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Demolition Techniques and Use of Demolition Waste: A Review

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Abstract: *Every structure has its own life period. After attaining its service life the structure becomes dangerous to surrounding buildings as well occupants. So the removal of such structure with proper technology is very important. Time and cost is also an important parameter for demolition. Implosion is a technique in which the explosive material is placed, proper timing is to be set in which the structure needs to be demolished. In this technique due to the effect on the vertical supports of the building, the structure collapses as the support get weaken building no longer bears its own self-weight. The paper basically deals with ideas of demolition technique and reuse of demolition waste for construction. By the utilization of this waste product we can actually reduce some impacts and difficulties which are been faced by the environment at present.*
Keyword*: Demolition, Implosion, Recycling, Building, Explosive*

I. Introduction

Every structure design for a certain time period after its service life it becomes a danger for surrounding building and occupant's demolition is a ground to earth technique in which the building with help of simple method or implosion technique id demolished without affecting surrounding occupants .if explosive used in demolition then it is called implosion technique. thus implosion and silent demolition prove worth in terms of cost and time ultimately the question arise on the management of waste from construction and demolition as the building industry is growing there is need to find proper waste management technique so that the material could be recycled and used for construction.

II. Literature Review

Poonam K, Trupti K and Aditi V:

Every structure is designed for a time period and Demolition is the method to deconstruct the structure after its life period gets over. The detailed study was done on demolition by imposition method, which is basically a strategic placing of explosive material and timing of its detonation so that a structure collapses on itself in a fraction of seconds, minimizing the physical damage to its immediate surroundings. According to them explosive demolition should be preferred as it can safely and efficiently demolish the structure layer by layer. They explained the steps to perform the imposition method. The had used ANSYS Analysis technique, Static analysis is used to determine the displacements stresses, stains and forces in structures or components due to loads that do not induce significant inertia and damping effects. This helps in finding the part were explosive has to be placed for explotion. They had used Pro-E software for meshing of the model, and then the model is imported to AUTODYN ANSYS software program, for the principle stress and displacement analysis. By performing with proper planning and processing they explained the process in detail. The paper gives the viewer the perfect process of demolition by imposition method. So we would recommend this paper for thus who wish to study about the covered topic. The experimental testing by use of non-destructive test was also performed to know about the internal condition of structure. And this test showed that the method is applicable at areas was the structure is surrounded by other buildings or civil structures.

André Coelho, Jorge De Brito:

The requirement of studying this topic is to generate awareness about Demolition Technologies & techniques as well as to reuse the waste which get generates after demolition process. The aim is to quantify comparable environmental impacts within a Life Cycle Analysis perspective, for buildings in which the life cycle stages are adjusted to several waste management options. This option clearly meant that only a scenario comparison was been processed. On comparing to most LCAs, the approach was "top-down" rather than the usually "bottom-up", which had involved large amounts of data and the use of specific software's. The waste materials are totally sent for reuse process and the hazardous materials are then landfilled and the rest are used on construction works. The fact that can be attributed was replacement levels of input materials remains low

<9% thus the production and transportation of construction elements made of virgin materials still prevails. Actually, with selective demolition, all the materials are send to recycle/reuse, were more than 95% of these materials, significant impact reductions and are possibly on the Materials stages up to a degree where impacts due to this stage are lower than those coming from End-of-Life, that these recycled materials are effectively applied again in the construction of new buildings. - Medium to low materials reuse percentage will not translate into appreciable environmental impact reductions when compared with equivalent recycled quantities. - It is particularly important to try and reintroduce recycled or reused materials into new construction. Ultimately around 6% and 7% reductions in climate change and acidification related impacts can be reduced. "From a complete life cycle perspective, in order to get any change in environmental impact reduction, especially in the climate change and acidification categories, recycling will have to be raised above 90%, and efforts must be made to incorporate the resulting materials into new construction" was their concluding point. This will really help to reduce the impacts of environment. Here it can be said that they have actually used the 3R system to protect the nature from impacts.

Vivek Patel

In this paper organizing and reducing construction and demolition waste: a review says as the construction is growing day by day the similarly the waste from construction and demolition is growing. Vivek B Patel in his paper focused on how to organize and minimize the construction waste management and in his paper, he has detailed some review on construction and demolition waste. He says large demolition of waste generation (road, flyover, and malls) small generates (housed, small building) in his Paper he concluded that 3R should be used in conduction and demolition waste to reduce construction and demolition municipal laws, bye-laws should be strictly implemented.

Yungu fu GAO

In his paper estimation method of construction and demolition waste generation, a review says that in recent year's construction and demolition waste is significantly increased. There is a need for proper quantification of demolition waste in his Paper and divided 2 methods for estimation of an amount of demolition waste. One is the basic method and other is comprehensive further the methods are divided into 7 methods. basic method comprises of direct measurement method, indirect measurement, per capita multiplier, financial value extrapolation, area-based calculation., the comprehensive method comprise of grey theory, Neutral Network, system dynamics, modeling. He concluded that sometimes there is a need of more than 1 method for quantification of C and D waste. His review will help authorities to plan the management of construction and demolition waste properly.

Sally M Elgi Zawy

In his paper Approach sustainability of construction and demolition waste using zero-waste concept. Has a booming housing and building industry is rising there is a continuous rise in construction and demolition waste. In this paper, the classification method of C& D its component and treatment using Zero waste concept is to be done. Zero waste technology is a promising technology leading to sustainable development. Recycle construction and demolition waste using zero waste management is challenging and requires a lot of research. There is some limitation but there is a need for more research on this topic.

Siddharth Patel

In his paper construction and demolition waste recycling focuses on the recycling method of masonry demolition waste. They studied deeply about construction and demolition waste they performed various test so that they could find an alternative solution. In this paper sidhart, Patel with his member came up with an n idea of using recycled sand and aggregate which result economically for construction. Further, they suggested the idea of using recycled material in the hollow block, concrete block, paper block. The recycled material provides the same strength as that of the locally available material.

Amrutha Mary, Vasudev

Studied the demolition process for small as well large building. Demolition is processed in which structure need to be demolished for small building it can be done with the help of simple technique but in case of the large building, there is a need for explosive. [7]

Susha (Rai) 2009

studied about implosion technology placing explosive material and detonation timing of that structure, structure collapse in seconds, building implosion technique do not depend on internal and external pressure,

implosion technique weaker the vertical support of the building so that building does not fall under the influence of gravity and fall under its own weight. The placing of explosive denotation timing is very important. [8]

Aria Vial (2013)

Studied about commonly pronounced waste demolition in the construction industry .according to rule building need to demolish after its small life the implosion technique is best suitable in terms of time and cost. Very less explosive required to demolish the structure in implosion technique as well implosion t references. [9]

III. Conclusion

There are various demolition techniques available to demolish a building using available material as well with the help of explosive. Demolition of the building is necessary after its service life so that its nearby occupants don't get disturbed after demolition. There are various techniques available to estimate the amount of demolition waste. Waste material can be recycled and used in construction. With the help of the available method & technique, we can recycle the waste demolished material for construction.

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