

9 Equipment Selection and Use

9.1 Harness

Safety harnesses must comply with the requirements of AS1891.1 Industrial Fall-Arrest Systems and Devices - Part 1: Harnesses and Ancillary Equipment.

Safety Harnesses with trauma straps and attachment devices must be worn and used in accordance with training provided.

9.2 Safety Lanyards (Energy Absorber Lanyards)

Lanyards must comply with the requirements of AS1891.1 Industrial Fall-Arrest Systems and Devices - Part 1: Harnesses and Ancillary Equipment.

Dual (“twin tail”) lanyards shall be used if an activity requires detaching and re-attaching at height (e.g. access on P&H Shovel Booms etc.). Snap hooks shall not be connected to each other.

Back hooking of lanyards to the anchor point is not permitted. Refer to Section 10.3 Periodic inspections - anchor points below.

Only lanyards with a shock absorber (energy absorber) incorporated may be used for Fall Restraint and fall arrest except energy absorber lanyards shall not be used in conjunction with Fall Arrestor inertia reel systems (or any other Type 1, Type 2 or Type 3 Restraint Systems – refer AS1891.3 Section 2.4).

9.3 Fall Arrestors (Inertia Reels etc.)

Fall arrestors shall be used only with safety harnesses specifically designed for attachment to them.

When considering the use of certain types of fall arrestors, consideration shall include that they may be less effective for certain applications, e.g. a type 2 inertia reel arrestor may not arrest a person falling down the inclined surface of a pitched roof as the line may continue to pay out.

Fall arrestors must not be used as working supports by locking the anchor and allowing it to take the weight. They are not designed to provide continuous support.

9.4 Karabiners and Snap Hooks

Karabiners are available in a number of styles including screw gate, double and triple action.

Steel Karabiners are preferred at MAC as they are less susceptible to inadvertent damage and abrasion.

All karabiners and snap hooks that are to be used as attachment hardware shall:

- Be self-closing.
- Require at least two (2) deliberate actions to open them.
- Be marked with the manufacturer identification, batch number and WLL.

Users should be aware of the risk of “roll out” with some karabiner / hook types. Further guidance is given in AS1891.4 Industrial Fall-Arrest Systems and Devices – Part 4: Selection, Use and Maintenance

9.5 Anchors

Permanent anchor points shall be designed, approved and labelled in accordance with AS/NZS 1891.4:2009 Industrial fall-arrest systems and devices – Part 4: Selection, use and maintenance.

Signage shall be provided for each anchor point in place for longer than 1 month.

Signs shall be provided for each anchorage point which will be in place for a period longer than one month. The sign shall show the following information:

- Name of installer and installation date, or if an existing structure has been certified, the name of the certifier and the certification date.
- The highest purpose category in Table 3.1 for which the anchorage is suitable.
- The ultimate strength rating if less than 15 kN. In this case words to the effect that the anchorage is not to be used for fall-arrest shall be added to the sign.

- The maximum number of people (not more than two) who are permitted to be connected to the anchorage at any one time.

If an anchorage point is to be used only for a period of less than one month and is not therefore labelled, it shall be removed as soon as it is no longer required.

At permanent installations the information shall be shown either on a sign located at each anchorage point or alternatively, on a plan prominently displayed at the entry to the area or in the equipment manual.

Descriptive and instructional signs are also required for fixed installations such as anchorages and horizontal lifelines or rails to control possible overloading and advise on correct use.

Anchor points for a work at heights system shall be located such that a person can securely attach to them before they are exposed to the risk of a fall.

Each anchor point of fall arrest system shall be located so that a lanyard of the system can be attached as close as practical to vertical above the workplace to reduce the pendulum effect.

The following requirements shall be adhered to:

Type of Fall	Description	Anchor Point Ultimate Strength
Limited free fall-arrest (including rope access anchorages)	Limited to any situation where a person using the fall arrest harness system cannot fall vertically a distance of more than 600mm before the system starts to take the load. This includes situations utilising a restraining device such as a pole strap or inertia reel.	12kN
Free Fall Single Person	Single point anchor in which the distance a person using the fall arrest harness system could fall vertically before the system starts to take loading is more than 600mm but not more than 2m.	15kN
Free Fall Two Persons	Two-person anchor point in which the distance a person using the fall arrest harness system could fall vertically before the system starts to take loading is more than 600mm but not more than 2m.	21kN

Anchor loading requirements for use with static lines (e.g. horizontal cables) are usually substantially higher than those used for personal fall arrest equipment. Refer to Section 11.7 Static lines (Horizontal lifeline)

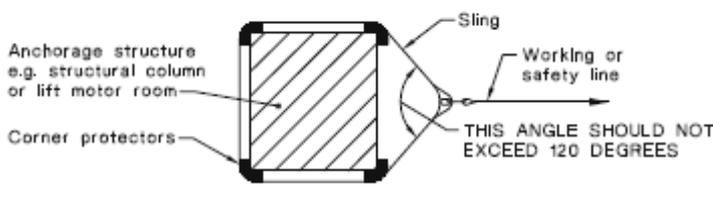
9.5.1 Ad-Hoc and Temporary Anchor Points

Selected anchorage points may include, but are not limited to the following:

- 150mm x 6.0mm 'I' steel beam (Universal beams)
- 150mm x 75mm x 6.0mm web thickness 'C' steel channel (Parallel flanged channel)
- Base of handrail stanchion (only if adequately attached to one of the above and integrity is checked)

Where slings are required to be used as anchorage points (e.g.: around the base of handrail stanchion or around a steel beam), the following must occur:

- A 2 tonne SWL sling and rated karabiner must be used to attach the lanyard to the anchor point.
- the angle between the sling legs must not exceed 120° in a basket hitch, and
- slings shall be protected from sharp edges and/or abrasion; and
- lanyard shall be attached by a shackle or karabiner through the eyes of the sling; and
- slings and lanyards shall not be reeved



All ad-hoc and temporary anchor points integrity must be confirmed to ensure they meet the anchor point ultimate strength for the type of fall.

9.5.2 Gridmesh Anchor System (GMA)

The Gridmesh Anchor system is a portable unit that can be used to set up an anchor system when working below gridmesh. Once installed the GMA can provide harness attachment points for working at heights activities.

Roles	Responsibilities
Inspection and Maintenance of GMA system	Hardware in this system shall be maintained fit for purpose in accordance with AS/NZS 5532:2013 Manufacturing requirements for single-point anchor device used for harness-based work at height; and AS/NZS 1891.4 A competent person on a minimum of a 6 monthly basis shall check all basic GMA equipment including: Ropes and wire slings Support Bar System Casing Individuals shall complete a pre-use inspection of the GMA before use as per section 0 of this Standard.
Selection of GMA system for use	The individual who is completing the Working at Heights activity is responsible for selecting the GMA system that is fit for purpose. GA01 is to be used for a single person task; GA02 is to be used for two personnel working at height. Connecting hardware must be capable of supporting at least 15kN for a single person or 21kN for a 2-person anchor The GA03 model is not to be used for Working at heights activities. It shall only be used for material handling
Installation of GMA System	Installation of the GMA system shall be completed by personnel with Intermediate Rigger or Advanced Rigger competency as detailed in MAC-STE-STD-148 Lifting. Personnel installing the GMA system should refer to MAC-STE-WIN-071 Gridmesh Anchor Installation. If the installer is unsure of or cannot verify the structures capability at the location of installation for the GMA system, they shall seek engineering assistance and or advice.
Use of GMA system once installed	Personnel using the GMA system as an anchor point must have the competencies as detailed in section Error! Reference source not found. of this Standard.

10 Equipment Inspection and Maintenance

10.1 Pre-use inspections

Personal equipment, which includes harnesses, lanyards, connectors and fall arrest devices (including common use devices).

All equipment users shall conduct an inspection of the personal fall restraint/fall arrest equipment prior to use (See Appendix 3/4/5 for additional guidance). The inspection shall include:

- Check item for damage, cleanliness.
- Check buckles and clips for correct installation and free from damage
- Check harness webbing and lanyards for fraying, cuts or any other damage.
- Check that the harness, and safety lanyard is within its “Remove from Service Date” – which is 10 years from date of manufacture unless otherwise marked.
- Check that the equipment is fitted with a current periodic inspection tag.

10.1.1 Inertia Reels

Pre use inspection should be conducted by fully reeling out all line and checking that the locking mechanism activates at all positions.

10.1.2 Ladders

All ladders must be inspected for damage prior to use.

- Check for loose or missing bolts or rivets
- Check ladder feet for excessive wear
- Check that ladder stiles/rungs/treads are straight
- Check spreaders are in good order
- Check fibreglass ladders for exposed fibres

- Check for evidence of damage sustained from a blow or impact
- Check ropes are not fraying and are securely attached
- Ensure the ladder is free from dust, water, grease and corrosion prior to use.

Exposure to excessive heat may weaken a ladder. Have the ladder checked by a competent person.

Remove ladder from service report any damage to your supervisor or the maintenance tool store.

10.2 Periodic Inspections - Fall Arrest and Restraint Equipment

All fall arrest equipment and associated devices shall be maintained fit for purpose in accordance with AS/NZS 1891.4:2009 Industrial fall-arrest systems and devices - Selection, use and maintenance.

A competent person on a minimum of a 6 monthly basis shall check all basic fall arrest and restraint equipment including:

- Harnesses, lanyards and associated personal equipment,
- Fall arrest devices (external inspection only)
- Ropes and slings

This equipment shall be tagged as per the requirements of MAC-STE-STD-148 Lifting.

Equipment involved in the arrest of a fall shall be either destroyed or returned to the manufacturer to determine if it is safe for use.

10.3 Periodic Inspections - Anchor Points

Every anchor or system of anchors is to be checked by a competent person regularly at intervals not exceeding 12 months as per the requirements of AS/NZS 1891.4:2009 Industrial fall-arrest systems and devices - Selection, use and maintenance.

Each anchor point shall have a service tag (aluminium preferred) for recording the last date on which it was fully serviced and shall include the date on which the next service is due.

10.4 Equipment that has Arrested a Fall or Shows a Defect

Any piece of equipment including both personal and permanently installed items, which has been used to arrest a fall or which shows any defect during operator or periodic inspection shall be removed from service and an out of service tag placed. The equipment is to be inspected by a competent person to decide whether the equipment is to be destroyed or repaired if necessary and returned to service. In the latter case, details of any repair shall be documented, and a copy kept on file.

10.5 Inspection, care and maintenance of rope access equipment

10.5.1 Pre-use inspection

Rope Access Technicians shall conduct pre-use visual inspection of the rope access equipment to ensure the equipment is:

- fit for purpose;
- in good condition; and
- free from defects.

If an item of equipment is found to be defective, it must be immediately tagged out of service and quarantined so that it cannot be used.

Rope Access Technicians shall conduct "Buddy Checks" prior to commencing the work tasks. Buddy checks ensure that rope access equipment is properly fitted and adjusted, that it is in good condition and that it functions correctly as intended by the manufacturer.

The Level 3 IRATA certified Rope Access Supervisor shall monitor the condition of all equipment and anchor points; in addition they shall monitor the effectiveness of the control measures in place to maintain the safe operating conditions of the worksite.

10.5.2 Periodic inspection

Periodic and interim inspections by a competent person must be carried out on all rope access equipment every six (6) months in accordance with AS/NZS ISO 22846.2 or the equivalent IRATA ICOP.

Prior to any equipment being mobilised to site it is to be visually inspected and logged in an equipment manifest which shall be accessible as required.

Defective or damaged rope access equipment shall be managed in accordance to section 0.

10.5.3 Managing Defective Equipment

If any component of the rope access system shows evidence of wear or weakness that may affect the systems safety, the defective component shall not be used. The defective component shall be removed from service, its details recorded and the component either repaired or destroyed.

In the event of catastrophic failure the IRATA incident reporting and disposal procedure shall be followed.

10.5.4 Disposal of Defective Rope Access Equipment

A defective item of rope access equipment must be destroyed when it is:

Unable to be repaired or refurbished “as good as new”; or,

Is not cost effective to repair;

Document Reference - MAC-STE-STD-155

9.1.2 Periodic inspections

All lifting equipment shall be inspected every three (3) months by a competent inspector.

All new equipment must have a periodic inspection prior to its first use and added to the lifting equipment register.

A colour coded tag shall be attached to each item of serviceable lifting equipment to indicate the validity period for the inspection.

All lifting equipment belonging to contractors operating at MAC should have the same colour tag attached for any given validity period. Where this is not the case the alternative periods or colours are used, each tag shall have the inspection validity period clearly labelled on it. Where the validity period is not clearly labelled the lifting register must be kept with the equipment as reference.

MAC shall use the inspection validity periods and tag colours detailed in Table 6.

The inspection validity period and associated colours shall be displayed in all workshops and locations where equipment is often used.

Periodic inspections for the next validity period performed within the last month of the current validity period will be considered valid for both validity periods.

January to March	RED
April to June	GREEN
July to September	BLUE
October to December	YELLOW

Table 6 – Lifting Equipment Colour Codes

Document Reference - MAC-STE-STD-148

8.3.1 Pre-operational inspection

Pre-operational inspections are conducted by the user of plant prior to use. These inspections are conducted in line with developed inspection checklists. Master copies of the checklists are available electronically in Documentum and TEMPO. Where defects are identified they are to be managed and resolved using MAC-MEC-STD-032 Maintenance and Defect Management and the BHP ARIS maintenance business processes for SAP.



Document Reference - MAC-STE-MTP-011