

GA462A

Construction activities

DISMANTLING AND DEMOLITION WORK

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Related process:

- A462** *Dismantling and demolition*
A459 *Asbestos on a construction site*

1. SCOPE

This document gives guidance on the actions necessary to ensure that the dismantling or demolition of existing installations or structures can be undertaken in as a safe a way as is possible. This work may arise either when it is necessary to remove an existing feature that is redundant or obstructing the construction of something else or when the existing installation or structure needs to be replaced, updated or refurbished.

2. INVESTIGATION

Before planning any dismantling or demolition activity, it is essential to make a full investigation of the nature and function of the items to be removed. The extent and scope of the investigation needed will depend upon the circumstances: small items of plant that are easily accessible and have been in recent use may require only limited research but disused or historic structures may need extensive research. The possible presence of asbestos should be considered and taken into account when planning any dismantling or demolition work — reference should be made to Process **A459** and the associated guidance documents.

The types of investigation that are appropriate may include:

- examination of record or construction drawings;
- detailed structural inspection;
- asbestos surveys (see Process **A459**);
- consultation with existing or past users of the installation or structure — for example, to determine whether it has been modified in the past;
- visual inspection;
- survey or the checking of principal dimensions (to confirm or disprove the validity of available drawings, to assist in determining practical method of removal or to ensure that any new or replacement items will fit into their planned locations);

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Date printed:	29 March 2011		

- undertaking exploratory trial pits to verify the location of buried structures or service connections;
- research into historic records to determine the nature of previous uses of the structure to be demolished or of activities in its vicinity;
- undertaking calculations to confirm that the structure can support the imposed loadings at all stages during dismantling and, if not, designing appropriate temporary works.

Those needing to undertake this type of work must contact the Health and Safety Department to determine whether there are any particular investigatory requirements and to agree the control measures that will need to be applied.

3. IDENTIFICATION AND MITIGATION OF POSSIBLE RISKS

The types of risks that arise in relation to this type of work may include those listed below, together with the actions that may need to be taken to minimise their effects.

(a) Flooding and release of contained fluids:

If the installation is (or may be) connected to any external system containing water, another liquid or a gas, there is the risk of an unexpected discharge of the fluid. The potential risks are increased if the fluid is (or may be) pressurised or may itself be hazardous. The risks can be minimised by ensuring that the elements to be dismantled are isolated from external systems (see Process **A456**).

Even if there are no external connections, the structure or installation may contain quantities of liquids or hazardous gases. Action may need to be taken to drain the system or extract the fluids in a controlled way before demolition commences.

(b) Live electrical systems:

If there is any live power supply entering or passing through the installation or structure to be demolished, it must be isolated before work commences — by applying the relevant elements of the Electrical Safety Rules (**ESR**) as in Process **A457**.

If cables are present entering the installation but they are believed to be dead, actions must be taken in accordance with the ESR to verify that they are indeed dead and the cut them at the perimeter of the working area.

If a live electrical cable passes above, below or in close proximity to the demolition area and it cannot be isolated or diverted, arrangements must be made to mark and protect the cable so that it will not be affected by the demolition works.

(c) Presence of hazardous (toxic or explosive) chemicals:

Hazardous chemicals may be present as a result of the current or previous uses of the installation or as a result of subsequent deterioration. Examples may include:

- residual process chemicals;

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- flammable residues inside tanks;
- asbestos-containing materials;
- lead paints and similar products;
- gases such as methane (from the ground or from organic decay) and radon.

If such hazards are suspected on being present, tests will be needed to check for the presence (and nature) of such chemicals. In the case of asbestos, the client (or site occupier) should be able to provide information on previous surveys and inspections. In addition, before any intrusive work is done, a detailed 'refurbishment and demolition' survey will need to be undertaken by a specialist organisation — as required by the 'Control of Asbestos Regulations'. For further information on asbestos, refer to documents **GA459A** and **GA459B** and consult the local Safety Adviser. If asbestos is present, it will be necessary to obtain approval from the BVL Insurance Department before any demolition work can proceed.

The risks from hazardous chemicals can often be minimised by purging the system, by selecting appropriate demolition techniques (such as limiting hot work, avoiding the generation of dust or avoiding work in confined spaces) or by using suitable personal protective equipment.

(d) Ground contamination in vicinity:

This is most likely to arise in cases where excavation is needed to expose existing structures or to undertake the demolition process in pre-used industrial sites. Tests may be needed to identify the materials present and their concentration. The potentially-contaminated ground may need to be contained or disposed of as hazardous waste. Personnel involved in handling the contaminated ground may need to use protective equipment.

(e) Pre-stressed components:

Prestressed components are potentially hazardous to those undertaking dismantling or demolition work because the stored energy may be released in an unexpected way. Examples of such items include pre-stressing tendons in concrete structures and springs built into mechanical systems. The risks arising can normally be minimised by the use of appropriate demolition sequences and techniques. Advice should be sought from temporary works and structural engineering specialists.

(f) Structural or geotechnical instability:

If proper care is not exercised, structures in the course of demolition have the potential to become unstable. The removal of some supports or fixtures may cause the stresses on other components to increase, possibly triggering a collapse. Soils that are exposed or become unsupported during the removal of structural components may also become unstable.

It must not be assumed that structural elements (such as unbraced walls and columns) are self-supporting. Therefore they must be restrained before removal. The Temporary Works Department can give advice if necessary.

These problems can often be minimised by selection of the sequence of demolition (such as, where possible, by reversing the sequence of construction) or by providing temporary supports. In some cases, the use of

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‘remote’ or ‘long-arm’ demolition plant (such as a wrecking ball or a hydraulic breaker mounted on a long excavator boom) — in conjunction with a pre-planned sequence of working — may be a means of achieving the demolition of large structures without exposing individuals to unacceptable risks. For any major or complex demolition process, it will normally be appropriate to sub-contract the work to an experienced specialist contractor.

4. PLANNING OF DEMOLITION WORK

During the planning of any demolition work, the following aspects are likely to need to be considered and, depending on the nature and extent of the work, implemented:

- isolation of any electrical systems — see **A457** ‘Electrical Safety Rules’;
- isolation of any hydraulic or mechanical systems — see **A456** ‘Isolation Rules’;
- establishment of a controlled ‘exclusion zone’ in the area directly affected by the works — see **A442** ‘Permits to work’;
- removal and safe disposal of any hazardous substances — see **B337** ‘Control of substances hazardous to health’ and **A459** ‘Asbestos on a construction site’;
- ensuring that there will be no unrestrained components at any stage;
- structural assessment of elements to be removed and the development of a practicable method for demolition or dismantling, ensuring that there will be no unplanned instability at any stage;
- design and installation of any temporary works needed to facilitate safe demolition — see **A620** ‘Temporary works’;
- consideration of the method to be used for handling the components removed in the course of the demolition — see **A451** ‘Lifting operations’ and **B336** ‘Manual handling’;
- consideration of any confined space working that will be needed — see **A460** ‘Confined spaces’;
- consideration of any work at height that will be needed — see **A453** ‘Working at height’;
- consideration of the potential health, safety and environmental effects of noise, vibration and dust generated by the demolition work — not only on the personnel performing the work but also on others that may be affected (including, if applicable, nearby residents) — see **B334** ‘Control of noise’, **B335** ‘Control of vibration’, **B316** ‘Personal protective equipment’ and **A800** ‘Site environmental management’;
- consideration of the arrangements for the safe, environmental and legal disposal of waste materials removed during the demolition, taking account of any opportunities for re-use or recycling of those materials — see **A810** ‘Waste management’.

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The proposed method and sequence of working must be recorded in a formal method statement (as described in Process **A441**). All personnel involved in (or affected by) the operation must be adequately briefed (as described in Process **A431**).