



JECRC Foundation



**JAIPUR ENGINEERING COLLEGE
AND RESEARCH CENTRE**

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTER

Class – VI A & B

Subject – Construction Technology & Equipment

Ch – 4 (Construction Planning)

Presented by – Shivangni Khandelwal (Assistant Professor)

VISSION AND MISSION OF INSTITUTE

VISION

To become a renewed center of outcome based learning, and work towards academic, professional, culture and social enrichment of the lives of inviduals and communities.

MISSION

Focus on evaluation of learning outcomes and motivate students to inculcate research Aptitude by project based learning. Identify, based on informed perception of Indian, Regional and global needs, areas of focus and provide platform to gain knowledge and solutions. Offer opportunities for interaction between academia and industry. Develop human potential to its fullest extent so that intellectually capable and imaginatively gifted leaders can emerge in a range of professions.

VISSION AND MISSION OF DEPARTMENT

VISION

To become a role model in the field of Civil Engineering for the sustainable development of the society.

MISSION

- 1)To provide outcome base education.**
- 2)To create a learning environment conducive for achieving academic excellence.**
- 3)To prepare civil engineers for the society with high ethical values**

SYLLABUS

S NO.	CONTENT
1	Introduction: Objective, scope and outcome of the course.
2	Engineering Economy: Principle of Engineering Economy, Minimum cost point analysis, Breakeven point analysis, Depreciation and depletion
3	Safety in construction: Causes, classification, cost and measurement of an accident, safety programme for construction, protective equipment, accident report, safety measure: (a) For storage and handling of building materials. (b) Construction of elements of a building (c) In demolition of buildings; Safety lacuna in Indian scenario. Fire safety provisions as per NBC.
4	Construction Planning: Need of construction planning, Constructional Resources, construction team, stages in construction, preparation of construction schedule, Job layout, inspection and quality control; Materials Management: Objective and functions of material management
5	Construction Equipment and Management: Earth Moving Equipment-Bull dozers tractor pulled scrapers Power shovels Draglines clamshells; cranes; Hoes, Trenching machine types Hauling Equipment; Drilling, Blasting and Tunneling Equipment; Pile Driving Equipment

COURSE OUTCOME

CO 1	To understand the concept of Engineering Economy, Depreciation and Depletion.
CO 2	To understand safety in construction.
CO 3	To understand need of construction planning and objective of material management.
CO 4	To understand the various technology and equipment involved in construction.

Construction Planning

Construction planning is the specific process construction managers use to lay out how they will manage and execute a construction project, from designing the structure to ordering materials to deploying workers and subcontractors to complete various tasks.

A construction plan lists out each step that it will take to achieve the desired result.

5 Steps to the Perfect Construction Planning Process

Step 1: Create the project

Every construction project, no matter how big or small, needs to start with a business case that lays out the feasibility of the project and what it's going to take to get the job done.

Start by creating a Project Initiation Document (PID), which describes the following in general—not technical—terms (the technical part comes later):

- **People:** Number of workers needed, as well as subcontractors such as plumbers and electricians.
- **Resources:** Necessary materials for this project.
- **Budget:** Total cost of the project including labor, materials, equipment, fees, and permits.

The purpose of this document is to outline the resources you'll need to complete the project, both for your stakeholders and your crew.

Construction software features that can help with this: Most options in Software Advice's construction software directory offer basic project management tools that should allow you to sketch out a plan. Make sure you demo any software product you're considering to ensure it suits your project management needs.

5 Steps to the Perfect Construction Planning Process

Step 2: Draft an initial plan

Now comes the point where you need to turn the PID into a more concrete plan by setting goals that are S.M.A.R.T. and C.L.E.A.R. You'll take the specific resources you listed in the previous step and use that to inform a broader strategy that will guide how you actually execute the project.

Let's start with **S.M.A.R.T.**

Specific: Set specific goals for your project such as deadlines for key milestones.

Measurable: Agree on how you will measure success for goals. For example, is it good enough that you have started laying concrete by the deadline you set, or should it be completely set by that date?

Attainable: You need to have a plan in place for how you're going to achieve these goals. For example, does your project depend on a specific material that might not be available at the quantity you need when you need it? If so, you need to make adjustments.

Realistic: Your goals need to be within your abilities as a construction manager. For example, if your project includes plans to get the electrical work done within three months when you've never done it in less than six months for a project of this size, you're setting yourself up for failure.

5 Steps to the Perfect Construction Planning Process

Timely: Lay out a specific time frame in which you can expect—realistically—that you can achieve these goals.

Now let's take a look at **C.L.E.A.R.**, a slight variation on this strategy.

Collaborative: Get everyone on board. Hold a meeting before the project begins with the entire team to lay out what is expected and have them help you identify any possible obstacles.

Limited: Limit these goals both in terms of scope and time frame to not get overwhelmed.

Emotional: Ensure that your goals will get your employees fired up and on board.

Appreciable: Break up big goals into achievable tasks so you don't overwhelm your workers.

Refinable: Count on having to be flexible, because you can never predict what will happen on a job site.

Construction software features that can help with this: Again, you want construction software with a good project management focus, but in this case you need to get much more detailed with budgets and timelines, so you need software that has project management as well as accounting, materials tracking, and document management.

5 Steps to the Perfect Construction Planning Process

Step 3: Execute the plan

It's time to execute your plan. Start by calling a team meeting to go over the plan and start assigning responsibilities. This meeting is critical for your plan's success. Without buy-in from your crew, you will fail to achieve your objectives.

Talk with each person on your crew individually, if possible, to discuss expectations and give them an opportunity to ask questions about anything they're confused about. Is your backhoe operator supposed to be in daily communication with your engineering team because they'll be working in the same area at similar times? They need to know that and what the expectations are as to how they will communicate and when.

You will also need to assign project managers to oversee your teams. If you're a very small business, you may be the only project manager, but you need to have a schedule drawn-up of what you will be checking and when. **Construction software features that can help with this:** A team management feature will be very helpful for this step. This feature allows you to monitor job status, team activities, and track time.

5 Steps to the Perfect Construction Planning Process

Step 4: Track your performance

It's essential that you accurately track the performance of your team on this construction project and ensure they are meeting the parameters you've set. And in the event of an unsuccessful project, it ensures you have data that you can dive into to figure out why you failed so it doesn't happen again. Successful construction managers typically use key performance indicators (KPIs) to monitor the performance of a project.

Some typical KPIs you can track include:

Project objectives: Are you on schedule and on budget?

Project performance: Is the project proceeding smoothly, or are you running into some obstacles you weren't expecting?

Quality: Sure, the crew is hitting their milestones—but is the work up to the quality that you want at this stage?

Construction software features that can help with this: Many construction software options offer tracking tools, such as materials management or equipment tracking, not to mention the team-tracking options mentioned above. Use as many tracking tools as makes sense: More data is better than less.

5 Steps to the Perfect Construction Planning Process

Step 5: Close out and evaluate the project

Just because the project is over doesn't mean you're done with the planning process. In fact, in some ways the work is just beginning—this project will go a long way toward informing how you approach the next project.

Thanks to the fact that you had a clearly-defined construction project plan and a way to track performance and obstacles, you're well-equipped to conduct an even more successful construction planning process the next time around. You'll know where the obstacles are, what mistakes were made, and therefore how you can tweak the next plan in order to maximize success.

But this shouldn't be a process that takes place just in your own head. Call a final meeting with your crew to discuss how you performed. Conduct a brainstorming session to get ideas on what you could have done better, and take extensive notes. They're your eyes and ears, so don't lose the opportunity to collect their valuable insight.

To formally close this project out, create a final project budget and contrast it with the original budget, and then draft a final project report that you share with key stakeholders.

Why Project Management Matters

The fundamentals of managing a project from start to finish require a team of individuals with different talents and skills. Those people are responsible for planning and executing the project objectives and that takes more than just labour and materials. Each project follows a Project Life Cycle. A sound project plan can mean the difference between success or failure. Each project follows a Project Life Cycle.

It's a hard skill to master, but well worth learning. And here's why:

1. Defines a plan and organizes chaos – projects are naturally chaotic. The primary business function of project management is organizing and planning projects to tame this chaos. A clear path mapped out from start to finish ensures the outcome meets the goals of your project.

2. Establishes a schedule and plan – Without a schedule, a project has a higher probability of delays and cost overruns. A sound schedule is key to a successful project.

Why Project Management Matters

3. Enforces and encourages teamwork – A project brings people together to share ideas and provide inspiration. Collaboration is the cornerstone to effective project planning and management.

4. Maximises resources – Resources, whether financial or human, are expensive. By enforcing project management disciplines such as project tracking and risk management, all resources are used efficiently and economically.

5. Manages Integration – Projects don't happen in a vacuum. They need to be integrated with business processes, systems and organizations.

You can't build a sales system that doesn't integrate with your sales process and sales organization. It wouldn't add much value. Integration is often key to project value. Project management identifies and manages integration.

6. Controls cost – some projects can cost a significant amount of money so on budget performance is essential. Using project management strategies greatly reduces the risk of budget overruns.

Why Project Management Matters

7. Manages change – projects always happen in an environment in which nothing is constant except change. Managing change is a complex and daunting task. It is not optional. Project management manages change.

8. Managing quality – Quality is the value of what you produce. Project management identifies, manages and controls quality. This results in a high quality product or service and a happy client.

9. Retain and use knowledge – projects generate knowledge or at least they should. Knowledge represents a significant asset for most businesses. Left unmanaged knowledge tends to quickly fade. Project management ensures that knowledge is captured and managed.

10. Learning from failure – projects do fail. When they do, it is important to learn from the process. Project management ensures that lessons are learned from project success and failure.

Effective Construction Management Plan

Construction project planning is like creating a roadmap that leads everyone through all the phases of the project. It's a formal document that requires approval from the client or stakeholder, and shows how the project will be executed and controlled.

You'll start with a business plan, which explains the whys of the project, including:

- **Business Benefits:** what is the return on investment of the project.
- **Planning Permission:** you must get approval and adhere to building and municipal codes.
- **Project Description:** outline what the project is and how you're planning to execute it.
- **PM and Team:** who is leading the project and who will make up the teams executing the plan.
- **Project Design:** the plans, blueprints and other drawings detailing the build.
- **Bid and Contract:** there are a couple of different bidding methods, which should be detailed here, also the details of the contract.
- **Construction Process:** identifying activities and resources required to make the design a physical reality.
- **Occupation and Defects Liability Period:** outlining the process the client takes once possessing the development to occupy it.
- **Evaluation After Occupation:** like a post-mortem to note what worked and didn't over the course of the project.

Effective Construction Management Plan

The project construction plan is made up of many documents, including:

- **Scope Documentation:** The scope is a list of goals, deliverables, features, functions, tasks, deadlines and costs. It's the overall needs of the project. You're outlining the business needs of the project, as well, by detailing the benefits among the milestones you'll track to reach them.
- **Work Breakdown Structure (WBS):** This is the document that visualizes the key project deliverables and organizes the work your team will do when the project is started into manageable sections. Think of it as a "hierarchical decomposition of the work to be executed by the project team," as defined by the Project Management Body of Knowledge (PMBOK).
- **Communication Plan:** To effectively implement that various aspects of your project plan, you must articulate them clearly and deliver them efficiently. That's where this communication plan comes in. You need to define your goals and objectives, then decide on what tools and methods you'll use to deliver them.
- **Risk Management Plan:** All projects have risks, but construction projects have risks on a different level. You're going to have to provide safety management, which will include a thorough assessment of what might go wrong and how you're resolve it. But the risks aren't only physical or life-threatening, they also include time and cost estimates and other more mundane aspects of the project.

Project Scheduling

Project schedule development uses the outputs from the processes to define activities, sequence activities, estimate activity resources, and estimate activity durations in combination with the scheduling tool to produce the schedule model.

The six processes within the Project Time Management knowledge area that are related to project scheduling are:

1. Plan Schedule Management
2. Define Activities
3. Sequence Activities
4. Estimate Activity Resources
5. Estimate Activity Durations
6. Develop Schedule

Project Scheduling

Step 1: Plan Schedule Management

The first step is to define the policies, procedures, and documentation which will govern the production of the project schedule.

Plan Schedule Management is the process of establishing the policies, procedures, and documentation for planning, developing, managing, executing and controlling the project schedule. The key benefit of this process is that it provides guidance and direction on how the project schedule will be managed throughout the project.

Although optional for small projects, the PMBOK (Project Management Book of Knowledge) specifies the production of a Schedule Management Plan, which is a component of the overall Project Management Plan. The following items could be addressed in this plan.:

Contingencies. How big will they be, and how will they be calculated?

Resources. Are there any resources whose availability has a major effect on the schedule?

Task Dependencies. Are there any major task dependencies the project depends on, such as completing the foundation before the framing can start?

Organizational Procedures. Maybe there is a certain software that must be used or standard procedures for updating the schedule.

Stakeholders. Who must approve the schedule, or to whom must it be distributed?

Project Scheduling

Step 2: Define Activities

At this point we start to dive into the meat and potatoes of project scheduling. In the field, the activity list is also known as a **Work Breakdown Structure (WBS)**, although the PMBOK distinguishes between these two items.

Define Activities is the process of identifying and documenting the specific actions to be performed to produce the project deliverables. The key benefit of this process is to break down work packages into activities that provide a basis for estimating, scheduling, executing, monitoring and controlling the project work.

there are a few rules of thumb for determining the activity list:

- **Make sure it can be reliably estimated.** The tasks should be broken down to a point where a reliable estimate can be produced. If you are still unsure about the cost and/or duration of the task, consider breaking it down further.
- **Base it on Deliverables.** Each deliverable should have a clearly defined task, or set of tasks, in place to produce it.

Project Scheduling

- **Have only one Responsible Party.** When you have multiple people and/or organizations responsible for the completion of a task, it is difficult to control and manage.
- **Match tasks to cost accounts.** Maybe your organization has predefined cost accounts, such as “Wood work”, or “Flooring” that should be used.
- **Make it measurable.** It should be easy to put a percent complete value on a task at any time. If this is not easy to do, the task should be broken down further.

Project Scheduling

Step 3: Sequence Activities

After the project has been divided into tasks the relationships between them must be determined. Most of the time a task starts when the previous one finishes, but not all the time.

Sequence Activities is the process of identifying and documenting relationships among the project activities. The key benefit of this process is that it defines the logical sequence of work to obtain the greatest efficiency given all project constraints.

Step 4: Estimate Activity Resources

Estimate Activity Resources is the process of estimating the type and quantities of material, human resources, equipment, or supplies required to perform each activity. The key benefit of this process is that it identifies the type, quantity, and characteristics of resources required to complete the activity which allows more accurate cost and duration estimates.

There are four major types of resources:

- a) Labor
- b) Tools and equipment
- c) Facilities
- d) Fixed cost items like subcontractors, etc.

Project Scheduling

Step 5: Estimate Activity Durations

Estimate Activity Durations is the process of estimating the number of work periods needed to complete individual activities with estimated resources. The key benefit of this process is that it provides the amount of time each activity will take to complete, which is a major input into the Develop Schedule process.

Estimating is a profession in itself, but there are three methods you can utilize to determine activity durations:

Analogous Estimating: In this method you consult the actual data from a previous or related project. Even if it has some differences to the current project, you can analyze those differences and apply a correction factor.

Parametric Estimating: In this method you break down the project into its fundamental units that have well known and understood unit rates. For example, the square footage of a house.

Three Point Estimating: When you have no real good data to go from, you can estimate the highest possible number (optimistic), and the lowest (pessimistic) as well as the most likely. Then you can use a triangular distribution (average them), or use a beta distribution.

Project Scheduling

Step 6: Develop Schedule

In this step we will develop the most efficient schedule for the project. This is defined as producing the official start and end dates for each task. This can be used to direct subcontractors as to when to schedule the work, order equipment, and to prioritize internal resources. It also uses the critical path method to determine the shortest possible project completion date and which tasks directly affect it. Issues that arise within those tasks can then be dealt with on a priority basis.

Develop Schedule is the process of analyzing activity sequences, durations, resource requirements, and schedule constraints to create the project schedule model. The key benefit of this process is that by entering schedule activities, durations, resources, resource availabilities, and logical relationships into the scheduling tool, it generates a schedule model with planned dates for completing project activities.

Job Layout

A job layout is prepared to promise that work proceeds smoothly without any obstruction.

The various construction resources such as material, men, machinery etc. should be arranged in such way to achieve optimal utilization of space.

The larger and more complex the project, greater will be the need for planned job layout and detailing at site.

And job layout can be defined as a site drawing of the proposed construction showing the location of entry, exit, temporary services, material stores and stocks, plant or equipment and site offices.

Temporary Facilities (TFs) are defined as those facilities and areas depicted to specific tasks that support the construction process.

Temporary facilities are typically not part of the permanent structure and have relatively short life spans.

Construction site layout involves identifying, sizing, and placing temporary facilities (TFs) within the boundaries of construction site. These temporary facilities range from simple lay down areas to warehouses, batch plant, fabrication shops, residence facilities and maintenance shops.

Job Layout

Good site layout planning leads to:

- 1) Provide a uniform flow of material about the site, free from bottlenecks.
- 2) Provide adequate control on equipment theft.
- 3) Facilitate movement of equipment on the jobsite.
- 4) Promote a safe working environment.
- 5) Provide safe, nondestructive access to the jobsite for visitors.

Job Layout

Identification of facility

The Following are the temporary facilities are identified to be constructed on site:-

- 1) Site Office
- 2) Booking office
- 3) Subcontractor's office
- 4) First Aid and Medical Room
- 5) Guard Room
- 6) Toilet on Site
- 7) Engineer and Staff quarters
- 8) Labor quarters
- 9) Equipment Maintenance room
- 10) Parking for machines
- 11) Bar bending shop
- 12) Fabricated rebar storage yard
- 13) Carpentry shop
- 14) Cement warehouse
- 15) Batching plant and aggregates storage
- 16) Testing Lab
- 17) Material storage lab
- 18) Water tank
- 19) Scaffolding storage
- 20) Canteen

Job Layout

Relationship chart

In the previous step, we have identified the facility required on construction site.

In this step, we are going to decide that which facility should be close for which facility or which facility needs to be kept far from which facility.

The relationship diagram shows the list of identified facility and right hand of the chart shows the description of relation between the one facility to the others facility.

Description of the relation between facilities can be denoted by alphabets as A, B, C, D, E. The alphabet is also called as “proximity weight” or “proximity value” because we have fixed some relation of facility in respect to the remaining facilities depending on proximity relation.

The chart shows the description about the proximity relation between facility locations therefore we called it as a “relationship chart”.

Job Layout

Relationship chart

Any effective layout needs to start with an in-depth discussion of work relationships.

In this case, the primary focus of the discussions surrounded the issue proximity.

Each of the major facility is listed on the left side of the relationship chart.

Each facility is related to every other facility at the site. In the relationship chart, these closeness

values were placed in the corresponding diamond based on the following scale:

A = Absolutely Necessary that the two facility should be close (to be close).

B = Especially Important that the two facility must be close.

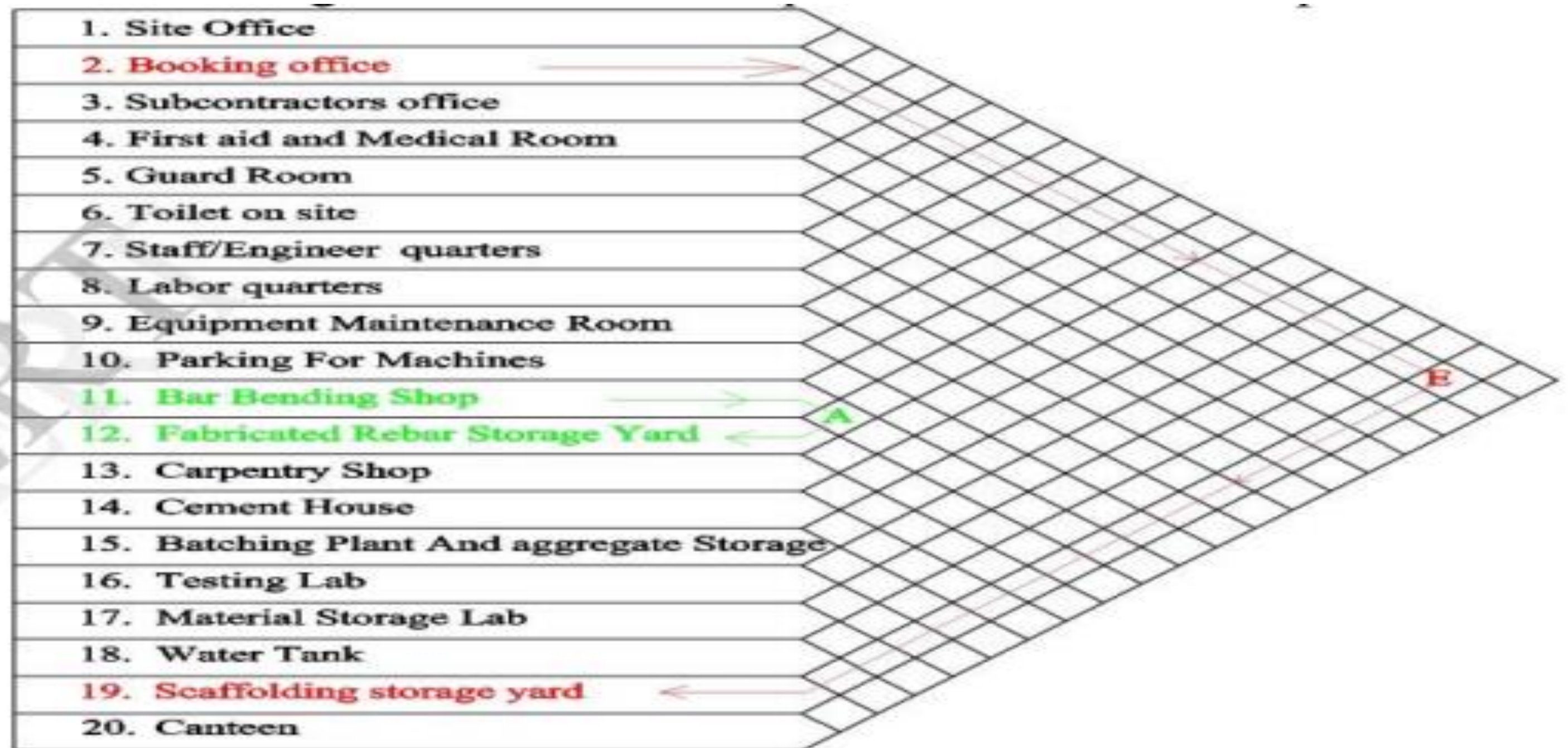
C = Important that the two facility may be close.

D = Unimportant or no need to be close the two facility.

E = Undesirable or need to be far the two facility.

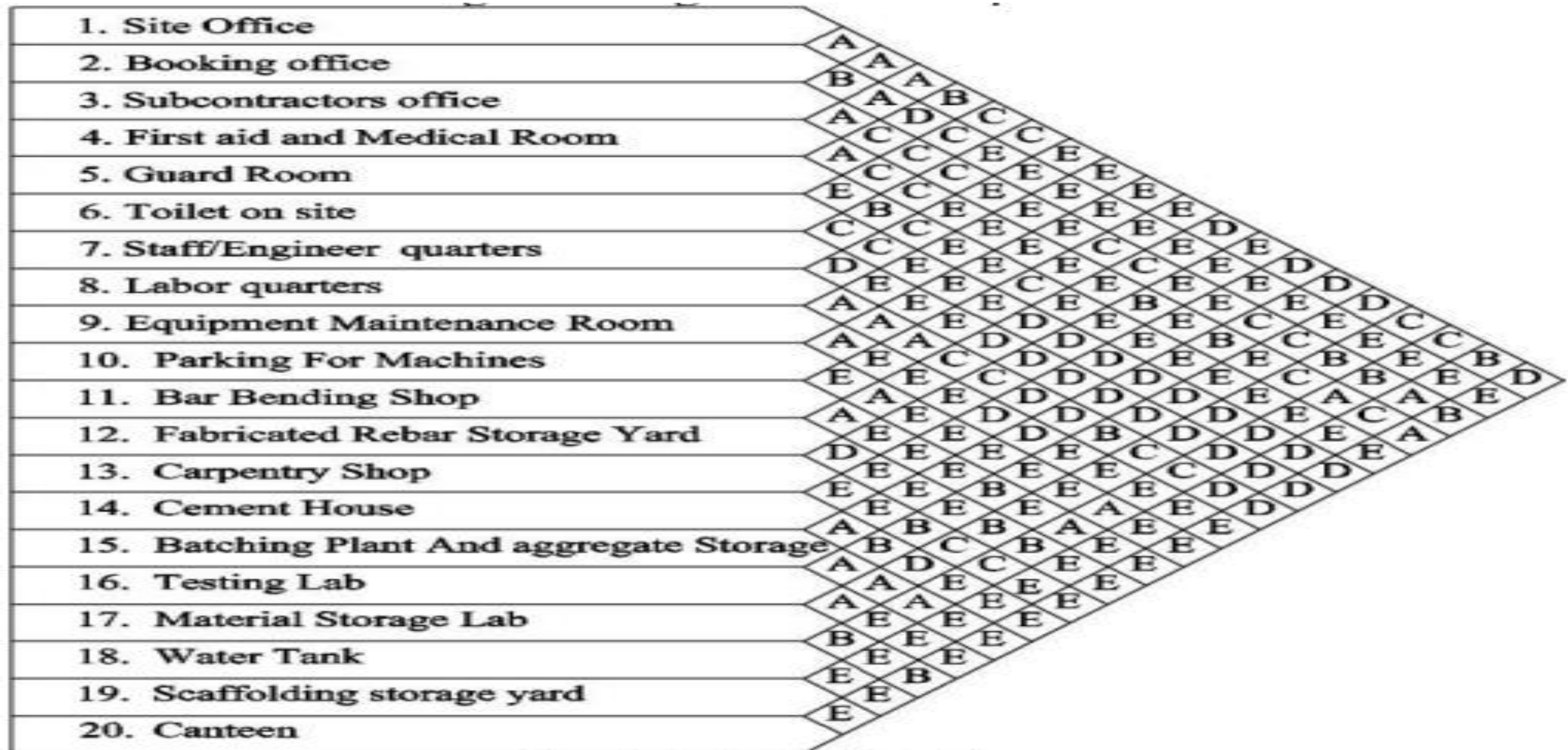
Job Layout

Filling of Relationship chart



Job Layout

Relationship chart



Job Layout

Facility movement

The decision of fixing the facility location is depend on the entry location, exit and how will be the flow of facility occurs on site.

Ex.- In construction project, we have fixed the entry location and exit. The entry should be fixed at the west side of plot where there is approaching a road of width 20m. The purpose behind the fixation of entry on west side is to attract the customer by showing them the extent of construction project. The extension of construction project cannot be visualized from any other side. The exit is kept on north side of the plot, where there is approaching road of width 30m. After fixing the entry location, we are going to think on facility movement on site.

To identify facility movement or the flow of facility, we take use of Fig 2 and randomly locate the facility to identify an optimized flow of facility. This process can be made in number of times till the optimized flow cannot be observed.

Job Layout

But if, we do facility movement simultaneously with relationship chart then we get some clear picture about optimized flow. Then we get facility location with proposed building location. Now, grouping or bundle of the same or nearly same function of facility can be done to get the initial relationship diagram. The grouping of facility is done in oval shape as shown in Fig 5. The grouping of facility is shown below.

Group 1

1) Site office 2) Booking office 3) Subcontractor office 4) First aid and medical room 5) Toilet on site 6) Labor quarter 7) Guard room

Group 2

1) Toilet on site 2) Carpentry shop 3) Water tank 4) Scaffolding storage.

Group 3

1) Cement warehouse 2) Batching plant and aggregate storage

Group 4

1) Toilet on site 2) Staff and engineer quarter

Job Layout

Group 5

1) Bar bending shop 2) Fabricated rebar storage yard

Group 6

1) Testing lab 2) Material storage lab

Group 7

1) Equipment maintenance room 2) Parking for machines

Group 8

1) Canteen 2) Toilet on site.

Others

1) Internal Road 2) Electric Poles.

With the help of relationship chart, the initial relationships diagram with grouping tasks is done

Job Layout

Space requirements

Once work relationships were worked out to the optimized level, the group involved in the construction project including project manager, senior Engineer, site Engineer etc wants to establish the space relationships for each facility.

Once again, this process was accomplished over a series of weekly, one hour meetings.

Each person listed their personal space needs and these were presented orally and discussed by all. The process of working through this activities area discussion added much understanding to how the business operates now and should operate in the future.

Job Layout

Activity relationship diagram

After completion of grouping of facility task, each group is now moving according to others group or move according to the relation that group with other group.

The relation among the group can be shown in figure by single, two, three and four line between the groups.

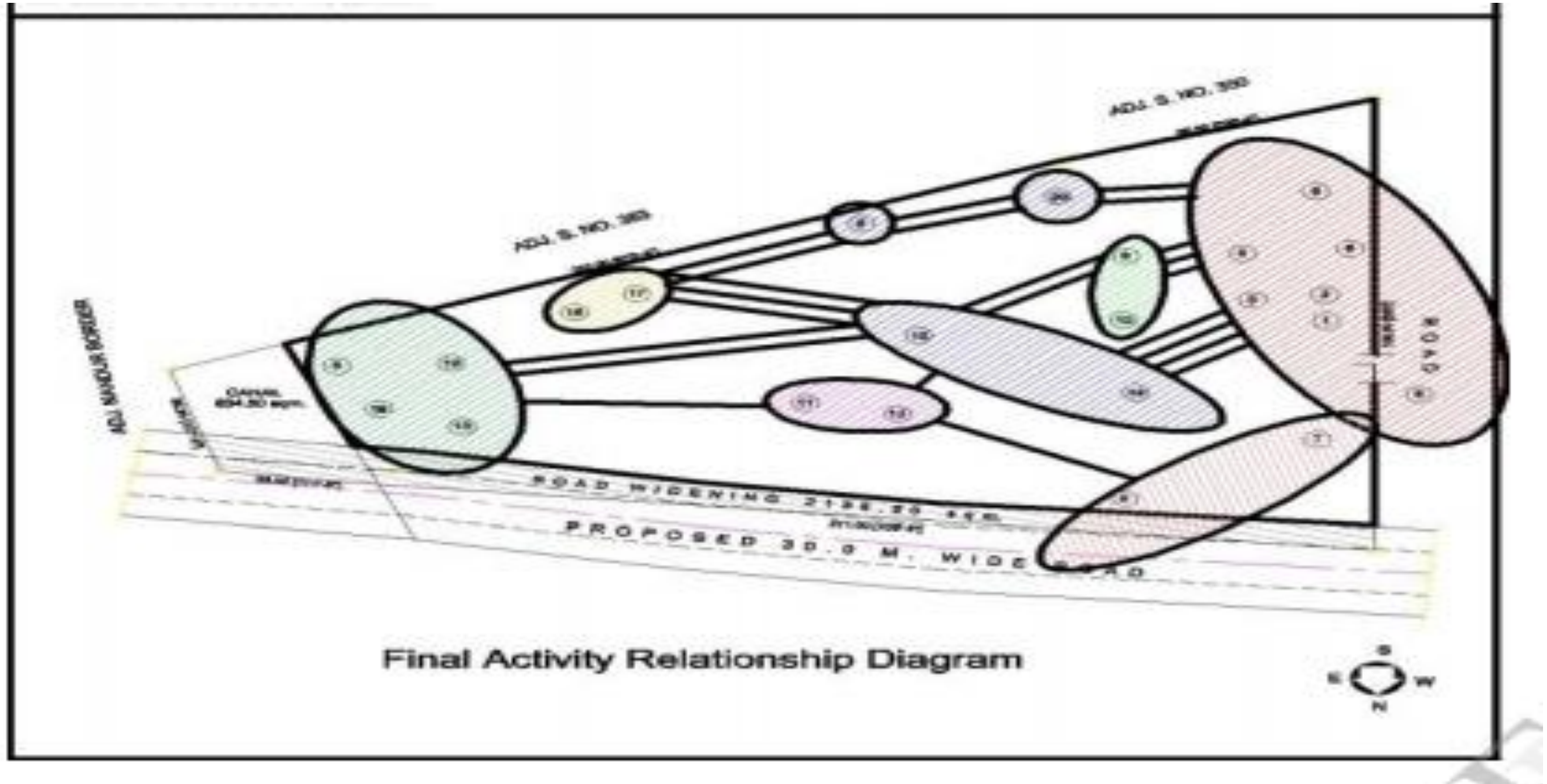
The meanings of those four lines between groups indicate that it is absolutely necessary that these groups should be close together.

Three lines show an especially important closeness relationship.

Two lines illustrate that it is important that they may or may not be close.

One line illustrate that there is no need to be close that groups.

Job Layout



Inspection and Quality Control

- Specifications for quality are available in Indian standards formulated by Bureau of Indian Standards, New Delhi.
- Different types of construction works are dealt with in different ways and different tests to assess their different quality characteristics are available. In different types of construction works or jobs different stages may be recognized.
- For example, if we wish to make a reinforced concrete beam structural member, we have to go through different stages such as providing supports to the form work, making of form work, cutting or reinforced bars for the beam, putting the reinforcement in the formwork, mixing of concrete, pouring of concrete in the formwork, vibrating concrete, curing concrete, etc.
- There are different types of guidelines to oversee each stage so that the quality of the beam is of a right type. We should appreciate that it shall be difficult to maintain the overall quality if quality is not maintained in some of these stages.
- We have to monitor quality of each and every stage to get the required quality of the concrete member.

Inspection and Quality Control

Salient points are given below regarding different stages and quality control aspects required to be considered in some general construction operations.

Earth Work

Stages

- Measurement of dimensions in different directions in terms of height, width and length •
- Excavation of soil
- Determination of soil properties
- Compacting soil

Quality Control Considerations

- Accurate measurements with precise instruments
- Use of good equipment
- Use of standard procedures for testing of soil
- Use of equipment for compaction

Inspection and Quality Control

Salient points are given below regarding different stages and quality control aspects required to be considered in some general construction operations.

Masonry

Stages

Measurement of dimensions in different directions in terms of height, width and length

- Construction of masonry
- Curing of masonry work

Quality Control Considerations

- Accurate measurements with precise instruments
- Use of good equipment
- Use of standard procedures for testing of soil
- Use of equipment for compaction

Material Management

1. Materials Management' is a term used to connote “controlling the kind, amount, location, movement and timing of various commodities used in production by industrial enterprises”.
2. Materials Management is the planning, directing, controlling and coordinating those activities which are concerned with materials and inventory requirements, from the point of their inception to their introduction into the manufacturing process. It begins with the determination of materials quality and quantity and ends with its issuance to production to meet customer's demand as per schedule and at the lowest cost.
3. Materials Management is a basic function of the business that adds value directly to the product itself
4. Materials Management embraces all activities concerned with materials except those directly concerned with designing or manufacturing the product.
5. Materials Management deals with controlling and regulating the flow of material in relation to changes in variables like demand, prices, availability, quality, delivery schedules etc.

Material Management

- Thus, material management is an important function of an organization covering various aspects of input process, i.e., it deals with raw materials, procurement of machines and other equipment's necessary for the production process and spare parts for the maintenance of the plant. Thus in a production process materials management can be considered as an preliminary to transformation process.
- It involves planning and programming for the procurement of material and capital goods of desired quality and specification at reasonable price and at the required time.
- It is also concerned with market exploration for the items to be purchased to have up to date information, stores and stock control, inspection of the material received in the enterprise, transportation and material handling operations related to materials and many other functions.

Material Management

Functions of materials management:-

1. Planning and programming for materials purchase.
2. Stores and Stock control.
3. Receiving and issue of the material.
4. Transportation and material handling of the material.
5. Value engineering and value analysis.
6. Disposal of scrap and surplus materials.

Objectives of Materials Management:-

Materials management contributes to survival and profits of an enterprise by providing adequate supply of materials at the lowest possible costs.

Material Management

The fundamental objectives of materials management activities can be:

(i) Material Selection:

Correct specification of material and components is determined. Also the material requirement in agreement with sales programme are assessed. This can be done by analysing the requisition order of the buying department. With this standardisation one may have lower cost and the task of procurement, replacement etc. may be easier.

(ii) Low operating costs:

It should endeavor to keep the operating costs low and increase the profits without making any concessions in quality.

(iii) Receiving and controlling material safely and in good condition.

(iv) Issue material upon receipt of appropriate authority.

(v) Identification of surplus stocks and taking appropriate measures to produce it.

Material Management

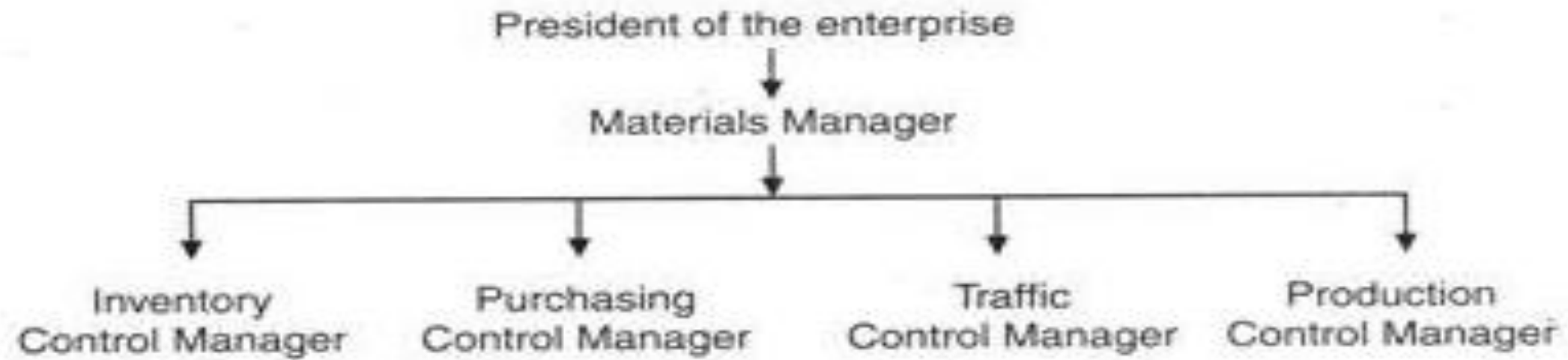
The outcome of all these objectives can be listed as given below:

- (i) Regular uninterrupted supply of raw-materials to ensure continuity of production.
- (ii) By providing economy in purchasing and minimizing waste it leads to higher productivity.
- (iii) To minimize storage and stock control costs.
- (iv) By minimizing cost of production to increase profits.
- (v) To purchase items of best quality at the most competitive price.

Organization of Materials Management Department:

To facilitate planning, direction, control and co-ordination of various activities related to material in an enterprise there should be a separate department of materials management. The organizational structure of the department can be.

Material Management



Material Management

The objectives of material management can be classified into two categories viz; primary objectives and secondary objectives.

Primary Objectives:

The following are the primary objectives:

1. Low Prices:

If materials department succeeds in reducing the price of items it buys, it contributes in not only reducing the operating cost but also in enhancing the profits.

2. Lower Inventories:

By keeping inventories low in relation to sales, it ensures that less capital is tied up in inventories. This increases the efficiency with which the capital of the company is utilized resulting in higher return on investment. Storage and carrying costs are also lower.

3. Reduction in Real Cost:

Efficient and economical handling of materials and storage lowers the acquisition and possession cost resulting in the reduction in the real cost.

Material Management

4. Regular Supply:

Continuity of supply of materials is essential for eliminating the disruption in the production process. In the absence of regular supply of materials, production costs go up.

5. Procurement of Quality Materials:

Materials department is responsible for ensuring quality of materials from outside suppliers. Therefore, quality becomes the single most objective in procurement of materials.

6. Efficient handling of Materials:

The effective material control techniques help the efficient handling of materials resulting in the lowering of production cost.

7. Enhancement of firm's goodwill:

Good relations with the suppliers of materials enhance the company's standing in the society as well as in the business community.

8. Locating and developing future Executives:

Materials manager must devote special effort to locate men at lower position who can take up the executive posts in future. It helps in developing talented personnel who are ready to undertake future responsibilities of the business relating to materials management.

Material Management

Secondary Objectives:

The following are the important secondary objectives of materials management.

1. Reciprocity:

The purchase of raw materials from the organisations/customer's by the concern and in turn, sale of finished products to the above customers is known as reciprocity. It serves the twin purpose of increasing purchasing as well as sales.

2. New Developments:

The staff of the materials department deals regularly with the suppliers responsible for new developments in material handling. These developments can be successfully applied in material handling and management.

3. Make or Buy Decisions:

The material manager with regular reviews of cost and availability of materials can safely conclude that whether the material is to be purchased or developed in the organisation itself.

Material Management

4. Standardization:

Standardization of materials is greatly helpful in controlling the material management process. With regular stock-taking, the non-standardised items can be rejected and standard components may be brought into product designs to reduce the cost of production. It is further helpful in promoting the standardization with suppliers.

5. Assistance to Production department:

By supplying the standardized materials or components to the production department, quality products can be assured. It is helpful in imparting the economic knowledge in bringing about the desired improvement in the product.

6. Co-operation with other departments:

Successful management of materials department contributes to the success of every other department in the organization. At the same time the success of materials department depends on how successful it is in getting the co-operation of the staff of the other departments.

Material Management

7. Conception of future outlook:

The materials manager must have some conception of future outlook for prices, cost and general business activity. Forecasting can be made about the future trends in materials. The materials manager should be able to foresee the prices and costs of the raw materials and general business conditions through their daily contracts with the suppliers.

Functions of Material Management:

Material management covers all aspects of material costs, supply and utilization. The functional areas involved in material management usually include purchasing, production control, shipping, receiving and stores.

1. Production and Material Control:

Production manager prepares schedules of production to be carried in future. The requirements of parts and materials are determined as per production schedules. Production schedules are prepared on the basis of orders received or anticipated demand for goods. It is ensured that every type or part of material is made available so that production is carried on smoothly.

Material Management

2. Purchasing:

Purchasing department is authorized to make buying arrangements on the basis of requisitions issued by other departments. This department keeps contracts with suppliers and collects quotations etc. at regular intervals. The effort by this department is to purchase proper quality goods at reasonable prices. Purchasing is a managerial activity that goes beyond the simple act of buying and includes the planning and policy activities covering a wide range of related and complementary activities.

3. Non-Production Stores:

Non-production materials like office supplies, perishable tools and maintenance, repair and operating supplies are maintained as per the needs of the business. These stores may not be required daily but their availability in stores is essential. The non-availability of such stores may lead to stoppage of work.

Material Management

4. Transportation:

The transporting of materials from suppliers is an important function of materials management. The traffic department is responsible for arranging transportation service. The vehicles may be purchased for the business or these may be chartered from outside. It all depends upon the quantity and frequency of buying materials. The purpose is to arrange cheap and quick transport facilities for incoming materials.

5. Materials Handling:

It is concerned with the movement of materials within a manufacturing establishment and the cost of handling materials is kept under control. It is also seen that there are no wastages or losses of materials during their movement. Special equipment's may be acquired for material handling.

6. Receiving:

The receiving department is responsible for the unloading of materials, counting the units, determining their quality and sending them to stores etc. The purchasing department is also informed about the receipt of various materials.



JECRC Foundation



**JAIPUR ENGINEERING COLLEGE
AND RESEARCH CENTRE**

*Thank
you!*

STAY HOME, STAY SAFE