

## Construction Drawings – Chapter 25 – Ballast

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### General:

1. Show technically correct ways of meeting functional requirements of the design:
  - a. Keep water out
  - b. Distribute power
  - c. Etc...
2. Drawings communicate clearly to all involved in a project
3. Documents must be coordinated with specifications and consultants work
4. Drawings are part of the contract and are legal documents

### Functional Characteristics of Details:

1. compatibility with design intent
  - a. constantly check the development of a detail against its original purpose, performance requirements, and desired appearance.
2. Structural Integrity
  - a. Consider loads, pressure, forces acting on the detail
3. Safety
  - a. Structural
  - b. Fire safety
  - c. Safety with human contact
4. Durability and Maintainability
  - a. Resistance to ultraviolet radiation
  - b. Temperature changes
  - c. Corrosion
    - i) Pollution
    - ii) Water
    - iii) Atmospheric
  - d. Resistance to:
    - i) Scratching and abrasion
    - ii) Impact
    - iii) Marking
5. Code requirements
6. Construction trade sequencing
  - a. Can construction proceed from one trade to another with the least amount of overlap
7. Fabrication and installation methods
8. Tolerances
  - a. Have been set by trade organizations
  - b. Allow for expected tolerances in detailing
9. Costs
  - a. Materials, labor, and equipment of construction
  - b. Life cycle costs
  - c. Need balance between
    - i) Client needs
    - ii) Initial costs
    - iii) Life cycle costs
  - d. It is up to the Architect to educate the Owner of choices and ramifications of design and detailing decisions.
  - e. The cost of a portion of the building in proportion to the total building is important to understand.
10. Material Availability
  - a. Consider locality when selecting material
11. Building movement and substrate attachment
  - a. One material must provide an appropriate base for the attachment of another
    - i) Rigid – if one material moves, both move
    - ii) Rigid but Adjustable – curtain wall anchored to floor beam

- iii) Flexible – movement is allowed
  - b. The base material must be compatible with the coating or the joining material
  - c. Movement is inevitable – it is always present
- 12. Conformance to industry standards
  - a. Certain common methods of building are considered industry standards
  - b. Methods:
    - i) Through practice and experience
    - ii) Recommendations of trade associations and testing agencies
    - iii) From building codes
  - c. Conforming to standards:
    - i) Increases the likelihood the detail will work
    - ii) Minimizes potential liability if something goes wrong
  - d. Deviation from industry standards:
    - i) Only after precise definition of the performance requirements specified for the building assembly
    - ii) After thorough research of the materials and construction techniques being proposed to meet the requirements
    - iii) Careful analysis of how the construction might actually perform
- 13. Resistance to Moisture and Weathering
  - a. Most troublesome area of detailing
  - b. Considerations
    - i) Permeability of the material
    - ii) Durability of the material
    - iii) Aggravating circumstances
    - iv) Joints
    - v) Capillary action
    - vi) Outlets
    - vii) Sealants
- 14. Thermal Resistance
  - a. Heat transfer needs to be investigated
    - i) Heat loss
    - ii) Heat gain
- 15. Other properties to consider:
  - a. Acoustical
  - b. Light reflection
  - c. Abrasion resistance
  - d. Resistance to termites or other insects
  - e. Holding strength of fasteners
  - f. Resistance to fading
  - g. Mildew resistance
  - h. Color
  - i. Finish

### **Organization and Layout of Construction Drawings**

1. the intent is to present the information in a logical sequence so that the contractors and others can find what they need without confusion.

### **Coordination**

1. the primary responsibility for overall coordination is with the architect.
2. Ways to accomplish coordination during the design and production of contract documents:
  - a. Periodic meetings
  - b. Progress prints
  - c. Notify consultants of changes in writing as they occur
  - d. Architect to check and coordinate entire drawing set prior to bid

**Correlation with the Specifications**

1. Specifications are complimentary to the drawings
2. They should work together without duplication or overlapping

## **The Project Manual and Specifications – Chapter 26 – Ballast**

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The Project Manual contains all contract and non-contract documents except the drawings.

### **Organization of the Project Manual:**

1. bidding requirements
2. parts of the contract
3. general and supplementary conditions
4. technical specifications

### **Coordination with the Drawings:**

1. Technical specifications describe the quality of materials and workmanship, and general requirements for the execution of the work, standards and other items that are more appropriately described in written, rather than graphic form.
2. Specifications should contain requirements for all the materials and construction indicated on the drawings.
3. Terminology used in the specifications should match that on the drawings.
4. Dimensions and thickness should only be indicated on one document – either the drawings or the specifications.
5. Notes on the drawings should not describe methods of installation or material qualities; these belong in the specifications.

### **Specifications:**

1. Master Specification is a pre-written text that includes the majority of requirements for a particular specification section.
2. Types of Specifications:
  - a. Prescriptive – sometimes called closed; specify brand names
  - b. Performance – sometimes called open; results you want achieved
3. The following types of specifications are the ones most commonly used:
  - a. Prescriptive (closed) Specifications
    - i) Proprietary Specifications – most restrictive
      - (1) Easier to write and usually short
      - (2) Gives architect complete control over what is installed
      - (3) Do not allow for competitive bidding
    - ii) Base bid with alternates (two types)
      - (1) Lists several approved manufacturers of a product
      - (2) Base bid with “approved equal” language
  - b. Performance (open) Specifications
    - i) Descriptive Specification
      - (1) Detailed written requirements for a material or product and the workmanship required for its fabrication/installation.
      - (2) Typically difficult to write
    - ii) Reference Standard
      - (1) Variation of descriptive
      - (2) Describes a material, product, or process based on requirements (reference standards) set by an accepted authority or test method.
      - (3) Fairly easy to write and relatively short
4. Organization of the Technical Sections
  - a. Masterformat System developed by Construction Specifications Institute (CSI)
  - b. 16 broad divisions that represent major categories of work
    - i) broad-scope sections
    - ii) narrow-scope section
5. Technical Section Outline and Format
  - a. Masterformat Individual sections made up of three parts
    - i) Part 1 – general requirements for the section
    - ii) Part 2 – details specifications for the materials and products

- iii) Part 3 – tells how the product is to be installed
- 6. Specification Writing Guidelines
  - a. Must be complete, accurate, and unambiguous
  - b. Important things to remember:
    - i) Standards and test methods are applicable to the project and are the most recent editions.
    - ii) Do not provide contradictory information
    - iii) Do not include standards that cannot be measured
    - iv) Avoid Exculpatory clauses: phrases that try to shift responsibility to the contractor or someone else in a broad general way.
    - v) Avoid ambiguous phrases (and/or, etc, any)
    - vi) Keep specifications short
    - vii) Describe only one major idea in each paragraph.

## The Primary Contractual Documents – Chapter 27 – Ballast

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2. The Contract documents consist of:
  - a. the owner-contractor agreement,
  - b. general conditions of the contract
  - c. supplementary condition of the contract
  - d. drawings
  - e. specifications
  - f. addenda
  - g. other documents listed in the agreement
  - h. modifications issued after execution of the contract
3. A modification is a:
  - a. Change order
  - b. Construction change directive
  - c. Written order issued by the architect for a minor change in the work
  - d. Written amendment to the contract signed by both parties
4. Approaches to Project Delivery
  - a. Description of the sequence of events necessary to provide an owner with a complete building.
  - b. Selection of people who will design and construct the project
  - c. Establishment of contractual relationship
  - d. Organizing contractors to perform the work
5. Responsibility for Design and Construction
  - a. Traditional method –
    - i) owner hires the architect to design the project
    - ii) owner hires the contractor to build
  - b. The architect acts as the owner's agent, looking after the owner's best interest with no financial stake in the project
  - c. The contractor agrees to finish the project according to the plans and specifications for a fixed price within a certain time period.
  - d. The owner has separate contracts with the architect and the contractor.
  - e. Another method is to have a single entity responsible for both designing and building a project.
    - i) Advantage:
      - (1) allows review by construction experts
      - (2) often include a guaranteed cost
    - ii) Disadvantage:
      - (1) Eliminates the advantages of competitive bidding
      - (2) Potential conflicts because goals of the designers vary from the goals of the contractor
6. Agency
  - a. Legal concept of agency involves three parties:
    - i) Principal (owner)
    - ii) Agent (architect)
    - iii) Third party (contractor)
  - b. The agent works on behalf of the principal and has the authority to perform certain duties.
  - c. In the performance of these duties the agent can legally bind the principal to the third party.
  - d. In contrast to an agent, the contractor is considered a vendor.
7. Contract types
  - a. Contract types are often classified by the primary relationship the owner has with the contractor (or contractors).
  - b. This relationship is called the prime contract.
    - i) Most common type: Single Prime Contract

- (1) General contractor is responsible to the owner and must coordinate the other subcontractors.
    - (2) Advantage: owner has a single source of responsibility
  - ii) Another type: Multiple Prime Contract
    - (1) Major portions of the work are contracted separately with the owner
    - (2) Disadvantage: more difficult for the architect to coordinate
  - iii) Third Type: Many prime contracts:
    - (1) Applied in fast track construction
    - (2) Much more difficult to manage
    - (3) Often requires the use of a construction manager ( if architect is unable to coordinate the effort ).
- 8. Design-Award-Build
  - a. The first and most traditional of the methods of project delivery
    - i) Architect produces drawings and specifications
    - ii) Contractor bids or negotiates contract to build
    - iii) Architect provides contract administration services
    - iv) The owner has separate contracts with the architect and contractor
  - b. Fairly simple because:
    - i) Roles are well defined
    - ii) Work proceeds in a linear fashion
  - c. Coordination problems are minimized
  - d. Contract relationships are straightforward
  - e. Owner receives a fixed price before proceeding with construction
  - f. Disadvantage: one phase must be complete before the next one proceeds
- 9. Fast Track
  - a. Used when the overall time for construction must be compressed
  - b. Overlaps some of the design process with some of the construction process
  - c. Requires many prime contracts and much more coordination
  - d. Can substantially reduce the time and cost of a project
  - e. May require assistance of a CM
    - i) Owner's agent
    - ii) Provides scheduling
    - iii) Early material purchasing
    - iv) Design review related to constructability
    - v) Contract preparation
  - f. CM may guarantee the cost and time of delivery of the project
- 10. Design-Build
  - a. Owner contracts with one entity to provide both design and construction services.
  - b. Design Build firm subcontracts as required
  - c. Advantages:
    - i) Single source of responsibility
    - ii) Administration is direct
    - iii) Fixed price early in the process
    - iv) Total schedule is typically reduced
  - d. Disadvantages:
    - i) Owner doesn't have much control over design
    - ii) Disagreements can occur concerning what was supposed to be included in the design
    - iii) Design build firm has control over the quality of the materials and construction methods used
    - iv) To get what is needed, the client must develop a specific set of performance requirements.
  - e. Many cases – owner hires an architect to act as advisor.
    - i) Architect helps set up performance requirements
    - ii) Evaluates potential design/build firms
    - iii) Administers the contract

- iv) Evaluates the progress of the work against the contract and approved design
  - f. Design build contracts are typically used by owners who have building experience with multiple facilities and who have clearly defined needs that can be stated in performance requirements
11. Owner-Architect Agreements
- a. There are several types of O-A agreements
  - b. Most common is AIA Document B141 – Standard Form of Agreement Between Owner and Architect
    - i) Used on projects where services are based on traditional five phases
      - (1) Schematic design
      - (2) Design development
      - (3) Construction documents
      - (4) Bidding or negotiation
      - (5) Construction Administration
  - c. When asked to perform more extensive services – AIA B161 - – Standard Form of Agreement Between Owner and Architect for Designated Services is used
  - d. All AIA forms do not have to be used, but they have been developed over many years and have become generally accepted by the industry.
12. The Architect's Responsibility
- a. Document B141 – first part outlines scope of basic services according to five phases.
  - b. At the end of each of the first three phases, the architect is to submit cost estimates for construction.
  - c. Bidding and construction – architect assists in:
    - i) Preparation of bidding documents
    - ii) Filing documents with governmental agencies for approval
    - iii) Obtain bids or negotiating proposals
  - d. Intent is all language is to make the owner an active participant – to have the owner assume responsibility.
  - e. Four very important provisions:
    - i) Site visits – visit at intervals appropriate to the stage
    - ii) Not responsible for means of construction – only contractor is responsible
    - iii) Owner and contractor communicate through the architect – architect is central point
    - iv) Review of shop drawings is for conformance with information given and the design intent expressed in the contract documents
  - f. One article of B141 lists services not included unless noted otherwise:
    - i) Programming
    - ii) Extensive site representation
    - iii) Revisions due to owner changes or change in codes/regulations
    - iv) Intent is to clearly communicate to the client what is not considered basic services.
13. The Owner's Responsibility
- a. Provide information
    - i) Program
    - ii) Desired schedule
    - iii) Budget
    - iv) Survey
    - v) Soil tests
  - b. Furnish the services of other consultants
14. Construction Costs
- a. Costs to build the project
  - b. Does NOT include services, a/e fees, financing costs, etc...
  - c. The architects estimate is a best judgement as a design professional
  - d. No fixed limit of construction cost will be established as a condition of the agreement unless agreed by all parties.

- e. Only if this fixed cost is agreed to and the construction bids come in over the agreed fixed cost, does the architect modify the documents at no additional cost to the owner.
15. Additional Services
- a. There is a long list of services not included in the standard services
  - b. These are divided into three parts
    - i) Project representation beyond basic services
    - ii) Contingent additional services
      - (1) If drawings and specs are required based on a change order – the architect is entitled to extra compensation.
    - iii) Optional additional services
      - (1) Services the owner would like but is beyond basic services
      - (2) Examples: programming, tenant planning, verification of work by others
  - c. If additional services are included in the agreement, they are written into the agreement along with the basis for compensation.
16. Other Provisions
- a. Arbitration – claims and disputes are subject to arbitration according to the Construction Industry Rules of the American Arbitration Association, unless both parties agree otherwise.
  - b. Architect's Documents – documents are instruments of a service and belong to the architect (copyright).
  - c. Termination – either party can terminate the agreement on no less than 7 days' written notice if the other party fails to perform according to the terms of the agreement.
    - i) Architect is allowed to suspend performance of services on 7 days' written notice to the owner if the owner fails to make fee payments when due.
  - d. Third Party Claims – one party is protected from claims from other parties with whom there is no direct contractual relationship.
  - e. Hazardous Materials – the architect has no responsibility for the discovery, handling, removal, or disposal of, or exposure of persons to, hazardous materials such as asbestos, PCBs, or other toxic substances.
17. Compensation Methods
- a. Stipulated sum (fixed fee) – fixed sum of money for set services. Reimbursable expenses are in addition to the fee.
  - b. Cost plus fee – architect is compensated for the actual expense to do the job plus a reasonable fee for profit.
    - i) Multiple of direct personnel expense – a multiplier that considers overhead and profit
    - ii) Multiple of direct salary expense – larger multiplier to provide for employee benefits
    - iii) Hourly billing rates – build in the multiplier to the hourly rate so that the client only sees one number for each of the types of people working on the project.
  - c. Percentage of Construction Costs – the professional fee is tied to the cost of construction as a fixed percentage.
  - d. Unit cost method – fees are based on a definable unit, such as square footage, for such work as tenant planning in a leased building or on a per-house basis in a large residential project.
18. Designated Services Agreements
- a. A more extensive range of services than is normal under the B141, AIA Document B161 can be used.
  - b. B161 Standard Form of Agreement Between Owner and Architect for Designated Services.
  - c. Services are broken into 9 categories:
    - i) Predesign
    - ii) Site analysis
    - iii) Schematic design
    - iv) Design development
    - v) Construction documents

- vi) Bidding or negotiations
  - vii) Construction contract administration
  - viii) Post construction
  - ix) Supplemental services
  - d. B162 Scope of Designated Services lists in great detail many of the possible tasks that might be included under each category.
  - e. B161 & B162 must be used together
19. Owner-Contractor Agreements
- a. Variations of agreements are usually based on the method of compensation for the contractor.
  - b. Common document used is AIA A101, Standard form of Agreement between Owner and Contractor
  - c. Identification of Contract Documents
    - i) The first article specifies that the contract documents include:
      - (1) Agreement
      - (2) General and supplementary conditions
      - (3) Drawings
      - (4) Specifications
      - (5) Addenda
      - (6) Modifications
      - (7) Other documents listed in the agreement
      - (8) The purpose of this article is to include all the other documents by reference.
  - d. Basic Provisions
    - i) Provisions common to all contracts:
      - (1) Description of work
        - (a) Includes what is described in the contract documents
        - (b) Exclusions can be spelled out in the Owner-Contractor agreement
      - (2) Times of commencement
        - (a) Construction completion time is measured from this time
        - (b) Date can be a specific calendar day or when contractor is given notice-to-proceed.
      - (3) Time of substantial completion
        - (a) Expressed with a specific date or by a number of calendar days from notice-to-proceed.
        - (b) Time when the Owner can occupy or utilize the work for its intended use.
      - (4) Contract sum
        - (a) States the compensation the contractor will receive for the work.
    - ii) If a particular date is important to the Owner, provisions for Liquidated Damages may be included.
      - (1) Liquidated damages are monies paid by the contractor to the Owner for every day the project is late.
        - (a) Represents anticipated losses the owner will incur if the project is not complete in time.
        - (b) Usually accompanied by a bonus provision for early completion based on saving the Owner will incur for early occupancy.
      - (2) If a penalty clause is included, a bonus provision must be included
    - iii) Progress Payments
      - (1) Periodic payments based on Contractor's application for payment
      - (2) AIA A101 states payment based on percent complete, materials purchased, and in approved storage
      - (3) Percentage is based on a schedule of values that the contractor submits to the architect
      - (4) Certain percentage, usually 10%, called retainage is withheld until final completion of the work.
      - (5) To receive payment, contractor must:

- (a) submit an application for payment to the architect listing the completed work and stored materials according to the schedule of values
  - (b) architect then reviews the application, verifies it, and recommends payment to the owner
  - (c) if there is work in dispute, the architect may choose not to certify payment of all or a portion of the amount until the problem is resolved.
- iv) Enumeration of Contract Documents
  - (1) Article of the contract that lists all of the documents individually
- v) Compensation Methods
  - (1) Ways contractor can be paid for work:
    - (a) Stipulated sum:
      - (i) fixed price the owner agrees to pay the contractor for the work shown in the contract documents
      - (ii) Simple way to arrange things
      - (iii) Owners like it because cost is known when the bids are made
      - (iv) Competitive bidding always uses a stipulated sum method
    - (b) Cost-Plus-Fee:
      - (i) Compensate the contractor for actual expenses plus a fixed fee for overhead and profit
      - (ii) More flexibility than fixed fees
      - (iii) Allow construction to proceed before design is complete
      - (iv) Disadvantage is cost is not known
      - (v) Cost not known can be mitigated with:
        - 1. Guaranteed maximums
        - 2. Target prices with incentives
        - 3. Partial cost guarantees
          - a. Involve getting fixed prices from certain subcontractors or material suppliers
    - (c) Unit Prices:
      - (i) Where it is not possible to firmly establish quantities at the time of bid, a unit price can be set
      - (ii) Where changes or additions are anticipated, the contractor can be requested to include unit prices in the bid.
- vi) General Conditions of the Contract
  - (1) AIA Form A201 –one of the most important parts of the entire contract documents.
  - (2) Incorporated by specific reference into both the Owner-Architect & Owner-Contractor agreements
  - (3) The Owner:
    - (a) Article 2 –duties, responsibilities, and rights of the owner
    - (b) Furnish evidence that financial arrangements have been made to fulfill the owner’s obligations (pay the contractor)
    - (c) Must provide free of charge necessary copies of the drawings and project manuals
    - (d) Owner may order the contractor to stop work until contractor corrects work not in conformance with the contract documents
    - (e) Owner has the right to carry out the work if the contractor fails in his/her duties.
      - (i) Contractor has 7 days from written notice from the owner to commence corrections.
  - (4) The Contractor:
    - (a) Contractor is solely responsible for the means, methods, and techniques of construction and for coordinating the work under the contract.
    - (b) Contractor is not liable to the owner or architect for damage resulting from errors or omissions in the contract documents.

- (c) Contractor is not responsible to ascertain that the contract documents are in accordance with building codes, ordinances, or other regulations
- (d) If the contractor notices some variance – he must notify the architect and owner in writing. If not – the contractor assumes responsibility for it.
- (e) The contractor is obligated to provide a schedule for Owner/Architect review.
- (f) Contractor will indemnify and hold harmless the owner, architect, architect's consultants and agents against claims, damages, and expense arising out of performance of the work.
- (i) To indemnify is to secure against loss or damage
- (5) Administration of the Contract
  - (a) Article Four (4) states the architects role and responsibilities in contract administration
  - (b) Architect visits sight at regular intervals
  - (c) Architect does not have control over construction means, methods, techniques, procedures, or safety precautions
  - (d) Architect has authority to reject work that is not in conformance with contract documents or design intent
  - (e) Architect does not have the right to stop work
  - (f) Architect reviews shop drawings and other submittals for design intent
  - (g) Architect prepares change orders
  - (h) Architect interprets and decides on matters concerning the performance of the contract
  - (i) Architects decisions regarding aesthetic effect are final if consistent with intent of contract documents
  - (j) Procedures for dealing with claims and disputes are outlined in this article
- (6) Construction by Owner or by Separate Contractors
  - (a) Owner has the right to perform construction on the project with the owner's own forces.
  - (b) Exercising this right does require the owner to provide for coordination of work.
- (7) Changes in Work
  - (a) After execution of the contract
    - (i) Made by written change order
    - (ii) Construction change directive
    - (iii) Minor change in the work
  - (b) A change order is based on a written agreement among the owner, contractor, and architect concerning the extent of the change and how it affects cost and schedule.
  - (c) Construction Change Directive only requires agreement between the owner and architect and may or may not be agreed to by the contractor. When final determination of cost and time changes are made through submittals by the contractor and reviewed by the Architect and Owner, a change order is issued.
  - (d) Minor Changes can be made by the Architect alone.
- (8) Time
  - (a) Contract Time is the period from the starting date established in the agreement to the time of substantial completion, including authorized adjustments.
  - (b) Contractor is expected to proceed expeditiously with adequate work forces and complete the work within the allotted time.
- (9) Payments and Completion
  - (a) Contractor makes monthly applications
  - (b) Architect reviews the applications and certifies them
  - (c) Owner signs the check

- (10) Liens
  - (a) Mechanics Lien – a claim by one party against the property of another for satisfaction of a debt.
  - (b) Common method for an architect, contractor or supplier to gain payment
  - (c) Property with a lien cannot be sold or transferred until the lien is satisfied. Except through foreclosure.
  - (d) If a lien is not paid, the property can be foreclosed by the lien holder, the lender, or a taxing entity.
  - (e) General conditions of the contract provide protection to the owner by requiring the contractor to submit a release of liens before final payment is made or retainage is released.
  - (f) Contractor must also provide an affidavit of release of liens stating that all obligations have been satisfied.
- (11) Protection of Persons and Property
  - (a) Contractor is exclusively responsible for on-site safety and precautions against damage to persons or property.
  - (b) Provisions concerning PCBs and Asbestos are covered in the general conditions – if found the work is to stop and the architect and owner are to be notified in writing, and work cannot start until the danger has been removed.
  - (c) If damage to work is sustained due to inadequate protection, the contractor must repair or correct it; this does not include damages caused by acts of the architect or owner.
- (12) Insurance and Bonds
  - (a) Owner and Contractor must maintain insurance to protect against various types of losses.
  - (b) Architect is NOT responsible for giving advice to either the owner or contractor on matters related to insurance and bonds. (architects' professional liability insurance typically exclude such advice from coverage.)
  - (c) Contractor
    - (i) Workers compensation
    - (ii) Damage to the work
    - (iii) Personal injury
    - (iv) Motor vehicle insurance
    - (v) Claims involving liability
  - (d) Amount of coverage should not be less than the limits of liability specified in the contract
  - (e) Insurance must be maintained from beginning of work until final payment without interruption.
  - (f) Architect shall have copies of contractors insurance certificates and will not issue a payment until received and reviewed.
  - (g) Owner
    - (i) Maintain liability insurance to protect against losses and claims arising from operations under the contract.
    - (ii) Insurance for property damage and loss of use.
      - 1. Property insurance – all risk policy for full value of work
  - (h) Bonds may be required of the contractor by the owner to protect against default by the contractor.
- (13) Uncovering and Correction of the Work
  - (a) If the contract documents state that the architect is to observe certain portions of work prior to being covered or enclosed, the contractor must uncover the work at no cost to the owner or architect.
  - (b) If above is not mentioned – the cost is borne by the owner through change order (only if work is in conformance with contract documents.)

- (c) Contractor must correct work rejected by the architect that is not in conformance with the contract documents. Contractor must bear the costs of such corrections.
- (d) If the owner chooses, he/she may accept non-conforming work as long as it meets code. A written change order will be required outlining the change. If appropriate, the contract amount maybe reduced.
- (14) Termination or Suspension of the Contract
  - (a) Either the Owner or Contractor may terminate the contract for valid reasons that are enumerated in the general conditions.
  - (b) Contractor may terminate the contract if work has stopped for more than 30 days, through no fault of the contractor. Seven days written notice is required. Some causes for terminating:
    - (i) A court order
    - (ii) An act of government
    - (iii) Failure by the architect to issue a certificate of payment without cause
    - (iv) Repeated suspensions by the owner
    - (v) Failure of the owner to provide proof of ability to fulfill financial obligations.
  - (c) If the architect certifies sufficient cause, the owner can give 7 days notice and terminate the contract if the contractor:
    - (i) Fails to supply enough workers or materials
    - (ii) Fails to pay subcontractors
    - (iii) Disregards laws and ordinances
    - (iv) Is guilty of substantial breach of contract
- (15) Supplementary Conditions of the Contract
  - (a) Covering conditions unique that are not covered in the standard document.
  - (b) Each job must be customized to accommodate different clients
  - (c) Information unique to each project can be included in one of four areas:
    - (i) Bidding requirements
    - (ii) Owner/contractor agreement
    - (iii) Supplementary conditions
    - (iv) Division 1 of the specifications

## **Bidding Procedures And Documents – Chapter 28 - Ballast**

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1. Bidding Procedures
  - a. Prequalification of Bidders
    - i) Purpose is to select only those contractors who meet certain standards of
      - (1) Reliability
      - (2) Experience
      - (3) Financial stability
      - (4) performance
    - ii) allows owner to review contractor's bids based on price, personnel, and completion time.
    - iii) Prequalification is usually based on:
      - (1) Financial qualifications
      - (2) Personnel
      - (3) Experience
      - (4) References
      - (5) Size
      - (6) Bonding capability
      - (7) Special qualities
  - b. Advertising for Bids
    - i) Two ways to notify prospective bidders:
      - (1) Advertising in newspapers and trade journals
      - (2) Invitation to bid
  - c. Availability of Bid Documents
    - i) Generally made available through architects office.
    - ii) Usually a deposit is taken on the documents – returned after bidding if the documents are in a usable form
    - iii) In most large cities – plan rooms get documents for contractors to review.
  - d. Substitutions
    - i) During bidding, many contractors request substitutions be considered
    - ii) Conditions of substitution review shall be outlined in the instructions to bidders.
    - iii) Bidder is typically required to submit a request for approval at least 10 days prior to bid opening
    - iv) Burden of proof rests on the bidder
    - v) If approved, the architect issues a notice to all bidders
  - e. Addenda
    - i) A written or graphic document issued prior to execution of the contract
    - ii) Clarification or change to the construction documents
    - iii) Sent to all registered bidders not later than 4 or 5 days before receipt of bids.
  - f. Pre-Bid Conference
    - i) Meeting with the owner, architect and bidders pre the bid
    - ii) Bidders can ask questions
    - iii) Owner and architect can emphasize particularly important conditions of the project
    - iv) Notes should be taken and sent to all bidders whether in attendance or not.
  - g. Bid Opening
    - i) Instructions to bidders will include date, time, and place for the bid opening and is strictly observed
    - ii) Bids received after the opening time should not be accepted
    - iii) Architect usually prepares a bid log – usually made available to all bidders for review
    - iv) There should be no announcement of the apparent low bid at the bid opening
      - (1) The architect should thank everyone for submitting
      - (2) Architect should state that the submissions will be reviewed and a decision of award will be made within a certain time (usually 10 days).
      - (3) Decision should be sent to all bidders.

- v) If at the opening, a bidder discovers and can support the claim that a mathematical error was made, the bidder is usually allowed to withdraw
- h. Evaluation and Awarding of Bid
  - i) Architect assists the owner in evaluating the bids.
  - ii) This typically requires review of:
    - (1) Lowest proposed bid
    - (2) Prices for alternates
    - (3) Substitutions
    - (4) List of proposed subcontractors
    - (5) Qualification statements
    - (6) Other documents required by instructions to bidders
  - iii) Owner has the right to reject any and all bids
  - iv) Owner has the right to reject bids not accompanied by the required bonds or other documentation
  - v) Owner has the right to reject bids that are in any way incomplete or irregular
  - vi) If all the bids exceed the project budget and the owner-architect agreement states a fixed limit on construction, the owner has four options:
    - (1) Rebid (or negotiate)
    - (2) Authorize an increase in construction cost
    - (3) Work with the architect to revise the scope
    - (4) Abandon the project
  - vii) Rebidding seldom results in any savings unless the marketplace is changing rapidly.
  - viii) Revision requires extra cost to the architect for revising the documents.
  - ix) Alternates are a flexible form of deleting or substituting alternative materials or elements to reduce costs.
- 2. Bidding Documents
  - a. Usually prepared by the architect using standard AIA forms
  - b. Some commercial clients who engage in a great deal of building have their own forms and procedures
  - c. Bidding Documents are bound into the project manual but are NOT part of the contract documents.
  - d. Bidding documents usually include the following:
    - i) Advertisement or invitation to bid
      - (1) Public building projects require an invitation to bid be placed in newspapers and trade journals
      - (2) Pre-qualified bidders get invitations to bid
      - (3) Invitation is to be bound into the project manual
    - ii) Instructions to bidders
      - (1) Outline procedures and requirements that bidders must follow
      - (2) Describe how the bids will be considered
      - (3) Describe submittals required of the successful bidder
      - (4) AIA A701, Instructions to Bidders is often used
      - (5) Instructions to bidders may include the following items:
        - (a) Bidder's representation- bidder represents that the documents have been read and understood, visited the site, reviewed the plans and specifications
        - (b) Bidding Documents – form states where documents may be obtained, provisions for bid security, and how to handle errors found in the documents
        - (c) Substitutions – procedure required for submitting substitution proposals. No substitutions should be considered after the contract award.
        - (d) Bidding Procedures – describes how the bid form is to be filled in, what kind of bid security is to accompany the bid, procedure for submitting the bid, provisions for modification and withdrawal of bids.

- (e) Consideration of Bids – procedure for opening and reviewing bids is explained. Conditions of rejection, evaluation, and conditions of award are included.
      - (f) Bonds – required bonds and time during which they must be delivered are outlined. Cost of bonds are included in the bidders price.
    - iii) Bid forms
      - (1) A standard form that bidders enter the required information
      - (2) Makes it easier to compare and evaluate bids
      - (3) Bid form should include:
        - (a) Space to write the amount of the base bid (numbers and words)
        - (b) Price for alternates
        - (c) Unit prices
        - (d) Number of days in which the bidder proposes to do the work
        - (e) Space for acknowledgement of addenda
      - (4) Form must be signed by someone legally empowered to bind the contractor
    - iv) Bid security information
      - (1) Required to ensure the successful bidder will enter into a contract with the owner
      - (2) Form of security may be:
        - (a) Certified check
        - (b) Cashiers check
        - (c) Bid bond
      - (3) Bid security can be used to make up the difference between low bidder and next lowest bidder
      - (4) Amount is usually fixed or percentage of bid (5% typically)
    - v) Performance bond, if required
      - (1) Statement by a surety that obligates them to complete construction if the contractor defaults.
      - (2) Mandatory on public work
      - (3) Advisable on private work
      - (4) Cost is paid by the owner and is included in the construction cost
      - (5) Architect and owner verify surety is reputable and able to issue bonds in the state that work is going on
      - (6) Some states do not accept surplus-lines carrier not based in their state.
    - vi) Labor and material payment bond, if required
      - (1) Protection against liens – contractors and suppliers will be paid
  - e. Other documents that are sometimes added are:
    - i) Qualification forms
    - ii) Subcontractor list form
    - iii) Certificates of insurance
    - iv) Certificates of compliance with local laws and ordinances
    - v) Information available to bidders
      - (1) Geotechnical data
3. Cost Control
  - a. It is only with bidding or final negotiation that the owner receives a firm price on the project.
  - b. If the architect has done a reasonable job of tracking design changes the bid price should be fairly close to the estimated amount.
  - c. Bidding in the Marketplace
    - i) Bidding is affected by the construction marketplace
    - ii) Lean times – more competitive pricing
    - iii) Plentiful times – bidding gets pricey
    - iv) Owner and architect need to be aware of this.
    - v) Flexibility in the owner's schedule can be advantageous
  - d. Effects of Documents on bids

- i) Poorly prepared drawings and specification result in unknowns that push up costs
- ii) Complete and clearly coordinated drawings give contractors confidence in scope and pricing is reasonable
- e. Alternates
  - i) Pricing for a variation in the bidding documents
  - ii) Alternates allow the owner flexibility in modifying the cost of construction
  - iii) Two types:
    - (1) Add-Alternates
    - (2) Deduct-Alternates
  - iv) Should not be used as an alternative to conscientious cost estimating
  - v) Should not be used to favor one contractor over another
- f. Unit Prices
  - i) Set costs for portions of work where quantity may not be known or setting a price is desired
  - ii) Space should be provided on the bid form for both add and deduct amounts for unit prices

## Construction Administration Services – Chapter 29 – Ballast

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1. Submittals
  - a. Shop drawings, samples, and product data
  - b. Shop drawings
    - i) Show how work is proposed to be supplied and installed to conform to the requirements of the contract documents
    - ii) Usually very detailed
  - c. Sample
    - i) Physical example of a portion of the work
    - ii) Samples become standards of appearance and workmanship
  - d. Product Data
    - i) Include brochures, charts, performance data, catalog pages, and other information that illustrate a portion of work
  - e. Submittals are NOT contract documents
  - f. General contractor is required to review the submittals and approve them
    - i) By reviewing them, the contractor represents that field measurements have been verified, materials have been checked, and other construction criteria have been coordinated
    - ii) If not signed and checked by the contractor the architect should return them immediately
  - g. Architect reviews for general conformance to the plans and design intent.
  - h. Architect is not responsible for determining accuracy of measurements and completeness of details, or verifying quantities, or for checking fabrication or installation procedures.
  - i. The architect's review does not relieve the contractor of his responsibilities under the contract documents.
  - j. Architects remarks:
    - i) No exceptions taken
    - ii) Marked corrections should be made
    - iii) Revise and resubmit
    - iv) Rejected
2. Changes in the Work
  - a. Changes may be necessitated by:
    - i) Errors discovered in the documents
    - ii) Unforeseen site conditions
    - iii) Design changes requested by the owner
    - iv) Rulings of building code officials
    - v) Many other factors
  - b. During construction, changes are accomplished in one of three ways:
    - i) Minor changes in the work
    - ii) Construction change directives
    - iii) Formal change order
  - c. Minor changes in the work
    - i) Change does not involve a modification to the contract sum or time line
    - ii) Architect issues a written order
  - d. Construction Change Directive
    - i) When a change must be made immediately and the owner and contractor cannot agree on the cost or time change, the architect will issue a construction change directive.
    - ii) Both architect and owner must sign. Contractor signature not required
    - iii) Directive outlines change and proposed means of evaluating cost and time
    - iv) The contractor must proceed with the work:
      - (1) If agrees – change order is created
      - (2) If disagrees – architect is responsible for determining final adjustment to cost and time based on costs or savings attributable to the work plus:

- (a) Costs of related equipment
  - (b) Costs of supplies
  - (c) Cost of premiums for bonds and insurance
  - (d) Cost for field supervision
  - (e) Overhead and profit
- e. Change Orders
- i) Document authorizing a variation from the original contract documents that involve a change in contract cost and/or time
  - ii) Technically issued by the owner, but is prepared by the architect
  - iii) Any of the three parties may suggest a change order
  - iv) Normally architect submits a proposal request to the contractor
  - v) Contractor responds with cost estimate and time
  - vi) If acceptable, owner initiates through the architect, a change order
3. Field Administration
- a. Construction Observation
- i) Part of basic services, the architect visits the site at intervals appropriate to the stage of construction or as agreed to in writing
  - ii) Purpose is to become familiar with the progress and quality of the work and if it is in accordance with the contract documents
  - iii) Number and timing of the visits are left to the judgement of the architect
  - iv) During each visit, the architect should make complete notes of the observations and include them in field reports.
  - v) Copies of the field reports are sent to the owner to keep him informed of the progress
  - vi) Architect is not responsible for exhaustive or continuous on-site inspections (unless written into the contract)
  - vii) Architect is not responsible for the contractor's failure to carry out the work, for means and methods, or safety precautions
- b. Rejecting Work
- i) Architect has the authority to reject work that does not conform to the contract documents
  - ii) Reasons for rejecting work should be carefully documented, and the owner should be kept well informed
  - iii) Architect has the right to request that the contractor uncover work for inspection
  - iv) The Owner has the right to accept non-conforming work and to adjust the contract sum if appropriate
- c. Safety
- i) Contractor is solely responsible for safety on the job site.
  - ii) If the architect volunteers suggestions or directions concerning construction means and techniques in regards to safety issues, legal responsibility can be assumed and the architect can be held liable for accidents or other problems.
  - iii) If the architect observes an obvious safety violation, he should call it to the attention of the contractor (but not suggest how it can be resolved) and follow up with a notice in writing.
  - iv) If safety problem is not corrected, the architect should notify both the contractor and owner in writing.
- d. Field Tests
- i) Contractor is responsible for making arrangements with testing agencies (if required by contract)
  - ii) Contractor pays for the testing
  - iii) Contractor must notify the architect of when and where tests will be performed
  - iv) Owner pays for tests required outside of the contract documents
- e. Documentation
- i) During the entire construction, the architect should keep complete records of the progress of construction
  - ii) Types of documentation:

- (1) Standard forms used
- (2) Change orders
- (3) Certificates of payment
- (4) Correspondence
- (5) Meeting notes
- (6) Telephone logs
- (7) Written material that records who, what, when, where, etc..

f. Claims

- i) Architect is responsible for reviewing claims and making decisions
- ii) Decisions are final but subject to arbitration
- iii) Worst case – a claim may have to be decided by litigation
- iv) Architect must act on a claim within 10 days of its receipt
- v) Actions include
  - (1) Rejecting the claim in whole or part and give reasons
  - (2) Request additional supporting data
  - (3) Submit a schedule when the architect expects to take action
  - (4) Recommend approval of the claim to the opposing party
  - (5) Suggest a compromise
- vi) If claim is not resolved, the acting party has 10 days for a response
- vii) This action may include:
  - (1) Submitting additional data
  - (2) Modify additional claim
  - (3) Notify the architect that the initial claim remains unchanged
- viii) If the claim is still not resolved, the architect must notify the parties of the architect's decision within 7 days.
- ix) The decision is final and binding, but is subject to arbitration

g. Arbitration

- i) Is an alternative to litigation
- ii) Proceedings per Construction Industry Arbitration Rules Association and any applicable state laws
- iii) Parties submit claims to an arbitrator and agree to abide by the arbitrator's final decision
- iv) Decision cannot be appealed
- v) Speed, economy, and privacy are advantages

4. Progress Payments

- a. Architect is responsible for making sure the amounts requested are consistent with the amount of work actually done and the amount of materials stored
- b. Intermediate Payments
  - i) Contractor must submit a notarized application for payment to the architect 10 days prior to date established for each payment
  - ii) Certification of the application for payment constitutes representation by the architect that work has progressed to the point indicated
  - iii) Certification is not a representation that the architect has made an exhaustive on-site inspection
  - iv) Certification is not a representation that the architect has reviewed requisitions received by the subs or suppliers to the contractor
  - v) Amount due the contractor is based on the schedule of values the contractor submits at start of project
  - vi) Retainage gives the owner leverage that the work will be completed
  - vii) The architect may withhold payment for any of the following reasons:
    - (1) Defective work
    - (2) Third party claims
    - (3) Failure of contractor to pay subs
    - (4) Reasonable evidence that the work can't be completed with the balance of funds
    - (5) Damage to the owner or other contractor

- (6) Reasonable evidence that the work will not be completed in time and that the unpaid balance will not be sufficient to cover damages from delay
    - (7) Consistent failure of the contractor to carry out the work in accordance with the contract documents
  - c. Final Payment
    - i) After final punch-list inspection, and project is ready for final inspection, contractor submits final application for payment
    - ii) Before the certificate can be issued, the contractor must submit:
      - (1) Affidavit of payment of debts and claims
      - (2) Release of liens affidavit
      - (3) Certificate of insurance to continue after final payment for at least 30 days
      - (4) Written statement that the contractor knows of no reason that the insurance will not be renewable
      - (5) Consent of surety to final payment
      - (6) Any other data required by owner
    - iii) If final completion is delayed by no fault of the contractor, the owner may make partial payment, with certification by the architect.
- 5. Project Closeout
  - a. Project Closeout
    - i) Contractor initiate closeout in writing to the architect
    - ii) Contractor submits detailed list of items to be completed
    - iii) Architect inspects the work
  - b. Substantial Completion
    - i) Owner can occupy the facility and use it for its intended purpose
    - ii) Date of substantial completion has legal implications
    - iii) This date is also the contractor's termination of schedule date
    - iv) If there are bonuses or liquidated damages, they are based on this date
  - c. List of items to be completed made by the architect is the punch-list
    - i) Contractor must correct these items after which another inspection is made
    - ii) If work shows substantially complete – architect issues certificate of substantial completion
  - d. Contractor must submit these items to the owner:
    - i) All warranties, maintenance contracts, operating instructions, certificates of inspections, and bonds
    - ii) All documentation required with the application for final payment
    - iii) Set of record drawings
    - iv) Certificate of occupancy
    - v) Extra stock of materials
  - e. Contractor must complete final cleaning, instruct the owner in operation of equipment, complete keying for locks and turn keys over to owner
- 6. Architects basic services terminate when the final certificate for payment is issued.

**End of Ballast Review**