

SAFE

ACCESS TO TOWER CRANES

ISSUE

Unsafe access to elevated work areas of tower cranes.

BACKGROUND

Use of tower cranes by their very nature involves working at heights, whether it be for its actual use and maintenance of its components, or, for remotely operated cranes, simply for its maintenance.

The *Occupational Health and Safety Regulation* ('the Regulation') has very specific provisions to safeguard persons working at heights and accessing these work areas. In addition, the design of tower cranes must comply with the Australian Standard AS 1418.4 *Cranes, hoists and winches Part 4: Tower cranes* ("the Standard"), or another standard that provides an equivalent level of safety. The Standard has specific requirements for accessing elevated areas, both for operating and maintenance purposes.

There has been a recent mini-revolution in tower crane design, and traditional large capacity, luffing cranes have been joined by a range of different types, typically large capacity, hammerhead cranes, smaller capacity 'city' cranes and self-erecting tower cranes. Many of these, in particular the city and self-erecting tower cranes, are primarily operated remotely from the ground, thereby eliminating the risk to operators having to access and work at height. However, some also have the option of working from a cabin in an elevated position, while most still require access to the elevated components for maintenance purposes.

All of these cranes, including the smaller city cranes, are bound by the provisions of the Regulation and therefore the Standard. However, there is evidence that some models being introduced into the workplace fail to meet these provisions and represent a risk to anyone needing to gain access to the elevated areas of the cranes.

The access requirements specified in the Standard for ladders and walkways are summarised below. Although these are recommendations in the Standard, they should be complied with unless alternatives are used that provide an equivalent level of safety.

- § The stiles/uprights should over-run the landing area by 1000mm.
Note: Where a 1000mm over-run on the top section of the ladder would interfere with the operation of the crane, it may be reduced to 900mm.
- § The rungs should be evenly spaced at a maximum of 300mm apart.
- § The rungs should be 20mm in diameter.
- § The clear distance between stiles/uprights should be 300mm.
- § There must be sufficient clearance between the rungs and the tower crane frame, or other obstruction, to enable a proper toe-hold be gained, and this should be at least 160mm.
- § Where vertical ladders are used, there should be an initial rest platform at 12.5m and then every subsequent 10.0m.
- § Landing platforms for people to alight from the ladder should be at least 450mm wide. Edge protection must be provided at this point to protect persons from falling
- § Walkways should be at least 225mm wide.
- § Edge protection must be continuous and consist of a horizontal handrail, intermediate guardrail and toeboard, or a handrail and an infill panel that serves the same function of an intermediate guardrail and toeboard, supported by posts. The components must be capable of withstanding a minimum point load

of 550N, or a 330N linear load, applied horizontally or vertically, without failing or deforming; steel rope or similar flexible material is not acceptable. Where infill panels are used, they must be made from welded mesh or similar material. The handrail should be 1000mm above the supporting area, the intermediate guardrail 500mm above, and the toeboard 100mm high.

The additional factors below must also be taken into consideration:

- § The Regulation requires edge protection be used to safeguard persons at height, and only when it is not reasonably practicable to do so, can fall arrest systems be used. Due to the limited space on the jibs of city cranes and other tower cranes, it may not be possible to provide edge protection along their length, so fall arrest systems have to be used. In such circumstances, persons must always be safeguarded, and where fall arrest systems are utilised, it must be possible to connect to the dedicated anchorage point from a safe and secure position.
- § Where walkways are provided with edge protection, the effectiveness of the edge protection must be maintained at all times. If a component or part of the structure impinges on the walkway requiring persons to climb over it, the edge protection must be extended at this point to maintain its effective height.
- § Where fall arrest systems are used, the anchor points, including safety lines, must be capable of withstanding a force of 15kN for an individual connected to it, or 21kN where two persons are connected. Where it is intended that more than two persons are connected to a safety line, it must be designed accordingly; refer to AS/NZS 1891.4 *Industrial fall arrest systems and devices Part 4: Selection, use and maintenance* for further guidance.
- § Where fall arrest systems are used, emergency procedures must be developed, and persons trained in their application, to rescue a person who falls while using a fall arrest system as a person can suffer serious health problems if not rescued within a short period of time.
- § It is acknowledged that the smaller tower and jib sections of city cranes makes it difficult to provide certain features that are considered standard in the bigger, larger capacity cranes. However, this does not mean that the level of safety can be diminished, and innovative means can be employed to create an equivalent level of safety. For example, where vertical ladders are used, intermediate platforms may be provided by running the ladder through the platform and using trapdoors to seal the space. In such circumstances, the trapdoors must be capable of being maintained in the open position so a person does not have to push their way through them or be exposed to them falling back onto them. Each trapdoor must be closed once a person has accessed through it to ensure no gaps are left in the platform for persons descending the ladder. In addition, emergency procedures must be developed, and persons trained in their application, to rescue a person who becomes incapacitated while using the ladder– it may not be possible to gain emergency access from below if the person is on a trapdoor.

WHAT SHOULD BE DONE?

Employers

Employers responsible for the use of tower cranes on site must ensure that there is safe access to all areas where persons have to work, either to operate the crane or maintain it. Where the access does not meet the requirements specified above, means must be immediately provided to safeguard persons needing to access the crane. Administrative procedures are not sufficient to overcome access problems. This may require placing the crane out of service until such time as the problem can be rectified.

Employers must also ensure that only persons who access the crane are those concerned with its operation and maintenance, or who are otherwise authorised to do so, such as WorkCover officers or Union delegates. Such persons must have the physical attributes to enable them ascend and descend the ladders, and be trained and competent in using all necessary personnel protective equipment, including fall arrest systems.

Suppliers

A person supplying tower cranes in NSW must ensure that they comply with the Standard, including the access provisions summarised above.

A WorkCover NSW officer encountering tower cranes that fail to provide safe access have been taking, and will continue to take, appropriate action.