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Materials Management of Water Treatment Plant using ABC, Earned Value and VED Analysis

Mr. Nachiket Balasaheb Patil, Dr. P.M. Alandkar, Prof. Swati Kshirsagar

DEPARTMENT OF CIVIL ENGINEERING

RMD SINHGAD SCHOOL OF ENGINEERING, WARJE, PUNE-58

ABSTRACT

Water treatment is an important issue because of lessening water resources. The primary reason for wastewater treatment process is to expel the different constituents of the polluting load: solids, natural carbon, supplements, inorganic salts, metals, pathogens and so on. In this paper, mainly de-centralized method is considered as a solution. A new rural wastewater treatment process is introduced with proper planning and designing by using empirical equations. This research shows that the proposed decentralized system is more feasible economically and environmentally (about 75% BOD removal), since the centralized system needs modern machineries and high initial investment. To design a sustainable wastewater treatment system for developing area, further assessment on environmental, health, social and institutional aspects are recommended. In this research, we have worked on the analysis of management of materials used for the construction of a Water Treatment Plant using various tools and techniques such as "ABC Analysis", "Earned Value Analysis" and "VED Analysis". Through our analysis, we observed that the project was behind schedule and over budget. This could have been avoided if techniques that are more efficient were used.

Keywords: ABC Analysis, Earned Value Analysis, VED Analysis, Water Treatment Plant.

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I. INTRODUCTION

The cost, time & quality are the important objective of material management. Cost is an important parameter of any project. The material availability at right cost is key for economy of project. If material is purchased too early, capital gets tied up as well as ,interest charges incurred on excess inventory of material .On other hand if material availability at site is delayed it will affect scheduling of activities Time is important parameter of any project. Material should be available in hand at right time for successful completion of project. Men & machinery become ideal if material is not available on time further it increases the time of com of construction can be achieved by procuring standard.

II. METHODOLOGY

The research methodology approach for this study contains various stages. In first stage need of material management, for that literature review is carried out. In literature review A.B.C analysis, S curve analysis is mostly used for material management. A.B.C analysis is most important. The preparation of a questionnaire is based on causes of Poor material management & techniques used for material management. Further to analysis the various methods & finally discussion on result obtained.

III. RESULT AND DISCUSSION

Material Management Process:

1. **Requisition Process**
   a. Site project manager
   b. Material indent is generated Purchase HO
   c. Checking for budgetory provision
   d. Within budgetory pr vision are considered
   e. Technical department for specification

2. **Procurement Process**
   a. Quotations requested from various vendor
   b. Comparative Statement is prepared
   c. Approved by managing director
   d. PO prepared in purchase department
   e. PO sent to vendor

3. **Delivery Process**
   a. Material dispatch to the site
   b. Material verified by site supervisor
   c. If found OK loaded otherwise unloaded
   d. Inward entries by store-incharge
   e. MRR will be prepared

4. **Billing Process**
   a. Purchase HO
   b. Verification of bill
   c. Forwarding to account for payment

IV. DATA FINDINGS AND ANALYSIS

Data analysis is a process of inspecting, cleansing, transforming, and modelling data with the goal of discovering useful information, informing conclusions, and supporting decision-making. In this research the primary data of the materials mentioned in Chapter 1 (Scope of Work) were collected from the project (3 MLD WTP). The collected data is then used in the various management techniques of material management.

ABC and VED analysis will be performed on 15 materials used for the construction of Water Treatment Plant. Based on ABC analysis, Earned Value Analysis will be done Class A materials to monitor the progress of the project. The materials used for analysis are as following:

1. Cement
2. Reinforcement
3. Sand
4. Aggregate
5. Bricks
6. Nozzle Fixing
7. Grouting Nozzle
8. Water Proofing Paint
9. Paint - white wash
10. Paint – Internal
11. Paint – External
12. Window
13. Door
14. False Flooring
15. Shuttering

ABC Analysis have provided the below results:

A. Class A materials – 02 items (70.66 % of Total Cost)
B. Class B materials – 03 items (23.09 % of Total Cost)
C. Class C materials – 10 items (06.25 % of Total Cost)

Class C materials includes Grouting Nozzle, False Flooring, Bricks, Water Proofing paint, Nozzle Fixing, Paint – Internal, Paint – External, Window, Paint – White Wash and Door.

Class B materials includes Shuttering, Aggregate and Sand.

Class A materials includes Reinforcement and Cement, these materials will be exclusively used for the Earned Value Analysis

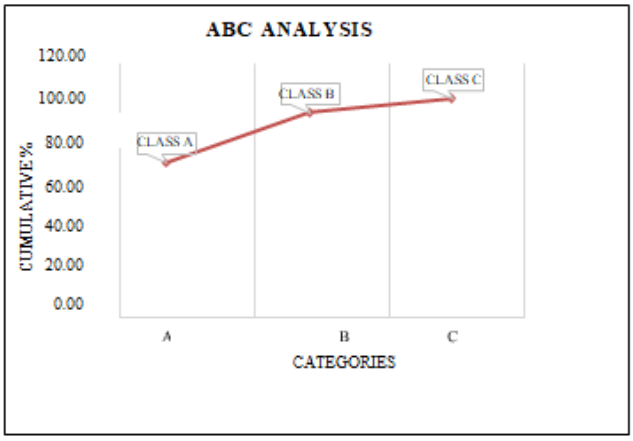

Figure 4.1 – Classification of ABC Analysis

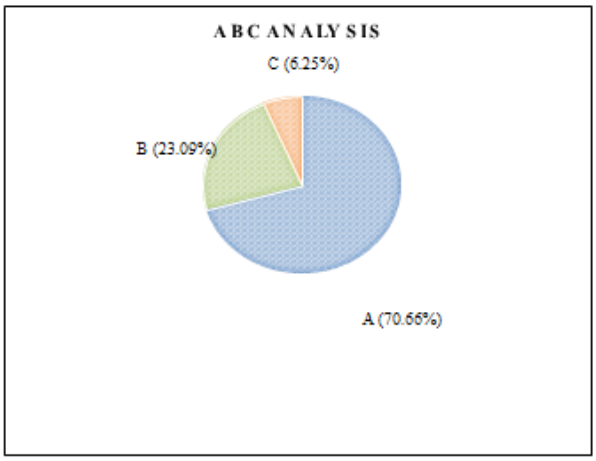

Figure 4.2 – Pie Chart of ABC Analysis

VED Analysis

VED analysis is an inventory management technique that classifies inventory based on its functional

importance. It categorizes stock under three heads based on its importance and necessity for an organization for construction or any of its other activities.

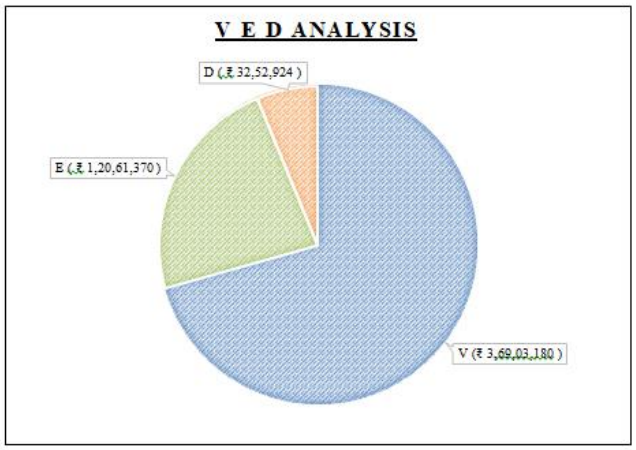

Figure 4.3 – Pie Chart of VED Analysis

V. CONCLUSION

When project is spread over longer duration it appears from ongoing analysis. A.B.C will prove to be most economical. Whereas this may be reverse in case of short duration project. This aspect will give scope for future result.

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