

## POSITION PAPER

# DESIGN OF VERTICAL LADDERS ON SILOS

**Revised – August 2008**

This position paper is intended to provide guidance to persons responsible for the design, manufacture and supply of silos, including persons importing silos from interstate or from abroad for their own use or for supply to others, to enable them to incorporate vertical ladders on their products. It applies from 1 August 2008.

The position paper is not intended for use by silo owners or others responsible for their use to retrofit the features specified herein. Anyone wishing to modify a silo to incorporate these features should seek advice from the silo manufacturer or their agent, or from a competent person, such as a structural engineer, to ensure that their silo is capable of being appropriately modified.

**Note:** The use of the term 'ladder' herein includes the section that extends over the roof where appropriate.

The approved industry code of practice Safety aspects in the design of bulk solids containers, including silos, field bins and chaser bins 2005('the Code') specifies the recommended means of gaining access to elevated areas of silos. This incorporates the requirements of the Australian Standard AS 1657 Fixed platforms, walkways stairways and ladders – Design, construction and installation ('the Standard'), which also has the status of an approved industry code of practice in NSW.

The use of vertical ladders for access has a number of inherent risks associated with it, and their use should be avoided. Indeed, the Standard provides no specific advice on their design and use, and as a result, the Code specifies that vertical ladders should only be used where it is not practicable to use inclined ladders.

WorkCover NSW acknowledges that in certain circumstances it is not reasonably practicable to use the forms of access described in the Standard – inclined ladders, stairways or walkways – on silos, and the only viable means of access is a vertical ladder that extends over the roof of the silo to the top hatch.

It is not appropriate to use a vertical ladder simply as an option. Where it is necessary to incorporate a vertical ladder into a silo, the following should be applied:

- Before incorporating a vertical ladder into a silo, the reasons for not being reasonably practicable to use an inclined ladder should be documented.
- Where a vertical ladder is incorporated on a silo, its use must provide an equivalent level of safety as an inclined ladder or other means of access specified in the Code. This requires a documented risk assessment to identify, assess and control all possible risks that may arise from using vertical ladders.
- The ladder should conform to AS 1657 in width, rung size and spacing, construction etc. Where the rung diameter deviates from the Standard, it should be certified to provide equivalent strength and function and should not be less than 16 mm in diameter.
- If the ladder extends more than 2.2 metres, it should incorporate a cage conforming to AS 1657 or designed to provide an equivalent level of safety. If wire mesh is used in place of vertical straps, the mesh opening should be no larger than 250 mm x 100 mm and the gauge should be no less than 5 mm. If this mesh is used then the cage hoops should be spaced at no more than 1100 mm and fitted at each end of the ladder cage.
- No section of the ladder should extend more than 6 metres. Where the height of the silo is more than 6 metres, an intermediate platform should be provided at a maximum of 6 metre intervals to serve as a resting point for persons using the ladder. Each section of the ladder running to and from an intermediate platform should be offset to effect a change in direction along its overall height. Each intermediate platform must have means to prevent persons falling, which may be edge protection that conforms to AS 1657, or by enclosure within the ladder cage.
- Where a section of ladder is provided that extends along the roof to access the filler inlet, a ladder cage should be provided to prevent persons falling. An alternative to a rung ladder along the roof is a cleated or grated walkway at a maximum angle of 30 degrees with handrails and mid rails provided. This provides a safer support and movement for persons than walking or crawling on ladder rungs.
- Where vertical ladders are used, additional administrative controls such as signage may be required to further control the risk. For example, a simple sign at eye level or, where the ladder incorporates a retractable bottom section, adjacent to the hinge point stating 'CAUTION: VERTICAL LADDER'. This would alert possible users that more care is required in ascending the silo.

- Persons responsible for the design, manufacture and supply of silos, where the silos incorporate vertical ladder access, should ensure it complies with the requirements specified in this position paper. This includes persons importing silos from interstate or from abroad for their own use or for supply to others.

This position paper does not create any statutory duties under occupational health and safety legislation. To ensure that you comply with your legal obligations, you should refer to the requirements contained in the *Occupational Health and Safety Act 2000* and the *Occupational Health and Safety Regulation 2001*.

For further information about this matter please contact WorkCover NSW's Assistance Service on **13 10 50**.

#### **Disclaimer**

This publication may contain occupational health and safety and workers compensation information. It may include some of your obligations under the various legislations that WorkCover NSW administers. To ensure you comply with your legal obligations you must refer to the appropriate legislation.

Information on the latest laws can be checked by visiting the NSW legislation website ([www.legislation.nsw.gov.au](http://www.legislation.nsw.gov.au)) or by contacting the free hotline service on 02 9321 3333.

This publication does not represent a comprehensive statement of the law, it apply to particular problems or to individuals or as a substitute for legal advice. You should seek independent legal advice if you need assistance on the application of the law to your situation.



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