ice
Institution of Civil Engineers
Publishing

Refurbishment Projects

Health and safety management

Edited by Dr David Oloke
BEng MSc PhD PGCert HE FHEA CEng MICE MCIOB MNSE
University of Wolverhampton

2.2.3 Arrangements for demolition

Demolition or dismantling must be done by competent persons. These arrangements should be written down before the work begins. This written safe system of work may be provided in the form of a safety method statement identifying the sequence required to prevent accidental collapse of the structure.

In addition to the temporary works design and supports, a safe system of work may include the following

- establishing exclusion zones and hard-hat areas, clearly marked and with barriers or hoardings
- covered walkways
- using high-reach machines
- reinforcing machine cabs to protect drivers from injury
- training and supervising site workers
- consulting the building control department.

It is expected that the relevant local authority building control department is contacted before any structural alterations are made to a building. Normally this should be through a building notice or a full planning application.

2.3. Key health and safety duty holders in refurbishment projects

CDM 2015 identifies several duty holders who are expected to undertake specified roles in the management of health and safety on projects. These are the client, principal designer, principal contractor, designer, contractor and workers. While these roles are the same on both new-build and refurbishment projects in terms of general duties, there are some aspects that are particular to refurbishment projects.

The most important aspect of the management of health and safety in alteration and refurbishment projects is information management. Duty holders on such projects are required to collect and collate the required information and transfer it to the appropriate risk registers (Figure 2.1). The duty holders are required to manage this information.

The roles of the duty holders are described briefly below to facilitate understanding of how they can discharge their duties effectively.

Figure 2.1 Proposed framework for information flow in alteration and refurbishment projects (Oloke, 2012)

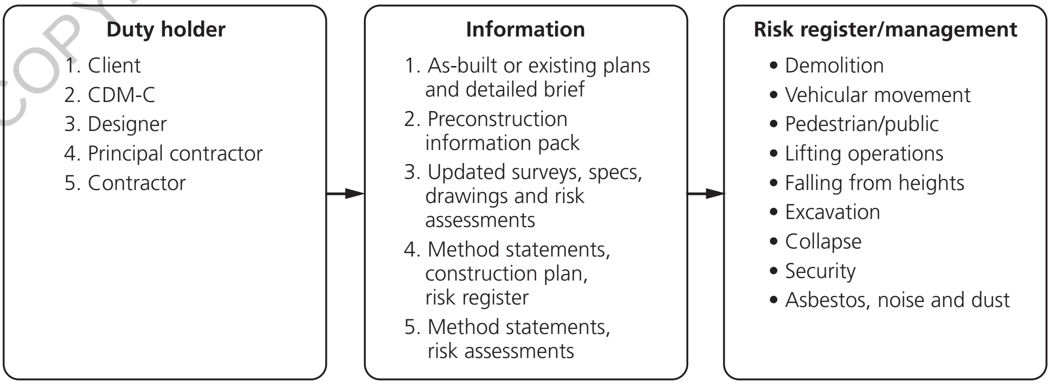
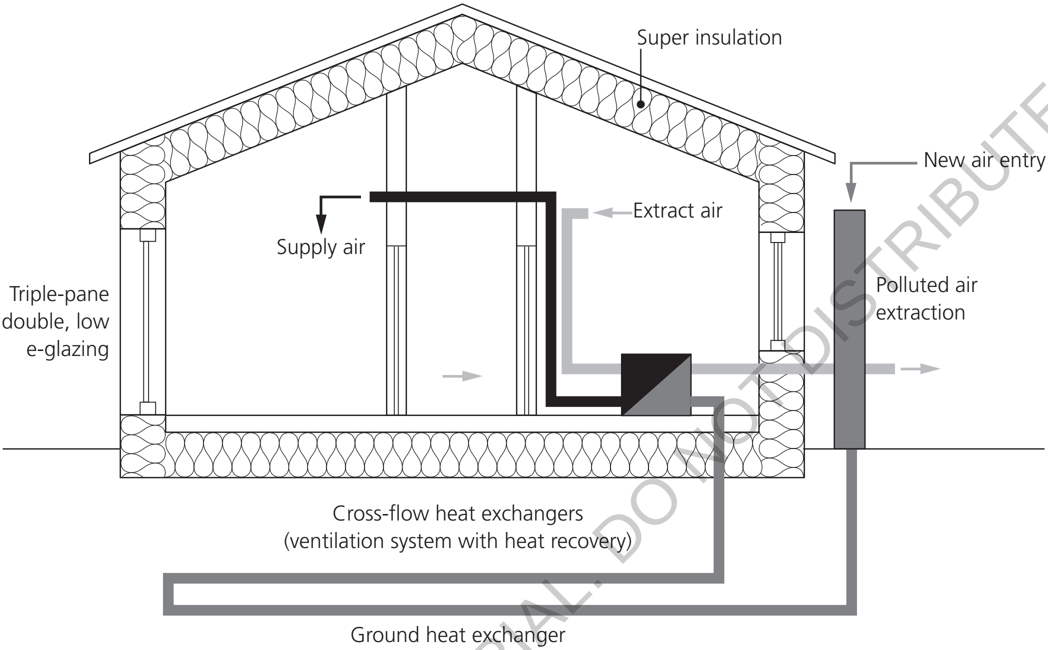


Figure 3.4 Proposed rear elevation

process that would be relied on by the modified structure. Externally, all accessible sides of the building were inspected, with brick courses, windowsills, lintels and general fittings and fixtures being examined. In general, the external walls and components appeared to have sound structural integrity, as no real or visible cracks were observed. In addition, an intrusive operation was undertaken to check the construction of the wall at the basement level and to determine the likely thickness of the wall at that level. It was established that the wall was indeed of brickwork construction and the thickness was 450 mm. To investigate the type and depth of the foundation, a 1 × 1 × 1 m deep trial pit was dug in the light wells close to the front and rear elevations, which were to host the additional floors. The foundation was found to be of a shallow strip type on a layer of gravelly clay soil. The analysis of foundation adequacy was conducted on the basis of this finding. An assessment of the load take-down was carried out to determine the estimated line loads in the existing structure and the estimated maximum line load in the foundation after superimposition of the new floors on the rear and front elevations. These estimated line loads were

Figure 4.5 Passive House – ventilation system with heat recovery



To achieve the Passive House standard a number of low-energy building techniques and technologies are used to obtain a significant reduction in energy consumption. The standard involves a shift in the approach to building design and construction. Designers may be assisted by use of the Passive House Planning Package (PHPP), which uses specifically designed computer simulations.

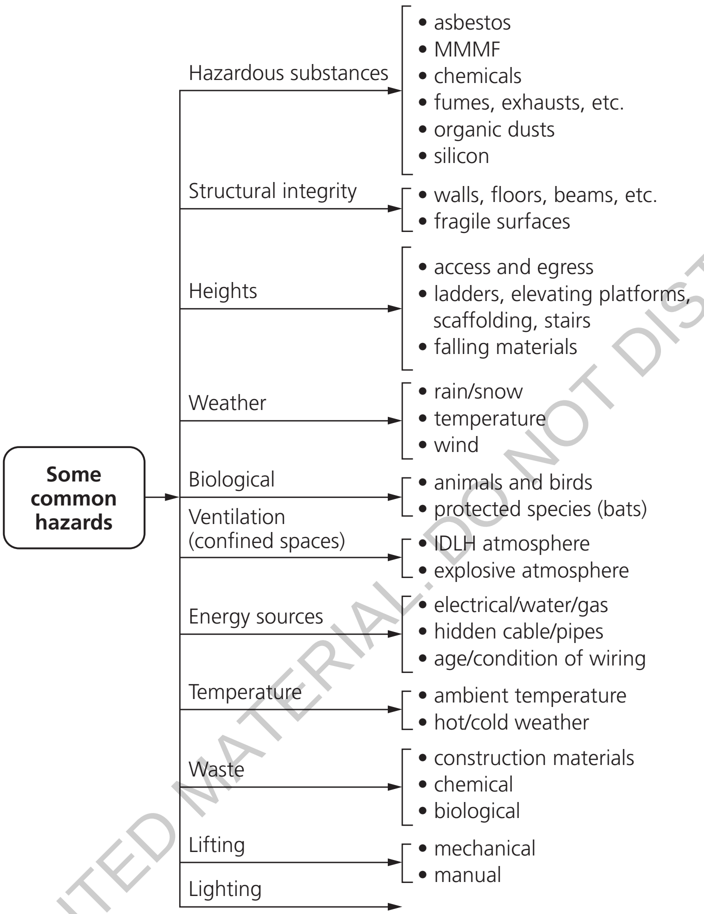
Passive solar design and landscape. Passive solar building design and energy-efficient landscaping support energy conservation and can be integrated into a neighbourhood and the wider environment.

Following passive solar building techniques, where possible, buildings are compact in shape to reduce their surface area, with the principal windows oriented towards the equator (south in the northern hemisphere and north in the southern hemisphere) to maximise passive solar gain. However, the use of solar gain, especially in temperate climate regions, is secondary to minimising the overall energy requirements of the building. Excessive summer passive solar heat gains are reduced by providing shade, trees, attached pergolas, vertical gardens and green roofs. Other techniques are also implemented.

Passive House buildings can be constructed from dense or lightweight materials, but some internal thermal mass is normally incorporated to reduce summer peak temperatures, maintain stable winter temperatures and prevent possible overheating.

Superinsulation. Passive House buildings employ superinsulation to reduce significantly the transfer of heat through the walls, roof and floor compared with conventional buildings. A wide range of thermal insulation materials can be used to provide the required high *R* values (low *U* values, typically in the range 0.10–0.15 W/m^2 K). Special attention is given to eliminating thermal bridges.

Figure 6.2 Some common hazards



6.6.1 Fragile, weak and unstable surfaces

Having a secure platform from which to work is a key consideration at various stages of a loft conversion project. At the commencement, particularly when surveying the proposed work, and when the work itself starts, the absence of suitable flooring presents the risk of workers falling between the rafters and through the ceiling below. Suitable temporary platforms of a robust nature must be laid to allow surveying to take place and initial work to commence. Loft openings that are covered during work activities must also have a robust cover or have barriers erected around them to prevent accidental falling through.

In addition to fall-prevention measures, such as restraint systems, when working on a roof the stability of the roof itself must be considered, particularly when sections have been removed in preparation for the installation of trusses, windows, dormers, and so on. Standing and walking directly on the roof can be avoided by the use of temporary fixed or mobile platforms such as scaffolding and elevating work platforms. The choice of an appropriate solution is determined by the size of the work areas, the duration of work and the ability to safely access the work area.

contractor and the contractors found this procedure to be most helpful. To progress the health and safety management process, an information flow structure as described by Oloke (2012) was used to facilitate the health and safety information flow requirements of each duty holder (Figure 7.1).

A list of the main risk elements assessed and the duty holders responsible for highlighting and/or mitigating the risks is given in Table 7.1. Each risk factor was assessed and residual risks that could not be eliminated were highlighted in the relevant documents, in particular the drawings and work schedules.

Figure 7.1 Proposed information flow framework for alteration and refurbishment projects (Oloke, 2012)

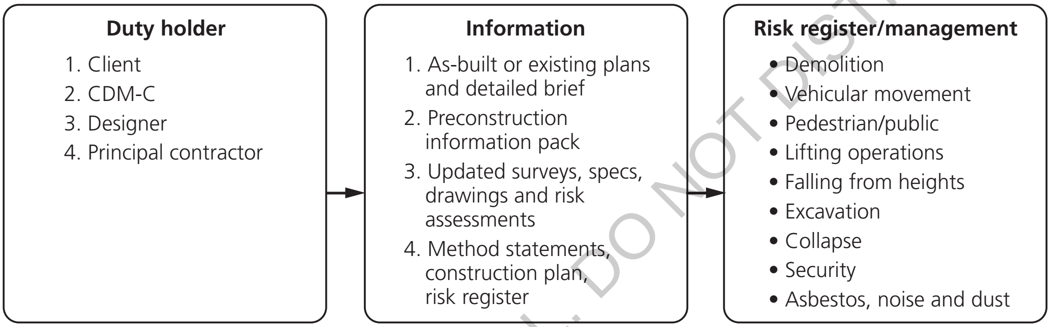


Table 7.1 Project risk information management schedule

S/No.	Risk factor (population at risk)	Party responsible for providing information	Party responsible for mitigating
1.	Unauthorised access to the site (public)	Client	Contractor
2.	Movement of vehicles, plant and equipment (contractors and public)	Principal contractor	Principal contractor
3.	Tripping (contractors and public)	Principal contractor	Contractor
4.	Contact with hazardous materials (contractors and public)	Principal contractor	Contractor/workers
5.	Asbestos, noise and dust (contractors and public)	Client/principal contractor	Workers
6.	Tripping/falling from height (contractors)	Principal contractor	Contractor
7.	Security (occupiers/public)	Principal contractor	Principal contractor
8.	Collapse (contractors/occupiers/public)	Principal contractor	Contractor
9.	Lifting operations – heavy steel members	Designer/principal contractor	Contractor
10.	Deep excavations	Designer/principal contractor	Principal contractor
11.	In-use hazards	Principal contractor/client	Principal contractor
12.	End-of-life/future alterations	Designer/client	Designers