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Actual and Analytical status of steel reinforcement on various buiilding projects.

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Abstract—In present economic situation, owners are investing scare resources, worth crores of rupees in countless projects. The investors / owners naturally have a right and are interested in "best value for the money spent" The construction projects, there are numbers of constraints which effect output e.g. Labor, Environment, Location etc. So, Zero wastage is not possible for any type of project. The aim of this study work is to find reasons of material wastage on construction site of multi storied buildings and how it can be minimized. So, overall project cost can be reduced or profit maximized. The study deals with basic contents (like classification of wastage, definition and mythological issue etc), various material management functions like reduction of wastage, material storage , site location , Quality control, site security, inventory control etc. the study involves study of five multi storied R.C.C. frame structure building like Educational building, Hospital building, Hostel building. But same approach can also become helpful in complex or industrial project. Data on estimated and actual consumption of major materials mainly: cement collected. For each projects negative variance or wastage worked out. From this wastage, gross wastivity calculated which effected on productivity or project. The analysis of data of various projects indicates that consumption of material or extent of wastage dependent on the various factors like primarily site and space, project management , construction methodology , manpower planning , material and equipment management etc

Keywords— wastage, steel reinforcement, material, estimate.

I INTRODUCTION

This study work is based on material waste management in construction topic. Through the study work, attempt is made to find reasons of wastage in construction industry and how it can be minimized.

A IMPORTANCE

- The fast developing Indian economy has placed before the material manager. A tremendous challenge and responsibility.
- Manager has 5-M at his command :
  a) Men (b) Machines (c) Money (d) Materials (e) Minute.

C HYPOTHESIS

Existing system of material management adopted by the construction company inefficient as they lack in proper implementation by top level management.

- These are the input of any business activity. The output is either good (s) services. For .example....organization with an annual turnover of Rs. 10 million, where material cost about Rs. 6 million and profit for Rs. 1 million and if a manager is given the work of improving the profitability by say Rs. 0.3 million, he has two way of achieving the result.

(1) Increased the sales turn over by 30% in a specific span of time such that overall profit will be Rs. 1.3 million.

(2) Reduce material cost by 5% in certain

time dimension, so as to result in an increased profit margin of Rs. 0.3 million.

Most of materials Manager choose second option for Improving Efficiency and Performance of the materials with a view to effective saving in the consumption and effort work for developing new alternative materials.
2Building material play a crucial role in the construction of housing stock Depending on the type of a project, material cost 40 to 60 % of the total project cost and about 70% of the direct construction cost. (The remaining 30% being the labor cost).

In housing project, building materials are the major single cost item. Land another major cost item in a housing project. Here, we are considering construction cost only, hence land related issues are not discussed.

B NEED FOR STUDY

In construction, 4-M (Material, Manpower, Money Machine) play crucial role. Depending on the type of a housing project, building materials account for 401 60% of the project cost. Through material waste management function, we can reduce the overall project cost by waste minimization or maximum utilization of resources (Material).

D OBJECTIVE

To study the wastage of major building materials of multi storied building.

E SCOPE

- Limited to public building projects work.
- For major material like cement, sand, brick, steel which used in R.C.C work, masonry work, plaster work etc.

F METHODOLOGY

- Data collection through site visit from company projects.
- Find the causes of wastage on site by experience and discussion with site engineer/builder/consultant.
- Analyzed data to find out wastage proportion.
- Study the effect of wastage on project cost

Line of action of work:

Here in our case studies

1) Wastivity = Wastage x100
(%) Estimated consumption

2) Consumption per SQM BUA= Estimated Consumption
(Estimated) Total BUA SQM

3) Consumption per SQM BUA = Actual Consumption
(Actual Total BUA SQ

4) Gross Wastivity = Total Wastage (Rs.) x100
Estimated cost of major Materials

5)Productivity=1-GrossWastivity

TABLE I CAUSES OF MATERIAL WASTAGE AT SITE.

Material	Stage	Main causes
Steel	Storage	Corrosion, pilferage. Loss due to rusting.

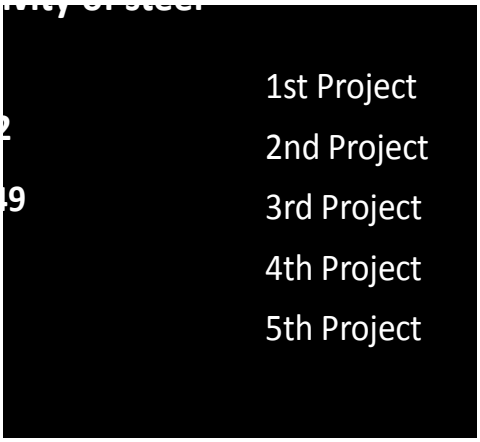
TABLE II DESCRIPTION OF PROJECT

PROJECT NO.	TOTAL BUA SQM	TOTAL COST RS.(CRS.)	NAME OF PROJECT	CONTRACTOR	DATA PROVIDED BY	NO.OF FLOOR
1	3020.00 smt	2.00	Admin & Library building at New v.v.nagar	Shreeji Builder v.v.nagar	Shri Vinay Patel (Proprietor)	4
2	16265.00 smt	8.00	Bio Tech building at New v.v.nagar	Jagaji Construction Baroda	Shri Sureshbhai Patel (Proprietor)	4
3	707.00 smt	0.65	Boy's Hostel for AAU	Dayaljibhai & Gopalbhai ni co. Anand.	Shri Nareshbhai Prajapati (proprietor)	1
4	1952.00 smt	1.60	Dr. Girish Jethva Hospital Building Anand	Devkaranbhai Ayar v.v.nagar	Shri Devkaranbhai (contractor)	4
5	5110.00 smt	4.25	FPT College for AAU at anand	k.r.makwan Anand	Shri Jignesh Prajapati (Proprietor)	3

II WASTAGE OF REINFOCED STEEL

TABLE III THE EXTENT OF WASTAGE OF REINFOCED STEEL BY PROJECTS

PROJ-ECT NO.	TOTAL COST RS. CRS.	TOTAL BUA SQM	COST PCR SQM RS.	TOTAL CONSUMPTION		WASTAGE KG.	WASTMTY %	CONSUMPTION PER SQM BUA	
				ESTIMATED KG.	ACTUAL KG.			ESTI (KG)	ACTU (KG)
1	2.00	3020	6623	121892	123750	1858	1.52	40.36	40.98
2	8.00	16265	4918	514982	533000	18018	3.49	31.66	32.77
3	0.65	707	9193	36966.21	38500	1533.79	4.15	52.29	54.46
4	1.60	1952	8196	52525	54022	1497	2.85	26.91	27.68
5	4.25	5110	8317	122468	125250	2782	2.27	23.97	24.51



CONCLUSION

In construction industries, there are numbers of constraints eg. Labour, Environment, Location etc. so, zero waste is not possible for any type of project.Even after some extent of wastage rate allowable in each project, this limit extended beyond the allowable limit, which ultimately effect on project profit or return on investment (ROI).

In our case it should be obvious from result, that the actual consumption exceeded the estimated consumption for every item, in every project, i.e. the incidence of wastage is universal.

Theoretical conclusion.

Builders/Owners appoints main civil contractor to carry out civil work on labour basis. Main contractor may appoint sub-contractors to execute sub items of work. Because of materials supplied by owners/builders, workman/contractor have no regard to material wastage.

In construction field, non-technical persons involvement is higher. They are interested in earning more profit without consideration of several other factors like quality control, material management etc.

Size of project, location of size, site condition and several other factors effect on the storage management. Improper storage management increase breakage, pilferge, corrosion, losses etc.

In Indian construction scenario, owners/builders appoints technical staff, whom given responsibility to complete work within time schedule with required quality and then after execution of another job. Thus, they are not conscious today reconciliation or other programmer reviewing, which planned in initial stage. Due to financial difficulties owner cannot appoint more technical staff for this purpose.

Numerical Conclusion:

1. Table-3 above brings out that the range of wastivity in consumption of **reinforced steel** is from **1.52 to 4.15 %** across project. The average wastivity of steel is about 2.86 %. Compared to cement, the range in wastage is less in this case. In project no.3 it is more because wastage is not utilized properly by site in charge. Of all the materials considered here, only steel has re sale value which reduces the net monetary loss.

Barbend schedule implemented only in project 4 and 5.

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