Construction Waste Management

Prof. Mandar Mahajan\textsuperscript{a}, Shaikh Raees\textsuperscript{b}, Junaid Shaikh\textsuperscript{c}, Hashim Tanwar\textsuperscript{d}, Idris Quereshi \textsuperscript{e}

\textsuperscript{a}Asst. Prof, Department Of Civil Engineering, Rizvi College Of engineering, Mumbai
\textsuperscript{b,c,d,e} Student, Rizvi College Of Engineering, University of Mumbai, Mumbai

Abstract: Construction and demolition (C&D) debris is generated from the construction, renovation, or demolition of a structure. This waste stream has become a concern across India. Recycling is often seen as a solution, but questions remain regarding the size of the debris stream, market availability for recycled waste materials, the environmental impacts from management methods, and how to encourage recycling. We are trying to generate the idea and awareness of recycling the debris and use it as a Road Dividers. And we think that that this the best way of recycling the debris for tertiary uses.

Keywords: Road Dividers, Construction Waste.

1. INTRODUCTION

Recycling is often pursued as the most environmentally preferable method for managing C&D debris. Finding a market for a recycled waste product is the most important step in establishing a recycling program. C&D debris is not recycled in many areas of India for varied reasons. One reason for the lack of recycling could be that markets for the recycled material do not exist. A market capacity analysis is needed to determine if there is sufficient demand for recycled materials to warrant C&D debris recycling programs.

Road Dividers

Using the C&D waste for making Road dividers, as the dividers won’t need new fresh products to produce it so using this construction waste to make dividers. Dividers don’t need much strength as there aren’t any loads coming on it except some of the plantations for beautification purpose or if any desire. Concrete debris is not at all waste. In fact it’s a raw material to several other products E.g. Recycled Debris Bricks. Concrete demolished debris is been used by and organization to recycle them and offer hope to minimize the impact negative of debris on nature & environment.

CONSTRUCTION WASTE MANAGEMENT

Recent concerns over the C&D debris stream and how it is currently managed have led more state and local governments to review their policies on the material. Solutions to problems presented by C&D debris require an understanding of what is in the waste stream and how much is generated. Since many regions in the US do not track the amount of C&D debris generated or have an idea of the waste composition, these amounts can only be estimated. Only one method has been used to estimate the amount of C&D debris generated. This method uses some measure of the current level of construction, demolition, or renovation activity and applies some waste generation factor to that level. While this method has produced results acceptable to many, there are no other estimates or definitive numbers to compare them. Other methods of estimation need to be tested for C&D debris.

Comparison of conventional method vs. reuse method

Kerbs are typically laid on a concrete bed of at least 100 mm thickness in such a way that they are joined with the pavement. The basic kerb profiles that are used for road construction are: Half-battered. For most purposes, the top of the kerb should be 100 mm above the road surface. If kerbs are placed too high it can induce ‘kerb shyness’ which is where the width of the carriageway is effectively reduced. Types of kerbs production.

- Pre-cast concrete dividers
- Lightweight precast concrete dividers
Lightweight dividers are easier to handle, and so there use has been encouraged for health and safety reasons. Divider lengths are usually 450 mm, and the profile has a frog (recess) which reduces the weight of each unit. Haunch concrete fills the frog so there is no loss of performance when laid.

- By reusing of construction waste method.

  - This method is quite simple, all we have to do is to crush the waste
  - Starting with the collection of debris material for collection sites. They pick up their bins placed at the sites.
  - There are electric powered machines which are set up at the initial startup of the debris recycling plant
  - The process is not complicated as simple as it can be with few steps until the making of products by moulding.
  - The manufacturing starts with a crushing and powdering

The debris is sourced from construction sites and is broken down into particles, 30-40 millimeters (mm) in diameter. This requires a crushing machine. It being done by help of a plate crusher. The particles are then powdered down by a pulverizing machine.

**COMPOSITION OF WASTE**

The Construction waste does not typically have the same characteristics as demolition waste. Building material inputs are principally needed during construction and operation. A builder will typically order excess sizes or quantities of materials to ensure that there will be enough materials on hand to construct the building.

As mentioned above, the composition of C&D waste varies according to the type of project and the method of construction and demolition. In terms of the individual components, there are sixteen categories of materials that make up C&D waste in general. Table 2 lists these categories and their sources. Each class of materials consists of several different types of materials. Several of these classes of materials, such as concrete, masonry, and ceramics are considered inert by solid waste authorities—because they will not degrade by bacterial activity once land filled. There are, however, many components of C&D waste that are not inert in nature and, therefore, are putrescible. Wood is the best example of a material that will putrefy under the right conditions in a landfill. There are also several types of materials that can be considered chemically-reactive, such as paint, paint thinner, etc., and must be handled in a special manner.

**Preparation**

Starting with the collection of debris material for collection sites, they pick up their bins placed at the sites. There are electric powered machines which are set up at the initial startup of the debris recycling plant. The process is not complicated as simple as it can be with few steps until the making of products by molding. The manufacturing starts with a crushing and powdering: The debris is sourced from construction sites and is broken down into particles, 30-40 millimeters (mm) in diameter. This requires a crushing machine. It is done by help of a plate crusher. The particles are then powdered down by a pulverizing machine.

**CONSTRUCTION PRINCIPLES**

In general, techniques used in conventional reinforced concrete construction need not be changed when bamboo is to be used for reinforcement. Concrete Mix Proportions - The same mix designs can be used as would normally be used with steel reinforced concrete. Concrete slump should be as low as workability will allow. Excess water causes swelling of the bamboo. High
early-strength cement is preferred to minimize cracks caused by swelling of bamboo when seasoned bamboo cannot be waterproofed. Placement of bamboo- Bamboo reinforcement should not be placed less than 1.5 inches from the face of the concrete surface. When using whole culms, the top and bottom of the stems should be alternated in every row and the nodes or collars, should be staggered. This will insure a fairly uniform cross section of the bamboo throughout the length of the member, and the wedging effect obtained at the nodes will materially increase the bond between concrete and bamboo.

**Research Methodology**

A structure can undergo three main activities: construction, renovation, and demolition. All of these activities generate waste, some more than others. The purpose of this research is to calculate this waste amount using a materials flow method. In accomplishing this goal it is important to first understand the flow of the materials.

**Results Analysis**

<table>
<thead>
<tr>
<th>Test Designation</th>
<th>Conventional method</th>
<th>Recycle method</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.Length</td>
<td>914</td>
<td>850</td>
<td>64</td>
</tr>
<tr>
<td>2.Breadth</td>
<td>305</td>
<td>300</td>
<td>5</td>
</tr>
<tr>
<td>3.Height</td>
<td>150</td>
<td>150</td>
<td>-</td>
</tr>
<tr>
<td>4.Rate (per unit)</td>
<td>Rs.150</td>
<td>Rs.90</td>
<td>Rs.60</td>
</tr>
<tr>
<td>5.Strength</td>
<td>35N/mm²</td>
<td>46.5N/mm²</td>
<td>11.5N/mm²</td>
</tr>
</tbody>
</table>

**Table No.1**: Comparison between Conventional and Recycling Method.

**Scope for Future Works**

The scope of the project was based around the eventual development of Guidelines for developing a C&D waste recycling project on the construction site. And handling the debris observed in the form of waste removed plaster, disposed concrete, demolished framed concrete structures, P.C.C and all. The various aspects of construction recycling projects to be addressed by this project include:

- To take in concern that the waste construction material can be used in reference to the future.
- The waste materials which create pollution are being recycled and hence would create less amount of pollution.
- The construction debris which usually get mixed with soil and losses the fertility of soil can be avoided and ecology is been balanced.
- The construction waste such as debris will be recycled for blocks (using as dividers and kerbs).
- The future scope of waste recycling is ever increasing with respect to industrial market. It is estimated the construction waste generated in Mumbai is going to be increased by 30% from today’s rates of civil expansion of the city. There will be very keen and high demand of construction waste management in the nearby future.
Talking about this study it will help to understand the present scenario of waste debris in the city, state. And to determine the future demand of the growing developing industries and companies in this city. Thus recycling of construction waste has a far better scope in the future.

Conclusion
C&D debris is a large waste stream of concern. Even if some estimates are too high, examination of the materials consumed show that there is a great potential for future waste generation. The materials flow analysis estimates larger amounts of C&D debris generation than previous estimates. This study has developed concepts for the reutilization of construction materials, including waste debris, by means of recycling into other components that are useful in construction. The various topics discussed above help us to understand the waste management scheme of debris recycling potential.

The scope of the project and etc, this idea relies heavily on studies and data-collection performed by others. Thus, this study did not collect the data initially or perform the studies that provided much of the data used, but aggregated the data and analyzed it in a manner that has not been done before. It contributes to a greater knowledge of the C&D debris stream, specifically, and how it should be managed in the future.

REFERENCES