

1. Title

The title of this code of practice is the **Code of Practice for Demolition (Amendment No. 1)**

2. Purpose

The purpose of this code of practice is to amend the Code of Practice Demolition (No. 14) (operative 1 October 1991), in respect to guidance on individual fall arrest systems.

3. Authorisation

This code of practice is approved under Section 55 of the **Occupational Health and Safety Act 1985**.

4. Amendment of Section On Individual Fall Arrest Systems

For clause 18.4 of the Code of Practice for Demolition, substitute-

"18.4 Individual Fall Arrest Systems

In this clause "minimum breaking force" means the tensile force which a rope or other line must withstand without breaking.

Systems of work that require the use of individual fall arrest systems should only be used where there is no practical safer alternative, eg scaffolding, guardrails around roofs with existing safety mesh in sound condition, purpose built purlin platforms or trolleys, purpose built roof ladders, safety nets, catch platforms.

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(a) Individual fall arrest systems can be used to arrest falls where workers are required to carry out their work near an unprotected edge. However, there are circumstances which could lead to failure of the fall arrest line, in particular, where inertia reel systems are used over edges. Where, in the event of a fall, the fall arrest line is likely to contact an edge, the employer should obtain verification from the manufacturer or supplier that the line will not fail. Note: it is important that the verification applies to the specific type of edge to be encountered.

Safety harnesses and lanyards can also be used as travel restriction systems to prevent persons moving from safe to unsafe areas on roofs.

(b) Where safety harnesses, lanyards, static lines or inertia reel systems are intended to be used, it should first be ascertained that:

(i) Safety harnesses comply with Australian/New Zealand Standard AS/NZ 1891.1 - Industrial Fall Arrest Systems and Devices, Part 1: Safety Belts and Harnesses.

(ii) Inertia reels or other self locking devices comply with British Standard BS 5062 - Self locking Safety Anchorages for Industrial Use or Australian/New Zealand Standard AS/NZ 1891.3 - Industrial Fall Arrest Systems and Devices, Part 3: Fall Arrest Devices.

(iii) Harnesses and other equipment are maintained in accordance with Australian Standard AS 2626 - Industrial Safety Belts and Harnesses - Selection Use and Maintenance.

(iv) Static lines and anchorages are designed for strength and movement restraint as described in this section.

(v) The persons required to use the equipment are properly trained in their use.-

- (c) Lanyard fall arrest systems should be installed so that the maximum distance a person equipped with a harness would free fall before the fall arrest system takes effect is 2 metres. Personal energy absorbers complying with AS/NZ 1891.1 should be used in conjunction with the lanyard.
- (d) Full body fall arrest harnesses should be worn. The harness connection point to the fall arrest line should be made at the top dorsal position. An alternative attachment position is when a line and rope-grab device is used on steeply sloping roofs and the user needs to manually operate the device by having the device in front. In these circumstances the user can make the connection onto a front connection point as recommended by the manufacturer.
- (e) Waist type belts should not be used for roof work as injuries can result when the wearer's fall is arrested.
- (f) The importance of having a minimum of slack in the fall arrest line between the person and the attachment cannot be too strongly emphasised. The anchorage used should be as high as the equipment permits and the hazard of working above the point of anchorage is emphasised.
- (g) When considering the use of inertia reels users should bear in mind that they may be less effective for certain applications, e.g., in arresting a person falling down the inclined surface of a steeply pitched roof, where the inertia reel line may not lock, but rather keep extending from the reel.
- (h) Inertia reels are not designed for continuous support but become effective in the event of a fall, and should not be used as working supports by locking the system and allowing it to support the user during normal work.
- (i) Vertical and self retracting anchorage lines can be used in connection with work from boatswains' chairs and ladders. Where such lines are used, not more than one person should be attached to any one line.
- (j) Individual fall arrest systems and safety harnesses should only be used with individual manufacturer's components known to be compatible.
- (k) Except where an engineering assessment can verify a lesser design load, static lines should have a minimum breaking force of 44KN and their anchorages should have a design capacity of 22 KN. This specification applies where there are no more than two persons connected to the static line at any one time and personal energy absorbers are being used.

Intermediate supports for static lines should not exceed 6.0 metre spacings to minimise sag in the event of a fall and to ensure that potential shock load on the static line is reduced to acceptable levels.

(l) Lanyards should have a minimum breaking force of 15 KN.

(m) Snaphooks should be of the double action type, requiring at least two consecutive deliberate actions to open. Snaphooks should not be connected to each other as this could prevent the safe operation of the snaphook (eg. 'rollout' may occur).

(n) Lanyards should not be used in conjunction with inertia reels as this can result in an excessive amount of free fall prior to the fall being arrested.

(o) It is important that rescue of a worker who is suspended in a full body harness should occur within 20 minutes of the arrested fall as being suspended in a harness for extended periods can cause injury and has the potential to restrict breathing and cause circulation problems in the legs.

Accordingly, persons using safety harnesses should not work alone

(p) Damage to Lines and Lanyards

When fall arrest anchorages are located lower than head height or the system user is situated at a horizontal distance away from the anchorage, the fall arrest line will contact an edge if the person falls from the roof. In some instances the line may completely fail as a result of contacting the edge.

Inertia reels should be used in accordance with the manufacturer's specifications. In the event of a fall the inertia reel line should not contact any surface or edge which may result in damage to the line which would impair the safe use of the inertia reel.

This hazard also applies to lanyard systems. Precautions should be taken to ensure that the lanyard will not be damaged or fail if it comes into contact with any edge during a fall.

(q) Pendulum Effect

This is a potential hazard connected with the use of individual fall arrest systems. It can occur in two situations:

(i) Swing down. The danger relates to the use of fall arrest lines extended out diagonally in such a way as to make an extreme angle of the line with the roof's perimeter edge. The forces generated in an arrested fall over the edge in this situation cause the line to rotate back along the perimeter until it reaches a position perpendicular with the anchorage point of the line. By necessity as the line moves back to make the right angle with the roof's edge, its unsupported section must lengthen, dropping the attached worker further than the original (arrested) fall distance. If the length of the unsupported line equals the height of the building then the worker will hit the ground. Also affecting the fall distance will be line slack, deflection, person height and extension of energy absorber.

The following safe guards will ensure that the pendulum effect cannot occur:

Making sure that the fall arrest line's anchorage point is more or less perpendicular to the line's position at the perimeter edge. A mobile anchorage is of assistance here.

The use of a perimeter guard rail would prevent any falls whatsoever over the perimeter edge.

Use of secondary anchor points.

(ii) Swing back. In an arrested outward propelled fall particularly from a perimeter edge a person will swing back into the building structure. If there are obstructions in the path of the swing that could cause injurious collision, then the use of individual fall arrest systems in these circumstances should be re-assessed. NB These effects may also occur within the interior of the roof.

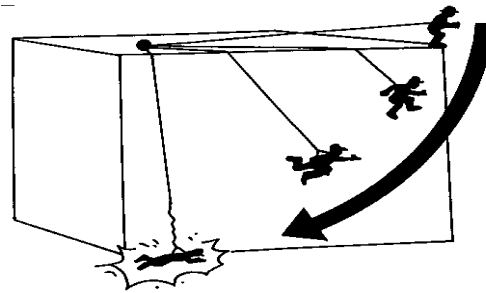


Figure 6

Pendulum effect and damage to the fall arrest line: Following an arrested fall at this extreme angle, the fall arrest line moves back along the roof, dropping the worker dangerously close to the ground. The diagram also illustrates how the fall arrest line can contact an edge following a fall. In some situations the line can break and the worker can free fall to the ground.

(r) Constant supervision should be maintained at all times that individual fall arrest systems are being used to ensure that the systems are used correctly and that the workers are correctly attached to the system from the moment of leaving the access point to the roof to the moment of egressing from the roof.

*Code of Practice for Demolition (No 14) came into operation 1 October 1991.

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