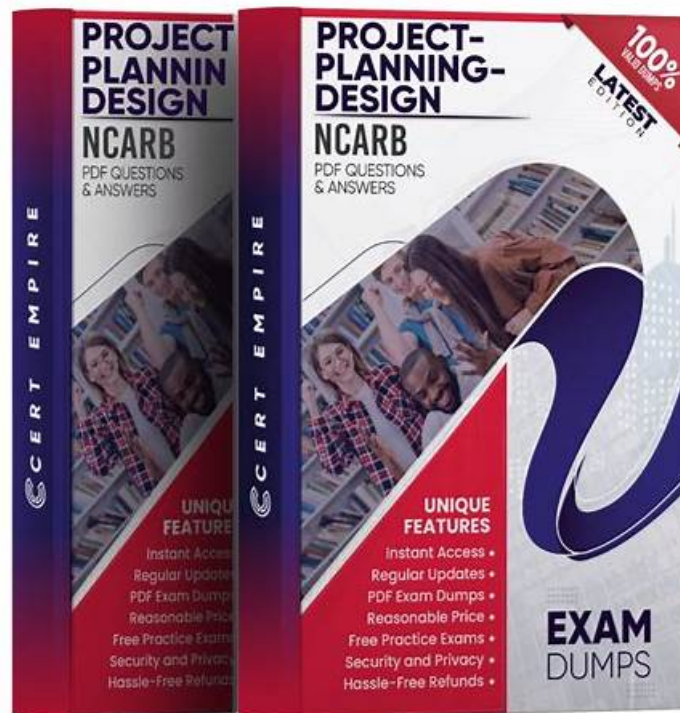


Project-Planning-Design Exam Exercise & Exam Project-Planning-Design Cram



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NCARB Project-Planning-Design Exam Syllabus Topics:

Topic	Details
Topic 1	<ul style="list-style-type: none">Codes & Regulations: This section of the exam measures the skills of project architects and focuses on applying zoning laws, environmental rules, and building codes during the planning stage. Candidates are tested on how to integrate multiple regulatory requirements into a project's design effectively.
Topic 2	<ul style="list-style-type: none">Project Integration of Program & Systems: This section of the exam measures skills of project architects and focuses on integrating decisions about environmental conditions, codes, and building systems into one cohesive project design. It highlights how to configure the building and incorporate both program requirements and contextual conditions in a unified design approach.
Topic 3	<ul style="list-style-type: none">Building Systems, Materials, & Assemblies: This section of the exam measures skills of architectural designers and covers the understanding of building systems such as mechanical, electrical, and plumbing, along with structural and specialty systems. It also involves selecting appropriate materials and assemblies to align with program needs, budgets, and regulations.

Topic 4	<ul style="list-style-type: none"> Environmental Conditions & Context: This section of the exam measures skills of architectural designers and covers how to use site analysis information to determine building placement and environmental planning decisions. It emphasizes applying sustainable principles and considering the neighborhood context to guide project design.
Topic 5	<ul style="list-style-type: none"> Project Costs & Budgeting: This section of the exam measures skills of architectural designers and assesses the ability to evaluate design alternatives based on program goals, perform cost evaluations, and manage cost considerations throughout the design process.

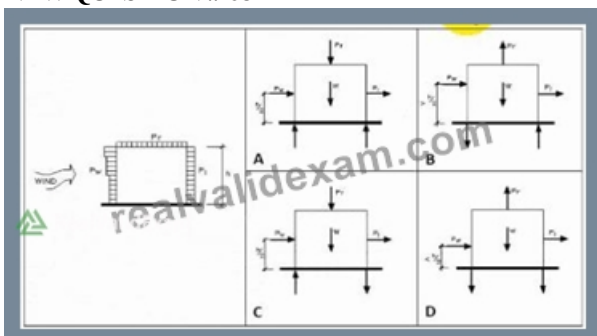
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NCARB ARE 5.0 Project Planning & Design (PPD) Sample Questions (Q68-Q73):

NEW QUESTION # 68



Refer to the exhibit (building subjected to wind with force diagrams A, B, C, D).

Which of the force diagrams shown correctly represents the resultant wind forces causing an overturning effect on the building and the forces that resist this overturning effect? (Direction and point of application of forces are to be considered; magnitude of forces is not.)

- A. C
- B. D
- C. B
- **D. A**

Answer: D

Explanation:

The diagram shows a building exposed to wind loading, which causes lateral pressure (P_w) on the windward wall and suction (negative pressure) on the leeward wall, generating an overturning moment about the base of the building.

* Diagram A correctly shows:

* The wind pressure (P_w) pushing on the windward wall, producing a lateral force applied at approximately two-thirds the building height (h), which tends to overturn the building.

* The wind suction (P_l) pulling on the leeward wall, acting in the opposite direction but also contributing to the overturning moment.

* The reaction forces at the base resist this overturning: an uplift force (negative vertical reaction) on the windward side and a downward force on the leeward side, counterbalancing the moment.

* Diagrams B, C, and D incorrectly orient or place the forces or reactions, failing to accurately depict the overturning moment and

the corresponding resisting forces.

NCARB ARE 5.0 PPD guidelines on environmental conditions emphasize understanding wind load effects, including lateral pressures, suction, overturning moments, and foundation reactions essential for structural design and safety.

References:

ARE 5.0 Project Planning & Design Content Outline: Environmental Conditions and Context - Wind Loads and Structural Response

ASCE 7-16: Minimum Design Loads for Buildings and Other Structures (Wind Load Provisions) The Architect's Handbook of Professional Practice, 15th Edition, Chapter 13: Building Codes, Standards, and Regulations

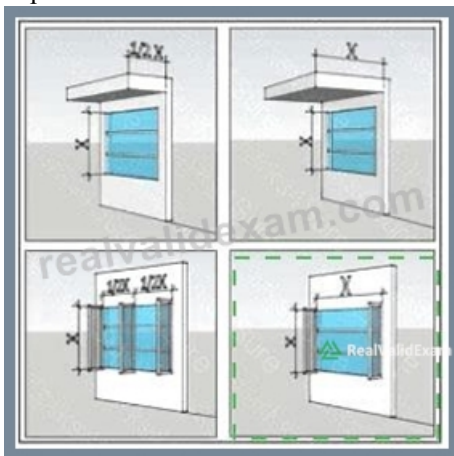
NEW QUESTION # 69

Click on the shading device illustration that most effectively reduces summer solar heat gain through a west-facing window in the Northern Hemisphere.



Answer:

Explanation:



Explanation:

bottom right (vertical fins or louvers shading the window) is the most effective.

* West-facing windows receive strong, low-angle afternoon sun in the summer, which is difficult to shade with horizontal overhangs because the sun's rays come in at a low angle.

* Vertical shading devices (like fins or louvers) placed perpendicular to the window are most effective in blocking low-angle sunlight from the west.

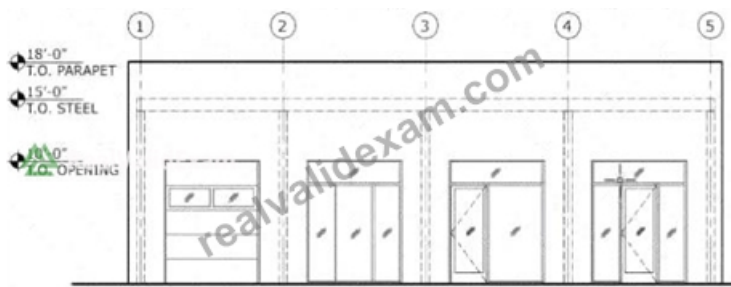
* The top left and top right images show horizontal shading, which works better for south-facing windows but is less effective for west exposures.

* The bottom left shows multiple horizontal fins, which help but still less effective for west-facing windows compared to vertical fins.

According to NCARB ARE 5.0 PPD content on solar shading and passive solar design, vertical shading is preferred for east and west exposures to minimize summer heat gain.

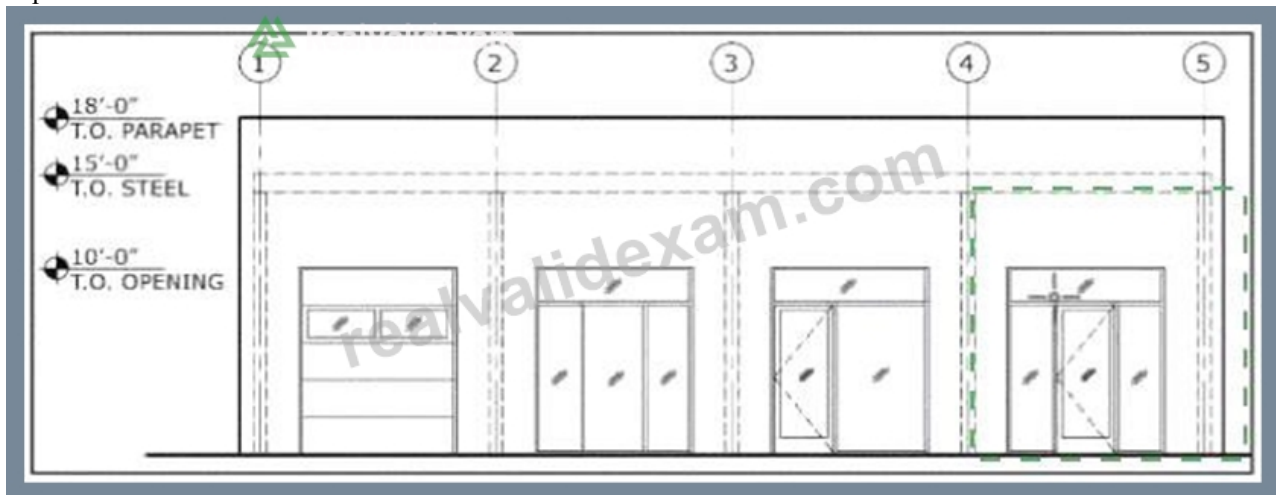
NEW QUESTION # 70

Click in the structural bay of the elevation that is the most appropriate location to install steel rod cross bracing.



Answer:

Explanation:



Explanation:

the most appropriate location to install steel rod cross bracing is in the fourth structural bay, which corresponds to the bay on the far right side of the elevation.

* Steel rod cross bracing is typically installed in bays that are fully open or contain large door openings and require lateral support to resist racking forces (lateral loads such as wind or seismic forces).

* The fourth bay shows a large door opening without any visible solid wall or shear wall elements, making it structurally weaker against lateral loads and thus the most suitable for cross bracing.

* The first bay, with a smaller door or solid wall, and the other bays with more enclosed or glazed openings may have other structural elements providing lateral resistance.

* Installing the bracing in the fourth bay enhances structural stability and prevents lateral displacement or deformation.

NEW QUESTION # 71

An elementary school requires a renovation, selective demolition, and a major addition in order to accommodate a growing student population. An architectural firm has prepared schematic design plans incorporating the school's increased programmatic needs, including an enlarged library, cafeteria, and gymnasium; a secure courtyard; and additional space for administrative offices and classrooms. The main entrance was relocated in order to improve the traffic and pedestrian flow at the beginning and end of the school day, and additional parking was provided to comply with current zoning requirements.

The existing single-story masonry building was built in 1950. Two small additions were built later: the north addition will be kept and repurposed, but the south addition will be demolished. The building contains asbestos and lead in roof soffits, floor tiles, pipe insulation, and window paint. All existing mechanical systems need to be replaced; new systems have not been selected.

Considerations for the renovation include:

* The relocated front entrance must be easily recognizable, highly visible, and secure.

* Interior and exterior materials need to be durable and maintainable in order to withstand frequent student abuse, but also economical due to strict budget limitations.

* Good indoor air quality and increased energy efficiency are priorities for the selection of mechanical equipment.

After completion, the entire school should look uniform, without a distinctive difference between the existing building and new addition.

Building information:

* Construction Type is II-B.

The following resources are available for your reference:

* Existing Plans, including site and floor plans

- * Proposed Plans, including site and floor plans
- * Cost Analysis
- * Zoning Ordinance Excerpts, for off-street parking requirements
- * IBC Excerpts, showing relevant code sections
- * ADA Standards Excerpts, showing relevant sections from the ADA Standards for Accessible Design Which of the following is the maximum height the platform can be above the gymnasium floor per the proposed design?

- A. 1'-9"
- B. 2'-6"
- C. 1'-6"

Answer: C

Explanation:

Per building and accessibility codes (such as ADA and IBC), raised platforms or stages in assembly areas like gymnasiums are limited in height to ensure safe access and egress. A maximum height of 1 foot 6 inches (18 inches) without requiring additional stairs or ramps is common to allow easy transition and avoid additional egress requirements.

Heights above 18 inches typically require stairs or ramps per ADA.

1'-9" or 2'-6" exceed these limits and would trigger additional code requirements.

References:

IBC Chapter 10 - Means of Egress

ADA Standards for Accessible Design

ARE 5.0 PPD - Codes and Regulations

NEW QUESTION # 72

An existing building containing the maximum allowable area may be extended horizontally provided the extension is separated from the existing building by which one of the following?

- A. An outside space separation of at least 10 ft
- B. A fire wall
- C. A water curtain
- D. A fire-rated shutter

Answer: B

Explanation:

Comprehensive and Detailed Explanation From Exact Extract:

According to the International Building Code (IBC) and reflected in the NCARB Project Planning & Design guidelines, when an existing building has reached the maximum allowable floor area, horizontal extensions (additions) can be made only if there is a proper separation between the existing structure and the new addition. This separation must prevent fire spread and protect structural integrity.

A fire wall is a continuous, fire-resistive barrier designed to prevent the spread of fire between adjacent buildings or different parts of a building. It must have structural stability under fire conditions and can allow the two portions of the building to be treated as separate structures for area calculations, effectively permitting expansion beyond the allowable area of a single building. Fire-rated shutters (Option A) are movable devices used for compartmentation but are not intended for permanent separation of building areas.

Outside space separation of at least 10 ft (Option B) is generally insufficient for full area separation unless it meets specific fire-resistance rating and distance requirements that typically exceed 10 feet.

Water curtains (Option D) are active fire protection devices but are not substitutes for passive separations required by code to extend allowable building area.

Thus, the correct method to extend a building beyond its maximum allowable area is to separate it with a fire wall, as per NCARB and IBC provisions.

References:

ARE 5.0 PPD - Codes and Regulations, Building Area and Occupancy Separation IBC 2018, Chapter 7: Fire and Smoke Protection Features The Architect's Handbook of Professional Practice, 15th Edition - Fire Protection

NEW QUESTION # 73

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