 for Homes, USGBC, accessed via LEED Online, confirming branch line length criteria.

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