



# **SAFE WORK ON ROOFS**

## **Part 1**

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## **CODE OF PRACTICE**

December 1997

# FOREWORD

This Code of Practice was approved by the Minister for Industrial Relations under section 87 of the *Occupational Health and Safety Act 1989* for application in the ACT. The aim is to provide employers, self employed persons and employees with practical advice on safe work on roofs for buildings other than single storey residential buildings.

This Code was developed by the Building Industry Advisory Committee, which is a tripartite working party of the ACT Occupational Health and Safety Council. Development of the Code involved extensive consultation with industry and other special interest groups.

ACT WorkCover

June 1999

## **What is a Code of Practice?**

An approved Code of Practice is a practical guide to achieving the standard of health and safety required by the Occupational Health and Safety Act, 1989 and Regulations for a particular area of work.

An approved Code of Practice should be followed, unless there is an alternative course of action which achieves the same or a better standard of health and safety in the workplace. An Industry Code of Practice is approved by the Minister for Industrial Relations and Employment. It comes into effect on the day the notice of this approval is published in the ACT Government Gazette or on the day specified in the Gazette notice.

An approved Code of Practice is designed to be used in conjunction with the Act and Regulations but does not have the same legal force. A person or company cannot be prosecuted for failing to comply with an approved Code of Practice. However, in proceedings under the Act or Regulations, failure to observe a relevant approved Code of Practice can be used as evidence that a person or company has contravened or failed to comply with the provisions of the Act or Regulations.

A WorkCover Inspector may cite an approved Code of Practice in a direction in an Improvement or Prohibition Notice, indicating the measures that should be taken to remedy an alleged contravention or non-compliance. Failure to comply with a requirement in an Improvement or Prohibition Notice is an offence.

## **In summary an approved CODE OF PRACTICE**

- 1.** Gives practical guidance on how the required standard of health and safety can be achieved in an area of work,
- 2.** Should be followed, unless there is an alternative course of action which achieves the same or better standard of health and safety in the workplace,
- 3.** Can be used in support of the preventive enforcement provisions of the Occupational Health and Safety Act,

4. Can be used to support prosecution for failing to comply with or contravening the Act or Regulations.

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# **1. INTRODUCTION**

## **1.1 Citation**

This Code of Practice may be cited as the *Code of Practice, Safe Work on Roofs, Part 1*.

## **1.2 Purpose**

This Code of Practice sets out guidelines to prevent injury to persons engaged in work on roofs.

## **1.3 Scope**

This Code covers the planning, preparation and conduct of work for the installation, maintenance and removal of roof coverings and the movement of persons working on roofs on all buildings, excluding single story residential buildings.

This Code does not apply to emergency service personnel, including the state emergency service, fire, police and ambulance personnel during emergency operations.

## **1.4 Commencement**

This Code of Practice commenced on 28 July 1999.

## **1.5 Authority**

This Code of Practice is approved as an Code of Practice pursuant to section 87 of the ACT *Occupational Health and Safety Act 1989*, by the Minister for Industrial on the recommendation of the ACT OH&S Council.

# **2. Planning and preparation**

The first essential step in ensuring that work is done safely is to plan it and prepare for it so that it can be done safely. Planning and preparation should involve consultation with all engaged in the work, including employee representatives.

## **2.1 Planning by designer**

Architectural and engineering designs of roofs and roof framing must take account whether the work practices necessary to carry out the installation, and maintenance of the designs are safe.

Matters to be considered include:

- a. provision of safety mesh.
- b. provision of anchorage points for static lines, inertia reel lines or safety nets if safety mesh cannot be used.
- c. installation of safety nets before roofing operations start.

- d. incorporation of guardrailing or guardrail attachments at the perimeter before roofing operations start.
- e. preparation of the floor below the roof area, including the perimeter, to provide a firm and level support for mobile equipment before roofing operations start.
- f. permanent provision of safe access to the roof for maintenance.
- g. use of building methods to reduce work at heights as much as is practicable, for example, the use of sections pre-assembled on the ground and the installation of guardrailing to perimeter members before hoisting.
- h. determine the position of bundles of roof material to avoid excessive point loading on the structure.
- i. provision of gutter boards to support the combined weights of the eave or box gutter and the personnel engaged in their installation.

## **2.2 Planning by builder**

When planning the site layout and sequence of construction, the builder or principal contractor, in conjunction with the roofing contractor, should consider such factors as:

- a. location of access roadways to enable a crane to place bundles of roof material in the most favourable position.
- b. personnel access to the roof area, including provision and placing of ladders, cat walks and guardrails at openings and the perimeter.
- c. preparation of a firm level surface below the work area, including the perimeter, to facilitate any use of scissor hoists or mobile scaffold.
- d. provision of anchorage points for static lines, inertia reel lines or safety nets.

The roof structure must be complete, fully tightened and correctly aligned before the roof covering operation starts.

## **2.3 Planning by roofing contractor**

In addition to collaboration with the builder or principal contractor in overall job planning, the roofing contractor should consider safe work issues such as:

- a. the most appropriate method of preventing falls by workers carrying out:
  - (i) the roof work - e.g. laying the roof sheets.
  - (ii) accessory work - e.g. penetrations, roof capping, interior box gutters.
  - (iii) perimeter work - e.g. eaves gutters, box gutters at permanent edge.
  - (iv) manual raising or lowering of materials, tools and equipment.



- b. provision of personal protective equipment for sunlight, glare and heat or cold.
- c. assessment of manual handling tasks which could cause back strains and other injuries.
- d. provision of safe access including elimination of trip and slip hazards.
- e. electrical safety, including the location of nearby power lines and systems of work which comply with the recommendations in the Australian Standard 3012.
- f. positioning of roof sheet packs to minimise the need for roofing workers to drag them back from beyond the leading edge of the previously laid sheets.
- g. duties of the crew, with the most experienced roof workers allocated to the more complex tasks, in particular the laying of the first sheet.
- h. special health and safety issues if fragile roof materials are encountered or the work involves removal of asbestos cement sheets.

## **2.4 Preparation**

The contractor should ensure the workplace and access to the workplace are safe before work starts, including:

- a. Assessment of frost, wind and weather.
- b. Organisation of:
  - (i) fall prevention equipment
  - (ii) crane placement schedule
  - (iii) access
  - (iv) personal protective equipment on site
  - (v) formulation of specific instructions for the workers
  - (vi) protection of portable electric tools by earth leakage devices
  - (vii) means of rescuing persons from safety harnesses following arrested falls.

- c. Inspection of existing roofs for:
  - (i) safety mesh
  - (ii) structural soundness, including inspection from below
  - (iii) fragile roofs or fragile panels in solid sheet roofs (including identifying and highlighting them).

### **3. Work practices and preventive measures**

#### **3.1 Prevention of falls**

Provision should be made to prevent persons falling if work is to be carried out within two metres of any edge on a new or existing roof from which any person could fall 1.8 metres or more. The method selected is generally determined by individual job factors including the nature of the work, the size of area to be roofed, availability of equipment and interaction with other trades. The need to minimise the risk of falls and the risk of injury when a fall occurs should also be taken into account when selecting protective measures. The recommended method is safety mesh and guardrails. Other available methods include individual fall arrest systems, scaffolding, safety nets or a combination of these methods. These other methods should only be used if the recommended method cannot be used. The use of on-ground prefabrication also helps to reduce risks.

#### **3.2 Safety mesh**

##### **a. Mesh description**

The recommended system for prevention of falls during sheet laying is permanent safety mesh securely fixed to the structure over the area to be roofed, in conjunction with appropriate edge and perimeter protection. This also offers long-term fall protection for maintenance workers.

The mesh should comprise 2 mm diameter wire of not less than 450 megapascals tensile strength welded into a mesh, with longitudinal wire spacings of 150mm and cross wire spacings of 300mm.

##### **b. Certification**

The roofing contractor must have a test certificate issued by a National Association of Testing Authorities (NATA) registered, or equivalent, testing authority showing that a sample of the mesh has successfully undergone the tests described in Australian Standard 1639-1990, The Design and Installation of Corrugated Fibre - Reinforced Cement Roofing and Wall Cladding. The test certificate must be available for examination on request.

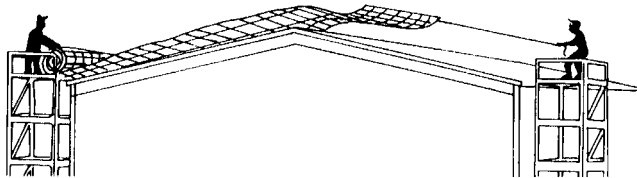
This certificate is not required if the safety mesh has been labelled by the manufacturer to indicate that it complies with the Australian Standard.

##### **c. Correct placement of mesh**

Wires parallel to the direction of the corrugations of the sheeting (longitudinal wires) should be in contact with the tops of the immediate supports of the sheeting. Wires at right angles to the direction of the corrugations (transverse wires) should be on top of the longitudinal wires (see Paragraph 2.3.3.3(b) of AS2424-1981).

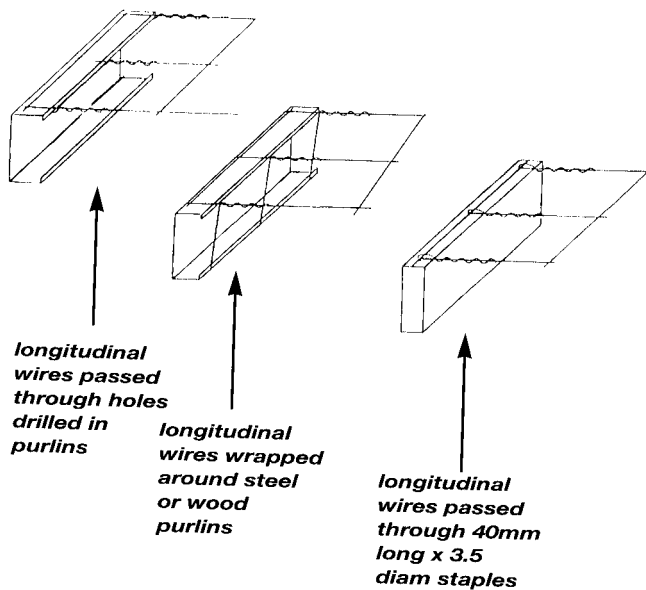
**d. Installation**

Figure 1 shows one satisfactory method for installation of the mesh. The mesh is first cut to length from the roll and run out over the roof using a continuous rope system. It can be installed safely from scaffolding positioned at each end of the roof.



**Figure 1** Mesh can be installed safely from scaffolding positioned at each end of the roof

The recommended method of fixing the mesh to metal purlins is to pass each longitudinal wire through a hole drilled in the top of the purlin and tie it off with at least four full turns around the wire as shown in Figure 2. If the mesh is to be fixed to timber purlins, use 40 mm x 3.5 mm diameter staples.



**Figure 2.**

**e. Side laps**

The runs of mesh should be side lapped by at least 150 mm (one opening width). If the purlin spacing exceeds 1.5 metres, the runs of mesh should be side lapped by at least 300 mm of intermediate fixing with 2 mm diameter staples. Intermediate stapling of the mesh should be carried out from underneath.

**f. End joins**

If it is necessary to make longitudinal joins, the knot and tie should be the full length of the tail wire, which should be 300 mm in length. The first tail wire should be tied at least three times around the knot. The other tail wire is placed under the longitudinal wire and tied around the transverse wire. To get a 300 mm tail wire, cut the longitudinal wire close to a join. The join should be the full width of the mesh with every longitudinal wire joined. Figure 3, illustrates the tying procedure. Any variation to the recommended method of tying should be avoided.

**g. General**

Mesh out all the roof framing that has been erected before loading the roof with bundles of decking. Do not use the mesh for access or as a working platform. Workers should avoid walking or standing on the mesh.

Use scaffolding, scissor hoists, safety nets or individual fall arrest systems to protect workers installing the mesh.

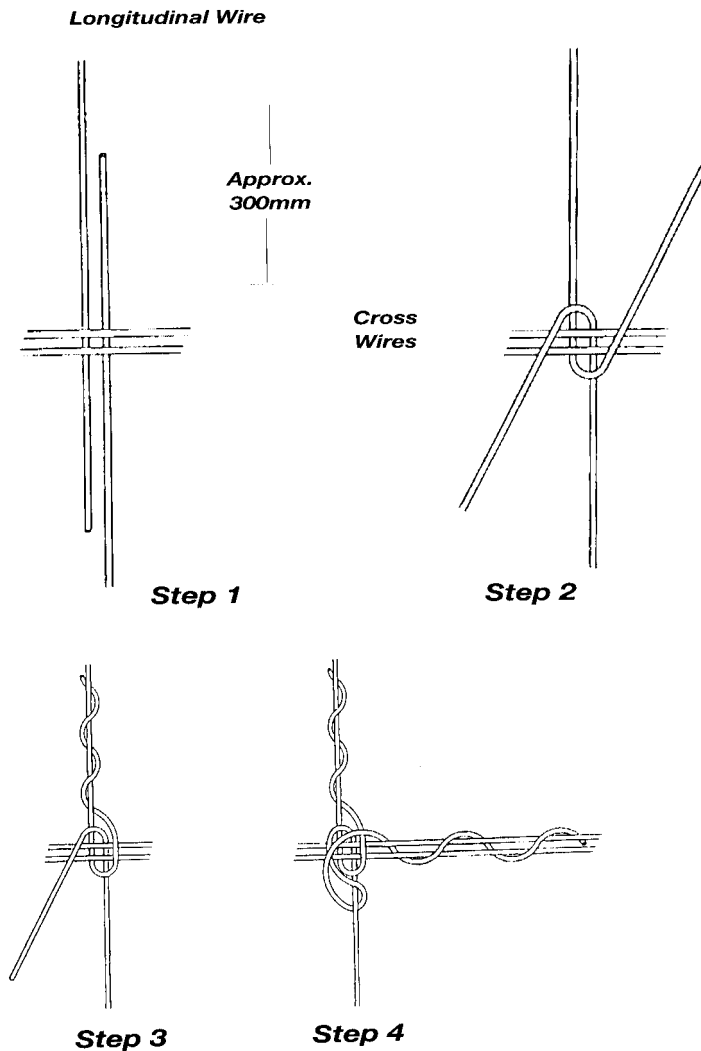
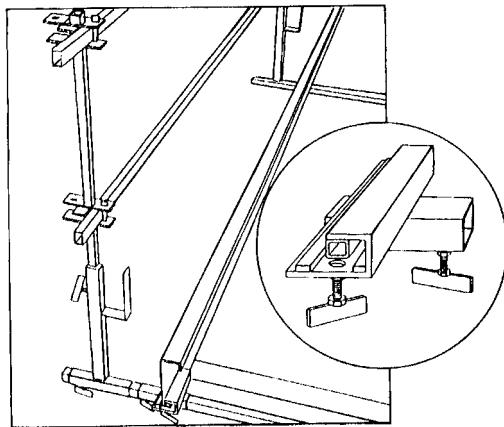
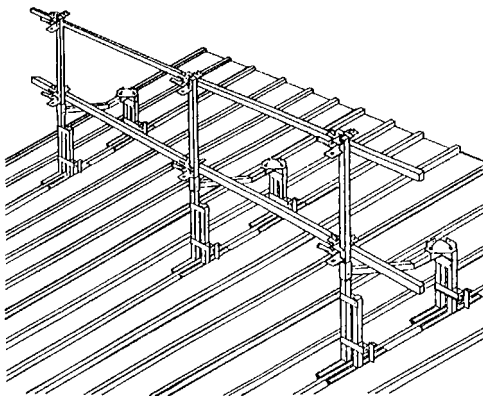


Figure 3 Longitudinal wire joining

### 3.3 Guardrails

- If guardrails are used on steel structures or tilt slab construction, the guardrail and fixings should be attached before the steel beam or slab is raised from the ground.
- Guardrails at the perimeter of the building or openings in the roof should:

- (i) be between 900mm and 1 metre in height above the working surface and incorporate a mid-rail and,
  - (ii) have a toe board if the slope of the roof exceeds 15 degrees from the horizontal, or,
  - (iii) include a mesh screen with integral toeboard
- c. Guardrails should be constructed to withstand a force of 0.445 KN applied at any point of the guardrail system.
  - d. Figures 4A & 4B indicate the use of two guardrail systems. (While these diagrams illustrate proprietary products, other products may also meet the recommendations of the Code).



Figures 4A and 4B

### 3.4 Individual fall arrest systems

The various parts of independent fall arrest systems and safety harnesses should be compatible. Compatibility should not be taken for granted. It is therefore essential to ensure that all components are compatible and fit safely together. Components from different manufacturers may be unsafe when used together and may lead to failure of the fall arrest system.

Use of individual fall arrest systems can restrict workers' movements and lanyards and safety lines can be a trip hazard.

**a. Safety harnesses and lanyards**

(i) Fall arrest systems should be designed so that a person equipped with a parachute safety harness cannot fall more than 1.8 metres.

(ii) Safety harnesses and lanyards can be used as travel restriction systems to prevent workers moving from safe to unsafe areas on the roof.

(iii) Use body harnesses of the parachute type connected to the lanyard or lifeline at the top dorsal position. If a lifeline and rope-grab device is used on steeply sloping roofs, the user needs the device in front in order to manually operate the mechanism. In this case the user can make the connection onto a D-ring on the side of the harness belt. Do not use waist type belts for roof work.

(iv) There must be a minimum of slack in the lanyard or safety line between the person and attachment to the anchorage.

(v) Lanyards must have a minimum of tensile strength of 22.2 KN.

(vi) Do not connect snaphooks to each other.

(vii) Do not use lanyards in conjunction with inertia reels.

(viii) Workers using safety harnesses should not work alone because a worker suspended in a full body harness should be rescued as soon as possible and within 20 minutes of the arrested fall.

**b. Inertia reel systems**

(i) Inertia reel systems can be used to prevent falls where workers are required to carry out their work near an unprotected edge.

(ii) Inertia reels are not designed for continuous support but become effective in the event of a fall. They should NOT be used as working supports by locking the system and allowing it to support the user during normal work. Inertia reels may be less effective for certain applications, e.g., stopping a person falling down the inclined surface of a pitched roof.

**c. Lines and lanyards**

(i) The anchorage used should be as high as the equipment permits as it is dangerous to work above the point of anchorage.

(ii) Static lines should have a minimum tensile strength of 22 KN and their anchorages should have a design capacity of 22 KN, except where verification of a lesser design load provides for a minimum factor of safety of six.

(iii) Intermediate supports for static lines should not exceed 4.0 metre spacings unless specifically designed to do so.

#### d. Vertical lifelines

- (i) Use vertical lifelines (droplines) in connection with work from boatswains' chairs and ladders. Only one person should be attached to any one lifeline.
- (ii) Vertical lifelines should have a minimum tensile strength of 22.2 KN. Self-retracting lifelines should have a minimum tensile strength of 13.3 KN.

### 3.5 Pendulum effect.

This is a potential hazard connected with the use of individual fall arrest systems. It can occur during 'swing down' and 'swing back'. The pendulum effect may also occur within the interior of the roof if the positioning of the inertia reel allows for a significant length of unsupported line connected to the user.

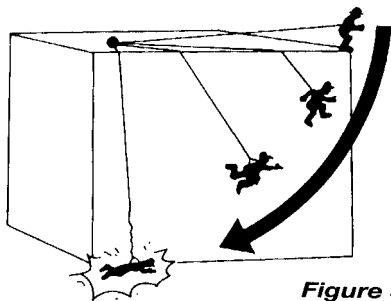
#### a. Swing down

Swing down can occur if an inertia reel is extended out diagonally so that the line makes an extreme angle with the roof's perimeter edge. In this situation, the forces generated in an arrested fall over the edge will cause the line to rotate back along the roof perimeter until it reaches a position directly in line with the anchorage point of the inertia reel and at right angles with the roof edge.

As the line moves back in this way, its unsupported section lengthens, thus dropping the attached worker further than the original (arrested) fall distance. If the length of the unsupported line equals the height of the building then the worker will hit the ground (see Figure 5).

To eliminate the pendulum effect:

- (i) Place the inertia reel anchorage point more or less perpendicular to the position of the line at the perimeter edge. A mobile anchorage helps here.
- (ii) Use a perimeter guard rail to prevent any falls over the perimeter edge.

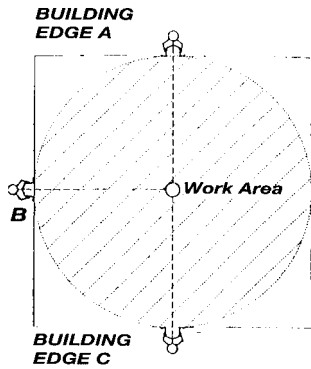


**Figure 5** Pendulum effect: Following an arrested fall at this extreme diagonal, the inertia line moves back along the roof, dropping the worker dangerously down to the ground.

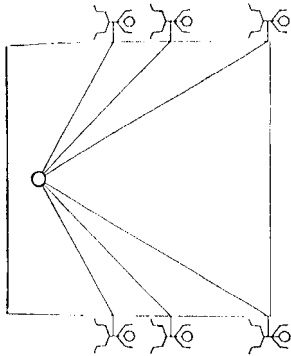


**b. Swing back**

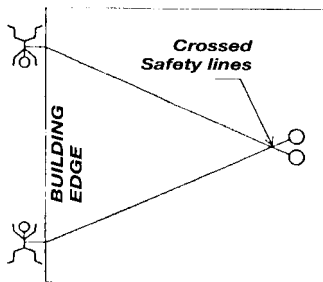
In an arrested outward fall, particularly from a perimeter edge, a person will swing back into the building structure and collide with any obstructions in the path of the swing. If this situation could arise, the use of an independent fall arrest system should be re-assessed.



**Figure 6 (a)** Suitable application at points A, B and C and within perimeter of defined circle



**Figure 6 (b)** Unsafe application at all points



**Figure 6 (c)**

**Unsafe application at both points**

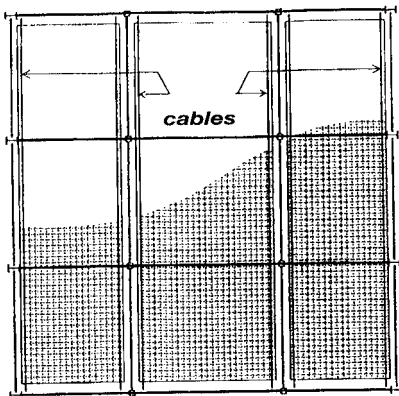
**Figure 6 (c)** Unsafe application at both points

### 3.6 Scaffolding

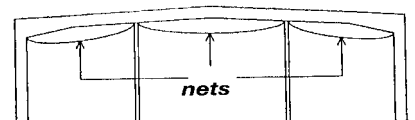
- a. Scaffolding can provide effective protection against falls at the perimeter of the building.
- b. Mobile tower frame scaffold can be used to provide a safe working platform while installing safety mesh, including the stapling of overlaps where purlin spacings are greater than 1.5 metres.
- c. If a mobile scaffold is used, position the platform as close as practicable to the underside of the roof and not more than two metres below the working surface.
- d. Where safety mesh is not used, the catch platform should be at least five metres front to back and the width of the roof area being laid. Position the platform so that at least two metres of it extends beyond all unprotected edges of the roofing work.

### 3.7 Safety nets

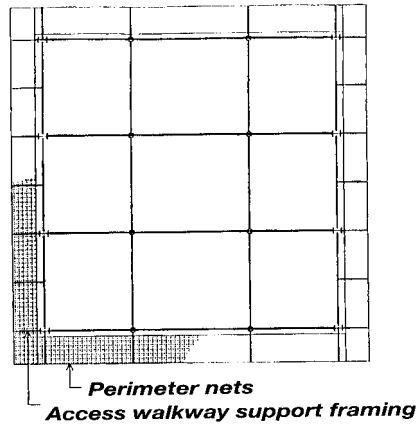
- a. Safety nets can provide a satisfactory means of fall protection while allowing roof workers maximum flexibility of movement. They are also useful for the safety of persons in other occupations such as the riggers erecting the roof framing.
- b. A typical application of safety nets over the work area and perimeter is shown in figures 7A, 7B, 8A and 8B. Cables are installed along the length of the building to cover each roofing bay. Safety nets are hung across these cables and moved along as the roofing work proceeds.



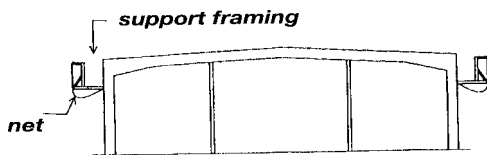
**Figure 7 (a)** Plan



**Figure 7 (b)** Elevation



**Figure 8 (a)** Plan



**Figure 8 (b)** Section

- c. Before starting roof work, the perimeter nets should also be in position. Hang nets as close as practicable to the underside of the work area, with sufficient clearance to prevent contact with the surface below if someone falls into them.
- d. When erected, perimeter nets should project horizontally at least  $(2 + H/5)$ m beyond the outermost working point above the net, where H = the vertical distance in metres between the net and the outermost working point above. In a normal roofing situation this would mean an outward extension of approximately 2.5 metres.
- e. Safety nets should be constructed in accordance with BS 3913 British Standard Specification for Safety Nets. The use and maintenance of the nets should be in accordance with CP93 British Standard Institution (BSI) Code of Practice for the Use of Safety Nets on Constructional Work.

### **3.8 Inspection and care of nets**

- a. Inspect nets immediately after installation, relocation or repair.
- b. Inspect nets daily for cuts and damage from abrasions, chemicals or heat. Repair before any work above the net is resumed.
- c. Store nets in dry, shaded areas with good air circulation.
- d. Nets can be seriously damaged by fire. Therefore do not let combustible material accumulate in suspended nets. When welding or oxy cutting is

being performed, examine nets to ensure that the welding slag has not caused any damage.

### **3.9 Prefabrication**

To reduce the risk of falls, wherever practicable roofs or sections of roofs should be prefabricated on the ground, with the completed roof or sections being placed into position by appropriate lifting procedures.

### **3.10 Access**

- a. The person who is in control of a workplace is responsible for ensuring that the access from the ground to the work area on the roof is safe and without risk to health.
- b. Access requirements should take into account any tools and equipment the roof worker may be required to carry to and from the work site. Mechanical lifting aids should be provided where appropriate.
- c. If temporary ladders are used for access:
  - (i) the ladders should have non-slip feet and be secured against displacement at the top.
  - (ii) workers who use the ladder should have a safe place to stand when getting off the ladder.
  - (iii) the stiles of the ladder should extend at least one metre above the stepping off point.
  - (iv) metal or wire bound ladders must not be used near power lines.
- d. A ladder access tower is recommended if access to a roof is between 6 and 15 metres above the ground or other access point. Above 15 metres consider suitable alternative access.
- e. Arrange means of access to the work site from the ladder or landing platform to eliminate the risk of injury. Pay special attention to any openings in the roof, such as smoke ventilation or box gutter sump installation.

### **3.11 Brittle and fragile roofs**

- a. If a roof or part of a roof covering comprises fragile or brittle material, the owner or occupier of the building must maintain a warning sign at any place where persons can gain access to the roof. The sign should be not less than 375mm by 330mm and made of a strong and rigid material. It should be securely fixed in an upright position where it can be seen clearly by persons wanting to gain access to the roof. The warning notice should incorporate the symbol shown in Figure 9 and display the following words:

## DANGER - KEEP OFF

### BRITTLE AND FRAGILE ROOF



**Figure 9**

- b. Before carrying out maintenance on a roof containing brittle or fragile materials, the employer or person in control of the roofing work should:
  - (i) Inspect the under-side of the roof to determine the extent of fragile roof material, existence of any safety mesh, and the structural soundness of the roof and safety mesh.
  - (ii) Provide temporary walkways where any person is required to work on or use as a means of access any part of the roof sheathed with brittle material and where permanent walkways are not provided. The walkways should be at least 450mm in width for persons and hand tools only, and 675mm in width for persons and materials, and should incorporate a guardrail. If the slope of the roof exceeds one vertical to six horizontal, timber cleats of not less than 50mm by 12mm should be fixed to the top side of the walkway planks and spaced no more than 350mm apart, centre to centre. The walkway should be adequately secured.
  - (iii) Provide temporary roof ladders of sufficient strength if any person is required to carry out work on or near to any part of a sloping roof sheathed in brittle material.
  - (iv) Provide individual fall arrest systems including anchorages for any person working on or near any brittle roof sheathing or from roof ladders, wherever safety mesh, safety nets or similar fall protection has not been provided.
- c. If the work involves removal of all or a major part of a roof sheathed with fragile material, safety harnesses should be worn by all personnel engaged in the work if:
  - (i) The pitch of roof is greater than 15 degrees, or
  - (ii) The roof is not provided with permanently installed safety mesh or at its perimeter:
    - \* a solid balustrade, or

- \* scaffolding, or
- \* a guardrail, which extends at least 900mm to 1 metre, above the roof level at the perimeter and includes a mid rail and toe board.

The safety harnesses should be attached by an individual fall arrest device to a static line positioned above the ridge line. While engaged in the work, persons should only walk or stand over the purlin line.

### **3.12 Asbestos cement roof removal**

#### **a. Handling of materials containing asbestos.**

All work practices and procedures adopted for the handling of materials containing asbestos should be in accordance with the Regulations and the ACT Asbestos Code of Practice and Guidance Notes.

#### **b. Fall protection**

Procedures to prevent falls during the removal of asbestos cement roofing should be in accordance with Section 3.10 of this Code of Practice.

## **4. Personal protective equipment (PPE) and clothing**

### **4.1 Provision of PPE**

Before starting roof work, the employer must assess conditions likely to affect the health and safety of employees and arrange for the provision and use of appropriate PPE. The following points need to be considered:

#### **a. Footwear**

To reduce the risk of falls resulting from slips, rubber soled shoes with herringbone or similar non-slip tread pattern, and with or without a steel cap, are recommended for work on metal roofs.

#### **b. Eye protection**

If the work involves the use of metal cutting discs or grinders, eye protection complying with AS 1337 - Eye Protectors for Industrial Applications should be provided and used. Sunglasses complying with AS 1067 - Sunglasses and Spectacles - Non Prescription Types should be provided and used to reduce glare in bright conditions. The sunglasses should be of a type that do not easily dislodge when the wearer bends over and should have lenses big enough to reduce side glare. If insulating foil is to be installed before the roof covering, use of anti-glare type foil is recommended.

#### **c. Sunburn prevention**

The exposed parts of the body should be protected by a sunscreen with an SPF (sun protection factor) rating of 15+. However, there should be sufficient supervision and monitoring conducted to ensure that employees do not have overlong exposure to strong sunlight, including reflection of light from the metal roof.

## **4.2 Clothing**

Clothing should be comfortable in all positions of standing, bending, and crouching and be suitable for the work being done and the weather conditions. Loose clothing or equipment which may snag or create a trip hazard should be avoided. If short sleeved shirts and shorts are worn in very hot weather, the exposed parts of the body should be protected by a sunscreen with an SPF rating of 15+.

## **4.3 Maintenance of PPE**

The employer must have all personal protective equipment provided for employees' use regularly inspected and replaced as necessary.

## **4.4 Special situations**

If work is to be carried out on roofs involving or near hazardous materials (e.g. asbestos removal or airborne hazardous chemicals), the employers should consult with their employees and an appropriate organisation to determine the most suitable personal protective equipment and any other control measures. In planning work in these situations, the employer should contact the ACT WorkCover about any Regulation, Code of Practice or special requirements relating to the specific situation.

# **5. Training and supervision**

Section 27 (d) of the ACT Occupational Health and Safety Act 1989 requires employers to provide information, instruction, training and supervision to employees necessary to enable them to perform their work in a manner that is safe and without risks to health.

## **5.1 Training**

The training and instruction given should cover at least:

- a. the work method to be used in loading, positioning and fixing roof materials, including access methods.
- b. the method to be adopted to prevent falls.
- c. the correct use, care and storage of individual fall arrest equipment and safety nets.
- d. the correct use, care and storage of personal protective equipment.
- e. the correct use, care and storage of tools and equipment to be used, including electrical safety.
- f. procedure to be adopted in the event of accident or injury.

## 5.2 Supervision

Supervision should ensure:

- a. that only those employees who have received training and instruction are authorised to carry out the work.
- b. include sufficient monitoring of the work to ensure that the agreed safe work practices are being adhered to, including the use of all protection systems and PPE.

## 6. Legal requirements

### 6.1 Employers' responsibilities

Installation and maintenance work on roofs requires compliance with Acts and Regulations relating to occupational health and safety. Compliance applies to work practices, equipment and qualifications of workers. If any uncertainty exists, enquiries should be made at the planning stage to ACT WorkCover. Standards and Codes which offer practical guidance on health and safety in roof work, appropriate Acts, and Regulations are listed in Section 6.3. However these are subject to change and checks should be made with ACT WorkCover.

### 6.2 Employees' responsibilities

Section 30 of the *ACT Occupational Health and Safety Act 1989* requires employees to take reasonable care for the health and safety of other persons in the workplace and to co-operate with their employer in the interests of health, safety and welfare. Additionally section 89 of the OHS Act states that no person shall interfere with equipment or the safeguards that are provided in the interest of health and safety. Employees must wear suitable clothing and use the appropriate protective equipment for the work being done.

### 6.3 Statutes, Standards and Codes

#### a. Statutory provisions

Occupational Health and Safety Act 1989

Scaffolding and Lifts Act 1957

#### b. Codes

ACT Code of Practice on Manual Handling

#### c Standards

AS1639 The Design and Installation of Corrugated Fibre -

Reinforced Cement Roofing and Wall Cladding

AS1067 Sunglasses and Spectacles - Non Prescription Types

AS1319 Safety Signs for the Occupational Environment

AS1337 Eye Protectors for Industrial Applications



AS1576 Scaffolding

AS1657 SAA Code for Fixed Platforms, Walkways Stairways and Ladders

AS1716 Respiratory Protective Devices

AS1891 Industrial Safety Belts and Harnesses

AS2626 Industrial Safety Belts and Harnesses Selection, Use and  
Maintenance

AS3012 Electrical Installations Construction and Demolition Sites

BS3913 British Standard Specification for Safety Nets

CP93 B.S.I. Code of Practice for the Use of Safety Nets on  
Constructional Works

AS2424-1981 Plastic Building Sheets - General installation  
requirements and design of roofing systems

BS5062 Self Locking Safety Anchorages for Industrial Use

AS2604-1986 Sunscreen Products - Evaluation and Classification.

## Appendix 1

Terminology used in fall arrest systems

**Active fall protection** is a system where the individual must take action to use equipment designed either to prevent them entering a fall hazard area or to arrest their fall.

**Individual Fall Arresting Systems (IFAS)** are designed to arrest an accidental fall and consist of some or all of the following:

- \* **anchorage**
- \* **lifeline**
- \* **fall arrester**
- \* **lanyard**
- \* **shock absorber**
- \* **harness**
- \* **retractable lifeline**
- \* **horizontal lifeline.**

**Individual Travel Restricting Systems (ITRS)** prevent the user from moving into the fall hazard area and consist of the following:

- \* **anchorage**
- \* **lanyard**
- \* **belt (harness)**
- \* **horizontal lifeline.**

**Work Positioning Systems (WPS)** provide a primary means of support in relative comfort.

**Body containment devices** are designed to contain the body of a falling worker and to distribute forces resulting from an arrested fall to minimise

the likelihood of injury. They consist of:

- \* **body belt**
- \* **chest waist harness**
- \* **full body harness (parachute type).**
- \* **plus other components**

**Anchorage points** are secure points of attachment for lifelines and lanyards.

**Drop lines** are vertical lifelines.

A **fall arrest system** is any device designed to minimise the length and severity of a fall.

**The fall distance** is the length of the lanyard elongated by the weight of a fallen worker.

A **restraint line** secures workers to a fixed anchorage.

A **lanyard** is a flexible line, rope or strap used to connect the containment device of a fall safety system to an anchorage or lifeline. They are usually less than 1.8 metres.

A **lifeline** is a heavy line used to transfer an anchorage site to a more convenient or secure site while providing horizontal or vertical freedom of movement.

A **static line** is a taut horizontal lifeline attached to two anchorage points.

A **fall arrester** is a mechanical device that arrests a fall by locking onto the lifeline but at the same time allowing freedom of movement.

**Type 1 Rope grab fall arresters** reduce the potential free fall distance and absorb much of the energy of a fall while allowing mobility along a lifeline. The rope grab can be either manually moved along the lifeline and locked in place, or it can be an automatic inertial device.

**Type 2 An inertial reel** is a retractable lifeline that has a fall arrester built into the feeding mechanism of the line. It consists of a drum

connected to a body containment device by wire rope, nylon webbing or fibre rope.

**A shock absorber (deacceleration device)** prevents a shock to the body by absorbing some of the fall energy before it reaches the end of the lanyard or safety line. A typical shock absorber consists of overlapped nylon webbing cross stitched with nylon thread that absorbs impact progressively by tearing away the nylon stitching.

**An anchorage** is the means for attaching a lanyard, lifeline or other components to a secure point.

**A transfastener (part of the latchway system)** is a travelling anchorage. It has a walking sprocket device that connects the user onto a static line system allowing the user to travel the entire length of the line without having to unclip and reclip when passing the line's support.

**A griplatch transfastener** arrest falls on roofs up to a 36° angle.

**A snap hook** is a self closing hood with a keeper latch that will automatically close and remain closed until manually opened.

**Arrest force** is the force imposed upon the worker at the moment the fall arrest system stops the fall.

**The fall distance** is determined by the length of the lanyard plus elongation caused by the impact of a fall.

## Appendix 2

### DESIGN QUALITY CHECKLIST

for

#### Safe Work on Roofs

Project:.....

Location.....

Client.....

Architectural and engineering designs of roofs and roof framing must take into account whether the work practices necessary to carry out the installation and maintenance of the designs are safe.

Code of Practice Ref.	Design consideration	Checked	Verified	Date
Clause 2.1a	Safety mesh to AS2424 -1981 (para 2.3.3(b) ) included.			
Clause 2.1b	Anchor points provided on roof frame elements for static lines etc.			
Clause 2.1d	Sleeves, clips etc incorporated for fixing of roof edge guard- railing.			
Clause 2.1f	Box gutter supports and linings  designed to support man- weight.			

Clause 2.1g Permanent safe access and anchor points for static lines etc provided for maintenance.

Clause 2.1h Roof frame designed for bulk bundles of roof sheet, advisory notes placed on drawings.

*Designer:*.....

*Issue: 1*

*Approved by:*.....

*Date*...../...../.....

**BUILDER'S QUALITY CHECKLIST**

Sheet..1...of..1.

for

**Safe Work on Roofs**

**Project**.....

**Location**.....

**Client**.....

Planning and sequencing of construction by the builder or principal contractor shall consider the following factors:

—

Code of Practice Ref.	Planning consideration	Checked	Verified	Date
Clause 2.1	Guardrailing to roof edge installed as Clause 3.3.			
Clause 2.2	Drawings/specifications checked for any conditions on loading/stacking roof cladding or plant and equipment on roof structure			
	Roof structure is complete, plumbed & braced.			
	Personnel access to roof structure in place and safe.			

Access for scaffold etc.

clear & level.

Anchor points for static lines

etc. in place.

General

Roofing contractor's Quality

checklists received and

verified.

*Contractor*.....*Issue*  
*1*

*Approved by:*.....

*Date*...../...../.....



for

**Safe Work on Roofs**

**Project**.....

**Location**.....

**Client**.....

In addition to collaboration with the builder in overall job planning, the roofing contractor shall address the following safe work issues:

Code of Practice Ref.	Planning consideration	Checked	Verified	Date
Clause 2.2	Roof structure, including all eave & box gutter supports complete.			
Clause 2.3	Work sequence discussed and agreed with builder & workforce.  Supply of all materials to site checked  Workforce provided with			
and wearing protective eye-				

ware, clothing etc.

Manual handling tasks

checked for excessive weight

Access and manual hoisting  
requirements assessed &  
checked.

All electrical systems and  
checked **and overhead**  
**wiring installations** identified

*Contractor*.....*Issue*  
*1*

*Approved by:*.....

*Date*...../...../.....

Code of Practice Ref.	Planning consideration	Checked	Verified	Date
Clause 2.3	<b>On existing roofs</b> - condition of roof sheet, safety mesh and roof surface inspected & accepted (including under-side inspection).			
Clause 2.4	Prevailing and forecast weather conditions checked & accepted: Prevailing:..... ..... Forecast:..... .....  Fall prevention equipment arranged in accordance with Code Clause 3.1, 3.4 & 3.5.  Method of rescue following arrested falls arranged.  General Completed Planning checklists provided to builder for			

verification.

### Construction Quality Checklist

Code of Practice Ref.	Planning consideration	Checked	Verified	Date
Clause 3.2	Mesh test certificate to AS1639 submitted.  Safety mesh installed to			

Clause 3.2.

Clause 3.11      Permanent signs installed to brittle roofs.

*Roofing contractor*.....*Issue 1*

*Approved by*:.....

*Date*...../...../.....