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Lecture Note
on
CONSTRUCTION MANAGEMENT

Diploma 6th Semester

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CHAPTER-1 Construction Management

1. To complete the work within estimated budget and specified time.
2. To get a reputation for high quality workmanship.
3. To provided a safe and satisfactory working condition.
4. To motivate people to give their best within their capacities.
5. To creat an organisation that works as a team.

Function of construction Management?-

1. planning and Scheduling
2. Organising
3. Staffing
4. Directing
5. Controlling
6. Co-ordinating

1. planning and Scheduling :-

- It involves formulation of numbers of alternative work plans for achieving the object and selecting a plan which is best.
- planning means what to do and how to do. Scheduling means when to do.

2. Organising :-

- It is concerned with division of construction work into different department and sections that relationship between various personals are established.

3. Staffing :-

- it is the provision of people to fill the positions recruiting the right people arranging staff training courses and carrying out proper staff assessment are the function of staffing.

4. Directing :-

- It is concerned with training Sub-ordinates to carryout assigned work- supervising the work.

Machines :- For any construction work varies plans of putment and tools are required there vatching plans mixture, trucks,

Funds :- Adequae fund suit be necessary maintenance of project. All of other resources depend on avelibility of fund.

Space :- Space is necessary ore storing material and enstalation of machines,

(2) what are the stages of Construction?

Ans:- There are 5 stages of construction

(1) Brief stage
(2) Designing stage
(3) tendering stage
(4) construction stage

- The contractor deals with office work such as desiging, tendering ect.

- The contractor has to execute varies types of works and to make all necessary arrangement for labour material, machines, power, connections in order to complete the project in stipulated time and cost.

- The contractor submise running bills for payment based on the progress of work and material brought at site.

Construction teams :-

- The construction team consists of owner, engineers and constracters. The team is formed to plan design and execute a particular project.

Owner :-

- The owner may be a single man or a group of people. The owner is the final holder of decision making financial and managerial and administrative power.
- He can approve any change in the project. He controls the project resources.
- The owner arranges for proper maintenance of the works.

Engineers :-

- This includes civil, mechanical, electrical engineers.
- The role of engineer is to permit the owner functional ~~rege~~ requirements and design.

CHAPTER-2 (Construction planning)

- planning is the starting point of all management functions.
- planning needs organising, staffing followed by directing, controlling and co-ordinating.

Characters of an effective planning :-

1. It must be accurate forcasting requirement of material man power machinary and money.

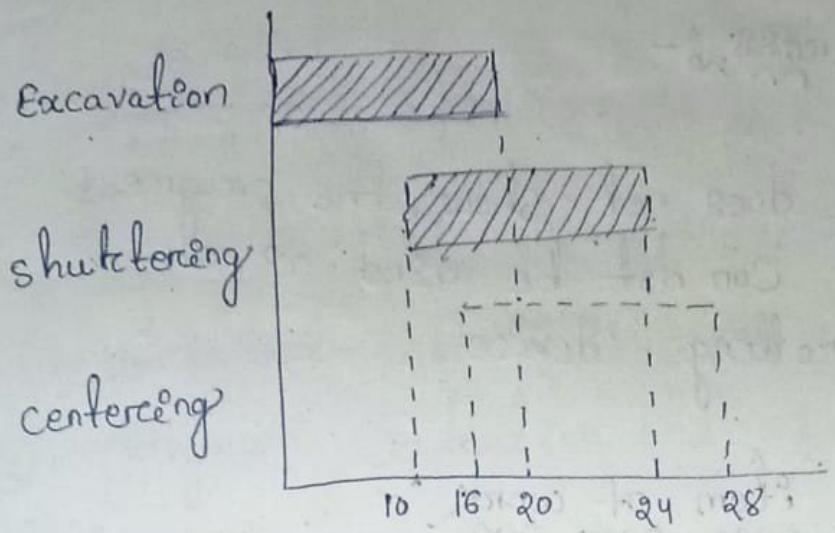
2. planning is an administractive process of work in an office called planning depontmenth planning means programming planning in done by the owners staff.

- For effective planning it is necessary to break down to the project into Sub-section and activitien.

Date - 03.02.25

Imp Scheduling by Bar chart :-

1. Scheduling is the process of fitting the work to a time frame indicating the begining of each activity.
2. Bar chart is a conventional method of Scheduling in construction industries.
3. The bar chart method was developed by "henry gantt" so it is also called gantt chart.
4. A bar chart consists of two co-ordinate axes one is time axis and other a activity axis.
5. Each activity is shown in the form of a horizontal line or bar in this the length of the bar indicates the duration of the activities.



1. what is planning ?
2. what is controlling ?
3. what is scheduling ?
4. what are the stages of planning
5. what is bar charts ?

L.Q

1. what is Construction teams and what are there duty ? (5 mark)
2. prepare a material schedule ?
3. prepare a labour schedule ?

ch-3 (Network Technique in CM)

- There are two types of network techniques in construction management :-

① Critical path method (CPM)

② Program Evaluation and review technique (PERT)

- The main objective of construction management is to complete with a specified time at the ~~of~~ estimated cost.
- planning is necessary to achive the objective. net work techniques are effective tools for planning scheduling and controlling.
- There are two types of networks.

① CPM -

② PERT -

① Optimistic time estimate (t_o) (Imp)

- it is the smallest time for completeing an activity. if it is done ideal condition.

② Most likely time estimate (t_l) :-

- It is the time for completing an activity under normal condetion.

③ pessimistic time (t_p) :-

- It is the maximum time required to complete an activity under extremely adverse condition.

Expleted time estimate :-

$$t_e = \frac{t_o + 4 + t_l + t_p}{6}$$

Date - 17.03.25

Float :-

Free float :- Free float of an activity is the difference between Est of Successive activity and EFt of the activity.

Total Float = LFT - EFT = LST - EST

Indepen float :- it is the excess of minimum available time over the activity duration.

Critical activity :-

The activities which have zero total float are called critical activity for a critical activity EST = LST and EFF = EFT

Critical path :- The path joining the Critical activity is a network is called the Critical path.

- It is the longest path is the network the critical path is shown by double line in a network.

(ii) To plan and organise construction work in his section in order to avoid delay in the process of work.

(iii) To keep a record of all measurement of work done and tests carried out at site.

(iv) To report regularly to the executive engineer on all the above matters.

Job layout :-

Purpose of job layout :-

The purpose of job layout is to facilitate the realisation of

- more economical method of working
- shorter leads for materials.
- Reduction in completion time

Important duties / Roles of the Executive Engineer

(i) To coordinate the work of various contractors and to check whether all necessary instructions have been provide to the contractors.

(ii) To check the progress of work regularly and to arrange for rectification of faulty workmanship or inferior quality material

(iii) clearing all bills related to construction work for which he is the final authority.

(iv) To carry out technical audit and settlement of final contractual dues.

Important duties / Roles of the Assistant Engineer

(i) To check the specifications jobs in regard to the quality of materials, methods are workmanship,

- reduction in wastage and deterioration of materials
- Higher productivity from labour and machinery
- greater safety

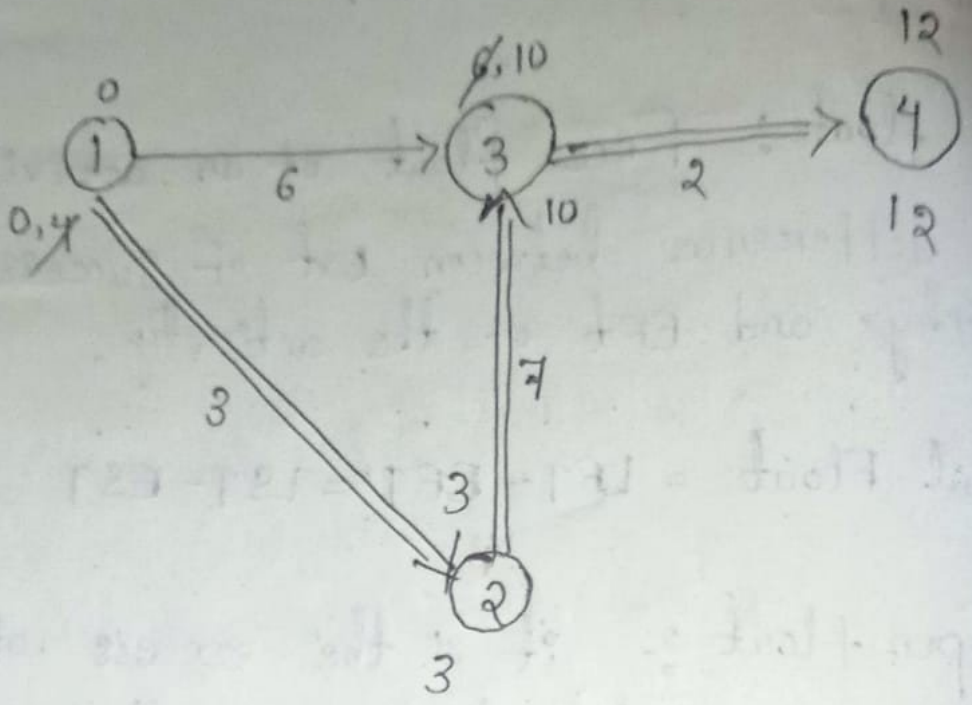
Factors Affecting Job layout :-

- Temporary Roads
- Access to site
- Topography of Ground
- Construction plant / Machinery
- Construction methods
- Construction materials
- Accommodation
- Services

Principle of Organisation :-

- Principle of unity of command means each per should known to whom he has to report and from whom he should receive order.
- Principle of span of control means there is a limit of subordinates under the executive person.
- principle of departmentation means the division of segarisation into different sections.
- principle of specilization means activities of the organisation should be grouped as per the specilisation.
- principle communication means the number of leveds must be as small as passible.

Eg :-



Critical path is 1-2-3-4

Activity	duration	EST	EFT	LST	LFT
1-2	3	0	3	0	3
1-3	6	0	6	4	10
2-3	7	3	10	3	0
3-4	2	10	12	10	12

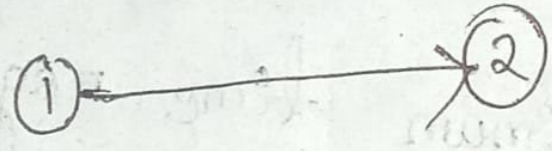
(a) Differentiate between PERT and CPM

	PERT	CPM
(i)	Its origin is military.	Its origin is industry.
(2)	it is an event-oriented approach.	it is an activity-oriented approach.
(3)	It allows uncertainty.	It does not allow uncertainty.
(4)	It is a probabilistic model.	It is a deterministic model.
(5)	It is time based	it is cost based
(6)	it average time	It does not average time.
(7)	It was developed in 1958	it was developed in 1957

Activity :- It is a work or job which consumes time and resources.

1. It has a beginning and end.
   ex- excavation of foundation laying of brick work.

Event :- It is the beginning point of an activity consuming time and resources.



2. Project progress :-

- A bar chart does not show the progress of work so it can not be used as an efficient controlling device.

3. Quantity of item of work :-

- The bar chart shows the time Sche Scedule but it does not indicate the quantities of work.

4. Critical activities :-

- It does not indicate the critical activities which requises careful attention of the construction team.

Preparation of a material Schedule :-

1. Material schedule is prepared weekly by construction program.
2. The material schedule manager storage space and necessary arrangement to be made for timely delivery of material.

Limitation of Bar charts :-

① Interdependance of activities :-

- The bar chart does not who clearly the intendependance among the activities. Consider a construction project involving excavation shuttring and concreting.
- Time of excavation is 20 weaks shutting time is 14 weaks and concreting time is weaks total time of for contreting the project in 50 weaks.

the work and the conditions of the work.

⑤ The report includes details of site investigation geography of the area local weather record.

② post tender stages :-

- post tender stages, start when the tender is accepted and it entends till completion of the contract.
- After the one tender stage the contractor has to under take detail planning to organise the activity of construction work.
- In the stage good communication system between members of the construction team is established for smooth running of the project.
- In this stage alternative construction method which is more economical efficient and selected.
- In this stage requirement of construction material are calculated.

Date

Imp

1.

2.

3.

4.

5.

6

- The role of civil engineers is to preparce design of struction to prepare the drawing plan.
- The role of mechanical engineer is prepare drawing for heading ventilating an conditionaring etc.
- The electrical engineer prepare the working drawing for eletrical powere and distribution systems.
- The role of Surveyes are -

→ To estimate the cost of work.
→ To preparce the bild of quantitien.
→ To prepare the tender documenth.

Contractor :-

- A contractor may be a single man undertaking small construction or large construction project.
- The contractor needs the Services of qualified engineers.

- Each activity of job may furthere be subdivided into smallere jobs for planning at varieous level.

Stages of planning :-

- planning for construction may be done in the following two stage -

(i) pretendere stage
(ii) contract stage / post tendere stage

(1) pretendere stage :-

- It is carried out by the construction -

(a) It is the stage at which the contractor has the best opportunity of planning for the futur contract.

(2) During this stage the main aim of the contractor is the see whether the contract is profitable or not.

(3) Befor a Contract is undertaken, contractor is visits the site of construction work.

(4) A pretendere report is prepared which decribes the complete circumstantances of

Commissioning stage :-

- In this stage the performance of the structure is evaluated.
- The purpose of this stage is to ensure that the construction work has been completed as specified in the Contract.
- During the stage records of the construction work are prepared.
- Various activities involved in this stage are -

① To keep varies records of the work.

② To inpect the construction work.

③ To prepare instructions and maintenance manuals.

④ To carray out tests.

① what are the resources of construction management?

Ans:- There are 5 resources for construction management.

① Materials
② Main power
③ Mechines
④ Funds
⑤ Spaces

Materials:-

- Materials are bricks, stone, cement aggregate steel, timber, water supply, sanitary, fitting, petrol, oil ect.

Main power:-

- Technical person are necessary to carryout the project activity the technical persons are engineeries, supervisor and technician

- Directing means to motivate people to achieve the objectives.

Controlling :-

- It is necessary for effective and effecient working.
- The following steps are necessary for controlling :-

(i) Measurement of actual performance by progress and quality.

ii) Analysis of shortfall

iii) Remedial measures

iv) Quick information

Co-ordinating :-

- It is necessary to bring together and co-ordinate the work of various department regular meetings of department head with top management one necessary to discuss the plans, remedies problems for best solution.