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"CONSTRUCTION MANAGEMENT- EXECUTION PROCESS" OF HIGH RISE RESIDENTIAL BUILDING IN PRAJAY *MEGAPOLIS*

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ABSTRACT : *From the very beginning of the existence of the human being on the planet, man has been constantly devising means of safeguarding himself against the onslaught of nature and wild animals. In the ancient times man used to live on trees, machines and in caves. With the advancement of knowledge and civilization man started constructing huts and then houses and started living in groups. The main objective of our academic major project is to study the aspects of CONSTRUCTION MANAGEMENT adopted in construction of a project. We shall study the execution process during our site visits. Construction management systems and procedures followed during the entire duration of the construction shall head the project towards success. The objectives of Construction Site Management of a work are to execute the project or work most economically is terms of money and time both.*

KEYWORDS *- Execution Process , Methodology of carrying out academic project.*

I. INTRODUCTION

India has a glorious past in the field of construction work. The earliest known organized of dwellings at Mohenjo-Daro dates back to 3000BC.The monuments of cave temples at Eldora and Ajanta are testimony of the skill and craftsmanship in construction of the early days. During British regime, the construction activities remained confined to a limited sphere of construction of some irrigation works, roads and cities, etc.,

From the very beginning of the existence of the human being on the planet, man has been constantly devising means of safeguarding himself against the onslaught of nature and wild animals. In the ancient times man used to live on trees, machines and in caves. With the advancement of knowledge and civilization man started constructing huts and then houses and started living in groups.

With the passage of time, new techniques of construction developed and construction activity turned into industry. Thus construction industry is the single largest importance undertaking in the economy of a country. Thus the basic needs of human beings from very beginning are Food, Clothing & Shelter.

1. Construction accounts for around 9% of GDP contribution
2. Sector wise it is only next to agriculture in employment generation
3. Direct, Indirect lively hood for 30 million
4. Construction witnessing 12-15% growth
5. Massive investments in Infrastructure: Power, Roads, urban transport, metro, bridges, flyovers), housing, Ports, Railways, Industrial structures, aviation sector, urban Infrastructure, SEZs
6. five year plan envisages $1 trillion spending (45 lakhcrores) in infrastructure
7. Govt. is Planning Infrastructure Development fund with 50,000 cr. Corpus
8. Implementation of Projects by modes:
9. State funded, PPP models, private investments

II. METHODOLOGY OF CARRYING OUT ACADEMIC PROJECT

2.0. **Methodology:**

Our methodology of academic project may be divided into two phases which is as follows:

Phase 1:

This phase is carried out as theory part to understand the project etc.

Phase 2:

This phase is carried out in the project site, a live project site located in Hyderabad. At site, we have observed in the following sequential procedure:

2.1. Phase 1:

- The concept of what a project is understood.
- People involved in a project and the stages of construction.

- The requirement to start a project is understood.
- Technical submittals. Organization structure of the team and responsibilities.
- Sequence of construction activities.
- How to begin construction.

2.1.1. PROJECT
What is a Project?

DEFINITION OF A PROJECT:
Project can be defined in many ways but following can be taken as simple definitions.
"IT IS A TEMPORARY ENDEAVOR UNDERTAKEN TO CREATE A UNIQUE PRODUCT, SERVICE OR RESULT."
"IT IS A GROUP OF UNIQUE, INTER RELATED ACTIVITIES THAT ARE PLANNED AND EXECUTED IN A CERTAIN SEQUENCE TO CREATE A UNIQUE PRODUCT AND SERVICES WITHIN A TIME FRAME, SCOPE AND BUDGET."
A project is a temporary undertaking or an effort to create a special product. It can be a service or some result. Construction of a residential building can be considered as a project, because, it is a temporary effort. It is a unique building. Similar buildings will not be constructed.

A few aspects of a PROJECT:
- A project has a mission or a set of goals.
- The project has a specified start and end points.
- Projects are composed of interdependent activities.
- Projects create quality deliverables.
- Projects involve multiple resources.

There are many examples to indicate a Project but a few given below can be considered as good examples:

1. Developing a new product:
Developing a new product is considered as a project, because substantial research is done to develop the new product. It is one time development and once it is developed to match the requirements, it ceases to be a project. The activity of doing research and development is considered a s a project.

2. Constructing a building:
Constructing a building is a project as it is unique and it has a specific start and specific date of finish. At the end of completion of construction it is a product and hence it is a project.

3. Implementing a computer application:
This also has a specific goal to meet with specific start and specific finish date within which the application has to be implemented.

4. Restructuring an organization:
This is nothing but reworking on the existing organization to improvise it. So, here the objective is to restructure the existing organization. This can be called as a project as it has a specific objective, specific start time and specific finish time.

5. Organizing a cultural event:
The cultural event can be any event in any type of society for any good reasons. These events have a definite objective, limited time to conduct program. Even a performing a daughter's marriage can be considered as a Project.

6. Relocating a Business:
If the existing business in a city is decided to be relocated to another city due to any reasons, it needs a lot of planning, infrastructure developing, developing new clientele etc. And, the relocating the business will time bound, within which the job has to be completed. Hence, it can be called as a Project.
All the above examples make it clear to understand what it means by project.
In our present context, we shall consider construction of residential towers of 2B+G+19 floors located in Hyderabad, as a Project.
In our present academic major project, all the procedures adopted before starting of the project construction shall be considered.
Following have been included in our project. They are preliminary or preparatory works to be taken up before the construction is commenced.
Phases of the project.

Site mobilization and logistics.
Site logistic plan or site lay down area.
All technical submittals during mobilization.

2.1.2. CONSTRUCTION TEAM: People involved in construction……
A group of persons or a team with specific duties is always required for construction of any project. The team will have specific skills and responsibilities for the performance of the project.
The construction team includes the following:

- Owner.
- Engineer/Architect/Consultant.
- Contractor or Builder.

The function of each team or the constituent of the construction depends on the type and size of the works and methods of construction. Each constituent has to discharge his responsibility and cooperate with other constituents to complete the construction works without delay and escalation of the cost of construction.
Functions of each constituent:
Following are the main functions of each team member involved in the construction:

Owner:
He is the one who owns the project. The owner may be an individual, group of persons, private or public body who promotes the work and finances for the project execution.
After completion of works, the owner arranges for proper utilization and maintenance of the project.

Engineer/Architect/Consultant:
May be an individual person or group of persons or a company who gives technical advice to the owner about the project.

Engineer:
Engineer is a technically qualified professional and is responsible for the safe and economical design and construction of the works. All the works are carried out under his supervision. He develops technical team to monitor all the works under his guidance.

He generally takes care of the following works:

- Field investigation for the proposed project.
- He is responsible to prepare all the designs or they are done under his guide lines.
- He quantifies all the activities and prepares all the estimates and draws all the required specifications.
- The engineer arranges to obtain all statutory approvals required from the government.
- He prepares or guides to prepare all the tender documents required for tender process.
- The engineer evaluates through tender process to evaluate the lowest bidder.
- The contractor is finalized under his guidelines and process.
- During execution of the works he supervises and controls all the works. He monitors progress, quality and safety.
- The engineer scrutinizes the works, measures and arranges to make the payments to the contractor.
- If the works are carried out departmentally, he arranges all the material, manpower, equipments, machinery etc and ensures smooth operations.

The engineer, being a professional, works on keeping the costs of construction within limits by proper scrutiny and evaluation of designs. He adds value in order to reduce cost. He may have to examine all the proposals of designs to finalize with the most economical design to suite the owner.

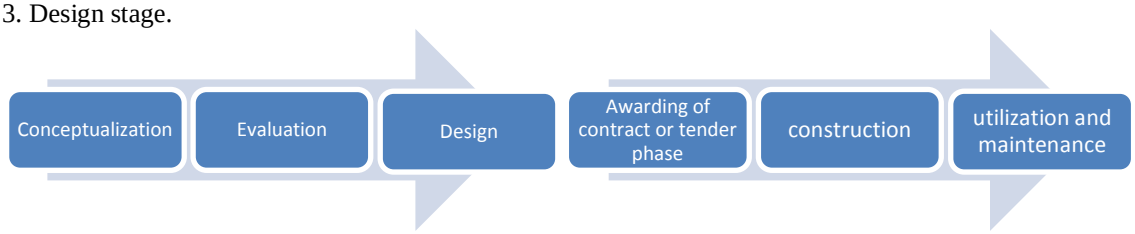
Architect:
Architect's involvement begins during conceptualization of the project. Once the owner takes the decision to come up with a project the role of the architect starts. The architect based on the owner's requirement prepares many options in his proposal.He designs the project based on the most optimum usage of available space giving aesthetic look to the building. The best option could be based the most economical design or the most aesthetical design. On finalization of the best option, he prepares all the drawings required for statutory approvals which are forwarded by the owner's engineer for approvals. On obtaining approvals the architect starts preparing the drawings required for construction purpose. These drawings are shared with the structural consultant for structural details.

Consultant:
The consultant is a highly technical and specialist in his field of engineering. A consultant may be appointed by the owner if the project is a specialized project or a complicated one. He is appointed to monitor the execution process closely and also to help the contractor to execute the works smoothly.

Builder/Contractor:
The contractor engaged by the owner to execute the works may be an individual or a group of persons or a company. The contractor, on being selected based on his bid and performance track records, offers to execute the works as required by the owner. He generally is a skilled person in the specific field of construction and competent enough to be depended on. The contractor will have on board all the technical staff, well run administrative systems. He understands all the project requirements and the scope he has to perform.The contractor is responsible to procure all the material required for the project, mobilize all the equipment and machinery. He has his own arrangements to mobilize the required labor, skilled and unskilled, as and when required. He is also capable enough to manage the financial crisis during construction phase. He has his own sources to arrange the required funds. The contractor systematically mobilizes, arranges all the required facilities at site to smoothly carry out the works. He also coordinates with all other agencies involved in the construction during works.

III. STAGES IN CONSTRUCTION OF A PROJECT

Any project undergoes the following stages:
1. Conceptualization stage.
2. Project evaluation stage.
3. Design stage.



4. Awarding of contract for construction stage.
5. Construction stage.
6. Utilization and maintenance stage.

As per the above, any project undergoes different stages right from conceptualization to hand over or utilization and maintenance phase. We shall study each and every stage step by step to understand how a project is conceived, how it is executed and handed over. But before proceeding further, we shall understand who all will be the participants in any project.

Resources required for the construction:
In general, following resources are required for any type of construction projects, without which the works cannot be carried out:
1. Money
2. Manpower
3. Material
4. Machinery
5. Management

All the above put together, they are called as 5Ms. So, absence of even one M will make the project fail.

Money:
It is the first and foremost item required for any project which is to be arranged before starting of the project. Financial support is required right from the day the project is conceived. Financial support is required for smooth progress of works. Insufficient funds for the project will cause delays and lead to failures. Irregular and insufficient supply of money will cause delays to the completion of the project and wastage of time and energy.

Manpower:
Manpower is the key to success of the project. For the successful completion of the project, manpower both skilled and unskilled is very essential. Since it is the oldest resource it is economical and dependable Manpower deployment plan is always required for executing the project. During execution of the works following manpower is required:

- Bar benders or steel fixers (for steel reinforcement cutting, bending and placing).
- Carpenters (for shuttering of footings, columns, slabs etc.).
- Masons (for brick or block work, plastering, flooring, concreting etc.).
- Joinery carpenters (for doors, windows etc.).
- Painters(for painting works).
- Helpers (unskilled labor to help bar benders, carpenters, masons, painters, for any earth works etc.)

Material:
Material is very much essential for carrying out construction activities. Examples of material may be steel, cement, sand, bricks, blocks, wood, shuttering material, binding wire, ply, aggregates etc. It is economical if the material

is available within 1 to 1.5kms from the site. The supply of the material should be continuous and regular. The progress of works depends on the supply of the material. Usually the material requirement is based on the calculations and it is arranged based on material delivery schedule. It is estimated that the cost of the material is around 45 to 50 percent of the total cost of the project.

Machinery:

Different type of machinery is required for different types of constructions. For any major projects it is economical to use machinery instead of labor. The engineer in charge should have sufficient knowledge to select the right machinery for the right job. Machinery deployment also has to be planned based on time of need. The machinery should not be kept idle without actually using it.

Management:

Management is nothing but administrative part of construction. The team who plan, estimate, monitor and control is management team. So, the main responsibility of management team is to organize, plan, estimate budgets, monitor, control, inspect for quality, check for safety, track accounts, team welfare etc. The entire management team can be broadly categorized as technical and non technical. The management team's goal is to achieve the targets by proper utilization of all resources, minimize wastages. Completion of the project within time and budget will be their prime target. The management is an art of arranging various activities and group of people to achieve the common goal. Thus, an executive must have managerial skills.

Site Mobilization / Site logistics:

On getting awarded the contract, the first activity the contractor does is plan for mobilization. Some specific duration is given to him to prepare and mobilize for site execution. This specific duration may be around 30 days, which is called as mobilization period. Within this mobilization period, the contractor has to complete mobilization. Mobilization means, the contractor mobilizes all the resources required to start the construction activities. The contractor, based on the type of works decides all the requirements for carrying out the works. Now, we shall briefly explain about each item considered. But before that, we shall understand more about the importance of systematic mobilization of all the basic resources prior to start of construction. The construction of a project is carried out in the form of a camp. The plan to set up this camp is well organized to see that there is no interruption from any item considered to perform any activity. The arrangement made to establish and locate all the resources required for smooth execution of the project is known as JOB LAYOUT. It is also called as site logistic plan or mobilization plan or site lay down area. A job lay out plan is a scaled drawing of the proposed construction site showing all relevant features or all facilities such as entry/exit points, store yard, project office etc. All the facilities are placed or located within the site premises in such a way that the material, machinery etc are within reach and also there is no obstacle created which will hamper the works.

IV. CASE STUDY

The academic project is carried out on the following project details of which have been furnished below:

3.1 DETAILS OF THE PROJECT

Construction Project Details:

Basically the project "Prajay Mega Polis" of an esteemed organization Prajay Engineers Syndicate Ltd., is located at Survey No: 78, Venkata Ramana Colony, Kukatpally Housing Board, Hyderabad, AP.

3.2 **SALIENT FEATURES OF THE PROJECT:**

Project Name : Prajay Mega Polis
Company Name : Prajay Engineers Syndicate Ltd.,
Architect : RSP Consultants
Structural Consultant: My Homes Consultants
Contractor Name: ASR Infra Pvt. Ltd.,
Details of the Entire Project:
The project "Prajay Mega Polis" is a full-size project consisting of following:
The entire project is planned for 3200 Apartments having 1, 2, 2.5,3 and 4 BHK residential apartments.
For 1bhk Apartments Sq Ft. 616.7 area range and for 4bhk Apartments it is Sq Ft. 2663.68.
The project is located at Hi-Tech City in Hyderabad.
Following are the special features of the project:

1. Apartment is fully provided with modern and luxurious features to give it a beautiful look and a comfortable life for the people residing in it.

2. Amenities like clubhouse, restaurants, banquet halls, private auditoriums, theatres, and Virtual Golf arena, Health Club with a Luxury SPA, Indoor games like Squash, Table Tennis, Badminton, Snooker, and Pool etc are available.
3. There is a separate swimming pool for men & woman.
4. Tennis Courts, Basket Ball Courts, Cricket Pitches with practice nets are provided.
5. Jogging Tracks, Extensive landscape parks set aside as leisure avenues for elders & Kids, beautiful view to give peace and relaxation.

3.3 STUDY IS UNDERTAKEN ON BUILDING No. 2, TOWER NO. 20:

The project research was conducted on Block – 3 of the Mega Township. The entire Block – 3 is having three Towers of Silt three +19 Floors. Stilt three floors are for facilitating the parking, services, STP, etc., and the remaining 19 floors are for residential purpose.

V. FIGURES AND TABLES

VI. CONCLUSION

The study on Execution Process based on CONSTRUCTION MANAGEMENT process has been done on the project, PRAJAY MEGAPOLIS, Hyderabad, under the guidance of CONSOFT TECHNOLOGIES. All the systems adopted in line with Construction Management processes have been studied in the project site. During our number of visits to the site within a specific period of time from 9th June 2016 to 28th Feb 2017, we watched, observed, studied and monitored the construction activities and their methodologies. We studied that the labor force is the back bone of any construction and the whole project deliverables depend on them. Their productivity has been studied while understanding the activity methodologies.

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