

Hazard Identification, Risk Assessment and Control (HIRAC) for Work at Height

Risk, Health and Safety

1 A. Introduction

Hazard identification and safety risk assessments should be conducted prior to carrying out any task where working at height is required. “Work at Height” is defined as any University activity which has the potential for a person to fall more than two metres. Most often work at heights involve roof access for routine maintenance of mechanical devices, roof repairs, cleaning gutters etc. Other situations which may present a fall hazard include laying of data cable, forestry operations, primary industry activities, science projects, student activities, theatrical productions, etc. (Theatrical performances and sporting activities have a different status under legislation. However it is University Policy to conduct a HIRAC review when a hazard is present).

To manage the risk of injury during any work at height, the HIRAC process to identify and implement any risk control measures is necessary. The process for identifying these measures is outlined in Section 2 of this document – *HIRAC Table for Work at Height*.

- in the first and second columns: identify and assess the risks specifically associated with work at height in that location/activity;
- in the third column: identify the risk control measures which will effectively and practicably eliminate or minimise the risks (see B & C below), and implement them in consultation with all stakeholders, including the contractors; and
- in the fourth column: verify that the risks have been eliminated or reduced to LOW.

B. Note on Assessing Risks

Risks can usually be assessed through a consultative process which makes use of the participants’ experience and judgement. Where necessary, risks can be assessed more formally on the basis of 2 key factors: (a) the likely severity of any injury/illness resulting from the hazard and (b) the probability the injury/illness will actually occur. For more information, refer to the [Risk Assessment Matrix](#).

C. Note on Controlling Risks

Working at Heights in an area or activity with HIGH or MEDIUM risks is **not acceptable**. Effective risk control measures (see options 1, 2 and 3 below) must be implemented to bring the residual risk down to LOW before the commencement of work becomes acceptable. It is inadequate to rely solely on administrative measures (e.g. permit to control HIGH risks). The risk control options below are ranked in decreasing order of effectiveness. Risk control measures should always aim to be as high in the list as practicable. The effective control of any given risk generally involves a number of measures drawn from the various options.

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Risk Control Options for Work at Height:

Control Measure	Description
1. Elimination	Eliminate the need to access the fall-risk area (e.g. by locating or relocating items requiring inspection, maintenance or other attention, elsewhere). It is best to work on the ground or solid construction. The elimination of hazard is 100% effective and is therefore the control measure of choice where death or serious injury may occur (HIGH risk).
2. Substitution	Provide alternative means of access to the point or item to which access must be made which avoids the risk of a fall (e.g. walkways). The effectiveness of substitution is wholly dependent on the choice of replacement.
3. Isolation	Barricade or enclose the fall risk so that it cannot be reached. Examples include the use of barriers or guardrails. These can be used in conjunction with a passive fall prevention system (e.g. temporary work platform, roof safety mesh, etc.).
4. Engineering	Passive systems such as permanent access and work platforms that comply with AS 1657 are preferred. Other passive devices such as scaffolding, elevated work platforms, guard railing, roof safety mesh, walkways on brittle areas, etc., are acceptable.
5. Work Positioning	Work positioning devices such as Elevated Work Platforms, industrial rope access systems, and travel restraint systems, which enable a person to be positioned and safely supported while working at height.
6. Administrative	These measures include the use of guidelines, safe work practices and Work at Height Permit. Provide training to ensure only employees and contractors competent in the relevant safe system of work at height undertake the work. Certification may be required. Administrative control should include regular monitoring to ensure the safety controls identified in the training are being followed. They typically require significant resources to be maintained over long periods of time for continuing levels of effectiveness. Although administrative measures are insufficient on their own, they form an essential part of any risk control option other than elimination.
7. Personal Protective Equipment	Fall prevention/fall arrest systems usually include harnesses, lanyards, anchor points, and rope systems. Their actual effectiveness in realistic work situations can be much lower than thought, so this option is generally <u>not suitable</u> on its own for work at height. However, it has a legitimate place as part of a combination of risk control measures.
8. Ladders	The use of portable ladders is the least preferred means of working at height. Using a ladder to carry out work at heights must be supported by a risk assessment.

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2 HIRAC Table for Work at Height in University Locations/Activities

LOCATION/ACTIVITY UNDER REVIEW: _____

DATE REVIEWED: _____

PEOPLE CONDUCTING REVIEW: _____

Identify Risks	Initial Risk (High/Med/Low)	Implement Control Measures	Residual Risk
<p>Are there risks due to the <u>physical environment</u> or <u>the design of the workplace</u>?</p> <p>Examples</p> <ul style="list-style-type: none"> <input type="checkbox"/> Uneven, steep, slippery or potentially unstable work surfaces. (Walkways should be provided on the roof for access to plant which need to be worked on or serviced if the stability of the roof is unknown) <input type="checkbox"/> Poor housekeeping, uncontained spillages, wastes, or debris (e.g. leaves) or stored or stacked materials where they interfere with access to work <input type="checkbox"/> Fragile, brittle roof surfaces (structural soundness of roof and frame to be checked before person walks on, or load is placed on, roof) <input type="checkbox"/> Inadequate work platforms, stairs, ladders, guardrails, etc. <input type="checkbox"/> Openings or gaps in walkways, handrails, balustrades or platforms <input type="checkbox"/> Close proximity to an unprotected edge (edge of surface has a horizontal gap, void or space > 300mm and there is not a barrier to prevent a fall) <input type="checkbox"/> Confined spaces, enclosed spaces or restricted/inadequate work area <input type="checkbox"/> Inadequate lighting <input type="checkbox"/> Exposure to harmful noise levels <input type="checkbox"/> Inadequate fixed anchor points or roof access points (e.g. difficult access). If anchor point/s are needed and there are none, temporary anchor points are to be installed. If possible, postpone work until permanent points have been installed. <input type="checkbox"/> Difficulty using equipment to gain access to an elevated level or to carry out the task at an elevated level <input type="checkbox"/> Roof, floor, gutters, materials, plant, or structures damaged or liable to fall or collapse <input type="checkbox"/> Mismatch between workplace and worker characteristics (e.g. height, strength, mobility, fitness, fear of heights, etc.) <input type="checkbox"/> Exposure to hot components/items <input type="checkbox"/> Extremely cold materials, components (e.g. dry ice) or radiation (ionising or non-ionising, lasers, ultraviolet) <input type="checkbox"/> Unsafe scaffolding 			

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Identify Risks	Initial Risk (High/Med/Low)	Implement Control Measures	Residual Risk
<ul style="list-style-type: none"> <input type="checkbox"/> No safe method for transporting tools on to roof work area or for preventing tools from falling below <input type="checkbox"/> Access to unauthorised personnel below the work area <input type="checkbox"/> Rubble or impaling hazards are present in the surrounding area (keep a 2 metre clear zone and prevent unauthorised access) <input type="checkbox"/> Rubbish or debris left after job is completed 			
<p>Are there <u>electrical</u> risks?</p> <p>Examples</p> <ul style="list-style-type: none"> <input type="checkbox"/> Contact with live components during testing, inspection, operation, maintenance, cleaning or repair <input type="checkbox"/> Accidental contact with power cables (overhead, other) <input type="checkbox"/> Explosion or ignition of electrical components, etc. <input type="checkbox"/> Unauthorised access to electrical services, controls, etc. 			
<p>Are there <u>chemical</u> risks?</p> <p>Examples</p> <ul style="list-style-type: none"> <input type="checkbox"/> Flammable or explosive gases, vapours, liquids, or dusts <input type="checkbox"/> Oxygen-depleted atmospheres (fermentation vessel, septic tank, etc.) 			
<p>Are there <u>mechanical</u> risks?</p> <p>Examples</p> <ul style="list-style-type: none"> <input type="checkbox"/> Entanglement of hair, fingers, clothing, or jewellery in moving components <input type="checkbox"/> Entanglement in, or impact against, fixed protrusions <input type="checkbox"/> Unexpected movement of machines, work pieces or loads <input type="checkbox"/> Unexpected movement of access equipment (e.g. snorkel, EWPs, scaffold) <input type="checkbox"/> Moving, sharp, hot, or "live" tools or components <input type="checkbox"/> Risk of being pushed, pulled or thrown off plant, structures, etc. <input type="checkbox"/> Components or materials liable to disintegrate (e.g. grinding wheels) <input type="checkbox"/> Damaged, poorly maintained or unguarded equipment <input type="checkbox"/> Failure of fall prevention equipment (e.g. harnesses, ropes, lanyards, or barriers) 			

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Identify Risks	Initial Risk (High/Med/Low)	Implement Control Measures	Residual Risk
<p>Are there <u>manual handling</u> risks?</p> <p>Examples</p> <ul style="list-style-type: none"> <input type="checkbox"/> Having to carry equipment/tools to elevated levels (e.g. up stairs, ladders, etc.). <i>Note: if the only option is using a rope to lift tools or small sized materials onto and off roofs, a rail or some type of restraining device shall be provided to keep the person loading onto the roof away from the roof's edge</i> <input type="checkbox"/> Lowering equipment/tools from elevated levels <input type="checkbox"/> Manual handling performed on roof when it could be done at ground level <input type="checkbox"/> Potential to over-extend or over-reach during task <input type="checkbox"/> Insufficient consultation with relevant people on suitable lifting methods <input type="checkbox"/> Unavailability of mechanical or manual winching systems for lifting loads <input type="checkbox"/> Handling device inadequate for lifting or moving loads <input type="checkbox"/> No control measures for falling objects (e.g. containment sheeting, toe-boards, lanyards secured to tools, exclusion zones, hoardings, gantries, catch platforms, signs, warning devices, barricades, and traffic controllers) 			
<p>Are there risks arising from <u>organisational or procedural</u> deficiencies?</p> <p>Examples</p> <ul style="list-style-type: none"> <input type="checkbox"/> Insufficient first-aid equipment or trained personnel <input type="checkbox"/> Insufficient evacuation, emergency or rescue planning for work at height <input type="checkbox"/> Access to roof, heights without permit. <input type="checkbox"/> Inappropriate, insufficient or poorly maintained personal protective equipment <input type="checkbox"/> Employees of contractors required to work at height are not suitably trained in use of fall prevention equipment or in incident/emergency procedures <input type="checkbox"/> The manager/supervisor is unaware of the work at height task and the expected time frame of the task <input type="checkbox"/> Work at height performed alone (prohibited) <input type="checkbox"/> No safe method of access to heights or method not used <input type="checkbox"/> No communication link with personnel on the ground for emergencies <input type="checkbox"/> Gutter cleaning schedule not developed or inadequate <input type="checkbox"/> Hazards created to others (e.g. mechanical blowers used to clean gutters, etc.). Care is to be taken to ensure no disruption occurs to the University community in the immediate area. Seek advice from immediate area as to staff, student and class movements. 			

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<p>Are there risks arising from the <u>natural environment</u>?</p> <p>Examples</p> <ul style="list-style-type: none"> <input type="checkbox"/> Exposure to extreme environmental conditions (hot, cold, wet, snowy, stormy, frost, etc.) <input type="checkbox"/> Lightning <input type="checkbox"/> Possibility of falling tree limbs, etc. <input type="checkbox"/> Exposure to sun <input type="checkbox"/> Strong wind 			
<p>Are risks arising from the use of <u>temporary access equipment</u>?</p> <p>Power operated mobile work platforms</p> <p>Examples</p> <ul style="list-style-type: none"> <input type="checkbox"/> Does not comply with AS1418.10 <input type="checkbox"/> Operated by untrained personnel <input type="checkbox"/> Not secured against uplift or displacement <input type="checkbox"/> Inadequate braking system to prevent unplanned movement <input type="checkbox"/> Not fitted with edge protection system <input type="checkbox"/> No suitably designed anchor point for fall prevention equipment <input type="checkbox"/> Is not large or strong enough to support materials, tools and personnel <input type="checkbox"/> Allows person's body to protrude from confines of platform while moving <input type="checkbox"/> Too windy for safe use <input type="checkbox"/> Used in the wet when not designed to do so 			
<p>Tower scaffolds and other scaffolds</p> <p>Examples</p> <ul style="list-style-type: none"> <input type="checkbox"/> Does not comply with AS1576 <input type="checkbox"/> Installed by untrained & uncertified personnel <input type="checkbox"/> Moved while people are on it 			

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Identify Risks	Initial Risk (High/Med/Low)	Implement Control Measures	Residual Risk
<p>Portable ladders (the least preferred means of access to a roof/height and should only be used after an assessment is made of their suitability)</p> <p>Examples</p> <ul style="list-style-type: none"> <input type="checkbox"/> Set up incorrectly (angle of slope to be between 60° and 70° from the horizontal, the vertical distance shall not exceed 6m, and the ladder is secured top and bottom) <input type="checkbox"/> Set up where a person or vehicle could hit it or where fall objects could hit someone <input type="checkbox"/> Unsuitable for task <input type="checkbox"/> No nominated access point with a fixed ladder point <input type="checkbox"/> Not an “industrial use only” type ladder with a load rating of at least 120kg <input type="checkbox"/> Used in the arc of swinging doors <input type="checkbox"/> Used to gain additional height from working platforms <input type="checkbox"/> May contact overhead power lines <input type="checkbox"/> Work being done off the ladder potentially causing over-reaching and loss of balance 			

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