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ACT OCCUPATIONAL HEALTH AND SAFETY ACT 1989

INSTRUMENT OF APPROVAL UNDER SECTION 87

NO. 55 OF 1993

Under Section 87(1) of the *ACT Occupational Health and Safety Act 1989*, I, Wayne Bruce Berry, after consultation with the ACT Occupational Health and Safety Council, approve the adoption of the ACT Demolition Code of Practice (Second Revised Edition) in the Australian Capital Territory.

Dated this

11th

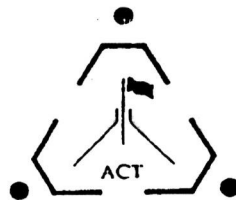
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June

1993.

Wayne Bruce Berry
Deputy Chief Minister
On Behalf of the
Chief Minister

May 1993



OCCUPATIONAL HEALTH
AND SAFETY OFFICE

DEMOLITION

A C T C O D E O F P R A C T I C E



SECOND REVISED EDITION

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Table of Contents

1.	Foreword	1
1.1.	ACT Occupational Health and Safety Act 1989	1
1.2.	Codes of Practice	1
1.3.	How Codes of Practice are Developed	1
2.	Executive Summary	2
2.1.	Introduction	2
2.2.	Assessment and Planning	3
2.3.	Workplan	3
2.4.	Safety Provisions	3
2.5.	Demolition Methods and Situations	5
2.6.	Training	5
2.7.	Consultation	5
3.	Introduction	6
3.1.	Authority	6
3.2.	Purpose	6
3.3.	Scope	6
3.4.	Definitions	6
3.5.	Compliance with Statutory Rules	7
3.6.	Responsibilities	7
4.	Assessment and Planning	9
4.1.	General	9
4.2.	Engineering Investigation	9
4.3.	Government Authorities to be Notified	10
4.4.	Supervision	11
4.5.	Investigation of the Site	11
4.6.	Workplan	12
5.	Safety Provisions	14
5.1.	Safety Plan	14
5.2.	Safe Work Platforms	14
5.3.	Scaffolding	15
5.4.	Ladders	15

5.5.	Elevating Work Platforms	15
5.6.	Personnel Boxes (Crane Boxes)	16
5.7.	Protection of Opening and Penetrations	16
5.8.	Roof Work	16
5.9.	Personal Protective Equipment	17
5.10.	Administration of a Personal Protective Equipment Program	18
5.11.	Safe Work Clothing	19
5.12.	Hand Protection	20
5.13.	Foot Protection	20
5.14.	Head Protection	20
5.15.	Eye and Face Protection	20
5.16.	Hearing Protection	20
5.17.	Respiratory Protection	21
5.18.	Fall Protection Devices	21
5.19.	Prevention of Unauthorised Entry	21
5.20.	Protective Structures	22
5.21.	Third Party Protection	22
5.22.	Heavy Duty Perimeter Scaffolding	22
5.23.	Protective Fencing	22
5.24.	Scaffolding Requirements	23
5.25.	Heavy Duty Coverways or Gantries	24
5.26.	Site Sheds and Access Ways	24
5.27.	Access and Egress to the Area Being Demolished	25
5.28.	Adjoining Buildings	25
5.29.	Removal of Debris	26
5.30.	Fire Prevention	27
5.31.	Noise	28
5.32.	Site Security	29
5.33.	Electrical Safety	29
5.34.	Protection of Sewers and Watercourses	29
5.35.	Protection of Public Roads	29
5.36.	Protection of Trees	29
6.	Demolition Methods	30
6.1.	Systematic Demolition	30
6.2.	General Precautions	30
6.3.	Stairs as Access	31
6.4.	Hazardous Substances	31

6.5.	Broken Glass	31
6.6.	Manual Demolition	32
6.7.	Mechanical Demolition	35
6.8.	Earthmoving Equipment on Suspended Floors	35
6.9.	Submission to the Authority	38
6.10.	Documentation for Demolition by Earthmoving Equipment on Suspended Floors	40
6.11.	Demolition by Wire and Chain Pulling	41
6.12.	Machine-Mounted Impact Hammer	42
6.13.	Power Grapples, Shears and Pulverising Attachments	42
6.14.	Drilling and Sawing	42
6.15.	Mechanical Demolition by Pusher Arm	43
6.16.	Mechanical Demolition by Deliberate Collapse	43
6.17.	Demolition by Explosives	44
6.18.	Lift Shafts	44
6.19.	Demolition of Basements, Cellars, Vaults and other Voids	45
6.20.	Demolition of Arches, Vaults and Domes	46
6.21.	Masonry and Brick Arches	46
6.22.	Demolition of Independent Chimneys	47
6.23.	Masonry Chimneys	47
6.24.	Deliberate Collapse	47
6.25.	Steel Chimneys	47
6.26.	Reinforced Concrete Chimneys (In situ and precast)	48
6.27.	Spires	48
6.28.	Demolition of Pylons and Masts	49
6.29.	Demolition of Flammable and Combustible Liquid Tanks	50
7.	Training	51
7.1.	Introduction	51
7.2.	Training Required	51
7.3.	Ongoing Training	51
7.4.	Records	51
8.	Consultation	52
8.1.	Employer-Employee Consultation	52
	Appendix 1 – Cutting and Welding	53

Personal Protective Equipment	53
Fumes and Gases	53
Safe Use of Cutting Torches	54
Safety in Arc Welding	56
Appendix 2 – Application for Approval of Plans and Application for a Building Permit.....	57
Approval for a Building Permit	57
Retention of Drawings and Specifications Lodged	59
Precautions During Construction or Demolition	60
Demolition	61
Appendix 3 – Checklists.....	69
Building Owner Checklist	69
Appendix 4.....	71
Some General Terms used in the Demolition Industry	71
Appendix 5.....	83
Disconnection of Power	83
Disconnection of Water	83
Disconnection of Gas Supply	83
Appendix 6.....	84
Australian Standards	84
British Standards	85

1. Foreword

1.1. A.C.T. Occupational Health and Safety Act 1989

The A.C.T. *Occupational Health and Safety Act 1989* (the *Act*) provides means for developing, administering, and enforcing occupational health and safety standards in the Australian Capital Territory private sector, with emphasis on prevention.

An Occupational Health and Safety Council is established under the *Act*. The Council has as one of its functions, the development and recommendation to the Minister of appropriate Codes of Practice for use in the Australian Capital Territory under the *Occupational Health and Safety Act 1989*.

The *Act* places certain duties on employers, employees, self-employed persons, manufacturers, designers, importers and suppliers.

Section 27 of the *Act*, for example, requires employers to take all reasonably practicable steps to protect the health, safety and welfare at work of their employees, and to provide and maintain working environments that are safe and without risk to health.

The ACT Occupational Health and Safety Office acknowledges the assistance of documents from the Victorian Occupational Health and Safety Commission and NSW Workcover Authority in the compilation of this Code of Practice.

1.2. Codes of Practice

The ACT *Occupational Health and Safety Act 1989* provides for Codes of Practice, for giving practical guidance, on specific areas of work, to employers, self employed persons and employees enabling them to achieve the standard of health and safety required of them under the general duties of the *Occupational Health and Safety Act 1989*. Codes of Practice are approved by the Minister

Codes of Practice are designed to be used in conjunction with the ACT *Occupational Health and Safety Act 1989* and associated regulations, but do not have the same legal force.

A Code of Practice may be used as evidence in legal proceedings to show that a person has failed to meet a standard set out in the *Act* or regulation, unless that person can establish that their alternate method provides equivalent or better standards of safety.

An OH&S Inspector may cite a relevant Code of Practice when issuing an improvement or prohibition notice. Failure to comply with an improvement or prohibition notice is an offence.

1.3. How Codes of Practice are Developed

The development of this Code of Practice involved extensive tripartite consultation between government, employer and employee representatives with interests in demolition work. The resultant draft document was endorsed by the Occupational Health and Safety Council for public comment and released. The comments received were analysed, assessed and considered by the tripartite process and amendments made where appropriate.

The ACT Occupational Health and Safety Council recommended to the Minister the final draft Code of Practice. The Minister approved the adoption of the first edition of the ACT Demolition Code of Practice. Approval took effect on 19 December 1992.

The ACT Demolition Code (Second Revised Edition) is now issued incorporating several editorial and cross-referencing amendments to the original text.

2. Executive Summary

2.1. Introduction

Section 27 of the *Occupational Health and Safety Act 1989* requires an employer to provide and maintain so far as is reasonably practicable, plant, systems of work and a working environment that is safe and without risk to health.

The purpose of the A.C.T. Demolition Code of Practice, (hereinafter referred to as the Code), is to provide practical guidance as to measures which can be taken to prevent injury and ill health to persons working on demolition sites, and to any other persons who might be exposed to risks arising from demolition activities.

This Code applies to the planning, preparation and conduct of work practices in connection with the demolition of buildings and structures. It also outlines the responsibility of building owners and occupiers.

2.1.1. Principal Contractor or Builder

The responsibilities of the principal contractor or builder include:

- providing a detailed description of the building to be demolished
- notifying and obtaining necessary planning approval from the relevant authorities
- arranging liability insurance
- notifying adjoining owners of the proposed demolition
- ascertaining the location of all utility services
- ensuring the security of a vacant building against fire risks
- ascertaining the extent, nature and location of hazardous materials and dangerous goods such as polychlorinated bi-phenols (PCB's), synthetic mineral fibres (SMF's) and asbestos, and arranging for appropriate action to in relation to such substances.

2.1.2. The Occupier or Demolition Contractor

The responsibilities of the occupier or demolition contractor include:

- planning the demolition work
- notifying and obtaining all necessary work permits from the relevant statutory authorities
- arranging liability insurance
- nominating a qualified person to control the work at all times
- erecting all appropriate hoardings and overhead protection barriers
- maintaining site security
- appropriately disposing of all material

2.2. Assessment and Planning

Prior to the commencement of any demolition, the occupier should ensure that an investigation of the structure to be demolished and of the site is carried out by a qualified structural engineer and a workplan prepared and documented.

As part of the investigation carried out by a qualified structural engineer, the following should be determined:

- type of structural system involved
- composition of structural components
- current load-carrying capacity of the structure
- proposed methods and sequence of demolition
- location and condition of such services as drainage, sewerage, electricity, gas, water, telephone cables, radio, television and computer relay lines, hydraulic pressure mains, liquid fuel lines, lubrication systems, chemical process lines and any hazardous materials
- general condition of structures on adjoining properties
- potential effect demolition may have on people working in, or seeking access to, and egress from, adjoining properties

2.3. Workplan

The workplan should be developed in consultation with site health and safety representatives, and should include summary documentation describing the:

- time frame of works
- location of the demolition site
- overall height of the structure above ground level
- building (occupancy class) and its structure
- proposed demolition methods and equipment to be used
- methods of maintaining access to, and egress from, the workplace and site
- proposed hoardings, scaffolding, fencing and any overhead sidewalk protection

Any other plans, illustrations or reports which clarify or substantiate the proposals made should be included in the workplan.

The workplan should be certified by a competent person that the proposal complies with the safety provisions set out in this Code of Practice.

2.4. Safety Provisions

This Code defines safety measures to be adopted in the following specific areas of the demolition process:

- safe work platforms, e.g. scaffolding, ladders, elevating work platforms, personnel boxes.
- protection of openings and penetrations to prevent persons or debris falling through.
- roof work, e.g. fragile roofs, metal roofs, asbestos cement roofs.
- handling of synthetic mineral fibres (SMFs.)

- protective structures to maintain public safety, e.g. street closures, hoarding, scaffolding, heavy duty coverages or gantries.
- personal protective equipment (PPE). For use in situations in which other means of controlling hazards are not practicable:
 - type of PPE. For example; gloves, safety shoes and boots, safety helmets, safety glasses, goggles, face shields, hearing protectors, respirators
 - selection, use and maintenance of personal protective equipment
 - administration of a personal protective equipment program
 - training of all persons involved with personal protective equipment
- prevention of unauthorised entry:
 - erecting hoardings and barricades
 - erecting safety warning signs
 - providing access openings with lockable doors
- shed sites and access ways:
 - marking of access and egress
 - protection of site amenities from falling debris.
- maintaining access and egress to the area being demolished.
- adjoining buildings:
 - maintenance of access to adjoining buildings
 - protection of adjoining buildings from flooding and structural damage.
- removal of debris
- noise control
- electrical safety
- natural gas
- site security
- protection of sewers and watercourses from refuse or waste
- protection of public roads from mud and debris connected with the demolition process
- protection of public from dust created in the demolition process
- protection of demolition workers and third parties from surprise discovery of asbestos in the demolition process
- removal of asbestos

2.5 Demolition Methods and Situations

This Code outlines specific safety measures to be taken when using a variety of demolition methods and in a variety of demolition situations. The methods and specific situational factors detailed in this Code (with reference to particular Sections of the Code) are as follows:

- manual demolition (Section 6.6)
- mechanical demolition (Section 6.7)
- use of earth moving equipment on suspended floors (Section 6.8)
- demolition by wire and chain pulling (Section 6.11)
- demolition by machine-mounted impact hammer (Section 6.12)
- use of power grapples, shears, or pulveriser attachment (Section 6.13)
- drilling and sawing (Section 6.14)
- mechanical demolition by pusher arm (Section 6.15)
- mechanical demolition by deliberate collapse (Section 6.16)
- demolition by explosives (Section 6.17)
- demolition of lift shafts (Section 6.18)
- demolition of basements, cellars and vaults and other voids (Section 6.19)
- demolition of arches (Sections 6.20 and 6.21)
- demolition of independent chimneys (Section 6.22)
- demolition of spires (Section 6.27)
- demolition of pylons and masts (Section 6.28)
- demolition of flammable and combustible liquid tanks (Section 6.29)

Note: Ball demolition and the deliberate use of fire in demolition has been prohibited in the ACT, by industry agreement.

2.6. Training

The *Occupational Health and Safety Act 1989* requires employers to provide such training as is necessary to enable employees to perform their work in a manner that is safe and without risks to health.

Under this Code, employers should identify the training needs of all employees and consequently provide for the required training. For example, employees should be trained in the safe use of the equipment which they will be required to operate.

2.7. Consultation

Employers should consult with employees and the site health and safety representatives working on a demolition project. Consultation should take place as early as possible in, for example, planning the demolition project and in the introduction of new tasks. Ongoing consultation should also take place with employees during training exercises and the lifetime of the demolition project.

3. Introduction

3.1. Authority

The ACT Demolition Code of Practice (First Edition) was approved pursuant to Section 87 of the *Occupational Health and Safety Act 1989* (the *Act*) and has effect as from 19 December 1992. This Code has subsequently been issued as the ACT Demolition Code of Practice (Second Revised Edition) effective from 1993.

Section 27 of the *Act* requires an employer, amongst other things to provide and maintain, so far as is reasonably practicable plant, systems of work and working environment which are safe and without risks to health.

Sections 32, and 33 of the *Act* requires designers, manufacturers, importers and suppliers of plant and substances for use at a workplace to ensure that, so far as is reasonably practicable, the plant and substances are designed and manufactured to be safe and without risk to health and safety when properly used. This duty includes provision for the testing, examination, and giving of information in respect of plant and substances.

Section 29 of the *Act* requires that a person who has, to any extent, control over a workplace, a means of access to and egress from a workplace, or plant or substances at a workplace, shall take all reasonably practicable steps to ensure that it is safe and without risks to health.

3.2. Purpose

The purpose of this Code is to provide practical guidance on measures to be taken to prevent injury to persons engaged in work on demolition sites, and to any other persons who might be exposed to risks arising from the demolition process.

3.3. Scope

The ACT Demolition Code of Practice applies to the planning, preparation and conduct of work in connection with the demolition of buildings and structures. It is not a manual of technical or engineering procedures. It should be read in conjunction with Australian Standard 2601 – 1991 and other relevant technical documents.

3.4. Definitions

Building Controller, for the purpose of this code of practice; means the ACT Builders Licencing Board, Building Surveyor and ACT Building Control Asbestos Officer

Contractor means, in relation to any demolition work, the person who directly or by means of agent, carries out that work.

Demolition means the complete or partial dismantling or destruction of a building or structure through the use of planned and controlled methods or procedures.

Framework means a structure constructed of metal, concrete, timber, brick or other rigid materials.

Health and safety representative means a health and safety representative selected in accordance with section 39 of the ACT *Occupational Health and Safety Act 1989*.

Immediate environment means the property(ies), including public thoroughfares and spaces, having common boundaries with the demolition site and any other properties which may be affected by the demolition of the structure. Where the property is a public thoroughfare, the immediate environment includes the properties directly opposite the demolition site.

Occupier of a workplace means a person who has the management or control of the workplace.

Personal Protective Equipment means items of equipment or clothing worn by a worker to minimise or eliminate exposure to specific occupational hazards.

Special buildings means buildings which, due to the nature of their construction, need particular care. These include precast concrete panel and framed structures, stressed skin structures (That is, buildings that rely on the sheeting, cladding or decking to stiffen and restrain the structural framework) and slung structures (That is, floors) that are in some way suspended from an umbrella type framework, supported from a concrete core, and prestressed and of post tension construction.

3.5. Compliance with Statutory Rules

This Code of Practice makes frequent reference to the use of cranes and scaffolding.

Where it is intended to use cranes and scaffolding in any way recommended in this Code of Practice, the plant and systems of work must be in accordance with the *Scaffolding and Lifts Act 1957* and the Regulations under the *Scaffolding and Lifts Act 1912-1948 (NSW)* in their application in the Territory (hereinafter referred to as the *Scaffolding and Lifts Regulations*).

Where there is any uncertainty as to the application of this Code, enquiries may be made to the ACT Occupational Health and Safety Office, First Floor North Building, London Circuit, Canberra ACT 2601, telephone (06) 205 0200, facsimile (06) 205 0797.

3.6. Responsibilities

3.6.1. Principal Contractor

The principal contractor should:

- provide to the demolition contractor or occupier all available descriptions of the building to be demolished, including drawings, site survey, plan of services, extent, nature and location of hazardous materials, relationship to surrounding properties and any special elements such as trees and shrubs
- obtain the necessary approvals from planning authorities and notify the relevant authorities controlling essential utility services prior to the commencement of the work
- arrange for liability insurance
- define the extent of the work
- reach an agreement with the contractor as to a realistic period of time involved in the work
- notify adjoining owners of the proposed demolition and, if necessary, request their permission for use of adjoining air space
- where appropriate, ensure the inspection of buildings and record existing defects
- ascertain the location of all utility services
- ascertain the location of all underground tanks, vaults, wells, voids and structures and

- certify that all chemicals, volatile fuels and gases have been deactivated
- locate and remove vermin
- ensure that immediately after vacating, and before demolition starts, that the vacant building is secure against fire risk
- where relevant, provide engineering computations on floor loadings to the ACT Occupational Health and Safety Office

3.6.2. The Demolition Contractor

The demolition contractor should:

- plan for demolition work and select the method or methods of demolition
- inform the owner and all relevant parties of the method or methods of demolition selected and equipment to be used
- take out all necessary work permits and forward notices to, and receive notices from the appropriate Government Department
- arrange for appropriate liability insurance
- nominate a person qualified in demolition to control the work at all times during which the demolition is taking place
- ensure an inspection of adjacent properties when necessary
- erect all appropriate hoardings, gantries and overhead protection barriers for the protection of the public and for the protection of personnel on site
- ensure that all surfaces are rendered safe at all stages of the work
- maintain the security of the site
- dispose of all material if required, and ensure that the demolition site is left in a clean and tidy condition
- provide appropriate change rooms, dining facilities and sanitary accommodation for workers
- comply with Regulation 119 of the Scaffolding and Lifts Regulations and Section 27 of the Occupational Health and Safety Act 1989 in relation to First Aid in the Workplace.

3.6.3. Employers and Persons in Control of Workplace

Employers must comply with the ACT *Occupational Health and Safety Act 1989* Section 27 states that an employer shall take all reasonably practicable steps to protect the health, safety and welfare at work of the employer's employees.

Section 28 of the *Act* states that employers shall, in relation to third parties, take all reasonably practicable steps to ensure that persons at, or near, a workplace under the employer's control, who are not the employer's employees, are not exposed to risk to their health or safety arising from the conduct of the employer's undertaking.

Section 29 of the *Act* states that persons in control of workplaces shall take all reasonably practicable steps to ensure that it is safe and without risk to health.

4. Assessment and Planning

4.1. General

Prior to the commencement of any demolition, the occupier shall ensure that an investigation of the structure to be demolished and of the site, is carried out by a person competent in all phases of demolition work, and a workplan prepared and documented. This workplan should include plans for avoiding potential hazards such as fires, cave-ins, and injuries. No demolition activity should commence until a workplan is completed. This should be done in accordance with the current version of Building Notes BN.46: Demolition, available from ACT Building Control. (Refer Appendix 2)

4.2. Engineering Investigation

In situations where:

- earthmoving machinery is to be used on suspended floors
- there is doubt concerning the design of the structural arrangements
- the structure has been weakened by deterioration, fire or other causes then an engineering investigation should be carried out

The investigation should be carried out by a qualified structural engineer experienced in design and construction. Where appropriate, this person should be experienced in the demolition processes of reinforced concrete and / or prestressed concrete.

A separate permit may be required in situations in which prestressed or post tension concrete buildings are involved. ACT Building Control should be contacted for further advice on this.

Prior to commencement of demolition, the qualified structural engineer should have investigated the structure by whatever means necessary and have determined as accurately as possible the:

- type of structural system involved;
- "as-constructed" details of the component members;
- current load-carrying capacity of the structure;
- likelihood that the proposed methods and sequence of demolition can be executed without causing accidental collapse of the whole, or part of, the structure; and
- any other details of the structure regarding strength, construction or contents which will influence the selection or demolition procedures given in the workplan.

A search for engineering details specifying; size, type and configuration of reinforcement, and the strength of materials (if available), should be made, and the located documents referenced. Floor penetrations to facilitate construction or structural irregularities need to be located and identified prior to commencement of demolition.

To eliminate any uncertainty regarding the composition or quality of structural components, it may be necessary to use one or more of the following methods:

- core drilling
- electronic reinforcement location

- exposure of reinforcement

These methods should be performed under the direction of the qualified structural engineer, and any resulting loss of strength should be taken into account when ascertaining structural adequacy.

In assessing the current load-carrying capacity of structural members, the qualified structural engineer should take into account;

- the strength and loading requirements of relevant Regulations and Standards relating to such members, current at the time of construction and at the time of demolition
- any degradation of the structure materials
- the capacity of the structure; as a whole, or in part, to sustain loads without:
 - premature collapse of any part of the structure; or
 - deformation to an extent which will lead to static instability of the structure or parts.

To allow for impact and vibration during demolition, a minimum impact factor of 1.5 should be applied, in addition to normal ultimate load factors, to the weight of the demolition machines and the weight of the falling debris. The resulting stress is to be within the allowable limits as set out in Australian Standard 3600-1988.

All phases of the proposed demolition need to be considered in order to identify and isolate critical conditions. The sequence of demolition should be described in the proposed work method statement.

The demolisher should give every assistance to the structural consultant in the investigation and, when requested, should provide any cores, load tests, chases, or documentation necessary to verify the load carrying capacity of the structure and the safety of the demolisher's proposals.

If propping is used to distribute loading to lower floors, then the specified ratings supplied by the prop manufacturer are not to be exceeded. Details of placement are to be specified by the qualified structural engineer.

4.3.

Government Authorities to be Notified

- ACT Occupational Health and Safety Office
- ACT Planning Authority
- ACT Building Control
- ACT Electricity and Water
- ACT Fire Brigade
- ACT Lease Administration
- ACT Dangerous Goods Unit
- ACT Waste Management (Department of Urban Services)
- ACT Traffic Control
- TELECOM
- The Natural Gas Company

4.4. Supervision

Demolition work is to be supervised on site by a person nominated by the demolisher. A building permit, endorsed for demolition work, must be obtained by the holder of an appropriate Class A, Class B, Class C or Class D Licence from the Building Controller at ACT Building Control before any demolition work is commenced. A minimum of three years practical experience in demolition work is necessary to obtain a demolition endorsement. Endorsements by the Building Controller will state that a licence is either:

- endorsed for manual demolition only; or
- endorsed for manual and mechanical demolition.

Separate permits should be sought for the demolition of prestressed concrete buildings.

The demolition contractor must also have had appropriate experience in the implementation of safe working procedures. This person is responsible for insuring that safe working procedures are consistent with the requirements of Sections 27, 28 and 29 of the *Occupational Health and Safety Act 1989*, as appropriate.

All supervisors involved are to be fully trained in accordance with Section 27(2)(d) of the *Occupational Health and Safety Act 1989*.

4.5. Investigation of the Site

An investigation of the site should be conducted by the person preparing the workplan and should include, but should not be limited to, identification of:

- The location and condition of the following:
 - drainage
 - sewerage
 - electricity
 - gas
 - water
 - telephone cables
 - radio, television and computer relay lines
 - hydraulic pressure mains
 - liquid fuel lines
 - lubricating systems
 - process lines (chemical, acid)
 - any hazardous materials and dangerous goods (such as, SMF, PCB and Asbestos)
 - the location and extent of any underground structures such as basements, cellars, or storage tanks. The effect of the removal of cross walls and the load of the superstructure on the stability of basement retaining walls should also be considered. The position, depth and type of wells and underground storage tanks should be determined as should the contents of storage tanks.

- The nature and extent of any retaining structures which support adjoining ground or buildings. Consideration should also be given to the existence of easements, rights of way, boundary walls and other encumbrances.
- All areas of the site, including; basements, cellars, vaults and other voids and dumps of material and rubbish should be examined to establish whether there are any items which could potentially create health and safety hazards. An assessment report on the extent of these hazards should be completed prior to the commencement of demolition. Where ever possible, hazardous substances should be removed first.
- The general condition of structures on adjoining properties, particularly where these are close to, or on the boundaries of the demolition site.
- The effect demolition may have on people working in adjoining properties or seeking access to and egress from those properties.

One of the most important elements of the pre-job planning is the location of all utility services. All electric, gas, water, sewer, steam and other service lines not required in the demolition process should be shut off, capped, or otherwise controlled, at or outside the building line, before demolition work is started. In each case, any utility agency which is involved should be notified in advance, and its approval or services, if necessary, gained. Any service which are not disconnected during demolition should be adequately protected.

4.6. Workplan

An application for approval of plans for building work involving the removal or demolition of an existing building (see Appendix 2) is required to be submitted to the ACT Building Control. Section 34(1) of the *Building Act 1972* requires that this application be accompanied by detailed plans relating to the demolition proposal.

This workplan should be developed in consultation with the site health and safety representative(s), in accordance with section 45(1) of the ACT *Occupational Health and Safety Act 1989*. Consistent with part 1.7.3 of Australian Standard 2601-1991, the workplan should include, but not be limited to, documentation of the following:

- Site location on which the structure to be demolished stands;
- Overall height of the structure above ground level and the minimum distance of the structure to each site boundary;
- Brief description of the type of building (occupancy class), its structural support system and the principal materials of its construction;
- Description of the methods of demolition proposed to be used and the number and types of major items of equipment proposed for implementing those methods;
- Description of the methods proposed for handling and disposing of demolished materials, and in particular, of hazardous materials and dangerous goods;
- Methods of maintaining access and egress to workplace and site;
- Description of the proposed demolition time frame and an estimate of the time (in days) it is likely to take to complete each of the stages of the work;
- Description of the proposed hoardings, scaffolding, fencing and overhead sidewalk protection;

- Plans, illustrations, written documents, or specialist reports as may be necessary to clearly define or substantiate the proposals made.
- Certification statement by a competent person that, subject to any conditions that may be prescribed, the proposals contained in the workplan comply with the safety standards set out in this Code; and
- Description of site amenities and their location.

If it is proposed that mobile equipment be driven by operators on a suspended floor, then the documentation should include details of the size and weight of each piece of equipment and the proposed method of raising and lowering the equipment, and of moving it from floor to floor. The documentation attached to an Application For a Building Permit (Refer Appendix 2) should specify the support to be given to the suspended floor concerned, and such other limitations on the operations of the equipment as may be necessary to maintain the safety of the operators and other site personnel.

5. Safety Provisions

5.1. Safety Plan

Prior to the commencement of any demolition job, the occupier should develop a safety plan to safeguard the health and safety of workers and others on the site and on adjoining properties. This safety plan should be an integral part of the workplan and a copy should be given to the health and safety representative, and made available to all employees.

If the structure to be demolished has been damaged by fire, flood, explosion, or some other cause, appropriate measures, including bracing and shoring of walls and floors, should be taken to protect site personnel and any adjoining structures. It should also be determined if any type of hazardous chemicals, gases, explosives, flammable materials, or other dangerous substances have been used or stored on the site. If the nature of the substance cannot easily be determined, samples should be taken and analysed by a qualified person prior to demolition.

Prior to work commencing, the employer should make provisions for prompt medical attention in case of serious injury. The nearest medical facility should be located as part of the workplan survey. The supervisor of the demolition site should be provided with instructions for the most direct route to these facilities. Proper equipment for the prompt transportation of an injured worker, as well as a communication system to contact any necessary ambulance service, should be available and readily accessible at the worksite. The telephone numbers of the hospital, physician, fire brigade or ambulances should be prominently posted. A first aider should be present at the site at all times work is occurring and appropriate first aid kit(s) be available and accessible in accordance with Section 27(2)(i) of the ACT *Occupational Health and Safety Act 1989*.

Amenities and toilets in accordance with Regulations 120 and 121 of the Scaffolding and Lifts Regulations and relevant Industrial Awards, should be set up in a suitable and safe location.

All issues related to the need for, and use of, personal protective equipment should be determined and resolved during the planning stage and the results included in the safety plan.

5.2. Safe Work Platforms

The occupier should ensure that safe work platforms are used in situations in which work cannot be performed safely from the ground or from solid construction. Solid construction which is safe to work from can be identified by consideration of all of the following characteristics of the surface:

- surface which is structurally capable of supporting people and material
- protected from open penetrations
- protection at perimeter and internal regions to prevent persons from falling to lower levels
- even and readily negotiable surface
- provided with a safe means of access and egress

5.3. Scaffolding

Scaffolding is the most common type of working platform and is suitable for most demolition procedures.

Scaffolding shall not be less than heavy duty classification and all scaffolds over 3.0 metres in height shall be built by the holder of a Certificate of Competency for the erection of scaffolding. Safe access should be provided to all scaffolds and workplaces.

Scaffolding should be based on solid foundations. Care should be taken to prevent damage to scaffolding planks and components from falling debris. Damaged planks and components should be removed and replaced. This work must be done by qualified scaffolders. Reports detailing damage to any load bearing component(s) of scaffolding must be submitted on an 'Injury and Dangerous Occurrence Report Form' to the ACT Occupational Health and Safety Office. Working platforms should be kept clear of debris.

Scaffolding should be dismantled progressively as a structure is demolished and should never be freestanding more than 4.0 metres above the last row of ties securing it to the building or structure. Care should be taken to prevent damage to scaffolding from site vehicles and earth moving machinery.

5.4. Ladders

Ladders should only be used for works of a minor nature such as slinging or unslinging loads, connecting wire ropes for pulling and so on.

Ladders should be secured top and bottom. Only one person should work from a ladder. Persons should not over reach when using a ladder. Oxy cutting or work involving the use of power tools should not be done from a ladder. Ladders should not be used near the perimeter of the building where there is a danger of them falling out from the building, or near lift shafts or stair-light wells where there is a danger of falling down them. All ladders should conform with Regulations 80 and 142 of the Scaffolding and Lifts Regulations and with Australian Standard 1892: Part 1 – 1986 or Part 2–1992 as appropriate.

5.5. Elevating Work Platforms

Elevating work platforms include scissors lifts, boom lifts, and cherry pickers and can be suitable to reach difficult areas. Elevating work platforms should only be used on a solid level surface.

The surfaces should be checked before use of elevating work platforms to ensure that there are no penetrations or obstructions that could cause violent movement or overturning of the platform.

Oxy cutting bottles should not be carried in the platforms of boom type elevating work platforms due to the dangers of fire. When oxy cutting from elevating work platforms, care should be taken to ensure that hot slag does not drop onto cutting hoses or bottles, or onto any part of the elevating work platform vehicle. When using oxy bottles in scissor lifts, the bottles should be secured in the upright position at the end opposite to that of the platform controls. A fire extinguisher should be in the scissor lift at all times when using oxy bottles.

Elevating work platforms should not be used in areas where debris may fall upon them. Persons should never enter or leave the platform whilst it is elevated. Safety belts shall be worn and these should be secured to a stable point when a person is working in boom lifts and cherry pickers. All persons using elevating work platforms should be trained in their use.

5.6. Personnel Boxes

Where it is necessary to use a personnel box attached to a crane to reach areas which are difficult to access, then:

- the box must have either ACT Occupational Health and Safety Office Approval or a NSW registration number
- the crane driver must have at least 12 months experience in driving the crane or an identical crane
- it must not be possible to operate the free fall facility in the hoist motion of the crane when the crane is supporting personnel
- the crane driver must remain in the control cabin at all times when the box is raised
- the crane must be set upon firm, level ground
- cranes other than crawlers should be blocked at all times when using a personnel box
- a clearance of at least 3 metres up to 8 metres must be maintained between the crane structure, hoist rope, slings and box, and any live electrical conductors
- no person may ride in a personnel box except in accordance with Regulation 127(108) of the Scaffolding and Lifts Regulations. An 'Application for Use of Manbox Suspended from a Crane' form must be submitted to the ACT Occupational Health and Safety Office and approval received prior to commencement
- a dogman holding a certificate of competency must be in the box at all times it is being used
- oxy cutting bottles should not be carried in the personnel box
- persons using a personnel box should be attached by safety harness to the hook of the crane
- persons should only enter or leave the personnel box from the ground or solid construction

5.7. Protection of Opening and Penetrations

All penetrations, in floors, roofs or in any other place where work may be carried out, should be covered with rigid and fixed material of sufficient strength to prevent any persons or debris falling through, or guard rails and toe boards should be provided around the opening.

The open sides of all floors, roofs, stairwells, lightwells, lift shafts and any place from which a person could fall should be provided with guard rails and toe boards or should be securely boarded up.

5.8. Roof Work

Where demolition work is to be carried out on a roof which consists of asbestos cement or other fragile or brittle material, the work should be performed from platforms such as boom lifts, scissor lifts or other suitable working platforms.

Where asbestos cement roofing is involved, work should be undertaken in accordance with the National Code of Practice and Guidance Note on Asbestos as adopted in the ACT.

Where work has to be performed from the roof, the provisions of Regulation 158 of the *Scaffolding and Lifts Regulations* shall be followed.

Metal roofs should be carefully inspected for soundness, and if not sound, they should be treated as fragile roofs.

5.9. Personal Protective Equipment

A number of hazards in demolition require the use of personal protective equipment. Wherever practicable, priority should be given to the elimination or control of hazards at their source, or along the path between the source and the worker. Control at the source may require isolation of the hazard, addition of safety features to existing equipment, redesign of the work process or purchase of new equipment. When the hazard cannot be removed personal protective equipment should be used. Personal protective equipment is categorised by the area of the body it protects, and includes protection for the head, eyes, ears, hands, feet, and respiratory system and fall arrest devices.

5.9.1. Basis for Selection of Personal Protective Equipment

The proper selection of personal protective equipment involves three basic steps:

Step 1. Identification and Evaluation of Hazards

The initial survey of the site, the work plan should identify where personal protective equipment may be required. Identification of potential hazards and chemical agents encountered routinely or periodically.

This process should confirm that all relevant regulations, codes of practice and other legislation are being complied with. When a survey has been completed and the data indicates personal protective equipment is the only solution, or a necessary element of the practicable solutions, care must be taken to select the appropriate type.

Step 2. Selection

The selection of personal protective equipment must be based on the following:

- a detailed evaluation of the nature of the hazard or hazards
- the circumstances and restrictions of the task or tasks to be performed
- the acceptable level of hazard to which the worker may be exposed
- the performance requirement for the personal protective device
- the fit of the device to the user

The selection of personal protective equipment should also take into account the suitability of the device for use in conjunction with any other personal protective equipment that may be required.

Step 3. Use and Maintenance

Equally important is using the selected device properly. Proper use can be ensured by carefully training both supervisors and workers in selection, use and maintenance of personal protective equipment.

Scrupulous maintenance must be made an integral part of any personal protective equipment program. Emergency escape and rescue devices are particularly vulnerable to poor maintenance. A proper maintenance program should include:

- inspection for defects
- cleaning and disinfecting
- repair or recharge
- storage

Where disposable protectors are provided, the system of inspection used should include checks to ensure that supplies are continuously available to all employees requiring them. Procedures for ensuring that control measures are properly used should be part of the normal supervision functions and should include:

- arrangements for monitoring usage of protective equipment, and
- checks that engineering measures to reduce specific hazards are kept in good order

5.10. Administration of a Personal Protective Equipment Program

Standard operating procedures should contain all information needed to maintain an effective personal protective equipment program that meets the individual user's needs.

These procedures should be written so as to be readily available and useful to all those directly involved in the personal protective equipment program.

The procedures should contain all information needed to ensure proper provision, use and maintenance of personal protective equipment for a specific group of workers against a specific hazard or hazards. Generally, the procedures should contain the following:

- guidance for selection of the appropriate personal protective equipment for protection against particular hazard(s)
- detailed instructions for training workers in proper use of the personal protective equipment, including fitting and fit testing
- detailed maintenance procedures for cleaning, disinfecting, drying and inspection; this should include procedures for the repair or replacement of work or defective components and/or devices and also for appropriate storage
- guidance of supervisory personnel in continued surveillance of personal protective equipment use and determination of workers' exposure to hazards
- procedures for evaluating the effectiveness of the personal protective equipment program

(a) Program Administrator – Personnel Protective Equipment (PPE)

It is preferable to assign responsibility for the entire Personal Protective Equipment program to one person. The administrator's technical and professional background should enable him or her to make sound judgements based on hazard evaluation input from the workplace. He or she should have the full support of senior management.

The program administrator should undertake or have control of the purchasing, fitting, cleaning and maintenance of Personal Protective Equipment and also of instruction and training in the use of Personal Protective Equipment and surveillance of usage.

The program administrator may be a supervisor in a small organisation or may have the administration of personnel protective equipment as his or her sole function in a large organisation where many staff are in need of Personal Protective Equipment.

Initial information can be provided in a number of ways, including advisory literature, posters, training programs and explanation by supervisors. Personal discussion is more effective as any problems the user may foresee can be raised and, if necessary, remedial action initiated.

Users will need training in when, where, why and how to use Personal Protective Equipment to achieve the necessary level of protection. The training needs and methods appropriate to each of these categories will be different, i.e. emergency visitors or temporary workers, as well as those permanently in the danger area.

5.20. Protective Structures

Throughout the demolition operations adequate safety should be maintained in public places adjoining the site. Safety of the public can be maintained by providing street closures, hoarding, scaffolding and other types of overhead protection either singly or in combination.

Where demolition sites adjoin public places and there is danger of debris falling, the preferred method of protection should be heavy duty perimeter scaffolding (Refer to Section 5.22) and heavy duty coverages or gantries. If different methods are used they should provide protection at least as effective as the preferred method.

5.21. Third Party Protection

At all times during the progress of the demolition work—

- any area in which there is a danger that persons might be injured as a result of demolished or other material falling or rebounding shall be fenced or barricaded to prevent persons from entering the area; and
- notices warning persons of that danger shall be kept affixed in positions where they will be readily visible to and clearly legible by persons approaching the area.

5.22. Heavy Duty Perimeter Scaffolding

Where the building or structure to be demolished (or, where a part of a building or structure is to be demolished, that part) is less than 3.5 metres from the adjoining boundary of a public place and is more than 7.5 metres in height measured from any point on that boundary, an overhead structure shall be erected for the protection of persons who are or may be in the public place. All hoardings shall conform to ACT Building Control classifications.

The overhead structure shall be—

- of approved width and construction;
- erected over that part of the public place which adjoins the boundary;
- erected before the commencement of the work; and
- kept in position at all times during the progress of work.

Demolished or other materials shall not be allowed to accumulate on the overhead structure.

5.23. Protective Fencing

Where;

- a building or structure to be demolished (or, where a part of a building or structure is to be demolished, then that part) is less than 3.5 metres from an adjoining boundary of a public place, or
- an overhead protective structure of the description is erected adjacent to that boundary,

then a 'protective fence' shall be erected for the protection of persons who are or may be in the public place.

The protective fence shall be—

- of approved construction;
- erected on or immediately adjacent to the boundary or, where such an overhead protective structure is provided, on that side of the overhead protective structure which is nearest the work site;
- at least 2.1 metres in height;
- closely timbered, or covered or sheathed;
- secured in position in such a manner that it will not become detached, or be blown down or fall;
- erected before the commencement of the work; and
- kept in position at all times during the progress of the work.

All openings, other than access openings, in a protective fence shall be effectively screened with wire mesh or acceptable alternative. Access openings shall be provided with doors capable of being locked or with other means for securing them against unauthorised entry.

5.24. Scaffolding Requirements

Where a building or structure to be demolished (or, where a part of a building or structure is being demolished, that part) exceeds 3.5 metres in height, and is less than 3.5 metres from an adjoining boundary of a public place, or from a building of lesser height that may be used or occupied, then the building, structure or part being demolished is one to which this paragraph applies. Under these circumstances, 'heavy duty scaffolding' shall be erected for the protection of persons who may be in either the public place or in the building of lesser height.

Scaffolding as prescribed by this paragraph shall be—

- erected on that side or part of the building or structure being demolished which faces the public place or the building of lesser height, as the case may be;
- erected before the commencement of the work; and
- kept in position at all times during the progress of the work.

With respect to 'heavy duty scaffolding'

- Where the building, structure or part being demolished is one requiring heavy duty scaffolding, double pole heavy duty scaffolding conforming to Regulations 86 and 87 of the *Scaffolding and Lifts Regulations* shall, unless otherwise approved, be erected.
- The scaffolding shall be at least of the height of the external wall or part of the building or structure to be or being demolished. Where spurred scaffolding is used it shall be effectively supported and effectively tied to the building or structure.
- Unless otherwise approved, each such scaffolding shall be provided with two platforms. One platform shall be located at the working level and the other not more than two storeys, but in no case more than 7.5m below the first mentioned platform. Each platform on the scaffolding shall extend the full width of the scaffold frame, be closely boarded, abut the wall or (where there is no wall) the external part of the building or structure and extend into any openings of such wall or external part to a

sufficient distance to prevent any materials caught by the platform from falling outside the building or structure.

- No platform or section of a platform, other than the platform at the final lower level of the scaffolding, shall be dismantled, repositioned or removed unless a further platform has been installed not more than two storeys, but in no case more than 7.5 metres, below the platform or section of platform to be repositioned or removed. No platform or section of a platform shall be dismantled, repositioned or removed unless all material on the platform has been removed.
- The scaffolding shall be effectively enclosed on the outer faces and ends for the full height with 0.63 millimetre steel wire mesh having an aperture not greater than 25 millimetre, or other approved mesh or enclosure. The mesh shall be positively secured to the scaffolding at not more than 2 metres centres where the mesh is placed vertically and at not more than 2.4 metres centres where the mesh is placed horizontally.
- The edges of the runs of mesh shall be overlapped a minimum of 100 millimetre, and where there is a horizontal lap the upper run of mesh shall overlap the inner face of the lower mesh. The overlaps shall be secured every 300 millimetre with effective wire ties.

The external face and ends of the scaffolding should be sheathed with heavy duty fire resistant protective cloth firmly fixed and secured. It will be arranged in such a manner as to contain rebounding materials and debris.

NOTE: Nothing in this paragraph applies to the demolition of a chimney stack. Refer to Section 6.22 to 6.27 of this Code.

5.25. Heavy Duty Coverways or Gantries

Coverways over public walkways or access ways for site personnel can be constructed from scaffolding, fabricated steel or timber and should be designed to withstand at least 5 kilopascals (kPa).

Protection over public pavements requires the approval of the ACT Building Controller as per Part III of the *Building Act 1972*, who will then forward this to the ACT Occupational Health Safety Office.

5.26. Site Sheds and Access Ways

All access and egress to site shall be clearly marked as such and should be in areas protected from falling debris. Before demolition commences, site amenities should be set up in an area protected from falling debris. Amenities should conform with Regulations 120 and 121 of the *Scaffolding and Lifts Regulations*.

Site offices, and all amenities and access to and from them should be in areas protected from falling debris and should not be in any area that could be affected by premature collapse of any part of the building or structure. The level of protection should be not less than that afforded to public places.

5.27. Access and Egress (on Structures with Two or More Levels) to the Area Being Demolished

Where practicable a minimum of two accesses should be maintained to the work area to provide an escape route in the event of fire cutting off the primary access.

Access routes to work areas should be clearly marked and well lit and should be in areas protected from falling debris. Access routes should be free from debris or other materials. Penetrations and openings should be covered or guarded.

At all times when the demolition work is being carried out there shall be exhibited at the site of the work at all points of access thereto, readily visible and clearly legible notices warning persons that demolition work is in progress and that unauthorised persons are prohibited from being on the site.

5.28. Adjoining Buildings**5.28.1. Access**

Access to adjoining properties should be agreed to beforehand and should be maintained throughout the demolition process. The level of protection should be not less than that afforded to public places.

5.28.2 Flooding

No part of the demolition process should cause flooding or water penetration of any adjoining building.

5.28.3 Structural Integrity

No part of the demolition process should adversely affect the structural integrity of any other building.

Consideration may need to be given to the use of shoring and underpinning, and to changes in the soil condition as a result of demolition.

Where the structure to be demolished adjoins other buildings, these buildings should be given lateral support not less than that given by the structure to be demolished. Provision should be made for the erection of shoring before the existing lateral support is disturbed.

The layout of the shoring should be designed to enable any new building to be constructed with the least possible interference. The shoring should be checked for effectiveness as the demolition proceeds.

Care should be taken to ensure that other buildings are not adversely affected by vibration or concussion during the demolition process.

Special precautions may need to be taken in the vicinity of hospitals and other buildings containing equipment sensitive to shock and vibration.

5.29. Removal of Debris

Debris should be progressively removed from the site to prevent:

- any build up of debris on floors that could affect the integrity of the floor
- any build up of debris that could affect access and egress on site
- any build up of debris that could become a fire hazard

Demolished materials should not be allowed to fall freely outside the structure unless confined within a chute or similar enclosure. Demolished material should not be allowed to fall freely within a structure unless confined within a shaft, or a similar enclosure, which is clear of obstructions to free fall.

5.29.1 Multi-storeyed Buildings

Note: Walls of the shaft should be regularly inspected to prevent damage and expansion of the area due to the compression of debris within the shaft.

When demolished materials are allowed to fall freely through internal floor openings, the following should apply in addition to the above:

- At the working level, each opening should, during the removal of debris by machinery, be protected by an adequate vehicle buffer, and guarded by suitable barriers at all other times.
- Where any demolished or other material is to be lowered from a building or structure large members should be cut to suitable size and where—
 - the dumping or dropping of the material from the building or structure would be dangerous to any person; or
 - the material is such that, if it were dumped or dropped from the building or structure, a substantial quantity of dust would be released from the material.

The material shall not be lowered from the building or structure except by means of cranes, hoists, conveyors or by the use of chutes.

- Where material may without contravention of this paragraph, be dumped or dropped from a building or structure otherwise than by the use of chutes, the following provisions shall be observed:
 - all openings in walls below dumping positions shall be boarded up where necessary to prevent danger to persons from falling or deflected material;
 - where the material is dumped or dropped through any hole or opening in a floor, and the whole or any part of the space between any two floors, and between the lower floor and the ground, through which the material may fall if not boarded up. Then for the purpose of this Code of Practice the area on each floor, and on the ground, within 1.8 metres of that space shall be deemed to be an area within which the danger requires
 - that adequate measures should be taken to dampen the materials before, during and following dumping in order to prevent dust; and

- areas into which the materials are dumped or dropped shall be effectively enclosed to contain these materials, and kept so enclosed at all times except when materials are being removed from there. No materials shall be dumped or dropped into such an area when any person is in the area.
- At all levels below the working level, access to the area through or onto which material is falling, should be prevented by the opening being enclosed from floor to ceiling by planking not less than 50 mm thick; or by signs and barricades being erected so as to prevent persons coming within six metres of such openings.
- The following provisions should be observed in relation to chutes used for lowering materials from a building or structure:
 - the lowest chute of any series of chutes (or, where only one chute is used, that chute) and every retaining bin or hopper into which material is discharged from a chute or chutes shall, where persons may be struck by materials ejected from the chute, bin or hopper, be equipped with an effective gate or stop and with suitable provision for stopping or regulating the flow of material by means of the gate or stop. The gate or stop shall be kept closed except during the discharge of material;
 - vertical chutes, or chutes inclined at an angle to the horizontal which exceeds 45 degrees, shall be completely enclosed. Chutes inclined at an angle of 45 degrees or less to the horizontal shall have vertical sides having a height not less than half the width of the chute tray, or such greater height as is necessary to prevent spillage of material. At points where material is transferred or fed from one chute to another and at any other points where an accumulation of material may occur, the height of the chute sides shall be increased to the extent necessary to prevent spillage;
 - suitable tools whereby material that has become jammed in the chute can be safely loosened shall be provided and kept readily available; and
 - readily visible and clearly legible notices warning of the danger from falling or ejected material shall be placed at the discharge end of every chute.

Where shafts or chutes are used for the removal of debris, care should be taken that debris falls freely and does not become jammed in the shaft or chute. Debris should be removed progressively and not be allowed to accumulate higher than the bottom opening of the shaft. Overhead demolition should cease during removal of the debris. Adequate measures should be taken to dampen before, during and following dumping to prevent dust. (In certain situations dust can explode violently).

5.30. Fire Prevention

5.30.1. Fire Protection Services

A fire hydrant service or a fire hose reel service should be maintained to each level at all times during the demolition of the building. Access to the fire protection service, including any booster fitting, should also be maintained.

If a sprinkler system is installed in a building to be demolished, it should be maintained in an operable condition at each storey as long as is practicable. Portable fire-extinguishers should be kept in working areas at all times and maintained in an operable condition.

Note: Where the existing fire protection service is supplied by water storage tanks not available during demolition, a free main or dry riser, and associated hydrants will need to be installed and dismantled progressively ahead of the demolition.

5.30.2. Fire Hazards From Welding and Cutting

Welding and cutting operations present a severe fire hazard unless strict precautions are taken.

In areas where the floor, walls or ground cover are combustible the area should be protected by spraying the area with water, spreading damp sand, laying fireproof welding blankets or other suitable means of protection. In cases where a serious fire might quickly develop, a fire watch should be assigned to the area. Fire extinguishing equipment should be readily available, and all employees trained in its use. Combustible debris should not be allowed to accumulate to the extent that it can become a fire hazard.

In cutting, the use of flammable fuel gases, and oxygen pose additional fire hazards. Pure oxygen is extremely dangerous. It can set fire to oil or grease even without flame or spark. Under some conditions it can explode. Oxygen regulators and fittings should never be oiled, greased, or cleaned with oily rags. Oxygen cannot be substituted for compressed air. It should not be used in pneumatic tools, on oil preheating burners, to start internal combustion engines, to blow out pipelines, to dust clothing, to create pressure, or for ventilation. Fuel gases can be just as dangerous as oxygen. At pressures above 104 kPa or uncertain mixtures with oxygen, acetylene can explode spontaneously.

Many modern synthetic building materials can smoulder for long periods before bursting into flames.

Refer to Appendix 1

5.30.3. Deliberate Burning

The deliberate burning of buildings must not be used as a method of demolition. Burning-off should not be permitted on demolition sites. All fires should be extinguished at least one hour before site personnel or an appointed fire-watchman leaves the site. Materials which give off toxic fumes or offensive smoke should never be burnt.

5.30.4. Fire Rules

- No person shall light any fire on the site of any demolition work;
- No contractor for any demolition work and no person in charge of such work shall cause or permit another person to light a fire on the site of the work contrary to this paragraph; and
- Where a fire has been lit on the site of any demolition work, the contractor for, and the person in charge of that work shall ensure that the fire is extinguished.

5.31. Noise

Silencers should be used on all jack hammers. Compressors should be insulated against noise. In some areas, the use of compressors and other plant may be restricted to certain hours. Appropriate hearing protection should be worn in all noisy areas as per Section 5.16 of this Code.

The *Inspection of Machinery Regulations* and the *Noise Control Act 1988* stipulates a maximum decibel noise level of 115dB(A) impact and a maximum of 85 dB(A) averaged over an 8 hour work exposure period.

5.32. Site Security

When the site is unattended all access to the site should be locked. All cranes, earthmoving machinery and plant should be locked to prevent unauthorised use. Oxy cutting gear and power tools should be in a locked room or container. For detail regarding demolition by explosives, see Section 6.17 of this Code.

The building or structure should always be left in a safe and stable condition. Any loose demolition material, such as roof sheets, should be secured in case of strong winds.

The site should be checked to ensure that no smouldering material is left that could burst into flames.

5.33. Electrical Safety

All electrical power tools, leads, site lighting and power supply on site should be in accordance with the ACTEW requirements and Australian Standard 3012-1990.

Where perimeter scaffolding is needed on the pavement, adjacent power lines should be covered, and the ACTEW consulted.

Before demolition commences all electrical wiring apart from the temporary electrical installations should be disconnected and rendered safe by an 'A' grade electrical technician, or where necessary, the ACTEW.

5.34. Protection of Sewers and Watercourses

No refuse or water should be allowed to enter public sewers or watercourses.

5.35. Protection of Public Roads

Precautions should be taken to minimise the spreading of mud and debris by vehicles, on to public roads.

5.36. Protection of Trees

Existing trees or other plants shall not be removed without the approval of the owner and the relevant regulatory authority.

Trees to be retained should be protected from damage to branches and trunk by surrounding them with a suitable fence. Such a fence should be a minimum distance of 1 metre from the trunk. Trees to be retained should not be used to assist operation on site in any way. If excavation has to be carried out within the spread of the foliage, care should be taken to avoid damage to the roots.

Heavy vehicles should be kept well clear of trees so as to avoid damage to branches and roots through compaction of the soil.

6. Demolition Methods

6.1. Systematic Demolition

- A building or structure having multi storeys should be demolished storey by storey.
- Subject to this Code of Practice, and unless otherwise approved –
 - demolition should be carried out in reasonably even stages commencing from the roof or top of the building, structure or part thereof being demolished;
 - masonry and brickwork should be taken down in reasonably even courses; and
 - every gable and the protruding portion of every chimney should be demolished at the time when the roof is removed, and before the ceiling of floor joists are removed.
- Except in special circumstances, buildings and structures should be demolished in reverse order to their construction. Demolition should be progressive, storey by storey and debris should be removed from site to avoid accumulation.

6.2. General Precautions

The building or structure to be demolished and all its components should be maintained in a safe and stable condition. Temporary braces, shoring or guys can be added for stability.

Precautions should be taken to ensure that sudden weather changes do not affect the stability of the structure. Poorly braced structures can be blown over and loose debris can become airborne.

Debris should not be allowed to accumulate or fall onto floors to the extent that collapse could be caused. Debris should not be allowed to accumulate against walls to the extent that adverse lateral loads are imposed.

6.2.1. Stripping Out

The techniques adopted for stripping out and for demolition should minimise the release of dust into the atmosphere.

It should be noted that under certain conditions in which there are deposits of combustible dusts on, for example, beams, machinery and other surfaces, spontaneous combustion of those materials may occur.

Prior to commencement of stripping of demolition in an area of structure, any existing accumulations of dust in that area should be watered down, or collected, placed in suitable containers and removed. Selection of an appropriate collection technique, such as vacuuming or hosing down, should take due account of the nature of the dust and the type of hazard it presents (explosive, respiratory etc.).

Dust generated during stripping, or during the breaking down of the building fabric to removable sized pieces, should be left damp until it is removed from the site or can be otherwise contained. The use of excess water for this purpose should be avoided.

6.3. Stairs as Access

Where stairs of the building or structure being demolished, either in whole or in part, are liable to be used as means of access to working places, the stairs, together with any landings and stair railings, shall be kept in place and in a safe condition and free from demolished or other material.

Nothing in this paragraph affects the operation of Regulation 73(2) of the *Scaffolding and Lifts Regulations*.

6.4. Hazardous Substances

6.4.1. Synthetic Mineral Fibres

Synthetic mineral fibres are used extensively for insulation. Synthetic mineral fibres should be removed during the stripping out process. Personal protective equipment should be worn and dust should be suppressed by damping down. Removal and handling should be carried out in accordance with the National Standard and Code of Practice on Synthetic Mineral Fibres.

6.4.2. Asbestos

Where loose asbestos has been found, the area should be isolated and the asbestos removed in accordance with the Section 51A of the *Building Act 1972*, the *Occupational Health and Safety Act 1989* and the National Code of Practice and Guidance Note on Asbestos as appropriate.

Where initial assessments have failed to discover asbestos and when undetected asbestos is revealed, the safe process of removal must be undertaken as stated above.

6.4.3. Poly-Chlorinated-Biphenols (PCBs)

Where PCBs have been discovered, the safe removal of the substance and containers must be undertaken with caution. Disposal should be carried out in accordance with the waste management guidelines promoted by the ACT Waste Management Authority.

6.5. Broken Glass

Where the glass in any glazed window, door or other opening of a building or structure to be demolished in whole or in part would be liable to break during the demolition and any person would be liable to be injured through such breaking, then before the commencement of the demolition work, either: -

- all glass shall be removed from the window, door, or other opening; or
- the window, door or other opening shall be boarded up in such manner as will prevent such injury.

Before the commencement of demolition work on any storey of a building or structure all glass shall be removed from every glazed window, door or other opening of that storey or the part thereof being demolished, as the case may be, and of the storey or part of a storey, respectively, immediately below it.

Where practicable the glass in windows, doors or other openings should be taken out, or the openings boarded up to prevent damage caused by broken glass.

6.6. Manual Demolition

Before the commencement of any demolition work the condition of the floors and walls of the building or structure to be demolished in whole or in part shall be carefully ascertained in order that injury or damage through the collapse, as a result of the demolition work, of any such floor or wall may be avoided.

No floor or other surface of the building or structure being demolished in whole or in part shall be used for supporting persons engaged in the demolition work, or cranes, plant, or other equipment used or intended to be used in the work, or for the transport of or to support demolished materials or materials being or to be used in or in connection with the work, unless the floor or surface is of sufficient strength to support all such persons, cranes, plant, equipment and materials.

Removal of the roof should be done in accordance with Part III of the *Building Act 1972* and in compliance with appropriate scaffolding and crane provisions in the *Scaffolding and Lifts Regulations*, such as Regulation 84. Walls and gables should be demolished course by course and all work should be performed from safe working platforms. Workers should not work from the top of a wall or partition being demolished. Areas where debris will fall should be barricaded off and signs erected to prevent persons from entering before demolition starts.

Care should be taken not to overload floors. Where water is used to keep down dust the increase in weight of the debris that this causes should be taken into account.

Removal of roof trusses should be from safe work platforms. Care should be taken that removal of trusses does not cause instability of walls.

When jack hammering concrete floors, sufficient reinforcing steel should be left through the floor.

Nails in timber should be removed or bent over flush to prevent puncture wounds.

6.6.1. Walls

A wall of partition –

- the height of which is more than thirty times its base thickness, and the length of which between buttresses, return walls or the like is more than forty-five times its base thickness; or
- which for any other reason is, or because of the demolition operations or otherwise has become, of insufficient strength to stability unless supported, to resist collapse as a result of winds, those operations, or any other cause,

shall not be permitted to stand unless it is effectively supported against collapse.

A wall less than 460 mm in thickness, or which is structurally weak, should not be demolished or partly demolished by a person or persons standing on the wall if any such person could fall a distance of more than 1.8 m from his working position. Such demolition work shall be carried out from a working platform, or other scaffolding, so constructed and located that the work can be carried out safely and conveniently.

No work of demolishing a wall shall be done within 3 m of an opening in a floor unless the opening is so protected, by being planked over or otherwise, as to prevent material from falling through it.

6.6.2. Floors and members

Subject to this Code of Practice, no floor or any members supporting it should be cut or removed until demolition above that floor has been completed and the demolished materials removed.

6.6.3. Vertical Structured members

- The demolition by felling of any walls or of any columns, piers or other vertical structural members of a building or structure, otherwise than in a manner specified in this Code of Practice –
 - should not be carried out except subject to such conditions.
- The provisions of this Code of Practice, are such that –
 - it is recommended that notification should be given, in writing, to the ACT Occupational Health and Safety Office, if any wall, column, pier or member shall, if any part of it is more than 3.5 m above the ground, be felled in such a manner that any part of it may fall outside the building or structure, whereby the Chief Inspector may attach conditions to the conduct of such work.
 - adequate precautions are taken to ensure that there is no danger to person(s) or property from falling, collapsing or rebounding material;
 - the remaining portion, if any, of the building or structure is of sufficient strength to withstand any loads, impact and vibration resulting from the fall and the means of felling used;
 - where felled material may fall on a floor, every opening in that floor should be protected by being planked over or otherwise as to prevent material from falling through; and
 - adequate precautions are taken against collapse or fall of any other building, structure, wall, column, pier or member through impact or vibration caused by, or otherwise as a result of, the fall of the means of felling used.
- **Chases**
 - horizontal chases shall not be made in masonry or brick walls to facilitate felling; and
 - reinforced concrete walls may be chased to facilitate felling provided the horizontal chase is made first, followed by any vertical chases. Vertical reinforcing bars should not be cut until the wall is pulled over.

Nothing in this paragraph applies to or is in respect of the demolition of a chimney stack. Refer to Section 6.22 to 6.27 of this Code.

6.6.4. Permission to Demolish

The demolition of a building or structure other than a chimney stack, or of part of a building or structure, by means of explosives or by the mechanical felling of walls or floors by a clam shell grab, or other mechanical means –

- this Code of Practice recommends notifying the Chief Inspector of the Occupational Health and Safety Office, who may attach conditions to any system of work; and
- should not be carried out without that notification and in accordance with any conditions required.

6.6.5. Framework

The following provisions should be observed in respect of the demolition or removal of any framework of a building or structure:

During the demolition or removal the following measures should be taken for the safety of persons below, unless such persons are effectively protected from injury by a floor or other part of the building or structure;

- every area which persons may enter, and into which materials from such demolition or removal might fall, shall be so decked over as to prevent any such materials from falling into it; or
- effective barricades and readily visible and clearly legible warning signs prohibiting entry shall be erected in order to prevent persons not directly engaged in the demolition or removal of the framework from entering every such area.

Demolition or removal of framework should proceed in the reverse manner to erection, that is to say in reasonably even tiers working from the top downwards. Any framework or member which is not demolished or removed shall be strong enough to remain safely in position or shall be guyed or otherwise supported to ensure that it is stable against the effects of wind to storm.

Before any framework is demolished or removed, all practicable precautions shall be taken to prevent the remainder of the building from collapsing after such demolition or removal.

All practicable precautions shall be taken to avoid danger from any sudden spring, twist, collapse or other movement of framework when it is cut, released or removed.

Members shall not be cut until adequate precautions have been taken to support them safely and effectively.

Members shall not be dropped, but shall be lowered in a safe manner.

Tag lines shall be provided and used on loads where necessary to ensure safe control of the load.

Oxygen cylinders and other gas cylinders used for such demolition shall be secured in stands or cradles and handled in a safe manner.

6.6.6. Danger of Collapse

Where during demolition work any building, structure, or part of a building or structure, including an undemolished part of a building or structure being demolished in whole or in part, becomes unstable and there is a danger that its collapse would injure any persons—

- all practicable precautions shall be taken to prevent persons from being injured by such collapse should it take place; and
- where there are or may be any person so liable to be injured in a public place not under the occupation or control of the contractor for the demolition work, an officer or member of the Police Force shall immediately be informed by telephone or otherwise of the danger of such collapse and of such persons being thereby injured.

6.7. Mechanical Demolition

All plant and equipment should be:

- operated by a competent person and where required by legislation that person should be the holder of a Certificate of Competency for the plant being used;
- used and maintained as recommended by the equipment's manufacturer or supplier;
- where appropriate, provided with overhead protection conforming with Australian Standard 2294-1980;
- where appropriate, operated in accordance with Parts III and IIIA of the Inspection of Machinery Regulations and
- all cranes used on site should be selected and used in accordance with Australian Standards 2550-1982, 1418-1986 (Part 1) and 1418-1990 (Part 5), and be fitted with a load indicator and hoist limiting (Anti-Two-Block) device.

Where cranes are used to suspend loads that are to be cut and then lowered to the ground it is important that the load is accurately calculated; it may be necessary to cut samples for weight per unit length or area; the safe working load that the crane is capable of handling for the test weighing should be reduced by 50% to allow for miscalculations. A similar approach should be followed where weights cannot be determined with reasonable consistency and accuracy.

6.8. Earth Moving Equipment on Suspended Floors

These provisions apply to the practice of mechanical demolition of reinforced concrete building and prestressed concrete buildings with bonded tenons using earthmoving machines on suspended floors.

In the case of the demolition of prestressed concrete structures that have been post tensioned and the tenons are unbonded, extreme caution is recommended with strict adherence to the special conditions specified by a qualified expert.

Now that more monolithic reinforced concrete structures are to be demolished it has become common practice to equip an excavator with a hydraulic rock breaker or pulverising attachment and use it to break up the walls and floors while other earth moving equipment organise the rubble.

It is the intention of this code of practice to clearly communicate the main statutory obligations of those involved in this method and to help ensure safe health practices.

6.8.1. Engineering Investigation

The practising structural engineer who certifies the structural adequacy of the supporting structures should be a corporate member of the Institute of Engineers, Australia and experienced in the design and construction of reinforced and or prestressed concrete as appropriate.

Prior to commencement of demolition, the structural consultant shall investigate the structure by whatever means necessary to determine as accurately as possible:

- the type of structural system involved;
- the 'as-constructed' details of the component members;
- the current load-carrying capacity of the structure; and
- whether the proposed methods and sequence of demolition can be executed without causing unpremeditated collapse of the whole or part of the structure.

A search for engineering details specifying size, type and configuration of reinforcement and the strength of materials (if available) needs to be made and the located documents referenced. Also floor penetrations to facilitate construction of structural irregularities need to be located and identified prior to commencement of demolition.

To eliminate any uncertainty regarding the composition or quality of structural components, it may be necessary to use one or more of the following methods:

- Core drilling
- Electronic reinforcement location
- Exposure of reinforcement

These methods are to be performed under the direction of the practising structural engineer and any resulting loss of strength is to be taken into account when ascertaining structural adequacy.

In assessing the current load-carrying capacity of structural members, the practising structural engineer should take into account:

- the strength requirements of the relevant structural standards current at the time of construction and the strength and loading requirements of those now current;
- degradation of the original properties of the materials used, due to time, weathering, wear, or other deleterious causes;
- the capacity of the structure as a whole and individual members to sustain superimposed loads without:
 - premature collapse of any member; or
 - deforming to an extent which will lead to static instability of the member itself or to connected members.

To allow for impact and vibration during demolition, a minimum impact factor of 1.5 should be applied in addition to the normal ultimate load factors, to the weight of the demolition machines and the weight of the falling debris. The resulting stress is to be within the allowable limits as set out in Australian Standard 3600-1988.

All phases of the proposed demolition method need to be considered in order to identify and isolate critical conditions. The sequence of demolition should be described in the proposed work method statement.

The demolisher should give every assistance to the structural consultant in his investigation and when requested, shall provide any cores, load tests, chases, or opening up necessary to verify the load-carrying capacity of the structure, or the safety of the demolisher's proposals.

If propping is used to distribute loading to lower floors, the specified ratings of the prop manufacturer are not to be exceeded and the details of placement are to be specified by the practising structural engineer.

6.8.2. Supervision

The subject demolition work is to be supervised on site by a person nominated by the demolisher. The person is to have a minimum of three (3) years experience in the demolition of multi-storey buildings. They should also have had appropriate experience in the implementation of safe working procedures. This person is responsible for ensuring safe working practices.

All personnel involved are to be fully trained in accordance with Section 27(2)(d) of the *Occupational Health & Safety Act 1989*, briefed on the adopted procedures and techniques and can show that they have fully understood the briefing.

A person nominated by the practising structural engineer is to be responsible for reporting on the on-site compliance with the engineer's specifications to the engineer and advising the demolition contractor. This person is to be responsible to the practising structural engineer and independent of the demolisher.

A reliable and effective means of communication shall be established between all areas of work and demolition supervisor to arrange and confirm evacuation of danger areas. The supervisor should be able to contact emergency services quickly in case of an accident.

Personnel working within the location of mechanical felling activity for two floors below should be located a safe distance from such activity.

6.8.3. Machine Access

Rubble ramps to facilitate machine access from floor to floor (i.e. a storey apart) are not permitted. However rubble ramps of a lesser height for access from roughly adjacent floors may be acceptable if certified as safe by the practising structural engineer.

Lifting operations to place machines onto the building are to comply with all pertinent Regulations under the *Scaffolding and Lifts Regulations*, such as Regulations 122 to 127 inclusive, and Regulations 143 and 144 in the case of the lifting of cranes.

6.8.4. Propping

All propping used is required to be braced in two directions with a material similar to the prop.

Care is to be taken to ensure that the props used are structurally sound and can safely support the loads to which they will be subjected and that those loads do not exceed the manufacturer's specified ratings.

6.8.5. Removal of Demolition Debris

No floor or member supporting it shall be cut or removed until demolition above that floor has been completed and the demolished material removed.

Barricades and notices shall be used to restrict access to the zone of demolition at all times during the progress of the demolition work.

Any area in which there is a danger that persons might be injured as a result of demolished or other material falling or rebounding shall be fenced or barricaded to prevent persons from entering the area; and

Notices warning persons of that danger shall be kept affixed in positions where they will be readily visible to and clearly legible by persons approaching the area.

When using lift shafts to remove rubble the build-up of rubble in the lift shaft is not to exceed the height of the opening.

Lift openings other than the clean-out hole are to be properly sealed off during the dropping of rubble.

Major items of demolition debris that would be dangerous to drop down a shaft, through an opening or over the side of the building are to be lowered in a controlled manner.

6.8.6. Personnel Access

Access for personnel to the demolition work face must be secure, adequately illuminated, provided with handrails and free from obstruction.

An expedient and safe means of emergency egress shall be available for injured people by stretcher.

For those buildings being demolished without two means of access and egress an alternative means is to be provided which is capable of handling a stretcher.

6.9. Submission to the Authority

No demolition by mechanical means should be carried out without written notification to the Chief Inspector who may attach conditions to any such systems of work.

To obtain permission for the type of mechanical demolition described by this document the following is required to be submitted to the ACT Occupational Health and Safety Office at least (two) weeks prior to work commencement;

- A covering statement describing the demolition methods (that is a work method statement) and the number, size, weight and type of machine(s) to be used, (including necessary back-up machinery).
- A diagram of machine locations and movements during demolition phases showing the sequence of operation.
- Structural engineer's calculations indicating assumed loadings imposed.
- Structural engineer's statement of structural adequacy and specifications of adequacy conditions including back propping and machine separation details if required.

- Evidence of investigation to ascertain the principle of design and method of construction (e.g. original engineering drawings, core holes or other methods to determine the size, placing and direction of reinforcement).
- A fully completed and signed copy of the Guidelines Proforma for Demolition by Earthmoving Machines on Suspended Floors (refer Section 6.10.1 of this Code).

6.9.1 Notification and Approval

The following ACT Government Authorities must be notified prior to the approval for the commencement of demolition work.

- ACT Occupational Health and Safety Office
- ACT Planning Authority
- ACT Building Control
- ACT Electricity and Water
- ACT Fire Brigade
- ACT Lease Administration
- ACT Dangerous Goods Unit
- ACT Waste Management (Department of Urban Services)
- ACT Traffic Control
- TELECOM
- The Natural Gas Company

Now that more monolithic reinforced concrete structures are demolished, it has become common practice to equip an excavator with a hydraulic rock breaker and use it to break up the walls and floors while other earthmoving machines organise the rubble.

Due to the weight of such machinery, the vibration caused and the build up of rubble, careful planning and extreme care is needed to prevent premature collapse of the structure. Before any work commences an engineering investigation as in Clause 6.8.1 should be carried out.

6.9.2. System of Work

A safe system of work is to be devised in conjunction with the practising structural engineer, the main contractor and the demolisher. It is recommended that a statement of this work method should be submitted to the ACT Occupational Health and Safety Office.

6.9.3. Machine Access

Rubble ramps to facilitate machine access from floor to floor (i.e. a storey apart) should not be used. However rubble ramps of a lesser height for access from roughly adjacent floors may be acceptable if certified as safe by the practising structural engineer.

6.9.4. Lifting Machines

Lifting operations to place machines onto the building should comply with all the pertinent regulations under the *Scaffolding and Lifts Regulations* (refer Section 6.8.3 of this Code)

6.9.5. Propping

All propping used should be adequately braced in two directions. Care should be taken to ensure that the props used are structurally sound and can safely support the loads to which they will be subjected, and that those loads do not exceed the manufacturer's specified ratings.

6.9.6. Removal of Demolition Debris

No floor or any members supporting it should be cut or removed until demolition above that floor has been completed and the demolition material removed.

Lift openings other than the clean-out hole should be properly sealed off during the dropping of rubble.

Major items of demolition debris that would be dangerous to drop down a shaft, through an opening, or over the side of the building, should be lowered in a controlled manner.

Where machines are being used to tip rubble down a lift shaft or nominated rubble area, vehicle buffers should be provided to prevent the machine from falling over the edge. The buffers should be high enough to prevent the machine from riding over them and solid enough to stop a fully loaded machine running into them.

6.9.7. Demolition of Walls

When using hydraulic rock breaker to demolish walls, a minimum of 900 millimetre of the wall being demolished should be left intact above the floor level to provide a protective barrier at the perimeter of the building and around all lift wells, stair wells, light wells, and any other place where persons could fall. The remaining wall can be safely demolished from the floor below.

6.9.8. Restriction of Personnel

The area that machines are working in should be barricaded off to prevent other personnel entering the area.

6.10. Documentation for Demolition by Earthmoving Machines on Suspended Floors**6.10.1 Guideline Proforma**

Information is required under the following headings:

- **General Information**

- Site:
Address:
Principal Contractor:
- Structural Engineering:
Structural Engineer:
- Owner:

- Machine Details:
 - No of:
 - Mass:
 - Type:
- **Demolition Method:**
Clearing Method:
- **Other Supporting Documents**
 - Nominated demolition supervisor
Nominated agent of the engineer
 - Structural Engineer (signed)
 - Demolisher (signed)
- **Engineering Checks:**
 - Allowable rubble depth (mm):
 - Are machines to work over rubble? (Yes / No):
 - Method of moving from floor to floor (Crane / Ramp):
 - If by ramp attach calculations for flooring loading:
 - Is propping, or floor strengthening required? (Yes / No):
If yes, attach details:
 - Are there any restrictions on machine travel? (Yes / No)
 - i.e. separation distance or 'no go' areas.
If yes, attach details.
 - Attach details and limitations.

6.11. Demolition by Wire and Chain Pulling

Where mechanical demolition is to be carried out by chain or wire rope pulling, the pulling medium should be a securely anchored winch or a vehicle having a mass adequate to apply the required tension without sliding or lifting from the surface on which it is located.

No person should be on either side of the wire or chain in any position where they could be struck by the wire or chain in the event of failure.

Walls should be cut into appropriate sections having regard to their height, width and construction, and where it is not possible to isolate such sections, the chains or wire ropes should be attached to their respective sections prior to the first pull being made. The free ends of the chains or ropes should be left a safe distance from the structure.

Where reinforced concrete walls are to be chased to facilitate felling, the horizontal chase should be made first, followed by any vertical chase.

Vertical reinforcing bars should not be cut until after the wall has been pulled over.

The wire rope or chain should be of such a length that the horizontal distance from the demolition work to the pulling medium is not less than twice the height of the highest part to be pulled.

6.12. Machine-Mounted Impact Hammer

A machine-mounted impact hammer is a larger and heavier duty form of the hand-held pneumatic drill, and may be pneumatically or hydraulically operated. As in the case of the lighter equipment, it is useful for breaking up massive construction such as concrete base slabs and the like, and for breaking larger pieces of debris into manageable sizes.

When used on vertical features such as columns or walls, the columns or walls should not be of such a height as to create a risk of debris falling onto the machine or operator. When used on suspended floors precautions as described in part 6.9 of this Code should be taken.

6.13. Power Grapples, Shears and Pulverising Attachments

Power grapples and shears are frequently hydraulically operated. Power shears may be used as an alternative to oxyacetylene cutting or the like to crop and cut through metal such as reinforcing steel or beams, particularly where there might otherwise be a risk of fire or where the more precise cutting with an oxyacetylene torch is not required. Care should be taken to ensure that any member to be severed is either effectively supported or, if allowed to fall and in so doing will endanger neither personnel nor the remaining structures.

Power grapples may be used to handle waste material, either to move it about a site or to load other vehicles when disposing of the waste. As some debris resulting from demolition has a high density, care should be taken to avoid overloading the equipment both to avoid damage to the equipment itself and to avoid the risk of the machine overturning as a result of instability induced by a heavy load.

Pulverising attachment is an attachment to hydraulic machinery which breaks concrete into easily managed pieces about 100 millimetre in size. This reduces noise during demolition and allows quick and efficient removal from the demolition site.

Areas that shears are operating in should be kept clear of other personnel due to the danger of bolts flying when sheared.

6.14. Drilling and Sawing

Drilling and sawing are used either to remove part of a structure or to produce a potential fracture zone (e.g. by stitch-drilling, which is drilling a line of overlapping holes), and are frequently used in conjunction with other methods of demolition, particularly bursting. Diamond or tungsten tipped drills or saws are normally used. These methods can be employed in confined spaces, or for work that requires a high degree of accuracy, or where the noise, dust and vibration resulting from some other methods would be unacceptable. They may be used to cut up floors and suspend slabs into manageable sizes, or to cut holes and slots in parts of a structure. Whilst this is being done the piece to be removed should be adequately supported. Use of these methods avoids damage to the surrounding area.

In order to flush out the resulting dust, and to cool the equipment during use, it is usual to employ running water in volume as a coolant. This needs to be borne in mind if it is proposed to adopt this method of demolition, and measures should be taken to provide a suitable supply of water, and to collect and safely dispose of the waste water that results. Care should be taken that any sparks produced during sawing do not constitute a health or fire hazard.

6.15. Mechanical Demolition by Pusher Arm

Mechanical demolition by pusher arm involves the progressive demolition of a wall using a machine fitted with a pusher arm exerting horizontal thrust.

The pusher arm should be used only when the equipment is on firm level ground. It should not be overloaded and should generally be used from outside and not from inside the building. No person should be within the vicinity of the demolition where there is a possibility of being struck by flying debris.

The pusher arm should be made of steel. Pusher arms of other materials should not be used.

The cab of the appliance should be sufficiently robust to withstand impact from flying debris and the cab windows should be of shatter-proof glass.

The height of the building should, in the first instance, be reduced by a hand demolition to a height to suit the machine being used; then the height should be reduced progressively by pushing small sections to the ground.

Where this method is adopted for demolition of attached buildings, the structure to be demolished should first be detached by hand demolition.

The clear space in which the equipment is to operate should be a minimum of 6.0 metres.

The plant should be used only in accordance with the manufacturer's recommendations; on no account should the point where the pusher arm is applied to a wall being demolished be more than 600 millimetre below the top of the wall.

6.16. Mechanical Demolition by Deliberate Collapse

Mechanical demolition by deliberate collapse involves the removal of key structural members causing complete collapse of the whole or part of the building or structure being demolished.

Expert engineering advice should be sought before this method is used; it should be employed only on detached, isolated, reasonably level sites and where the whole structure is to be demolished. There should be sufficient space to enable equipment and personnel to be removed to a safe distance.

Sections of structure should not be pulled down by deliberate collapse in separate operation if instability of the remaining structure may result, causing a possible hazard to personnel on the site.

6.17. Demolition by Explosives

A specialist experienced in the controlled application of explosives for the purpose of carrying out the demolition of building structures should be consulted before deciding whether explosives are to be used for demolition. Account should be taken of the type of structure and its situation. An explosives specialist should be employed, experienced in this type of work.

Tests may have to be conducted in a place remote from the actual demolition site. Things which have to be considered are air shock, noise and dust if the explosives are to be used above ground. Also the type of day has to be considered. Air shock will vary with cloud cover.

Prior to the blasting of any structure or portion thereof, a complete survey should be made by a qualified person of all adjacent improvements and underground utilities. When there is a possibility of excessive vibration due to blasting operations, seismic or vibration tests should be taken to determine proper safety limits to prevent damage to adjacent or nearby buildings or other property.

Utilities require special consideration, and the proximity of underground and overgrown services should be carefully considered before blasting operations are carried out. Consultations should be carried out with the authorities responsible for concealed underground works (e.g. pipes, cables, etc.).

The preparation of a structure for demolition by explosives may require the removal of structural columns, beams, or other building components. This work should be directed by a structural engineer or a competent person qualified to direct the removal of these structural elements. Extreme caution should be taken during the preparatory work to prevent the weakening and premature collapse of the structure.

The explosives specialists should decide the charges to be used and their placing. In the event of a misfire the area should remain cleared until the explosives specialist has dealt with the situation. If, after blasting operations, a misfired charge is found during the subsequent removal of debris the area should be cleared and entrance restricted until the explosives specialist has rendered the misfire safe.

Buildings should not be demolished by explosives without the express permission of ACT Building Control and the ACT Dangerous Goods Unit.

6.18. Lift Shafts

6.18.1. Demolition and Removal of Lift Shafts by Hand

The lift cage should be taken to the top of the shaft and supported by steel beams. The steel beams should be inserted through pockets cut into the lift shaft walls.

Prior to the removal of the lift cage and machinery room, the lift shaft should be fully decked over, at least two levels. Lift doors should be welded shut from the outside or guarded by some other method. Electrical power to all areas of the lift machinery should be disconnected.

Counterweights shall be disconnected at ground or basement level and removed. The unwinding of the lift rope should be done in a controlled manner. It is not a good practice to leave lift cages at a lower level and allow lift weights to free fall down the shaft.

The lift cage may be removed by crane or by cutting into sections. Safe working platforms should be provided for these procedures. Demolition of lift shaft walls should be done from internal scaffolding or specially constructed internal platform at floor level. Walls should be progressively demolished onto each floor and the debris removed.

6.18.2. Demolition of Lift Shafts by Mechanical Means

Lift cage and counter weights should be removed as above.

If the lift shaft is on a perimeter wall, ensure adequate protection is provided for personnel or adjoining properties.

Walls should be worked progressively down to a height of at least 900 mm above floor level to ensure a protective barrier is left in place to prevent machinery or personnel from falling down the open shaft.

Machinery should be used in accordance with Section 6.7 of this Code.

6.19. Demolition of Basements, Cellars, Dome Vaulted or Arched Roofs

6.19.1. Removal of Organic Matter

Where basements and cellars vaults and void are to be back filled, all organic matter should be removed.

6.19.2. Strength of Adjoining Walls

Where basement, cellars, vaults and voids, adjoin any other property any party walls or adjoining cellar walls should be inspected to determine whether they are of adequate strength to withstand the resultant ground pressure. If the party walls or adjoining walls are inadequate, approval should be obtained from ACT Building Control on the proposed methods of strengthening them.

6.19.3. Backfilling

Where the basement, cellar, vaults, or voids are completely surrounded by ground and are to be backfilled, inorganic material shall be tip spread and consolidated to ground level or to the requirements of ACT Building Control.

6.19.4. Prevention of Floatation

Where a basement has been built in ground having a high standing water table level, adequate precautions shall be taken to prevent floatation.

6.19.5. Fire Damaged, Ruinous and Dangerous Buildings

Adequate safety precautions shall be taken during the assessment and demolition of buildings that have been identified by ACT Building Control as being fire damaged, ruinous or dangerous.

A list of references which give guidance on the assessment of fire damaged buildings is given in Appendix E of the Australian Standard 2601 – 1991. It should be noted that the assessment of fire resistance in elements of construction is a developing science and the assessment of fire damage is at an even more embryonic stage.

6.20. Demolition of Arches, Vaults and Domes

During the demolition of an arch, vault or dome frequent inspections should be made to detect any movement and appropriate action shall be taken to avoid any premature collapse. Only competent persons conversant with this type of structure should demolish these structures.

6.21. Masonry and Brick Arches

6.21.1. Sequence of Demolition

Demolition of masonry and brick arches shall be performed in the following sequence:

Step 1.

As much dead load as possible should be removed without interfering with the stability of the main arch rings.

Step 2.

The spandrel infilling down to the springing line should be removed. The load carrying capacity of many old arches relies on the filling between the spandrels.

Step 3.

The arch rings should be removed. A single span arch can be demolished by hand by cutting narrow segments progressively from each springing parallel to the span of the arch until the width of the arch has been reduced to a minimum. The arch can then be collapsed. Where deliberate collapse is feasible, the crown may be broken by the demolition method working progressively from the edges to the centre.

Step 4

The abutment should be removed.

Step 5.

In multi span arches, before individual spans are removed lateral restraints should be provided at the springing level. Demolition shall then proceed as for a single span.

6.21.2. Falling Debris

In situations where debris is allowed to fall to the ground below, supports designed to carry the load with appropriate allowance for impact, shall be erected and the arch demolished progressively.

6.21.3. Use of Explosives

Where explosives are used, charges shall be inserted into bore holes drilled in both the arch and the abutments.

It is preferable to ensure the collapse of the whole structure in one operation so as to obviate the chance of leaving unstable portions standing.

6.22. Demolition of Independent Chimneys

6.22.1. Preliminary Procedures

A detailed inspection and survey shall be made by the Contractor prior to demolition.

Measurements may need to be taken to determine whether there is any deviation from the perpendicular.

6.22.2. High Winds

During all stages in the demolition of independent chimneys consideration should be given to the possibility of the danger resulting from high winds.

6.23. Masonry Chimneys

6.23.1. Hand Demolition

Hand demolition of masonry chimneys shall be carried out from a safe working platform. The platform shall be supported by either an internal or external scaffold.

Where external scaffolding is used, debris shall be dropped down inside the chimney. The debris shall be progressively removed in order to restrict lateral pressure on the walls of the chimney. During removal of debris all demolition work overhead shall cease.

6.24. Deliberate Collapse

Deliberate collapse of masonry chimneys should be used only where a clear space, defined as that segment of a circle forming an angle of 40 degrees, being 20 degrees each side of the proposed line of fall, and of the radius of at least 1.5 times the total height of the chimney measured from its centres is available for fall. The chimney should be felled by the deliberate cutting away with the subsequent weakening, at the base on the side of the line of fall. Demolition by explosives shall be in accordance with the requirements of ACT Building Control and the ACT Dangerous Goods Unit.

6.25. Steel Chimneys

6.25.1. Hand Demolition

Hand demolition of steel chimneys shall be carried out from a safe working platform provided by an external scaffold.

The chimney shall be taken down from the top. The plate shall be cut into manageable sizes and lowered to the ground. The internal lining shall be demolished progressively with the steel work, and if appropriate the debris allowed to fall to the ground internally. Debris shall be progressively cleared. During removal of debris, all demolition work overhead shall cease.

Temporary guys shall be fixed where necessary. Temporary and permanent guys shall be cut systematically as demolition progresses.

Notes:

- If the lining is of concrete, difficulty may be experienced in burning the plate with the lining in position and the lining should be removed first.
- Where guys form part of the structure, an engineer should be consulted.

6.25.2. Deliberate Collapse

Deliberate collapse of steel chimneys shall be used only under conditions as described in section 2.3. of Australian Standard 2601 – 1991

Movement of the chimney shall be observed. If the chimney is guyed, two steel wire roped shall be attached at 45 degrees on plan to each side of the line of fall before felling. The rope shall be made taut and the guys on the far side of the line of fall shall be systematically severed.

6.26. Reinforced Concrete Chimneys (In situ and precast)

6.26.1. Hand Demolition

Hand demolition of reinforced concrete chimneys shall be carried out from a safe working platform provided by an external scaffold.

The chimney shall be taken down in sections from the top in manageable sizes which shall be lowered to the ground. The concrete shall be shattered by pneumatic tools to expose the reinforcement and each section shall be supported while the reinforcement is cut.

The lining shall be demolished progressively with the shaft. The debris may be allowed to fall to the ground internally.

6.26.2. Deliberate Collapse

Deliberate collapse of reinforced concrete chimneys shall be in accordance with previous recommendations.

6.26.3. Glass Reinforced Plastic Chimneys

Glass reinforced chimneys shall be demolished in accordance with procedures for Steel Chimneys (see section 6.25 of this Code).

6.27. Spires

6.27.1. Hand Demolition

Hand demolition of spires shall be carried out from a safe working platform provided by scaffold.

6.27.2. Deliberate Collapse

Deliberate collapse of spires shall be used only when a clear space all around the spire of at least 1.5 times the total height of the spire measured from its centre is available for fall.

6.27.3. Masonry

The heavy solid stone work at the peak of a masonry spire which can normally be removed only after release of the central tie rod shall be reduced to manageable sizes before being lowered to the ground. Where necessary, the stone work above the spider should be supported temporarily in position before the tie rod is released. Any over hanging stone work should be supported when the structure above is released or removed. Below the solid peak of the spire where the structure is hollow with the sides battened inwards, one complete course at a time should be removed; where openings occur, temporary bracing shall be provided.

The condition of the stone work and the built-up metal cramps should be inspected as work proceeds to avoid any sudden fall of fractured or badly weathered stone.

6.27.4. Timber

Cladding and timbers should be removed progressively from the peak in manageable size and lowered to the ground. Timber spires should be inspected prior to commencing any work to determine whether any rot or defect is present. This deterioration is particularly prevalent at the foot of timber spires.

6.28. Demolition of Pylons and Masts**6.28.1. Hand Demolition**

The pylon or mast shall be taken down in the reverse order to that in which it was erected.

6.28.2. Demolition by Wire Rope Pulling

The sequence of demolition by wire rope pulling should be as follows.

Step 1.

A steel wire rope shall be attached to the spreader near the top of the structure.

Step 2.

The slack in the rope shall be taken up by the pulling medium positioned at least 1.5 times the total height of the pylon or mast from the centre of the base of the pylon and mast.

Step 3.

The two legs near the direction of fall shall be partially severed.

Step 4

The two legs remote from the direction of fall shall be completely severed. All necessary precautions should be taken to prevent twisting.

Step 5.

All personnel shall be cleared from the site.

Step 6.

The pylon or mast shall be pulled over. This operation should be undertaken by experienced workers.

6.29. Demolition of Flammable and Combustible Liquid Tanks

6.29.1. General

Where it is necessary to demolish industrial processing plants or tanks which have been used to store flammable, toxic, noxious or combustible liquids, preliminary procedures and safety precautions as listed in this document should be observed.

6.29.2. Preliminary Procedures

Before a tank is demolished, it should be emptied and gas freed in accordance with the requirements of section 8 of Australian Standard 1940-1988.

The words '**DANGER FLAMMABLE LIQUID**' shall be painted in clear conspicuous letters at each end and on opposite sides of the tank.

No demolition should take place on any structure or tank until its previous usage has been determined, and appropriate action has been taken to identify and remove hazards due to toxic, noxious or explosive materials.

6.29.3. Safety Precautions during Demolitions

During demolition of such structures, precautions should be taken with the associated pipework and equipment. Tools used to remove pipes and fittings shall be of non-ferrous material so as to prevent sparking.

During demolition, the following precautions should be taken.

- Appropriate danger notices shall be displayed.
- No smoking or naked lights shall be permitted in the vicinity.
- A copious supply of water shall be used to lessen the risk from sparking.

Care should be taken to ensure that no flammable, toxic or noxious substances, or combustible liquid is allowed to enter any drainage system or watercourse.

Due attention should be given to the fact that where a tank is being excavated, there is danger that the surrounding earth may have been contaminated either by leakage from the tank or by spillage.

Special precautions should be taken during demolition of chemical works, gas works and similar establishments.

It is strongly recommended that the examination of these types of works is carried out in conjunction with a chemical engineer so as to determine the nature of any of the chemical deposits and their influence on the method of demolition or dismantling. The removal of flammable material and its new locations should be ascertained before demolition.

7. Training

7.1. Introduction

Proper training of all employees involved is an essential element for the safe and efficient conduct of any undertaking.

In instances such as crane drivers and riggers, training will be necessary to enable operatives to meet statutory qualification requirements (Certificates of Competency).

Section 27(2)(d) of the *Occupational Health and Safety Act 1989* requires that employers provide such training as is necessary to enable employees to perform their work in a manner that is safe and without risk to health.

7.2. Training Required

The owner should identify the training needs and requirements of all staff. All operatives should be trained in the use of equipment they will be required to operate.

7.2.1. Certificated Personnel

Formal training of a practical and theoretical nature, followed by passing a mandatory examination prior to unsupervised operation is a requirement of certain activities. The holder of a learners permit must also be adequately trained and supervised by such a qualified person while gaining experience. Typical activities which require certified operators include rigging, dogging and crane chasing work.

7.2.2. Non-Certificated Personnel

It is equally important that employees involved in activities which do not require certificated operations are also fully trained in the safe use of equipment they will be required to set up, operate or dismantle. Inspection and maintenance personnel should also be trained in safe work procedures in addition to any specialist knowledge required for their work.

7.2.3. Supervisor

The supervisor should receive safety training in all activities including selection of planning, site operations and safe operations.

7.2.4. All Personnel

All personnel involved in the demolition should be trained in safe working practice, emergency procedures and awareness of first aid facilities and procedures.

7.3. Ongoing Training

Refresher courses and training should be given on an ongoing basis.

7.4. Records

Records should be maintained of training programs and individual employees' training accomplishment.

8. Consultation

8.1. Employer–Employee Consultation

Employers should consult with employees required to work in demolition and with the health and safety representatives for the relevant designated work groups.

Consultation should take place as early as possible in planning for the introduction of new or modified tasks or in the review of existing tasks, to allow for changes arising from the consultation.

Ongoing consultation should take place with employees during training exercises and actual operations.

Employees should be consulted when a particular control measure is proposed or when the effectiveness of implemented control measures is being reviewed.

Consultation is required with the relevant health and safety representative throughout this process, under Section 45(1)(a) of the *Occupational Health and Safety Act 1989*.

This consultation could occur:

- when the employer is identifying the problem areas in order to establish priorities during assessment;
- when the employer has decided to embark on a strategy of process for addressing demolition problems which may affect the representatives designated work group;
- when determining the approach and method to be used in assessing a particular task;
or
- when decisions are being taken on various control measures to reduce risk factors.

Appendix 1 - Cutting And Welding

Personal Protective Equipment

In addition to fire explosion hazards, welders and cutters may be exposed to health hazards in the form of intense light rays and toxic fumes. The intense flame at the tip of the torch, or the electrode, emits light rays of three types; visible, infrared, and ultraviolet rays which can cause 'welder's flash'. To prevent damage to the eyes, goggles or safety glasses with impact-resistant glass filters in accordance with Australian Standard 1338-1981 (Part 1) should be worn during cutting. Tinted lenses drastically reduce visibility, and should only be worn while actually cutting. Face shields are required when there is a chance that splatter will fall in the worker's face.

To eliminate skin damage, workers should wear proper protective clothing. Synthetic fabric should not be worn, because it melts when struck by hot slag. Cuffs and open pockets catch burning metal and should be eliminated. Flame-resistant gloves and safety shoes should always be worn while cutting. Clothes should be kept free from oil and grease, because these present a fire hazard.

Fumes and Gases

Hazardous fumes and gases can be released into the air during welding and cutting. As seen in the table below, some of these are released regardless of the material being cut; others depend on the type of metal or its coating. The two hazards which are considered most dangerous are cutting through lead-based paint and cutting in the presence of degreasers. Cutting materials which have been cleaned with a degreaser, or even in the vicinity of a degreasing operation, can produce deadly phosgene gas. Adequate ventilation should be ensured before starting any cutting job.

Toxic Fumes and Gases Produced by Cutting Torches

<u>Source</u>	<u>Chemical Produced</u>
Cutting Carbon	Monoxide
Cutting & Welding	Ozone
Welding Rods	Fluorides
Chrome-coated Fixtures	Chromates
Cadmium	Cadmium
Lead Pipe	Lead Oxide
Zinc	Zinc Oxide
Any material painted with Lead-based Paint	Lead Oxide
Any material which is or was cleaned with degreasers	Hydrochloric Acid & Phosgene Gas

Ventilation

Cutting in enclosed spaces, such as tanks, tunnels, or small closed rooms, demands particular attention to workers safety. A hazardous situation can develop because oxygen can easily be replaced by gases or toxic fumes. A fume educator is a hose attached to a cutting torch or welding gun through which fumes are exhausted at high velocity. If adequate mechanical ventilation cannot be provided, workers should be equipped with air-supplied respirators and a lifeline which is consistently watched by an outsider observer. Cylinders should be kept outside the enclosed space, and gases should be shut off at the cylinder when work stops for more than a few minutes. A leaky hose or fitting in an enclosed space can easily result in an explosive or oxygen-deficient atmosphere.

Containers that have held combustibles

Welding and cutting work on containers that have held combustible solids, liquid, gases, or dusts can result in fire or explosion if the containers are not entirely free of these materials. It is important that a rigorous cleaning process be undertaken and that instructions for cleaning be rigidly followed. Containers which have held any of the following materials are considered dangerous, and hot work should not be started before they are properly cleaned:

- petrol, kerosene, solvents, or light oils
- acids which react with metal and produce explosive hydrogen gas
- heavy oils, tars, or solids which release combustible gases when exposed to heat
- combustible solids, finely divided particles of which may form an explosive dust cloud

As a general rule, any container which has held combustibles should be considered unsafe until proven otherwise by a qualified person.

Safety precautions consistent with Australian Standards 1674-1990 (Parts 1 & 2) and 1940-1988 shall be taken when welding is required.

Safe Use of Cutting Torches

Cylinder Handling

Cylinders should never be dropped, dragged, or struck in any way. Pry bars and hammers must never be used on any part of the cutting torch system. Cylinders must always be kept in an upright position and secured. When cylinders are transported or moved at the job site while connected for use, the cylinder valves must be closed, and the cylinders secured in place. Valve protection caps must be in place when cylinders are not connected for use. When cylinders are hoisted by crane, they must be secured to a cradle or platform. Cylinders must never be lifted by their valve protection caps or with electromagnets. Oil or grease must never be used on threads.

Cylinder Storage

The contractor should set aside separate areas for the storage of fuel, gas and oxygen cylinders. These areas must be at least 6 metres apart, outside the range of falling debris, and away from heavily trafficked areas. Storage areas should be kept clear of combustibles, including fuels, and be designed as 'NO SMOKING' areas. Cylinders should not be placed where they might become part of an electrical circuit, such as near radiators and piping systems that may be used for grounding electrical equipment such as arc welding machines. Storage areas should be protected from direct sunlight.

Empty Cylinders

Empty cylinders should be treated the same way as full cylinders. Empties should be stored in a designated area after the following procedure has been completed:

- cylinder marked 'EMPTY' or 'MT'
- valve closed
- valve protection cap replaced
- cylinder secured

Torch Set-up

Setting up a cutting torch requires careful attention to a detailed procedure. Only properly trained workers should set up this equipment. There should be no smoking while setting up the equipment.

After removing the valve protection cap the regulator is attached according to the procedure outlined by the manufacturer. Pressure regulators should be serviced and tested for accuracy on a regular basis. No oil or grease should be used on the threads. Flash back arresters should be fitted to all cutting torch assemblies and should be mandatory.

Hoses

It is important that the regulators are used only for those gases listed on the regulator. Oxygen and fuel gas fittings are equipped with right and left hand threads to prevent accidental switching. To avoid confusion, oxygen, acetylene, propane, and other fuel gases should be called by their proper names, and not by 'air' or 'gas'.

Once the regulators are in place, the hoses (maroon for fuel, black for oxygen) are connected and the torch is attached. Fittings must not be forced. Any sign of wear means a hose must be repaired or replaced at once. Hoses which are kept neatly coiled are less likely to become kinked, tangled, or get run over.

Torch valves and fittings should not be oiled or greased. Torches should be treated with the respect deserving a fine tool, and never as a slag hammer.

Leaks

A leak test can be performed to assure that fittings and valves are correctly seated. The test involves pressurising the lines and applying soapy water on each fitting and valve. Leaks, which show up as bubbles, must be repaired. If, when the valve on a fuel gas cylinder is opened, there is a leak around the valve stem, the valve should be closed and the gland nut tightened. If this action does not stop the leak, the use of the cylinder should be discontinued, and it should be properly tagged and removed from the work area. If the fuel gas should leak from the cylinder valve and cannot be shut off, the cylinder should be tagged and removed from the work area. If a leak develops at a fuse plug or other safety device, the cylinder should be removed from the work area.

Start-up Procedures

The correct procedure for opening valves and lighting a cutting torch is as follows:

- The fuel gas cylinder should be opened between 3/4 and 1 1/2 turns. If a detachable wrench is required to open the valve wrench must be left in place whenever the valve is open. In this way, the fuel gas can be shut off quickly in an emergency.

- Standing away from the face of the regulator, the operator should open the oxygen cylinder valve all the way. This prevents leakage around the valve stem.
- The working pressures on the regulators should be adjusted.
- After moving away from the cylinders, the operator should open the fuel gas torch valve 1/4 turn, and light the torch with a friction lighter. Serious injury can result from lighting torches with matches or cigarette lighters.
- The oxygen torch valve is then adjusted to set the flame.

CAUTION: A squealing sound means that gases have flashed back into the torch. This fire could burn back into the hoses. Torch valves and cylinder valves must be quickly closed, and the cause of the flashback remedied before relighting the torch. Common causes of flashbacks are; improper pressures, kinked hoses, and loose, clogged, or overheated tips. Hoses that have been damaged should be replaced.

Shut-down Procedures

During short breaks, only the torch valves need be shut-down. When the worker leaves the area, cylinder valves should be shut off as well. At the end of a shift, the following shut-down procedure should be followed:

- torch valves should be closed, fuel gas first
- cylinder valves should be closed next, fuel gas cylinder first
- the torch valves should be opened to release pressure then closed; this should only be done in a well ventilated area
- the regulators, hoses, and torch should be removed and stored properly
- valve protection caps should be replaced on the cylinders whenever they are not connected for use

Safety in Arc Welding

The hazards encountered in electric arc welding are similar to those encountered in cutting, with compressed gas hazards being replaced by those of electricity. The dangers of flying sparks must be guarded against, particularly near floor and wall openings where other workers or combustibles may be hidden from view. Personal protective equipment requirements are identical, except that arc welders are required to wear a welding helmet fitted with the correct shade of filter in accordance with Australian Standard 1338-1981 (Part 1). The higher intensity of the light rays emitted required that arc welding be shielded by screens or curtains which will protect any person in the vicinity.

Electric Shock

The avoidance of electric shock is, in most cases, within the control of the welder. Therefore, it is particularly important to be aware of and observe safe work practices. The employer should provide employees with instruction and training on the procedures to avoid electric shock while welding. Printed rules and instructions covering the safe operation of the equipment should be made available to the workers, and supervisors should ensure that these are strictly followed.

Although the voltages used in arc welding are considered low, they can be quite dangerous under certain conditions. Mild shocks can cause an involuntary contraction of muscles which might cause a worker to fall from the work platform. Skin which is damp from perspiration or wet working conditions may be conductive enough to cause violent muscular contraction that could prevent the welder from letting go of the live part. Careful adherence to these safe work practices will minimise the dangers of electric shock to the welder and to the other workers.

Appendix 2 - Application for Approval of Plans & Application for a Building Permit from ACT Building Control.

Approval for a Building Permit

Under Section 35(2)(a) of the *Building Act 1972*, an application for a building permit must be made by a person who holds a builder's licence authorised for the kind of building work involved in the approved plans and specifications. Section 39 of the *Building Act 1972* should be referred to in situations requiring endorsement where no builder's licence is required.

Form of Application

An application for approval to demolish or remove a building should be in accordance with the most recent edition of Building Note BN.46_Demolition. (Edition Issue No 3, dated 1/8/91 appears at the end of Appendix 2).

Demolition of a building is defined as 'building work' in Section 5(1) of the *Building Act 1972*. Consequently there are a number of requirements to be met and procedures to be followed in any proposal to carry out demolition work.

Requirements for Approval of Demolition

Application to ACT Building Control for Approval of Demolition is required. Section 34 of the *Building Act 1972* requires the applicant to provide the following information:

- Site plan showing location and extent of demolition.
- Full details of the proposed methods of demolition (e.g. blasting methods, mechanical demolition, etc.).
- Full details of public safety measures and protection of adjacent structures, including protective hoardings, shoring and warning devices, protection of public footpaths, kerbs, gutters, etc. adjacent to the property.
- Where the applicant is not the owner or lessee of the property a statement of consent by the owner or lessee.
- An estimate of the total cost required of the demolition work. This is required for calculation of fees.

Additional information will be required where asbestos material is included in the demolition work. A separate permit is required for the removal of any asbestos before demolition or alteration work is carried out. It is advisable to have buildings surveyed for asbestos before an application for demolition is lodged for approval. Information about the requirements for the removal of asbestos can be obtained by contacting the Building Controller.

Redevelopment proposals are required to be lodged at the same time. Approval to demolish may be conditional on approval of the redevelopment.

Approval by Other Authorities

A number of other authorities in the ACT may impose requirements on demolition work.

The application will be checked for compliance by:

- **ACT Lease Administration** – will check compliance with development policies and conditions and covenants of the lease and Minister's approval under the lease. Application to ACT Building Control will ensure this requirement is met. Applicants may obtain prior leasing approval and submit plans endorsed with lease approval.
- **ACT Planning Authority** – will ensure compliance with its planning policies and may consult with those concerned with the protection of buildings in heritage sensitive areas.
- **ACT Electricity and Water** – to arrange disconnection of existing electricity services and water supply.
- **Telecom, AGL, Natural Gas Company** – to arrange disconnection of telephone and gas supply.
- **ACT Waste Management** – arrangements for disposal and dumping of building debris.
- **ACT Traffic Control** – traffic and parking arrangements for removal of building debris.

Permit to Carry Out Demolition

A building permit for demolition work must be obtained by the holder of a Class D builder's licence, endorsed for demolition work, before any demolition work is commenced. A minimum of three years practical experience in demolition work is necessary to obtain a Class D demolition licence or a demolition endorsement. The holder of another licence classification is not permitted to carry out demolition work unless the licence is endorsed accordingly.

In addition a permit holder must obtain a 'Notice of Intention to Commence Work' in accordance with Regulation 72A of the *Scaffolding and Lifts Regulations* and pay fees in accordance with Regulation 72A of the *Scaffolding and Lifts Regulations*.

Demolition to Comply

Demolition work must be carried out in accordance with approved plans and the conditions of the permit and in accordance with the requirements of other relevant authorities. The Building Controller or building inspectors may issue a Stop Notice in accordance with Section 43 of the *Building Act 1972* if demolition work is not carried out in accordance with the approved plans. Heavy penalties may be imposed for unauthorised demolition.

Completion of Demolition Work

Spot checks are carried out by building inspectors during the progress of the demolition work. When the work has been completed a clearance certification should be obtained from ACT Electricity and Water to ensure that disconnected services meet requirements.

The Building Controller may require a certificate from a practising structural engineer endorsed by adjacent site owners that the structural stability of adjacent or adjoining property has not been affected by the demolition work.

Further Information

Further information about the demolition of buildings can be obtained by contacting ACT Building Control offices.

Information that May be Required

The following information may be required to be lodged with an application for approval to demolish or remove a building;

- an outline and a description of the building or part of the building to be demolished or removed;
- an allotment plan showing the location of the building in relation to the boundaries of the allotment and such other features as adjoining buildings or other buildings on the allotment, streets, footpaths, crossings;
- where a part only of the building is to be demolished or removed, computations or other information to show that the remainder of the building will comply with the provisions of this Code, either as it remains after the proposed demolition or removal takes place, or after other works are carried out;
- information showing the position and description of hoardings, barricades, temporary crossings, protective awnings and outriggers;
- details of any proposed work for the protection of property and the public;
- a written description of the demolition procedures; and
- evidence that –
 - the demolisher is in possession of a public liability insurance policy for not less than \$1 million in respect of the proposed demolition work and that the policy will not expire during the demolition work;
 - the demolisher has the necessary knowledge, experience, equipment and storage facilities to properly conduct the demolition operations.

Retention of Drawings and Specifications Lodged*Where a Building Approval is Granted–*

- one copy of the drawings and specifications, together with all documents lodged therewith, should be retained by ACT Building Control until the building concerned is demolished;
- 2 copies of the drawings and specifications with evidence of approval stamped or endorsed there on, should be retained to the applicant who ensure that –
 - for Class 1 or X buildings where required by the building controller; and
 - for other than Class 1 or X buildings, one copy is available for inspection on the allotment while the work is in progress;
- a copy of the building approval should be forwarded by the co-ordinator to every appropriate relevant authority.

Precautions During Construction or Demolition

Public Safety – Protection to be Provided

Before and during the carrying out of any building work:

- protection should be provided if and when required by the Building Controller; and
- within 3 metres of any street alignment, precautions should be taken to ensure the safety of the public using the street and particulars of such precautions should be approved before any building work is commenced.

When Protection May be Dispensed With

The requirements may not apply in the case of underpinning if the building Inspector is satisfied that the foundation of a building on an adjoining property consists of hard stable rock. Clearance should be sought from the Building Controller.

Notice to Adjoining Owners

The notice required to be given by the owner to the adjoining owners should be in accordance, with guidelines as prescribed by the *Building Act 1972*.

Response from Adjoining Owner

A notice required to be given by an adjoining owner agreeing or disagreeing with the proposed protection works or requiring more information should be in accordance with the *Building Act 1972*.

Guarding of Excavations

All excavations should be fenced or otherwise guarded against being a danger to life or property.

Fire Protection During Construction

During the construction of a building which is to exceed 25 metres in height above ground level other than a mast, pole, aerial or similar structure–

- a fire main not less than 100 millimetre nominal size fully charged with water should be provided;
- the fire main should be extended upwards along with the construction and be available for use not more than 2 storeys below the highest formed floor level of the building;
- the fire main should be fitted with a 63 millimetre hydrant and a fire hose reel containing 36 metres of 20 millimetre hose at each storey served by the fire main;
- the fire main should be equipped with the necessary valves and connections at ground level for the connection of a fire brigade booster pump;
- the fire main should be provided with a header tank, pump or other means so that the topmost hose reel should be capable of operating at an inlet low pressure to the reel of not less than 70 KPA for a period of at least 15 minutes when it is the only hose reel that is in operation; and

- the locations of required fire mains, hydrants and fire hose reels should be subject to the approval of the Chief Fire Officer, ACT Fire Brigade.

Demolition

Interpretation

For the purpose of this Code of Practice a **demolisher** means any person who demolishes or removes or authorises the demolition or removal of any building or part thereof.

Responsibility for Demolition

The demolisher should be held responsible for the whole of the work referred to in the approval to demolish including any work carried out by sub-contractors.

Application

This Part should apply to demolition works on all buildings except those works in the opinion of the Building Controller are of a minor nature.

Precautions Before and During Demolition

Precautions before and during demolition should be as follows:

- The demolition should not be commenced until precautionary measures have been inspected and approved.
- Before demolition is commenced and also during the progress of such work all electric cables or apparatus which are liable to be a source of danger, other than a cable or apparatus used for the demolition works should be disconnected.
- During the progress of demolition the work should be under the continuous supervision of the demolisher or of an experienced foreman.
- Unless otherwise expressly approved demolition should be executed storey by storey commencing at the roof and working downwards.
- All practicable precautions should be taken to avoid danger from collapse of a building when any part of a framed building is removed.
- Demolished material should not be allowed to remain on any floor or structure if the weight of the material exceeds the safe carrying capacity of the floor or structure and such material should be so piled or stacked that it will not endanger workmen or other persons, and should be removed as soon as practicable from the site unless otherwise authorised by the building Controller.
- Dust creating material, unless thoroughly dampened should not be thrown or dropped from the building but should be lowered by hoisting apparatus or removed by material chutes.
- Chutes should be completely enclosed and a danger sign should be placed at the discharge end of every chute.
- No part of any external wall on or within 3 m of a street alignment should be pulled down except during such hours as the building Controller may direct.

- No wall, chimney or other structure or part of a structure should be left unattended or unsupported in such a condition that it may collapse due to wind or vibration or otherwise become dangerous.
- Protective outriggers should be installed where necessary to guard against danger to life or property or when required by the building Controller.

Historic and Special Buildings

Restrictions may apply in situations in which it is proposed to alter or demolish any existing building of historic or special interest.

Department of Urban Services
ACT Building Control

Issue: 3

BUILDING NOTES

Date: 1/8/91

BN.46 DEMOLITION

Demolition of a building is defined as 'building work' in Section 5(1) of the Building Act 1972. Consequently there are a number of requirements to be met and procedures to be followed in any proposal to carry out demolition work.

REQUIREMENTS FOR APPROVAL OF DEMOLITION

An application to ACT Building Control for approval of demolition is required. The Building Act requires the applicant to provide the following information:

1. Site plan showing location and extent of demolition.
2. Full details of the proposed methods of demolition (eg. blasting methods, mechanical demolition, etc).
3. Full details of public safety measures and protection of adjacent structures, including protective hoardings, shoring and warning devices, protection of public footpaths, kerbs, gutters, etc, adjacent to the property.
4. Where the applicant is not the owner or lessee of the property a statement of consent is required from the owner or lessee.
5. An estimate of the total cost of the demolition work. This is required for calculation of fees.

Additional information will be required where asbestos material is included in the demolition work. A separate permit is required for the removal of any asbestos before demolition or alteration work is carried out. It is advisable to have buildings surveyed for asbestos before an application for demolition is lodged for approval. Information about the requirements for the removal of asbestos can be obtained by contacting ACT Building Control's Asbestos Officer on 247 3522.

Redevelopment proposals are required to be lodged at the same time. Approval to demolish may be conditional on approval of the redevelopment.

APPROVAL BY OTHER AUTHORITIES

A number of other authorities in the ACT may impose requirements on demolition work.

BN. 46 Continued

The application will be checked for compliance by:

- . Lease Administration - will check compliance with development policies and conditions and covenants of the lease and Minister's approval under the lease. Application to ACT Building Control will ensure this requirement is met. Applicants may obtain prior leasing approval and submit plans endorsed with lease approval.
- . ACT Planning Authority - will ensure compliance with its planning policies and may consult with ACT Heritage Committee for protection of buildings in heritage sensitive areas.
- . ACT Electricity and Water - to arrange disconnection of existing electricity services and water supply.
- . Telecom/AGL - to arrange disconnection of telephone and gas supply.
- . Waste Management - arrangements for disposal and dumping of building debris.
- . Traffic Control - traffic and parking arrangements for removal of building debris.

PERMIT TO CARRY OUT DEMOLITION

A building permit for demolition work must be obtained by the holder of a Class D builder's licence, endorsed for demolition work, before any demolition work is commenced. A minimum of three years practical experience in demolition work is necessary to obtain a Class 'D' demolition licence or a demolition endorsement. The holder of another licence classification is not permitted to carry out demolition work unless the licence is endorsed accordingly.

In accordance with section 31, of the Building Act, the application form for the building permit must be endorsed with the approval of ACTPA prior to lodgement at ACT Building Control.

In addition a permit holder must obtain a "Notice of Intention to Commence Work" and pay fees determined in accordance with the Scaffolding and Lifts Act as applicable.

DEMOLITION TO COMPLY

Demolition work must be carried out in accordance with approved plans and the conditions of the permit and in accordance with the requirements of other relevant authorities. The Building Controller may issue a Stop Notice if demolition work is not carried out in accordance with the approved plans. Heavy penalties may be imposed for unauthorised demolition.

BN.46 Continued

COMPLETION OF DEMOLITION WORK

Spot checks are carried out by building inspectors during the progress of the demolition work. When the work has been completed a clearance certificate should be obtained from ACT Electricity and Water to ensure that disconnected services meet the requirements.

The Building Controller may require a certificate from a practising structural engineer endorsed by adjacent site owners that the structural stability of adjacent or adjoining property has not been affected by the demolition work.

An application may then be made to the Building Controller for the issue of a Certificate under Section 53(10) of the Building Act stating that the demolition has been completed in accordance with the prescribed requirements.

FURTHER INFORMATION

Further information about demolition of buildings can be obtained by contacting the Building Surveyor in any of the ACT Building Control offices.



Department of Urban Services
ACT Building Control

Application for Approval of Plans

Name of Applicant (please print clearly)		Address	
Contact name	Phone: Wk	Hm	Postcode
Name of lessee / owner of parcel of land		Address (show PO Box No. if any)	
		Phone: Wk	Hm Postcode
Description of the building work involved in this application		Tenancy fitouts: include details of Tenancy No., Shop No., Floor level	
Division (Suburb) District		Section	Block Unit
To be specified in accordance with the appropriate classification in the Building Code of Australia.	Type of Construction (N/A for Class 1 or 10 Buildings)	Class of Building	Total Floor Area m ²
Cost of Building Work Fixed by Contract			Cost \$
Estimated Value (to be completed only where not fixed by contract) (refer Building Cost Guide "BN25" for building types and current rates to calculate costs)	Building Work(BN25)	Rate/m ² (BN25)	Area
		\$	m ²
		\$	m ²
		\$	m ²
Total Estimated Value of Building Work			\$
This application is for:			
New Work <input type="checkbox"/>		Existing Building Work <input type="checkbox"/>	Amendment to Details for <input type="checkbox"/> Approved Plan No. <input type="text"/>
I hereby request that approved plans be posted to the applicant's address <input type="checkbox"/> held at the counter for collection <input type="checkbox"/>			
Design Information required under Section 32 of the Building Act to be provided by designer		Declaration	
Classification of foundation material - AS 2870.1		I declare that the particulars on this application for approval of plans are true and correct in every detail and that I am the person indicated by a tick in the relevant box below.	
Certificate of Site Classification should be attached with this application unless engineering option (Item 6) is selected below.		<input type="checkbox"/> 1. I am the / a person to whom the lease for the land is registered at the Land Titles Office, or	
I or the permit holder will be submitting certification from a practising structural engineer for:		<input type="checkbox"/> 2. I am a director / secretary of the company to which the lease for the land is registered at the Land Titles Office, or	
• Certification of foundation material on the "Certificate of Site Classification" standard form,		<input type="checkbox"/> 3. I am a person authorised to act on behalf of the person / company in 1 or 2 above. (Give original written evidence of authority from the person / company), or	
• Certification of the footing and/or slab preparation.		<input type="checkbox"/> 4. I am an architect engaged by and acting on behalf of the person / company in 1 or 2 above, or	
As a result I wish to apply for:		<input type="checkbox"/> 5. I am a solicitor engaged by and acting on behalf of the person / company in 1 or 2 above.	
• Plans of the building work to be approved subject to the above.		<input type="checkbox"/> 6. I also select Site Classification - Engineering option	
• A discount of permit fees that are payable.		Declaration / Signature	
		Important: Section 59A of the ACT Building Act 1972 provides for severe penalties for false or misleading statements.	
For Office Use Only	New Work <input type="checkbox"/>	Approved Plan No.	Licence Required
	Amendment to approved plans <input type="checkbox"/>		Type of Construction
	Details <input type="checkbox"/>	Class of Building	Area
	Existing building work <input type="checkbox"/>	Valuation	Total Fees payable
Plan endorsed	Plans		
new permit required <input type="checkbox"/>	Approved <input type="checkbox"/>		
endorse existing permit <input type="checkbox"/>	Not approved <input type="checkbox"/>		
	Deputy Building Controller		

BL1/6(3/91)

Classification of Buildings

Section 32 of the Building Act requires the application for approval of plans to specify the class of building according to the use to which the building is intended to be used when erected or altered. The classification of buildings is summarised as follows. For full details refer to Part A3 of the Building Code of Australia.

Residential Buildings

Class 1: a residence which may comprise one or more buildings including any habitable outbuildings which in association constitute -

- (a) a single dwelling-house, terrace house, townhouse, row house, villa house, or the like, which may be detached or separated by a common wall;
- (b) a dwelling-house used as a boarding-house, hostel, group house, dual occupancy house, or the like, in which not more than 12 persons would ordinarily be resident; or
- (c) a residential building that does not exceed a rise of 3 storeys and contains only 2 sole-occupancy units located one above the other and each unit has direct egress to a road or open space.

Class 2: a building containing 2 or more sole-occupancy units each being a separate dwelling, other than a building of Class 1.

Class 3: a residential building, other than a building of Class 1 or 2, which is common place of living for a number of unrelated persons, including -

- (a) a boarding-house, guest house, hostel, or lodging-house;
- (b) a residential part of an hotel or motel;
- (c) a residential part of a school;
- (d) accommodation for the aged, disabled or children; and
- (e) a residential part of a health-care building which accommodates members of staff.

Class 4: a dwelling in a building that is Class 5, 6, 7, 8 or 9 if it is the only dwelling in the building.

Commercial Buildings

Class 5: an office building used for professional or commercial purposes, excluding buildings of Class 6, 7 or 8.

Class 6: a shop or other building for the sale of goods by retail or the supply of services direct to the public, including -

- (a) an eating room, cafe, restaurant, milk or soft-drink bar;
- (b) a dining room, bar shop or kiosk portion of an hotel or motel;
- (c) a hairdresser's or barber's shop, public laundry, or undertaker's establishment;
- (d) market or sale room show room, or service station.

Class 7: a building which is -

- (a) a public carpark; or
- (b) for storage, or display of goods or produce for sale by wholesale.

Class 8: a laboratory, or a building in which a handicraft or process for the production, assembling, altering, repairing, packing, finishing, or cleaning of goods or produce is carried on for trade, sale, or gain.

Class 9: a building of a public nature -

- (a) Class 9a - a health-care building;
- (b) Class 9b - an assembly building, and

Class 9a includes a pathology laboratory in a health-care building and Class 9b includes a trade workshop in a primary or secondary school, but excludes any other part of these buildings that are of another Class.

Other Structures

Class 10: a non-habitable outbuilding or structure -

- (a) Class 10a - a carport, private garage, shed, or the like;
- (b) Class 10b - a fence, mast, antenna, retaining or free-standing wall, swimming pool, or the like.



ACT Building Control

Application for a Building Permit

Building Act 1972, Section 35 and 39

Note: This application must be made by the holder of a Builder's Licence or If by an Owner-Builder must be accompanied by an Application for Owner - Builder Permit.

White: Fee
Green: Australian Bureau
of Statistics

Project No. - Office Use		Applicant to Complete				
		Approved Plan No.	Suburb	Section	Block	Unit
Name of Builder		Initials	Address		Postcode	
			Phone: Work		Home	
Name of Lessee		Initials	Address		Postcode	
			Phone: Work		Home	
Class of Builder's Licence held by Applicant		Licence Number	Expected date of completion of building work / /			

Type of Work (please tick appropriate boxes)

<input type="checkbox"/> New Building	<input type="checkbox"/> Additions to existing building	<input type="checkbox"/> Refurbishing
<input type="checkbox"/> Demolition	<input type="checkbox"/> Alterations to existing building	<input type="checkbox"/> Other (please specify)

Type of Construction and Class of Occupancy as shown on the approved plans

Type of Construction	Class of Occupancy	Lease covenant completion date / /	Cost of Building work (excluding land) \$ <input type="checkbox"/> Contract Value <input type="checkbox"/> Estimated Value
Non-residential Building type eg. shop, factory Please specify	Residential Number of new/additional self-contained dwellings		
	<input type="checkbox"/> Transportable house	<input type="checkbox"/> Kit house	
	<input type="checkbox"/> Flat, Unit, Apartment	<input type="checkbox"/> Duplex, semi-detached, row/terrace house, townhouse	
	<input type="checkbox"/> Separate house	<input type="checkbox"/> Other - please specify	
Main material used in outside walls (if applicable)	Main material of roof (if applicable)	Total Floor Area in square metres	
Main material of building frame (if applicable)	Main material of floors (if applicable)	Total number of storeys including the ground floor, excluding the basement	
Permit Period Required <input type="checkbox"/> 6 months <input type="checkbox"/> 1 year <input type="checkbox"/> 2 years <input type="checkbox"/> 3 years Subject to lease covenant (unless otherwise approved)		Note: The following permit periods apply • Residences, major alterations/extensions 1 year • Minor alterations/extensions/garages/carports/swimming pools 6 months • Small commercial projects 1 year • Medium commercial projects 2 years • Large commercial projects 3 years • Shop fitouts/office refurbishments/alterations/extensions 6 months	

The information you have provided will be treated with strict confidence and in accordance with the provisions of the Privacy Act.

Declaration I declare that the particulars on this application for the grant of a permit are true and correct in every detail and that I am the person eligible for the permit. Signature Date / / Important: Section 59A of the ACT Building Act 1972 provides for severe penalties for false or misleading statements.	Lessee's Signature Date / /
--	------------------------------------

Office Use Only			
Total fees payable \$	Valuation	Permit approved <input type="checkbox"/> Permit Refused <input type="checkbox"/> Housing indemnity <input type="checkbox"/>	
Class of Licence	Owner Builder Yes <input type="checkbox"/> No <input type="checkbox"/>	Conditions <input type="checkbox"/> Survey required <input type="checkbox"/> insurance policy sighted	
Licence File No.	Permit Expiry Date / /	Deputy Building Controller's Signature	Date / /

BL1/1(4/91)

Appendix 3 - Checklists

Building Owner Checklist

- ☐ Have all the available plans and specifications of the building been provided to the demolition contractor?
- ☐ Have the necessary approvals been obtained from the regulatory authority?
- ☐ Have the relevant authorities controlling essential utility services been notified?
- ☐ Has the extent of the demolition work been defined?
- ☐ Has a realistic period of time been allocated for the demolition?
- ☐ Have the adjoining owners been notified and protection works agreed to?
- ☐ Has the extent, nature and location of hazardous materials been documented?
- ☐ Have all services been located?
- ☐ Have all underground tanks, vaults and wells been located?
- ☐ Have all chemicals, volatile fuels and gases been deactivated?
- ☐ Is the building free from vermin?
- ☐ Is the vacant building secure from fire?

Safety Checklist

- ☐ Workplan prepared and available on site?
- ☐ Safety plan prepared and available on site?
- ☐ Telephone with all emergency numbers displayed?
- ☐ First aid person and kit on site?
- ☐ Overhead protection, hoarding, gantries and protective structures sufficient to protect public and prevent unauthorised entry?
- ☐ Fire fighting equipment available and persons trained in its use?
- ☐ Demolition warning signs in place?
- ☐ Safe access to site office clearly marked?
- ☐ Toilets, and amenities clean and in a safe area?
- ☐ Safe access to work areas clear of rubble and well lit?
- ☐ Competent supervision on site?
- ☐ Asbestos and other hazardous substances been removed?
- ☐ Tanks, voids and vaults located?
- ☐ Tanks degassed and rendered safe?
- ☐ Electricity, gas and other services not required cut off?
- ☐ Earth leakage to all temporary power?
- ☐ Shoring and underpinning where required?
- ☐ Floors back propped where required?
- ☐ Penetrations in floors covered or barricaded?

- ☐ Open sides of floors, roofs, stairwells, lightwells and lift shafts protected?
- ☐ Vehicle buffers provided at debris chutes and openings?
- ☐ Debris dropping zone clearly signed and barricaded?
- ☐ Welding and cutting cylinders in cages or otherwise secured?
- ☐ Fire extinguishers with cutting gear?
- ☐ Goggles, gloves and protective equipment provided with cutting gear?
- ☐ Jack hammers and compressors fitted with silencers?
- ☐ Compressor hose connections fitted with safety pins?
- ☐ Respiratory, hearing and eye protection provided?
- ☐ Debris cleared from floors to prevent overloading?
- ☐ Combustible debris not building up to become a fire hazard?
- ☐ Lift shafts barricaded and catch platforms where necessary?
- ☐ Safe work platforms provided?
- ☐ Hard level surface provided for elevated work platforms, free from penetrations or upstands?
- ☐ Scaffolds tied to structure and fully boarded guardrails, toe boards and access provided?
- ☐ Scaffold undamaged and free from debris?
- ☐ Where site adjoins public place perimeter scaffold provided and dust proofed?
- ☐ Earthmoving equipment and demolition machinery operated by competent persons with the appropriate certificates of competency where required?
- ☐ Earthmoving equipment and demolition machinery provided with overhead protection where appropriate?
- ☐ Earthmoving equipment and demolition machinery used on floors certified safe by an engineer and backropped where required by engineer?
- ☐ Engineers report on floors to support earthmoving equipment and demolition machinery made known to the relevant persons on site?
- ☐ Health and safety representatives consulted and informed of all workplans, safety plans and intended work procedures on site?

Appendix 4

Some General Terms used in the Demolition Industry

Battens: Timber members of small sectional dimensions.

Ceiling: Light members, nailed to ceiling joists, to which the ceiling is fixed.

Roof or Tile Roofing: Timbers fixed to the tops of rafters to which the roof coverings may be secured.

Beams: A horizontal load-bearing structural member.

Cantilevered: A projecting beam with one end unsupported.

Bearer: A sub-floor timber supporting the floor joists.

Bearing: That part of any member of a building that rests upon its supports.

Brace: A member, usually a diagonal, which resists lateral loads and / or movements of a structure.

Brace Frame: A building framework in which the corner posts are braced to sills and plates.

Brick Construction: A construction where the external and internal walls are built of brick.

Brick Corbelling: A brick, load bearing projection from a wall either isolated or continuous.

Brick Pier: A detached mass of masonry which serves as a support.

Brick Veneer Construction: A method of construction in which wall framing of timber or metal is enclosed externally by veneer of brickwork.

Building Line: The line or limit, on a lot beyond which the law forbids the erection of a building.

Bulkhead: A box like structure which projects above or below a roof, floor or ceiling.

Ceiling: The overhead internal lining of a room.

— **Acoustic:** Ceiling materials to absorb or reflect sound or prevent sound transference to adjacent areas.

— **Suspended or False:** A ceiling which is suspended from and is not in direct contact with the floor or roof construction above and generally used to conceal services.

Ceiling Joists: The joists, usually acting as a tensile roof member and which support the overhead interior lining of a room or serving as floor joists for a storey above.

Chase: A rough groove or recess cut into a masonry wall for water pipes, conduits, etc.

Chutes: An inclined or vertical trough or tube through which articles are passed from a higher to a lower level.

Cleat: A small piece of timber fixed to a larger piece, as a bearing block.

Clout: A nail, usually galvanised, with a flat circular head.

Column Footings: Concrete footings, reinforced with steel rods, used as supports for columns.

Coping: The capping or covering at the top of a wall.

Corbel: A projection from a wall, either isolated or continuous, usually load bearing.

Cornice:

- (a) Horizontal projection at the top of a wall.
- (b) A mould placed at the junction of wall and ceiling.

Crazing: Fine cracks that may occur on plastered or rendered surfaces.

Dado: The lower portion of a wall above the skirting when finished in contrast to the remainder of the wall.

Datum: A predetermined level on a site from which all other levels are established.

Dead Load: A permanent inert load on a building or other structure due to the weight of its structural members and the fixed loads they carry, which impose definite stresses and strains upon the structure.

Decibel: A unit for measuring sound intensity.

Disturbed Load: A load spread over a surface expressed in kilograms per square metre, or along a length of member exposed in kilograms per metre.

Division Wall: Wall which separates buildings or which divides space within a building into several rooms or compartments.

Door Frame: A frame into which a door is fitted.

Doorhead: The upper part of the frame of a door.

Door Jambs: Two vertical members of a door frame.

Dowel: A wood or metal pin used to strengthen a joint by its insertion partly into each of the joined pieces.

Eaves: The lower part of a roof that overhangs the wall.

Egress: Way out.

Elevation: A geometric drawing of a facade of a building.

Engineering: A professionally qualified person, who when associated with building and planning, designs, supervises and manages civil, structural and services components of the project.

Facade: The face or front wall of a building.

Facia: A board fixed horizontally to the lower end of the rafters, to which spouting may be fixed; also forms the outside board of boxed eave.

Fibro-cement or Cement: A building sheet composed of asbestos fibres and asbestos cement.

Finishes: The final applied coat or natural surface of a material used in walls, ceilings or floors of a building.

Fire Escape: A fire rated stairway to provide a means of escape, in case of fire, for persons within the building.

Fire Hydrant: An outlet from a water main to which a fireman can connect his hose and control the flow as he wishes.

Fire Floor: The floor which is next above the floor at ground level.

Floor (Finished Floor): Floor covering, usually of highgrade material laid over the subfloor or structural floor.

Floor Framing: The framework for a floor, consisting of bearers and joists.

Footings: The construction whereby the weight of the structure is transferred from the base structure to the foundation.

Foundation: The ground upon which the footings of a building are constructed.

Frog: The indent on one of the larger faces of a brick which forms a key for mortar.

Gable: The triangular end of a house formed at the end of a pitched roof, from eaves level to apex.

Gantry: A structure for the manipulation and transmission of heavy weights which normally runs parallel to the ground.

Girder: A main beam resting upon a wall or pier at each end and employed for supporting a superstructure.

Gutter, Quadrant Eaves: A gutter section with the lower outside edge in the form of a quadrant.

Valley: Inclined gutter formed between intersecting sloping surfaces of a roof.

Roof or Eaves Sprouting: The channel for collecting rain water from a roof.

Handrail: A railing which serves as a guard and which is intended to be grasped by hand to serve as a support.

Hanging Beam (Hanger): A beam above the ceiling joists, supported on walls or partitions to which the ceiling joists are fixed by 'dogs', cleats or straps (e.g. hoop iron or small timbers) in order to prevent any deflection.

Hardboard: A hard wallboard of highly compressed wood fibre.

Hatching: Parallel lines drawn close together for the purpose of shading or to indicate a material shown on a drawing.

Hearth: The floor of a fireplace, including a small area in front of the fireplace paved with incombustible materials.

Iron:

- **Black:** Ungalvanised steel, e.g. piping.
- **Galvanised:** Rolled sheet or strip iron, zinc coated in flat and corrugated sheets of various gauges.

Joists: Timber members spanning between walls or other support.

Ceilings: Supports to which the ceiling battens or ceiling is attached.

King Post: Vertical timber tie used to connect the ridge and the tie beam of a roof, shaped at its lower end so as to afford bearing to two struts which support the middle point of the rafter.

Lagging: Insulated covering for services (e.g. hot water pipes).

Lap:

- **End:** In roofing, the amount by which the upper sheet or unit of roofing overlaps the sheet or unit immediately below it.
- **Side:** In roofing, the amount by which sheets or units of roofing materials overlap each other at the side joints.

Lateral Thrust: The pressure of a load which extends to the sides.

Lean-to: A small building or extension of a building having a single-sloped roof whose rafters pitch or lean against another building or support.

Lintel: A beam spanning an opening.

Live Load: The load arising from the intended use or purpose of the building or structure, but excluding wind, snow and earthquake loads.

Load Bearing Wall or Partition:

- (a) a wall which supports the floors and roof in a building.
- (b) a partition that carries the floor joists and other partitions above it.

Main: Street reticulation service provided by the supply authority, e.g. gas, water and sewerage.

Mantle: A shelf over a fireplace.

Masonry: Brick, concrete, stone, artificial stone or terra cotta laid in mortar.

Matrix: The mixture of sand and cement that binds together the aggregate of concrete.

Metal ties: A type of steel tie used to bond two separate wall sections together in cavity type walls.

Meter: In the commercial distribution of electricity, water and gas, an instrument for measuring the quantity of service supplied to a consumer.

Mortar: A composition of lime and/or cement and sand mixed with water in various proportions.

Mortar Joints: Types of joints in finishing the mortar in stone or brick work.

Mosaic: Combination of small coloured stones, glass or other material to form a decorative surface design, inlaid usually in a ground of cement or stucco.

Moulding: When any work is wrought into long regular channels or projections forming curves, rounds, hollows, it is said to be moulded and each member is a moulding.

Mullion: A vertical member is dividing a window frame.

Nail Spring-Head: A galvanised nail with a mushroom-shaped head used to fix corrugated iron sheets.

Natural Foundation: A foundation in soil which requires no preparation (e.g. the driving of piles to make an effective foundation for supporting the structure).

Needle: A short stout timber, steel or iron beam which is passed through a wall horizontally to support the end of a shoring timber.

Niche: A recess or hollow sunk in a wall.

Noggin: A horizontal piece of timber fixed between studs in a framed wall.

Over-loading: Placing too heavy a load on a beam, column or floor.

P.V.C.: A widely used plastic – main uses include water pipes, (Polyvinyl Chloride) waste pipes and flooring.

Pad Stone: A bearing stone in a wall under a girder or other beam or as a lintel to distribute the weight or pressure of the load above.

Pane: Single piece of glass in a window or door.

Parapet: Low wall at the edge of a roof, balcony, bridge or terrace.

Partition Wall: An interior non-bearing wall dividing a building into rooms.

Party Wall: The wall between two adjoining buildings but common to an used to the advantage of both buildings.

Pergola: An open framework over a path, terrace or patio.

Picture Rail: Moulding or rail, around the interior walls of a room near the ceiling provided for hanging pictures.

Pier: A column or post supporting a super-structure such as floor bearers, verandahs, beams, etc.

Engaged Pier: A pier bonded into a wall.

Sleeper Pier: Independent brick, concrete or wooden supports for floor bearers.

Pillar: An upright shaft or column, relatively slender in comparison to its height.

Pile Driving Machinery: A mechanised device which raises and drops a heavy metal 'hammer' onto piles from a height sufficient to drive the piles into the earth. The motive power is obtained from oil or steam engines.

Planning: A process by which a forward program of events is formulated.

Plaster: Material of a mortar like consistency used for covering walls and ceilings of buildings usually made of Portland cement mixed with sand and water.

Plasterboard: A rigid insulating board made of plastering materials covered on both sides with heavy paper.

Plumb: Vertical or perpendicular.

Point of Entry: The point at which the service line or the consumer's mains enter a building.

Polystyrene Foam, Polyurethane Foam: Plastic materials in foam form used for thermal insulation.

Polythene (Polyethylene): Widely used flexible plastic, its main use being as a moisture barrier under floors.

Porch: A covered entrance to a building.

Portal: An entrance way (e.g. door or gate).

Portico: An open space covered with a roof supported by columns.

Post: A vertical structural member.

Power Socket: An electric outlet at the terminal of a power circuit.

Pre-cast: Poured or cast in any place other than its ultimate position (e.g. pre-cast units of concrete houses).

Prefabricated Construction: The manufacture in a factory of whole parts of buildings such as individual rooms, walls and roofs, in contrast with the conventional construction of a building piece on the site.

Pre-mix: To mix materials together (e.g. concrete or mortar) before being transported to the building site. The process is usually carried out in a large central depot.

Projection: A jutting out of any part or member of a building.

Purlins or Underpurlins:

- (a) In simple roof construction, longitudinal roof timbers giving intermediate support for rafters, supported at intervals longitudinally by struts.
- (b) In some roofs of trussed construction the purlins perform a different function, being the direct support for the roof covering, they bear on the principal rafters of each truss and span between trusses.
- (c) In roofs of trussed construction employing common rafters purlins span between trusses supporting the lighter common rafters at requisite intervals.

Pylon: A gateway, a marking post, tower or other marker.

Quoin: The dressed corner stone in a random masonry wall.

Rafter (Common): In roof construction, a timber framing member providing the principal support for the roofing material.

Rail: A piece of timber or metal extending from one post to another, as in fences, balustrades, staircases, etc.; in joinery framing and panelling, the horizontal members are called rails, e.g. in doors, top rail, lock rail, bottom rail.

Ram: To compact or consolidate, e.g. the consolidation of earth around fence posts, footings.

Reinforced: To strengthen by the addition of new or extra material (e.g. reinforced concrete – steel rods are embedded to give additional strength).

Reinforced Concrete Construction: Building construction in which the principal structural members are made of concrete which is poured around isolated steel bars or steel meshwork, in such a way that the two materials act together.

Reinforcing Fabric: Prefabricated steel reinforcement for concrete, consisting of an oblong or square mesh of parallel steel wires welded at points of contact and manufactured in flat sheets or rolls.

Reinforcing Steel: Steel bars of various sizes and shapes used in concrete construction for giving added strength.

Rendering Cement: The covering of a wall surface with one or more coats of cement mortar.

Retaining Wall: Any wall subjected to lateral pressure other than wind pressure and built to retain materials.

Reveal: The thickness of a wall from the wall face to the door or window frame. The remainder of the thickness of the wall is known as the 'jamb'.

Ridge: The highest part of the roof of a building at the meeting of the upper end of the rafter.

Roofing: The material put on a roof to make it watertight.

Roof Truss: A truss providing structural support for a roof.

Rot-Dry: A fungus disease in timber mainly caused by poor ventilation in which the fibres of the timber are reduced to a dry powdery dust.

Rot-Wet: A fungus disease in timber caused by excessive and continuous dampness, that results in the decomposition of the timber fibres.

Roughcast: External finish to a wall surface obtained by mixing bluestone toppings or pebbles, sand and cement to a creamy consistency and casting, to throwing the aggregation onto the surface.

Rubble: Rough broken stones or brick used to fill in courses of walls or for other filling.

Rubble Masonry: Masonry built of rough fragments of broken, unsquared or rudely dressed stones, irregular in size and shape. When only the roughest irregularities are removed, it is sometimes called scabbled rubble, and when the stones in each course are roughly dressed to almost a uniform height, it is often called ranged rubble.

S.A.A. Code or Specification: A code or specification recommended by the Standards Association of Australia.

Safe Carrying Capacity: Design of any piece or part of a building to support the load without falling.

Sagging: The bending of a structure of structural member because of its own weight or from the load upon it.

Sarking: A covering of waterproof building paper beneath the external roof covering.

Sash Balance: A mechanical suspension designed to balance the weight of a vertically sliding window sash.

Scabble: The dressing down of the roughest irregularities and projections of stonework or the roughening of a smooth finish (e.g. concrete).

Scaffold: A temporary support structure for workmen and materials, when the work is too high to be reached from a permanent platform.

Scantlings: Swan framing timbers of comparatively small dimensions (e.g. 100 x 50) in a building.

Scarfig: The joining of two pieces of timber together in length by which the two ends are cut to lap over and fit each other.

Score (Scoring): Marking with lines, scratches and grooves across a material with an instrument, to roughen the surface.

Secret Nailing: Driving nails in such a way that the holes are concealed (e.g. through the tongue in tongue and groove boarding).

Services: Supply or distribution pipes for cold or hot water, steam or gas; also power cables, telephone cables, lift machinery, transformers, drains, ventilation ducts, computer cables etc.

Sheathing: Outer casing or sheeting of a building.

Sheeting: Flat sheets of material to protect or cover a building framework.

Shingles: Thin pieces of wood or other material, oblong in shape and thinner at one end, used for covering roofs or walls.

Shoring:

- (a) Timbers used to prevent the sliding of earth adjoining an excavation.
- (b) The temporary or permanent support of existing structures, especially where they may be weakened by the removal of adjoining buildings.

Site: Ground on which a building stands, stood or is to stand in relation to its environment.

Skirting: Trim fixed on a wall at its junction with the floor.

Skylight: A window let into a roof generally with the same slope as the roof.

Slab: Flat thin piece of any material, such as stone, marble or concrete.

Slab Floor:

- (a) A reinforced concrete floor.
- (b) A floor covered with slabs of terrazzo, marble, slate, limestone, granite, cast stone.

Lack: A looseness in a fitting or a structural member which must be removed to ensure proper construction.

Slates: Roofing material made from slate which has a laminated structure capable of being split into thin pieces.

Soffit: The lower face or under-surface of anything (e.g. the under-surface of an arch, the underside of the eaves of a roof).

Spall:

- (a) A fragment or chip of masonry.
- (b) To reduce an irregular stone block to approximately the desired size by chipping with a hammer.

Specification: A written document containing details of work to be done and materials to be used in the construction of a building.

Stability: The resistance of a structure to sliding, overturning or collapsing.

Staging: The same as scaffolding.

Storey: That portion of a building situated between any floor level and the floor level next above it; if there is no floor level above, that portion between the floor level and the ceiling above it.

Storeys: The number of storeys in a building is the number of main floors above ground level, including the ground floor but excluding penthouses, or machine or plant rooms above the main roof level. Basements below ground level should be stated separately (e.g. 2B + 12 Storeys).

Structure:

- (a) The loadbearing part of a building.
- (b) Anything built by man, from an earth wall to a power station. A structure is not necessarily roofed, a building is.

Strut: An inclined structural member in compression.

Stucco: A process of cement rendering external walls.

Stud Partition: A room or building containing electrical equipment such as switches, usually with transformers to reduce high – voltage incoming power to a voltage at which the consumer can conveniently use it. It may be provided by the electricity authority or the consumer.

Substructure: The lower portion of a structure forming the supports for the super-structure of a building.

Sullage: The waste liquids discharge from all plumbing fixtures, excluding water closets and urinals.

Sump: A pit generally constructed with the floor below the level of the outlet pipe and designed for the disposal of stormwater or sullage.

Sump Pump: A pump of small capacity for occasionally emptying a sump in a part of a building which is below the level of the drains.

Surface: Face of a material.

Switchboard: Electric switchgear with or without fuses or instrument which includes distribution boards, but does not include groups of switches in final sub-circuits, where each switch has its own insulating base and protective covering.

Tension: A pulling or stretching force.

Terra Cotta: Clay shaped into various building forms, e.g. roofing tiles, and baked at high temperatures in special kilns.

Terrazzo: Material produced by setting irregular fragments of marble in a matrix of cement and rubbing them down to a smooth surface.

Thrust: The outward pressure on a material due to the load carried by it (e.g. by a rafter against a supporting wall).

Tie: A horizontal member in tension, usually a timber or steel rod binding two members of sections of a building together to prevent spreading.

Tie-Collar: A timber member tying a pair of rafters, usually placed midway between the wall plate and ridge.

Ties-Wall: Shaped galvanised wire or galvanised iron straps built into cavity walls to bind the inner and outer leaves; also in brick veneer construction to bind the framework to the brickwork.

Tile Wire: In tile roofing, copper, galvanised or other wire, used to tie roofing tiles to the battens in the French (Marseille) pattern tile. The wire is inserted through a special lug on the underside.

Tile-Apex: A special angular ridge tile used to cover the intersection of a ridge and hips.

Tile-Concrete: Roofing tiles made of concrete in various shapes and sizes.

Tile-Floor & Walls: Usually thin slabs of specially prepared clay in a variety of sizes, colours and patterns, baked at high temperatures. Glazed tiles are generally used for walls and unglazed tiles for floors.

Tile-Terra Cotta: A terra cotta roofing component; the shape most commonly used has been the French pattern, commonly known as Marseille tiles.

Tom: A temporary prop or strut.

Tonguing & Grooving: A method by which one board is grooved along the edge and the other tongued, so that one fits into the other.

Traps: A plumbing term used to describe any fitting which retains water to form a water seal for preventing the passage of gases, or for intercepting gases or silt, grease, acid or oil and that permits the free passage of liquids and solids through it. The depth of water in a trap through which gas must pass to effect passage is called the 'water seal'.

Trap Boundary or Interceptor: A trap generally placed as near as possible to the point or where the sewer leaves a property for discharge to the main sewer or where the house sewer line discharges into the main sewer; a trap preventing the passage of air or gases from the sewer and the lowest inlet to the drain.

Trap Disconnecter or Gully: A trap for isolating or disconnecting waste pipes from the drain and soil pipes and providing inlet ventilation to the waste pipe or pipes discharging into it.

Trap Grease: A trap designed to prevent grease entering the drainage system.

Trap Door: A covering for an opening in a floor, ceiling or roof.

Tread: In a stairway, the horizontal portion of each step.

Trellis: A structure or frame of cross-barred or lattice work.

Trench:

- a) In joinery, a groove.
- b) In drainage and plumbing, the excavation in which pipes are laid.
- c) In foundations, the excavation in which footings are placed.

Tuck Pointing: The finishing of masonry joints along the centre lines with a narrow parallel ridge of fine lime mortar.

Underpinning: The construction of new footings and walling under the footings of a existing structure which have failed or may fail.

Utility Services: All reticulation services such as water supply, gas supply, sewerage, electricity and garbage disposal.

Valley: The internal angle formed by two inclined slopes of a roof.

Vault:

- a) An arched structure of masonry usually forming a ceiling or roof.
- b) Specially constructed space for security of documents.

Veneer: Thin slices of a material used as a facing on other elements of a structure. Timber veneer is commonly used as a facing. This veneer is produced by rotary cutting or slicing logs or billets.

Ventilation: The process of changing or circulating the air in a space by either natural or artificial means.

Wall: An upright structure of definite dimensions for enclosing space, constructed of stone, brick or other suitable building material.

Wall – Bearing: A wall that supports a vertical load additional to its own weight.

Wall – Cavity: A wall built in two sections (leaves) with a space between, generally tied together.

Wall Anchor: A type of anchor used to tie the walls to the floors and hold them firmly in position.

Wall Bracket: Any bracket attached to a wall to support a structural member.

Wall Face: The finished surface of the wall.

Warped: Twisted out of shape (e.g. timber).

Wash Basin: A basin or bowl for holding water in which to wash one's hands and face.

Waste: A fitting connecting an internal plumbing fitment to the external drains.

Water Closet: A room equipped with toilet fixtures and facilities.

Water Heater: Equipment designed to heat water.

Waterproof: Materials and a construction which will prevent water from passing through walls and joints.

Water Service: Pipe reticulation for the purpose of supplying water from the water main to various fittings, e.g. bath, basin, sink.

Watertight: Construction which is waterproof.

Watt: A unit of electric power.

Weatherboarding: External wall sheeting formed with horizontal over-lapping or rebated boards.

Weathering: The sloping surface (e.g. of a sill or coping) designed to permit rapid shedding of water.

Weathertight: A joint which does not permit wind, water, heat or cold to pass through.

Wedges – Folding (Fox Wedges): Timber wedges used in pairs for lifting and tightening. In Australia, commonly called 'fox wedges'.

Weep Holes: Openings sometimes left in the perpend of a brickwork course over flashings, and at the bottom of wall cavities for drainage purposes.

Welding: Joining of two pieces of metal together when raised to a great heat.

Wind Brace: A structural member, either a tie or a strut, used to resist lateral wind loads.

Wind Load: The estimated pressure or force exerted upon a structure by the wind, which must be provided for, in the design of the structure.

Wind Proof: Construction which prevents the passage of wind through joints or materials.

Window: An opening in an outside wall (other than a door) to provide natural light and / or ventilation and covered by transparent material inserted in a frame either openable or fixed.

Wiring: In electrical work, placing and connecting the various conductors of lighting and power circuits.

Wood Flooring: Standard dressed and matched flooring.

Wood Frame Construction: Construction in which the structural members are of wood or dependent upon a wood frame for support.

Wood Mouldings: Timber trim members consisting of mouldings.

Wood Turning: The process of shaping pieces of wood into various forms by a lathe.

Woodwork: Work done in, or parts made of, wood.

Work Face: In squaring up a material, the first surface to be finished is called the work face.

Working Drawings: Drawings which are produced by the architect and his consultants for the purpose of constructing a building.

Wrought Iron: A commercial form of iron which is malleable, tough and relatively soft.

Appendix 5

Disconnection of Power

The Licenced Builder / Demolisher must apply to the ACTEW to have the electricity disconnected from the building. The ACTEW Engineer in Charge will supply a quote for the costs of disconnection to a large site where mains power must be disconnected and sub-station power must be shut down. Meters must be removed and returned to ACTEW.

In 1993 the domestic disconnection fee is \$104.00. Other fees are by estimation and quote for the costs of the service.

On payment of charges the services will be carried out.

Temporary Power

Application for temporary power to a site must be made to the Engineer ACTEW. Costs will be as per estimation and Quote. A meter will be supplied and connection of power to a temporary site will be made.

Disconnection of Water

Applications requesting disconnection should be made to the Senior Engineering Water Supply. Quote on the costs of disconnection will be given and upon payment of charges the services will be disconnected and the meters removed.

In domestic housing a licensed plumber may disconnect the water from the dwelling and return to meter to the Plumbing Inspectors or the ACTEW Water Supply Depots.

For large buildings, notification of disruption to supply must be made to other buildings in the vicinity by ACTEW. Special arrangements may need to be made to allow disconnections to be made without inconveniencing other users.

Disconnection of Gas Supply

The Natural Gas Company requires notification of disconnection prior to the commencement of work. The meter will be removed and the service will be disconnected at the building line and the excess gas will be burned off as required. At least 48 hours notice is required for the service to be supplied.

The Natural Gas Company will supply free of charges, a service to mark out the main supply lines to a building, to prevent accidental damage while sites are being excavated.

Appendix 6

Australian Standards referred to in this document (as at 19 December 1992) are as follows;

- 1270-1988** Acoustics – Hearing protectors
- 1337-1992** Eye protectors for industrial applications
- 1338** Filters for eye protectors
- Part 1-1992** Filters for protection against radiation generated in welding and allied operations.
- Part 2-1992** Filters for protection against ultraviolet radiation.
- Part 3-1992** Filters for protection against infrared radiation.
- 1418** SAA crane code (including hoists and winches)
- Part 1-1986** General requirements
- Part 2-1990** Serial hoists and winches
- Part 3-1990** Bridge, gantry, and portal cranes (including container cranes)
- Part 4- 1988** Tower cranes
- Part 5-1990** Mobile, vehicle loading and vehicle tow cranes.
- Part 6-1988** Guided storing and retrieving appliances
- Part 7-1988** Builders' hoists and equipment
- Part 8-1989** Special purpose appliances
- Part 9-1987** Vehicle hoists
- Part 10-1987** Elevating work platforms
- Part 12-1991** Crane collector systems
- 1558-1973** Protective clothing for welders
- 1674** Safety in welding and allied processes
- Part 1-1990** Fire precautions
- Part 2-1990** Electrical
- 1715-1991** Selection, use and maintenance of respiratory protective devices
- 1716-1991** Respiratory protective devices
- 1801-1981** Industrial safety helmets
- 1891-1983** Industrial safety belts and harnesses
- 1891** Industrial fall-arrest systems and devices
- Part 3-1992** Fall-arrest devices
- 1892** Portable Ladders
- Part 1-1986** Metal
- Part 2-1992** Timber.
- Part 4(INT)-1992** Selection, safe use and care
- 1940-1988** SAA flammable and combustible liquids code (storage and handling)

- 2161-1978** Industrial safety gloves and mittens (excluding electrical and medical gloves)
- 2210-1980** Safety footwear
- 2294-1990** Earth moving machinery – Protective structures.
- 2550-1982** Cranes – Mobile tower and derrick – Selection and operation.
- 2601-1991** The demolition of structures
- 2626-1983** Industrial safety belts and harnesses – Selection, use and maintenance
- 3012-1990** Electrical installations – Construction and demolition sites.
- 3600-1988** SAA Concrete structures code

The British Standard referred to in this Code is:

BS 5062-1985 Self locking safety anchorages for industrial use.

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The Whelan family has been involved in demolition, recycling and related activities since 1892.