

DEMOLITION- THE NEED OF THE DEAD BUILDINGS

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ABSTRACT

Demolition- The need of the dead buildings. This idea basically deals with the demolition of the structure with the help of various techniques that are being used currently for the demolition of the structure. Every civil engineer designs a building for a life period upto which that building can properly work. After that the existence of a structure is very dangerous. Hence removal of such structures with proper safety measures has got great importance. Demolition of a building means tearing down or falling down of a building with the help of heavy equipments or explosives. These techniques have been used widely for the structures which are aged and are not favorable for the future use. We are basically deals with the floor-by-floor demolition of the building. our basic aim is how a demolition work is to be performed safely and also elaborate different steps involved before and during the execution of a demolition job. The various steps involved before the demolition process includes surveying, removal of reuse materials, and preparation of demolition plan, stability data and the precautionary safety measures to be taken for the further demolition process. The presence of aged buildings which lack proper care and maintenance poses potential threats to human society and the community at large.

INTRODUCTION

In the field of civil engineering, Demolition – the need of the dead building. This idea basically deals with the demolition of the structure using floor by floor reduction of the building. The current status of the process of the demolition of the high rise building is done with the help of the detonators and also with the use of the twinkle tows. But these two systems of the demolition have certain disadvantages. An structure which is made by any material is to be demolished after it's designed age is completed in order to reutilized the valuable land. Demolition was also necessary to remove danger of falling. From the analysis done so far it is concluded that demolition of building / structure will prove very useful, economical and quickest in contest of future planned project and also it would be very helpful in designing the new era of the nation. This is also kept in mind that the demolition of the structure should be done safely so that no loss in the life and the property takes place. This paper relates to the demolition of the building by floor by floor reduction in the height of the building and collecting the inner material of the building safely at the ground level, not spending extra penny on the transferring of the goods from inner structure and then demolishing it.

METHODOLOGY

Currently the demolition of the structure is being carried out with the help of twinkle tows and detonators.

1. TWINKLE TOWS (65M)

The excavator is based on a 2008 Liebherr 984 that was heavily modified by Kocurek Excavators Ltd for the Birmingham-based demolition Coleman & Company. It was bought for around NZ\$4m and imported to New Zealand by Auckland-based demolition firm Nikau Contractors, and arrived in the Port of Littleton in September 2011. The tracked excavator weighs 208 tonnes (205 long tons; 229 short tons) and has a maximum reach of 65 meters (213 ft). When the articulated arm is not extended, the reach is 25 meters (82 ft). The excavator is not suited for demolishing the bottom two storey's of a building. At full reach, a 2.5 tonnes (2.5 long tons; 2.8 short tons) demolition attachment can be fitted to the hydraulic boom. At 40 meters (130 ft) reach, the machine can handle a 6 tonnes (5.9 long tons; 6.6 short tons) concrete breaker.

"VARIOUS TYPES OF TWINKLE TOES"

CLASS1 TWINKLE TOWS



The largest high reach excavator in the Southern Hemisphere, Twinkle Toes is finally in Christchurch to assist with the recovery to rebuild by providing safe, fast and efficient deconstruction options for buildings in excess of 10 storeys.

CLASS2 TWINKLE TOWS



Demolition of redundant two lane solid concrete and steel constructed rail over bridge in Papakura. Successfully completed within a 24hour timeframe.

class3 twinkle tows



Ports of Napier successfully completed within live port operations..

2. DETONATORS

An implosion is an event where something collapses inward, because the external atmospheric pressure is greater than the internal pressure. For example, if you pumped the air out of a glass tube, it might implode. When a building is surrounded by other buildings, it may be necessary to "implode" the building, that is, make it collapse down into its footprint. We can demolish a stone wall with a sledgehammer, and it's fairly easy to level a five-story building using excavators and wrecking balls. But when you need to bring down a massive structure, say a 20-story skyscraper you have to haul out the big guns. Explosive demolition is the preferred method for safely and efficiently demolishing larger structures. The basic idea of explosive demolition is quite simple: If you remove the support structure of a building at a certain point, the section of the building above that point will fall down on the part of the building below that point. If this upper section is heavy enough, it will collide with the lower part with sufficient force to cause significant damage. The explosives are just the trigger for the demolition. It's gravity that brings the building down. Demolition blasters load explosives on several different levels of the building so that the building structure falls down on itself at multiple points. When everything is planned and executed correctly, the total damage of the explosives and falling building material is sufficient to collapse the structure entirely, so clean-up crews are left with only a pile of rubble.

INTRODUCTION TO THE NEW SYSTEM

FLOOR BY FLOOR DEMOLITION OF THE STRUCTURE

In this system, the basic idea behind this system is only the safely taking out the material that can be made in use like various electronic goods, etc. this system is also helpful in the reduction of the height of the building. In certain circumstances the option to use *long reach machines* to demolish high rise structures without taking unnecessary risks is not feasible. When such doubt in methodology occurs, perhaps due to environmental considerations or adjoining buildings, the only sensible option is to employ a Top Down

'Floor by Floor' demolition technique. Floor by Floor deconstruction is a complex and technically challenging procedure that involves the highest degree of engineering investigation and design throughout the planning and implementation stage of the works. But, now a day Our demolition teams are highly skilled and experienced with all methods and techniques involved, ensuring your project is always in safe hands from the embryonic stages to the day of completion. This technique is very much safe.

Irrespective of the demolition by the detonators and with the help of the twinkle tows.

The floor by floor demolition is valid for two-two floors simultaneously. This technique takes place as follows:-

1. The hydraulic jacks according to the need of the building are being selected and their numbers are also based on the superimposed load of the buildings.
2. The outer portion of the ground floor and first floor is taken out or removed so that the hydraulic jacks can be set up.
3. The entry of the JCB and the towing trucks is opened and simultaneously the slab of the first floor and other waste material is removed and the material which is of use is being separated and at last the columns are also being cut off and the jacks are activated so that they can reduce their height. And lower the height of the building or the structure.
4. By this way, the whole process works

The only delay in this system is that it may take 10 days to demolish the 20 to 30 storey building.

HYDRAULIC – LEVEL BY LEVEL DISADVANTAGES OF THE CURRENT SYSTEM TWINKLE TOWS

The arm of the twinkle tows can only reach up to the 65m; hence it cannot be used for that building whose height is more than 65m. And also equipping the twinkle tows for the demolition of the building can cause the misbalance in the structure and a state may occur where the structure may tilt and result in fall.

DEMOLITION WITH THE HELP OF THE DETONATORS

They have the major drawback of the dust and the pollution that is being created at the time of the explosion and also there is initial cost which being used for the excavation of the materials that is good in state to be made in use. The establishment of the monkey cranes and the tower cranes is done in this case.

CONCLUSION

It is concluded that this methodology of demolishing building / structure will Prove very useful, economical and quickest in contest of future planned Project and freight corridor project. Hence, the step by step demolition of the building is very effective as it helps in the less excavation cost and it does not produces any pollution dust and also the material that can be made used again from that building can be easily accessed.



References

- [1] Peck, R.B., W.E.Hanson and T.H. Thornburn(1974), 'Foundation Engineering', John Wiley and Sons Inc., New York, USA
- [2] Tomlinson, M.J.(1986), "Foundation Design and Construction", Longman Singapore Publishers, Singapore
- [3] www.wikipedia.com/demolition.org
- [4] Momber, A.W.: Hydrodemolition of Concrete Substrates and Reinforced Concrete Structures
- [5] Bohart, Maura"Demolition Eliminates Final Remnant of Charlotte Hornets"