NCARB

ARE 4.0 EXAM GUIDE

Construction Documents & Services

Overview 1

Sample Multiple-Choice Questions 2
Sample Multiple-Choice Answers 13

Building Section Vignette 14
Sample Passing Solution 16
Sample Failing Solution 17

References 18

*This document, **effective July 2010**, supersedes all previous editions of the* ARE® 4.0 Exam Guide: Construction Documents & Services. *Please check NCARB's web site, www.ncarb.org, regularly for updates to the* ARE 4.0 Exam Guides *and for the most current information regarding the ARE.*

Copyright © 2010

Construction Documents & Services

Overview

Sample Multiple-Choice Questions

Building Section Vignette

References

DIVISION STATEMENT

Application of project management and professional practice knowledge and skills, including the preparation of contract documents and contract administration.

Content Areas

1. CODES & REGULATIONS

Incorporate building codes, specialty codes, zoning, and other regulatory requirements in construction documents and services.

2. ENVIRONMENTAL ISSUES

Incorporate sustainable design principles, adaptive reuse concepts, alternative energy systems, new material technologies, and hazardous material mitigation in construction documents.

3. CONSTRUCTION DRAWINGS & PROJECT MANUAL

Prepare and coordinate construction drawings including building systems, product selection, and constructability. Prepare, coordinate, and review general and supplementary conditions and technical specifications.

4. PROJECT & PRACTICE MANAGEMENT

A. Cost

Prepare estimates of probable construction cost. Consider cost implications of design decisions.

B. Scheduling & Coordination

Prepare and manage project schedule and coordinate all contract documents including those of consultants.

C. Project Delivery (including submittals)

Establish project delivery method. Provide contract administration documentation and services.

D. Contracts & Legal Issues

Review and administer professional services and construction contracts. Consider issues pertaining to practice including risk management and professional and business ethics.

Vignette

BUILDING SECTION

Delineate a building section that integrates structural, mechanical, and lighting systems and incorporates life safety considerations.

Construction Documents & Services

Overview

Sample Multiple-Choice Questions

Building Section Vignette

References

SAMPLE MULTIPLE-CHOICE QUESTIONS

Go to page 13 for answers

1. The architect informs the owner that because of budget constraints and ceiling heights, the sprinkler piping must be exposed. The owner directs the architect to delete the sprinkler system. Prior to deleting the system, the architect should check the requirements for sprinklers in

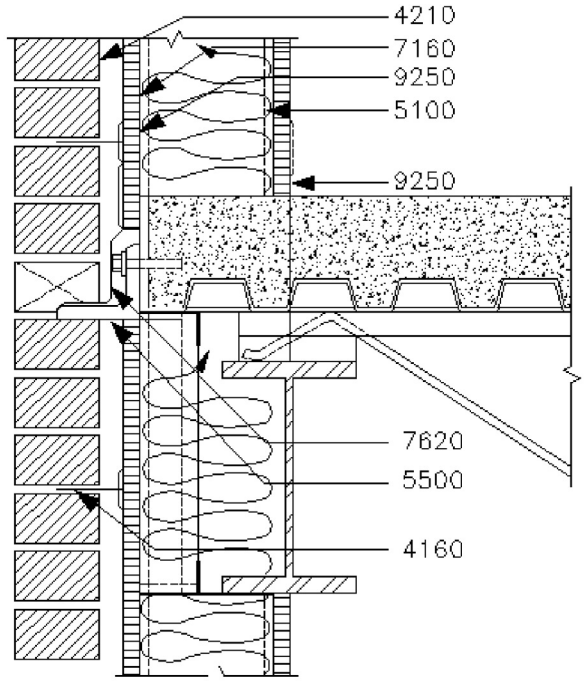
- ☐ the building code
- ☐ the plumbing code
- ☐ ASTM
- ☐ ACI

2. Which of the following methods of bidding is required on most projects for which government funds are to be used?

- ☐ Direct
- ☐ Negotiated
- ☐ Invited
- ☐ Public

3. Which of the following project delivery methods always requires preparation of several individual bid-document packages?

- ☐ Design-bid-build
- ☐ Fast track
- ☐ Design-build
- ☐ Turnkey



4. The numbered keynotes in the detail above are referenced to the

- ☐ detail numbers
- ☐ finish schedule
- ☐ specifications
- ☐ construction sequencing

Construction Documents & Services

Overview

Sample Multiple-Choice Questions

Building Section Vignette

References

SAMPLE MULTIPLE-CHOICE QUESTIONS

Go to page 13 for answers.

5. In developing a list of bidders for a private project, the architect's role is to
- ☐ select the contractor
- ☐ recommend qualified contractors
- ☐ rank the contractors in order of preference
- ☐ discourage owner-recommended contractors

6. A contractor's ability to obtain a performance bond for a specific construction contract is determined by the
- ☐ owner
- ☐ architect
- ☐ contractor
- ☐ surety

7. AIA Document A305 [CCDC 11], Contractor's Qualification Statement, includes a
- ☐ financial statement
- ☐ list of subcontractors
- ☐ list of proposed consultants
- ☐ list of proposed material suppliers

8. After considering all bids, the owner favors a bid with irregularities. According to AIA Document A701, Instructions to Bidders [CCDC 23, A Guide to Calling Bids and Awarding Contracts], the owner
- ☐ has the right to waive irregularities and accept the bid
- ☐ has the right to extend the bidding period for corrections
- ☐ must informally request corrections from the bidder
- ☐ must only consider bids without irregularities

9. A local bank has a budget of $30,000,000 to construct a new main office. The bank wants to use contractors who are customers of the bank; however, none of the bank's contractor customers can bond the entire amount of the contract. Which of the following is a possible option?
- ☐ Design-build
- ☐ Fast-track
- ☐ Multiple prime contractors
- ☐ Additive change orders

10. Which of the following is an appropriate agenda item for the prebid conference?
- ☐ Occupancy-permit procedures
- ☐ Notification of future addenda
- ☐ Pre-commissioning procedures
- ☐ Status of change orders

Construction Documents & Services

SAMPLE MULTIPLE-CHOICE QUESTIONS

Go to page 13 for answers.

11. A contractor under a fixed-price construction contract has allowed the electrical subcontractor to install lighting fixtures other than those stated in the contract documents. The electrical subcontractor and the contractor both believe the substituted fixtures to be of equal value. The construction is substantially completed [substantially performed] and the architect rejects these fixtures. According to AIA Document A201 [CCDC 2], General Conditions, which of the following is true?

- ☐ The architect must accept the lighting fixtures as installed without a cost credit to the owner.
- ☐ The architect must accept the lighting fixtures as installed but with a cost credit to he owner.
- ☐ The contractor is required to replace the lighting fixtures with the fixtures specified without reimbursement.
- ☐ The contractor must replace the lighting fixtures with the fixtures specified but is entitled to reimbursement for labor costs for the replacement.

12. Architect estimates of construction costs based on final documents should consider which of the following?

- ☐ Known change order sums
- ☐ The bidding climate
- ☐ The amount of monthly certificate of payment
- ☐ The amount of retainage [holdback]

13. A preconstruction conference is generally held in order to

- ☐ review bonds and affidavits
- ☐ determine whether a performance bond and a payment bond are required
- ☐ discuss changes to completed work
- ☐ clarify responsibilities and operating procedures

14. Shop drawings for dormitory windows have been prepared by the manufacturer, checked by the local distributor, and reviewed and approved by the contractor and the architect. During installation, it is discovered that the quantity of windows as indicated on the shop drawings is one less than that shown in the contract documents. Who is responsible for the discrepancy?

- ☐ The architect
- ☐ The manufacturer
- ☐ The distributor
- ☐ The contractor

15. On- site field observations [reviews] by the architect are made to determine which of the following? **Check the three that apply.**

- ☐ A. The progress and quality of the work
- ☐ B. The amount work completed [totally performed] for progress payment
- ☐ C. The techniques of the construction being utilized
- ☐ D. Whether the work is being performed according to contract documents
- ☐ E. Whether the contractor is following the proper sequence of installation
- ☐ F. Whether the contractor is following proper safety procedures

Construction Documents & Services

SAMPLE MULTIPLE-CHOICE QUESTIONS

Go to page 13 for answers.

16. The contractor for a project submits to the architect shop drawings that contain deviations from the contract documents not noted as deviations on the shop drawings. The drawings are then approved and returned to the contractor by the architect. According to AIA Document A201 [CCDC 2], which of the following is true in this situation?

- ☐ The contractor assumes responsibility for deviations from the contract documents.
- ☐ The contractor is allowed to build according to the approved shop drawings containing deviations.
- ☐ The architect assumes responsibility for deviations from the contract documents because the architect approved the shop drawings.
- ☐ The owner must be informed of all deviations from and alterations to the contract documents.

17. At a project site, the architect notices the mechanical subcontractor unloading equipment for which shop drawings have not been received. The architect's most appropriate first course of action is to

- ☐ stop the unloading at once and report the incident to the owner
- ☐ advise the general contractor that the equipment is subject to rejection pending the architect's review
- ☐ ask whether the shop drawings are in the subcontractor's possession
- ☐ inspect the equipment to determine whether it meets the requirements set forth in the project specifications

18. Which of the following conditions should be met before the start of interior painting?

- ☐ The permanent heating system is operational.
- ☐ Exterior openings are sealed.
- ☐ The exterior temperature is above 50° F [10°C].
- ☐ Sidewalks have been completed for dirt control.

19. During a concrete pour, a portion of the third floor of a project collapses because of inadequate shoring. The architect informs the contractor that work in the area of the collapse will not be approved until the architect can fully evaluate the impact of the failure on adjacent work in place. The contractor states that the architect will be held responsible for the cost of delays unless the analysis is performed within 24 hours. The architect should

- ☐ perform as complete and thorough an analysis as possible within 24 hours
- ☐ perform a complete analysis in a timely manner and make it clear that the contractor will be responsible for the schedule
- ☐ put the owner on notice that the owner may have to pay additional costs for an extended completion date
- ☐ allow the contractor to proceed with work in the adjacent area so that no time is lost

Construction Documents & Services

Overview

Sample Multiple-Choice Questions

Building Section Vignette

References

SAMPLE MULTIPLE-CHOICE QUESTIONS

Go to page 13 for answers.

20. In accordance with AIA Document A201 [CCDC 2], General Conditions, the obligation to pay or to see to the payment of money to a subcontractor, except as may otherwise be required by law, rests with the

- ☐ contractor alone
- ☐ architect alone
- ☐ owner alone
- ☐ contractor, the architect, and the owner

21. When delivering brick to the site, the supplier offloaded the bricks at a point very distant from where they are needed. The contractor requests an extra for relocating the brick. The architect should

- ☐ reject the request for an extra on the grounds that it is the contractor's responsibility
- ☐ require the brick supplier to relocate the brick
- ☐ prepare an appropriate change order giving the contractor a contract increase for relocating the brick
- ☐ prepare an addendum to the contract outlining the responsibility of the brick supplier in the delivery of brick

22. Six months after final payment, the building manager notifies the architect that an operating and maintenance manual for a key piece of equipment was never received. The architect should do which of the following?

- ☐ Instruct the contractor to provide the manual.
- ☐ Withhold an amount of retainage [holdback] necessary to provide for the manual.
- ☐ Suggest the building manager contact the manufacturer directly for the manual, since final payment has been made to the contractor.
- ☐ Contact the manufacturer directly to obtain the manual.

23. After occupying a portion of a building, the owner notices a dent in a wall. The dent was not noted on the punch [deficiency] list prepared by the contractor and reviewed by the architect. What determination should the architect make?

- ☐ The contractor is responsible for the repair even though it was not on the original punch [deficiency] list.
- ☐ The owner has taken occupancy and is therefore responsible because the cause ofthe damage cannot be established.
- ☐ The contractor is responsible because only a portion of the building is occupied and other construction activities continue.
- ☐ The architect is responsible because he/she missed the damage during the original punch [deficiency] list walk-through.

Construction Documents & Services

SAMPLE MULTIPLE-CHOICE QUESTIONS

Go to page 13 for answers.

24. A contractor omits an item of incomplete or incorrect work from the punch [deficiency] list accepted by the architect. Who is liable for the cost of completing or correcting that item when the omission is discovered?

- ☐ The architect
- ☐ The surety
- ☐ The owner
- ☐ The contractor

25. Which of the following types of test equipment is used to check for air infiltration on an already constructed exterior wall system?

- ☐ A smoke pencil
- ☐ A cylinder
- ☐ An HEPA filter
- ☐ An ultrasonic detector

26. Which of the following is commonly used as a reference for testing materials?

- ☐ ANSI
- ☐ ASTM
- ☐ OSHA
- ☐ NAAB

Reprinted by permission

27. What procedure is taking place on the concrete footing pedestal at the project construction site in the illustration above?

- ☐ Rebars are being placed by hand.
- ☐ Concrete is being placed by hand.
- ☐ Concrete is being covered to retain heat.
- ☐ Concrete is being covered to prevent the rebars from rusting.

Construction Documents & Services

Overview

Sample Multiple-Choice Questions

Building Section Vignette

References

SAMPLE MULTIPLE-CHOICE QUESTIONS

Go to page 13 for answers.

28. An occupancy permit is
- ☐ an agreement by the authorities that the building complies with fire, safety, and health regulations
- ☐ certification by the architect that the building is substantially complete [performed] and may be occupied by the owner
- ☐ legal acceptance of the building by the owner
- ☐ the act of taking possession of the building

29. Existing mature vegetation on a property line was inadequately protected and, consequently, damaged by a subcontractor's excavation equipment. The owner should require which party to remedy the damages?
- ☐ The owner's own forces
- ☐ The subcontractor
- ☐ The contractor, with no additional compensation
- ☐ The contractor, with compensation for additional work administered in a change order

30. After excavation, which of the following construction sequences would be likely to be the most productive?
- ☐ Footings, walls, toilet partitions, roofing, carpet, painting
- ☐ Concrete, structural steel, roofing, drywall, painting, carpet
- ☐ Structural steel, concrete, walls, millwork, roofing, painting
- ☐ Grade beams, walls, drywall, roofing, millwork, site work

31. Which of the following is true of the list of incomplete work and work to be corrected?
- ☐ It is prepared after the start of the warranty period.
- ☐ Work listed must be completed prior to occupancy by the owner.
- ☐ It is limited in value to one percent of the contract.
- ☐ It is prepared to cover all trades.

32. A contract allowance for building signage is established at $50,000. The signage chosen during construction costs only $45,000. In accordance with AIA Document A201 [CCDC 2], the contractor should offer a credit change order for
- ☐ $5,000
- ☐ $5,000 minus the contractor's expense of processing the credit
- ☐ $5,000 minus the cost of installation, overhead, and profit
- ☐ the cost of installation, overhead, and profit

33. Which of the following are considered security for a project? **Check the two that apply.**
- ☐ A. Bid Bond
- ☐ B. Payment Bond
- ☐ C. Completion Bond
- ☐ D. Performance Bond
- ☐ E. Certified check

Construction Documents & Services

SAMPLE MULTIPLE-CHOICE QUESTIONS

Go to page 13 for answers.

34. The contractor decided not to purchase a specific material for a project near the time of bidding because there was no place on site to store the material and it would not be needed until months later after construction had progressed. When the contractor did purchase the material, the price had risen by 30 percent compared to the price at the time of the bid. Which of the following is true?

- ☐ The contractor is entitled to a change order for the price increase.
- ☐ The contractor is entitled to a change order for half of the price increase.
- ☐ The contractor is entitled to a change order for the difference between the added cost of the material and the estimated value of appropriate storage space for the intervening months.
- ☐ The contractor is not entitled to a change order.

35. A contractor unbound the specifications for a project and gave specific sections to subcontractors for bidding. The contractor later discovered gaps in the overall coverage of the bids. In this situation, which of the following statements is true?

- ☐ The subcontractors should be forced to absorb the cost of the work.
- ☐ The owner should sign a change order for the omitted work.
- ☐ The architect or its insurer should pay for the cost of a change order.
- ☐ The contractor is not entitled to a change order.

36. An architect is providing full architectural and engineering design services for a new detention center. The construction contract has been signed and the contractor informs the architect that the fire-sprinkler contractor does not have the fire line from the city main to the building in the price because it was not on the drawings or in the specifications. According to AIA Document A201 [CCDC 2], which of the following should be done?

- ☐ The contract amount should be adjusted by a change order.
- ☐ The fire protection subcontractor should install the fire line at no additional cost.
- ☐ The fire protection engineer is required to pay for the installation of the fire line.
- ☐ The architect should issue supplementary instructions directing the contractor to install the fire line.

37. During the construction phase, the owner and the contractor have a difference of opinion about the quality of the erection of the steel frame and the progress of the work. The first step that should be taken to resolve the problem is for the owner and/or the contractor to

- ☐ stop the project
- ☐ request arbitration
- ☐ consult with the steel fabricator
- ☐ request the architect's interpretation

Construction Documents & Services

Overview

Sample Multiple-Choice Questions

Building Section Vignette

References

SAMPLE MULTIPLE-CHOICE QUESTIONS

Go to page 13 for answers.

38. During construction, the architect realizes that the specifications did not include requirements for some nondestructive testing of welds on some of the structural steel. The city inspection department requires the contractor to perform these tests. The individual responsible for paying for the tests is the

- ☐ structural engineer
- ☐ architect
- ☐ owner
- ☐ contractor

39. Which of the following methods of contractor compensation would an owner be more likely to choose when the construction time is limited and the design criteria or construction cost is secondary to meeting the deadline for completion?

- ☐ Cost-plus-fee
- ☐ Cost-plus-fee with a guaranteed maximum price
- ☐ Stipulated sum
- ☐ Unit price

40. Separate [other] contracts by the owner generally require

- ☐ more extensive services by the architect
- ☐ coordination of all separate [other] contractors by the surety
- ☐ these separate [other] contracts to be subcontracts of the contractor
- ☐ a special consultant to assume overall responsibility for compliance with the applicable health and construction safety legislation at the place of work

41. Final completion [total performance] of a commercial building occurred 2 weeks behind schedule. The contract contained a liquidated damages clause that required deduction of monetary damages from the final payment to the contractor. Deductions from the architect's compensation should

- ☐ be a percentage of the amount deducted from the payment to the contractor
- ☐ be an amount agreed to by the owner and the architect
- ☐ not be greater than 10 percent of the architect's total compensation
- ☐ not be made

42. Matters affecting the basic legal rights and responsibilities of the parties to the contract, but which may vary from one project to another, should be handled in

- ☐ the bidding requirements
- ☐ the owner-contractor agreement
- ☐ the supplementary conditions
- ☐ Division 1, General Requirements

Construction Documents & Services

Overview

Sample Multiple-Choice Questions

Building Section Vignette

References

SAMPLE MULTIPLE-CHOICE QUESTIONS

Go to page 13 for answers.

43. Before starting the construction documents phase, which of the following procedures would help assure quality control in preparing the construction documents? **Check the three that apply.**

- ☐ A. Maintain documentation standards
- ☐ B. Review documents with local code officials.
- ☐ C. Provide detailed cost estimate.
- ☐ D. Provide for thorough review and checking procedures
- ☐ E. Use an approved set of design development documents
- ☐ F. Have contractor check documents

44. The architect can decrease the amount of construction-related waste by doing which of the following? **Check the four that apply.**

- ☐ A. Designing a materials flow plan for the contractor and user
- ☐ B. Specifying recycled materials and products
- ☐ C. Requiring recycled product packaging.
- ☐ D. Specifying a single dumpster on site.
- ☐ E. Specifying masonry construction over wood construction
- ☐ F. Assisting the owner and contractor in a waste management plan

45. Which of the following should be included in the written contract for architectural services? **Check the two that apply.**

- ☐ A. Means and methods to be used in construction
- ☐ B. Programming services
- ☐ C. Description of reimbursable expenses
- ☐ D. Name of the general contractor
- ☐ E. Insurance requirements
- ☐ F. Additional services that may be provided by the architect

46. Which of the following is a true statement about substitutions during construction phase? **Check the three that apply.**

- ☐ A. They may be accepted if they replace unavailable products.
- ☐ B. They may be accepted if they replace unsuitable products,
- ☐ C. They may be accepted if the contractor forgot to order the product.
- ☐ D. They may be accepted by oral agreement between architect and contractor
- ☐ E. They may be rejected as defective work if they lack proper approval or authorization.
- ☐ F. They may be included in the shop drawings without official written notice

Construction Documents & Services

Overview

Sample Multiple-Choice Questions

Building Section Vignette

References

SAMPLE MULTIPLE-CHOICE QUESTIONS

Go to page 13 for answers.

47. The bids for a new office building exceed the owner's budget. According the AIA document B141 [Document 6], options available to the owner include which of the following? **Check the four that apply.**

- ☐ A. Give written approval for an increase in the budget
- ☐ B. Authorize rebidding or renegotiation of the project
- ☐ C. Cooperate in revising the scope or quality of the work
- ☐ D. Require the architect to modify the documents without additional compensation once the scope is reduced
- ☐ E. Require the architect to compensate the owner for the difference between the budget and the bid
- ☐ F. Terminate the agreement without paying full for the bid documents

48. During the construction phase, the architect is responsible for which of the following. **Check the three that apply.**

- ☐ A. Evaluating the change orders
- ☐ B. Endeavoring to guard against defects in the work
- ☐ C. Conducting continuous in-site inspections [field reviews]
- ☐ D. Determining if the work is in general conformity with the contract documents
- ☐ E. Verifying that the contractor's construction methods and procedures are adequate
- ☐ F. Assisting the contractor in the development of safety programs and reporting methods

Construction Documents & Services

Overview

Sample Multiple-Choice Questions

Building Section Vignette

References

SAMPLE MULTIPLE-CHOICE ANSWERS

1. the building code
2. Public
3. Fast track
4. specifications
5. recommend qualified contractors
6. surety
7. financial statement
8. has the right to waive irregularities and accept the bid
9. Multiple prime contractors
10. Notification of future addenda
11. The contractor is required to replace the lighting fixtures with the fixtures specified without reimbursement.
12. The bidding climate
13. clarify responsibilities and operating procedures
14. The contractor
15. A, B, D
16. The contractor assumes responsibility for deviations from the contract documents.
17. advise the general contractor that the equipment is subject to rejection pending the architect's review
18. Exterior openings are sealed.
19. perform a complete analysis in a timely manner and make it clear that the contractor will be responsible for the schedule
20. contractor alone
21. reject the request for an extra on the grounds that it is the contractor's responsibility
22. Instruct the contractor to provide the manual.
23. The owner has taken occupancy and is therefore responsible because the cause ofthe damage cannot be established.
24. The contractor
25. A smoke pencil
26. ASTM
27. Concrete is being covered to retain heat.
28. an agreement by the authorities that the building complies with fire, safety, and health regulations
29. The contractor, with no additional compensation
30. Concrete, structural steel, roofing, drywall, painting, carpet
31. It is prepared to cover all trades.
32. $5,000
33. A, E
34. The contractor is not entitled to a change order.
35. The contractor is not entitled to a change order.
36. The contract amount should be adjusted by a change order.
37. request the architect's interpretation
38. owner
39. Cost-plus-fee
40. more extensive services by the architect
41. not be made
42. the supplementary conditions
43. A, C, F
44. A, B, E, F
45. C, F
46. A, B, E
47. A, B, C, D
48. A, B, D

Construction Documents & Services

Overview

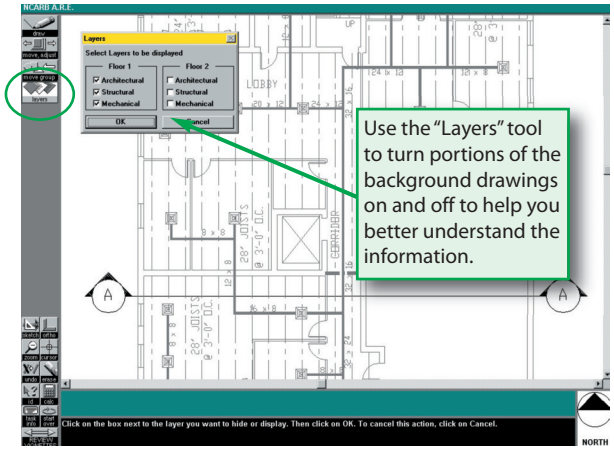
Sample Multiple-Choice Questions

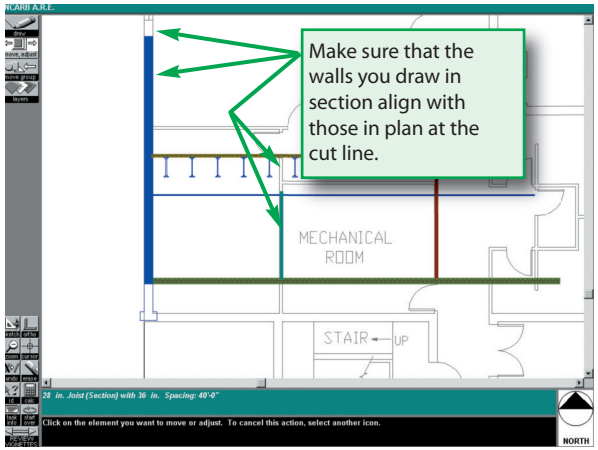
Building Section Vignette

References

BUILDING SECTION VIGNETTE

General Tips for Taking Building Section





Directions

On the work screen, locate a grade line and draw a schematic building section corresponding to the section cut line shown on the floor plan. You will be asked to draw elements such as a slab on grade, finished ceilings, interior partitions, ducts, etc. You are required to draw only the elements that are cut by the cut line as well as joists in elevation immediately adjacent to the cut line. A 4 in [100 mm] deck will be drawn automatically on top of the joists you select. **The left side of your section should be placed along the line that is designated "exterior face of section."**

Your section should include all required sectional components and should reflect accurately the dimensions, structural relations, and spatial relations indicated in the program and the plans. Vertical clearances not explicitly stated in the program or vignette directions must be accurately interpreted and indicated on your solution.

Before beginning your solution, you should review the program information that can be accessed through the Vignette Index screen and the architectural, mechanical, and structural layers of the floor plans on the work screen.

Construction Documents & Services

Overview

Sample Multiple-Choice Questions

Building Section Vignette

References

BUILDING SECTION VIGNETTE

Program

The structural system consists of top chord bearing steel joists on masonry bearing walls with continuous concrete spread footings and a concrete slab on grade.

1. All ceilings and roofs are flat.
2. Non-bearing corridor and lobby walls have a one-hour (minimum) fire-resistance rating.
3. Exterior and bearing walls have a two-hour (minimum) fire-resistance rating.
4. The ceiling height of the laboratory is 15'-0", the ceiling height of the remaining first floor spaces is 8'-4", and the ceiling height of the second floor spaces is 9'-0".
5. Ceilings are used as return air plenums. All ceilings are non-rated.
6. Assume fire/smoke dampers and transfer grilles are provided as needed.
7. The space between each ceiling and floor or roof slab must be held to the minimum dimension required to accommodate light fixtures and the structural and mechanical components shown on the plans.
8. All ducts are placed below the joists.
9. Provide 8" of clearance between the bottom of all the ducts and the finished ceiling to accommodate light fixtures.
10. Parapets must extend 2'-0" above the top of adjacent roof decks.
11. The frost depth is 5'-0" below grade.

Construction Documents & Services

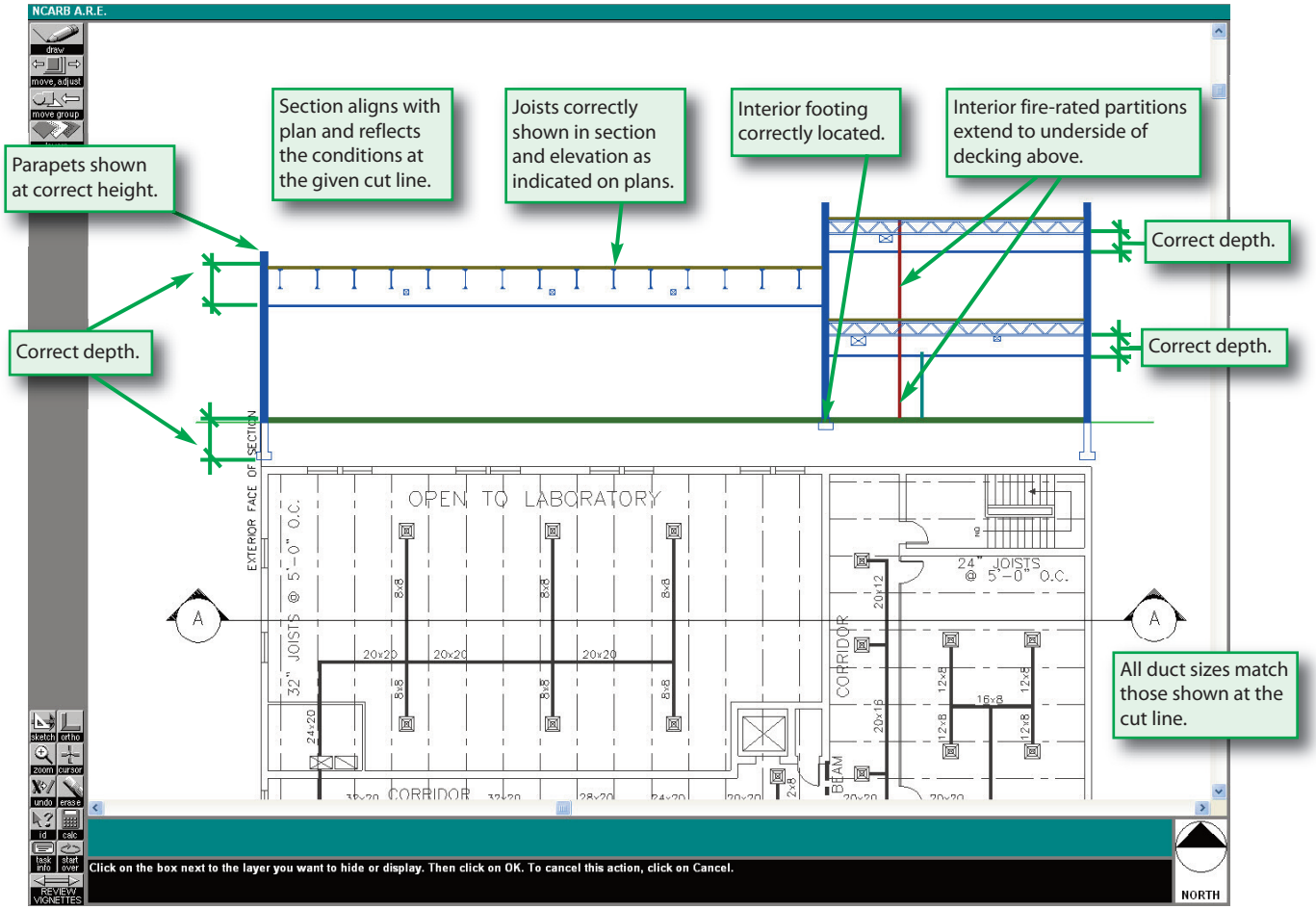
Overview

Sample Multiple-Choice Questions

Building Section Vignette

References

BUILDING SECTION VIGNETTE - Sample Passing Solution



A first check of this solution shows that it is lined up horizontally with the floor plans and the grade line has been drawn. It is important to establish all the information for your section from the given cut line, and not from where you place the grade line. In this solution, the slab rests on grade while the footings are deep at the perimeter and just below the slab at the interior bearing wall. All ceiling heights are correct, and the parapets are correctly sized. The interstitial spaces have the eight-inch clearance for lighting and can accommodate the largest duct on the floor. The ducts are sized and located per the section cut line. The joists are drawn as shown on the plan and are the proper size and span the appropriate direction.

Procedural Tips

- Familiarize yourself with the contents of each layer by turning the **layers** on and off.
- You may find it useful to start by laying out a rough drawing and adjusting the elements later.
- To draw joists, select the joist depth and spacing you desire. When allocating room for structure, be aware that a 4 in [100 mm] deck will be drawn automatically on top of your joists.
- Use **move group** to relocate the entire joist run. Using **move,adjust** will change the location of the joists within the joist run.
- **Zoom** in quite closely to adjust elements and to read small text.
- When elements overlap, you may have trouble selecting a particular element. If this happens, keep clicking (without moving the mouse) until the desired element highlights.

Construction Documents & Services

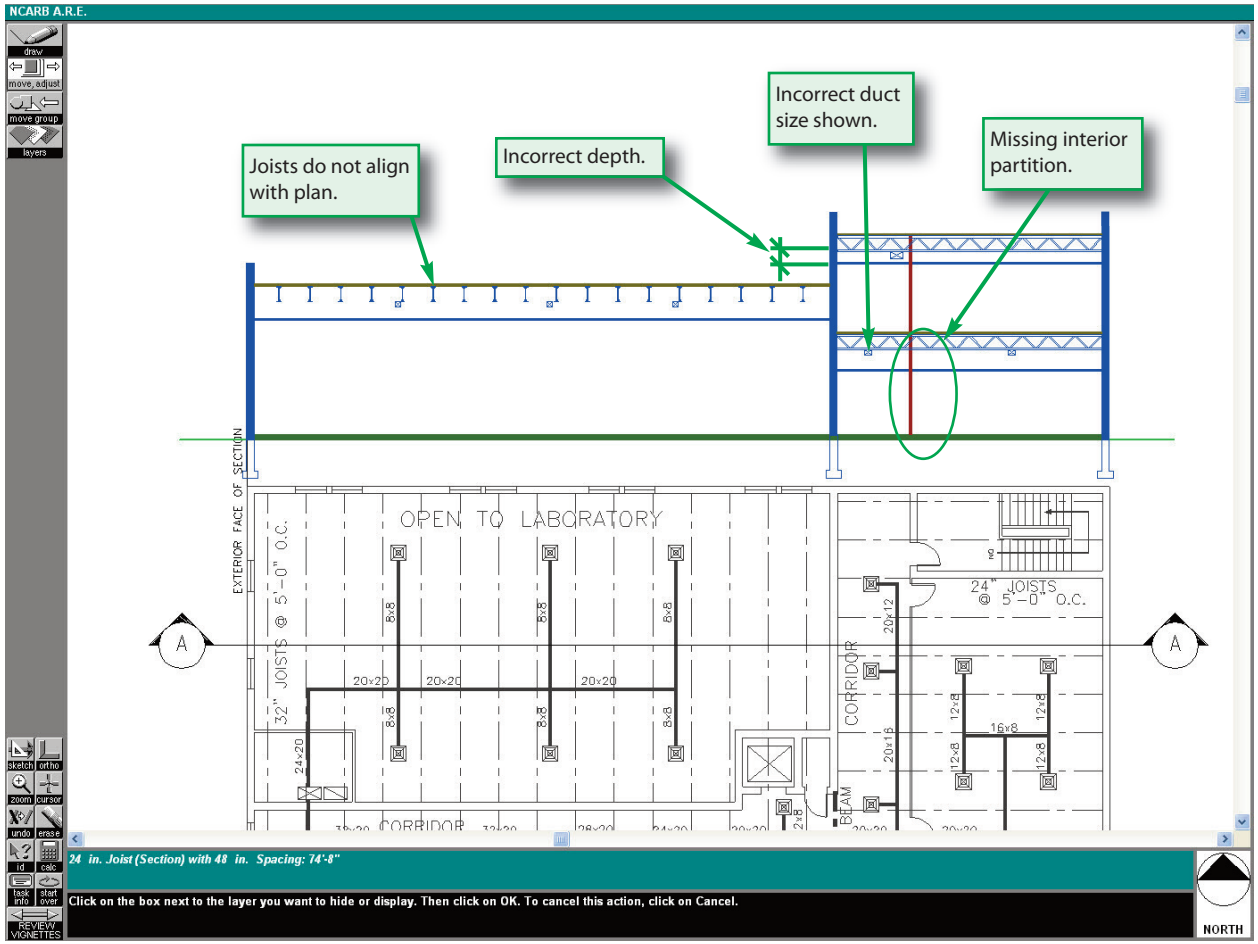
Overview

Sample Multiple-Choice Questions

Building Section Vignette

References

BUILDING SECTION VIGNETTE - Sample Failing Solution



In this solution, there are multiple errors. As drawn, the largest duct on the second floor will not fit between the lights and the joists above. On the first floor, there is a duct that is incorrectly sized and an interior partition cut by the section line is missing.

Warnings

- You must draw a grade line in order for your solution to be scored.

Tools You Might Find Useful

- **Layers** to turn off and on in order to view base drawings more clearly
- **Zoom** to achieve the greatest accuracy in your drawing
- **Full-screen cursor** to align elements
- **Sketch** tools to establish heights and clearances

Construction Documents & Services

Overview

Sample Multiple Choice Questions

Building Section Vignette

References

REFERENCES

The references are presented as a guide in preparing for the examination. It was developed by the committee that prepares the examination. This is not intended to be an exhaustive list of all possible reference materials for the subject area of any given division. NCARB makes no guarantee that the various references are currently in print.

The Architect's Handbook of Professional Practice
Joseph A. Demkin, AIA, Executive Editor
The American Institute of Architects
John Wiley & Sons, latest edition

Architectural Graphic Standards
Charles G. Ramsey and Harold R. Sleeper
The American Institute of Architects
John Wiley & Sons, latest edition

Building Construction Illustrated, Third Edition
Francis D. K. Ching and Cassandra Adams
John Wiley & Sons, latest edition

Canadian Handbook of Practice for Architects
Committee of Canadian Architectural Councils and
The Royal Architectural Institute of Canada,
latest edition

CSI Manual of Practice
Construction Specifications Institute, latest edition

Rules of Conduct
National Council of Architectural Registration Boards,
latest edition

Starting July 2010, Construction Documents & Services will reference 2007 AIA Documents.