SPECIFICATIONS

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Outline

• Specifications Definition
• Specification Divisions
• General Conditions
• Supplementary Conditions
• Types of Specifications
• Material and product standards
Specifications

• “Are written instructions concerning project requirement.”

• The drawings show what is to be built and the specification describe how the project to be constructed and what results are to be achieved.

• The word “Specification” referred to a specific statements concerning technical requirement of the project such material, workmanship, and operating characteristics.
Specifications

• It become customary to include the bidding and contract documents to the technical specification and call it “Specification”.

• The preparation of the specifications is an important part of an architect engineer responsibilities.

• Every specification writer should relay on material and equipment manufacturers to furnish technical data and accurate description of their products.
Specifications

• The architect-engineer combines this information with its own experience and judgment to specify the appropriate product or material.

• Many architect-engineer have established computerized system of specification writing using word processors and stored master specifications.
Specification Divisions

• The initial division normally contain the **non technical provisions** of the contract.

• Succeeding divisions contain the technical provisions that describe the **workmanship and material** for each of the individual construction segments.

• Such as; site work, concrete, masonry, carpentry, mechanical, and electrical.
Construction Specification Institute (CSI)

- Construction Specification Institute (CSI) Master format organizes project information into major divisions.

- A list of the CSI numbers and titles includes:
  0 - Bidding and Contracting Requirements.
  1 - General Requirements.
  2 - Site Construction.
  3 - Concrete.
  4 - Masonry.
  5 - Metals.
  6 - Wood and Plastics.
  7 - Thermal and Moisture Protection.
  8 - Doors and Windows....
General Conditions

• General conditions (provisions) set the manners and procedures whereby the provisions of the contract are to be implemented according to accepted practices in the construction industry.

• They are not intended to regulate the internal workings of either party to agreement, except the activities that may affect the contractual rights of the other party or the proper execution of the work.
General Conditions

1. Definitions
2. Contract documents
3. Rights and responsibilities of the owner
4. Duties and authorities of architect-engineer
5. Rights and responsibilities of the contractor
6. Subcontractors
7. Separate contracts
8. Time
9. Payments and completion
10. Changes in the work
11. Protection of persons and property
12. Insurance and bonds
13. Disputes
14. Termination of the contract
15. Miscellaneous provisions
General Conditions

• **Standardized** sets of general conditions have been established.

• An example of General Conditions is that published by the American Institute of Architects and the FIDIC.
Supplementary Conditions

- General conditions is intended to apply to a relatively broad range of construction and must be adjusted at times to conform to special conditions a given project.

- This is accomplished by a section of the specifications called the supplementary conditions or special conditions.
Supplementary Conditions

• Common examples of supplementary Conditions:
  – Number of contract documents
  – Special instructions to the contractor
  – Changes in insurance requirements
  – Special documentations required by the owner as a condition of final payment.
Supplementary Conditions

• Additional articles to those in General Conditions:
  – Conditions of project location
  – Order of procedure
  – Times during which the work must proceed
  – Owner provided materials or equipment
  – Other contracts
  – Unusual contract administration requirements
  – Early occupancy by the owner
  – Time of project completion
  – Liquidated damages
Types of Specifications

• Measurement;
  – Performance (End-result) Specifications
  – Design (Prescriptive) Specifications

• Acceptance;
  – Closed Specifications
  – Open Specifications
Technical Specifications

• Is a verbal descriptions of the technical requirements of the work to be accomplished, with emphasis placed on the levels of quality to be achieved.

• These specifications are normally presented in approximately the same general sequence as the corresponding construction operations actually proceed in the field.

• Separate divisions are devoted to each major type of construction operation such as excavation, concrete, piping, and insulation.
Technical Specifications

• For material that is impossible or impractical to measure the quality by field test, the technical specifications prescribe the materials and workmanship standards required (Prescriptive Specifications).

• With other elements that is possible to measure or test the finished product quality, the technical specifications specify only the desired result. (Performance specifications)
  – Performance or End-result specifications is widely used.
Performance Specifications

• Describes the required performance or service characteristics of the finished product or system without specifying in detail the methods to be used in obtaining the desired end result.

• This type make the contractor responsible for obtaining the expected results.

• An end product is required that will meet the acceptance tests and standards specified.
Performance Specifications

• The selection of construction method and procedure is left to the contractor.

• A performance specifications allows considerable competition among products and systems.

• Commonly used in conjunction with project mechanical and electrical systems, Asphalitic and Portland cement concrete, and compacted fill.
Performance Specifications

• By leaving the construction firm to exercise its creativity, skills and experience to the fullest extent in achieving the desired result, the cost of construction may well be reduced.
Design (Prescriptive ) Specifications

• The drawings and specifications spell out in explicit terms **what** must be done in order to accomplish a desired end result.

• It **describes** the
  – Kinds and types of materials to be provided,
  – Their physical and performance properties,
  – Their sizes and dimensions,
  – Standard of installation and workmanship,
  – Inspection tests required for quality verification.

• Sometimes called **materials and workmanship specifications**.
Design (Prescriptive) Specifications

- It is common practice to specify a brand name with model numbers to establish the standard of quality desired.

- The end result may or may not be described because it is a natural result of the procedure specified.

- This type is used in connection with structural work where the architect-engineer specifies exact dimensions, methods, materials, weights, sizes, quantities, and procedures.

- In this case the architect-engineer assumes responsibility for the adequacy of end product.
Performance Vs Design Specifications

• It can be seen that many construction specifications involve elements of both performance and design specifications.

• This condition makes it hard to assign responsibility for adequacy of an end product.

• Where there is conflict between performance and design specifications; the design specification controls
Material and product standards

• There are many standard material and product specifications published by:
  – American Society for Testing and Materials (ASTM)
  – American National Standard Institute (ANSI)
  – American Association of State Highways and Transportation Officials (AASHTO)
  – American Concrete Institute (ACI)
  – ....

• These standard establish reliable quality criteria for particular work classifications.
Types of Specifications

• **Closed** specification:
  – A material or process specification is worded such that only one manufacturer product will be acceptable and no provision for substitution.

• **Open** specification
  – A material or process specification is worded such that the product of various manufacturers will be acceptable.
Open Vs Closed

• Closed spec. has the advantage of ensuring the desired quality of material but the disadvantage of eliminating competition among suppliers.

• Open spec. has the advantage of providing competition but, by permitting substitutions, it introduces the possibility of using materials less than to standard.
Other Material Specifications

• **Combination** between closed and open such;
• **Base-bid material** specification:
  – Materials are specified by closed specification.
  – Contractors bid based on specified materials.
  – The winning bidder may offer alternate proposals accompanied by fully descriptions and technical data and cost added to or subtract from the base bid.
  – The owner make the decision to accept or reject any or all of the alternate proposal.
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QUESTIONS?