

Construction Planning and Management

Civil Engineering

Comprehensive Theory *with* Solved Examples

Civil Services Examination



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Basics of Construction Management

1.1 Introduction

1.1.1 Project

A project is a temporary effort undertaken to achieve a clear goal or objective within specific constraints of time and resources,

1.1.2 Project Management

It is an art of attaining the project objective by utilising human, material and financial resources within a specified time period.

1.1.3 Objectives of PM

1. A project should be completed in minimum time
2. A project should be completed in minimum cost
3. A project should utilise the available resources as sparingly as possible

1.2 Key Phases of Project Management

1.2.1 Planning

It involves:

- Defining of objectives
- Listing of jobs to be performed
- Determining gross resource requirement

1.2.2 Scheduling

It involves:

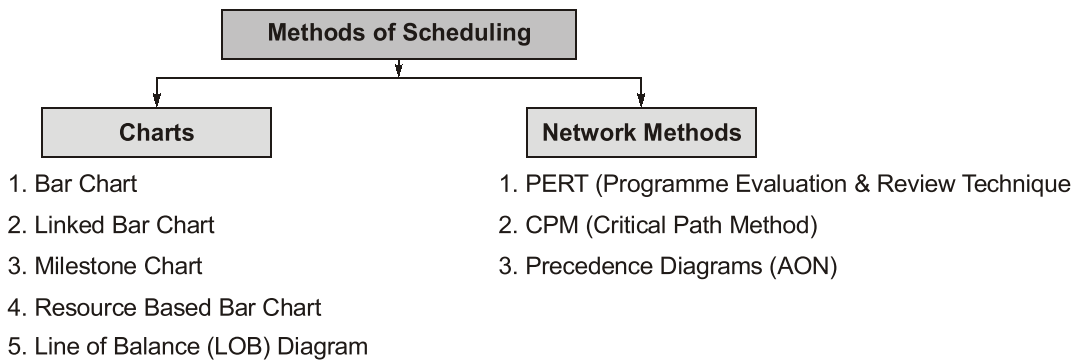
- Allocation of resources to various tasks/activities
- Placing the tasks logically and sequentially
- Identifying the scheduled completion time of the project

Note: Planning and scheduling are done even before the actual start of the project.

1.2.3 Monitoring and Controlling

It is the execution of planning & scheduling. If the project deviates from its proposed plan & schedule, it also deals with replanning & rescheduling which is also called as Updating.

Note: A project is said to be complete only when all the activities are 100% complete.



1.3 Basics of Construction Management

- A construction project is an endeavor or a venture taken up by a project team on behalf of an owner or client to build a facility as per the owner or clients requirements.
- From inception to completion, the project goes through various stages.
- Each stage involves definite inputs, processes and deliverable.
- Typically, the life cycle of a project from inception to completion has the following stages:
 - **Project appraisal:** Inception, feasibility and strategic planning.
 - **Project development:** Project planning and design finalization of proposals, procurement method, construction documents along with tender drawings, fabrication drawing, cost estimate, BOQ etc.
 - **Construction planning:** Sequencing of project components, resource planning, time-cost-trade off etc.
 - **Tendering:** Competitive bidding, pre-qualification of agencies, issue of tender documents, bids evaluation, negotiation and award of work.
 - **Construction:** Execution, monitoring, control and acceptance of work.
 - **Commissioning and handing over:** Contract closure, financial closure, defect liability commencement, handing over etc.
- It is always required to get the project done within the specified time limit.
- Project management is essential to provide the necessary directions, coordinating the various activities involved and coordinating the responsibilities of the various stake holders of the project.
- **IS 15883 (Part 2) : 2013** lays down the various construction project guidelines.

1.3.1 Types of Construction Projects

Construction projects are classified into various categories which are as given below:

1. **On the basis of type of work**, construction projects are classified as:
 - (a) Building project
 - (b) Infrastructure projects

- (c) Industrial project
 - (d) Other projects
2. **On the basis of project completion time**, construction projects are classified as:
- (a) Long duration projects (with duration exceeding 5 years)
 - (b) Medium duration projects (with project duration 3 to 5 years)
 - (c) Short duration projects (with project duration 1 to 3 years)
 - (d) Special short term projects (with project duration less than 1 year)
3. **On the basis of project value**, construction projects are classified as:
- (a) Mega value projects
 - (b) Large value projects
 - (c) Medium value projects
 - (d) Small value projects
4. **On the basis of pace of execution**, construction projects are classified as:
- (a) Fast track projects
 - (b) Normal pace projects

1.3.2 Tenders and Contracts

Tender: Tender is an offer in writing to execute some specified work at certain rates, within a fixed time under some agreement.

Whenever work has to be executed, tenders (i.e., offers) are invited through NIT (Notice Inviting Tender).

Contract: A contract is an agreement between the two parties to undertake a work. This agreement is enforceable by law. Thus any agreement between the two parties that is enforceable by law is called contract.

NOTE: All contracts are agreements but all agreements are not contracts.

Offer: A proposal to perform an act or to pay an amount for that is called as **offer**.

Acceptance: It is the assent to the person to whom offer is made. A proposal when accepted becomes a promise.

The party who makes the offer is called as **promisor** and the party who accepts the offer is called as **promisee**.

Essential conditions of contracts: There are, in general four essential conditions viz.:

- (a) **Competent parties:** The parties entering into the contract must be competent i.e., they must not be minor, they must not be of unsound mind and they must not be disqualified by law.
- (b) **Free consent:** The parties entering into the agreement must give free consent i.e., consent is not due to coercion, fraud, mistake, misrepresentation or under influence.
- (c) **Lawful subject matter:** The agreement is for a lawful consideration i.e., consideration must not be forbidden by law, must not be fraudulent and must not oppose the public policy.
- (d) **Not declared void:** The agreement may satisfy all the conditions of a valid contract and must not have been expressly declared void by the law in force.
- (e) **Proper and valid consideration:** It is defined as the promise to do something by a party in return of some money or other interest.

1.3.3 Types of Tender

In general, there are three types of tender viz.:

- (a) **Open tender** wherein the tender is open for everyone and any one can take part in the tendering process.
- (b) **Limited tender** where the offer of tender is sent to limited parties and is not open for all.
- (c) **Single tender** where the tender enquiry is sent only to one party. This type of tender is generally used for certain specialized items of work for which there are very limited firms available.

1.3.4 Types of Contracts

Contracts in general can be classified as:

- (a) **Item rate contract** wherein the contractor is required to quote his/her rate against each item of work as given in the schedule of items.
- (b) **Percentage rate contract** wherein the contractor is required to quote his/her percentage above or below the estimated value of work.
- (c) **Lump sum contract** where contractor is required to quote his/her lump sum rate to undertake the work. This is generally used for petty works of small values.

