

Effective Planning and Selection of Construction Equipments required in Flyover Project

¹Komal V. Deshmukh, ²U.R.Saharkar

¹P.G.Scholar, D. Y. Patil Institute of Engineering & Technology, Ambi, Pune, Maharashtra, India

²Corresponding Author: Assistant Professor, D. Y. Patil Institute of Engineering & Technology, Ambi, Pune, Maharashtra, India

Submitted: 10-08-2021

Revised: 25-08-2021

Accepted: 28-08-2021

ABSTRACT: The demand of Construction Equipments is rising day by day. As conventional methods are dropping out by replacing them with the modern equipments and machineries in order to reduce the manpower and to have timely projects. But with the increasing demand the costs are also increasing. And to deal with this, one have to plan effectively. Effective Planning and Selection of Equipment will reduce your hassle of finance management as well, also will result in timely completion of the project. And this Research paper deals with the implementation of the blueprint and the factors to be considered while chalking out the best methods for Planning and Selection of Construction Equipments, and will also help in decision making for equipments at Initial, Planning and Execution Stages.

KEYWORDS: Construction Equipment, Planning and Selection, Timely Project, Modern Equipments.

I. INTRODUCTION

The main aim of Construction Equipment Planning is to identify the best suitable construction equipment to execute the project task, to assess the equipment performance capability and to be able to forecast the date wise requirements of equipments

II. AIM AND OBJECTIVE

This Research paper have the following objectives:

- (1) – To analyse the different factors on which the Planning and Selection of construction Equipment depends.
- (2)- To study the parameters affecting the Planning and Selection of Construction Equipment.
- (3)- To analyse and study the best suitable methods for Effective Planning and Selection of Equipment.

depending upon the number and types of equipments. The equipments are playing major role in road projects. In order to complete any construction project, effective planning is must, in other words, success of any project is incomplete without proper planning. A good Construction Plan plays a crucial role in budget development as well as the schedule for work. Equipment Planning is a challenging task which can be simplified by keeping certain factors in mind. Equipment intensive projects are usually the very ones that can prove great financial risks due to improper planning of these costly equipments. Due to these factors it is very essential for contractors to go through effective planning of equipments. Nowadays, by Indian Infrastructure contracting companies, the equipment planning was made based on maximum of the past experience from the previous projects and also the specification provided by the equipment manufacturers. A problem which occurs frequently is in front of the Indian Construction Companies, while the construction planning of the flyover project is selection of the suitable equipment. The selection of equipments through proper Planning will help the concern to accomplish the project within the specified period of time.

III. IMPORTANCE OF THE STUDY

1. By doing the research, we can enhance our knowledge on Equipment Planning and Selection. We are aimed to find out effective procedure of Planning and Selection of equipments used in a specific project in conjunction with the prevailing site conditions.
2. The Case study which had been taken here, will help other Planners and Contractors to serve as a guide for Planning and Selection of equipments for various Construction projects.
3. The research would enable to analyze and

compare the methods of Planning & Selection of Major construction equipments employed in the execution of Flyover projects thereby identifying the best possible methods and measures of Construction Equipment Management.

4. This aims at bringing out some sort of guidelines which the planners and selectors equipments should follow at the initial stages, so as to prevent or minimize the variations between the planned and the executed.

IV. CASE STUDY – LULLANAGAR FLYOVER, PUNE, INDIA

(a) DETAILS OF THE FLYOVER

This Flyover is 490 m in length which is constructed from Pune cantonment via route Kondhwa to Lullanagar Chowk. The Flyover is having 4 spans. It consists of two spans of 30 m each, and one of 25m and other having 20 m. The estimated duration for the completion of this project is of 18 months, while the estimated cost is 14.93 crore. The Pune Municipal Corporation's special project cell provided the funds for the above said work.

1. Length of the Flyover - 490m
2. Width of the Flyover - 15m
3. Approach Road - 385m(both sides)
4. Spans in Total –
4(30m*2, 25m*1, 20m*1)
5. Total length (Elevated) – 105 m
6. Type of Construction - Precast Prestressed Girder
7. Height of Anticrush Barrier – 1m

(b) PLANNING OF EQUIPMENTS

Equipment planning on major construction project besides its relation includes type of equipment, number and size of machines, type and amount of works to be done, availability of equipment and its parts including facilities for repair, working shifts etc. If proper planning of the operation of equipment or its surrounding environment is not done properly, availability of equipment for the actual production or its use will be less. Many times due to lack of knowledge of equipment, either equipment lies idle or work is not taken from equipment of his capacity. Initial planning of work on which equipment is to be used should be made sufficiently in advance of commencement of the work, to arrange for procurement / transfer of equipment and setting up the facilities.

(c) SELECTION OF EQUIPMENTS

The type of equipment selected depends on type of work, amount of work, soil of condition and type of material to be handled. The number as well as the size of equipment depends upon the amount of work, available working days, number of shifts, labour availability, etc. Topographical condition where the equipment is to be used should be considered properly while selecting, planning and execution operation of equipment. Proper records of the operation of the equipment is to be maintained. This record must give an idea about the production, usage, break-down hours, amount spent on repairs etc. those records help in cost accounting.

Factors influencing selection of equipments are as follows

- Nature and Magnitude of work.
- For heavy lifting or transportation of materials and machineries.
- Cost of Equipment.
- Job site conditions like Climate, Place, Geography, type of material to be handled.
- External or Internal Power Supply.
- Requirement of Fuel and power consumption for work.
- Quality, work precision and duration of work.

V. PARAMETERS TO BE CONSIDERED FOR THE PLANNING AND SELECTION OF EQUIPMENTS

The following parameters should be taken care of while planning and selection.

1. Reconnaissance survey of local factors and site conditions affecting the performance of the equipment should be made.
2. The second and the important parameter is time. The time frame within which the job needs to be done, also the specification and the methodology adopted.
3. The next parameter we need to study is Availability. For any work where the complete utilization of new construction equipment for its entire life is not foreseen, in such case utilization of old equipments can be done if the further utilization is uncertain.
4. Even though the operating cost of the old equipment is more expensive, still it can be considered as the depreciation cost of the new equipment is high which will increase its owning cost.
5. Factors affecting financial appraisal of equipments like Downtime Cost, Depreciation,

Obsolescence Cost, Cycle time should be studied and taken care of.

6. Clear Identification of items of works to be done by equipments may be decided upon.
7. Suitability for Job with specific reference to climatic and other conditions.
8. Size of Equipment- It is indicated as either minimum number of large size of machines or more number of small/medium sized machines.
9. The main advantage of selecting large size of equipment is that they are generally sturdy and tuned to tough working conditions.
10. The size of standby equipment will also be a consideration in selection of equipments.
11. Standardization and variety reduction.
12. Along with planning of selection of equipment, planning of equipment operations, its relation with other jobs under execution etc. Should be done properly.
13. We need to estimate the requirements of equipments for the given job, it is essential to know Quantum of Work, Time period of Work and Output of the equipment.

VI. CONCLUSION

BEST METHOD OF PLANNING - Many companies have their own planning policies and planning methodologies. It depends on the management that what points are taken into consideration and at what micro level planning is adopted. Generally schedule is planned as per the experience of the person and requirement. Good

Companies generally opt for the zero budget planning of equipment in terms of cost. There are many methods of planning like mass diagrams, IRC method, Zero budget method, etc. But out of that all best practiced is zero budget method. Best method of planning is learned by own experience.

BEST METHOD OF SELECTION - Selection of equipment is very complex procedure and it includes many factors to be considered at time of selection. There are following factors which should be considered while selection of equipment in practical;

- Minimum Capacity of Equipments available.
- Minimum Cost.
- Maximum Service Life.
- Resell Value or Salvage value in the Market.
- Minimum Repairs and Maintenance.
- Maximum Average.

REFERENCES

- [1]. Collecting Construction Equipment Activity Data from by Justin Mark Kable B.S.
- [2]. Saxena S.C., Construction Planning and Equipment.
- [3]. Christan John A. John wiley & Sons- Management, Machines & Methods in Civil Engineering.
- [4]. Parker Albert D, Donald B.S., Robert S.M., Planning and Estimating Heavy Construction, Mcgraw-Hill Book.
- [5]. Peston, Construction Equipment, Virginia Publishers, 1987.