CONSTRUCTION DOCUMENTS AND SERVICES

September 18, 2012

Presented by AIA-Pittsburgh’s Young Architects’ Forum
Agenda

- 5:30  Introduction/ Division Overview
- 6:00  Multiple Choice
- 7:30  Graphic Vignettes
- 8:00  Questions?
Division Statement
Application of project management and professional practice knowledge and skills, including the preparation of contract documents and contract administration.

Exam Structure
- 100 Multiple-Choice Questions
- 1 Graphic Vignette
  - Building Section
Test Day...

- Intro Time : 15
- **MC Testing Time**: 2:00
- Scheduled Break : 15
- Intro Time : 15
- **Graphic Testing Time**: 1:00
- Exit Questionnaire : 15
- **Scheduled Appointment Time**: 4:00
Content Areas

- CODES & REGULATIONS  (5-8% of scored items)
  - Incorporate building codes, specialty codes, zoning, and other regulatory requirements in construction documents and services.

- ENVIRONMENTAL ISSUES  (4-9% of scored items)
  - Incorporate sustainable design principles, adaptive reuse concepts, alternative energy systems, new material technologies, and hazardous material mitigation in construction documents.

- CONST DRAWINGS & PROJECT MANUAL  (41-46% of scored items)
  - Prepare and coordinate construction drawings including building systems, product selection, and constructability. Prepare, coordinate, and review general and supplementary conditions and technical specifications.
Content Areas

- PROJECT & PRACTICE MANAGEMENT (41-46% of scored items)
  - Cost
    - Prepare estimates of probable construction cost. Consider cost implications of design decisions.
  - Scheduling & Coordination
    - Prepare and manage project schedule and coordinate all contract documents including those of consultants.
  - Project Delivery (including submittals)
    - Establish project delivery method. Provide contract administration documentation and services.
  - Contracts & Legal Issues
    - Review and administer professional services and construction contracts. Consider issues pertaining to practice including risk management and professional and business ethics.
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 formally request corrections from the bidder
- must only consider bids without irregularities

REFERENCE
Where available, click here to access formulae and other reference material.

REVIEW
Click to see the status of each question.

TIME DISPLAY
Shows the time remaining in your multiple-choice section.

QUESTION NUMBER
Shows the number of the question you are on and the total number in the division.

PREVIOUS
Click here to return to the last question.

NEXT
Click here to move to the next question.

MARK
Click here to mark the question on the screen for later review.
**MARKED FOR REVIEW**
If you click the "Mark" icon on any question, a red "✓" will appear in this column.

**INCOMPLETE**
If you do not answer or choose to skip a question, a green "ï" will appear in this column.

**Symbols Key**
- = Marked question
- = Completed question
- = Incomplete question

**Options:**
- **Review All**: Selecting this icon will sequentially deliver all questions.
- **Review Incomplete**: Selecting this icon will sequentially deliver all "Incomplete" questions.
- **Review Marked**: Selecting this icon will sequentially deliver only the questions you "marked."
- **End Exam**: Selecting this icon will terminate your multiple-choice section.
By the numbers...

- 100 questions...
- 2 hours testing time...
  ...1 minute, 12 seconds per question

- By content areas...
  Codes/ Regulations.................................5 - 8 questions
  Environmental Issues................................4 – 9 questions
  Const. Drawings/ Project Manual...........41 – 46 questions
  Project/ Practice Management...............41 – 46 questions
AIA Documents

- **NOTE:** Since July 2010, the ARE references the 2007 edition of the AIA Documents.

- **A-Series – Owner-Contractor Agreements:**
  - **A101–2007** Standard Form of Agreement Between Owner and Contractor -- Stipulated Sum
  - **A102–2007** Standard Form of Agreement Between Owner and Contractor -- Cost of the Work Plus a Fee with a Guaranteed Maximum Price
  - **A103–2007** Standard Form of Agreement Between Owner and Contractor -- Cost of the Work Plus a Fee without a Guaranteed Maximum Price
  - **A105–2007** Standard Form of Agreement Between Owner and Contractor – Residential/ Small Commercial Project
  - **A107–2007** Standard Form of Agreement Between Owner and Contractor -- Limited Scope
  - **A201–2007** General Conditions of the Contract for Construction
  - **A701-2007** Instructions to Bidders
AIA Documents

- **NOTE:** Since July 2010, the ARE references the 2007 edition of the AIA Documents.

- **B-Series – Owner-Architect Agreements**
  - B101–2007 Standard Form of Agreement Between Owner and Architect
  - B102–2007 Standard Form of Agreement Between Owner and Architect - No Predefined Scope of Architect’s Services
  - B104–2007 Standard Form of Agreement Between Owner and Architect - Project of Limited Scope
  - B105–2007 Standard Form of Agreement Between Owner and Architect - Residential/ Small Commercial Project
  - B195–2008 Standard Form of Agreement Between Owner and Architect - Integrated Project Delivery
  - B202–2009 Standard Form of Architect’s Services: Programming
  - B211–2007 Standard Form of Architect’s Services: Commissioning
  - B214–2007 Standard Form of Architect’s Services: LEED® Certification
AIA Documents

- **NOTE:** Since July 2010, the ARE references the 2007 edition of the AIA Documents.

- **C-Series – Other Agreements**
  - C401–2007 Standard Form of Agreement Between Architect and Consultant

- **G-Series -- Contract Administration and Project Management Forms**
  - G701–2001 Change Order
  - G702–1992 Application and Certificate for Payment
  - G703–1992 Continuation Sheet
  - G704–2000 Certificate of Substantial Completion

- View a complete list of AIA Documents at [http://www.aia.org/contractdocs/aiab081445](http://www.aia.org/contractdocs/aiab081445)
AIA Documents

- Generally recognized terms and conditions.
- All documents complement each other.
- General contractual relationship.
Industry Standard
Additional Resources

- Architectural Working Drawings, Ralph Liebling
- Cross-Check, Pat Guthrie
- ANSI
- A Manual of Construction Documentation, Glenn E. Wiggins, AIA
Additional Resources

- The Architect’s Handbook of Professional Practice
- Architectural Graphic Standards
- Canadian Handbook of Practice for Architects
- CSI Manual of Practice
- Rules of Conduct National Council of Architectural Registration Boards
Disclaimer

- This Seminar, so brilliantly crafted and presented, is by no means to be construed as a substitute of taking the time to thoroughly read and understand the referenced AIA documents, requisite study guide or practicing for the graphic exam.

- By not reading the referenced Contract Documents, you hereby waive any grounds for complaining when things don’t go your way.

- Furthermore, failure to understand any particular Article, Paragraph or modification, hereinafter called the “That will never be a question” clause, will not be considered an invalidation to the above mentioned waiver.
AIA B101

- Standard Form of Agreement between Owner and Architect
- Basis for discussion is the 2007 Edition.
- Not the CM version
AIA A101

- Standard Form of Agreement Between Owner and Contractor
- Basis for discussion is the 2007 Edition.
- Not the CM version
AIA A201

- General Conditions of the Contract
- Basis for discussion is the 2007 Edition.
- Not the CM version
B101 OVERVIEW
Two Part Overview

- Standard Form of Agreement between Owner and Architect
  - Part 1: Standard Form of Architect’s Services.
  - Part 2: Design and Contract Administration.
AIA A141 Responsibilities

- Six standard subcategories that define Architect’s role and obligation for
  - General Administration
  - Evaluations of the Work
  - Certificate of Payment
  - Submittals
  - Changes in the Work
  - Project Completion
Overview

- Generally accepted terms and conditions.
- Uniformly interpreted by courts in all 50 states.
- Eliminates unknown of “self-written” contracts.
- Product of collaboration.
Contractual revisions

- Recognizes demands by Owners for:
  - Management expertise.
  - Cost control.
  - Customized service.
- Overlapping of services.
- Use of electronic data.
- Flexible compensation methods.
- Easy modifications to agreements for life of project.
11 Principles of B101

I. Expanded service: pre-design and post-contact services.

II. Strong link between fee and service.

III. Clearer descriptions of services.

IV. Positive, pro-active, readable and less risk avoidance.
11 Principles of B101

V. Demonstrates value of Architect’s services.
VI. Clarifies the Owner’s role.
VII. Conflict resolution - mediation.
VIII. Flexible compensation based on services.
Sample Question

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
11 Principles of B101

IX. Lists project assumptions.
   I. Scope.
   II. Budget.
   III. Site
   IV. Schedule

X. Cost management for entire project.

XI. Familiarity and direct links to A201
Non AIA Documents

- Owner written contracts.
- Closely compare contents to B101 and riders.
- Requires extensive Attorney and liability carrier review.
- Can assign undue burden and liability.
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. The architect should review the requirements in which of the following?

1. the building code
2. the plumbing code
3. ASTM
4. ACI
Typical Attachments

- Copy of original proposal.
- Owner’s Program
- Hourly rate schedule.
- Consultant’s rate schedule.
- Consultant’s proposal or Scope of Work.
AIA A201 OVERVIEW
General Conditions of the Contract

- Define the basic rights, responsibilities, and relationships of the parties of the Contract.
- Wide applicability to most projects
- Standardized pre-printed documents.
  - AIA A201 – 1997 Edition
  - EJCDC C-700
- Modified by Supplementary Conditions.
Conditions of the Contract

- Closely coordinated with related documents:
  - Owner Architect Agreement.
  - Agreement between Owner and Contractor
  - Division 01-General Requirements.
- Interrelated and may necessitate changes to other documents.
Conditions of the Contract

- Claims.
- Dispute Resolution.
  - Mediation
  - Arbitration
  - Jury or Civil Trial
Supplementary Conditions

- Specially prepared to modify and expand the General Conditions as needed to accommodate the unique requirements of a specific project.
- Modify clauses of General Conditions.
- Written separately for each project.
- Do not address specification-level detail.
- Separate section: not edited General Conditions.
Supplementary Conditions

- Insurance requirements.
- Progress payments.
- Wage rate requirements.
- Equal employment opportunity requirements.
- Liquidated damages.
- Bonus/Penalty clauses
- Retainage.
- Tax-exempt status of the Owner.
Owner’s Responsibility

- Fiduciary responsibility
- Obtaining permits
- Owner’s work force
- Owner’s Consultants
  - Coordination with the work of the Contract
Owner’s Responsibility

- Builder’ Risk Insurance
  - Increasing policy value
- Indemnification
  - Non-Consequentail Damages
- Surveys
- Hazardous Materials
Stopping the Work

- Owner.
Architect’s Responsibility

- Authorized representative of the Owner
- Prompt and timely responses and interpretations
- These interpretations are to be consistent with the Contract Documents
  - Architect’s Supplemental Instructions
  - RFI
  - Supplemental Drawings
  - Project Memorandum
  - Change Authorization – Field Directives
- My mantra: WRITE IT, DON’T SAY IT.
Architect’s Responsibility (continued)

- Evaluation of the Work
  - Architect’s Field Report
  - Project Memorandum
- Rejection of Work
- Certification of Payment
  - Initial Application.
  - Final Application.
Architect’s Responsibility (continued)

- Changes in the Work
  - Change Orders
  - Minor Changes
  - Construction Change Directives
- Architect prepares the Change documents
- Change Logs
Architect’s Responsibility (continued)

- Project Closeout
- Who performs the punch list?
  - The Contractor, not the Architect.
    - The Architect inspects after the Contractor submits a comprehensive listing of item to be completed or corrected.
- Operation and Maintenance Manual.
- Receives Bonds, Consent of Surety, Waiver of Liens.
- Certificate of Substantial Completion.
- CBO (State and Local) Inspections
  - Initiated by the Contractor
Sample Question

In accordance with AIA Document A201, 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.

A. Contractor alone
B. Architect alone
C. Owner alone
D. Contractor, the Architect, and the Owner
Contractor’s Responsibility

- The good ole’ days

A.18 All questions and disagreements between the Owner and Contractor relating to the interpretation of the drawings and specifications, or the kind and quality of work and material required thereby, shall be referred to the Architect. His decision shall be final, conclusive and without appeal.

Ready-written Specifications
Holland and Parker, 1929
Contractor’s Responsibility

  - Necessary to facilitate construction, not find errors
  - Reporting discrepancies to the Architect.
- Contractor’s review is made in the capacity of a Contractor, not a licensed design professional.
Contractor’s Responsibility

- Code compliance is NOT the responsibility of the Contractor.
  - But the reporting of any non-conformance is.
Sample Question

During a routine site visit, the Architect notices that there is non-conforming Work being installed. What is an Architect to do?

A. Allow the Work to proceed.
B. Look the other way.
C. Notify the Owner and ask that they reject the Work.
D. Notify the Contractor in writing that the Work is non-conforming and is rejected.
Contractor’s Responsibility

- Competent Supervision
- Construction CPM Schedule
- Safety
- Shop drawings, product literature and samples.
  - Stamp each drawing attesting review
  - One approved copy kept on site
  - Deviations must be noted with submission
Change Modification

- Change Orders
- Change Directives
  - Construction Change Directive
  - Construction Change Authorization
- Field Directives
- RFI
- Architect’s Supplemental Instructions
Payment Procedures

- List of Sub-contractors
- Schedule of Values
- Preliminary Project CPM Schedule
- Permits
- Certificate of Insurance
- Bonds
- Submittal Schedule
Construction Progress

- Project CPM Schedule
- Schedule must have submittals, review and fabrication activities.
- Updating of schedule.
- Extension of time: by Change Order
  - Particularly critical on projects with Liquidated Damages.
Sample question

- 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?

A. The Architect  
B. The manufacturer  
C. The distributor  
D. The Contractor
Definitions AIA A201

3.12.1 Shop drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

3.12.2 Product data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate material or equipment for some portion of the Work.

3.12.3 Samples are physical examples which illustrate material, equipment or workmanship and establish standards by which the Work will be judged.
Definitions AIA A201

3.12.4 Shop drawings, Product Data, samples and similar documents are not Contract Documents. The purpose of their submittal is to demonstrate for those portions of the Work for which submittals are required by the Contract Documents the way the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents. Review of the Architect is subject to the limitation of Subparagraph 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action, may be so identified in the Contract Documents. Submittals which are not required by the Contract Documents may be returned by the Architect without action.
AIA A101 OVERVIEW
AIA A101

- Corrdinated with General and Supplentary Conditions of the Contract
- Defines Contract Time
  - Calendar Days
  - Work Days
- Delineation of Documents that are the basis of the Contract.
- Liquidated Damages
- Payment Schedule
AIA A101

- Defines the terms under which the Contractor will perform.
- Defines Architect as Initial Decision Maker.
- Defines the terms and frequency of Payments.
- Contractually binds Contractor to maintain insurance.
- Defines retainage amounts.
- Defines Binding Dispute Resolution.
Sample Question

During the course of construction, liability insurance should be maintained by which of the following?

I. The mortgagee.
II. Trade unions.
III. Surety.
IV. The Owner.
V. The Contractor.
Coordinated Documents

2.6.4.1 The Architect shall review and approve or take appropriate action upon the Contractor’s submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed on the Contract Documents. The Architect’s action will be taken with such reasonable promptness as to cause no delay in the Work of in the activities of the Owner, Contractor or separate contractors, while allowing sufficient time in the Architect’s professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect’s review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect’s approval of a specific item shall not indicate approval of an assembly of which the item is a component.
The Architect shall review and approve or take appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken with such reasonable promptness as to cause no delay in the Work or in the activities of the Owner, Contractor, or separate contractors, while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining accuracy and completeness of other details, such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment, systems, or materials, which remain the responsibility of the Contractor as defined in the Contract Documents. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.
SPECIFICATIONS
Master Format

- Six-and eight-digit numbering system.
- Three parts of each section
- Categorizes products and activities.
- Used for:
  - Specifications.
  - Filing systems.
  - Life-cycle information systems.
  - Cost Data
Contract Documents
Modification of Bidding Documents

- **Addenda**
  - Issued prior to receipt of Bids and Proposals.
  - Issued prior execution of Agreement.

- **Modifications**
  - After execution of Agreement.
Procurement Requirements

- Provisions are not in force during Construction Phase.
  - Unless specifically incorporated into the Agreement.
- Should reference, not repeat, Division 01.
- Must address separate requirements.
  - Substitutions after award of contract.
Invitation to Bid

Figure 5.2-A
Sample Invitation to Bid

Jones and Brown, Architects
5555 Main Street
Smithville, OH 44000
Phone (999) 888-7777

STATE UNIVERSITY SCIENCE BUILDING
Project No. 3813
October 1, 2003

You are invited to bid on a General Contract, including mechanical and electrical work, for a two-story, thin-shell concrete, circular Science Building, approximately four hundred feet in diameter. Bids shall be on a stipulated sum basis; segregated bids will not be accepted.

Project is to be completed within 480 calendar days from the date of award of contract.

The State University Board of Governors will receive bids until 3:00 p.m. Eastern Standard Time on Tuesday, November 2, 2003, at 233 Uptown Street, Room 313, Smithville, Ohio. Bids received after this time will not be accepted. Bids will be opened publicly and read aloud immediately after specified closing time. All interested parties are invited to attend.

Procurement Documents may be examined at the Architect's office and at:

The Plan Center
382 West Third Street
Smithville, OH

Associated Plan Bureau
1177 South Barnes
Smithville, OH

Copies of the Procurement Documents may be obtained at the Architect's office in accordance with the Instructions to Bidders upon depositing the sum of $100.00 for each set of documents.

Any bidder, upon returning the documents in good condition immediately following the public opening of the bids, shall be returned deposit in full. Any non-bidder returning the documents in good condition will be returned the sum of $75.00.

Bidders are required to be prequalified for this project and may obtain appropriate qualification forms from the Architect's office.

Bid Security in the amount of five percent of the bid must accompany each bid in accordance with the Instructions to Bidders.

The Board of Governors reserves the right to waive irregularities and to reject bids.

By order of the Board of Governors

State University
Smithville, Ohio
Hiram J. Downe, Secretary
Advertisement for Bids

Figure 5.2-B
Sample Advertisement for Bids.

A. Project Identification:
Name, project number, and date of issue. Name and address of architect or engineer.

B. Description of Work

C. Type of Bid

D. Time of Completion
(Not included in this sample)

E. Prebid Meeting
(Not included in this sample)

F. Bid Opening

G. Examination and Procuring of Documents

H. Bidder's Qualifications
(Not included in this sample)

I. Bid Security

J. Owner's Right to Reject Bids

K. Laws and Regulations: usually required for legal advertisements

ADVERTISEMENT FOR BIDS

Bids: November 2, 2003
STATE UNIVERSITY
SCIENCE BUILDING
SMITHVILLE, OH
Project No. 3813

October 1, 2003
Jones and Brown, Architects
5555 Main Street
Smithville, OH 44000
Phone: (999) 888-7777

The Board of Governors, State University, Smithville, Ohio, will receive sealed bids on a General Contract, including mechanical and electrical work, for a two-story, thin-shell concrete, circular Science Building, approximately four hundred feet in diameter.

Bids shall be on a stipulated sum basis; segregated bids will not be accepted.

The State University Board of Governors will receive bids until 3:00 p.m. Eastern Standard Time on Tuesday, November 2, 2003, at 233 Uptown Street, Room 313, Smithville, Ohio. Bids received after this time will not be accepted.

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Bid Security in the amount of five percent of the bid must accompany each bid in accordance with the Instructions to Bidders.

Any bidder upon returning the documents in good condition immediately following the public opening of the bids, shall be returned the deposit in full. Any non-bidder returning the documents in good condition will be returned the sum of $75.00.

Contracts for work under this bid will obligate the Contractor and subcontractors not to discriminate in employment practices. Bidders shall submit a compliance report in conformity with Executive Order No. 11246.

This contract is Federally assisted. The Contractor must comply with the Davis-Bacon Act, the Anti-Kickback Act, and the Contract Work Hours Standard.

The Board of Governors reserves the right to waive irregularities and to reject bids.

By order of the Board of Governors

STATE UNIVERSITY
SMITHVILLE, OHIO
General Requirements

- Expands broad provisions of the General Conditions of the Contract.
- Governs execution of the Work of all Sections.

- “Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section”
Division 1

- Specify administrative requirements.
- Procedural requirements.
- Temporary facilities.
- Administrative and procedural requirements for Construction Administration.
- Applies to Division 2 through 50.
Division One Examples

- Alternates
- Submittals
- Quality Controls
- Temporary Facilities
- Delivery, Storage and Handling
- Substitutions
- Start-up
- Contract Closeout
Overview of Division 2-50

- Selective Demolition
- Concrete
- Masonry
- Finishes
- Electrical
- Heating, Ventilating and Air Conditioning
- Site Work
- Landscaping
Types of specifications

- Performance
- Proprietary
  - Open
  - Closed
- Used for:
  - Filing systems.
  - Life-cycle information systems.
  - Cost Date
Document Relationship

- **Conditions of the Contract**
  - Legal provisions which relate to entire project.

- **Division 01**
  - General work which relates to entire project.

- **Divisions 02-50**
  - Specific requirements relating to a specific product or system.
Part 1 – General

- Summary
- Price and Payment Procedures
- Administrative Requirements
- Quality Requirements
- Temporary Facilities and Controls
Parts 2 and 3

- PART 2 PRODUCTS
  - Product Requirements.
  - Performance Requirements.

- PART 3 EXECUTION
  - Execution and Closeout Requirements.
  - Life Cycle Activities.
Sample Question

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

A. The Bidding Requirements
B. The Owner-Contractor agreement
C. The Supplementary Conditions
D. Division 1, General Requirements
Hierarchy Example

- **Conditions of the Contract**
  - Inherent part of Agreement.
  - Modified by Supplemental Conditions.
  - Agreement govern *entire* contract.

- **Division 01**
  - Inherent part of Specifications.
  - Governs Divisions 02 through 50.
  - Expands detail.
Specification Writing

Figure 5.6-D
AIA Document A201, Levels of Detail for General Administrative and Procedural Requirements.
Specification Writing

- Gives the design professional significant control.
- Match the requirements to the project.
- Apply the requirements:
  - Specify what you require.
  - Don’t require what you won’t insist on.
Specification Writing

- Don’t over specify:
  - Say what you mean, mean what you say.
  - Additional costs to project.
  - Excessive obligations for administering the contract.
Methods of Bidding

- Direct
- Negotiated
- Invited
- Public
Sample Question

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?

- A. Cost-plus-fee
- B. Cost-plus-fee with a guaranteed maximum price
- C. Stipulated sum
- D. Unit price
Project Delivery

- Design/Bid/Build
- Design-Build
- Construction Management
  - As the Constructor
  - Advisor
- Integrated Project Delivery
Cost Estimates

- Limited responsibility defined in AIA B101
- Area/volume estimates
- Subsystem costs estimate
- Detailed cost estimate
- Good bidding documents=good estimates
Definitions

- **Base calendar** – specifies working and non-working time.
- **Baseline plan** – original schedule used to track progress.
  - Tasks – start and finish date
  - Resources
  - Assignments
- **Duration** – total span of active working time for an activity.
- **Logic** – the dependencies between activities.
  - Project network diagram – PERT chart.
  - Gantt Chart scheduling
Definitions

- Slack (Float) – time that an activity can slip
  - Free float
  - Total float
  - Float belongs to whomever needs it first.

- Task relationships
  - Successor
  - Predecessor

- Task dependencies
  - Finish to Start
  - Start to Start
  - Finish to Finish
  - Start to Finish
Definitions

- Constraints – flexible or fixed limitation on task for start or finish.
- Flexible – task not tied to a date
  - As soon as possible
  - As late as possible
  - Finish no earlier than (scheduled from start date)
  - Finish no later than (scheduled from finish date)
  - Start no earlier than (scheduled from start date)
  - Start no later than (scheduled from finish date)
Definitions

- Inflexible – task tied to a date
  - Finish no earlier than (scheduled from finish date)
  - Finish no later than (scheduled from finish date)
  - Must finish on – (All projects)
  - Must Start On – (All projects)
  - Start no earlier than (scheduled from finish date)
  - Start no later than (scheduled from start date)
Definitions

- Critical path method – calculating the duration of project based on task durations dependencies.
- Lag time – delay between tasks that have dependencies.
- Milestone – unmovable reference point for a major event.
- Progress bar – displays completion of a task.
Definitions

- Summary Task – outline bar summarizing sub-tasks
- WBS – organizes tasks for reports.
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

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

- Graphic delineations of design and project scope.
- Quantity and limit of work.
- Related work not part of the Contract.
- Phasing
- Closely coordinated with Project Manual.
Sample Question

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

A. Rebars are being placed by hand.
B. Concrete is being placed by hand.
C. Concrete is being covered to retain heat.
D. Concrete is being covered to prevent the rebars from rusting.
Accuracy counts
Building materials and accuracy
It ain’t a watch, it’s a building - Tolerance reality check

Building products require tighter tolerances.

3 5/8” Metal stud

7 5/8” CMU

Reality of built environment?

¼ inch

Coordinate partition types with plan dimensions.

Draw accurately.

Actual size.

Avoid antagonizing “watchmaker” dimensions.
It ain’t a watch, it’s a building - Tolerance reality check

- Know the tolerances of the building materials
- Refer to trade industry standards
  - Steel
  - Concrete
  - Masonry
    - Standard brick
    - Utility brick
    - CMU
- If you don’t know ASK!
- Check published industry association standards
  - ACI
  - IMI
  - Steel Manual
Tolerance reality check

- Code minimums - are just that - MINIMUMS
  - accommodate workmanship tolerances
  - incorporate additional space
  - be aware of door approaches
- Incorporate a little wiggle room
- Incorporate turning radii, approach clearances
- Two objects can not occupy the same space
  - do not show furring tight to masonry
  - do not show doors tight to adjacent walls
  - do not show appliances/equipment/furniture tight to a corner
Drawing Coordination

Executive Display Board

Tryptic
Drawing Coordination

COORDINATION OF DRAWINGS & SPECIFICATIONS

Figure 1.2
Drawing Coordination?
Drawing Coordination?
General Tips…

- Study comprehensively…
- Save practice tests until the end.
- Don’t get stuck.
- Answer every question!
QUESTIONS...?
The Testing Software

- “Generic interface,” intended to be equally unfamiliar to all exam candidates
- Complex program with a simple purpose – inputting a design solution to a given set of parameters
- “Rubber stamp” mentality
- Practice makes perfect!!
Delineate a building section that integrates structural, mechanical, and lighting systems and incorporates life safety considerations.
Graphic Vignette

- Don’t be the designer: You are not graded on design.
- It’s all about time management
- Note the code requirements for each section
- Fully read and understand the program.
  - Take notes for the major requirements.
- Draw in ortho and keep things orthogonally.
- Don’t over think issues.
  - It’s not the real world.
  - It ain’t gotta be beautiful!
- RTFQ!
Graphic Vignette

- Note where section is cut.
- DRAW OVER THE PLAN.
- All ceilings and roofs are flat
- Ceiling height is constant.
- Look for the largest combined joist and duct.
  - Check for this at the riser.
- Draw grade above section.
- It is a slab on grade-
  - Draw the ON GRADE!
- Depths of footing is either top or bottom – UNO.
- Use sketch rectangle for ceiling heights
Graphic Vignette

- Footings under all bearing walls – including interior wall.
- Continuous rated partitions.
  - Floor to underside of deck.
- When drawing joists
  - Use move group to move vertically
  - Bearing on each end.
- Follow program requirements to determine parapet heights.
- Walls align with plan.
- Include space for lights.
- Include space for clerestory.
- Sketch circle or rectangle for clearance check
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.
<table>
<thead>
<tr>
<th></th>
<th>1st</th>
<th>2nd</th>
<th>HIGH VOLUME</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ceiling</strong></td>
<td>8'-4&quot;</td>
<td>8'-4&quot;</td>
<td>26&quot;</td>
</tr>
<tr>
<td><strong>Wall</strong></td>
<td>8&quot;</td>
<td>8&quot;</td>
<td>8&quot;</td>
</tr>
<tr>
<td><strong>Duct</strong></td>
<td>24&quot; (36x24)</td>
<td>24&quot; (36x24)</td>
<td>12&quot;</td>
</tr>
<tr>
<td><strong>Joist</strong></td>
<td>24&quot; x 8&quot;</td>
<td>24&quot; x 8&quot;</td>
<td>26&quot; x 8&quot;</td>
</tr>
<tr>
<td><strong>Deck</strong></td>
<td>4&quot;</td>
<td>4&quot;</td>
<td></td>
</tr>
<tr>
<td><strong>Foundation</strong></td>
<td>13'-6&quot;</td>
<td>13'-0&quot;</td>
<td>30'-4&quot;</td>
</tr>
</tbody>
</table>

**Room Per:** 2'-6" 2'-6" 2'-6"

- Top Churn Bearing must be max. 13.25'
- Ceiling/roof must flat 1 level
- Non-bearing columns & lobby walls 1 hr
- Exterior/beside walls: 2 hr
- Ceiling HTS: V V
- Non-rate (reinforced concrete)
- Rated fire/smoke includes
- Min RM for all from above ceiling
- Tough below joints
- 6" liquid
- Parging 2'-8'
- Frost Depth: 3'-0"
Graphic Vignette
Graphic Vignette
Building Section
Sample PASSING Solution
Building Section
Sample FAILING Solution
General Tips…

Clear your head.
Remember – it’s not AutoCAD…
... or design studio.
Practice makes perfect...
... but don’t over-practice!!
Take your time.
Follow all of the instructions!!
Don’t second-guess yourself.
QUESTIONS...?
THANKS!