





# The effective utilization of construction materials

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## Abstract

All our world Construction industry have major role to providing better life to everyone with respect to the development of nation, road service, transportation ect., meanwhile this industry consume lot of resources and producing waste also. This will affect the environment by carbonization. The awareness about the wastage of materials should mandatory to every person and every industry. This paper deals with percentage of wastage on concrete, reinforcement, and formwork in residential building, commercial building as well as other type of building and the percentage of wastages for the causes of wastages factors are design and documentation, operational wastage, procurement and materials storage and handling.

## Introduction

In construction industry produces more waste compare to other industry and affects the environment [9]. The major factor for causes of wastage at construction was design and documentation, procurement, Material storage and handling as well as operational factors [1]. Poor workmanship have vital role on operational factor, design changes during construction period on design and documentation, inappropriate storage facilities on material storage and handling, mismatch of material purchased with specifications on procurement [5]. The waste resources are less on low capacity contractors due to less facility on storage, financial factors, and material handling methods [2]. More wastage occurs on architectural works compared to structural works. The material wastage percentage has differs different types of buildings[7]. Poor workmanship and improper supervision make huge waste on construction [3]. In this paper discussing about the percentage of waste of materials such as concrete, reinforcement, formwork on residential building, commercial building & other type of building by conducting online survey with civil engineers [6]. The factor of causes of wastage such as design factors, procurement factors, and operational factors has analysed. Table 1

## Section snippets

### Concrete

Concrete is a heterogeneous material have fine aggregate, coarse aggregate and water. Each and every sub structure and super structure have major role on it. The workable person doesn't know about exact quantity on which may

change due to environment, location, height of the building, etc. [8]...

## Analyze and discussions

The survey reports has analysed by the following formulas mean & standard deviation

Mean  $X = \sum x / N$ ...

Standard deviation  $= \sqrt{(\sum (x-X)^2) / N}$ ...

X is mean value...

X is percentage of wastage...

N is Number of votes...

The survey has been attended by 100% of civil engineers. We obtained the results as 98% of people have aware about the wastage of materials and 56% of people had attended the training about the wastage of the resources. Wastage of concrete on Residential building is 6.71%, commercial building is 8.38% and...

## Conclusion

The project team must have awareness about the wastage of resources within the project team even from workman, supervisor, foreman etc. the major wastage of concrete due to over ordering and transportation, however need to recheck the factors are related to quantity of concrete before ordering such as site measurement, weather condition etc. the reinforcement wastage occurs during cutting and bending of reinforcement, in terms of back to back contract for cutting and bending of reinforcement...

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper....

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