

Construction Equipment Management

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Abstract—Selection of construction equipment plays very crucial role in effective completion of any civil project. Thus selection and planning of equipment is essential for the its utilization with minimum cost. It is an engineer's responsibility to assign a particular equipment to complete a task as per site conditions. As there are large number of equipments available in the market it becomes a difficult task to select the equipment depending upon its productivity & other responsible factors.

Many of the construction firms are unaware of the new construction equipment available in the market. To complete the project within a stipulated time use of equipments becomes a priority. Thus the equipments should be well classified so as to reduce their selection time. The objective of this paper is to deal with classification , selection & utilization of all construction equipments to ease the method of selection & timely completion of project.

Keywords-Construction equipment, selection, management.

1.Introduction

To function any project in smooth manner it is essential that an engineer should have a detailed knowledge about the equipment available and to direct it on a particular task.

The overall progress of the project depends upon how fast the work is carried out. Hence it becomes a necessity to select the equipment by considering all aspects of working conditions of site. So it is necessary to make the proper planning & management of equipments available to use it in an effective manner at minimum possible cost and with maximum output productivity.

2. Planning

The main aspect of this research paper is to focus upon the selection of various equipment available in the market and their planning for an appropriate task.

The construction equipments can be classified as

Vertical moving equipment

Horizontal moving equipment

Hand held equipment

Personal protective equipment

Concreting equipment

Inspection equipment

Surveying equipment

In order to select the equipment from the above categories it becomes a crucial task to select an appropriate equipment at minimum possible cost.

We also have to consider the working conditions and availability of trained manpower to operate the equipments. Also the performance of equipment selected is to be measured on basis of various factors like fuel consumption, productivity of an equipment per hour,& hiring cost if an equipment.

3.Selection

The equipments can be selected on the basis of categories they are needed for. For selecting an equipment for excavation we need to search for the equipments depending upon the site conditions , duration of work for which equipment is required and its overall cost. While selecting an excavation equipment it becomes essential to prioritize the main course for which machine is required as like for block excavation, for piling, etc. while selecting an equipment there must be a past experience about the selection of machinaries so as to avoid any errors and issues on site. Selection of equipments governs the quality of executing the work. Thus whole decision is pending to the senior authority to assign the equipment on site for a particular task. After studying every technical and economical aspect the equipment is selected. Also the limited time duration of project forces us to work with high speed equipments thus thereby increasing overall cost of project. There exist and

should exist plants and machineries department on every project site to ensure the proper selection and effective utilization of machineries and all equipments.

4.Sourcing

The equipments can be available with companies or also can be outsourced. So for outsourcing the equipment we need to scrutinize the vendor for each and every information provided by him. As if we are hiring an equipment from a vendor and if it breakdowns at a site then vendor must have provisions for other backup equipments. So as to avoid any lags for an activity. Equipment is also available at a company but when the situation comes where we require the same machine for more than one place then we are in need of an outsourcing agencies. A firm should have good database of such vendors. Depending upon the factors like

Time period of equipment to be hired, Hiring cost, original cost, Name of manufacturer, Capacity of an equipment, Space constraints, Productivity of equipment, Maintenance cost, Working cost of equipments, the company/contractor can decide whether to purchase the equipment or to lease it or to hire it.

5.Factors affecting the selection of equipments

Let us consider for selection of an excavation equipments

- I. **Size of the job:** Larger volumes of work will require large capacity, or smaller smaller capacity machines in greater number.
- II. **Activity time constraints:** Shortage of time for e.g excavation may force contractors to increase the size or numbers of equipment for activities related to excavation.
- III. **Availability of equipment:** Productivity of excavation activities will diminish if the equipment used to perform them is available but not the most adequate.
- IV. **Cost of transportation** of equipment: This cost depends on the size of the job,

the distance of transportation, and the means of transportation.

- V. **Type of excavation:** Principal types of excavation in building projects are cut and/or fill, excavation massive, and excavation for the elements of foundation. The most adequate equipment to perform one of these activities is not the most adequate to perform the others.
- VI. **Soil characteristics:** The type and condition of the soil is important when choosing the most adequate equipment since each piece of equipment has different outputs for different soils. Moreover, one excavation pit could have different soils at different strata.
- VII. **Geometric characteristics of elements to be excavated:** Functional characteristics of different types of equipment makes such considerations necessary.
- VIII. **Space constraints:** The performance of equipment is influenced by the spatial limitations for the movement of excavators.
- IX. **Characteristics of haul units:** The size of an excavator will depend on the haul units if there is a constraint on the size and/or number of these units.
- X. **Location of dumping areas:** The distance between the construction site and dumping areas could be relevant not only for selecting the type and number of haulers, but also the type of excavators.
- XI. **Weather and temperature:** Rain, snow and severe temperature conditions affect the job-site productivity of labor and equipment

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