Best Practice Guidelines: Safe Use of Elevating Work Platforms in the Horticultural Industry

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Avocado Industry Council Ltd

STRATEGICON

MBIE has endorsed this edition of these guidelines and has actively participated in the Horticulture New Zealand Health and Safety Committee guidelines working party.

Comments anyone may wish to be included in future reviews should be forwarded in writing to the:

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Health and safety in the workplace is an on-going matter. There will be issues that arise which need to be addressed in the future and a review is planned five years after publication of these guidelines. The industry will undertake annual reviews via Horticulture New Zealand's Health and Safety Committee.

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INTRODUCTION

Horticultural mobile elevating work platforms (H/MEWP) are complex pieces of equipment that are used in hazardous conditions. As the current state of knowledge has changed around the use of this equipment these best practice guidelines are an update of the 2003 version.

Since 2004, 17 serious harm accidents involving H/MEWPs have been reported to MBIE. Nine of these accidents involved tip-overs of the H/MEWP and two serious harm injuries occurred when operators fell from the work platform.

In two separate accidents the operator suffered an electric shock when the H/MEWP touched power lines. In three serious harm injuries operators suffered amputations after becoming entangled in the moving parts of an H/MEWP.

Additionally, two serious harm accidents occurred when orchard workers were run over by moving H/MEWPs.

These guidelines provide guidance on safe work practices for the use and maintenance of H/MEWPs in the horticultural industry and are supplementary to other guidance on working at heights and the use of elevating work platforms.

This guidance does not attempt to cover the requirements for the design of elevating work platforms in detail.

The active involvement by the horticultural industry in the development of design standards and safe work practices will ensure that orchard H/MEWPs continue to evolve into functional, relatively low-cost machines that are readily maintained in the rural community.

These are industry-specific best practice guidelines which are intended to cover only the following industry activities:

- horticulture
- arboriculture
- horticulture plant and machinery hire

- horticultural contractors
- agriculture
- nurseries, parks and reserves.

These updated guidelines outline the obligations of duty holders under the Health and Safety in Employment Act 1992 (HSE Act), and summarise the relevant part of the industry standards *AS 2550.10: Cranes Hoists and Winches – Safe Use – Mobile Elevating Work Platforms* and *AS/NZS 1418.10: Cranes, Hoists and Winches – Part 10: Mobile Elevating Work Platforms*.

AS/NZS 1418.10 recognises that using H/MEWPs in horticulture may require some variations to the conventional mobile elevating work platform (MEWPs) requirements and specifications. These guidelines also reflect changes in the 2006 revision of *AS 2550.10*.

A new international standard *ISO 16653.3 Mobile elevating work platforms – Design calculations, safety requirements and test methods relative to special features – Part 3* was developed by the International Standards Organisation (ISO) which sets out very similar requirements.

These guidelines also introduce variations to the above standards which the committee considers are appropriate control measures for particular hazards inherent in the New Zealand horticultural work environment.

The variations to the above standards are:

- inclinometer as referenced in of *AS/NZS 1418.10 section 5.2.3*
- self-propelled platforms as referenced in *AS/NZS 1418.10 section 5*
- total restraint harness system as referenced in *AS 2550.10 section 5.15.*

1. SCOPE

The H/MEWPs to which these guidelines apply are:

- machines which in the terms of *AS/NZS 1418.10 sections 1.3.24 and 1.3.25* are classified as Group B/Type 3
- rough terrain self-propelled platforms of a single, rigid, articulated or telescoping boom type
- with single-person work platform
- multi-person work platforms designed for use in horticulture
- intended to be driven and operated from the work platform with the boom in the elevated position
- inclusive of building maintenance in horticultural situations using H/MWEP.

These guidelines are not intended to cover the following:

- scissor lifts
- forklift trucks with working platforms
- cages or platforms attached to crane hooks
- personnel buckets temporarily attached to mobile cranes
- suspended scaffolds
- building maintenance units (other than in a horticultural situation)
- vehicle-mounted work platforms
- electrically insulated units
- railbound elevating crop care work platforms.

Therefore, these best practice guidelines have been developed to assist the safe operation of purpose-built H/MEWPs in conformance with the current *AS 2550.10* and the *AS/NZS 1418.10* standards while they are being used in the horticultural work environment in New Zealand.

1.1. Responsibilities

Employer responsibilities under the HSE Act

Employers have a responsibility to make the workplace safe, and to ensure the health and safety of those working in or visiting the workplace under their control. To achieve this employers are expected to:

- systematically identify hazards
- systematically manage those hazards by eliminating them, isolating them or minimising them, in that order of preference
- put in place effective control measures to isolate or minimise hazards
- provide suitable protective clothing and equipment to staff
- provide safety information to staff
- provide training or supervision so that work is done safely
- monitor the environment and health of employees to ensure that their work is not having a detrimental effect on them
- provide opportunities for employees to participate in all of the above
- record and investigate workplace accidents
- report serious harm accidents suffered by employees to MBIE.

Employee responsibilities under the HSE Act

Employees are required to take all practicable steps to ensure the safety of themselves and others in the workplace. This includes considering both the things they do and the things they don't do (such as not using safety gear).

Employers should make clear to employees their responsibilities to use the provided safety equipment and to wear protective clothing. The expected level of an individual employee's responsibility will often be seen to increase with knowledge and seniority, but it's the employer's overall responsibility to ensure a safe workplace.

Practicable steps the employee can take also include reporting to the employer any hazards or incidents, so that the employer can investigate and put safeguards in place.

Self-employed and employee operators

Employees and/or self-employed operators must ensure they work in a safe manner so they don't put themselves or others at risk.

Employees and/or self-employed operators must:

- have access to safety instructions and manuals for the safe use of H/MEWPs and safe working practices in an orchard environment
- understand what the hazards and control measures are in their work environment
- wear the recommended personal protective equipment and clothing
- ensure they work in a safe manner and do nothing that could cause harm to themselves or any other person
- operate the H/MEWP safely and in accordance with the operating instructions of the manufacturer and these best practice guidelines
- participate in any training provided
- be familiar with the emergency procedures.

Principals and contractors

Anyone who is contracting the services of another business, a contractor or a self-employed person has duties as a principal or person who controls the place of work. This will apply to orchard owners if they contract in harvesters.

Section 18 of the HSE Act requires all principals to a contract to take 'all practicable steps' to ensure contractor, subcontractors and their employees are not harmed while undertaking work under the contract.

All practicable steps may include ensuring a hazard management process and plan was in place and hazards managed effectively.

The general process involved in effective contractor management requires the principal and/or contractor to:

- **scope the work** to consider health and safety implications and issues, and identify the significant hazards
- **assess the capability** of potential contractors

- **select contractors** on the basis of their health and safety planning and performance and commitment
- **award the contract** and outline agreed health and safety standards, systems and processes
- **monitor the contractor** to ensure the agreed health and safety standards are being met
- **review** at the end of the contract to determine the successful outcome.

Hazard management

Section 7 of the HSE Act requires all employers to have in place an effective method for systematically identifying and regularly reviewing hazards in the place of work (existing, new and potential), to determine whether they are significant hazards and require further action.

If an accident or harm occurs that requires particulars to be recorded (see section 25 of the HSE Act), employers are required to investigate it to determine if it was caused by or arose from a significant hazard.

The HSE Act sets out the following steps employers must take when there is a significant hazard:

- where practicable, the hazard must be eliminated (section 8)
- if elimination is not practicable, the hazard must be isolated (section 9)
- if it is impracticable to eliminate or isolate the hazard completely, then employers must minimise the likelihood that employees will be harmed by the hazard (section 10).

Where the hazard is not eliminated or isolated, employers must, where appropriate:

- ensure that protective clothing and equipment is provided, accessible and used
- monitor employees' exposure to the hazard
- seek the consent of employees to monitor their health
- with informed consent, monitor employees' health.

Employers are also required to inform employees of the results of any health and safety monitoring. In doing so, the privacy of individual employees must be protected.

2. OPERATION OF H/MEWPS

The H/MEWPs referred to in these best practice guidelines are specialised items of equipment for use in horticulture. The purpose of this guidance is to promote the safe use of these machines in horticultural applications. The operation and maintenance of the H/MEWP must be carried out in line with the manufacturer's instructions and specifications.

2.1. Safety plan

Before commencing work the following should be assessed in each orchard by a competent person and a safety plan developed and put in place. This assessment should cover the:

- work to be carried out
- range of methods by which the work can be carried out
- types of H/MEWP that are required
- hazards involved and the associated risks
- hazard controls and safety requirements
- emergency procedures in the event of any accidents.

This hazard assessment should address the proposed operation, rather than each individual machine. The safety plan should be monitored for on-going effectiveness and modified to take into account additional hazards or increased risks.

For a complete definition of this requirement, refer to *AS 2550.10 section 1.6.*

2.2. Hazard assessment

An assessment of hazards in any work area should be undertaken. Inspect the area for obstructions, and ensure that the gradient of any slopes are within the machine's capability before beginning work.

Ensure all hazards are identified and controls in place if the H/MEWP is to be used close to the edge of banks, drains, irrigation lines, fences, power lines, or stay wires.

A hazard assessment must be completed to assess the risk when operators are working at height and the most effective controls put in place to minimise the likelihood of injuries occurring.

Identify all power lines and plan the work so no H/MEWP or the operator comes within 6.4 metres of any live overhead electric line. Identify trees and tree branches that are 4 metres or closer to power lines as electricity can be conducted to anything it is in contact with (a person, H/MEWP or tool) and cause electrocution.

Assess whether the H/MEWP is suitable for the slope and nature of the terrain, and beware of slippery conditions.

Ensure all operators understand H/MEWPs must be only operated in the areas defined by the supervisor or orchard owner, or principal.

An example of a site safety plan template can be found in Appendix A of these guidelines and an example of a hazard assessment checklist template in Appendix B.

2.2.1. Assessing sloping ground

A map of the work area should be made available to the contractor and/or H/MEWP operators and their supervisors. The map should show the slopes of the land and any potential hazards such as holes, drains, mulch, overhead wires, and hazardous surface conditions.

If this is not available, a competent person should undertake a hazard assessment and also measure the degree of the sloping ground. The competent person must also identify any potential hazards such as holes, drains, mulch, overhead wires, and surface conditions of areas in the workplace.

Every machine must display the certified maximum degree of inclination. This information must be included in the operator's/owner's manual which must be provided with every machine.

For more detailed information, refer to *AS/NZS 1418.10.*

The competent person must assess the overall working environment before making a judgement as to what types of machine should be used. The person selecting the type of machinery must have sufficient knowledge and experience to ensure the machine can be used safely in the work environment.

2.3. Operating the machine

Machinery must only be operated by a trained and competent person. These operators must not be under the age of 15 (Regulation 56, Health and Safety in Employment Regulations 1995).

The operator must ensure safety devices such as pressure relief valves are not adjusted outside the manufacturer's specifications. This includes not interfering with stability devices or warning systems which are fitted to the machine.

Ensure operators are familiar with and follow the manufacturer's operating instructions and loading specifications must be strictly adhered to.

Ensure there is a safe operating zone where it is not possible for anyone to walk into or under the area where the machine is operating. Do not operate an H/MEWP near children or spectators.

H/MEWPs fitted with internal combustion engines should not be used in a confined or enclosed space unless adequate ventilation is provided.

2.3.1. Machinery limitations

Be aware of the maximum rated capacity, (safe working load), of the H/MEWP and ensure it is not exceeded as this can cause tip-over. Never exceed the maximum manual force as specified by the manufacturer.

An H/MEWP must not be used as a prop, tie or crane. Only approved attachments can be used with the H/MEWP.

2.4. Training

Anyone operating an H/MEWP shall be given training or be supervised by a competent person on how to safely use the machine and manage hazards associated with the work.

New operators should be supervised by a competent person until they are deemed able to operate the machine in a safe manner.

A recommended means of achieving competence is through training that would be to the NZQA standard for the use and operation of relevant MEWP, or suitable equivalent training, including on-the-job training that covers this material. Training to this standard is available from various training providers, and may include industry group organisations, manufacturers or employers.

The recommended NZQA unit standards for MEWPs are:

- *Unit Standard 23966: Describe types of elevating work platforms (EWPs), and legislative requirements for their use*. This Unit Standard is the prerequisite for the following *Unit Standards 23960–23964*
- *Unit Standard 23960: Assess the worksite, prepare and operate a scissor lift elevating work platform (EWP)*
- *Unit Standard 23961: Assess the worksite, prepare and operate a truck mounted elevating work platform (EWP)*
- *Unit Standard 23962: Assess the worksite, prepare and operate a self-propelled boom lift elevating work platform (EWP)*
- *Unit Standard 23963: Assess the worksite, prepare and operate a trailer mounted elevating work platform (EWP)*
- *Unit Standard 23964: Assess the worksite, prepare and operate a vertical lift elevating work platform (EWP).*

Trainee operators must be supervised by a competent person and carefully monitored. Trainee operators must not work unsupervised when working in hazardous areas such as difficult ground conditions or slopes, until they are deemed competent by their supervisor.

2.5. Preventing falls

To minimise the risk of a fall when working at height in a H/MEWP, an operator should use a total restraint system. The total restraint system should consist of a harness and lanyard attached to an approved anchor point.

An example of a total restraint for MEWPs is described in *AS/NZS 1891.4: Industrial fall-arrest systems and devices - Selection, use and maintenance*. The lanyard must be a non-shock-absorbing type, and must be of a non-adjustable design, and of a length which confines the operator to the working platform where they are not at risk of a fall.

Total restraint should be worn unless a hazard assessment has demonstrated that the work can be safely undertaken without a harness. An example of a hazard assessment is provided in Appendix B. Operators can adapt this checklist for their own use.

For more information on the use of fall restraint, refer to *AS 2550.10 section 5.15*.

2.6. The effects of overloading

The rated capacity or safe working load must be strictly followed to avoid instability and the potential of tipping over.

The rated capacity includes the weight of an operator and a picking bag full of fruit. Once the machine is loaded beyond this, the manufacturer's stability ratings do not apply. Overloading the picking bag beyond its designed capacity may bring the machine into an overloaded state and increase the potential for tipping over.

2.7. Instability

Instability is a significant hazard when operating H/MEWPs in a horticultural work environment. The nature of the terrain and work requirements has led to the

evolution of specialised machinery which does not require the deployment of stabilisers, and yet is stable.

The operator must be trained or supervised by a competent person to know the limitations of the machinery and how to use it safely.

The H/MEWP must always be operated within the manufacturer's design parameters to maintain safety in the workplace.

Newly manufactured machines with a lift height greater than four metres must now be fitted with an inclinometer. The inclinometer sounds an audible alarm before the maximum incline has been reached.

For more information on the inclinometer, refer to *AS/NZS 1418.10 section 5.2.3*.

2.8. Moving the H/MEWP

Don't start moving the M/MEWP unless the way is clear and will remain clear.

If any fault in the control system is suspected, operations must cease until the suspected fault is identified and rectified.

A competent person/operator should ensure that the route chosen is safe and hazard-free before moving an H/MEWP while it is elevated. Shortcuts should be avoided especially if it involves hazardous terrain. At all times the machine's wheels should remain on a firm footing, stable ground, and within the slope specifications.

During travel the operator must always have a clear view of the ground, and keep a safe distance from changes in slope, depressions, debris, buildings, overhead power lines, and other obstacles. Avoid moving the H/MEWP while the platform is at maximum elevation.

When towing the H/MEWP, ensure that the approved towing equipment, pins and clips are used.

When towing on public roads, keep to speed limits and never exceed the manufacturer's speed recommendations when towing. Never tow more than two machines at a time.

Remove the pick-bag as falling equipment or produce can cause hazards for other drivers.

For further guidance refer to the requirements in *AS 2550.10 section 4.6*.

2.9. The effects of wind

Owners and operators of H/MEWPs which may be used under high wind conditions must be aware of the wind speeds the machine is designed to operate in, and work within these limits and check daily forecasts for high winds.

Any H/MEWP built to the standard *AS/NZS 1418.10 section 2.1.4.2.1* has a minimum design allowance for a wind speed of 12.5m/sec – 45kph.

Where owners require the use of the H/MEWPs in high wind conditions, they should specify a higher wind speed capability when purchasing machines.

3. WORKING NEAR OVERHEAD ELECTRIC POWER LINES

The risk of accidental contact with live overhead power lines by horticultural workers operating H/MEWPs is a significant hazard in orchards. There have been several serious harm accidents where H/MEWPs have come into contact with live power lines resulting in serious injury to the workers involved.

Trees touching or nearly touching power lines can also become electrically livened and there may be no visual signs this has occurred. Electricity may also arc or flash over to trees near to or touching power lines. If a tree becomes livened, electricity can spread out through anything nearby that can conduct electricity, e.g. H/MEWPs, people, tools, wire fences, and even through the ground. A worker can receive an electric shock in the instant that the electrical contact occurs, even if they are walking on the ground nearby or are in an H/MEWP.

3.1. Work procedures

The hazard assessment must identify all overhead power lines in the vicinity of the workplace and it must identify all trees that are within 4 metres of the overhead electric lines. All safety plans must include these identified hazards and give details of how the hazards are controlled.

Treat all overhead electric lines as being live, unless the power company or power lines owner formally advises that the lines are safe from electrical hazards.

3.1.1. Exclusion zone – 4 to 6.4 metres from power lines

If any H/MEWP is likely to approach closer than 6.4 metres to any overhead electric power lines, the following measures must be put in place:

- **Operators, mobile plant, tools and equipment and all associated work activity must remain at least 4 metres away from the overhead electric lines at all times.**
- Hazard controls should be put in place to ensure the H/MEWP cannot come within four metres of any overhead power line.

- The area between 6.4 metres and four metres from the overhead power line shall be separated from the workspace and be marked out by cones or tape to form an exclusion zone.
- The safety plan should cover how the H/MEWP will operate so that the power lines are always visible to the operator. This may require the trees to be approached from a different angle than is usual.
- The work should be planned so that the operators are able to keep the power line in front of them and at all times visible to them as they work.
- All operators of machines in the workplace must be briefed on the limitations of movement and understand that the exclusion zone, (4 to 6.4 metres from an overhead power line) must be worked by specifically designated operators.

3.1.2. Within the exclusion zone

- The designated operators must be competent in the operation of the machines, be thoroughly briefed, and must understand the dangers of working near overhead power lines.
- A competent safety observer must be present at all times to ensure the operator does not breech the minimum 4 metre approach distance.
- The safety observer must be able to maintain effective communication with the operators and alert operators immediately if they are about to breech the 4 metre minimum approach distance.
- This must be the safety observer's sole task. To avoid distractions of any kind, the designated operators are not to use cell phones or electronic equipment of any kind, or wear clothing which could in any way impede their vision or movement while working in the defined area.
- The designated operators working in the exclusion zone must obey any instructions given by the safety observer.
- The owner of the power line should be contacted, and where practical, arrange to have the line de-energised. Any power line should be treated as though it is live until it is proven to be de-energised by the power line network company.

3.1.3. No go zone – within 4 metres of overhead power line

No work can be carried out within 4 metres of the power line without first contacting the power line network owner. Permission from the power line network owner must be obtained before any work can commence within 4 metres of the power line.

Further guidance on pruning or tree maintenance near power lines can be found in the MBIE *Approved Code of Practice for Safety and Health in Arboriculture*.

3.2. Emergency procedures

If an H/MEWP comes into contact with overhead power lines or equipment, anyone in the H/MEWP at the time should remain there and warn any others in the vicinity to stay clear. If it is safe to do so, operate the controls to break contact.

If it is not safe to break contact, the safest course of action is to:

- call for assistance, warning all persons to keep well clear of the machine
- do nothing until the line is de-energised.

If assistance is unavailable and electrical contact cannot be broken then leave the H/MEWP and:

- switch off the motor and, where applicable apply brakes
- remove any loose clothing
- climb to a point about one metre above the ground from where you can safely jump to the ground
- **jump** so that you clear the platform **before** any part of you touches the ground
- fall away from the H/MEWP and not towards it
- do not touch the H/MEWP until the lines are de-energised.

3.3. Electrical industry safety information

Additional guidance on safe use of mobile plant in the vicinity of power lines is available at the Electricity Engineers Association's (EEA) website at www.eea.co.nz.

4. RESPONSIBILITIES

4.1. Manufacturers, importers, and sellers

Manufacturers or suppliers of H/MEWPs under section 18A of the HSE Act must take all practicable steps to ensure that their plant is designed, made, and is maintained, so that it is safe for any known intended use or any use of that plant that the buyer could reasonably expect.

Manufacturers, importers and sellers must ensure that the H/MEWP:

- is designed in accordance with *AS/NZS 1418.10 section 5*
- is manufactured in accordance with the design
- is fully tested as required in *AS/NZS 1418.10*
- is supplied with appropriate documentation to the owners of the machine – for further details refer to *AS/NZS1418.10 section 4.1.2 and 4.1.3*
- is provided with full operating and maintenance manuals (in English)
- is maintained correctly as recommended by the manufacturer.

When a second-hand machine is sold “as is”, the buyer is made aware that the machine may not be compliant with these guidelines.

4.1.1 Maintenance manual

The maintenance manual should include:

- commissioning information
- specified inspections or tests based on number of operating hours
- total number of designed operating hours or load cycles or both
- Group Classification
- characteristics of the vehicle that are necessary to ensure the stability of the MEWP (e.g. weight, wheelbase, chassis stiffness, etc)
- parts detachable for functional reasons
- for foam filled tyres, the weight
- care and maintenance and test procedures of electrical insulation.

4.1.2 Operator’s manual

The operator’s manual shall also include:

- transport and storage information

- emergency procedures
- rated capacity
- allowable manual force
- maximum allowable wind speed in metres per second
- allowable special loads and forces
- maximum permissible chassis inclination
- cautions and restrictions of operation
- insulation rating
- the load of distribution on the wheels or stabilizers under the most onerous loading conditions
- H/MEWP mass
- for electrically powered H/MEWPs, supply voltage.

4.2. Employers

Employers may include owners, contractors, hirers or principals. Employers must take all practicable steps to ensure the safety of employees while at work. This requirement includes ensuring that plant used by any employee at work is designed, made, and maintained so that it is safe.

All safety features of the H/MEWP must be in sound working condition. All operating instructions must also be clearly legible. Ensure the H/MEWP is ballasted as specified by the manufacturer.

The H/MEWP should be inspected regularly, repaired and maintained by a competent person. Periodic checking must be carried out as recommended in these best practice guidelines.

All newly manufactured H/MEWPs must meet the requirements of *AS/NZS 1418.10* or these best practice guidelines. When an H/MEWP is due for a major inspection where possible it should be upgraded to meet the current specifications.

Appropriate documentation and records must be provided and maintained, and be available for inspection.

The H/MEWP must be operated by a competent operator, or the operator must be supervised by a competent person. The H/MEWP must be used in accordance with the manufacturer's operating instructions and these best practice guidelines.

The H/MEWP must only be operated on suitable orchard terrain, where the grade of all slopes are within the manufacturers' specifications for the specific machine as required by *AS 2550.10 section 4.7*.

4.3. Hirers

Anyone who hires, leases, or loans an H/MEWP to another person has an obligation to ensure the machinery is designed and maintained so that it is safe for its intended use.

The hirer should be provided with the appropriate information, advice, and training so the machine can be used safely.

4.4. Principals

Principals have a responsibility to those they contract to work for them or work on their properties. The general process involved in effective contractor management would require the principal and/or contractor to scope the work, assess the capability of contractors to complete the work and have a method of selecting them, have a means of awarding contracts, and have a process to review and monitor the contractor's health and safety performance. For more detailed information about contractor management in these guidelines, refer to section 1.1 Responsibilities.

When hiring a contractor/H/MEWP operator the principal must:

- provide the contractor/H/MEWP operator with a briefing of the hazards identified in the work area
- mark any obstacles or hazards in the work area and draw them to the attention of the operator/contractor
- define the areas where the H/MEWPs are to be used
- provide a map of all power lines on the property
- provide a map showing any slopes on the property and include other hazards such as drop-offs, and windy areas. This map should be made available to the contractor/H/MEWP operators and their supervisors
- request a safety plan from the contractor that outlines hazard controls and safe methods of work
- regularly check that the contractor and H/MEWP operators are working in a safe manner and working to the requirements of the safety plan.

5. MAINTENANCE OF H/MEWPS

5.1. General

A well-maintained H/MEWP is essential for the safe operation of the machine. H/MEWP owners have a legal obligation to ensure the H/MEWP is well maintained.

Where manufacturer's specifications for the maintenance and inspection of an H/MEWP are available they should be used. Maintenance and inspection should also meet the requirements as set out in *AS 2550.10 Appendix C*, especially when there are no manufacturer's instructions available.

Inspections should be carried out at a frequency to enable the H/MEWP to be kept in a safe and well-maintained condition. An enhanced periodic inspection may be carried out after the first five years of service or continue with periodic inspections followed by a major inspection by the end of the tenth year. Regardless of the option chosen, all critical components should be inspected by the tenth year.

The manufacturers' instructions may be based on operating hours or a time-based system. The machine should be registered with the manufacturer who may require the machines serial number and other details to provide machine specific requirements.

Further guidance on maintenance can be found by referring to *AS 2550.10 section 6* and its subsections.

5.2. Log books or file records

Log books or file records are to be kept by the owner of the H/MEWP showing details of certification, repairs, modifications, inspections and examinations. These records of repairs and maintenance must be available for inspection.

5.3. Daily pre-operational inspection

The manufacturer's instructions recommended daily pre-operational checks are to be carried out before the machine is used. These checks should meet the requirements set out in *AS 2550.10, table 6.4.2*.

This inspection is to be carried out by the operator or competent person before each day's use of the H/MEWP.

Where the manufacturer's instructions are not available, a daily pre-operational check consisting of at least the following items should be carried out by the operator or competent person before the H/MEWP is used.

Pre-operational inspection

The following pre-operational inspection and checks should be completed before using the H/MEWP.

Component	Visual inspections	Functional test
Platform and base controls	✓	✓
Emergency controls system		✓
Visual and audible alarms		✓
Personal protective equipment	✓	
Air, hydraulic and fuel system leaks	✓	
Cables and wiring harness for security and damage	✓	
Brakes		✓
Tyres and wheels		✓
Placards, decals, warnings, control markings and presence of operating manuals on the MEWP	✓	
Outriggers and stabilisers		✓
Guardrail system including gates with self-closing action		✓
Control descent devices where fitted	✓	
Slew brake function		✓
Safety switches and interlocks		✓
Structural defects or damage	✓	
Correct operation of drive and speed functions, including speed-limiting devices		✓

The operator or competent person must:

- record the inspection in the machine's logbook along with any defects
- bring any faults to the employer's or principal's notice, to ensure that these are fixed before the work platform is used again.

5.4. Monthly routine inspection

A monthly routine inspection should be carried out as per the manufacturer's recommendations. This check should meet the requirements set out in *AS 2550.10 Appendix C*.

The inspection must be carried out by a competent person or a person certified by the manufacturer.

When the manufacturer's instructions are not available, a monthly check consisting of at least the following items should be carried out by a competent person.

The monthly inspection should check that:

- tyres are undamaged and correctly inflated
- all wheel studs are tight
- fuel, water and oil levels are correct
- hydraulic lines are free from leaks and damage
- the supporting structure is sound and free from distortion and cracking
- the powered mechanism for lifting and driving the H/MEWP is working properly
- all brakes are working efficiently
- the operation of all controls
- the emergency controls and alarms function correctly
- any safety equipment (e.g. safety harness) is in good condition.

For H/MEWPs that are hired out this inspection must also be completed at the end of each hire contract or in the case of long-term lease completed at the end of each month of hire.

The owner or delegated competent person must record the results of any inspection along with any defects in the machine's logbook. Ensure that any faults are corrected before the machine is returned to service.

5.5. Twelve-month periodic inspection

Twelve-month periodic inspections should be carried out by a competent person, or a person certified by, or supervised by, the manufacturer. Follow the manufacturer's instructions for the twelve-month inspection and meet the recommendations set out in *AS 2550.10 Appendix C*.

When suitable instructions from the manufacturer are not available, the twelve-month checks should be carried out by a competent person and consist of at least the following checks:

- tyres are undamaged and correctly inflated
- all wheel studs are tight
- fuel, water and oil levels are correct
- hydraulic lines are free from leaks and damage
- the supporting structure is sound and free from distortion and cracking
- the powered mechanism for lifting and driving the H/MEWP is working properly
- all brakes are working efficiently
- the emergency controls and alarms function correctly
- any safety equipment (e.g. safety harness) is in good condition
- operational controls are in good working order.

Any parts replacements, or modifications recommended by the manufacturer for safety reasons, should be actioned as part of this inspection.

The competent person must record the inspection and any defects found in the machines logbook or file records. Any faults discovered must be corrected before the machine is returned to service.

5.6. Major inspection

In addition to the previous inspections, H/MEWPs should have a major inspection every ten years, or after an accident or modification.

The recommended manufacturer's major inspection should be carried out. The inspection criteria should meet the requirements set out in *AS 2550.10 Appendix C*.

The major inspection must be carried out by a qualified person experienced in the servicing of MEWPs, or a person certified by, or supervised by, the manufacturer.

Where possible the machine should be upgraded to the current specifications. Any parts replacement or modifications recommended by the manufacturer for safety reasons must be completed.

When suitable instructions from the manufacturer are not available, the recommended inspection should cover at least the following requirements that are outlined in *AS 2550.10 section 6.4.5*.

The major inspection includes the following:

- inspect the machine's logbook or file records
- disassemble and remove paint, grease, and corrosion from critical components to allow a complete and thorough inspection and crack testing of these areas and components
- a thorough and detailed visual inspection and checking of the tolerances of all wear components must be carried out
- where possible upgrade the machine to the current specifications
- check that all safety decals are installed and legible, and that emergency operating instructions are in place as specified in *AS 1418.10*
- check that the hour meter is operational
- all controls must return automatically to off and be correctly labelled
- all functions including the emergency stop function must operate correctly
- check that all hydraulic hoses are in serviceable condition and are routed correctly. Hose failure protection devices (counterbalance valves or flow-limiting devices) must be present, functional and tested
- check that the hydraulic system relief valves are set to specification
- hydraulic cylinders are to be tested to maximum pressure and fully serviceable
- check that the electrical looms are adequately installed, protected, and fully serviceable
- the pivot points must be secured, have no excessive clearance, and be adequately lubricated

- all load carrying components, wheels, and axles must be structurally free from deformation or cracking, to be determined by non-destructive crack testing
- the machine is free of corrosion, and the surface is protected
- the condition of the platform is sound, and guardrails adequate
- check that suitable harness anchor points are fitted to the work platform
- check that the drive brakes hold H/MEWP on rated gradient
- check that the tyres are sound, in adequate condition, and are of the correct specification
- check that the wheel nuts are set to the correct torque
- check that the inclinometer operates correctly
- check that the audible warning device is operational
- check that the engine fuel and exhaust systems are appropriately guarded, sealed, and serviceable
- check that the battery is adequately secured and with correct specification
- check that the condition of lifting/tie-down points is adequate.

Any parts replacement or modifications known to be issued by the manufacturer for safety reasons must be incorporated. The major inspection must meet the requirements as set out in *AS 2550.10 section 6 and Appendix A*.

This check must be recorded in the log book or file records of the H/MEWP and be signed off by the competent person as per *AS 2550.10 section 6.4.5*.

A New Zealand Chartered Professional Engineer's assessment should be carried out for all H/MEWP machines that have:

- been imported
- components that maintenance records indicate repeated failures
- had any structural modifications.

5.6.1. Machines involved in accidents

Where a machine was involved in an accident of any kind, it must undergo a major inspection before being returned to service.

6. GENERAL – NEW TECHNOLOGIES

Technology can change very quickly. New technology may mean hazards may be controlled in other ways than those outlined in these guidelines. Any alternative methods of controlling hazards must ensure that all practicable steps have been taken into account, including the current state of knowledge about the new technology and its intended purpose.

An example of a new technology is outlined in Appendix C.

Applications for the introduction of new technology or variations to these best practice guidelines should be made to:

Horticulture Health and Safety
Horticulture Elevating Work Platforms Working Committee
C/- Horticulture New Zealand
P.O. Box 10232, The Terrace
Wellington

APPENDIX A: EXAMPLE OF SITE SAFETY PLAN

Contractor name:
Offsite supervisor:
Type H/MEWP or H/MEWPs:
Maximum safe working slope:
Maximum SWL of H/MEWP or H/MEWPs:

Orchard name:
Location:
Task undertaken:
Date of assessment:
Assessment completed by:

Safe access to work area

Emergency procedures

Controlling the following orchard hazards

- Slope measurement of work area
- Excavations/drop-offs/embankments
- Slippery ground conditions
- Pot holes
- Broken branches
- Under trees hazards
- Environmental hazards – wind/rain/ice
- Other hazards

Safety plan for working near power lines

- Safe zone established to work further than 6.4 metres away?
- Safety observers appointed?
- Is there any risk or need to work within the 4 to 6.4 metres safe zone?
- Has the electricity network company been called?
- What are the hazard controls to be put in place to work within the exclusion zone?

- Has consent been obtained from the electricity network company?
- Has the work plan incorporated the consent conditions?

Findings of physical pre-operational inspection

Log book completed and routine inspections noted

Operators are trained and competent or are supervised, and trained in the use of personal protective equipment – e.g. gloves or total restraint.

Operators advised of hazards

APPENDIX B: EXAMPLE OF A HAZARD ASSESSMENTCHECKLIST

Contractor name: **Offsite supervisor:** **Type H/MEWP:** **Maximum safe working slope:** **Maximum SWL of H/MEWP:**		**Orchard name:** **Location:** **Task undertaken:** **Date of assessment:** **Assessment completed by:**
Environmental assessment		**Is the machine suitable for the terrain of the orchard? Yes/No**
Hazard	Significant hazard	Control measures
Slope measurements of direct work	Yes/No	
Slope above maximum working slope of H/MEWP	Yes/No	
Safe access to designated work	Yes/No	
Slippery ground conditions	Yes/No	
Pot holes/subsidence	Yes/No	
Under tree hazards	Yes/No	
Broken branches	Yes/No	
Excavations/steep drop-offs/embankments	Yes/No	
Wind does not exceed manufacturer recommendations	Yes/No	

Exclusion zone in place for overhead power lines	Yes/No	
Other environmental factors	Yes/No	
Emergency procedures	Yes/No	
Other		
Machinery inspections	Status	Actions
Findings of physical pre-operational inspection.	Pass/Fail	
Log book completed and routine inspections show no maintenance requirements	Pass/Fail	
Machine is fit for purpose and complies with the manufacturer's instructions for the task	Pass/Fail	
Monthly inspection completed	Pass/Fail	
In the event of punctures, have instructions been given that any water-filled tyres are to be re-filled before the machine is used?	Pass/Fail	
Human factors		
Operator skill/competency meets task	Yes/No	
Operator advised of hazards	Yes/No	
Operator training completed	Yes/No	

Tip catapult	Significant hazard	
Can H/MEWP catapult effect be eliminated?	Yes/No	
Can H/MEWP capsize be eliminated	Yes/No	
Any risk by total restraint use to operator	Yes/No	
Other information		

APPENDIX C: ORCHARD PLATFORMS

Background

Orchard platforms are a new family of the H/MEWP developed for pruning and harvesting the new dwarf trees which some orchards are developing. These machines were not considered when the *AS/NZS 1418.10* or the *AS 2550.10* were published.

Platform height

Key differences are these orchard platforms are self-propelled with a maximum lift height to the platform floor of not more than 2.5 metres. These machines are designed to travel by themselves unattended by the operator.

Travel controls

A competent person must be nominated to work at the control area of the platform and be responsible for the manoeuvring and overall operation of the machine.

Where multiple people are working on the machine, an emergency stop control must be easily accessible to all of the people working on the platform to stop the machine's travel at any time. The machine cannot be moved unless all of the emergency stop controls are deactivated.

The automatic drive controls must be guarded to prevent any risk of accidental operation.

Work platform design

The work platform may be designed for use by multiple workers. Some of these people may be located on other platforms at various heights on the machine.
The size of the platform may be adjustable to suit different orchard designs.
The adjustment must be locked by a self-locating latch system to ensure there is no risk of inadvertent movement of the platform adjustment.

Where the rails of the work platform are broken as the result of the adjustable design, some provision must be made to ensure that a continuous barrier is provided around the worker at all times to eliminate any risk of accidental falls. Where necessary, elements of this barrier may be formed by chains/ropes or some other flexible device.

The minimum work platform rail height is lowered to 800mm to enable workers of smaller stature to work conveniently with a picking bag over the rail as outlined in *AS/NZS1418.10 section I2.2*.

Ingress and egress from the work platform must be convenient with suitable non-slip steps being provided where necessary.

Fruit handling systems

Conveyors and their drive systems must be adequately guarded and protected to eliminate the risk of injury to any worker.

For further information refer to MBIE's safe use of machinery factsheet: *Guarding of conveyors.*

Where bulk product bins are situated in an area adjacent to workers, the bins must be contained by tracks or some other means to eliminate any risk of workers being crushed in the event of any sudden change of altitude or movement of the machine.

APPENDIX D: MEASURING SLOPES

The slope rating for an H/MEWP

All H/MEWPs must have a minimum stability of five degrees. Individual H/MEWPs may be rated to a higher level of stability. This information can be found on the manufacturers 'Stability Certificate' which is issued with each machine.

The manufacturer's stability rating is for the H/MEWP in any position on a slope – sideways, or fore and aft. All stability ratings are determined with the machine ballasted as specified by the manufacturer, raised to maximum elevation, and loaded to its maximum SWL.

Measuring a slope

Use a suitable measuring device to measure the slope of the incline, moving around the area to be worked to find the greatest slope on the block.

When choosing the machine to be used, the manufacturers maximum slope specification must be greater than the steepest slope you are able to find. It may be necessary to divide off certain areas of the area to be worked by H/MEWPs that have different rating capabilities.

Remember:

It is always necessary to consider the greatest angle you find on an incline.

Some manufacturers may express stability as a percentage. Use the attached chart to convert this scale to degrees.

Slope by degrees	Slope by %
6°	10.51
8°	14.05
10°	17.63
11°	19.44
12°	21.25
13°	23.08
14°	24.93
15°	26.79
16°	28.67
17°	30.57
18°	32.49
19°	34.43
20°	36.39
21°	38.38
22°	40.40

APPENDIX E: DEFINITIONS

Best practice guidelines

A document which has been developed with consultation of an industry group to be used as a basis for the safe work place practices.

Chartered Professional Engineer (CPEng)

A person who is registered and holds a current New Zealand registration certificate, and who has the appropriate experience and competence to assess the integrity of a structure or anchorage points.

Competent person

A person who, by possession of a recognised degree, certificate or professional standing or by knowledge training and experience, has successfully demonstrated the ability to solve problems in the subject matter.

Contractor

A person engaged by any person (other than as an employee) to do any work for gain or reward.

Critical weld

One positioned where failure could affect the soundness of the structure and result in injury to an employee on the platform.

Designated operator

An operator who has been properly briefed and assigned to operate the machine in areas where a risk assessment process has identified specific hazards.

Employer

A person who or that employs any other person to do any work for hire or reward; and, in relation to any employee, means an employer of the employee.

Employee

Any person of any age employed by an employer to do any work (other than residential work) for hire or reward under a contract of service and, in relation to any employer, means an employee of the employer.

Extending structure

A structure that is connected to the chassis to support the work platform and allow movement of the work platform to its required position.

Horticulture

Production horticulture, as described by Horticulture New Zealand, that includes New Zealand grown fruit, vegetable and berry crops.

Hirer

A person supplying plant for use in the place of work for hire or reward.

Horticultural/mobile elevating work platform (H/MEWP)

A mobile machine (device) is a specialised item of equipment for use in horticulture and intended to move persons, tools and material to working positions. It consists of at least a work platform with controls, an extending structure and a chassis, but does not include mast climbing work platforms.

Importer

A person or organisation who purchases goods in another country for resale in New Zealand, either through dealers, or directly to end users.

Instability

Condition of a H/MEWP in which the sum of the moments tending to overturn the unit exceeds the sum of the moments tending to resist overturning.

Lift height

The maximum elevation of the operators work platform floor above ground.

Manual force

A side-loading imposed on the machine by the operator pushing/pulling on an outside object from the work platform.

Manufacturer

The person or organisation who builds machinery or equipment for distribution to end users, either through dealers, or by selling directly to the end user.

Operator

The person who controls the movements of the H/MEWP.

Pickbag

A mounted container supplied by the manufacturer to carry fruit as it is picked.

Person who controls a place of work

A person who is, in relation to a place of work:

(a) the owner, lessee, sublessee, occupier, or person in possession, of the place or any part of it; or

(b) the owner, lessee, sublessee, or bailee, of any plant in the place.

Principal

A person who or that engages any person (otherwise than as an employee) to do any work for gain or reward.

Qualified person

Either a fitter or mechanic who holds a relevant New Zealand Trade Certificate or a person trained and certified by the manufacturer.

Safety observer

A person assigned the sole duty of observing and warning an operator of any approach to within a unsafe distance of overhead electric lines or other hazards.

Stability

The condition when the total restoring moments exceed the overturning moments.

SWL/Rated capacity

The maximum load, expressed in kilograms, for which the H/MEWP has been designed for safe normal operation, and is composed of persons, tools and material acting vertically on the work platform.

NOTE: An H/MEWP can have more than one rated capacity depending on different configurations.

Tool carrier

A mounted container or bracket supplied by the manufacturer which can be attached to the work platform to carry tools or materials.

Total restraint

Total restraint is a control on a person's movement by means of a combination of a belt or harness, a line and an approved anchor point which will physically prevent the person from reaching a position at which there is a risk of a free or limited free fall.

Work platform

Work platform(s) can also be referred to as cage(s).

APPENDIX F: PUBLICATIONS

Acts and Regulations

- The Health and Safety in Employment Act 1992 (HSE Act 1992)
- The Health and Safety in Employment Regulations 1995
- Electricity Act 1992
- Electricity (Safety) Regulations 2010

A full copy of the legislation and regulations can be downloaded free of charge at www.legislation.govt.nz

Australian and New Zealand Standards – www.standards.co.nz

- AS/NZS 1418.10 - Cranes, hoists and winches - Part 10: Mobile elevating work platforms. Specifies the requirements for the design and features of mobile elevating work platforms.
- AS/NZS 1891.4 - Industrial fall-arrest systems and devices - Selection, use and maintenance.

Australian Standards – www.saiglobal.com

- AS 2550.10 - Cranes, hoists and winches - safe use - mobile elevating work platforms. (foreign standard) Specifies requirements for the safe use of mobile elevating work platforms.

European Standards - www.en-standard.eu

- ISO 16653-3 - Mobile elevating work platforms - Design, calculations, safety requirements and test methods relative to special features - Part 3.

MBIE Guidance – www.mbie.govt.nz

- Approved Code of Practice for Power-Operated Elevating Work Platforms (Currently under review).

- Approved Code of Practice for - Includes the Design, Manufacture, Supply, Safe Operation, Maintenance and Inspection of Cranes (Cranes ACOP)
- Approved Code of Practice for Safety and Health in Arboriculture
- Best Practice Guidelines for Working at Height in New Zealand
- Safe use of machinery factsheet: Guarding of conveyors

Electricity Engineers Association Guidance - www.eea.co.nz