

Industry Standard

Elevating work platforms

For the safe use of elevating work platforms

Edition 4

June 2023



Disclaimer

The information presented in the Industry standard, is intended for general use only. It should not be viewed as a definitive guide to the law and should be read in conjunction with the *Occupational Health and Safety Act 2004*.

Whilst every effort has been made to ensure the accuracy and completeness of the industry standard, the advice contained herein may not apply in every circumstance. Accordingly, the Victorian WorkCover Authority cannot be held responsible, and extends no warranties as to the suitability of the information for your specific circumstances; or actions taken by third parties as a result of information contained in the Industry standard.

Copyright

The information contained in this publication is protected by copyright. WorkSafe Victoria hereby grants a non-exclusive licence in this publication to the recipient on the condition that it is not disseminated for profit. WorkSafe Victoria encourages the free transfer, copying and printing of the information in this publication if such activities support the purpose and intent for which the publication was developed.

Images produced by Floodlight , ABN 84 61 29 11 305.

WorkSafe Victoria is a trading name of the Victorian WorkCover Authority.

© WorkSafe Victoria



Contents

Foreword	1
Who should use this industry standard?	1
Scope	1
Part 1 – Introduction	3
1.1 Who has duties	3
1.2 EWP selection and planning	5
1.3 EWP types	10
Part 2 – Safe operation of EWPs	13
2.1 Training and competency	13
2.2 Harnesses	17
2.3 Collection and delivery of EWPs	23
Part 3 – Hazards	28
3.1 Electrical hazards	29
3.2 Crushing hazards	35
3.3 Overturning hazards	38
3.4 Water hazards	40
3.5 Falling objects	41
3.6 Collision hazards	42
3.7 Environmental hazards	43
Part 4 – Work practices	44
4.1 Installing overhead pipework	45
4.2 Installing overhead ductwork	46
4.3 Installing large panels (for example glazing, plaster board)	47
4.4 Modifying the EWP or attaching shade cloths or welding tents	48
4.5 Painting, welding, grinding, shotcreting (or similar) from the platform of the EWP ..	49
4.6 Travelling the EWP with the platform raised	50
4.7 Welding and hot works from the platform of an EWP	51
4.8 Pulling, towing or misusing the EWP as a crane	52
4.9 Overloading or over-stacking materials in the EWP	53
4.10 Refuelling or recharging EWPs	54
4.11 Travelling scissor-type EWPs through or into restricted spaces	55
4.12 Working and traveling on inclines	56
4.13 Lifting electrical cross arms using the basket of electrically insulated EWPs	57

Part 5 – Emergency procedures 58

 5.1 Emergency procedures when using EWP. 58

 5.2 EWP contact with overhead electrical powerlines. 60

 5.3 Hazards following overhead electrical powerline incident. 62

Part 6 – Inspection and maintenance 64

 6.1 Inspection. 64

 6.2 Maintenance 71

Key terms 72

Further information 73

Acknowledgements 74

Who should use this industry standard?

This industry standard is for operators of mobile elevating work platforms (EWPs) and persons, such as employers, who have responsibilities managing hazards and risks associated with the operation and use of EWPs.

Scope

This industry standard provides practical advice on the safe use and maintenance of mobile elevating work platforms (referred to as EWPs and also known as MEWPs) and includes the principles and requirements for using EWPs that are common across a broad range of industries and applications. The content is based on industry expectations, current practices and systems at the time of publication. This industry standard does not prevent the use of other approaches, practices and systems from being used in the future if those methods achieve an equivalent or improved level of safety.

EWPs can be vehicle-mounted, self-propelled, towed or moved by hand and used to access work above or below ground level.

This industry standard applies to EWPs where the height of the platform can be adjusted by:

- powered scissor mechanisms
- telescoping boom or tower
- articulation
- any combination of the above methods.

It does not apply to the following (as defined in the OHS Regulations 2017):

- forklift trucks (industrial lift trucks) with working platforms
- order picking forklift trucks
- work boxes temporarily attached to a crane
- suspended scaffolds
- lifts (elevators)
- non slewing mobile cranes (telehandlers) except when configured as an EWP
- building maintenance units and equipment
- mast climbing work platforms
- personnel and material hoists

Foreword

This industry standard also does not apply to:

- horticultural EWPs (specifically designed for the horticultural industry)
- plant or equipment used by Victorian fire services (Country Fire Authority and Fire Rescue Victoria)

This industry standard is not intended to provide detailed information in relation to the duties of designers and manufacturers of EWPs. For information about duties in relation to plant design registration, the design registration process and design verification, see the Plant compliance code at [worksafe.vic.gov.au](https://www.worksafe.vic.gov.au).

Part 1 – Introduction

1.1 Who has duties

Employers must:

Provide and maintain, so far as is reasonably practicable, a working environment for their employees that is safe and without risks to health.

OHS Act s21

Ensure, so far as is reasonably practicable, that persons other than their employees (such as members of the public) are not exposed to risks to their health or safety arising from the business activities undertaken by the employer. OHS Act s23

Not allow an employee to perform high risk work unless the employee holds an appropriate high risk work licence.

OHS Regulations r129

Not perform high risk construction work unless a safe work method statement is prepared for the work before the work commences and the work is performed in accordance with the statement.

OHS Regulations r327

For information about what reasonably practicable means when complying with Part 3 of the OHS Act or the OHS Regulations, see the WorkSafe Position *How WorkSafe applies the law in relation to reasonably practicable* at [worksafe.vic.gov.au](https://www.worksafe.vic.gov.au).

Employer's duties to prevent falls

Employers have specific duties under the OHS Regulations to prevent involuntary falls from more than two metres in the workplace, including a duty to:

- identify, so far as is reasonably practicable, any task that involves a fall hazard. OHS Regulations r43
- control any risk, so far as is reasonably practicable, associated with a fall at the workplace in accordance with the hierarchy of control. OHS Regulations r44

Other duties apply in relation to the prevention of falls.

For information about duties in relation to the prevention of falls, see the Prevention of falls in general construction and Prevention of falls in housing construction compliance codes at [worksafe.vic.gov.au](https://www.worksafe.vic.gov.au).

Part 1 – Introduction

Employer's duties regarding plant

Employers must eliminate any risk associated with the plant, so far as is reasonably practicable.

OHS Regulations r98(1)

Where a risk cannot be eliminated, an employer must work through the hierarchy of control in order to reduce the risks, so far as reasonably practicable.

OHS Regulations r98(2)

Other duties apply in relation to the use of plant in the workplace.

For information about duties in relation to the use of plant in the workplace, see the Plant compliance code at worksafe.vic.gov.au.

Plant design registration

Certain plant design must be design registered before it can be used in the workplace. OHS Act s40 and OHS Regulation 125. This applies to:

- boom-type elevating work platforms
- hoists with a platform movement of more than 2.4 metres, designed to lift persons (e.g scissor-type EWPs).

A list of plant that must be design registered is contained in Schedule 2 of the OHS Regulations and in the Plant compliance code.

Self-employed persons

Self-employed persons must, so far as is reasonably practicable, ensure that persons are not exposed to risks to their health or safety arising from the conduct of the undertaking of the self-employed person. OHS Act s24

Employees

Employees, while at work, must take reasonable care for their own health and safety, and that of others who may be affected by their acts or omissions in the workplace. Employees must also co-operate with their employer's actions to make the workplace safe (for example by following any information, instruction or training provided). OHS Act s25

Note: The word **must** indicates a legal requirement that has to be complied with. The words **need(s) to** are used to indicate a recommended course of action in accordance with duties and obligations under Victoria's health and safety legislation. The word **should** is used to indicate a recommended optional course of action.

1.2 EWP selection and planning

An assessment should be undertaken during the planning phase of the job to determine the correct and safest method to perform the work at height. This may result in the conclusion that EWPs should not be used due to the risks associated with the specific task, and other forms of height access should be used, for example scaffolds.

If an EWP is deemed to be the safest way to perform the task, then it is important to identify the most appropriate type of EWP to carry out the work safely.

EWPs are available in a variety of types and sizes (see 1.3 EWP types). When selecting the EWP ensure it is suitable for:

- the application
- site conditions
- operator competency
- controlling the identified hazards.

The decision to use a specific EWP should not be based solely on the availability of a particular EWP at a workplace.

This industry standard provides extensive information on work practices, common hazards and controls. Table A (see next page) provides an overview of factors that should be considered during the selection process. This is not an exhaustive list and should be read in conjunction with information provided throughout this industry standard.

Part 1 – Introduction

Table A: EWP selection factors

Location	
Indoor / outdoor	<p>Is the task to be performed indoors or outdoors?</p> <p>For example, will it be exposed to wind loading?</p>
Space	<p>Consider the operating space available including:</p> <ul style="list-style-type: none"> • access routes • the tail/boom swing of the EWP • physical size. <p>Can the ground controls (including emergency stop and lowering) be accessed when the EWP is in use?</p>
Clearances	<p>Is there sufficient clearance distance for:</p> <ul style="list-style-type: none"> • roads • footpaths • buildings • structures (including overhead) • structural supports • other plant?
Access	<p>Will any crane be required to lift the EWP into position or to remove it from a working area?</p>
Air flow	<p>Is there sufficient ventilation and air flow in the working area?</p> <p>Can harmful fumes or gases build up? For example if working indoors, consider using an electric powered EWP – instead of a combustion engine, to avoid exhaust gases building up inside.</p>
Underground considerations	<p>Could the surface underneath the EWP collapse or fail?</p> <p>For example consider any underground services, ground cavities or cellars in the area.</p>
Powerlines	<p>Are there any energised overhead electric lines near the area where the work will be undertaken?</p>
Radiation	<p>Are there any sources of electro-magnetic radiation located near the work area, that may be harmful or affect the EWP?</p> <p>For example, airport radar towers or healthcare facilities where magnetic resonance imaging (MRI) scanners are operating.</p>

Part 1 – Introduction

Table A: EWP selection factors

Surface and ground conditions

Type

Consider the surface that the EWP is to be operated on, including access route surfaces, and ensure the surface can support the EWP so that it remains stable during use, for example:

- hard surface, e.g. concrete
- soft surface, e.g. rocky, earth terrain
- sloping or undulating surfaces
- benched or multi-level surfaces and the capacity of an EWP to self-level
- suspended surfaces, e.g. bridge decks, suspended slabs – can the slab support the weight and point loading of the EWP?
- barges – can the barge support the weight of the EWP and any required movements?

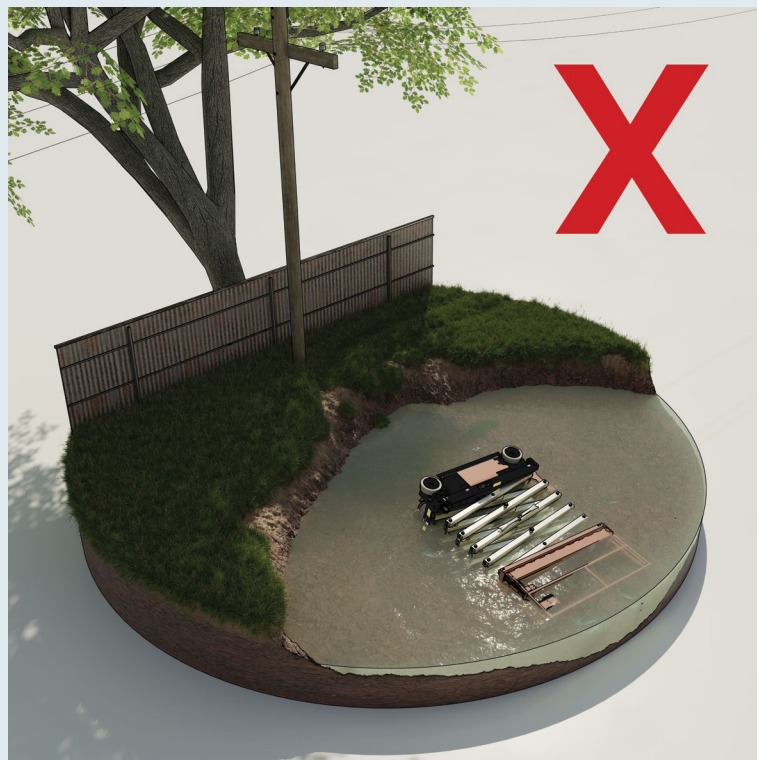


Figure 1 – Example of a toppled EWP used near water

Part 1 – Introduction

Table A: EWP selection factors

Task considerations

Height What working height and reach is required to undertake the task?
For example, can the EWP reach the task location?



Figure 2 – Example of an EWP being used for a task at height

Capacity Can the EWP support the required number of personnel, equipment and materials combined?
Consider the EWP rating and the specific tasks being undertaken from within the EWP.

Attachments Are any EWP attachments required to lift the materials or equipment?

Type What EWP configuration suits the specific workplace constraints? For example scissor-type, knuckle boom, telescopic?

Task specific hazards What risk controls are required due to the task? For example insulated boom or secondary guarding.

Methodology Forces that may be exerted on the EWP as a result of the force required to undertake the task. For example side forces.

Part 1 – Introduction

Table A: EWP selection factors

Other	
Training	Are the operators suitably trained and licensed (where required) for the specific task being undertaken and the EWP being used (see part 2.1 Training and competency)?
Emergencies	Does the working method facilitate emergency rescue and retrieval? Is additional rescue equipment or personnel required?

Part 1 – Introduction

1.3 EWP types

There are many different types of EWPs available in the industry today. Many have been designed for specific applications or for use in environments with specific constraints. Selections of these are depicted in this section.

Scissor-type

For operating on flat, solid surfaces or rough terrain surfaces depending on the design.



Figure 3 – Scissor-type EWP for operating on a flat or solid surface



Figure 4 – Scissor-type EWP for operating on rough terrain or uneven surfaces

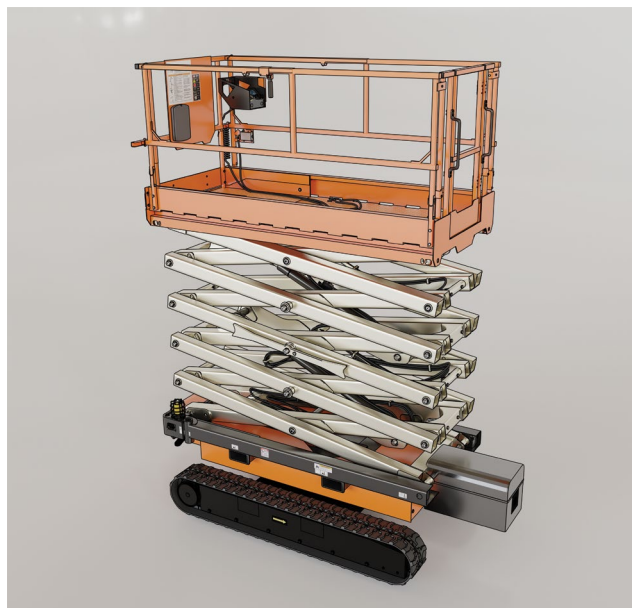


Figure 5 – Scissor-type EWP for operating on rough terrain or inclined surfaces

Part 1 – Introduction

Vertical mast lift

Mainly used on flat solid surfaces. Manually operated or mechanical units.



Figure 6 – Vertical mast lift

Truck-mounted

Mainly used in the electrical or arborist industries. Other common names include bucket truck and cherry picker.



Figure 7 – Truck-mounted EWP

Part 1 – Introduction

Self-propelled boom lift

For driving on flat solid surfaces, rough terrain surfaces and hard to reach places. Other common names include knuckle boom, straight stick and cherry picker.



Figure 8 – Self-propelled boom lift

Trailer-mounted

For accessing hard to reach places. Commonly called a cherry picker.



Figure 10 – Trailer-mounted EWP



Figure 9 – Spider lifts or compact crawlers for sites with restricted access

Part 2 – Safe operation of EWPs

2.1 Training and competency

Information, instruction, training or supervision must be provided to those involved with the operation of EWPs, prior to operating or undertaking the task. High risk work licences (HRWL) may also be required, depending on the type of EWP being operated.

EWP operators need to be supervised during the training period until they are deemed competent.

Training needs to be given to other employees using the EWP on issues such as:

- harness use (where required)
- emergency procedures
- identifying hazards and risks associated with EWP use, for example overhead structures.

Information about the hazards and risks need to be shared regularly, for example, through daily safety meetings/toolbox talks. These could be used to provide information on topics such as:

- Safe use and operation of the EWP in the workplace environment
- Any identified hazards and any measures that are to be implemented to control the risks
- Carrying out pre-operational inspections prior to use (see part 6 for more information on inspections).

Part 2 – Safe operation of EWPs

Table B: Training of persons involved in the safe operation of EWPs

	Boom-type EWP with a boom length over 11 metres	Scissor-type EWP Boom-type EWP with a boom length under 11 metres Other EWPs
Evidence of operator competency and/or training:	High risk work licence with boom-type elevating work platform operation (WP) licence class	Training should comprise of structured, nationally recognised training that includes assessments overseen by a suitably trained assessor to ensure that the operator has achieved the required level of competency. Proof of competency evidence should be available. For example, an Elevating Work Platform Association of Australia (EWPA) yellow card or certification of EWP training from a registered training organisation (RTO).
Content of operator training	<p>All EWP operator training should include:</p> <ul style="list-style-type: none"> • legal requirements in regard to health and safety • getting to know the operator’s manual • hazard management – identifying, assessing and controlling hazards • equipment and safety features • prestart (pre-operational) inspection • control facilities and positions • understanding and identifying the limitations of machinery, such as rated capacity, wind rating, and machine weight • moving and positioning an EWP • transporting including loading and unloading (where required) • working near overhead power lines • selecting, inspecting and using a harness • refuelling tools and battery charging • reporting problems and incidents • emergency retrieval systems • emergency rescue plans. 	

Part 2 – Safe operation of EWPs

Table B: Training of persons involved in the safe operation of EWPs

Familiarisation training	For all EWP operators If the EWP model is different to the model used during training and assessment, then the operators need to be provided with familiarisation training on the specific EWP they will be operating. EWP designs can differ between manufacturers and even models by the same manufacturer.
--------------------------	--



Figure 11 – Example of a High risk work licence



Figure 12 – Example of an Energy Safe spotter registration card

Other training or qualifications may be required, such as:

Safety observer:

- Must be trained in the operation of the EWP and licensed where required under the legislation for the type of EWP being operated. See part 5.1 Emergency procedures when using EWPs and Key terms for more information about safety observers.

Electrical spotter:

- Must be the holder of an Energy Safe Victoria (ESV) issued registration card.
- Electrical spotter registration needs to be specific for the plant and equipment working in the vicinity of overhead electrical assets.
- See the Energy Safe Victoria website at esv.vic.gov.au for specific training requirements.

Note: The use of ESV spotters do not apply to workers engaged in distribution and transmission power company works.

Part 2 – Safe operation of EWP

Supervisor:

- Training for supervisors in relation to EWP selection and safe use.

Other:

- Professional qualifications in relation to the safe use of EWPs such as structural engineers, geotechnical engineers. These persons may be engaged to assess the ground bearing capacity of the ground or structural capacity of the surface upon which the EWP is to be travelled and operated on, to ensure it has the capacity to support the EWP and any imposed loads during the activity.

2.2 Harnesses

A full body safety harness needs to be worn by every person on the platform of a boom-type EWP or vertical mast EWPs fitted with a jib.

The full body harness needs to be specifically designed for attachment to a lanyard assembly and include a personal energy absorber.

The harness needs to be secured to the designated anchor point on the EWP, not the handrail.

This is to help control the risk of:

- a fall from the platform, should the platform strike an object
- a fall from the platform, should the EWP platform levelling system fail, resulting in the platform tilting or inverting
- a person being catapulted out of the EWP, for example while travelling over uneven ground or over a terrain drop-off.

Note: When an EWP is working over water, there may be an exception to the use of safety harnesses. For example, if a person is wearing a safety harness and the EWP tips over into the water, the use of the safety harness may mean that the person on the platform is dragged underwater with the machine. In this instance, a site-specific risk assessment should be conducted, and recorded, to determine whether a safety harness or other risk control measures are required.

See part 3.4 Water hazards and part 1.2 EWP selection and planning for further information

Part 2 – Safe operation of EWPs

Safety harness fall arrest systems need to comply with the AS/NZS 1891 Industrial fall arrest systems and devices series.

When selecting lanyard lengths everyone on the platform should ensure that:

- the length of the lanyard is as short as possible, while still permitting the occupants in the EWP freedom of movement
- the operator is able to maintain both feet on the platform floor.

For relatively low height tasks a site-specific assessment should be conducted to identify:

- if there is an inadequate fall clearance, where a fall arrest system (including energy absorber) may deploy, and the occupant may still impact the ground, receiving serious or fatal injuries (see figure 13 on next page).
- if other methods for working at height, such as using a mobile scaffold may be a safer method for undertaking the task.

If no alternative safe method is available, a lanyard system in a travel restraint configuration (with energy absorber, secured to the designated anchor point(s)) may be used.

Part 2 – Safe operation of EWP

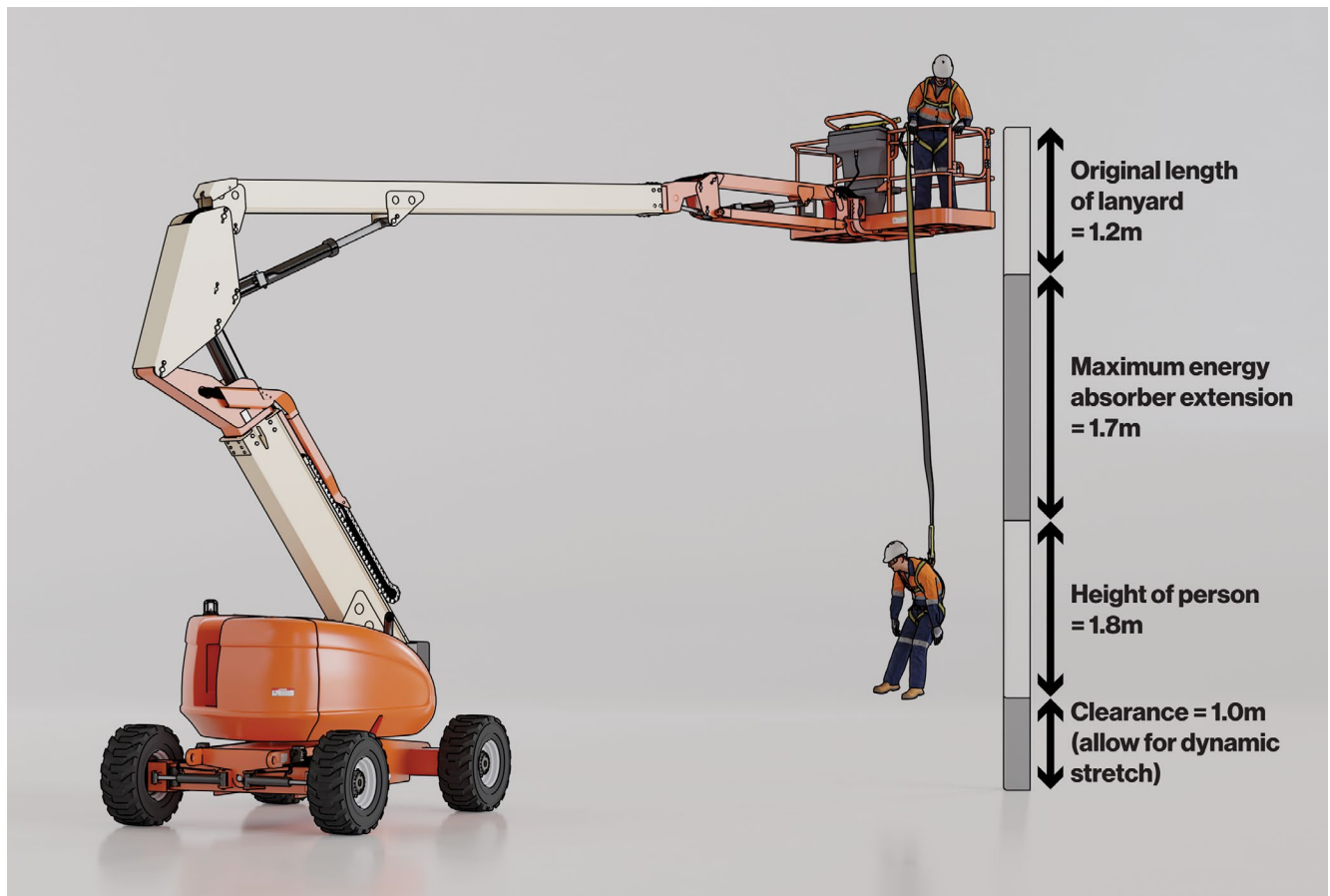


Figure 13 – Example of the required minimum fall clearance below the level of the harness anchorage, including the total fall distance before the configuration would be effective in arresting a fall of 5.7m

A safety harness system only needs to be used for a scissor-type EWP if advised by the manufacturer or indicated in the risk assessment. This is because occupants of a scissor-type EWP are protected by the guard rail on all sides of the platform. Due to its design, the platform on a scissor-type EWP cannot invert if the EWP malfunctions, or rebound causing a catapult effect.

Where a safety harness is used, a suitable anchor point needs to be provided (see figure 14).

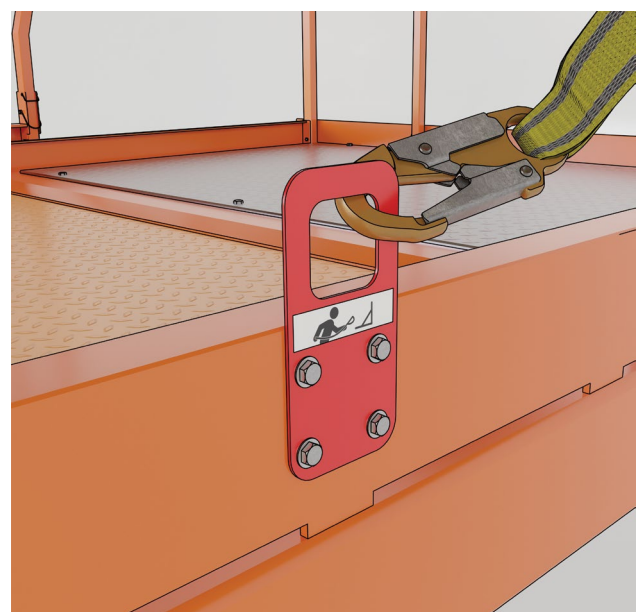


Figure 14 – Example of a harness attachment point on an EWP

Part 2 – Safe operation of EWP

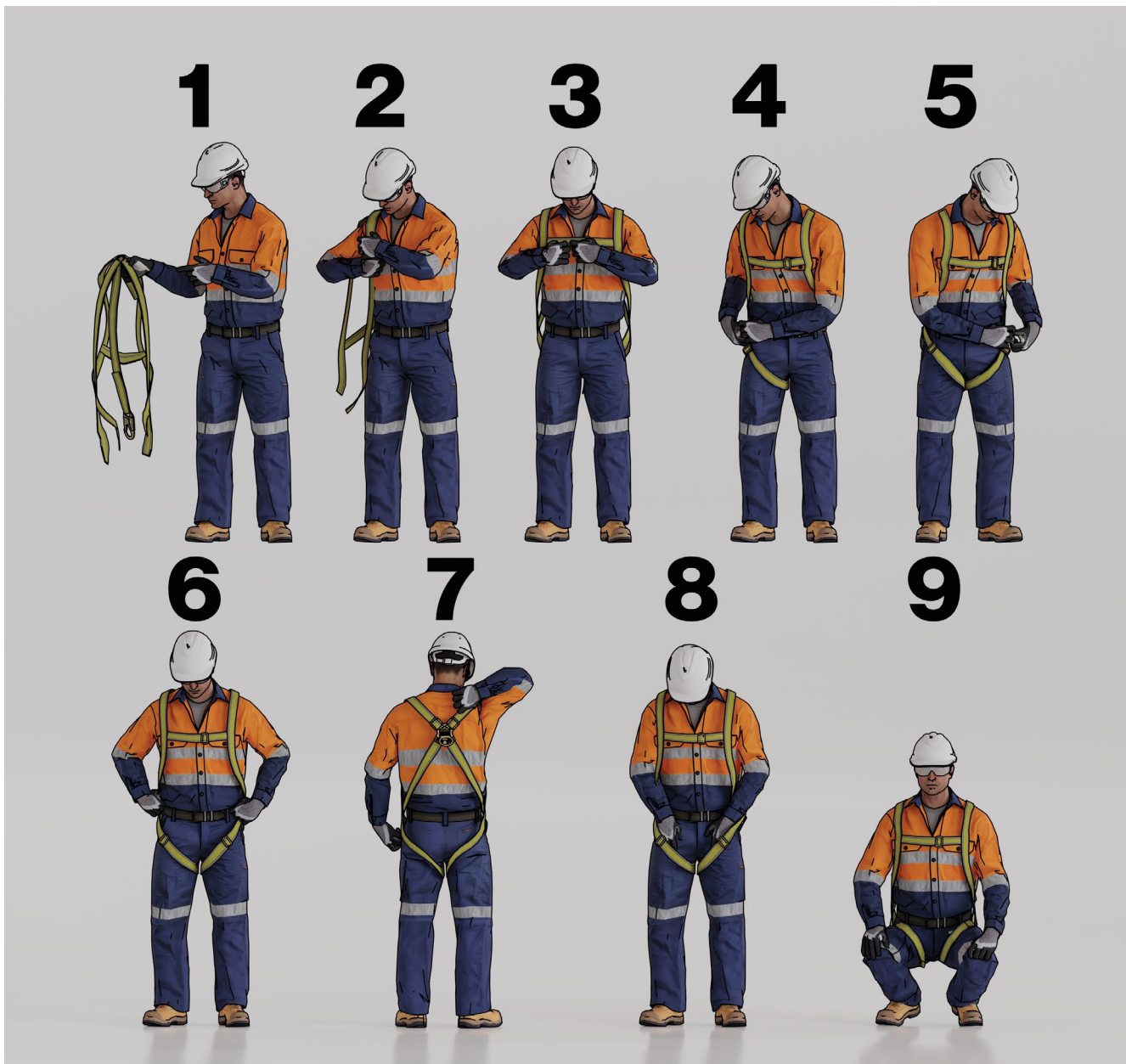


Figure 15 – Example of fitting a harness

Harness inspections

Every person using a harness should be competent in how to inspect, wear, use and secure a harness in accordance with the manufacturer's instructions. To avoid malfunction, harnesses need to be inspected for defects prior to and after use.

Personal equipment (including harnesses and associated equipment) should be routinely inspected by a suitably competent person at six-monthly intervals.

In accordance with AS/NZS 1891.4, harnesses that present with any of the following defects should be removed from service.

Part 2 – Safe operation of EWP

Table C – Harness inspection checklist

Action	Fail	Pass	Comments/ action required
Webbings			
• Visually check for cuts, tears, scratches and grazing	<input type="checkbox"/>	<input type="checkbox"/>	
• Test for excessive stretching	<input type="checkbox"/>	<input type="checkbox"/>	
• Look for signs of deterioration due to rotting, mildew or ultraviolet exposure or heat damage (e.g. due to welding) exposure to corrosives or solvents	<input type="checkbox"/>	<input type="checkbox"/>	
Stitching			
• Check for any indication of weak or damaged threads such as fraying, cuts or tears	<input type="checkbox"/>	<input type="checkbox"/>	
Snap hooks			
• Look for any hook or latch distortion (for example bending)	<input type="checkbox"/>	<input type="checkbox"/>	
• Look for cracks or forging folds	<input type="checkbox"/>	<input type="checkbox"/>	
• Check for excessive wear at swivels and latch pivot pin	<input type="checkbox"/>	<input type="checkbox"/>	
• Check for any open rollers	<input type="checkbox"/>	<input type="checkbox"/>	
• Test the latch to ensure it doesn't move freely or over its full travel	<input type="checkbox"/>	<input type="checkbox"/>	
• Check for any broken, out-of-place or missing latch springs	<input type="checkbox"/>	<input type="checkbox"/>	
• Look for any soil or grime build-up	<input type="checkbox"/>	<input type="checkbox"/>	

Part 2 – Safe operation of EWP

Table C – Harness inspection checklist

Action	Fail	Pass	Comments/ action required
Buckles and adjusters			
• Look for physical defects such as cracks, corrosion and other physical damage	<input type="checkbox"/>	<input type="checkbox"/>	
• Check for any missing parts	<input type="checkbox"/>	<input type="checkbox"/>	
• Test functioning correctly	<input type="checkbox"/>	<input type="checkbox"/>	
• Look for bent tongues	<input type="checkbox"/>	<input type="checkbox"/>	
• Look for any open rollers	<input type="checkbox"/>	<input type="checkbox"/>	
D-Rings			
• Check excessive movement of the D-Ring	<input type="checkbox"/>	<input type="checkbox"/>	
• Look for cracks, signs of excessive wear and any other physical damage	<input type="checkbox"/>	<input type="checkbox"/>	
Energy absorber			
• Check for evidence of activation, tampering or damage	<input type="checkbox"/>	<input type="checkbox"/>	

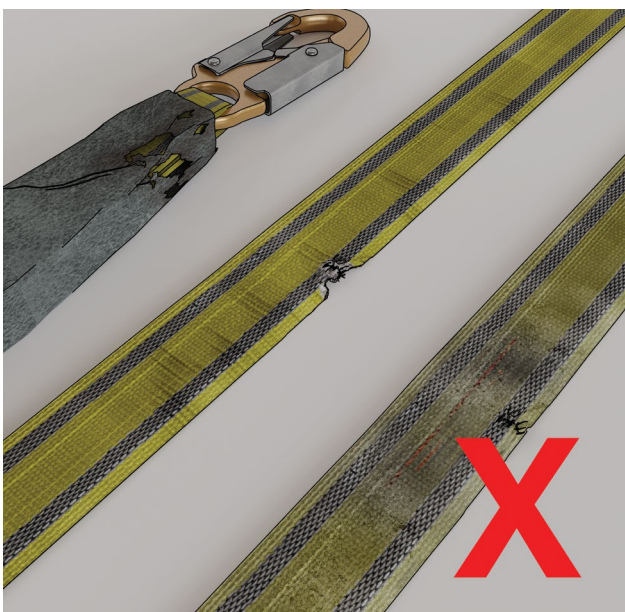


Figure 16 – Example of damaged harnesses and associated equipment

2.3 Collection and delivery of EWPs

Most types of EWPs will require transporting to and from the workplace. This involves the use of transport vehicles to relocate the EWP via the road network. Delivery and collection of EWPs is a hazardous activity and has resulted in serious incidents, including a number of fatalities.

It is essential that the hazards are identified and risks controlled when undertaking these tasks.

If adequate risk control measures are not in place then the persons involved in the delivery or collection should be authorised to abandon or delay the delivery or collection until risk control measures are implemented.

Safe systems of work

Safe systems of work must be in place throughout the delivery and collection process for the EWP. These may include:

Planning and preparation

- Contact the delivery or collection site in advance to provide an estimated time of arrival to allow:
 - site personnel and hirer time to prepare the designated unloading and/or loading area
 - arrangements to be made for site personnel and hirer to be at the site during the unloading and loading task if practicable.
- Ensure emergency procedures are in place (including systems and resources). In the event of an incident there should be a person available and nominated to take action such as to administer first aid or contact emergency services.
- Prepare the designated loading and or unloading area.
- Assess the loading and unloading area for hazards prior to commencing, such as:
 - overhead powerlines
 - weather conditions
 - lighting at the site
 - traffic on the routes to be used to and from the transport vehicle
 - collision with moving vehicles, equipment and pedestrian traffic
 - the ground is able to support the EWP and its transport vehicle
 - collision and crushing hazards, such as structures, fences, and overhead structures.

Part 2 – Safe operation of EWP

- Ensure transport operators are trained and competent:
 - to operate the EWP
 - to use the associated loading and load restraint equipment (refer to the National Transport Commission's Load Restraint Guide)
 - to inspect the load restraint equipment prior to use
 - in the emergency procedures for the type of plant
 - with the EWP manufacturers' instructions, including operation, emergency devices, loading and unloading, disengaging the drive motor (if required) and any tie-down procedures.
- Ensure transport operators hold an appropriate road licence and/or a licence to perform high risk work (see part 2.1 Training and competency).

Chain of responsibility

The Heavy Vehicle National Law (HVNL), enforced by the National Heavy Vehicle Regulator, requires that every party in the heavy vehicle transport supply chain has a duty to ensure the safety of their transport activities.

In practical terms, this primary duty represents an obligation to eliminate or minimise potential harm or loss (risk) by doing all that is reasonably practicable to ensure safety. As a party in the supply chain, the best way to do this is to have safety management systems and controls in place, such as business practices, training, procedures and review processes that:

- identify, assess, evaluate, and control risk
- manage compliance with requirements for speed, fatigue, mass, dimension, loading and vehicle standards, through identified best practice
- involve regular reporting, including to executive officers
- document or record actions taken to manage safety.

Go to www.nhvr.gov.au for more information on chain of responsibility requirements.

Part 2 – Safe operation of EWP



Figure 17 – Example of an EWP secured to a delivery vehicle for transport

Equipment

- Ensure necessary equipment is provided and in place for:
 - traffic management
 - exclusion zones
 - adequate lighting at the origin and final destination of EWP transport.
 - Ensure that operators wear the appropriate PPE, including hi-visibility clothing.
 - Ensure harnesses are provided and worn (if required), including while operating the EWP from the platform of a boom-type EWP.
 - Ensure that the transport vehicle is the appropriate type and size to safely transport the EWP without overhanging the vehicle, and that it is in a safe condition for use.
- Ensure the transport vehicle is road registered.
 - Provide non-rebounding tensioners when using tie down chains.
 - Check that the mass of the EWP is within the capacity of the winch (if fitted), truck and/or trailer.
 - Ensure that adequate lighting is provided to illuminate the controls and for the loading and unloading travel path of the EWP.
 - Transport EWPs on a drop deck trailer (low loader) rather than a tilt tray truck, if practicable.
 - Use technology such as remote control devices to operate the EWP onto/off the vehicle, if available.

Part 2 – Safe operation of EWP

The task

- Ensure that the EWP is loaded and unloaded according to the manufacturer's instructions.
- Establish exclusion zones, where possible, around the transport vehicle during the loading and unloading process to prevent persons entering the area.
- Ensure that the correct method for loading the specific EWP on to the specific transport type is used, examples may include:
 - drive on/off
 - free wheel and winch
 - drive and winch on/off
 - direct crane lift on/off.
- Adhere with the latest version of the National Transport Commission's Load Restraint Guide.
- Ensure that all loose items are secured, including engaging the slew lock (if fitted), and any outriggers (if fitted).
- Ensure that the braked wheels of the EWP are always in contact with the ground/bed of the truck to prevent inadvertent freewheeling.
- Ensure that the EWP does not enter any live lanes of traffic when travelling to and from the delivery vehicle and appropriate traffic management controls are in place (where required).

- Ensure that the EWP is parked and secured in accordance with the manufacturer's recommendations and that the keys are kept in a secure location.
- Ensure the EWP is shut down and the winch cable (if fitted) is attached before the brakes are released.
- To prevent damage to the EWP brakes and tyres, ensure that winching (if fitted) is not undertaken with the EWP brakes applied.
- If the platform is required to be tilted for transport, ensure that the platform tilting is done by using the ground controls.

Routine maintenance

Transport vehicles must be maintained in a safe condition. A competent person should carry out inspections of all critical components on the transport vehicle as prescribed by the manufacturer, or at least annually.

This includes but is not limited to the inspection of the winch and winch cable (if fitted), chains, and tie down points.

A record of maintenance and servicing should be kept.

Part 2 – Safe operation of EWP



Figure 18 – Example of a delivery driver operating an EWP on a delivery vehicle

Note: Operators of boom-type EWPs should be wearing a harness when loading and unloading the EWP.

Part 3 – Hazards

Incidents, injuries and even fatalities can occur when hazards are not adequately identified or when risks are not controlled in the workplace. Once hazards have been identified, the employer must ensure that the risks associated with those hazards are controlled so far as is reasonably practicable.

Controlling any risk(s) associated with the use of EWPs in the workplace includes following the hierarchy of control outlined below.

Table D: Example hierarchy of control

Level	Examples
1. Eliminate the risk	<ul style="list-style-type: none">• If a risk of crushing exists; eliminate the risk by replacing the EWP with a scaffold.
2. Reduce the risk (substitution, isolation, engineering controls)	<ul style="list-style-type: none">• Use a different EWP for the task, such as an insulated boom-type EWP for electrical hazards.• Isolate the operating EWP by implementing physical exclusion zones.• Use engineering controls such as design controls, guarding and barriers.
3. Reduce the risk using administrative controls	<ul style="list-style-type: none">• Warning signs.• Safety observers.• Providing appropriate information, instruction, training or supervision.
4. Reduce the risk using personal protective equipment (PPE)	<ul style="list-style-type: none">• Hearing protection.• Respirators.• Face masks.• Hard hats.• Gloves.• High visibility vests.• Protective eye wear.

3.1 Electrical hazards

EWPs are often used in locations where overhead assets (powerlines) are present. Contact with powerlines can result in electric shock injuries that can be fatal. In some circumstances electricity can arc over an air gap and energise people, materials, or the EWP.

It is critical that EWP operators comply with the 'No Go Zone' (NGZ) rules.

Note: For workers engaged in distribution and transmission power company works the NGZ rules and use of ESV spotters do not apply. These workers must comply with clearances and training as required in the Blue book (Code of Practice on electrical safety for the work on or near high voltage electrical apparatus) and their own company procedures.

For detailed information about the NGZ rules see the guidebook Using powered mobile plant near overhead assets at worksafe.vic.gov.au.

Spotter required

An electrical spotter for the EWP should be in place when the machinery is operating between 3–6.4 metres of pole-mounted powerlines or between 8–10 metres of tower-mounted powerlines.

The electrical spotter should not undertake any other tasks except for the spotting of the EWP.

Note: Electrical spotters for EWPs need to have the suitable plant/licence class listed on their spotter registration certificate, see part 2.1 Training and competency for details on spotter registration requirements.

No Go Zones

No part of an EWP or its load should come closer than 3 metres to pole-mounted powerlines or within 8 metres of tower-mounted powerlines.

Where work is required within 3 metres of pole-mounted powerlines or 8 metres of tower-mounted powerlines, contact the asset owner to obtain a Permit to Work. Works are to be carried out in accordance with NGZ Permit to Work requirements.

Where an EWP could approach or travel into the 'spotter required' or NGZ areas, systems of work should be in place to meet the 'deemed to comply' requirements. See the guidebook Using powered mobile plant near overhead assets at worksafe.vic.gov.au, or contact the asset owner to obtain a Permit to Work. .

Note: For a list of current electrical asset owners in Victoria, visit the Energy Safe Victoria website at esv.vic.gov.au.

Part 3 – Hazards

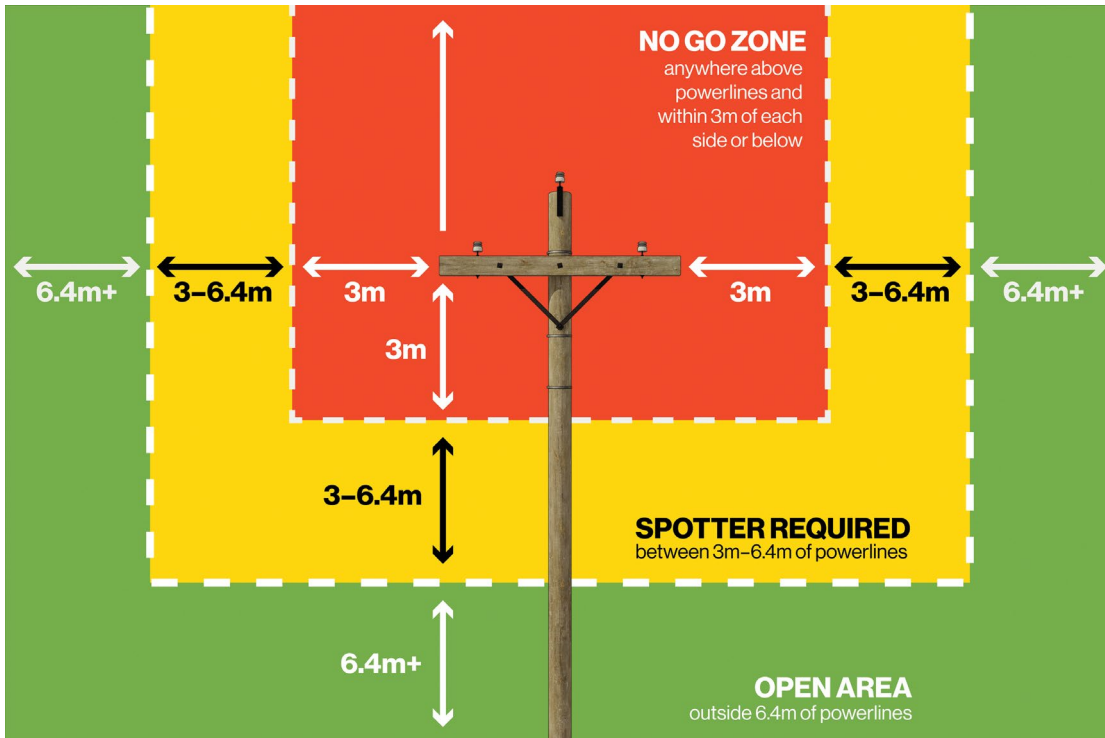


Figure 19 – No Go Zones for power poles

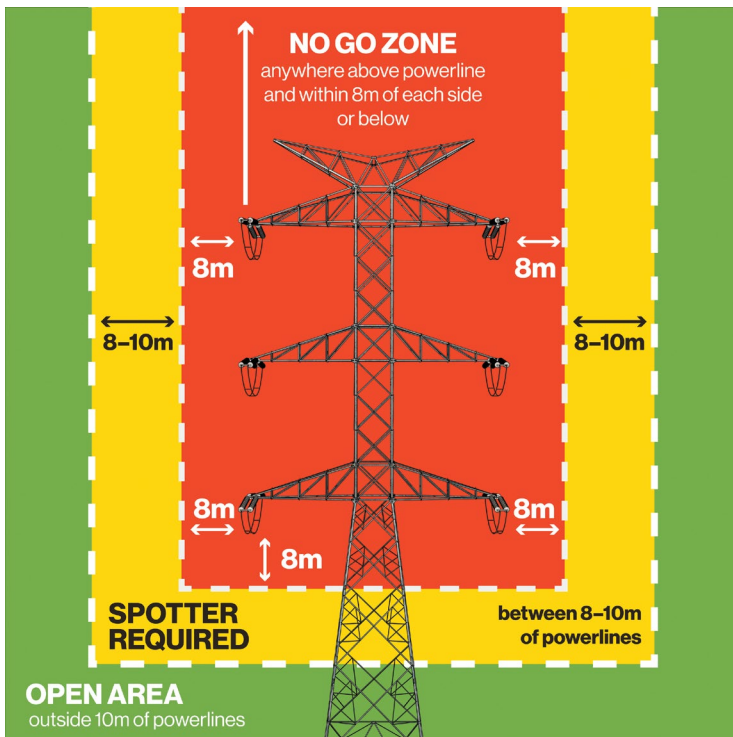


Figure 20 – No Go Zones for towers/transmission powerlines

Part 3 – Hazards

The hierarchy of controls should be used to consider electrical hazard control measures in order from levels 1 to 3. Some examples include:

Table E: Hierarchy of controls for electrical hazards

Level	Examples
1. Eliminate the risk	<ul style="list-style-type: none">• De-energise overhead powerlines.• Consider using an alternative, smaller EWP which cannot encroach into the NGZ.
2. Reduce the risk (substitution, isolation, engineering controls)	<ul style="list-style-type: none">• If fitted, utilise an earth chain when working in the spotters zone.• Utilise mechanical devices to restrict the motion of the EWP.• Utilise barriers to restrict EWP movement.
3. Reduce the risk using administrative controls	<ul style="list-style-type: none">• Adhere to the NGZ guidelines.• Maintain NGZ distances and exclusion zones.• Use electrical spotters.• Comply with NGZ permit conditions.• Fit proximity sensors and warning devices to the EWP.• Have the power authority fit visual warning devices to overhead lines ('tiger tails').• Use warning signs to indicate the location of overhead powerlines.• Conduct safety assessments and consider:<ul style="list-style-type: none">– swing and sag of overhead powerlines– location and voltage of the overhead powerlines– wind strength and direction and weather conditions– daily check of administrative controls.

Testing of EWP power supply

Electrical power outlets used to supply power to tools or equipment within the EWP platform, need to be protected by a residual current device (RCD).

RCDs, also known as residual current circuit-breakers or safety switches are electrical safety devices that will turn the power supply off if a fault is detected, and break the electrical circuit protecting the individual from suffering an electric shock, or electrocution.

If the EWP is fitted with an electrical power outlet, before operating the EWP the operator needs to:

- check to ensure that it is fitted with an RCD
- check that the RCD is fit for purpose and free from visible defects, for example:
 - damage to plug, bent pins, taped leads
 - coloured wires are visible
 - signs of overheating such as burn marks or staining on the plug
- conduct a daily push-button test, to ensure the RCD is functioning correctly.

Electrical power supply outlets also need to be routinely tested and inspected by a competent and suitable qualified person (as per AS/NZS 3760), to detect electrical faults and deterioration that cannot be found by visual inspection.

Operators should check log books to ensure the testing has occurred.

The nature and frequency of inspection and testing depends on factors such as the type of electrical equipment, the operating environment and the relevant standards (see tables F and G on the next page).

These include:

- AS/NZS 3012:2019 Electrical installations – Construction and demolition sites
- AS/NZS 3760:2010 In-service safety inspection and testing of electrical equipment
- Electrical installations on construction sites, Industry standard, WorkSafe Victoria

Part 3 – Hazards

Table F: Testing requirements for EWP used for non-construction activity, or at a non-construction workplace

EWP Type	Test Type	In accordance with
Engine powered, with GPO and RCD	Trip in time test	AS/NZS 3760
Engine powered, without GPO	N/A	N/A
Battery powered with GPO supplied from an RCD protected inverter	Trip in time test	AS/NZS 3760
	Electrical asset test	AS/NZS 3760
Battery powered, without GPO	Electrical asset test (Plant)	AS/NZS 3760

Table G: Testing requirements for EWP used for construction activity or at a construction workplace

EWP Type	Test Type	In accordance with
Engine powered, with GPO and RCD	Monthly, Trip in time test	Electrical installations on construction sites, Industry standard
Engine powered, without GPO	N/A	N/A
Battery powered, with GPO supplied from an RCD protected inverter	RCD Monthly: Trip in time test	Electrical installations on construction sites, Industry standard
	Electrical asset test	EWP testing per AS/NZS3012
Battery powered, without GPO	Electrical asset test (Plant)	AS/NZS 3012

Note: On a construction site AS/NZS 3012 takes precedence over AS/NZS 3760 in regards to testing timeframes.

Part 3 – Hazards

Electrical hazards continued

Some safe work practices/control measures

- ✓ Use properly maintained and insulated EWP's
- ✓ De-energise overhead powerlines
- ✓ Use an EWP that cannot enter the NGZ
- ✓ Use mechanical devices that restrict the EWP from entering the NGZ
- ✓ Use barriers
- ✓ Use electrical spotters
- ✓ Implement exclusion zones around the EWP

Some work practices to avoid

- ✗ Entering the NGZ without permits and prescribed risk controls
- ✗ Storing items on the platform that might protrude into the NGZ
- ✗ Approaching the EWP while it's operating
- ✗ Operating an EWP without adequate training or licence

3.2 Crushing hazards

The risk of people, operators or passengers being crushed while using an EWP may be increased where:

- overhead or adjacent fixed structures are present near the EWP operational areas, such as:
 - roofs
 - structural beams
 - cable trays
 - pipework.
- the platform moves unexpectedly while the EWP is close to an overhead or adjacent fixed structure, due to:
 - unstable ground conditions
 - an operator not being familiar with the specific EWP model controls
 - malfunction of the controls.
- ground-based obstacles are in close proximity to the EWP. Obstacles on the ground may divert an operator's attention from overhead or adjacent structures (or their passenger's safety) while traveling or manoeuvring the EWP.

Some safe work practices/control measures

- ✓ Use an EWP fitted with secondary guarding (barriers/sensors) (see figures 22, 23 and 24)
- ✓ Operate the EWP in creep mode when near fixed structures
- ✓ 'Walking' the EWP with the operator at ground level using the removable controls or other mobile control device through areas with restricted headroom (see figure 25)

Some work practices to avoid

- ✗ Using an EWP that is not fitted with secondary guarding when there's a risk of crushing
- ✗ Travelling with a raised platform, especially where ground conditions (undulations) may expose the operator to crushing
- ✗ Driving EWP's through doorways while operating the EWP from the platform



Figure 21 – Example of an EWP working near overhead structures fitted with a pressure sensing device

Secondary guarding

Where there is a risk of crushing against a fixed structure, an effective operator protective device needs to be fitted, so far as is reasonably practicable. These devices are commonly known as secondary guarding and may include, but are not limited to:

- physical barriers attached to the platform, which reduce the likelihood of employees being crushed against structures (see figures 22 and 23)
- pressure sensing devices positioned over the control panel, which detect pending crush incidents and prevent further hazardous movements (see figure 24)
- proximity sensing devices which prevent an EWP's platform from manoeuvring into high-risk areas near to fixed structures.

Part 3 – Hazards



Figure 22 – Example of a physical barrier attached to the platform



Figure 24 – Example of a pressure sensing device



Figure 23 – Example of a physical barrier attached to the platform



Figure 25 – Operator 'walking' the EWP through restricted area, using the removable control

3.3 Overturning hazards

Overturning and tip-overs of EWPs are a leading cause of incidents involving the use of EWPs. If an EWP overturns, operators and other people in the vicinity are at risk of serious injury. EWPs can easily become unstable if used incorrectly or on unstable surfaces.

It is critical that operators ensure that the ground can support the EWP in a stable manner, both at the work location and during any travel. If the ground is unsuitable alternative control measures should be implemented, such as:

- using an EWP that is suitable for the ground conditions
- having a competent person install road plates
- modifying the ground to suit the EWP.

Some safe work practices/control measures

- ✓ Use suitable EWPs for the task and conditions
- ✓ Lower the EWP prior to travelling
- ✓ Cover ground voids or holes with suitable load bearing material such as road plates, or make them visible so they can be avoided
- ✓ Physically protect and highlight slab drop-offs
- ✓ Ensure the EWP platform is levelled prior to use
- ✓ Cease to use the EWP in winds that exceed the designed maximum allowable wind speed limit
- ✓ Use outriggers where provided
- ✓ Assess and ensure the ground bearing capacity upon which the EWP is to be travelled and operated has the capacity to support the EWP and any imposed loads

Some work practices to avoid

- ✗ Using EWPs on packing or blocks in an attempt to 'level' the EWP
- ✗ Tying off the EWP to other structures
- ✗ Carrying large materials like plasterboard on the platform, if the EWP is not designed for this
- ✗ Travelling or operating on slopes when the EWP isn't designed for it
- ✗ Ignoring stated maximum gradeability
- ✗ Travelling the EWP with the platform raised (unless the EWP is designed for it and a thorough inspection of the route has taken place to check for voids or soft spots)
- ✗ Exceeding the safe working load (SWL) of the platform
- ✗ Using an EWP near an unsupported excavation, embankment, or other underground hazard

Part 3 – Hazards

Continued from previous page

Some safe work practices/control measures

- ✓ Identify underground services or recently disturbed ground

Some work practices to avoid

- ✗ Attaching shade cloth, signs, banners or similar to the platform of the EWP
- ✗ Using indoor-rated EWPs outdoors or in areas exposed to wind
- ✗ Subjecting the EWP to excessive manual side force (exceeding the rating) due to activities such as drilling
Note: The side force rating may be found on the plate, decals or operation manual. As a guide, 200N equates to the equivalent of 20kg of weight.
- ✗ Locating the EWP in a position that is susceptible to being struck by an object that is being worked on (e.g. limbs of trees, steelwork etc. falling onto or against the EWP)
- ✗ Attaching or tying leads, hoses, etc. to the EWP from a location outside of the EWP platform



Figure 26 – Example of an EWP with outriggers



Figure 27 – Example of a warning decal

Part 3 – Hazards

3.4 Water hazards

Operating EWP's on or near water presents additional hazards which need to be considered during the selection of work equipment, risk controls and PPE.

Employers must, so far as is reasonable practicable, identify all hazards associated with the use of EWP's, if necessary, assess the likelihood of risk and control any associated risk.

Some safe work practices/control measures

- ✓ Wear a Personal Flotation Device (PFD) or a fall arrest harness when working over water depending on risk assessment outcome
- ✓ Ensure the barge or supporting vessel is capable of supporting the weight of the EWP, the loads, and the point loads
- ✓ Disable the drive function if possible while located on the vessel
- ✓ Be aware of tidal changes or water flow that may affect supporting ground or clearance to other objects
- ✓ Securely fix the EWP to the barge or vessel if possible
- ✓ Operate at creep speed
- ✓ Have competent persons and equipment ready to undertake a water rescue in the event of an emergency

Some work practices to avoid

- ✗ Overloading the barge or vessel
- ✗ Relocating the EWP to areas not permitted by the barge-EWP combination design
- ✗ Working above persons or boats

Note: When an EWP is working over water, there may be an exception to the use of safety harnesses. For example, if a person is wearing a safety harness and the EWP tips over into the water, the use of the safety harness may mean that the person on the platform is dragged underwater with the machine. In this instance, a site-specific risk assessment should be conducted, and recorded, to determine whether a safety harness or other risk control measures are required.

See part 2.2 Harnesses and part 1.2 EWP selection and planning for further information

3.5 Falling objects

Falling objects are a leading cause of death and serious injury and pose a hazard to people in workplaces or in areas adjacent

to them. Even relatively light and small objects such as a nut or bolt can cause serious or fatal injuries if it falls from height and hits a person.

Some safe work practices/control measures

- ✓ Set up exclusion zones beneath and around EWP
- ✓ Fit mesh to platforms (with the approval from the manufacturer or competent person to ensure that it doesn't adversely affect the safe operation of the EWP)
- ✓ Use tools and equipment fitted with lanyards
- ✓ Ensure loads on the platform are secured

Some work practices to avoid

- ✗ Working above or beneath other EWPs
- ✗ Working over footpaths, work areas, or public areas without controls in place
- ✗ Overloading the platform
- ✗ Stacking material on the platform that can slip or fall through the guardrails of the platform



Figure 28 – Example of a mesh fitted to an EWP

Part 3 – Hazards

3.6 Collision hazards

EWPs may be used in environments where there is a risk of powered mobile plant

colliding with pedestrians or other plant or structures. To control the risk of collisions, employers need to implement safe work practices and avoid unsafe work practices.

Some safe work practices/control measures

- ✓ Implement a traffic management plan with controls for public and pedestrian protection
- ✓ Install an appropriate barrier systems to exclude other plant from the EWP operational areas
- ✓ Use safety observers
- ✓ Use communication tools effectively
- ✓ Use warning device – visual and audible
- ✓ Operate at creep speed
- ✓ Use a horn to warn others of the movement of the EWP
- ✓ Load and unload EWPs using correct procedures

Some work practices to avoid

- ✗ Working in close proximity to other EWPs, mobile plant, vehicles, persons, structures
- ✗ Operating or driving EWPs in poor light



Figure 29 – Example of traffic management controls



Figure 30 – Example of an exclusion zone

3.7 Environmental hazards

Using an EWP that is not suitable for the operating environment can introduce serious risks to the operator and other people nearby. For example, if a

diesel-powered EWP was used in an area with poor ventilation, fumes could cause high levels of carbon monoxide to accumulate, placing people in the nearby area at risk of asphyxiation.

Some safe work practices/control measures

- ✓ Select the appropriate type and power source of EWP for the environment
- ✓ Ensure the EWP has been tested and/or approved for electromagnetic capability when operating near electromagnetic sources

Some work practices to avoid

- ✗ Using diesel powered EWPs in areas with poor ventilation
- ✗ Using inappropriate EWPs in locations with explosive or hazardous atmospheres

Part 4 – Work practices

When using EWPs, safe systems of work need to be implemented, to ensure the task is being carried out safely. Changes in work practices may need to be considered to ensure risks to employees, others and equipment are effectively controlled. This may include using specialised EWPs or EWPs with purpose built attachments. Some common work practices are described in this section.

Note: The examples presented here are not exhaustive. Other risks may be present at workplaces that are not covered in these examples.

Part 4 – Work practices

4.1 Installing overhead pipework

Some safe work practices

- ✓ Use a pipe rack fitted to the EWP, to support the pipes during installation. The pipe rack should be designed by a competent person
- ✓ Ensure that the manufacturer or a competent person has assessed the effects of the pipe rack on the specific EWP and has de-rated the EWP, if required
- ✓ Operating instructions should be developed and operators should be trained in the safe use of any designed attachments

Some work practices to avoid

- ✗ Using the guardrails of the EWP to support the pipes

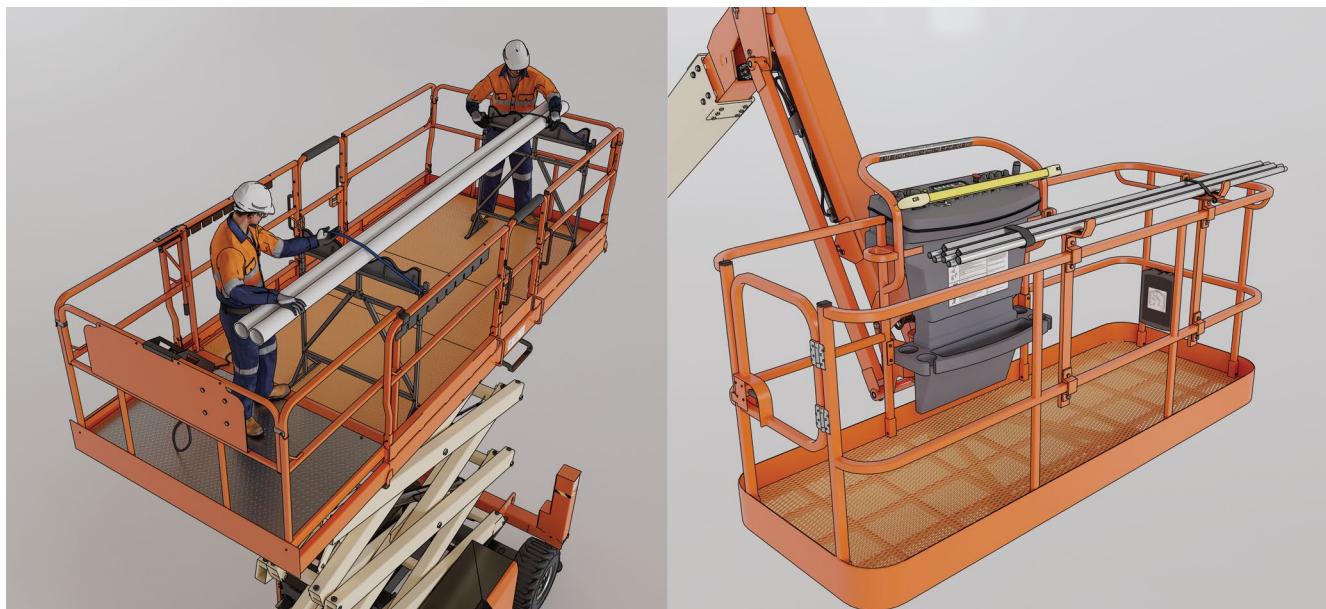


Figure 31 (a) and (b) – Examples of pipe racks fitted to EWPs

Part 4 – Work practices

4.2 Installing overhead ductwork

Some safe work practices/control measures

- ✓ Use an appropriate duct lifter to support and position the ducts
- ✓ Use an attachment fitted to EWP that has been designed to lift duct work, ensure that the manufacturer or competent person has assessed the effects of the attachment on the specific EWP and has de-rated the EWP, if required

Some work practices to avoid

- ✗ Using the guardrails of the EWP to support and position the ducts



Figure 32 – Example of a duct lifter

Part 4 – Work practices

4.3 Installing large panels (for example glazing, plaster board)

Some safe work practices/control measures

- ✓ Use a purpose made panel handling device fitted to the EWP to support the panels during installation
- ✓ Ensure the manufacturer or a competent person has assessed the effects of the attachment on the specific EWP and has de-rated the EWP as required

Some work practices to avoid

- ✗ Using devices fitted to the EWP where the effects on the attachment and the safe use of the EWP have not been assessed



Figure 33 – Example of a glass handling attachment fitted to an EWP

4.4 Modifying the EWP or attaching shade cloths or welding tents

Modifying or attaching material to the EWP increases the surface area that is subject to wind loading, which may lead to instability.

Some safe work practices/control measures

- ✓ Ensure the manufacturer or a competent person has assessed the effects of modifications (such as the use of the shade cloth or a welding tent) and has de-rated the EWP, if required

Some work practices to avoid

- ✗ Using modified EWPs (such as the use of shade cloths or welding tents) where the effects of the modification fitted to the EWP and the safe use of the EWP have not been assessed

Part 4 – Work practices

4.5 Painting, welding, grinding, shotcreting (or similar) from the platform of the EWP

Paint, concrete dust or dirt can create a rescue situation by causing the EWP controls to cease operating, malfunction or obscure the control panel.

For example, an obscured control panel may cause the operator to inadvertently move the EWP in an unsafe direction.

Some safe work practices/control measures

- ✔ Use an appropriate device to protect the controls from debris that is created while carrying out the activities, for example paint, weld splatter, concrete and dust

Some work practices to avoid

- ✘ Undertaking painting, welding, grinding and similar from the platform of the EWP without protecting the controls



Figure 34 – Example of an EWP control protection

4.6 Travelling the EWP with the platform raised

Some EWPs are designed to travel backwards and forwards while the platform is raised. The platform of EWPs should be lowered when travelling to another location, as the stability of the raised EWP is heavily reliant upon the ground conditions and the absence of hazards.

Note: This does not apply to the raising of a jib (with the extending structure lowered) to aid visibility during travel.

Some safe work practices/control measures

- ✓ Lower the platform of the EWP prior to travelling to ensure maximum visibility of the travel path and to lessen the impact of any hazards
- ✓ Drive slowly

Some work practices to avoid

- ✗ Travelling the EWP with the platform raised

4.7 Welding and hot works from the platform of an EWP

Some safe work practices/control measures	Some work practices to avoid
<ul style="list-style-type: none">✓ Make sure the gas bottle is secure while on the platform✓ Minimise the number of gas bottles present on the platform to undertake the task or a certain portion of the task✓ Carry a fire extinguisher on the platform✓ Remove any earthing cables and connections to nearby structures prior to moving the EWP	<ul style="list-style-type: none">✗ Carrying unsecured or excessive amounts of gas bottles on the platform of the EWP✗ Carrying gas bottles on the platform of an EWP that could accumulate gas (in a platform with solid walls and floor)✗ Having excessive material, debris and equipment on the platform✗ Using an EWP as a ground or earth for welding✗ Threading cables or hoses through the work area that can become snagged and could destabilise the EWP✗ Storing aerosol cans in the platform or flammables on the platform

4.8 Pulling, towing or misusing the EWP as a crane

Some safe work practices/control measures

- ✓ Use independent ropes or lifting equipment connected to cranes or separate structures to lift or lower loads
- ✓ Use equipment specifically designed for pulling, towing or lifting

Some work practices to avoid

- ✗ Pulling, towing or using the EWP as a crane where the effects on the EWP haven't been assessed by a competent person and additional risk controls haven't been put in place
- ✗ Attaching ropes, slings or similar to lift, lower, pull, or tow loads using the EWP
- ✗ Extending the platform of the EWP against nearby structures in an attempt to free the EWP from a bogged position

Part 4 – Work practices

4.9 Overloading or over-stacking materials in the EWP

Some safe work practices/control measures

- ✓ Ensure that the safe work load (SWL) for the total weight of person(s), tools, equipment and materials are not exceeded
- ✓ Ensure that the weights of all persons, tools, equipment and materials are known prior to the works commencing
- ✓ Strap loose materials down or place them in containers to ensure that items don't fall through the guardrails of the platform
- ✓ Use an EWP fitted with approved in-fill panels

Some work practices to avoid

- ✗ Exceeding the EWPs rated load capacity
- ✗ Stacking materials and equipment to a height that they can slide between or over the guardrails and out of the platform to the ground below

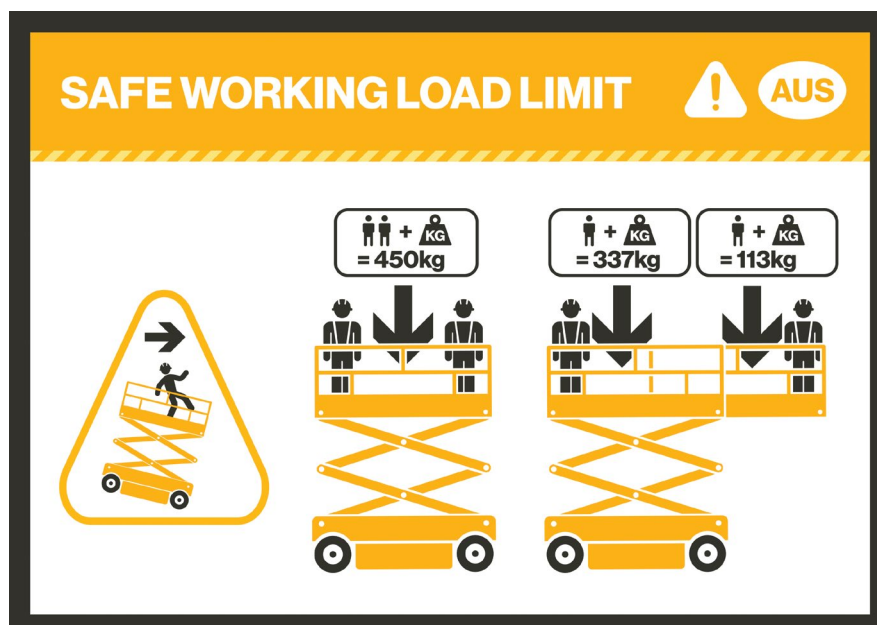


Figure 35 – Example of a safe working load decal

4.10 Refuelling or recharging EWP

Some safe work practices/control measures

- ✓ Turn off engines prior to refuelling
- ✓ Ensure the refuelling and recharging area is:
 - well-ventilated to prevent the build-up of gases
 - free from sources of ignition
- ✓ Use an RCD protected power source

Some work practices to avoid

- ✗ Carrying fuel on the platform
- ✗ Leaving the EWP connected to the power source when it is in operation
- ✗ Fuelling an EWP while the engine is running

Part 4 – Work practices

4.11 Travelling scissor-type EWP through or into restricted spaces

Some safe work practices/control measures

- ✓ Ensure the operator is at ground level, using the removable controls (or other mobile control device), to operate (walk) the EWP through restricted spaces
- ✓ Ensure that there is a good view of the EWP support surface and route of travel
- ✓ Remain a safe distance from the EWP and ensure that the cable to the control box is long enough to achieve that safe distance
- ✓ Ensure that the orientation of the control box is correct prior to commencing movement to prevent inadvertent movement
- ✓ Drive slowly
- ✓ Ensure people in the area are aware of the activity
- ✓ Use a safety observer to warn others so they are clear of the EWP
- ✓ Refer to the manufacturer's instructions for recommendations on 'walking' the EWP

Some work practices to avoid

- ✗ Travelling the EWP while crouching, squatting, or kneeling down on the platform because:
 - a clear view of the route and hazards cannot be achieved
 - this increases risks of being crushed or trapped between the handrails and the structure



Figure 36 – Example of an EWP being walked through a doorway

Part 4 – Work practices

4.12 Working and traveling on inclines

Some safe work practices/control measures

- ✓ Use a boom-type EWP with sufficient span to reach over the slope rather than set up the EWP on a slope
- ✓ Assess the ground conditions prior to setting an EWP up on an incline (for example newly painted ramps, wet ramps, or loose surfaces can cause the EWP to slide)
- ✓ Place the braked wheels facing up the incline (*note: the braked wheels aren't usually the steer wheels – check manufacturer's instructions if unsure*)
- ✓ Keep the boom basket on the upside of the boom-type EWP base
- ✓ Create steps in the slope to lower any outriggers into. This ensures that the outrigger footplates are level enough that they can support the weight of the EWP and its contents (depending on ground conditions), see figure 37

Some work practices to avoid

- ✗ Exceeding the gradeability or maximum operating slope rating of the EWP
- ✗ Using packing materials under the wheels in an attempt to 'level' the EWP
- ✗ Placing the outrigger footplates on a slope

Note: The maximum gradeability and operating angle of the EWP can be found by referring to the plate on the EWP or the Operators Manual.



Figure 37 – Scissor-type EWP outriggers lowered into steps created in a slope

Part 4 – Work practices

4.13 Lifting electrical cross arms using the basket of electrically insulated EWP

Some safe work practices/control measures

- ✓ Ensure that the manufacturer or a competent person has assessed the effects of using the basket edges to support the cross arms
- ✓ Adhere to the SWL of the platform
- ✓ Use purpose-built equipment to temporarily secure the cross arm to the basket while it is being lifted into position
- ✓ Establish and maintain an exclusion zone beneath the working area

Some work practices to avoid

- ✗ Failing to assess the capability or capacity of the EWP to lift the cross arms using the basket edges
- ✗ Supporting the cross arms manually rather than equipment being used to secure the cross arms as they are lifted

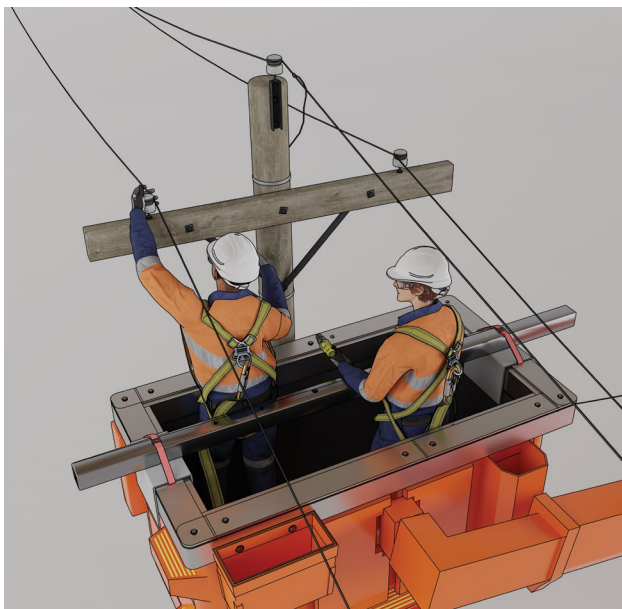


Figure 38 – Example of purpose built equipment to temporarily secure the cross arm to the basket while it is being lifted into position

Part 5 – Emergency procedures

5.1 Emergency procedures when using EWP

Emergency procedures and resources need to be in place to rescue the operator(s) of the EWP should they become sick, injured, stranded or trapped at height due to malfunction or misuse of the EWP. Other emergency situations can occur when the operator has fallen outside the platform of the EWP and is suspended by a harness.

All EWPs are fitted with lower/ground controls at the base or ground level that override the platform controls.

All EWPs are also fitted with auxiliary (emergency) or controlled descent devices, which should be used if ground-based controls are non-operational at the time of the emergency or retrieval. These include auxiliary power units, bleed down valves, hand pumps, emergency lowering cables and ropes.

It is important to check that the emergency controls and lowering capabilities are functional before an EWP is used.

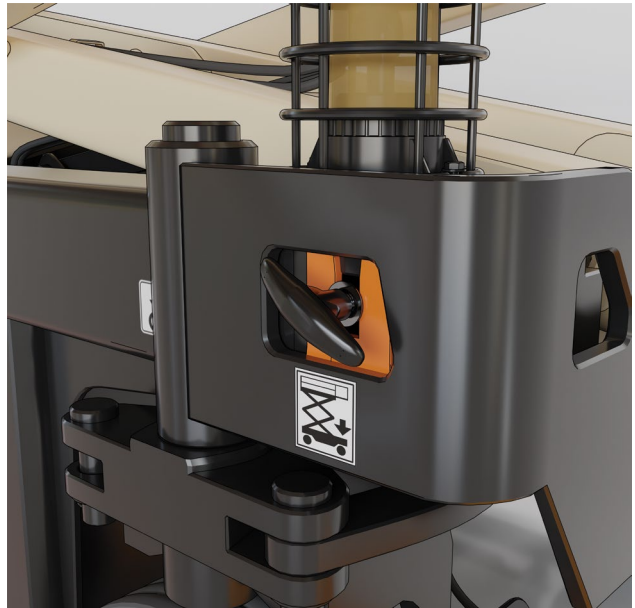


Figure 39 (a) – Example of emergency descent devices and ground based controls



Figure 39 (b) – Example of emergency descent devices and ground based controls

Part 5 – Emergency procedures

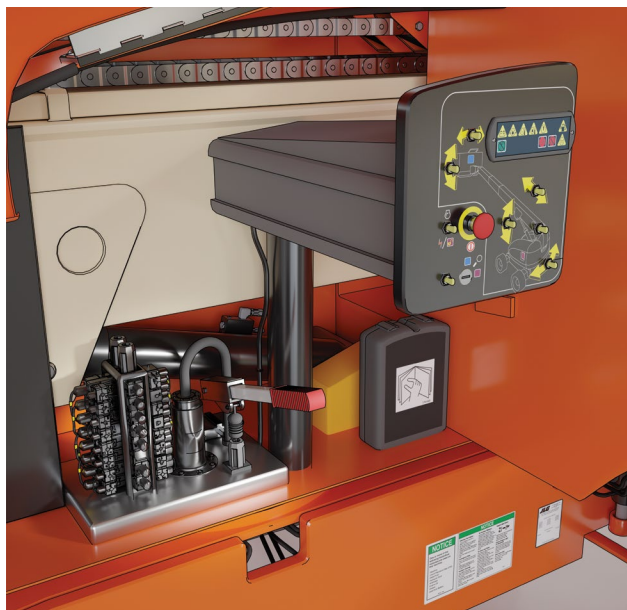


Figure 39 (c) – Example of emergency descent devices and ground based controls

The design, type, complexity and location of ground-based controls and retrieval systems vary. Prior to work, the safety observers should have awareness, training and practice of the ground-based retrieval systems for their equipment.

Delays in the rescue of operators can have serious consequences. Operators can be trapped against a structure, causing asphyxiation or suffer from suspension trauma. Suspension trauma is a condition where a person suspended in a harness in a substantially upright position may experience blood pooling in the legs. Depending on the susceptibility of the individual, this may lead to loss of consciousness, renal failure or death.

Due to the importance of a prompt rescue, EWP operators should never operate an EWP alone. A safety observer should be appointed to warn the operator(s) of hazards and ensure prompt action to rescue the operator(s). The safety observer:

- must be trained in the operation of the EWP and licensed where required under the legislation for the type of EWP being operated
- needs to have a line of sight to the operator
- needs to be trained in the emergency procedures for that specific EWP
- should not leave the area until the EWP is lowered to a stowed position and the operator has alighted from the platform.

If an emergency situation arises, any risks associated with the emergency response must be identified and controlled, for example fumes, water, electrical and instability.

Emergency procedures should include:

- ensuring that the manufacturer's instructions are available for the safe and correct use of the ground based emergency and retrieval controls
- training the safety observers in the ground based emergency and retrieval controls
- function testing the ground based emergency and retrieval controls prior to work to ensure that they are operating correctly

Part 5 – Emergency procedures

- checking that the path to be taken by the platform of the EWP in order to lower it is clear of obstructions
- ensuring that the ground-based or emergency retrieval controls are not blocked in by nearby structures, such as walls, fences or meshed edge protection, that would prevent access to the ground-based controls in an emergency
- ensuring that the ground-based controls can be used to bring the platform down or alternative controls are put into place, when the EWP platform is working over protruding structures (or has been extended over structures using an extension deck)
- selecting a means of communication between the EWP operator and safety observer
- using any other equipment that may be required including, for instance, a second EWP or rescue boat.

Note: For construction workplaces, emergency procedures need to be contained within the safe work method statement.

5.2 EWP contact with overhead electrical powerlines

If contact is made with an energised overhead electric powerline or a flash-over occurs between an energised overhead electric powerline and the EWP, the following actions should be taken:

1. Operator should warn others not to enter the area, and should attempt to break contact between the EWP and the energised overhead electric powerline by moving the boom or driving the machine clear.
2. If it is not possible to break the contact with the energised overhead electric powerline:
 - ensure the operator of the EWP remains inside the platform
 - call the electricity supply authority immediately to isolate electricity to the energised overhead electric powerline
 - ensure the operator remains in place until the electricity has been isolated, and the 'all clear' given by the electricity supply authority.
3. If it is essential to leave the platform or the operator's position due to fire or another life threatening reason, then:
 - jump clear of the equipment
 - do not touch the equipment and the ground at the same time

Part 5 – Emergency procedures

- when moving away from the equipment, the operator should hop or shuffle away from the EWP (with both feet together) until at least 10 metres from the nearest part of the plant
 - under no circumstances run or walk from the EWP as voltage gradients passing through the ground may cause electricity to pass through the body resulting in an electric shock.
4. Keep all persons 10 metres clear from the EWP and:
- do not touch or allow other persons to touch any part of the EWP
 - do not allow persons to approach or re-enter the vehicle until the electricity supply authority has determined that the site is safe
 - remember electricity flows through the ground, so an electric shock could be received from walking close to the scene
 - if the EWP operator is immobilised, ensure the electricity supply has been isolated and the site made safe before giving assistance.
5. Never allow an unauthorised or unequipped person to attempt to rescue the person receiving an electric shock. Secondary deaths often occur because others get electrocuted trying to help earlier victims.

Note: If the operator is immobilised, ensure the electricity supply has been isolated and the site has been made safe before giving assistance.

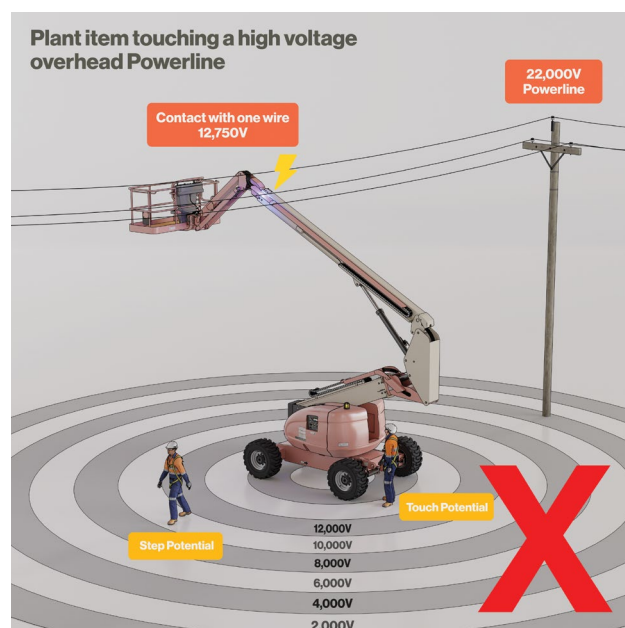


Figure 40 – Example of plant item touching a high voltage overhead powerline



Figure 41 – Example of step potential

5.3 Hazards following overhead electrical powerline incident

When an un-insulated section of an EWP has been in contact with an energised overhead electric powerline, or when an insulated EWP section makes contact with an energised electric powerline greater than its rated insulation level, it needs to be checked by a competent person for any damage. The EWP can only be returned to operation once a competent person has verified that it is safe for use. Any actions recommended or specified by the competent person need to be completed before the EWP is returned to service.

Any rubber-tyred EWP that has been in contact with overhead electric lines where electrical flash-over and current flow occurs through the rubber tyres, needs to be considered as a potential hazard. The rubber tyres may catch fire and explode, with no apparent external signs.

Explosions can occur when excessive heat is developed in or applied to a tyre (known as pyrolysis), as is the case from contact with overhead powerlines.

Vast amounts of energy can be released by a tyre explosion, often leading to significant equipment damage, serious injuries or fatalities. Pyrolysis-related explosions are very unpredictable and have been known to occur immediately or up to 24 hours after initiation.

An explosion can occur where no fire is visible. The danger of projectile debris from a tyre in this type of explosion can reach a significant distance.

Part 5 – Emergency procedures

Post-incident, the following actions need to be undertaken to reduce the risks associated with a tyre explosion:

1. Remove all persons from the area of the incident.
2. Remove EWP contact with powerlines (see 5.2 EWP contact with overhead electrical powerlines for further information).
3. The EWP needs to be isolated for 24 hours prior to inspection.
4. The isolation zone should be established with a minimum radius of 300 metres (due to potential for tyre explosion):
 - The isolation zone needs to be free from persons and plant.
 - If an isolation zone is not available in the location the EWP was used:
 - assess if the EWP can be safely transported
 - if safe to transport, transport the EWP to an isolation zone, the isolation zone should be established with a minimum radius of 300m and be free from persons and plant.
5. Monitor and alert firefighting services if required.
6. After 24 hours, inspect the plant and tyres to identify if the plant is safe before returning it to service.

Note: Avoid isolating the EWP in an area where, if an explosion occurs, the explosion could cause a fire, for example dry bushland or grass fields.



Part 6 – Inspection and maintenance

EWPs must be regularly inspected and maintained to ensure that the risks associated with the use of the EWP are controlled. This may be achieved by adhering to the inspection and maintenance recommendations supplied by the manufacturer or by adhering to AS 2550.10 – Cranes, hoists and winches – Safe use – Mobile elevating work platforms, where inspections, such as pre-operational inspections are required by this standard.

6.1 Inspection

At the start of each shift, before first daily use or when there is a change of operator, the EWP operator needs to:

- inspect (check) the EWP for any defects
- test the functions
- test the safety devices and interlock controls
- ensure the operating instructions and logbook have been supplied.

If faults are identified, the EWP needs to be taken out of service (tagged out) and fixed before being used again.

Operating instructions and a logbook should always be supplied with the EWP and be readily available for inspection. The logbook should contain records of pre-operational inspections, other routine inspections and records of maintenance undertaken. If the operating instructions or the EWP logbook is not supplied, then the EWP should not be used.

Note: Under the OHS Act duty holders must provide and maintain plant or systems of work that are, so far as is reasonably practicable, safe and without risk to health. Such systems need to ensure that regular inspections (including pre-operational inspections) are undertaken to monitor any risks associated with the use of the EWP. See part 1.1 Duties for more information.

Part 6 – Inspection and maintenance

Inspections should be supported with information to guide the person inspecting the EWP on:

- what is looked at
- what is looked for
- how is it looked for
- what is found
- what is the rejection or acceptance criteria
- what actions are to be taken.



Figure 42 – Example of an EWP logbook

Prior to checking (or operating) the EWP:

- Check the logbook for any reported defects and ensure that they have been rectified.
- Check to ensure that any other required inspections have been undertaken and are up to date such as routine, periodic, and major inspections.
- Check manufacturers operating instructions (or equivalent) on the EWP and familiarise yourself with them before operating the EWP.
- Before checking or operating the EWP, disconnect the battery charger and any extension cords, and check the surrounding environment for any hazards.

Part 6 – Inspection and maintenance

Table H – Example of a pre-operational inspection checklist

Operator should:	Item	Safe for use
Visually check there is no slackness or damage	<input type="checkbox"/> Chain <input type="checkbox"/> Cable mechanisms	<input type="checkbox"/>
Check there are no cracks, damage and that everything is securely fitted	<input type="checkbox"/> Chassis <input type="checkbox"/> Scissor <input type="checkbox"/> Boom sections <input type="checkbox"/> Outrigger or stabiliser legs <input type="checkbox"/> Keeper plates, keeper pins, bolts, nuts <input type="checkbox"/> Level bubble(s) (if fitted)	<input type="checkbox"/>
Check that inflation pressure is correct and condition is safe (free from damage) <i>Note: Self-propelled EWPs can have solid or foam filled tyres</i> <i>Foam-filled tyres will have a bolt or plug present. This is intentional and is used to plug the hole after filling</i>	<input type="checkbox"/> Tyres	<input type="checkbox"/>
Check there is no damage and all parts are secure	<input type="checkbox"/> Steering linkages <input type="checkbox"/> Wheels <input type="checkbox"/> Wheel nuts <input type="checkbox"/> Castors	<input type="checkbox"/>
Check there are no leaks or damage – look for puddles of oil on ground	<input type="checkbox"/> Hydraulic hoses <input type="checkbox"/> Fuel system	<input type="checkbox"/>
Check all fluid levels are maintained	<input type="checkbox"/> Engine oil to main/aux engines <input type="checkbox"/> Radiator <input type="checkbox"/> Fuel <input type="checkbox"/> Hydraulic tank <input type="checkbox"/> All other fluids	<input type="checkbox"/>

Part 6 – Inspection and maintenance

Table H – Example of a pre-operational inspection checklist

Operator should:	Item	Safe for use
Check there is no damage	<input type="checkbox"/> Cables <input type="checkbox"/> Wiring <input type="checkbox"/> Visible limit switches <input type="checkbox"/> Battery charger (as fitted)	<input type="checkbox"/>
Conduct 'Push Button' test (as fitted) to ensure it is operating correctly Test tag in date	<input type="checkbox"/> Earth leakage circuit breaker	<input type="checkbox"/>
Check signs are legible	<input type="checkbox"/> Safety and SWL signs such as: <ul style="list-style-type: none"> • warning • operation • electrical hazard • controls • wind rating 	<input type="checkbox"/>
Check there is no damage or excessive wear	<input type="checkbox"/> Personal protection equipment (PPE) such as: <ul style="list-style-type: none"> • harnesses • lanyards • energy absorbers 	<input type="checkbox"/>
Check there is no damage, cracks or excessive wear and points are securely installed	<input type="checkbox"/> Harness attachment points	<input type="checkbox"/>

Part 6 – Inspection and maintenance

Table H – Example of a pre-operational inspection checklist

Operator should:	Item	Safe for use
Check to ensure: <ul style="list-style-type: none"> • there is no excessive damage • securely fitted • the self-closing actions of doors or access points are working • floor is free from grease and debris • slide out deck(s) (as fitted) have smooth operation and the latches are operational 	<input type="checkbox"/> Platform <input type="checkbox"/> Handrails	<input type="checkbox"/>
Check to ensure safe operation: <ul style="list-style-type: none"> • free from damage • return to neutral central position when the function enable 'deadman' control (e.g. button, switch, foot pedal) fitted at both upper and lower controls is released 	<input type="checkbox"/> Operator controls	<input type="checkbox"/>
Visually check all components for cracks	<input type="checkbox"/> Fibreglass components <input type="checkbox"/> Areas that are bonded to boom (if applicable)	<input type="checkbox"/>
Test to ensure functioning <i>Note: Allow for 'overrun' (time delay) when testing controls and brakes</i>	<input type="checkbox"/> Emergency stops <input type="checkbox"/> Function enable 'deadman' control as fitted at both upper and lower controls <input type="checkbox"/> EWP stops when function enable 'deadman' control is released	<input type="checkbox"/>

Part 6 – Inspection and maintenance

Table H – Example of a pre-operational inspection checklist

Operator should:	Item	Safe for use
Test to ensure functioning	<input type="checkbox"/> Controls at ground <ul style="list-style-type: none"> • raise • lower • slew • any other ground control <input type="checkbox"/> Controls at platform forward <ul style="list-style-type: none"> • reverse • raise • lower • slew • any other platform control 	<input type="checkbox"/>
Test to ensure functioning	<input type="checkbox"/> Safety features such as: <ul style="list-style-type: none"> • lockouts • outriggers • drive/elevation cut out • high/low speed change over • pothole protection system • any other safety feature 	<input type="checkbox"/>
Test to ensure functioning and free from excessive run <i>Note: Some EWP's have a time delay before brakes apply</i>	<input type="checkbox"/> Brakes (including slew brake as fitted)	<input type="checkbox"/>
Test to ensure functioning as required <i>Note: Ensure valves and controls are returned to 'normal operating' position (as per manufacturers manual) after the check</i>	<input type="checkbox"/> Platform emergency descent <input type="checkbox"/> Operator retrieval system (as fitted)	<input type="checkbox"/>

Part 6 – Inspection and maintenance

Table H – Example of a pre-operational inspection checklist

Operator should:	Item	Safe for use
Test to ensure functioning	<input type="checkbox"/> Flashing lights <input type="checkbox"/> Audible alarms	<input type="checkbox"/>
Check for correct function and operation	<input type="checkbox"/> Secondary guarding system (if fitted)	<input type="checkbox"/>
<input type="checkbox"/> Any other operational checks specified by manufacturer		

6.2 Maintenance

EWPs must be maintained so that they are, so far as is reasonably practicable, safe and without risks to health. EWPs should be maintained by a suitably competent person so that they operate as per the manufacturer's recommendations. Any defects identified during the inspection regime must be rectified.

Further information on inspection and maintenance can be found by referring to the Plant compliance code, AS 2550.10 – Cranes, hoists and winches – Safe use – Mobile elevating work platforms and Guidance note – Major inspection of cranes, hoists and winches.

Boom-type elevating work platform

A powered telescoping device (including vertical and inclined), hinged device or articulated device or any combination of those devices used to support a platform on which persons, equipment and materials may be elevated to perform work, but does not include an industrial lift truck.

Competent person

A person who has the knowledge, skills, qualifications and experience to enable the person to correctly perform the required task.

Electrical spotter

A competent and trained person who observes and warns against unsafe approach to overhead assets. An electrical spotter for overhead assets must have successfully completed an endorsed training course and be registered with Energy Safe Victoria.

Elevating work platform (EWP)

A mobile device that is used to support a platform on which persons, equipment and materials may be elevated to perform work, and consists of a work platform with controls, an extending structure and a chassis.

Must

The word '**must**' indicates a legal requirement that has to be complied with.

Needs to

The words '**need(s) to**' are used to indicate a recommended course of action in accordance with duties and obligations under Victoria's health and safety legislation.

Operator

The individual in control of the EWP.

Safety observer

A person with line of sight to the operator / occupants located within an operating EWP, who is trained in the emergency rescue procedures for the specific EWP(s) that they are acting as a safety observer for, in order to take prompt action to rescue the operator(s) or warn the operators of hazards.

Note: A safety observer cannot spot for overhead electrical assets unless they hold the ESV Electrical spotter registration (with the exception of workers engaged in distribution and transmission power company works).

Should

The word '**should**' is used to indicate a recommended optional course of action.

Further information

WorkSafe Victoria Publications

Electrical installations on construction sites, Industry standard

How WorkSafe applies the law in relation to Reasonably Practicable, Guideline

Major inspection of cranes, hoists and winches, Guidance note

Occupational Health and Safety (OHS) Act 2004

Occupational Health and Safety (OHS) Regulations 2017

Plant, Compliance code

Prevention of falls in general construction, Compliance code

Prevention of falls in housing construction, Compliance code

Safe work method statements, Information about

Using powered mobile plant near overhead assets, Guidebook

Australian Standards

AS/NZS 1891– Industrial fall arrest systems and devices series

AS/NZS 1891.4:2009 – Industrial fall-arrest systems and devices – Selection, use and maintenance

AS 2550.10:2006 – Cranes, hoists and winches – Safe use – Mobile elevating work platforms

AS/NZS 3012:2019 – Electrical installations – Construction and demolition sites

AS/NZS 3760:2010 – Information about: In-service safety inspection and testing of electrical equipment

Energy Safe Victoria

The Blue Book, Code of Practice on electrical safety for the work on or near high voltage electrical apparatus

National Transport Commission

Load Restraint Guide

Acknowledgements

This industry standard has been published by WorkSafe Victoria on behalf of Foundations for Safety Victoria, the peak consultative body representing the Victorian construction industry as a whole on OHS matters of public interest and importance. Foundations for Safety Victoria has endorsed this document as an Industry Standard for Elevating Work Platforms.

The industry standard was developed with the assistance of a working group of industry associations, unions and WorkSafe Victoria. The working group consisted of representatives from:

- CFMEU, Construction and General Division
- Electrical Trade Union
- Elevating Work Platform Association Australia (EWPA)
- Energy Safe Victoria
- Housing Industry Association
- Master Builders Association of Victoria
- Major Transport Infrastructure Authority
- Plumbing and Pipe Trades Employees Union
- Victorian Construction Safety Alliance
- WorkSafe Victoria

Consultation with WorkSafe Victoria ensured overall compatibility with OHS legislation and technical alignment with Australian Standards.

Foundations for Safety Victoria and WorkSafe Victoria would also like to acknowledge and thank SafeWork South Australia and WorkSafe New Zealand for allowing us to use and incorporate some content from each regulators respective Mobile Elevating Platform Guidelines within this industry standard.



WorkSafe Agents

Agent contact details are all available at
worksafe.vic.gov.au/agents

Advisory Service

Toll-free 1800 136 089
Email info@worksafe.vic.gov.au

Head Office

1 Malop Street, Geelong 3220
Phone (03) 4243 7000
Toll-free 1800 136 089
Website worksafe.vic.gov.au

Information in your language

For information about WorkSafe in your own language, call our Translating and Interpreting Service (TIS National) on **131 450**.