Caged ladders — a case of mistaken identity

Many workers have to regularly access elevated points on buildings or structures to perform routine maintenance or other tasks using fixed ladders that are built into or onto a structure. In these situations, it's common for building owners or designers to install a cage around the ladder, mistakenly believing this will mitigate the risk of injury from workers falling off the ladder.

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A fixed ladder with a cage around it is not a fall arrest system. So why do so many ladders have cages fitted around them? One commonly held belief is that the idea of protective ladder hoops may have come from a maritime background, where the safety hoops were a downward extension of the sides of the 'crow's nest'. This would make sense because, in this particular situation, part of the fall risk is the sideways rolling of the vessel.

For many years, building codes and standards have recommended the use of cages around ladders that are more than a specific height (usually 6 m). Developments in fall-prevention technology have moved on sufficiently that caged ladders are no longer sustainable as some sort of effective 'collective' fall prevention method.

Safety compliance

It has long been argued that if a caged ladder 'complies' with the relevant building codes, and if an employee were to then slip and fall from the 'compliant' ladder, the employer would be safe from any litigation. But nothing could be further from the truth.

It is the responsibility of any employer to provide a safe working environment for their employees, which includes those who climb ladders. Their ultimate responsibility is not one of complying with a rule or guideline about ladder design. The courts may take compliance into consideration but, in situations like this, where available technology has developed quicker than the industry rules, the point will be made that the technology was available to protect the employee and that their protection is a more important obligation than compliance.

During a recent fall protection seminar held by Sperian, the head engineer from a major mechanical engineering site in New South Wales refuted the need for fall arrest systems on ladders they were using to access their bridge cranes, on the basis that they were compliant because they were caged. When asked to visualise that environment and describe what would happen to a worker losing their grip in one of these ladders, the engineer stated that the worker would fall, bang against the ladder and maybe catch the side of the cage, although he may be travelling too fast to wedge himself between the ladder and the cage. Essentially, the person would fall to the next level, potentially a distance of up to 6 m at this particular site.

Our question was: "Do you think it would be safe for a person to fall 6 m onto a steel surface?"

His reply was: "No, of course not."

In this situation, a senior engineer admitted that the workplace they provided (the ladder) was not safe in the event of a foreseeable accident. It could even be argued that part of an engineer's job is to visualise how something would work and to understand forces acting on it, in this case someone falling off a ladder. In a legal sense, they would bear a greater degree of responsibility if it were proved they decided that a caged ladder was an appropriate workplace, even if it was not going to protect the employee in the event of a fall.

It all comes back to this single crucial rule — the employer must provide a safe workplace. Providing cages around a ladder does not in itself convert the ladder into either a safe workplace or a safe method of access.

Real fall protection

For a person climbing a ladder, there are only two systems that will genuinely provide fall protection:

1. Provide an inertia reel fall arrest block (also known as a Type 2 or 3 fall arrester) that is fixed to a suitable anchorage point at the top of the structure and connect this to the person's harness; or
2. Provide a guided fall arrest system (cable

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or rail based) that is permanently fixed to the ladder.

Fitting an inertia reel fall arrester to the top of a ladder typically provides the best protection, but it is not always practical. The design of a good fall arrest system must take into account some basics of modern fall protection thinking.

- The system must be easy to use. If it is not, the level of compliance may be lower than expected;
- The system must limit the forces that will be applied to the person in the event of a fall to less than 6 kN, the less force the better;
- The system must not drag on the person as they climb, otherwise it makes climbing all the more difficult, increasing the risk of fatigue;
- A fall arrest system must be a system of components that enable the line of the system to follow the building or structure that it is connected to; and
- A good system will provide 'continuous connection' from the moment the person leaves the ground. This will enable the person to climb to wherever the job is, carry out the task and return, without disconnecting from the system.

Cable- and rail-based guided type fall arresters have been available in Australia and New Zealand for many years and both have their own benefits.

The rail-based system can be used in situations of high traffic, strong winds or particularly complex installations. These systems make it possible to create a truly continuous connection situation where a person can climb a vertical system and then, using a turntable or 'twisted exit', continue onto a horizontal system.

Cable-based systems, on the other hand, are usually more economical, and are better suited to dusty environments and typically quicker to install in simple, straight applications.

Most manufacturers will offer both types of systems in galvanised steel for most applications, as well as stainless steel for applications in harsh chemical or food handling operations.

Whichever system the customer chooses to have installed, the crucial component is the fall arrester that connects a worker to the rail or cable. For a system to work well, the fall arrester must travel on the wire or rail with little or no drag. The fall arrester must also be easy and intuitive to connect to the system, while preventing an accidental inverted connection (if the fall arrester is installed upside down, this would prevent the braking mechanism operating in most fall arrest systems).

As required by Australian, New Zealand and European Standards, there must be an energy-absorbing component in the fall arrester that prevents the force that is going to be applied to a falling person exceeding 6 kN. For example, the fall arrester components of both the cable and the rail-based Miller systems have a very low wearer impact peak load of only 3.7 kN.

The connections to the rail (or wire) and the climber's harness must both be 'double action', requiring two distinct actions to release. This type of technology provides ladder fall arrest systems that will actually work when required, protecting workers wherever they have to climb.

This is not a tirade against caged ladders. In some situations, such as climbing in a highly exposed environment, a cage around the ladder does provide a level of physical and psychological comfort, which will be very important to the climber. However, a cage around a ladder is not going to prevent an unconscious person from falling, whereas a fall arrest system will lock and prevent the person falling more than just a few millimetres. A caged ladder must not be mistaken for a ladder with an integral fall arrest system. Only a ladder (caged or otherwise) fitted with a fall arrest system will provide long-term safe access for workers in a way that will minimise the risks involved in climbing.