Cantilevered Crane Loading Platforms (CCLPs) are temporary platforms attached to the face of multi-storey buildings or structures to allow materials and equipment to be directly loaded on or shifted off floor levels by cranes during construction or demolition.

CCLPs may be fixed or rolling and a variety of designs are used including fully fabricated and demountable types. The platforms are supported on needles (cantilevered beams) anchored to the supporting structure.

Designers and installers of cantilevered crane loading platforms need to consider various factors to ensure their safe use.

CCLP Design

Designers should ensure that CCLPs are designed to withstand the following loads where applicable:

- The rated uniformly distributed load (UDL) distributed over either the full platform or over a lesser area, whichever produces a more adverse effect on the structural components.
- The rated point load located in a position which produces the most adverse effect on the structural component that is being designed. Where appropriate, the point load may be assumed to be spread over a maximum area of 1 square metre.

Load Calculation

Either of the following methods can be used when calculating the capacity of structural components of a CCLP to withstand the intended load:

1. Limit State Analysis
2. Working Stress Analysis

When limit state analysis is used to ensure that the CCLP has adequate strength, take into account:

- load factors for inaccuracies in load estimations. Load combinations for the most adverse effect can be obtained from the Australian Standard AS 1170.0 - Structural design actions -- General principles.
- capacity factors for uncertainties in material strength which can be obtained from the Australian Standard AS 4100 Steel Structures --Commentary.
A factor of 1.15 should also be used to allow for rough handling and repeated use.

In a working stress analysis, the load and material factors are not applicable but the factor for rough handling should be used.

Irrespective of which method is used, designers need to allow for the dynamics of the load. The Australian Standard AS 1418.1 - Cranes, hoists and winches -- General Requirements recommends a factor of 1.0 to 2.2 based on the hoisting speed of the crane used with the CCLP. A factor of 2 in the working stress approach and a factor of 1.3 to 1.5 when adopting the limit state method have provided satisfactory results in the past. Whatever factor is eventually used in the design for dynamics, it should be justified by the designer, as appropriate.

The whole structure and any part of the CCLP has to be stable. It must be designed to prevent overturning, uplift or sliding. The procedure is as follows:

1. Subdivide loads into the components tending to cause instability and the components tending to resist instability.
2. Follow the combination of loads stipulated for stability limit state in Australian Standard AS 1170.0.

**Platform supports**
The needles supporting a platform must be braced to prevent lateral movement and be adequately anchored to the support structure to prevent uplift. The means of support may be by the use of:

- bolts anchored through the supporting structure and/or
- props (individual or manufactured propping system), secured at the top and base against lateral displacement.

*Expanding masonry anchors, chemset anchors, cast in ferrules and similar fixings should not be used for anchoring where the anchors are the sole means of resisting tension loads.*

Where the needles are propped to the floor above, these anchors provide a convenient and economical means of securing the needles and individual props against lateral movement.

**Supporting structures**
Supporting structures should be structurally adequate to sustain the loads on the platform, including at the anchor points. The loads imposed by the CCLP on the permanent support structure should be reviewed and "signed off" by the building's structural designer.

If the supporting structure consists of hollow slabs, bearing plates recommended by the slab manufacturer or designed by a suitably qualified engineer should be used.

Holes drilled in slabs for anchoring should be at locations recommended by the slab designer or, if this is not possible, at locations where a suitably qualified engineer has determined that the structural integrity of the slab will not be affected.

**Installation of CCLPs**
When installing CCLPs:

- The person directly responsible for carrying out the installation must hold a certificate of
competency of at least the Basic Rigging (RB) or the Intermediate Scaffolding (SI) certificate class.

- Platform landings should be flush with the floor slab or suitable ramps should be fitted.
- There should not be any gap between the side of the platform and the site guardrails, through which a person can fall.
- Solid panels not less than 1 metre high should be fitted to the sides of the landing and extend at least 300 mm inside the building's face.
- The landing edge of the CCLP should be fitted with inward opening gates that are positively prevented from opening beyond the edge of the platform by a stop fixed to the floor and restraining chains.
- Platforms facing a public roadway should not extend beyond the line of the overhead protection provided for the public.
- Where non-retractable platforms are used on a building face, no part of any platform should be directly beneath any part of another platform, scaffold or other work platforms.
- Retractable platforms should also not be placed directly beneath a scaffold or other working platform. They may be placed one above the other but generally only one such platform should be extended at any one time. When more than one platform is extended, engineered operational configurations and operational safety (No Go) zones must be in place to ensure safe placement of materials.
- A minimum of two signs should be located on the platform stating the platform's maximum UDL and maximum point load in characters at least 100 mm high. These loads should be marked in tonnes or kilograms.

**Site documentation**

A copy of the installation drawings and the engineer's letter verifying structural adequacy of support structures should be kept on site for the information of employees, contractors, Health and Safety Representatives and WorkSafe Victoria inspectors.

**Before use**

A checklist for inspection before use is recommended. It should include, as a minimum, the following points:

- All bolts or connectors are secured and tightened in position.
- The size and capacity of all connections are in accordance with engineer's installation documentation.
- All props are plumb and positively secured in position.
- Rear guardrails are in position.
- Side panels and gates are positively fixed in position.
- Before use, a competent person should verify that the platform has been installed in accordance with the design drawings.

**Acts and Regulations**
Acts and regulations are available from Information Victoria on 1300 366 356 or order online at www.bookshop.vic.gov.au.


**Standards Australia**

Australian Standards referenced in this document
AS 1418 Part 1: 2002 Cranes (including hoists and winches) -- General Requirements
AS 1170 Part 0: 2002 Structural design actions -- General principles
AS 4100 Supp 1: 1999 Steel Structures -- commentary (Supplement to AS 4100: 1998)

Copies of standards can be obtained by contacting Standards Australia on 1300 654 646 or by visiting the web site at www.standards.com.au.

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**Further information**

A Guide to Rigging can be obtained by phoning, tel. (03) 9641 1333 or by contacting your local WorkSafe Victoria office.

**Note:** This guidance material has been prepared using the best information available to WorkSafe Victoria. Any information about legislative obligations or responsibilities included in this material is only applicable to the circumstances described in the material. You should always check the legislation referred to in this material and make your own judgement about what action you may need to take to ensure you have complied with the law. Accordingly, the Victorian WorkCover Authority extends no warranties as to the suitability of the information for your specific circumstances.