

Construction Hazard and Risk Control

Lecture Title: Demolition and Deconstruction - Hazards and risk Control

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**Undergraduate Diploma in
Occupational Health and Safety**

This lecture covers the following learning objectives:

- Identify the main hazards of demolition and deconstruction work
- Outline the control measures for demolition and deconstruction work
- Identify the purpose and scope of a pre-demolition/refurbishment survey
- Outline the main control measures that a demolition/refurbishment method statement should include



Demolition and deconstruction hazards and risks

- Deconstruction preserves various components of the structure, such as limestones, for reuse at another building or structure.
- Demolition reduces the structure to rubble, which is either treated as waste or, in some cases, used as hard core for other construction projects.

There are two forms of demolition:

- piecemeal
- deliberate controlled collapse

<https://youtu.be/H4sQ42aWRjQ>



Principal hazards of demolition and deconstruction work

- falls from height or on the same level;
- falling debris;
- premature collapse of the structure being demolished;
- dust and fumes;
- the silting up of drainage systems by dust;
- the problems arising from spilt fuel oils;
- manual handling

Principal hazards of demolition and deconstruction work

- presence of asbestos and other hazardous substances;
- noise and vibration from heavy plant and equipment;
- electric shock;
- fires and explosions from the use of flammable and explosive substances;
- smoke from burning waste timber;
- pneumatic drills and power tools;
- the existence of services, such as electricity, gas and water;
- collision with heavy plant; and
- plant and vehicles overturning

Control measures

Management of the demolition (and deconstruction) and general controls include all or some of the following:

- avoidance of premature collapse;
- disconnection of services to the site;
- separation between the public and demolition activities using barriers and fences;
- excluding unauthorised persons from the site;
- use of an induced collapse technique, in place of people working at heights



Control measures

Management of the demolition (and deconstruction) and general controls include all or some of the following:

- use of power shears, in place of grinding or oxyacetylene cutting, where a risk of fire exists;
- provision of shatterproof/guarded windscreens on plant;
- provision of falling-object protective structures (FOPS) and rollover protective structures (ROPS) on vehicles and plant;
- installation of safe working platforms on scaffolds and elevated work platforms



Control measures

Management of the demolition (and deconstruction) and general controls include all or some of the following:

- installation of safe working platforms on scaffolds and elevated work platforms;
- installation of edge protection to open edges of landings, stairways and fixed platforms;
- installation of static lines and anchor points for fall arrest systems;
- use of chutes for dropping debris;
- use of cranes for lowering loads;
- limiting the amount of time a person is exposed to a particular hazard (e.g. vibration); and
- training and instruction for all workforce (including an explanation of the method statement)



A risk assessment informs the contents of the method statement.

Demolition method statement should include:

- method of demolition to be used, including prevention of premature collapse;
- safe removal of debris from upper levels;
- site access and security;
- location of any underground or overhead services;
- arrangements for protection from falling materials;
- equipment, including access equipment, required;



Demolition method statement should include:

- any hazardous substances to be used;
- arrangements for the protection of the public and the workforce against noise and release of hazardous substances;
- details of the isolation methods for any services which may have been supplied to the site and any temporary services required on the site;
- details of personal protective equipment to be worn on site

Demolition method statement should include:

- details of personal protective equipment to be worn on site;
- first-aid, emergency and accident arrangements;
- training and welfare arrangements;
- arrangements for waste disposal;
- names of site supervisors; and
- required level of competence of site workers



Summary of demolition controls:

- prior to work, a full site investigation;
- risk assessments (two required – project designer and contractor);
- a method statement;
- waste disposal arrangements;
- piecemeal and deliberate controlled collapse; and
- training and information to all workers

Personal protective equipment includes:

- Safety helmets
- Fall arrest harnesses and lanyards
- Safety boots
- Gloves
- Goggles
- Respirators
- Hearing protector

Purposes and scope of pre-demolition, deconstruction or refurbishment survey

- The property owner (the client) has a duty to provide pre-demolition information to the Principal Designer and the Principal Contractor.
- Before any work is started, a full site investigation must be made by a competent person (e.g. a specialist structural engineer) to determine the hazards and associated risks which may affect the demolition workers and members of the public

Pre-demolition investigation and survey includes

- construction details of the structures or buildings to be demolished and those of neighbouring structures or buildings;
- the identification of key structural elements, including pre- and post-tensioned components;
- a review of drawings, structural calculations, health and safety file related to the structure;
- previous use of the premises



Pre-demolition investigation and survey includes

- load-carrying capacity of adjoining land, including the presence of underground culverts;
- need for possible temporary support structures for the building being demolished and adjoining buildings;
- prevention of falls of materials and people;
- location of any dangerous machinery;
- presence of asbestos, lead or other hazardous or radioactive substances



Pre-demolition investigation and survey includes

- environmental issues, such as dust, water pollution and noise;
- public safety, including the provision of high fencing or hoardings;
- manual handling issues;
- location of any underground or overhead services (water, electricity, gas and sewage);
- location of any underground cellars, storage tanks, chimneys

Pre-demolition investigation and survey includes

- location of any underground cellars, storage tanks, chimneys;
- means of access to the site;
- removal of waste;
- details of any traffic or pedestrian routes through the site;
- provision of welfare facilities;
- proximity of neighbours;
- location of any public thoroughfares adjacent to the structure or building; and
- name of the principal designer



	5 marks	4 marks	3 marks	2 marks	0 marks
Presentation Etiquette	Student presented the material in a professional manner.	Student presented the material in a mostly professional manner.	Student presented the material in a somewhat professional manner.	Not Applicable	Student did not take presentation seriously.
Citations	All sources (information and graphics) are accurately documented in the desired format.	All sources (information and graphics) are accurately documented, but one is not in the desired format.	All sources (information and graphics) are accurately documented, but two or more are not in the desired format.	Some sources are not accurately documented	No citations
Appearance	Presentation shows considerable originality and inventiveness. The content and ideas are presented in a unique and interesting way.	Presentation shows some originality and inventiveness. The content and ideas are presented in an interesting way.	Presentation shows an attempt at originality and inventiveness on most of the slides.	Presentation shows an attempt at originality and inventiveness in only a few of the slides.	Presentation is a rehash of other people's ideas and/or graphics and shows very little attempt at original thought.
Sequencing of Inform	Information is organized in a clear, logical way. It is easy to anticipate the type of material that might be on the next slide.	Most information is organized in a clear, logical way. One slide or item of information seems out of place.	Some information is logically sequenced. An occasional slide or item of information seems out of place.	There is a haphazard plan for the organization of information.	No plan for the organization of information.
Use of Graphics	All graphics are attractive (size and colours) and support the theme/content of the presentation.	A few graphics are not attractive but all support the theme/content of the presentation.	All graphics are attractive but a few do not seem to support the theme/content of the presentation.	Several graphics are unattractive AND detract from the content of the presentation.	Student did not use any graphics at all.
Timing	The presentation was delivered within the time given.	Presentation was over or under the time given to deliver the whole presentation	The presentation was over 5 minutes longer or shorter than the allocated time.	The presentation was far too long	The presentation was far too short
Preparedness	Student was very well prepared and had obviously rehearsed	Student seemed very prepared but might have needed to rehearse some more.	Student was prepared but lacked rehearsing.	Student was not very prepared and lacked rehearsing.	Student was not prepared at all.
Questions	Student answered all questions made by the other students and tutor in a confident and correct way.	Student answered most of the questions made by the other students and tutor in a way that shows good understanding of the subject.	Student answered only some of the questions made by the other students and tutor in a way that shows lack of a good grasp of the subject.	Student failed to answer most of the questions made by the other students and tutor.	Student failed to answer any of the questions made by the other students and tutor.
	46 - 60 marks	31 - 45 marks	16 - 30 marks	01 - 15 marks	0 marks
Content	Presentation includes all material needed to gain a comfortable understanding of the topic	Presentation includes most material needed to gain a comfortable understanding of the material but is lacking one or two key elements.	Presentation is missing more than two key elements.	Presentation is lacking several key elements and has inaccuracies.	Presentation does not address the assignment question.

	5 marks	4 marks	3 marks	2 marks	0 marks
Cover Page	Title, Student's Name, Teacher's Name, Course Intake month and year, Submission Date, Neatly finished-no errors	Evidence of four	Evidence of three	Evidence of two or less	No cover page
Citations	All cited works, both text and visual, are done in the correct format with no errors.	Some cited works, both text and visual, are done in the correct format. Inconsistencies evident	Few cited works, both text and visual, are done in the correct format.	Not Applicable	No citations
Appearance	Creative and attractive cover, clear organization, readable and neat, title page, table of contents.	Contains title page, table of contents	Poorly organized and difficult to read; lacking neatness.	No organization, missing significant criteria.	Absent structure and organization.
Support	Uses evidence appropriately and effectively, providing sufficient evidence and explanation to convince.	Begins to offer reasons to support its points, perhaps using varied kinds of evidence. Begins to interpret the evidence and explain connections between evidence and main ideas. Its examples bear some relevance.	Often uses generalizations to support its points. May use examples, but they may be obvious or not relevant. Often depends on unsupported opinion or personal experience, or assumes that evidence speaks for itself and needs no application to the point being discussed. Often has lapses in logic.	Depends on cliches or overgeneralizations for support, or offers little evidence of any kind. May be personal narrative rather than essay, or summary rather than analysis.	Uses irrelevant details or lacks supporting evidence entirely. May be unduly brief.
	61 - 80 marks	41 - 60 marks	21 - 40 marks	01 - 20 marks	0 marks
Content	Excels in responding to the assignment question. Interesting, demonstrates sophistication of thought. Central idea is clearly communicated, worth developing; limited enough to be manageable. Assignment recognizes some complexity of the subject: may acknowledge its contradictions, qualifications, or limits and follow out their logical implications. Understands and critically evaluates its sources, appropriately limits and defines terms.	A solid assignment, responding appropriately to the question. Clearly states a central idea, but may have minor lapses in development. Begins to acknowledge the complexity of central idea and the possibility of other points of view. Shows careful reading of sources, but may not evaluate them critically. Attempts to define terms, not always successfully.	Adequate but weaker and less effective, possibly responding less well to assignment question. Presents central idea in general terms, often depending on platitudes or cliches. Usually does not acknowledge other views. Shows basic comprehension of sources, perhaps with lapses in understanding. If it defines terms, often depends on dictionary definitions.	Does not have a clear central idea or does not respond appropriately to the assignment question. May be too vague or obvious to be developed effectively. Student may misunderstand sources.	Does not respond to the assignment question, lacks a central idea, and may neglect to use sources where necessary.



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