



Work safely at heights

RIIWHS204D



“We acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture. We pay our respects to their Elders past, present and emerging.”



COMMONGROUND

<https://www.commonground.org.au/learn/acknowledgement-of-country>

Site policies & procedures

- ***Site induction***
- ***Evacuation Protocol***
- ***Assembly area***
- ***Mobile Phone etiquette***
- ***Toilets - location***

- By the end of this topic, you should be able to:
 - Identify work requirements
 - Identify who has a duty a care and what for under legislation
 - Identify work procedures and instructions
 - Access and install equipment
 - Perform work at heights
 - Clean up work area



- Work health and safety Act 2011 and associated Work Health and Safety Regulation 2011
 - Is a statutory document
 - Covers a broad framework, duties of care / obligations
 - You must learn your responsibilities relating to the Act and associated Regulation
- Code of Practice
 - Managing the risk of falls
 - Codes of practice state ways to manage exposure to identified risk.
 - The code of practice acts as a good practice guide to risk management in these areas of industry and can be used as benchmark type tool for management and workers.

More information can be found here:

<https://www.worksafe.qld.gov.au/laws-and-compliance/work-health-and-safety-laws>

- Standards Australia is the nexus for Australian industry. It is internationally renowned for its role in the development of standards and is recognized by the Government as the peak, non-government standards body in Australia. Standards Australia is dedicated to setting benchmarks to meet the growing expectations of the Australian community, industry and government.
- The Australian standard can be used as a statutory document if referred to by the Regulations.
- AS/NZS 1981.1 Industrial fall-arrest systems and devices Harnesses and ancillary equipment states:
 - that the maximum free fall distance allowed is 2 metres.
 - That the harness is designed to:
 - Arrest the fall
 - Distribute the shock load
 - Ensure the wearer is head up
 - Prevent injury

- AS1891.1

- Belts were banned for fall arrest because:

- They caused serious injuries in falls
- High possibility of falling out
- Shock load to the body
- Restraint only
- Maximum drop in a restrain belt is 0 metres.

- Minimum requirements for a harness include:

- Shoulder straps
- Dorsal “D”
- Leg straps
- All in one construction



- It is important to:
 - Assess the worksite for:
 - Hazards
 - Weather conditions
 - Access
 - Method of moving tools and equipment
 - Attend a pre-start meeting to determine:
 - Necessary tools, equipment and materials
 - Work requirements
 - Refer to plans, SWMS and relevant workplace documents
 - Wear suitable PPE
 - Check tools and equipment for issues and faults

PPE

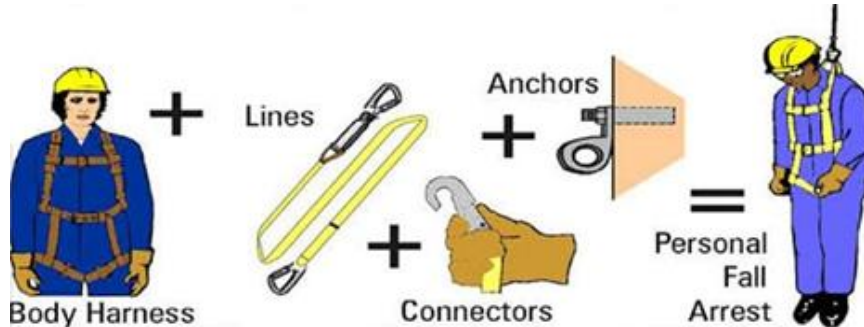
- Hard hat
- Steel capped boots
- Hi-viz clothing
- Hand protection
- Eye protection
- Hearing protection



- Site Safety Plan
 - Site rules, policies and procedures
 - Emergency procedures
 - Work at heights Rescue procedures
 - During team work be mindful of the following points:
 - Using clear language
 - Best methods IE: verbal, written
 - Abilities of the teams members
 - Cultural & Ethnic back grounds
 - Communication:
 - Visual – e.g. hand signals
 - Verbal – e.g. team meeting
 - Non-visual – 2-way radio

Fall protection systems

- The most commonly used fall protection systems include:
 - Fall arrest systems
 - Fall restraint systems
 - Safety line systems
 - Inertia reel systems



Other forms of protection include

- Edge protection/ fall prevention devices such as – handrails, scaffolding, EWP, Formwork
- Perimeter containment such as perimeter screens, safety mesh, travel restraint systems, guard rails, barriers,
- Fall prevention systems such as safety harnesses, safety net, catch platform
- Barricades used may include hard barricades such as concrete or water barriers & soft barricades such as cones or tape
- Signs to be erected include signs similar to:
 - PPE requirements
 - No unauthorised access
 - Workers above

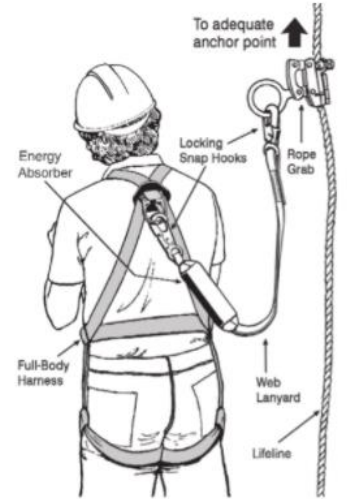


Safety line systems

- Safety line systems are used to prevent falls from areas when work has to be carried out in the absence of safety screens or handrails.
- The installer designs the system based on the number of persons on the line at any given time, taking into account whether or not energy absorbing lanyards are to be used and any other restrictions on the use of the line system. **MUST BE INSTALLED BY LICENCED RIGGER OR SCAFFOLDER**
- Static line spans:
 - The static line is the supporting safety line attached to the inside of the perimeter columns. The line should be supported at each column or in accordance with an engineer's specification.
 - The line should be placed to eliminate the risk of tripping. Where practicable, the line should be located no less than 2.1m above the floor of the work area. The point of attachment to the safety line system should be within reach of the user standing on the floor.

A personal fall- arrest system

- A personal fall arrest system consists of:
 - Anchorage points
 - Full body harness
 - Shock absorbing lanyard
 - Lifeline
 - Rope-grabs
- All components of the fall arrest system should be compatible.



Full-Body Harness and Fall-Arrest System

- A personal energy absorber is used in conjunction with a fall arrest harness and lanyard to reduce deceleration force imposed by a suddenly arrested fall and correspondingly reduces loading on the anchorage. The energy absorber may be a separate item or manufactured into the lanyard.
- The energy absorber or shock absorber should be used on the lanyard assembly to reduce load to the body.
- The risk management table requires:
 - Identify the hazards
 - Assess the risk
 - Select and implement controls
 - Monitor and review

Lanyards with shock absorbers

Single hook lanyard



Double hook lanyard



Safety signs



Moving tools and equipment

- Hoist
- Forklift
- Cranes
- Electronic lifting devices
- Pneumatic lifting devices
- Hydraulic lifting devices
- EWP's
- Scissor lifts

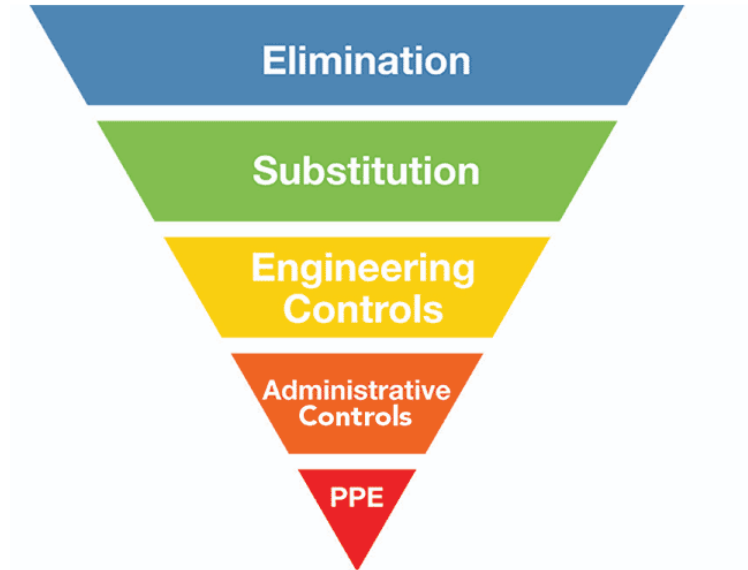


- Harnesses should be inspected by a competent person:
 - Every 6 months
 - The maximum life span of a harness is 10 years from date of manufacturer:
 - Always Inspect Your Harness, Lanyard, Attachment Point And Associated Equipment before use.

WARNING: Safety harnesses and fall arrest equipment is PPE and must be considered the last option to protect a person from falling from heights.

If a person is expected to work at a height using a fall arrest system, a documented retrieving procedure **MUST** be in place **BEFORE** work commences.

Hierarchy of control



Inspect for:

- Cracked rope inlets
- Distortion or cracks on D – Ring and buckles
- Lanyard stitching worn or damaged
- Damage to shock absorber
- Deliberate modification of hook, Karabiner, latch
- Cracks in hooks, Karabiner
- Fouling in the free movement of the latch over its full travel
- Broken, weak or missing latch springs
- Corrosion or rust
- Karabiner gate lock not fully engaging

Scaffolding and handrails



Do not alter or
adapt any scaffold
on site without prior
official approval



Danger
Falling hazard

**Fall arrest
equipment
must be worn**



KEEP CLEAR

**Scaffolding
being
dismantled**

Rescue of workers using a IFAS

- Harnesses can become deadly whenever a worker is suspended for prolonged durations in an upright position. - This is called suspension trauma.
- In the event of a fall a worker must be rescued as soon as possible to prevent further injury what should there be in place and minimum minutes to minimise injury
- There should be written procedures that must ensure that persons who fall can be rescued in less than 5 minutes.
- A person should not use a fall arrest system unless there is at least one other person on site they are in contact with who can rescue them in the event of a fall.
- Individual fall arrest systems (IFAS) are intended to safely stop a worker falling an uncontrolled distance and reduce the impact of the fall. IFAS are an assembly of interconnected components consisting of a harness connected to an anchorage point or anchorage system either directly or by means of a lanyard.

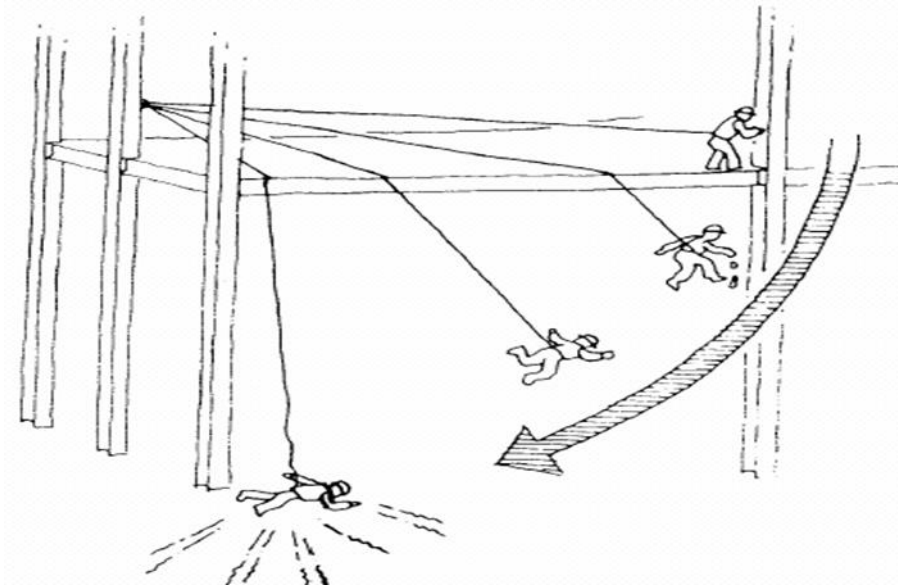
Equipment subject to fall or fall arrest impact forces

- Equipment exposed to a live load where a person falls 0.6m or more...MUST be removed from service and either destroyed or retested to ensure all parts still comply with current and relevant standards.

Definitions:

- Free Fall – means a fall in which the distance a person using a fall-arrest harness system falls vertically before the system starts to take loading is more than 600mm but not more than 2m.
- NOTE: All Work at Heights equipment subjected to more than 600mm free fall must be removed from service & retested
- Limited free fall – means a fall in which the distance a person using a fall-arrest harness system falls vertically before the system starts to take loading is not more than 600mm.
- The potential hazard of using an inertia reel include that the pendulum effect can occur if the positioning of the inertia reel allows for a significant length of unsupported line connected to the user.

Pendulum effect

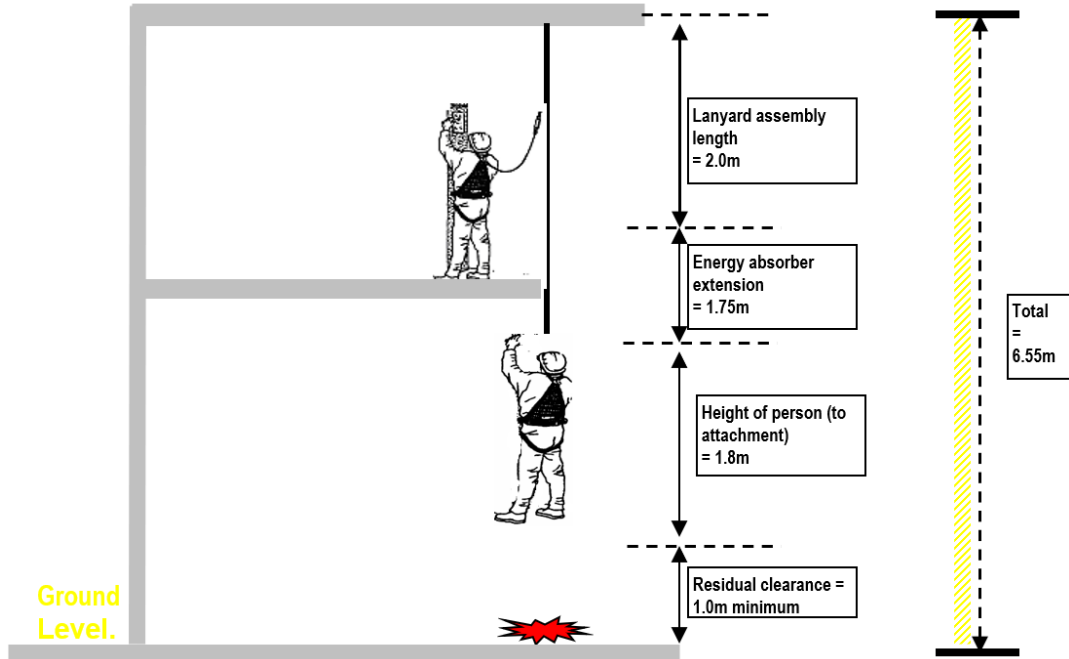


Before using a fall arrest system the following should be ensured:

- There is adequate vertical distance below the working surface to prevent the person using the system from hitting an obstruction below if the person fell. In some situations the distance may be:
 - ❖ In excess of 6.5 metres or;
 - ❖ Less than 6.5 metres if for instance, an energy absorber with a smaller extension is used

The distance will need to be greater if a static line is used or the length of the lanyard is excessive.

Minimum fall distance when wearing a harness:



Anchoring

- The most important consideration is the anchor point.
- All anchorage points must be checked before you connect to them and must be an approved anchor point.
- You must ensure that the anchorage point is sound and is capable of sustaining the shock load.
- All anchorage points must be capable of withstanding load placed on them for a single user.
- a minimum of 15kn (1500kg) or 22kn for two people
- The maximum force that can be put on the body is 6kN , but we can generate a force of 16kN over a 2 meter fall. Therefore we need to limit this force so less than 6kN is generated.

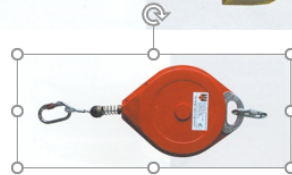
❖ Use a shorter Lanyard



❖ Use a retracting lanyard



❖ Use Inertia Reel/Recovery Reel



❖ Use Shock Absorbers



Rope Grab/ Shock Absorber



Rope Grab



Identifying risk

- Attempt to manage or minimise the risk
- Report potential risk or hazards
- Monitor risk controls & ensure effectiveness
- Reassess risk controls measures & make changes as required



Environmental requirements

- Maintain Tools & Equipment
- Dispose of all materials that cannot be recycled or reused
- Clean all Tools & Equipment before storage
 - Gear register
 - Work at heights equipment must comply with current safety inspection tag (each 6 months); In date 10 years from date of manufacturer.
 - Stop, tag, report and record

Many things in our work environment can affect our harnesses and associated equipment, such as:

- Chemicals and Corrosives
- Sharp edges and rough surfaces
- Welding splatter
- Excessive heat
- Cements and dusts
- Dirt and grit
- Oils and grease

Suspension trauma

Suspension Trauma or 'Orthostatic Intolerance', has been thought to contribute to the deaths of free fall victims awaiting rescue.

Suspension Trauma sets in when the body is suspended motionlessly, affecting blood circulation. After a sustained fall, harnesses work very effectively to hold people in an upright position and if left immobile, blood can accumulate in the legs, which in turn reduces the amount of circulation.

The reduction in the quality and quantity of blood to vital organs in the body can cause the suspended worker to lapse into a state of unconsciousness. If the worker is not rescued promptly, the outcome could be fatal.

Until recently, there have been only limited options in the prevention of suspension trauma. The first is to ensure you are working in such a way where a free fall is not possible (working in restraint). The second is ensuring there is a rescue plan in place where the victim is recovered within a very tight time frame

(less than 5 min)

Now workers are having the options expanded with items to use in conjunction with fall arrest harness systems to temporarily aid in the prevention of suspension trauma.