OPTIMIZATION OF STEEL WASTE AT CONSTRUCTION SITE

Literature Review Paper

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Abstract

 Waste of bars can be minimized with minimum use of discrete bars in market length. In order to achieve this goal, the accurate and detailed information bars is extracted, followed by both rapid and efficient bar combination. No research paper is directly deal with reduction of steel waste at construction site, although many paper have proposed indirect approaches to utilize the safety, quality , constructability , recycling and reusing of steel waste at construction building. This paper , therefore prepared with the aim of developing a Steel stock software which provide us a full detail of Received stock and Issued or Balanced Stock of different length of bars which required to help in minimize steel waste during cutting and bending of waste bars.
At the same time , the BBS study is also help to enhance the software which ultimately result in reduction of steel waste .The effectiveness of the suggested software was validated by case studies.

KEY WORDS: Steel waste reduction ,steel stock software ,pattern of cutting bars, minimization of steel waste.

I. INTRODUCTION

The construction and demolition sectors are Under increasing pressure to improve performance, ,reduce steel waste and According To IS2549:1994 the waste is around 2 to5% in india.
In a drive towards the circular economy .Reducing waste is a priority for various private and government sectors and there are many new regulations ,measures and reduce steel waste within the construction site.
Steel waste construction products are inherently low waste through all stages of building life cycle production construction and end of life of building .Everyone in the construction site can contribute to tackling this by reducing steel waste, using material in better way and waste for recycling. Therefore guidance for small and medium sized construction companies.
Even simple changes can save your money and reduce the environmental on construction site are as:

1 The first aim is to reduce the amount of steel waste you create.
2 If waste is create ,identify ways you can reuse it.
3 Finally ,if waste cannot be reused then collect them to recycle.

REDUCING,REUSING THE STEEL WASTE CAN BRING MANY BENEFITS.

- Generate income from collecting some Waste steel.
- Reduce your costs from purchasing less material and maximizing skip space.
- Comply with legislation.
- Reduce accidents by storing materials carefully to ensure a tidy site
- Reduce carbon dioxide emission .
- Reduce impact on environment.

REUSE POTENTIAL OF STEEL WASTE

Reinforcing steel bars are usually collected and sent to scrap sites Where it is melted down into a small pieces of steel bars and turn Back into new reinforcing bars. The entrepreneurs in this business collect the used steel bars From debris and manually then sell them   it at half the price of the New steel bars .new homeowners tend to buy from these rebars Sellerrs to cut down on cost.

LITERATURE REVIEW

Sadhan k ghosh (2015)
Now a days in india ,a lot of construction company are not focusing on the wastage of steel reinforcement and they are keep dumping it .It is imperative that these bar wastes generated from these sites are managed efficiently before we run out of space for

landfilling .Moreover ,leachate from then landfills pose a heavy threat to human habitat. Authorities must respond to these alarming findings and act according to tackle the situation.

The common causes of bars waste on site were founded as:

- Damage to bars e.g.through inappropriate handling or inadequate storage.
- Inaccurate or surplus of materials.
- Rework due to errors and poor workmanship or defective site processes.
- Inefficient use of reinforcement bars.

'Minimizing the bar waste by reutilizing the reinforcement.

Sun-kuk kim* (2004)

The main objective of the paper is to developing algorithms to supply bar which help in to minimize bar waste during cutting and bending of discrete reinforcement in rebar shops and his main aim is also to present an automatic rebar detailing concept,a logical process of rebar combination by case study .A sufficient attention is must in management which help in reduction of waste .Rebars can be saved with increased productivity when purchased order is carried out according to company schedule

Chandrasekar M.K 2018

The aim of the paper is to present the study to analyze the factors influencing the steel waste in building construction of Hawassa town and to apply best practices to reduce the rebar wastages .The study respondents were consultant managers ,designers ,bar benders ,supervisors and quantity surveyors. Using SPSS software to finalize the factors influencing the wastage of steel.

Design and detailing shall be followed correctly according to code ,bar benders shall be work as per detailing given by designer and supervised by engineer this help in to minimize the cost overrun due to rebar.

Zahra s. Moussavi2016

The main objective of the paper is to minimize the steel waste by optimizing the cutting pattern to be selected .This paper present a selection of the lap splices ,through generating all lapping patterns .The focus is to optimize the waste bars in according to reduce the waste at site .All waste bars used in concrete column as their arrangement is affected by multiple guidelines that make preparation in shop drawing a tedious job.

The result indicate that reduction in the steel bars wasted is possible by optimizing lapping pattern.

Although, it should be noted that customizing the cutting pattern

Srujal patel,Asso prof C.G patel2016

The objective is to determine the use of minimization of steel waste technique in creating sustainable steel waste managemenet so as to identify the pattern which are the most helpful in minimizing the steel waste at construction site. The aim is to assess the waste minimization technique taken from 4R pattern which is reduce ,reuse and recycle technique which help in reducing the steel waste at construction management.

The main aim is to measuring of material in building project and finding its main causes .companies need to done.

N.Poonkodi 2016

This research paper is all about to generate all possible cutting pattern of steel reinforcing bar and also include the mathematical programming theory to solve the method that yield minimum waste .On successful testing of the software will result in minimizing the steel waste.

The study shows to construction project that the bar bending list during construction has less steel waste as compared to the project that have no bar bending list at site.

However, planning of cutting technique can directly reduce the steel waste.

Eunice ofeibea Damptey

This research investigated the recycling of bars as a substitute for virgin gravel ,compared to landfill disposal, use the Tripple Bottom Line +1 (TBL+1) concept to discuss the environmental ,Social Economic and governance impacts .The method of data analysis applied were End Of Life cycle Assessment.

M. KalilurRahman2015

The main objective of the paper is to identifies and detects factors contributed to the generation of steel waste. Mapping technique were applied for identification of works and various interview was conducted to determine the physical and non physical steel waste .These factors are in seven categories; Design, Handling ,worker, management ,site condition ,procurement and External

factors .By identifying the significant factor in construction process and team member notice the best was to apply new practices for reducing steel waste ,time delay and cost overrun .

Santi Chinanuwatwong

This paper is concerned about the method of reducing waste from the cutting. This will include two steps. The first step is to get the bar bending list and amount of wastes caused by cutting steels .Second is to finding the best method to reduce the steel waste though it was caused due to cutting of bars .This paper implement a great combination in order to apply cutting patterns of bars and analysis of mathematical programming though it ultimately help in minimizing the steel waste .A software program is applied in order to reduce the waste.

Conclusion

At construction site some of the steel waste which not only causes health problems but also causes lot of environmental degradation that's why a few technique is applied in order to minimize the steel waste .The main step is finding the method to minimize steel waste due to cutting .This technique is all about to implement a mathematical programming to solve for the pattern that yield minimum waste .The result shows that the waste of bars from analysis Are much less than the waste of bars from the collecting data.

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