4. Specification:

Definition and Introduction

According to the Shorter Oxford English Dictionary a specification is "a detailed description of the dimensions, construction, workmanship, materials etc., of work done or to be done, prepared by an architect, engineer, etc."

According to the Dictionary of Architecture & Construction a specification is, “a written document describing in detail the scope of work, materials to be used, and methods of installation, and quality of workmanship for a parcel of work to be placed under contract; usually utilized in conjunction with working (contract) drawings in building construction.”

To define the quality required, material workmanship, its properties, types and strength of construction material is known as specifications. It is such kind of information, which cannot be described from construction drawing.

In the same manner, concrete ingredients, their ratio and specialties can only be shown through specifications. It is possible to show concrete symbolically on drawing. But separate explanation is required for its ingredients, type and properties of coarse aggregates, sand, cement, amount of water. The cost of a work depends much on covered area and on the specifications. Therefore, specifications should be clear.

A specification is a document that describes in words which cannot be visualized or explained on a drawing or model. This document can be incredibly wide-ranging - covering the establishment of the site, the type of contract to be used, the performance criteria of the asset, the quality of the systems and products, which standards are applicable and how they should be executed, and even the products to be used.

Specifications do not include information on cost, quantity or drawn / visualized information so need to be read in conjunction with documents detailing quantities, schedules and drawings.

Materials Specification:

Specification which describes the material properties is known as material specification.

A material specification is necessary to establish a frame of reference for design and analysis activities and to provide a basis for material parameters.

Work Specifications:

Work/ Workmanship specification covers the method of construction, inspection of work, surface preparation, surface compaction and curing etc. Procedure of every single work should be mentioned in detail.

Purpose of specifications

Purpose of specification is to highlight the necessary information which cannot be obtained from drawing. Further main purposes of writing specifications are;

1. To show the strength of construction material or construction work.
2. To show the ratio of concrete or mortar ingredients.
3. TO show the type of material like type of wood, glass etc.
4. To show the color of construction material.
5. To show the clauses of contracts.
6. To show the cost of material.
7. To show the procedure of construction works.
8. To show the construction equipment used during construction.

Why specifications are important? (Needs Of Specification)

The main reasons why the specification is so important to the construction process:

1. It provides clear instructions on the intent, performance and construction of the project.
2. It can reference the quality and standards which should be applied.
3. Materials and manufacturers' products can be clearly defined.
4. The requirements for installation, testing and handover can be identified.
5. Classification in the specification can be used to support handover and running of the asset.
6. The drawing or model does not need to be overloaded with detailed information, which can sometimes be difficult to identify.
7. It can be used to support the costing of a project: not only the materials and products but also the performance and workmanship
8. The specification forms part of the contractual documents, along with the drawings, and therefore can help minimize project risk and provide support should there be any legal disputes.
9. It supports the interpretation of the client brief and gives the client assurance that the asset which they commissioned is being delivered.
10. It is not only essential for the construction phase but also used as part of the soft landing process, subsequent asset management and the lifecycle plan.
11. By being clear and concise and containing all the information, it saves the project team, the client and the contractor time and money by providing answers to many of the on-site construction questions.
12. There is the option for the design team to build a suite of office masters, which would improve efficiency, provide quality assurance and project consistency.
13. Office masters can save the team time and money by being developed over a period of time and then being adapted to suit the

project specifics, therefore drawing on specialist knowledge when needed.

14. The specification should be used by all the project team throughout the construction phase; it should be a living document and not stop being used at the design phase.
15. The specification and any variations or value engineering can also be used for the project audit trail and should form part of the handover documents. It will then form the basis for the running of the asset by the asset management team

Types of Specification

Each project is unique and will need a different set of specifications and most likely corresponding packages. However, there are three main types of construction specifications commonly used on projects:

- **Prescriptive:** Provides details on the types of materials and installations needed to complete a project. Additionally, prescriptive specifications also describe how to measure installations to ensure that they were up to project quality and standards.

  Contain detailed descriptions of what specific materials must be used as well as the installation instructions. This type of spec usually involves three key components:

  1. General provisions: requirements surrounding codes and standards
  2. Required products: the type of products required based on performance and structural stipulations
  3. Execution procedures: how to do the install and measure its effectiveness

- **Performance:** Describes the operational requirements. Fundamentally, the performance specifications should describe to

the contractor what is needed for the final product and how it should essentially function once completed.

- **Proprietary:** Although not as common as prescriptive and performance, proprietary specifications are used if only one specific product can be used for an installation.

How should specifications be structured?

The structuring of specifications will vary from project to project but should reflect the work packages on a particular project and any sub-contracts. This structuring should make it easier for contractors to price a job and give a more accurate tender.

Basic principle of writing specifications:

Specifications define the quality of any construction work. Therefore, specifications should be clear. Language for specifications should be such that no chance of ambiguity lefts. Specifications are the important part of contract and it has legal value. In case of any dispute, one can even consult with court. Most of disputes occur, only because of not properly explained specifications. Therefore, following principles of specifications should be considered while writing that prevent conflict and ambiguities.

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1. **Description of Material**

It is very important to write in detail about the construction material. Type and size of construction material should be clearly mentioned. Besides this, ingredient ratio and mixing method of concrete and mortar should also be clearly defined. If treatment of any material required before use, then it should be mentioned in specifications.

2. **Workmanship**

Workmanship covers the method of construction, inspection of work, surface preparation, surface compaction and curing. Procedure of every single item should be mentioned in detail.

3. **Tools and Plants**

Different equipment, tools and plants required during construction should be clearly mentioned in specifications. Arrangement of machinery before construction is only possible, if it is mentioned in specifications. It should also be mentioned that either contractor has to arrange on its own or client will arrange equipment for the contractor.

4. **New Work Protection**

It should be clearly mentioned that how new work will be protected from rain water, temperature, freezing and other atmospheric changes. New work includes excavation, brick masonry, concrete pouring, plaster etc…

5. **Expression**

Expressions should be very clear. Specifications have legal value, therefore sentences should be short and complete. For conveying complex information, short sentences should be used. It break up information into smaller and easier to process units. Long complicated sentences can confuse reader and doubtful the main point. Every single paragraph should only be limited to only one issue.

Vocabulary should be such that it not creates a dual meaning. It should be such that every reader grasps the same meaning. Language, format and usage should be consistent. Beside this, specifications must also be consistently enforced. Specifications only remain effective, if it is consistently enforced. Without it even well written specifications become ineffective.

6. **Clauses of Specifications**

Clauses of specifications should be written in ascending order, in short follow the construction schedule. First thing come first. For Example:

Clauses related to excavation should come before foundation or footing related clauses.

Some finding regarding specifications on Building Projects

- Specifications are often presented on working drawings without complementary notes or instructions thereby causing many important specification details to be left out. Cases of ambiguous expressions exist in specifications in practice; and many drawings lack sufficient details necessary for construction purposes.

- There is no regular market survey to ascertain the availability of specified materials for building projects. This results to unavailability of some specified materials in the market
- Quality assurance of materials supplied for building construction is poor as the method of checking of materials by designers is by visual inspection. The use of instruments or laboratory tests is not common.
- Enforcement of specification is poor; the development control department (which is the only external monitoring team) issues stop-work order but rarely attempts to enforce it. The legal framework for the enforcement of specifications is weak. The Urban Tribunal set up as a specialized court to try building construction cases is not yet operational.

- Poor quality specifications and/ or poor implementation and enforcement give rise to frequent case of rework and dissatisfaction by client.

Writing the specification some writing tips…

- Use simple, clear language without jargon (to minimize misinterpretation)
- Define terms, symbols and acronyms (include a "Glossary of Terms")
- Be concise
- Do not explain the same requirement in more than one section
- Define each aspect of the requirement in one or two paragraphs where possible
- Adopt a user-friendly format
- Number the sections and paragraphs
- Seek feedback from someone unfamiliar with the requirement
- Discuss the draft and refine it

There are no fixed rules on formats and structures because each specification reflects a different requirement or need. A specification should list the functional, performance and technical characteristics separately.

HOME ASSIGNMENT

1. Why project manager of any construction project needs of specification. What are the points to be concerned with client in preparing or drafting of specification of any civil work? Explain it.

2. What is specification? Discuss general principles used in writing of specification.

3. Write short notes on: **Specification and its purpose in construction project**