

5.6 CONSTRUCTION MANAGEMENT

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RATIONALE

This is an applied civil engineering subject. The subject aims at imparting basic knowledge about construction planning and management, site organisation, construction labour, control of work progress, inspection and quality control, accidents & safety and accounts.

COURSE OUTCOMES

After undergoing the subject, the students will be able to:

- CO1 Explain pre-tender stage and contract stage
- CO2 Prepare scheduling techniques i.e. PERT and CPM
- CO3 Prepare job layout of building
- CO4 Comply with various labour laws
- CO5 Inspect quality at various stages of the construction
- CO6 Prepare measurement books and bill of quantities

DETAILED CONTENTS

UNIT-I

CONSTRUCTION MANAGEMENT

1. Introduction

- 1.1 Concept of construction management
- 1.2 Main objectives of construction management and overview of the subject
- 1.3 Functions of construction management, planning, organising, staffing, directing, controlling and coordinating, meaning of each of these with respect to construction job.
- 1.4 Classification of construction into light, heavy and industrial construction
- 1.5 Stages in construction from conception to completion
- 1.6 The construction team: owner, engineer, architect and contractors, their functions and inter-relationship

UNIT-II

2. Construction Planning:

- 2.1 Importance of construction planning
- 2.2 Stages of construction planning- Pretender stage and Contract stage
- 2.3 Scheduling construction works by bar charts
 - 2.3.1 Definition of activity, identification of activities
 - 2.3.2 Preparation of bar charts for simple construction work
 - 2.3.3 Preparation of schedules for labour, materials, machinery and finances for small works
 - 2.3.4 Limitations of bar charts
- 2.2 Scheduling by network techniques
 - 2.2.1 Introduction to network techniques; PERT and CPM,
 - 2.2.2 Differences between PERT and CPM terminology

UNIT-III

3. Organization

- 3.1 Types of organizations: Line, line and staff, functional and their characteristics
- 3.2 Site Organization:
 - 3.2.1 Principle of storing and stacking materials at site
 - 3.2.2 Location of equipment
 - 3.2.3 Preparation of actual job layout for a building
 - 3.2.4 Organizing labour at site
- 3.2 Construction Labour
 - 3.2.1 Conditions of construction workers in India, wages paid to workers
 - 3.2.2 Important provisions of the following Acts:
 - a) Labour Welfare Fund Act 1936 (as amended)
 - b) Payment of Wages Act 1936 (as amended)
 - c) Minimum Wages Act 1948 (as amended)
 - d) Acts relating to Labour Safety

UNIT-IV

4. Control of Progress: Analysis of progress and methods of recording progress

- 4.1 Taking corrective actions keeping head office informed
- 4.2 Cost time optimization for simple jobs - Direct and indirect cost, variation with time, cost optimization

- 4.3 Inspection and Quality Control: -Need, Principles and Stages of inspection and quality control for- Earth, Masonry, RCC work and Sanitary and water supply services
- 4.4 Accidents and Safety in Construction: Concept, causes and remedies
 - 4.4.1 Safety measures for: - Excavation work, drilling and blasting, hot bituminous works Scaffolding, ladders, form work and demolitions.
 - 4.4.2 Safety campaign and safety devices, safety training

UNIT-V

5. ACCOUNTS

- 5.1 Public Work Accounts: Introduction of various technical terms used in public work accounts:-Technical sanction, allotment of funds, re-appropriation of funds bill, contractor ledger, measurement book running and final account bills complete, preparation of bill of quantities (BOQ), completion certificate & report, hand receipt, Aquittance roll. Muster Roll labour, casual labour roll-duties and responsibility of different cadres, budget-stores, returns, account of stock, misc. P.W. advances T & P – verification, survey report, road metal material charged direct to works, account - expenditure & revenue head, remittance and deposit head, definition of cash, precaution in custody of cash book, imprest account, temporary advance, treasury challan, preparation of final bills, earnest money, performance security, Students must learn to prepare accounts register.

RECOMMENDED BOOKS

1. "Civil Engineering Management" by Wakhlo, ON ; Light and Life Publishers, New Delhi
2. "Construction Equipment and its Planning and Application by Verma, Mahesh
3. "Management in Construction Industry" by Dharwadker, PP; Oxford and IBHPublishing Company, New Delhi
4. "Construction Planning and Management" by Gahlot PS; Dhir, BM; Wiley Eastern Limited, New Delhi
5. MS Project – Microsoft USA
6. Primavera Manual by Sh. Vinod Kumar; NITTTR, Chandigarh.
7. e-books/e-tools/relevant software to be used as recommended by AICTE/HSBTE/NITTTR.

RECOMMENDED WEBSITES

1. <https://swayam.gov.in/>
2. <https://www.udemy.com/>
3. <https://www.upgrad.com/>
4. <https://www.khanacademy.org/>

INSTRUCTIONAL STRATEGY

This is highly practice-based course and efforts should be made to relate process of teaching with direct experiences at work sites. Participation of students should be encouraged in imparting knowledge about this subject. To achieve this objective the students should be taken to different work sites for clear conception of particular topics, such as site organization, inspection of works at various stages of construction and working of earth moving equipment. This subject contains five units of equal weightage.