

Demolition: The word **demolition** means destruction, breaking down or removal. **Demolition** of building is the process of **dismantling** or destroying of a **structure** after its life of serviceability by pre-planned and controlled methods.

As we know that every design of a building or a structure has a lifespan known as design life. The building is designed considering a span of life, say 80 -100 years. When this design life of the building is over, the structure is not safe for living and neighboring buildings.

There can be more reasons for demolition of a building, old structures are to be replaced by new ones. The structure lost its stability or having any structural damage. Small structures are demolished to build big structures etc.

Definitions

Demolition: The word demolition means destruction, breaking down or removal. Demolition of building is the process of dismantling or destroying of a structure after its life of serviceability by pre-planned and controlled methods.

Building Demolition Process

Different steps are involved in the process of demolition of building structures which are:

1. Surveying
2. Removal of hazardous materials
3. Preparation of plan
4. Safety measures

Surveying of Buildings for Demolition

Surveying means study of different parameters of the structure and its surroundings. There are two types of surveying are mainly conducted. They are

1. Building surveying
2. Structural surveying

1. Building Surveying

In survey of buildings for demolition, following process are carried out:

- Types of construction material used
- Usage of building prior and present during demolition.
- The presence of wastewater, hazardous materials, matters arising from toxic chemicals, flammable or explosive and radioactive materials, etc.
- Drainage conditions and possible problems on water pollution, flooding and erosion.
- Shared facilities with adjoining building, including common staircases, partition walls.
- Adjoining pedestrian and vehicular traffic conditions
- The sensitivity of neighborhood with respect to noise, dust, vibration and traffic impact.

2. Structural Surveying

In structural survey, following process are involved in demolition:

- The method of construction
- The structural system and structural conditions of basements, underground tanks or underground vaults.
- The original structural system employed in the design.
- The condition of the building.

Removal of Hazardous Materials

If hazardous materials like asbestos minerals, petroleum contamination, and radioactive metals are found in the investigation of site for demolition. Specialized personals are called for the removal of the hazardous materials from the site prior to the demolition of structure.

Preparation of Demolition Plan for Structures

A detailed demolition plan is made which illustrates the different process involved and they are:

- The location of the building to be demolished.
- The distances from the building to be demolished to its adjacent buildings, streets, structures and significant street furniture.
- The structural support systems of the building.

- A plan showing the procedure for the demolition of the building; detailed sequence of demolishing structural members; and the method of demolition to be adopted.
- A plan showing all precautionary measures for the protection of the public including hoardings, covered walkways, catch platforms, catch fans, scaffolding, protective screens and safety nets.
- Method of handling demolished building debris.
- Time required for the complete demolition process etc.

Safety Measures during Demolition of Building Structures

All the workers, site supervisors and engineers including plant and equipment operators are briefed with the potential hazards and process of demolitions.

All goods that are flammable are removed from the site unless it is used in the work involved. All the flammable materials like wood, timber, fuels etc. are stored in proper storage facilities. Firefighting appliances are stationed in the demolition site till the process is completed.

Due to the demolition of structure, many problems are faced by the workers, such as. exposure to dust, chemical exposure, heat stress and ventilation, noise exposure, medical and first aid facilities, sanitation and occupational diseases. To overcome these problems suitable measures are undertaken.

Demolition Methods for Buildings and other Structures

There are two types of demolition methods used for buildings and structures

1. Non-explosive demolition
2. Explosive demolition.

1. Non-Explosive Demolition Method

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

a) Sledge hammer

It is a small handheld hammer used for the demolition of small wall or single column.



b) Excavators and Bulldozers

These are big machines used to demolish buildings of small sizes. They are used for excavation of soil or transferring of debris to trucks etc.





c) Wrecking Balls

The building with the greater height up to (6-7 story) cannot be demolished with the help of excavators or bulldozers. In such cases crane with wrecking balls are used to perform the demolition activity. The wrecking ball crack is crack attached with a huge steel ball hanging from a steel rope.

The steel ball is pulled and released towards the building. The steel ball with force strikes the building and the part of the building is demolished. This method is not recommended as the trajectory of the steel ball cannot be controlled after it strikes the structure.



d) High Reach Excavators

High Reach Excavator machines are used in the demolition of tall building where demolition by explosion is not possible. The building of height up to 300ft can be demolished by this type of machine.

High reach excavators can be used for different use by doing some attachments such as:

- Excavators with shear attachments – excavators with shear attachments.
- Hydraulic hammers – Hydraulic hammers and remove steel reinforcement.



Explosive Demolition Method for Building Structures

Implosion Method of Building Demolition

Implosion is the process of demolition of a building using explosives. If the supports of the building are removed, the structure collapses.

Using implosion technique, the main supports of the buildings such as column's, beams and slab are fixed with explosives. When these explosives are detonated, the column collapse and so is the structure.

Depending how the structure falls, there are two types of implosion:

a) Falling

like

a

tree



In this type of implosion, the building is made to fall like a tree to the sideward. This is the commonly used type of implosion. When free space is available besides the building, this type of demolition is prescribed.

If the free space is available on the left side of the building, the explosives are set on the lower level of the building on the left side columns. As the explosives are detonated, the columns bursts, the building tends to falls towards the left side. Steel cables are tied to the building to control the falling direction of the building.

b) Falling into its own footprint

When the free spaces are not available around the building and the structure around the building are to be protected. This type of demolition is used. In this type of demolition, explosives are set in the floor below the middle part of the building.



These explosives are to be heavy as the explosion must demolish the building at once. If one part blast and followed by another. Then the building falls towards the first blasted part. So only less companies in the world are experienced in this type of demolition.

As the explosions are detonated, the upper part of building destroys and falls upon the lower building. Due to the heavy load and force the lower part of the building also collapses and falls on its own footprint.

