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# Using soft landing systems

In the previous *Build*, we looked at WorkSafe NZ recommendations for using safety nets below high-level work areas to reduce the distance a person can fall. Here's their alternative – soft landing systems.

**SOFT LANDING SYSTEMS** are bags or mats that provide cushioning in the event of a fall. They may be either soft filled or air inflated.

The soft fill is a resilient, compressible material, typically polystyrene beads, while air bags may be either inflated and sealed or connected to continuously operating air pumps to keep them inflated.

Continuous-flow air bags that are not sealed have a continual loss of air through vents to provide the cushioning. Soft-filled and sealed air-inflated bags are designed to allow some air loss through the seams when a fall occurs as part of the cushioning effect.

## Scaffolding usually more practical

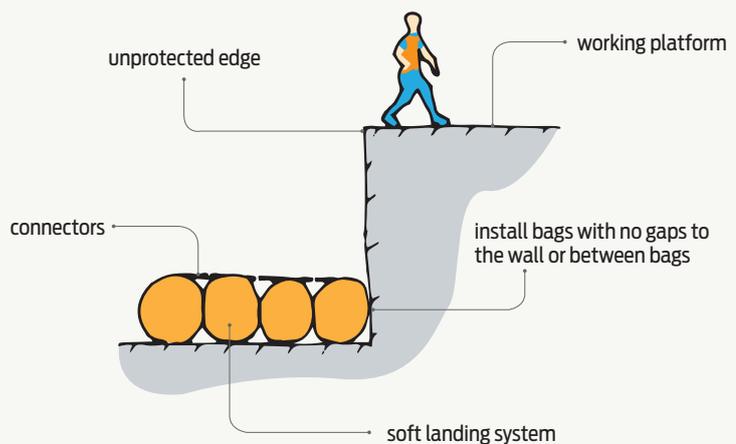
While soft landing systems offer a solution, they do not prevent falls, and they significantly restrict access around a site.

Installing scaffolding and/or edge protection is likely to be a more practical solution to allow all trades to safely work on site and prevent falls.

## Don't leave any gaps

Both soft and air-filled bags are available in a range of sizes. They are laid side by side to cover the ground below the high-level work area and are secured by interlocking clips so a falling person cannot slip between the bags.

Bags without interlocking clips can only be used in enclosed spaces where they can be contained by walls or partitions. There must be no gaps between bags and the walls (see Figure 1). If the area does not fit a full module width, the bags may be laid to ride partially up the wall (see Figure 2).



**Figure 1** Install bags without gaps.

## Suits residential construction

Soft landing systems should only be used when the fall height or maximum distance a person can fall is no more than 2–3 m above the top surface of the bags.

If the fall height is more than this, a second layer of bags may be installed. Some manufacturers also allow the fall height to be increased if there are two layers of bags.

Soft-filled or air-inflated bags are typically used in residential construction and are effective where the catch area is too small to install a safety net, such as within bathrooms.

When used to provide fall protection for roof framing and top plate work, do not install ceiling battens until the high-level work is completed and the bags are no longer required.

Soft landing systems can provide protection at building edges.

## Prepare a rescue plan first

Put a rescue plan in place before any high-level work above a soft landing system begins. This needs to detail the rescue procedures to be followed if someone falls.

Workers on the site need to know how to carry-out a rescue, and the equipment required must be on site and ready for use at all times.

## Limited guidance available

There are no New Zealand standards or codes of practice covering soft landing systems but WorkSafe NZ will publish best practice guidelines on the use of soft landing systems this year. ➤

British standard PAS 59:2014 *Specification for collective fall arrest soft landing systems* provides some guidance on the use, inspection and testing requirements of soft landing systems. However, it only applies to soft-filled bags and does not cover any air-inflated soft landing systems.

### Start by installing correctly

When installing a soft landing system:

- remove rubbish and sharp objects from the area to be protected – they could puncture the bags
- place bags as firmly together as possible over the entire area
- clip all bags together
- some air bag systems require cover sheets to be laid over the bags once they are inflated
- if possible, fasten the outer bags to structural elements of the building such as to wall framing so they cannot move in strong winds.

Some manufacturers require the outside edges of the bags to be covered with strips of polythene or a similar material to protect them from falling mortar or debris. Do not cover the connection clips – these must be visible for daily inspections.

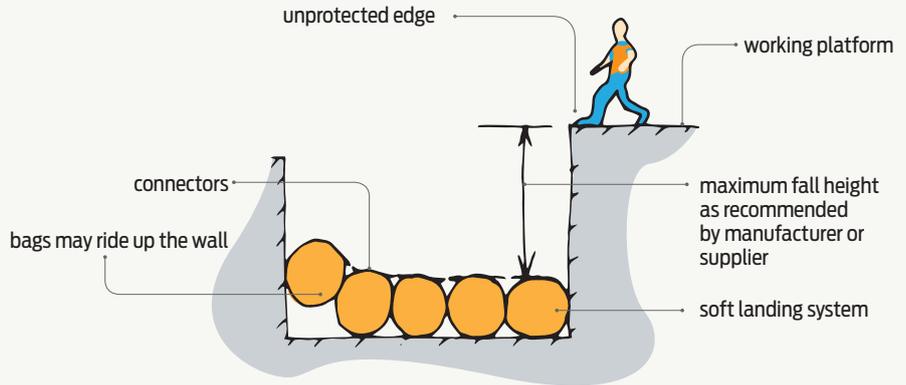
If there is no safety barrier at the edge of a high-level work platform, extend the bag coverage at least 3 m beyond the edge of the platform. Alternatively, use the distance recommended by the manufacturer (see Figure 3).

### Test the installation

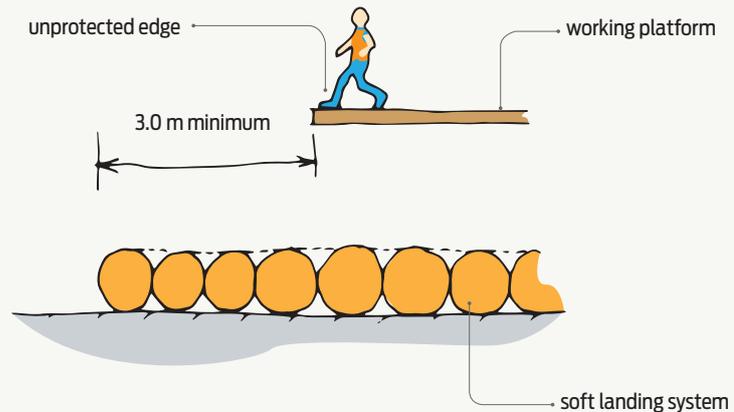
A simple foot test should be carried out once all the bags are in place. Push your foot in between bags. If sufficient bags are installed, your foot should not be able to go down between them. If your foot can slip between them, more bags are required.

### Can use on multi-storey buildings

Bags may be used on successive floors of multi-storey buildings by lifting up to each higher floor level as construction proceeds. They should be passed up through stairwell openings or lifted using a crane or forklift fitted with stillage. They should not be carried up ladders.



**Figure 2** Install bags so ground is completely covered.



**Figure 3** Provide extended edge protection.

Bags cannot span openings without support. This means stairwells and other openings below a high-level work area must be shielded with scaffolding planks or temporary joists and then covered with 20 mm minimum plywood to provide a firm base.

### Check the labels

Each bag should have an ID label attached with information about the bag including the:

- name of the manufacturer
- month and year of manufacture
- size and weight of the bag

- maximum design fall height of the bag.
- PAS 59:2014 recommends that soft-filled bags have conditions of use information provided, such as which way up to place bags, if relevant.

### ***Inspect bags regularly***

Bags should be regularly inspected for damage or deterioration:

- before installation
  - daily before high-level work begins
  - when the bags are removed.
- Inspections involve visually checking for:
- UV damage or deterioration to the outer casings of each bag
  - compression of filling material (soft-filled bags only)
  - damage to components such as connection clips
  - debris on the surface.

Remove any damaged bags and either repair or dispose of them.

Soft landing systems should also be inspected annually regardless of how much use they have had.

### ***Pumps on when working***

Place pumps supplying continuous-flow air bags in a well ventilated space with easy access for monitoring and refuelling (if required).

If the pumps stop operating, stop all work above the protected area immediately. Work should only resume once the pumps are operating and the bags have been fully re-inflated.

If no work is being carried out above a protected area, the pumps may be switched off and the air bags deflated.

### ***Handle and store carefully***

Soft landing systems should be handled and stored carefully.

When handling bags:

- do not walk on them unless absolutely necessary, for example, during a rescue
- do not expose them to heat or flame
- lift rather than drag bags into position as they can tear on sharp or projecting objects
- do not throw scaffolding, tools or other heavy objects onto the bags
- avoid letting debris fall onto bags if possible.

Cover soft landing systems to provide protection from the weather and UV radiation, and keep them off the ground if they are being stored outdoors. 