WorkSafe BC

Selected Regulations and Standards for Lifting Suspended Work Platforms with Cranes

OHS Regulation Part 13:
Ladders, Scaffolds and Temporary Work Platforms

Division 3 - Work Platforms

13.7 Access
Safe access must be provided to every work platform.

13.8 General requirements
Each work platform must

(a) have sufficient strength to bear the load to be placed on it, and

(b) be secured against separation from the supporting equipment, structure or surface to which it is attached.

13.9 Lines supporting work platforms
Rigging and lines used to suspend or support work platforms must

(a) have sufficient breaking strength to withstand the loads likely to be imposed with the required factor of safety,

(b) be free of knots or splices except for terminal eye-splices,

(c) be suitable for the purpose for which they are used,

(d) be protected from abrasion or other damage from the work environment,

(e) be secured to the platform and to an anchorage able to withstand the loads likely to be imposed on them,

(f) be of sufficient length to lower the work platform to a safe lower landing, and

(g) except for load lines, be used exclusively for suspending the work platform.

13.12 Removal from service
A work platform must be removed from service until certified safe for use by the manufacturer or a professional engineer if it has

(a) been subjected to a sudden drop,

(b) been in contact with exposed energized electrical equipment or conductors, or

(c) shows signs of any kind of structural or mechanical damage or substantial wear.

Division 5 - Movable Work Platforms

13.20 Marking of equipment

(1) The following equipment must be clearly marked with a rated capacity:

(a) a platform that is suspended from or attached to a crane or hoist,

(b) an elevating work platform,

(c) Repealed. [B.C. Reg. Reg. 312/2012, effective February 1, 2013.]

(d) a swing stage, and

(e) interchangeable load bearing components of a suspended work platform system.

(2) The rated load for allowable thrust-out beam projections must be clearly marked on a thrust-out beam.

(3) A swing stage platform, counterweight and hoist unit must each be clearly marked with their own weight.

(4) A work platform that is suspended from a crane or hoist or attached to a crane boom must be marked with the weight of the platform and rigging and the rated capacity.

13.27 Cranes and hoists used to suspend work platforms

(1) The weight of a work platform suspended from a crane or hoist or attached to a crane boom and its rigging, plus the rated capacity, must not exceed 50% of the rated capacity of the crane or hoist at the working radius or configuration.

(2) If a work platform attached to a crane boom causes eccentric loading on the boom,

(a) the effect on the rated capacity of the crane must be determined and the rated capacity certified by the crane manufacturer or a professional engineer, and

(b) the rated capacity of the crane must be reduced accordingly.

(3) The boom of a crane used to suspend a work platform must have a powered boom or a fixed boom.

(4) A work platform must not be

(a) suspended from an articulating boom crane, or

(b) attached to an articulating boom crane, unless the crane manufacturer approves the installation.

(5) If workers are on a work platform suspended from a crane, a secondary hoisting line on the crane must not be used.

13.28 Two-blocking

(1) A crane or hoist used to raise a work platform on a load line must be equipped with

(a) a device to prevent two-blocking at all points, or

(b) in the case of a lattice boom crane, a two-blocking warning device.

(2) Despite subsection (1), a work procedure acceptable to the Board may be followed to minimize the risk of two-blocking if it is not practicable to maintain a two-blocking prevention or warning device on a conventional lattice boom crane used for pile driving and similar applications.

13.29 Hoisting and lowering work platforms

(1) Cranes, winches and other devices used for hoisting and lowering movable work platforms must

(a) be operated as slowly as practicable while supporting the work platform,

(b) be lowered under power, if the device is powered, and

(c) not be equipped with a free running boom or hoisting winch controlled only by brakes.

(2) If a moveable work platform is suspended from a crane, winch or other device over a structure that cannot safely support its weight or if other hazards exist below the platform, lower limit travel devices compatible with the hoist system must be used to ensure the platform cannot be lowered beyond the safe lower limit of travel.

(2.1) If the lower limit travel devices required by subsection (2) are not practicable, the employer must ensure that work procedures acceptable to the Board are used that will minimize the risk of the platform going beyond the safe lower limit of travel.

(3) A trial lift for a work platform suspended from or attached to a crane or hoist must be performed at all work locations before the platform is occupied.

WCB Standard: WPL 2-2004
Design, Construction and Use of Crane Supported Work Platforms

1. Scope
This Standard applies to the design, construction, use, and maintenance of work platforms suspended from or attached to cranes or hoists. These work platforms are intended to support personnel and limited materials. Generally, these cranes or hoists were not specifically designed for lifting persons.

This Standard is an update of former WCB Standard A326 Design, Construction and Use of Suspended Platforms.

2. Definitions
“crane supported work platform” means a personnel platform which is raised, lowered, and held in working position by the hoisting line of a crane or hoist, or is attached to a crane boom, (generally the occupants of platforms suspended from cranes or attached to crane booms do not have direct personal control over the movement of the platform);

“rigging” means fibre ropes, wire ropes, chains, slings, attachments, connecting fittings and associated components.

3. Exclusions
The following types of platforms are not governed by this Standard:

- platforms which are supported by hoists or cranes designed for the suspension of work platforms (such as swing stages, digester platforms, chimney hoists, vehicle-mounted aerial devices, digger derricks)
- cranes or hoists specifically rated by the manufacturer for lifting personnel
- platforms intended solely for lifting materials

4. Design of crane supported work platforms
Crane supported work platforms must be certified by a professional engineer or other qualified designer (i.e., an engineer registered in the jurisdiction in which the platform was designed). Drawings and specifications containing all information necessary to construct and rig the platform according to the design requirements must be provided and kept available for the duration of the service life of the platform.

The following information must be available on the drawings:

(a) the geometry of the platform and the sizes and required properties of all components,

(b) the type, quality and strength of materials,

(c) the fabrication details, sizes and specifications, for all bolted and welded connections,

(d) the rigging components, such as length and size of slings and the size of fittings, shackles, and any proprietary items, to permit accurate field identification for a crane supported platform or the details for attaching a platform to the boom,

(e) the relevant data to be displayed on a data plate, as detailed in the appropriate section of the Occupational Health and Safety Regulation,

(f) the professional engineer's dated seal and signature, and the names of the platform fabricator and the owner of the platform, and;

(g) a statement by the professional engineer, or other qualified designer, indicating that the crane supported work platform design and fabrication meets this Standard.

5. Design loads and stresses

5.1 Design loads

A specified design live load of not less than 1.1 kN (250 lb.) per occupant must be used. The design live load must be calculated from the number of occupants and additional load due to tools, equipment, and materials carried on the work platform. The design live load must be applied to produce the most critical stresses on the platform structure and the rigging or the attachment to the boom.

A crane supported work platform designed for transporting injured workers must be designed for a minimum 3.5 kN (800 lb.) capacity to accommodate two occupants plus one occupied stretcher.

The guardrail must be able to withstand a concentrated force of 1000 N (225 lbf) in any direction at any point without sustaining permanent deformation.

6. Suspension system

6.1 Work platforms suspended by load lines

Work platforms may be suspended from the main line or auxiliary line of cranes or hoists that meet the requirements the Occupational Health and Safety Regulation and the Workers Compensation Act. The allowable load on rigging components must not exceed 10% of their breaking strength (10-1 design or safety factor).

The suspension system must be designed to prevent the platform from tipping when personnel are occupying the platform move. Headroom must be provided to allow occupants to stand upright in the platform.

6.2 Platforms attached to crane booms

Work platforms may be attached to the boom tip of telescopic boom cranes that meet the requirements of the Occupational Health and Safety Regulation and the Workers Compensation Act. The components and method of connecting a platform to a crane boom must be designed and certified by the crane manufacturer or a professional engineer. Platforms must be designed to remain level while occupied.

7. Guardrails

The perimeter of work platforms must have standard guardrails complete with an intermediate rail and toeboard, or be fully enclosed. Screen mesh to cover the area between the toeboard and the intermediate rail is recommended if full enclosure is not provided. The top rail must be 102 cm to 112 cm (40 in to 44 in) above the platform level. If an access door is provided, it must open inward, or have an equally effective latching mechanism to prevent the door from inadvertently opening. Guards around the perimeter of a platform used to transport injured personnel must consist of standard

guardrails with mesh or solid enclosure at least up to the level of the midrail.

8. Construction

Crane supported platforms must be constructed accurately, according to the drawings and specifications required by section 4 of this Standard. The welding must be carried out by firms registered under CSA W47.1 or W47.2, for steel and aluminum welding, respectively, or alternatively welding must be inspected and certified by a professional engineer. All rough edges exposed to contact by workers must be surfaced or smoothed to prevent injury from punctures or lacerations.

9. Data plate

A data plate displaying the following information must be permanently affixed to the platform:

(a) names of the engineer or other qualified person certifying the platform, and the fabricator of the platform,
(b) identification which correlates the platform to the relevant design drawings,

(c) date of manufacture,

(d) rated capacity,

(e) minimum rated capacity required for the crane or hoist,

(f) number of occupants for which the platform was designed,

(g) all-up weight (weight of platform and rigging plus rated capacity), and

(h) a statement that the platform conforms to this Standard.

10. Rigging

When a fibre, wire rope or chain bridle sling is used to connect a crane supported platform to the hoisting line, each bridle leg must be connected to a master link or shackle in a manner that ensures the load is distributed amongst the bridle legs. The slings, shackles, rings, and master links must be designed with a safety factor of 10 on the breaking strength of the component, based on the all-up weight. The working load limit (WLL) of a bridle with more than 3 legs is limited to the WLL of any 3 legs of the bridle. All supporting hooks or shackles must be safety-wired, or must be a type that can be closed and locked, to prevent dislodgment. All eyes in fibre or wire rope slings must be fabricated with thimbles. The rigging slings and fittings must be permanent attachments to the platform and must not be used for other load lifting purposes.

No spreader bar(s) may be interposed between the load hook and the work platform.

11. Lifeline anchors and fall protection

11.1 Personal fall protection equipment and anchorages

Workers on a platform suspended from a crane or attached to a crane boom must wear personal fall protection equipment, including a full body harness and shock-absorbing lanyard, secured to a designated anchorage point. Single or multiple anchorages must have an ultimate breaking strength of at least 8 kN (1800 lb.) for each lanyard attached. The strength requirement applies only to the local attachment and not the overall lifting capacity of the crane or hoist.

11.2 Work platform suspended from a crane
Anchorages for workers on platforms suspended from cranes may be above the load hook or on the platform.

11.2.1 Anchorage above load hook
A lifeline anchorage above the load hook may consist of an appropriate eye welded to the load block of the crane providing the modification to the block is certified by a professional engineer or approved by the load block manufacturer. A wire rope sling may be connected to the eye on the load block, and lanyards may be snapped onto the lower eye of the sling. Where a single part line is used, lanyards may be snapped onto the hoisting line above the load hook, or onto a sling connected to the hoisting line above the load hook. The anchorage strength requirement applies only to the local attachment, not the overall lifting capacity of the crane or hoist.

11.2.2 Anchorage on platform
If a platform is suspended from a crane or hoist and anchorages are provided on the platform, an additional safety sling, designed to a safety factor of 10 based on the all-up weight of the occupied platform, must be interposed between the platform (i.e. the master link) and an anchorage above the load hook that will prevent the platform from falling more than 15 cm (6 in.) if the platform becomes dislodged from the hook.

11.3 Work platform attached to a crane boom
Anchorage(s) must be provided on the crane boom when the work platform is attached to the boom.

12. Crane requirements
12.1 Load rating of crane or hoist
The all-up weight of the suspended platform must not exceed 50% of the manufacturer's rated capacity of the crane or hoist at the radius at which the lift will be made.

12.2 Types of cranes and hoists
Platforms must be suspended from cranes having telescoping or fixed booms and from hoisting gear only capable of lowering under power. Free running boom and hoisting winches, controlled only by brakes, must not be employed. Any dog-clutches in the hoisting winch drives must be secured against inadvertent disengagement.

12.3 Two-block prevention
A crane or hoist used to suspend a work platform on the load line must have a device to prevent two-blocking if the equipment has a telescoping boom, or a device to warn the operator of impending two-blocking if the crane has a fixed length boom.

13. Crane operation
13.1 Operator qualifications
A qualified operator, who must remain at the controls while workers occupy the crane supported work platform, must operate the crane or hoist. Platform movements must be controlled by the Standard code of hand signals published in the Occupational Health and Safety Regulation or by effective radio or telephone communications. The platform must not be moved except upon receipt of a clearly understood signal from the designated signaler upon the platform.

13.2 Footing
Cranes must be set on a firm footing, uniformly level within 1%. Cranes must not travel while supporting a platform occupied by workers, except for rail-mounted cranes.

13.3 Trial lift

A trial lift with the unloaded platform, from the location where workers enter the platform to all locations to which workers will be hoisted, must be done prior to placing workers on the platform. The trial lift is to determine that all work locations can be reached without contacting obstructions, that all controls function properly, and that the all-up weight indicated on the data plate remains within 50% of the crane or hoist rating throughout the range of intended operation.

14. Maintenance and inspection

A crane supported work platform and it's rigging, must be inspected by a qualified person prior to each lift. A worker must not be hoisted in a work platform until all deficiencies have been corrected. If broken, bent, or heavily corroded structural members, or fractured welds or otherwise defective connections are found, the platform must be taken out of service for repair and must be re-certified by a professional engineer. A platform must be re-certified by a professional engineer if structural modifications are made, or components are welded to the structural members of the platform.