

Planning for demolition of building



**ASSIGN
BUSTER**

Identify a derelict building and taking into account factors such as its previous use, condition, structural features and location, prepare a plan for the safe demolition of the building that identifies the preferred method of demolition and outlines suitable technical and procedural control measures.

The objectives of this report are to identify a derelict building and plan its demolition. The planning has to take account of the specificities of the building's structure, its previous use, the site, the neighbouring properties and other parameters. Control measures from a health and safety point of view have to be included.

The building identified is a very old Victorian three-storey building that has not been used for many years.

The methodology consists of analysing the existing structure and adjoining properties. A detailed description of the structure has been given and the demolition sequence has been chosen in accordance with the structure and in a way to cause minimal disruption to other properties and the general public.

The actual demolition plan is given in the form of a list of tasks and a brief explanation for each task. The demolition process has been divided into critical phases.

The control measures have been incorporated in the plan of the demolition but a health and safety risk assessment has been done that lists the possible hazards from such a work.

1 The Derelict Building

1.1 Structures to be Demolished

This three storey Victorian building is one of three buildings in the same compound that used to house an old hospital on the site. The other two are also not in use and there are plans to demolish them as well but at a later date. The Victorian building is a detached three storey building positioned centrally on the site with a shed used as boiler house on one side. Access is from the south side where the building is about 10 m from the road.

The Boiler House is set to the north of the building but is detached from the main building. It consists of one tall stone building with attached oil and water tanks.

There is a network of underground pipes between the boiler house and the Victorian buildings for the supply of hot water for domestic and heating purposes.

As most Victorian buildings of that size, these buildings have certain characteristics that distinguish them from other buildings. The building construction is of masonry. The load bearing walls are made of two lines of brick with no gap in between. These external walls rise uninterrupted to the roof.

The roof consists of square timber rafters sitting on a timber ring beam on top of the walls. The rafters support a series of rectangular timber purlins that in turn support the slate tiles that form the roof. The edges are sealed by hammered lead foils.

The internal floors are made up of timber joists supported by stone brackets off the brick walls. A grid of timber beams are supported off the joists and wooden planks are nailed to the top of the timber beams. The partition walls consist of plastered timber frames.

The buildings also consist of basement that have been sealed several years ago but has not been filled.

There is no insulation on the walls and roof and there is no air conditioning installed in the building. The only services are the hot and cold water pipes, drainage pipes and electric wiring. The water pipes date from the original construction and are of lead. The sanitary drainage pipes also date from original and consist of 5 cast iron pipes and fittings lined with bitumen. The electric wiring has been installed much later and has been fixed to the timber joists by means of nailed clips.

The boiler house is a stone building with corrugated iron sheet roof. It contains a coal-fired boiler that is out of operation. The boiler is connected to the Victorian buildings via underground pipes to supply hot water. The Boiler House also contains a large number of pipe work and fittings as well as a coal pit.

1.2 Adjacent Land Use

The site is situated between two main roads on the South and East sides and two B-class roads on the North and West sides. The site shares a boundary with a much newer construction used as NHS clinic which will remain in use during the demolition. The site is surrounded completely with 2.5 m tall masonry walls except on the south side. The south side is cordoned by

wrought iron fencing. There is no wall between the parking lot of the clinic and the compound.

1.3 Ground Conditions

Ground investigations were carried out on samples of the south of the site during the construction of some of the newer buildings. The investigation results are available from the council. Since no new construction is being undertaken in this project, ground information is deemed to be unnecessary.

2 Description of Works

2.1 Methodology

2.1.1 Survey

Since the building has not been in use for a significant period of time, its exact state is not known even to the client. So the first thing to be done is a full structural survey of the building to assess the danger from hazardous material and to decide on the best method of carrying out the work. This will need to be done as early as the tender stage as the information from this survey will be essential for the rest of the work.

Before the start of the demolition, a full scale demolition survey will need to be done. This should take account of the following(Holroyd, 1999):

- Adjoining properties
- The type of structure and the key elements in it.
- The condition of the elements.
- Any requirement for temporary works or staging during demolition.
- Are there any confined spaces.
- Are there hazards from asbestos, lead, contaminated land, etc?

- Is access and egress adequate?

2. 1. 2 Preferred Method

The demolition can be carried in a number of ways but given the proximity of other properties such as the NHS block and main roads, the demolition should be carried out in a way as to minimise disruption to the neighbourhood and also to cause minimum noise level.

The demolition should be planned to be carried out in a controlled manner from top to bottom, de-constructing the components in the reverse order of original construction. Demolition balls will be used only as the last resort and no explosive will be used.

2. 1. 3 Method Statement

A method statement needs to be prepared before the job starts and should cover (Holroyd, 1999):

- The sequence and method of demolition noting access/egress details.
- Pre-weakening details of the structure
- Personnel safety, including the general public
- Service removal/make safe
- Services to be provided
- Flammable problems
- Hazardous substances
- The use of transport and waste removal
- Identity of people with control responsibilities.

3 Particulars of Work

3.1 Phase 1: Planning

Before the demolition starts, careful planning is required to ensure smooth operations. It also allows problems to be identified at an early stage. The cost of remedial action at the planning stage is significantly less than that at the demolition stage. So, allocation of time and effort to careful and thorough planning is very important.

3.2 Phase 2: Site Preparation

Once on site, the demolition cannot start immediately. There is a lot of work that needs to be done to make the demolition work possible. Several preventive measures and control measures have to be established right at the start. It is cheaper and better than to apply remedial action when things go wrong. The planning stage must have identified the areas that need attention and the control measures that are required. The processes involved in the actual demolition are site specific and site preparations must be done accordingly. Good site preparation also allows minimal disruption to the neighbourhood.

3.3 Phase 3: Demolition of Boiler House

From the risk assessment, it is clear that the boiler house, although much smaller in size than the main building, represents a greater health hazard to the site workers as it contains asbestos, oil tanks, water tanks and a lot of pipe work. To reduce the exposure of the personnel to such risks, it has been decided to demolish and make safe the boiler house first before starting with the main building.

3.4 Phase 4: Demolition of Main Building

The main building will be demolished manually as far as possible. In order to contain the noise and air pollution as much as possible, the external walls and roof will be maintained until the entire interior has been demolished. The internal partitions do not contribute to the structural strength and stability of the building and it is therefore safe to demolish them. The floors do provide some lateral stability to the walls and will not be removed until an alternative temporary support is not provided to the walls.

3.5 Phase 5: Site Reinstatement

After the demolition is complete, the site has to be cleared of remaining debris and decommissioning of site offices and other facilities installed for the purpose of the site. The site offices and welfare facilities will be removed. The state of residual contamination has to be assessed and if any remedial action needs to be taken, it should be done. The landscaping should be re-established. Finally, the fencing and screens will be removed and the site handed-over.

3.6 Other Elements

The Principal Contractor should also be aware of the following:

- Traffic Management, an increased awareness is required for traffic control to and from the site from the South and East sides. The South side adjoins a particularly busy road with several shopping complexes further along the road.
- Unauthorised access to site from clinic block
- Unauthorised access from the main roads.

4 Control Measures

4.1 General Health Hazards

4.1.1 Operational Hazards

- Electric shock/burns
- Striking existing services
- Working at height
- Disconnecting of existing services
- Operating machinery, equipment, hand tools and mobile plant
- Hot works
- Manual handling
- Slip, trip, fall type injuries
- Dust / fumes
- Crush type injuries
- Contact with harmful substances
- Working in contaminated ground
- Working in confined spaces

4.1.2 Hazardous Construction Materials

Materials within the project with the potential to cause a hazard to health and safety:

- Aggregates
- Fuel oils
- Sand
- Glass fibre insulation
- Sewage

- Glass
- Wood treatment products
- Used drainage pipes
- Dust
- Cement
- Mastics
- Sealants
- Paints
- Floor Mastics / glues
- Asphalt
- Fumes

4.2 CDM

The Construction (Design and Management) Regulations came in effect in UK 31st March 1995. The main duties of the five key parties (CIRIA, 2001) are:

- The Client – shall appoint a competent planning supervisor and principal contractor for each project
- The Designer – should design structures to avoid, wherever possible, foreseeable risks to health and safety during construction, maintenance and cleaning work. Information should be provided on unavoidable risks. Design includes the preparation of specifications and not limited to calculations and drawings.
- The Planning Supervisor – the organisation or person with overall responsibility for ensuring co-ordination of the health and safety aspects of the design and planning phase, the early stages of the health and safety plan and health and safety file.

- The Principal Contractor – develops the construction-phase health and safety plan and manages and co-ordinates the activities of all contractors to ensure they comply with health and safety legislation. They have duties relating to the provision of information and training on health and safety for everyone on site and the coordination of employees' views working on site.
- Contractors and the Self-Employed – must co-operate with the principal contractor and other contractors and provide relevant information on the risks created by their work and how they will be controlled.

5 References & Bibliography

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