International Journal of Advance Research in Science and Engineering
Volume No.07, Special Issue No.01, February 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354

DEMOLITION OF STRUCTURES

Umang Singhal[1], Prashant Sharma[2],

Shreyans Kumar Sharma[3]

[1,2,3]Civil Engineering, IIMT College of Engineering, (INDIA)

ABSTRACT

This project explores the idea of 'DEMOLITION OF STRUCTURES'. As we all know that buildings are meant for some specific period of time limit. After the construction of the building that area will takes steps towards the development. After the total time period of the building that area will be fully developed and it's a big problem of destruction of the building for the civil engineers. So, in the following paper we have studies the main factors on which we must take care and the processes for the demolition of the buildings.

CONTENTS

I.INTRODUCTION

Weknow everystructureis designedforalifeperiod. The existenceof thestructure after theservicelifeperiod is verydangerous to its occupants and surroundingbuildings .The buildingact usuallycontains provisions that enable local authorities to control demolition works fortheprotection of publicsafetyand toensureadjoiningpremises andthesite aremadegood.

Oncompletion ofthe demolition. A noticeof conditions is issuedthat require certain works to be undertaken to achievethese aims. Wheredemolition of abuildingtakes place,the owner must inform the council. Greenhous-

es, conservatories,prefabricatedgarages and sheds do not require permission to bedemolished. Usuallyif the-buildingto be demolished hasavolumeof less than
1750 cubic feet (49.56 cubic meters), then permission is not required to knock it down.

II.DEMOLITION

Demolition isthe process of tearingdown or fallingdown ofabuildingafter its life period with the help of some equipment or anyothermethod. Everycivil engineeringstructureis designedforalifeperiod. Afterthat theexisten-ceof astructureis verydangerous. So removal of suchstructures with proper safetymeasures hasgot great impor-tance.

III.STEPSBEFOREDEMOLITION

Thedifferent steps beforethe execution ofademolition processare:

3.1SURVEYING

Surveying means study of different parameters of the structure and its surroundings.
There aretwo types of surveying aremainlyconducted. Theyare

A. Buildingsurveying
B. Structural surveying
(a) Record Drawings
(b) Survey Items
(c) Special Structures
(d) Investigation and Testing

3.2Removal of hazardousmaterials

If hazardous materials, such as asbestos containing materials, petroleum contamination & radioactive contami-nation, exist in the building, further investigation and removal of such hazardous material or contamination by specialist shall be referenced.
Asbestos Containing Material
Soil Contamination Material

3.3Preparation ofplan

A Demolition Plan shall include the following:

3.4A plan showing

(a) Thelocation ofthe buildingto be demolished;

(b) A detailed topography of the site.

(c) Details of ground removal and/or backfilling;

(d)Thedistances from thebuildingto be demolished to its adjacent buildings, streets, structures and significant street furniture.

(2)A layout plan ofallfloors ofthe buildingto bedemolished, with adequate sections, showing:

(a) Theoccupancyusageofthe floors;

(b)Thestructural support systems;

(c) Principal materials ofconstruction;

(d)The condition of thebuildinge.g. the degreeof deterioration; and

3.4Stabilityreport

According to Building (Administration) Regulation, the Demolition Plan must be accompanied by a Stability Report with supporting calculations. The Stability Report shall include the following parts:

(1) A report on the stability of the building to be demolished during all stages of demolition;

(2) In the case when powered mechanical plants or equipment are used, a report on the stability of the building with supporting calculations to demonstrate that the use of the plants and equipment will not render inadequate the margin of safety of, or cause damage to any building, structure, street, land and services;

(3) A report on the stability of neighboring buildings, adjoining properties.

(4) A report with calculations demonstrating that the demolition work will not render inadequate the margin of safety of, or cause damage to any building, structure, street, land and services

3.5Safetymeasures

A) Training and Communication

Demolition workers, including plant or equipment operators, shall go through proper job safety training and be informed of the potential hazards by attending training sessions as well as on-the-job training

B) Equipment Maintenance

All equipment shall be tested and examined before use. They shall be properly stored and maintained. The equipment shall be inspected daily and results of the inspection shall be recorded accordingly

C) Electrical Safety

A properly connected power source from a local electric utility supplier or a mobile electricity generator shall be utilized in demolition sites.

D) Fire

All flammable goods shall be removed from site unless they are necessary for the works involved. Any remaining flammable goods shall be stored in proper storage facilities. All furniture, timber, doors, etc. shall be removed before any welding work is performed.

E) Emergency Exit Requirements in Demolition Sites

Emergency exits shall be provided during building demolition. In case of any emergency evacuations, the emergency exit will serve as a lifeline for transportation of injured workers. A minimum of one exit route shall be maintained and designated as the emergency exit at all times during the demolition. Adequate lighting and fire extinguishing equipment shall be provided. Emergency exit shall be properly protected, free of obstruction, and properly marked with exit signs or other indications to clearly show the route. All workers shall be informed about the exit route.

F) Occupational Health

The health of workers on site shall be properly protected in accordance with the relevant subsidiary regulations of the Factories and Industrial Undertakings Ordinance and the Occupational Safety and Health Ordinance with particular attention to the following areas:

(A) Exposure to Dust; (B) Chemical Exposure;

(C) Heat Stress and Ventilation; (D) Noise Exposure;

(E) Medical and First Aid Facilities; (F) Sanitation; and

(G) Occupational Diseases.

IV.METHODS OF DEMOLITION

There are two types of demolition

1. **Non explosive demolition**
2. **Explosive demolition.**

4.1Non explosive demolition

It means the demolition of a structure done with some equipment without the use of any explosive. Different equipments used for the demolition activity are:

A sledge hammer, equipment used for removing a stone wall or a single column. It consists of a long stem with a metallic head. It is used to give impacts on the surfaces and that cause the demolition of structure. It cannot be used for removal of large buildings.

SLEDGE HAMMER

CRANE WITH WRECKING BALL

HIGH REACH EXCAVATOR

4.2Explosive demolition

The basic idea of explosive demolition is quite simple. If we remove the support structure of a building at a certain point, the section of the building above the 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 trigger for the demolition. It's gravity that brings the building down.

Demolition blasters or blasting expert ("Blasting expert" means a person who is the holder of a valid mine blasting certificate.) load explosives on several different levels of the building so that the building structure falls down on itself at multiple points.

4.11.Felling like a tree

In this the blasting crew will be able to tumble the building over on one side, into a parking lot other open area. This sort of blast is the easiest to execute, and it is generally the safest way to go. Tipping a building over is something like felling a tree. For example to topple the building to the north, the blasters detonate explosives on the north side of the building first , in the same way you would chop into a tree from the north side if you wanted it to fall in that direction . Blasters may also secure steel cables to support columns in the building, so that they are pulled a certain way as they crumble.

4.1.2. Falling into its own footprint

Sometimes, though, a building is surrounded by structures that must be preserved. In this case, the blasters proceed with a true implosion, demolishing the building so that it collapses straight down into its own footprints (that means the total area of building is removed into the base of the building). This feat requires such skill that only a handful of demolition companies in the world will attempt it.

Demolition of a chimney in Germany (falling into footprint)

V.CONCLUSION

Type ofdemolitionmethoddependsuponvariousfactorssuchassite condition,type ofstructures,ageofbuilding,heightofbuildingandeconomy.Anyway controlleddemolitionof buildingisnecessarytoensuresafety.Explosivedemolitionisthepreferredmethodforsafely andefficiently demolishing thelargerstructures.Almostallmajorbuildingimplosionsinthe worldarehandledby 20well-establishedcompanies,blastingispassedonfromgenerationto generation.

REFERENCES

[1.] www.google.com
[2.] www.wikipedia.com
[3.] www.SeminarSlide.com