

	<h1>ELEVATING WORK PLATFORMS IN MINING</h1>	
	<p>Peter Wenn</p> <p>Wenn Wilkinson &amp; Associates</p>	
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	<h2>EWPS in Mining</h2>	
	<ul style="list-style-type: none"><li>■ To outline the state of the art with regard to access equipment</li><li>■ Hazards</li><li>■ Applicable standards<ul style="list-style-type: none"><li>- Design</li><li>- Safe use</li></ul></li></ul>	
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	<h2>Wenn Wilkinson &amp; Associates</h2>	
	<ul style="list-style-type: none"><li>■ Consulting engineers<ul style="list-style-type: none"><li>- Melbourne</li><li>- Central Coast NSW</li></ul></li></ul> <p>Combined 40 years experience with Elevating Work Platforms</p>	
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## Wenn Wilkinson & Associates

### ■ Access Equipment

- EWPS
- MEWPS
- Aerial Device
- Boom Lift
- Travel Tower
- Cherry Picker
- Bucket Truck
- Scissor Lift



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## Wenn Wilkinson & Associates

### ■ Access Equipment



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## Wenn Wilkinson & Associates

### ■ Utilities



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## Wenn Wilkinson & Associates

### ■ Emergency Services



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## Wenn Wilkinson & Associates

### ■ Emergency Services



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### ■ Aircraft Ground Support Equipment



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<ul style="list-style-type: none"> <li>■ Telehandlers &amp; Attachments</li> </ul>	
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<b>Wenn Wilkinson &amp; Associates</b>	
<ul style="list-style-type: none"> <li>■ Peter Wenn <ul style="list-style-type: none"> <li>– BEng CPEng NPER-3</li> <li>– Standards Australia <ul style="list-style-type: none"> <li>■ Chairman ME005-10 (AS1418.10 &amp; AS2550.10 – Elevating Work Platforms)</li> <li>■ Member ME005-22 (AS1418.19 &amp; AS2550.19– Telehandlers)</li> <li>■ Member ME005</li> </ul> </li> <li>– Member Elevating Work Platform Association Australia</li> </ul> </li> </ul>	
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<b>Applicable Standards</b>	
<ul style="list-style-type: none"> <li>■ AS1418.10    Design</li> <li>■ AS2550.10    Safe Use</li>   <li>■ En280        Design</li>   <li>■ ISO 16368    Design</li> <li>■ ISO 18893    Safe Use</li>   <li>■ Ansi A92 (6 Parts) (Design &amp; Safe Use)</li> </ul>	
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# LIFTING PERSONNEL

- Primary Hazards
  - Falls from Height
  - Instability
  - Collision
  - Structural/Mechanical/Hydraulic Failure
    - Failure of load supporting systems
  - Electrical
    - Work near Live Electrical Apparatus
  - Isolation
    - Emergency Recovery

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# Falls from Height

- Gaurdrailing & Protective Structures



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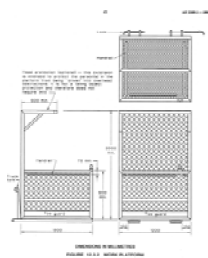
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# Falls from Height

- Workbox
  - AS2359



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## Falls from Height

- Access & Egress at Height
  - AS2550.10 outlines specific recommendations relating to access and egress at height
  - It should only be undertaken if a risk assessment shows that there is no safer method



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## Falls from Height

- Extending the platform
  - An alteration to the EWP
  - Affects Stability, Load Capacity
  - Anchorage of harness
  - Gaurdrailing

A supplier will NOT accept liability for unauthorised alteration or addition



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## Falls from Height



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## Instability



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## Instability

- Control Measures
  - Level Gauges or Alarms/interlocks
  - Stabiliser Interlocks
    - Stabilisers must be set before use
    - Stabilisers cannot be operated whilst the EWP is raised from its stowed position
  - Verification by calculation and test

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## Instability

- Unlike other parts of AS1418, AS1418.10 specifies a "limit states" approach to the verification of stability
- The EWP shall not overturn under the least favorable combination(s) of:
  - Rated Wind load (12.5m/s)
  - Manual force (200N per person or 400N max.)
  - Positioned on the maximum allowable slope +0.5 degrees
  - Rated load (Minimum or Maximum)

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## Instability

- Considering the following Influences
  - Dynamic Effects
  - Distortions
  - Deflections
  - Play on connecting components
  - Tyre failure

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## Instability

- Additional Tests for self propelled EWP's
  - Kerb Test
  - Depression Test (ISO)

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## Instability

- Residual Risks
  - Uneven or soft ground
  - Improper siting (On temporary founding)
  - Over culverts or ground with inadequate load bearing capacity
  - In streams or changing environments
  - Overload
    - Load & Moment Limiting (ISO)

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## Collision

- Hazards associated with the mobility of Machinery
  - Collision with equipment or personnel on the ground
  - With surrounding structures

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## Collision

- Personnel at ground level
  - Reversing/motion alarms visual or audible
  - Isolation of the area
  - Speed limits (ISO)

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## Surrounding Structures

- Controls at the platform
  - Emergency Stop Control or separate deadman control (frequently foot pedal)
- Speed limited motions (ISO)
- Load limiting (ISO)
  - Limits the damage but does not reduce the risk of collision

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## Mechanical/Hydraulic Failure

- May result in collapse of the EWP with catastrophic results
  - A high rated capacity does not mean that the machine will not fail when supporting a small load.

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ABC News

### Worker entitled to \$7m for cherry-picker accident, says court

Posted Thu Nov 30, 2006 7:00pm AEDT

**An ACT Supreme Court judge has ruled that a father of three who became a paraplegic after a workplace accident is entitled to \$7.25 million in damages.**

Michael Hay, 32, was employed as an electronics technician by the Australian Federal Police in Canberra.

He was working on a communications tower in 1997 when the cherry-picker carrying him collapsed, causing him to fall eight metres.

In his judgement, Justice Terry Connolly described the accident as catastrophic.

The court found Mr Hay is entitled to more than \$7 million in damages, but that is only an interim assessment and liability is yet to be established.

Justice Connolly criticised the companies that made and distributed the cherry-picker.

He said that despite being ordered to produce documents relating to past incidents, the companies did not properly disclose all the material.

**Tags:** workplace-accidents, courts-and-trials, canberra-2600

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	<h2>Mechanical/Hydraulic Failure</h2>
	<p>Design</p> <ul style="list-style-type: none"> <li>■ Design</li> <li>■ Test (Overload test)</li> <li>■ Independent Design Verification</li> <li>■ Inspection &amp; Maintenance Instructions</li> </ul> <p>9/17/2007 <span style="float: right;">WENN WILKINSON &amp; ASSOCIATES 31</span></p>

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	<h2>Structural Mechanical Failure</h2>
	<ul style="list-style-type: none"> <li>■ Hydraulic Hose Failure <ul style="list-style-type: none"> <li>– All load Holding Actuators are equipped with load holding valves</li> <li>– Load Holding valves in the majority of instances can be fitted to earth moving equipment and other LHD's without significant loss of performance</li> </ul> </li> </ul> <p>9/17/2007 <span style="float: right;">WENN WILKINSON &amp; ASSOCIATES 32</span></p>

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	<h2>Mechanical/Hydraulic Failure</h2>
	<p>SAFE USE</p> <ul style="list-style-type: none"> <li>■ Preoperational Inspection</li> <li>■ Routine Inspection (3 Monthly)</li> <li>■ Periodic Inspection (Annual)</li> <li>■ Major Inspection (Nominally 10 yearly)</li> </ul> <p>9/17/2007 <span style="float: right;">WENN WILKINSON &amp; ASSOCIATES 33</span></p>

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## Electrical Hazards

- Hazards Associated with operation near live Electrical Apparatus

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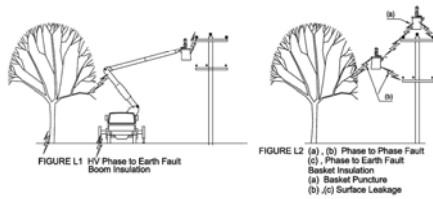
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## Electrical Hazards



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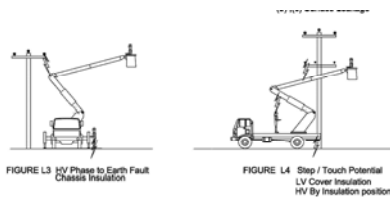
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## Electrical Hazards



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## Electrical Hazards

- Clearances
  
- Appropriate Selection of an Insulated EWP
  - Insulation Rating to the voltage to which persons will be exposed
  - Work Procedure
    - Authorisation
    - Work Method
    - PPE

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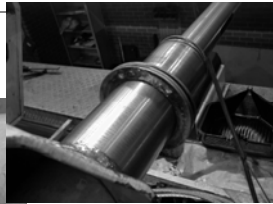
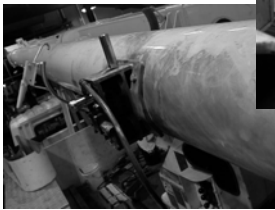
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## Electrical Hazards

- Equipment



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## Electrical Hazards

- Design
- Acceptance Test
- Periodic Test
  - Maintenance
- Insulation Marking

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# Insulation Marking

## ■ Rating Plate



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# Insulation Marking

## Insulation Markers



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# Isolation

- Isolation refers to the isolation of personnel at height due to equipment breakdown.
- Control system Failure
- Operator Incapacitation
- Failure of the primary power source
  - Intrinsic in this is that trained ground personnel are ALWAYS available to effect rescue.

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	<h2 style="margin: 0;">Isolation</h2>
	<ul style="list-style-type: none"> <li>■ Control System Failure or Operator Incapacitation           <ul style="list-style-type: none"> <li>– Duplicate Controls at ground level</li> <li>– NOT travel controls for Self Propelled EWP's (risk of injury to ground personnel or instability)</li> </ul> </li> </ul>
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	<h2 style="margin: 0;">Isolation</h2>
	<ul style="list-style-type: none"> <li>■ Emergency Power           <ul style="list-style-type: none"> <li>– Electric Pump</li> <li>– Hand Pump</li> <li>– Gravity Lowering</li> </ul> </li> </ul>
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	<h2 style="margin: 0;">Isolation</h2>
	<ul style="list-style-type: none"> <li>■ WARNING           <ul style="list-style-type: none"> <li>– Some safety systems maybe overridden during emergency procedures</li> </ul> </li> <li>■ ALWAYS           <ul style="list-style-type: none"> <li>– Consult the manual</li> <li>– Rehearse the procedures</li> <li>– Maintain minimum operating radius</li> </ul> </li> </ul>
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## Secondary Hazards

- Transport
  - From site to site
    - EWPS must be adequately restrained on the carrying vehicle
    - Proper procedures are followed during loading and unloading
    - The EWP is stowed according to the manufacturers recommendations.

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ABC Online

**Worker killed in cherry picker fall, 02/02/2007, ABC News Online**

[This is the print version of story <http://www.abc.net.au/news/stories/2007/02/02/070202n1875290.htm>]

Last Update: Friday, February 2, 2007, 5:48pm (AEDT)

### Worker killed in cherry picker fall

A man in his 40s has died when a cherry picker he was in fell to the ground south of Melbourne.

The accident happened at an equipment hire business on the South Gippsland Highway, in Dandenong South about 3pm AEDT.

Ambulance paramedic David Llewellyn says the worker was unloading the cherry picker from a truck.

"Something's gone wrong, terribly wrong, and the cherry picker that he was in impacted with the ground," Mr Llewellyn said.

"The basket that the man was in has broken and he was flung under the steel structure, and was subsequently killed."

WorkSafe is investigating the incident.

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## Secondary Hazards

- Maintenance
  - Ensure that all recommendations are followed during maintenance
  - Safety Props are used
  - Adequate lifting gear is used
  - PPE including harnesses are worn as appropriate.

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<b>How does your plant stack up?</b>	
<ul style="list-style-type: none"> <li>■ Stable?</li> </ul>	 <ul style="list-style-type: none"> <li>■ Interlocks</li> <li>■ Level alarms/indicators</li> <li>■ Puncture proof tyres</li> <li>■ Verified by test – Static, Dynamic, Kerb and Depression</li> </ul>
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<b>How does your plant stack up?</b>	
<ul style="list-style-type: none"> <li>■ Collision?</li> </ul>	 <ul style="list-style-type: none"> <li>■ Speed Limited</li> <li>■ Controls in the hands of the operator</li> <li>■ Retrieval from ground</li> </ul>
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<b>How does your plant stack up?</b>	
<ul style="list-style-type: none"> <li>■ Collapse?</li> </ul>	 <ul style="list-style-type: none"> <li>■ Load Holding Valves?</li> <li>■ Inspection and maintenance regimes in place?</li> </ul>
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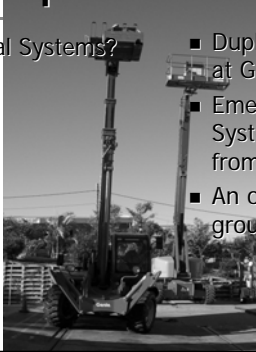
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## How does your plant stack up?

- Retrieval Systems?
  - Duplicate Controls at Ground?
  - Emergency retrieval System accessible from the ground
  - An operator at ground level?



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## How does your plant stack up?

- DESIGN REGISTERED?



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**EWPA**

- Code of Ethics
- Newsletter
- Documentation
- Seminars
- Training Schemes
- International Affiliation with IPAF

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