

CONSTRUCTION MANAGEMENT AND TECH(CIV-703)

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COURSE CONTENTS

S. No.	Topic/ contents	Lecture Hours
1	Construction Management, its necessity; objectives & Functions	03
2	Construction methods and plant important equipments Only	06
3	Project scheduling: Various techniques namely Bar chart; CPM and PERT.	07
4	Engineering economics of projects; Depreciation; Sinking Fund; compound interest factors, Selection of most economical alternative by variable cost method/Cost benefit ratio. Owning and Operating cost.	10
5	Organization of Leadership: Function of protect organization. Principles and advantages of good organization. Leadership and motivation	04
6	Works accounting. Cashbook, Imprest cash, contractors bills, store accounts. Materials at site account. Indent, invoice, Debit & Credit note, suspense head stock, Engineering Statements, Form of agreement.	06

Books Recommended:

1. Construction Management by Mahesh Verma
2. Construction of Plant and Equipment by Peurifay

LECTURE 1

1.1 What is Construction Management?

Management is the science and art of planning, organizing, leading and controlling the work of organization members and of using all available organization resources to reach stated organizational goals.

Construction management deals with economical consumption of the resources available in the least possible time for successful completion of construction project. ‘Men’, ‘materials’, ‘machinery’ and ‘money’ are termed as resources in construction Management.

The construction industry is composed of five sectors: residential, commercial, heavy civil, industrial, and environmental. A construction manager holds the same responsibilities and completes the same processes in each sector. All that separates a construction manager in one sector from one in another is the knowledge of the construction site. This may include different types of equipment, materials, subcontractors, and possibly locations

1.1.1 Importance of Construction Management:

- Construction management practices invariably lead to “maximum production at least cost”. A good construction management, results in completion of a construction project with in the stipulated budget.
- Construction management provides importance for optimum utilization of resources. In other words, it results in completion of a construction project with judicious use of available resources.
- Construction management provides necessary leadership, motivates employees to complete the difficult tasks well in time and extracts potential talents of its employees.
- Construction management is beneficial to society as the effective and efficient management of construction projects will avoid, escalation of costs, time overrun, wastage of resources, unlawful exploitation of labor and pollution of environment.

1.1.2 The role of project manager

A project manager is a professional in the field of project management. Project managers have the responsibility of the planning, procurement and execution of a project, in any domain of engineering. Project managers are first point of contact for any issues or discrepancies arising from within the heads of various departments in an organization before the problem escalates to higher authorities. Project management is the responsibility of a project manager. This individual seldom participates directly in the activities that produce the end result, but rather strives to maintain the progress, mutual interaction and tasks of various parties in such a way that reduces the risk of overall failure, maximizes benefits, and minimizes costs.

1.1.3 The role of a contractor

A contractor is assigned to a construction project once the design has been completed by the person or is still in progress. This is done by going through a bidding process with different contractors. The contractor is selected by using one of three common selection methods: low-bid selection, best-value selection, or qualifications-based selection.

A construction manager should have the ability to handle public safety, time management, cost management, quality management, decision making, mathematics, working drawings, and human resources.

1.1.4 Objectives of Construction Management

The main objectives of construction management are,

- Completing the work within estimated budget and specified time.
- Maintaining a reputation for high quality workmanship
- Taking sound decisions and delegation of authority
- Developing an organization that works as a team.

1.1.5 The functions of construction Management are

- (a) Planning
- (b) Scheduling
- (c) Organizing
- (d) Staffing
- (e) Directing
- (f) Controlling
- (g) Coordinating

(a) Planning in Construction Management:

It is the process of selecting a particular method and the order of work to be adopted for a project from all the possible ways and sequences in which it could be done. It essentially covers the aspects of 'What to do' and 'How to do it'.

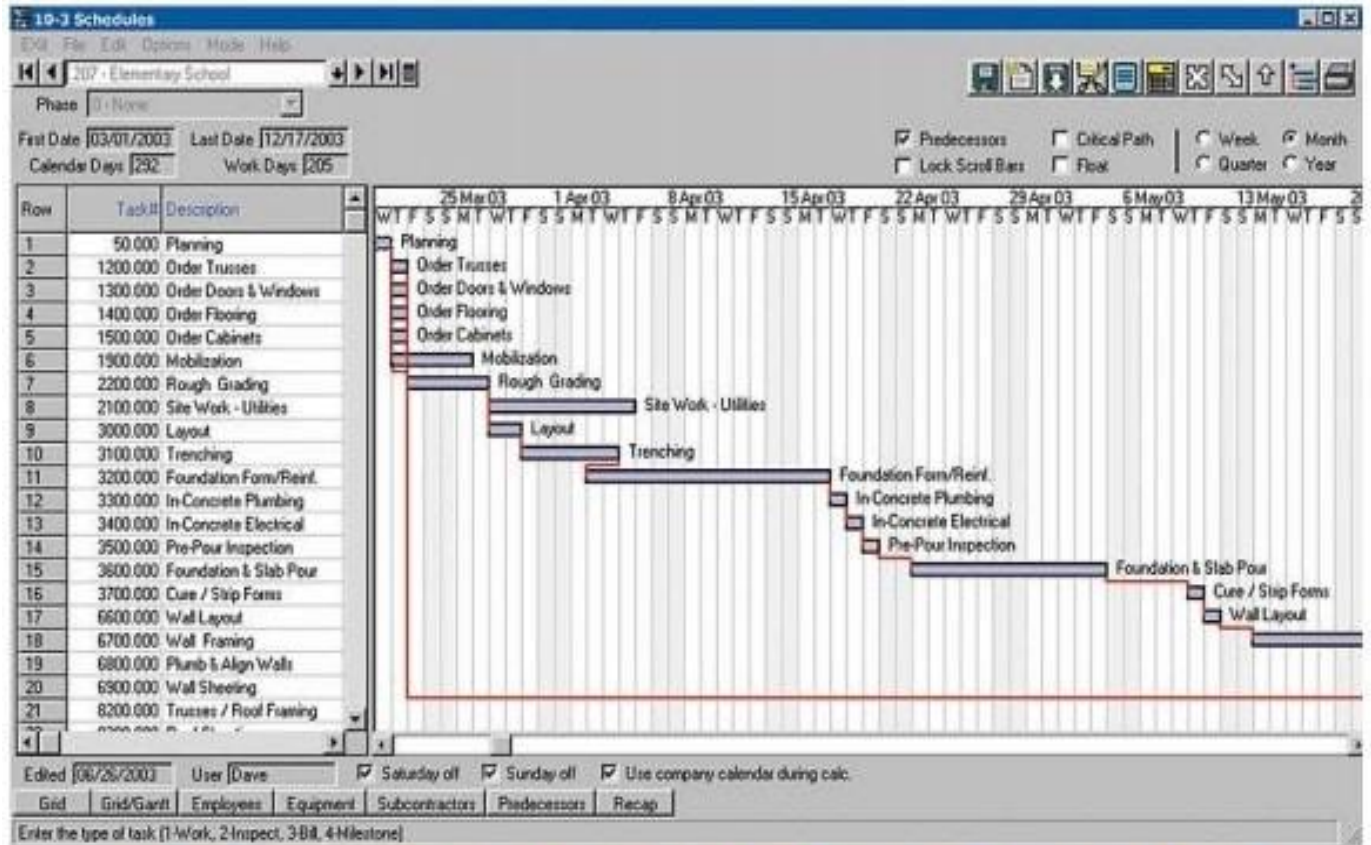


Importance of construction project planning:

- Planning helps to minimize the cost by optimum utilization of available resources.
- Planning reduces irrational approaches, duplication of works and inter departmental conflicts.
- Planning encourages innovation and creativity among the construction managers.
- Planning imparts competitive strength to the enterprise.

b) Scheduling in Construction Management:

Scheduling is the fitting of the final work plan to a time scale. It shows the duration and order of various construction activities. It deals with the aspect of ‘when to do it’.



Visual representation of the schedule lets you quickly see where you're ahead—or behind—on each project.

Importance of construction project scheduling:

Scheduling of the programming, planning and construction process is a vital tool in both the daily management and reporting of the project progress.

c) Organizing:

Organizing is concerned with decision of the total construction work into manageable departments/sections and systematically managing various operations by delegating specific tasks to individuals.

d) Staffing:

Staffing is the provision of right people to each section / department created for successful completion of a construction project.

e) Directing:

It is concerned with training sub ordinates to carryout assigned tasks, supervising their work and guiding their efforts. It also involves motivating staff to achieve desired results.

f) Controlling:

It involves a constant review of the work plan to check on actual achievements and to discover and rectify deviation through appropriate corrective measures.

g) Coordinating:

It involves bringing together and coordinating the work of various departments and sections so as to have good communication. It is necessary for each section to aware of its role and the assistance to be expected from others.

ASSIGNMENT NO 1

Q1: CHALLENGES BEFORE CONSTRUCTION INDUSTRIES IN INDIA

**Q2: WHAT ARE THE DIFFERENT PROBLEMS FACED BY A PROJECT
MANAGER IN CONSTRUCTION WORK?**

Note: Kindly submit your assignment on mentioned mail id

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LECTURE 2

1.2 PROJECT PLANING:

As we have already studied about project planning, here we will discuss it in detail.

It is already mentioned in my first lecture that planning is the most important phase of project management. Planning involves defining objectives of project, listing of tasks or jobs that must be performed, determining gross requirements for material, equipment and manpower and preparing estimates of costs and durations for the various jobs or activities to bring about the satisfactory completion of the project.

In the planning phase , PLAN is made and STRATEGIES are set, taking into consideration the company's policies, procedures and rules

STEPS IN PROJECT PLANING

Following eight steps are generally recognized in the planning process of project:

1. DEFINE : the objectives of the project in definite words.
2. ESTABLISH : goals and stages intermediate to attain the final target.
3. DEVELOP : forecast and means of achieving goals , i.e , activities.
4. EVALUATE : organization's resources (financial, managerial and operational) to carry out activities and to determine what is feasible and what is not.
5. DETERMINE : alternatives (individual courses of action that will allow to accomplish goals.
6. TEST : for consistency with company's policy.
7. CHOOSE : an alternative which is not only consistent with its goals and concept but also one that can be accomplished with the evaluated resources.
8. DECIDE : on a plan.

1.2.1 RESOURCES

In running a project, there is a basic need of *resources*. These resources can be classified as under:

- (i) Material resources (what)
- (ii) Equipment resources (how)
- (iii) Space resources (where)
- (iv) Manpower resources (who)
- (v) Time resources (when)

1.2.2 STAGES OF PLANNING

Usually the stages of planning are as follows:

1. PRE PLANNING:

- a) During this stage of planning objectives are clearly spelt out.
- b) A general framework of the project is to be formulated.
- c) Justification for the construction of the project is to be laid down.
- d) A cost-benefit analysis is to be carried out.
- e) Cost analysis of all alternative sites is to be done.

2. DETAILED PLANNING :

- a) Preparation of detailed design.
- b) Preparation of detailed working drawings.
- c) Preparation of drawing specifications.
- d) Working out the quantities of materials.
- e) Breaking the project into different activities.
- f) Detailing the sequence of operation of various activities and allotting time duration to different activities.

3. MONITORING AND CONTROL:

- a) In this phase, the progress of construction is monitored as per proposed scheduled.
- b) Updating the schedule according the actual progress of work.

- c) Preparing the revised forecasts regarding the availability of various resources.

1.3 CONTROLLING :

The planning and scheduling phase of a project are undertaken before the actual project starts while the controlling phase is undertaken during the actual project operations. Controlling consists of reviewing the difference between the schedule and actual performance once the project has begun. Project control is the formal mechanism established to determine deviations from basic plan and to replan and reschedule to compensate for the deviations.

STEPS IN CONTROLLING:

Controlling is accomplished in the following well recognized steps:

1. ESTABLISH : standards or targets. The targets are generally expressed in terms of time.
2. MEASURE : performance against the standards set down in the first step.
3. IDENTITY : the deviations from the standards.
4. SUGGEST : correcting measures. This will involve all the problems identifying AND SELECT decision-making and organising and leadership skill of the decision-maker.

1.4 PROJECT SCHEDULING :

Scheduling is the allocation of resources. These resources in conceptual sense are time and energy, but in practical sense are time, space ,equipment and effort applied to material. More specifically, scheduling is the mechanical process of formalising the planned functions, assigning the starting and completion dates to each part (or activity) of the work in such a manner that the whole work (or project) proceeds in a logical sequence and in an orderly and systematic manner . In other words, scheduling is the laying out of the actual activities of project in time order in which they are to be performed and calculating the manpower and material requirements needed at each stage of production, along with the expected completion time of each of activity.

STEPS IN PROJECT SCHEDULING:

Scheduling is done in the following steps:

1. CALCULATE : detailed control information.
2. ASSIGN : timings to events and activities.
3. GIVE : consideration to the resources. The manager is generally concerned with those resources whose availability is limited and which there thereby impose a constraint on the project. The important ones are usually skilled, technical and supervisory manpower and capital investment.
4. ALLOCATE : the resources.

1.4.1 CLASSIFICATION OF SCHEDULING

Schedules can be classified into groups according to the requirement for which it is required as follows:

1. Construction schedule
2. Materials schedule
3. Labour schedule
4. Equipment schedule
5. Financial schedule
6. Control schedule
7. Organization schedule

.....End of unit 1.....

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