

Australian Standard[®]

Cranes (including hoists and winches)

Part 13: Building maintenance units

This Australian Standard was prepared by Committee ME/5, Cranes. It was approved on behalf of the Council of Standards Australia on 9 January 1996 and published on 5 April 1996.

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Australian Institute of Building
Bureau of Steel Manufacturers of Australia
Construction and Mining Equipment Association of Australia
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Department of Industrial Affairs, S.A.
Department of Defence
Department of Employment, Vocational Education, Training and Industrial Relations, Qld
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Cranes (including hoists and winches)

Part 13: Building maintenance units

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PREFACE

This Standard was prepared by the Standards Australia/Standards New Zealand Committee ME/5 on Cranes to cover specific requirements for building maintenance units. It is a result of a consensus among representatives on the Joint Committee to produce it as an Australian Standard. It is intended to be used in conjunction with AS 1418.1, *Cranes (including hoists and winches)*, Part 1: *General requirements*.

This Standard gives guidance to manufacturers, statutory authorities and users in the form of minimum engineering requirements which are necessary for the design, manufacture, installation and commissioning of building maintenance units. In special instances, additional requirements may be necessary for adequate performance or safety.

It should be noted that NOHSC:1010, the National Standard for Plant, issued by the National Occupational Health and Safety Commission to Parliamentary Counsel in the Commonwealth, and various States and Territories jurisdictions for guidance on drafting legislative requirements for the design, manufacture and supply of plant, and the use of plant in the workplace, draws a distinction between the terms 'building maintenance equipment' in general, and 'building maintenance units' in particular. It uses the expression building maintenance unit in a narrower sense than is used in this Standard.

The term 'normative' has been used in this Standard to define the application of the appendix to which it applies. A 'normative' appendix is an integral part of a Standard.

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STANDARDS AUSTRALIA

Australian Standard

Cranes (including hoists and winches)

Part 13: Building maintenance units

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard specifies requirements for building maintenance units and supporting structures, permanently provided for use and which incorporate power-operated suspension equipment. It does not include requirements for suspended scaffolding.

It is complementary to AS 1418.1, but the requirements specified herein shall take precedence over the corresponding requirements given in that Standard.

NOTE: Guidance on the safe use of building maintenance units is provided in AS 2550.1.

The provisions of this Standard shall apply to building maintenance units Types A, B and C (refer to Clause 1.5), unless stated otherwise.

1.2 INNOVATION It is not intended that this Standard impose unnecessary restrictions on the use of new or unusual materials or methods, providing that all of the performance requirements of this Standard are maintained.

1.3 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS

- 1418 Cranes (including hoists and winches)
- 1418.1 Part 1: General requirements
- 1418.2 Part 2: Serial hoists and winches
- 1576 Scaffolding
- 1576.4 Part 4: Suspended scaffolding
- 1657 Fixed Platforms, Walkways, Stairways, and Ladders—Design, construction and installation
- 1768 Lightning protection
- 1939 Degrees of protection provided by enclosures for electrical equipment (IP Code)
- 1979 Electric cables—Lifts—Flexible travelling
- 2549 Cranes—Glossary of terms
- 2550 Cranes—Safe use
- 2550.1 Part 1: General requirements
- 3000 Electrical installations—Buildings, structures and premises (known as the SAA Wiring Rules)
- 3100 Approval and test specification—General requirements for electrical equipment
- 3133 Approval and test specification—Air break switches

AS/NZS

- 1891 Industrial fall-arrest systems and devices
- 1891.1 Part 1: Safety belts and harnesses

NOHSC

1007 (National Occupational Health and Safety Commission) National Standard for Occupational Noise

2009 National Code of Practice for Noise Management and Protection of Hearing at Work

1.4 DEFINITIONS For the purpose of this Standard, the definitions given in AS 2549 and those below apply.

1.4.1 Building maintenance unit—a suspended platform and associated equipment on a building used to provide maintenance access to the faces of the building.

1.4.2 Davit safe working load—the maximum mass that can be suspended from the davit or boom, i.e. the maximum suspended load for which the davit has been designed according to Section 2 and which has been permanently marked thereon, expressed in kilograms.

1.4.3 Divisional planes—two planes at right angles to the fulcrum axis at their intersection, dividing the distributed masses of the building maintenance unit, and the distributed and concentrated applied loadings, into stabilizing and destabilizing actions on the unit (see Figure 2.11.2).

1.4.4 Fulcrum axis—the vertical plane produced through one or more support points about which rotation may be considered to occur should the building maintenance unit become unstable (see Figure 2.11.2 and note that depending on dynamic factors and platform and wind orientations, there may be more than one possible worst case fulcrum axis about which instability may occur).

1.4.5 Hold-down fastening—a fastening providing a permanent connection to anchor, wholly or partly, a roof rig to the building.

1.4.6 Overturning moment—the sum of the moments of all the forces acting through the divisional planes in directions tending to destabilize the device, taken about the fulcrum axis.

1.4.7 Pick-up point—the point of attachment of the suspension rope to the platform.

1.4.8 Platform safe working load—the maximum mass that can be carried in the platform, i.e. the payload which is permanently marked on or within the platform, expressed in kilograms.

1.4.9 Roof rig—any system of components resting on, connected to or moveable over a roof, parapet or supporting floor which provides the suspension point or points for a working platform in an operating state.

1.4.10 Roof trolley—a wheeled, self-contained roof rig structure which can be moved around the roof or supporting structure to provide various working positions.

1.4.11 Suspension height—the distance between the point of suspension in the working position of the platform and the ground level. This may vary for each working position.

1.4.12 Tie-down fastening—a roller and rail fastening or other device providing temporary or moveable anchorage between a roof rig (or roof trolley) and the building. The extent of a tie-down fastening shall encompass any single bolt, link or other component which in the case of failure would negate the action of the tie down.

1.5 TYPES The type of a building maintenance unit shall be determined by the location of the hoisting mechanism as follows:

- (a) *Type A*—hoisting mechanism permanently installed on the building.
- (b) *Type B*—hoisting mechanism installed on a dedicated platform and used in association with supporting equipment permanently installed on the building.
- (c) *Type C*—hoisting mechanism installed on a non-dedicated platform used in association with suspension equipment permanently installed on the building.

SECTION 2 DESIGN

2.1 GENERAL The design of building maintenance units shall be on the basis of AS 1418.1

Group classification according to AS 1418.1 shall be not less than the following:

- | | |
|--|-----|
| (a) For the building maintenance unit as a whole | C2. |
| (b) For the structure | S2. |
| (c) For the hoisting mechanism (except as given in Clause 2.8.2) | M5. |
| (d) For the travelling mechanism | M2. |
| (e) For the slewing mechanism | M2. |
| (f) For the luffing mechanism | M5. |

2.2 DESIGN LOADS

2.2.1 General Design loads shall be determined in accordance with the methods given in AS 1418.1 and the following:

- (a) The effect of the platform safe working load in respect of any platform pick-up point shall be determined with the safe working load in the most adverse position, relative to a point not more than 350 mm from the inner edge of any guardrailing.
- (b) The following special loads shall be considered, as applicable:
 - (i) Dynamic loading due to the emergency stopping of the hoisting mechanism.
 - (ii) Dynamic loading due to the arresting of an overspeed condition.
 - (iii) Dynamic loading due to the action of safety devices such as rope grabs.
 - (iv) Dynamic loading occasioned by interference with the free motion of the platform.
 - (v) Loads on the platform occasioned by an out-of-level condition.
- (c) Wind loading for in-service conditions shall be determined on the basis of a wind speed of not less than 20 m/s (72 km/h).

NOTE: The purchaser should determine the expected wind conditions at the installation site and may specify other limiting conditions, where appropriate.

2.2.2 Load combinations For the purposes of the design for strength of any structural or mechanical component of the platform or of the system of suspension, the most adverse combinations of all the applicable loads shall be formed as pertaining to the in-service condition.

The load combination group factor for strength (δ) shall be taken as 1.25 for any in-service condition which includes a component representing the safe working load. All other conditions where the safe working load is not represented shall be based on the load combination group factors given in AS 1418.1.

2.3 DESIGN FOR STRENGTH The design for strength of a building maintenance unit shall be in conformance with AS 1418.1 and be based on the loads and combination factors set out in Clause 2.2 and Clause 2.4.4.2, as applicable.

The structure of building maintenance units shall be designed for a design life of the building structure or the faces to be serviced, or 25 years, whichever is greater.

2.4 DESIGN FOR LIFE

2.4.1 Wear The mechanism shall be designed for a minimum life of 15 years, determined by the operating time and the load condition applied during the operating time.

Wearing parts shall be identified and be subject to regular inspection and replacement as required in accordance with provisions which shall be specified in the operation and maintenance manual (see Section 11).

2.4.2 Corrosion Where possible, all metal within the structure of a building maintenance unit shall be inhibited against corrosion. Where inhibiting is not possible, the design shall include an allowance for loss of material over the design life. Where a corrosion allowance is made, it shall provide for a loss not less than 10% of the thickness.

Where a building maintenance unit is not housed when parked, it shall incorporate additional features to preserve and protect vital components against deterioration from the weather.

Non-hygroscopic, non-porous electrical insulating material shall be placed between connections of dissimilar metals unless a corrosion assessment of the connection shows that there will be no adverse effects.

Sockets supplied on a building for use with davits shall be provided with suitable drain holes. Where this is not practical, then each socket shall be protected from the accumulation of water.

2.4.3 Lifting tackle and gear If standard lifting tackle and gear such as shackles, are included in a suspension system, such items shall not be loaded beyond 80% of their designated safe working load.

2.4.4 Davits and building attachments Davits and building attachments shall comply with the following requirements for Type B and Type C building maintenance units as appropriate.

2.4.4.1 Type B building maintenance units For Type B building maintenance units, the design of fixed or moveable davits and davit posts and sockets or other building attachments shall be based on the design loads applied by the suspended equipment which forms part of the installed (provided) system according to Clause 2.2.

2.4.4.2 Type C building maintenance units For Type C building maintenance units, the davit safe working load shall be specified by the contract between the purchaser and supplier of the building maintenance unit equipment.

The design of Type C fixed or moveable davits, davit posts and sockets or other building attachments shall be based on the specified davit safe working load with the following factors:

- (a) Vertical dynamic-hoisting factor: 2.0.
- (b) Vertical dead load factor: 1.10.
- (c) Horizontal load (any direction): 0.25 of the davit safe working load.
- (d) Group application factor: 1.25.

2.5 PLATFORM

2.5.1 Type A and Type B building maintenance units Working platform of a Type A and Type B building maintenance units shall be made of steel, or steel and aluminium, or other structural combinations of materials and shall be designed to the appropriate material structural Standards and AS 1418.1.