

Specification for

**Suspended access
equipment (suspended
chairs, traditional
steeplejack's seats,
work cages, cradles and
platforms) for use in the
building, engineering
construction,
steeplejack and
cleaning industries**

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Committees responsible for this British Standard

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 Cleaning and Support Services Association
 Department of the Environment (Property Services Agency)
 Federation of Manufacturers of Construction Equipment and Cranes
 Health and Safety Executive
 Institution of Mechanical Engineers
 Institution of Plant Engineers
 Institution of Structural Engineers
 National Association of Scaffolding Contractors
 National Federation of Master Steeplejacks and Lightning Conductor Engineers
 National Federation of Painting and Decorating Contractors
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Foreword

This British Standard has been prepared under the direction of Technical Committee B/514, "Access and Support Equipment" and is a complete revision of BS 2830:1973 which is superseded and withdrawn.

This British Standard is the specification for the manufacture of access working platforms which are suspended on ropes and are capable of being raised and lowered.

The platforms to which the standard applies are those for use in the building, engineering construction, steeplejack, cleaning and maintenance industries. Section 9 deals with platforms which will only be used on the permanent installation for which they are designed.

The suspended access equipment specified are intended to be used as detailed in BS 5974 for temporarily installed suspended scaffolds and access equipment and BS 6037 for permanently installed suspended access equipment.

The first edition of this specification in 1957 introduced safety chairs as an alternative to, and not a replacement for, the traditional bosun's chair or seat. The 1967 edition extended the scope to include painter's cradles. In 1993 the standard was updated and in this 1994 edition includes long platforms, hinged platforms and multi-deck platforms. It is not intended to preclude the use of the earlier types where circumstances are such that they may be used with safety.

In view of the rapid developments in this industry, amendments will be introduced periodically to ensure that the specification remains up to date.

Developments in materials and design and the introduction of long platforms, powered winches and hinged platforms have necessitated the additional sections in this edition. In this standard Annex A is included to give recommendations with regard to winches.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations. Attention is drawn to the following statutory regulations.

Control of Substances Hazardous to Health Regulations 1988

Electricity at Work Regulations 1989

Health and Safety at Work etc. Act 1974

Management of Health and Safety at Work Regulations 1992

Manual Handling of Loads Regulations 1992

Off-shore Installations (Operational, Safety, Health and Welfare) Regulations 1976

Personal Protective Equipment at Work Regulations 1992

Provision and Use of Work Equipment Regulations 1992

Shipbuilding and Ship Repair Regulations 1960

The Construction (Head Protection) Regulations 1989
The Construction (Lifting Operations) Regulations 1961
The Construction (Working Places) Regulations 1966
Workplace (Health, Safety and Welfare) Regulations 1992¹⁾

Summary of pages

This document comprises a front cover, an inside front cover, pages i to vi, pages 1 to 36, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

¹⁾ The Workplace (Health, Safety and Welfare) Regulations 1992 do not apply to construction sites.

Section 1. General

1.1 Scope

This British Standard specifies the requirements for suspended chairs, seats, work cages, cradles, single platforms and hinged platforms, including platforms used with permanent suspended access equipment which are designed to match permanent roof rig equipment.

In addition to the definitive requirements, this standard also requires the items detailed in 1.4 to be documented. For compliance with this standard, both the definitive requirements and the documented items have to be satisfied.

NOTE 1 Further guidance is given in BS 5974 and BS 6037 where details of roof mounted equipment and suspension systems are included. The user is reminded that BS 5974 recommends assembled rigs to be inspected every morning before use.

NOTE 2 Annex B contains advice on the use of temporary platforms with permanently installed roof mounted equipment.

NOTE 3 Figure 1 to Figure 8 give outline drawings showing the various types of suspended access equipment specified in this British Standard.

1.2 References

1.2.1 Normative references

This British Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are made at the appropriate places in the text and the cited publications are listed on the inside back cover. For dated references, only the edition cited applies; any subsequent amendments to or revisions of the cited publication apply to this British Standard only when incorporated in the reference by amendment or revision. For undated references, the latest edition of the cited publication applies, together with any amendments.

1.2.2 Informative references

This British Standard refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

1.3 Definitions

For the purposes of this British Standard the following definitions apply.

1.3.1 Types of suspended access equipment

1.3.1.1 cradle

a rigid unit comprising decking, toe boards, guard rails and stirrups, and suspended on two main suspension ropes, constructed to carry operatives and their equipment

NOTE A cradle is sometimes known as a small platform.

1.3.1.2 painter's cradle

a lightweight, manually operated cradle restricted to use by two persons

1.3.1.3 fixed cradle

a cradle which does not traverse horizontally but is capable of being raised or lowered

1.3.1.4 permanent cradle

a platform which will only be used on the permanent installations for which they are designed

1.3.1.5 travelling cradle

a cradle which is suspended from rolling blocks or trolleys on a fixed track allowing lateral movement

1.3.1.6 platform

a unit made up of prefabricated components (used singly or in multiples) comprising decking, toe boards, guard rails and stirrups, on two main suspension ropes and always suspended on steel wire ropes

1.3.1.7 hinged continuous platform

a platform with more than two suspension points having articulated sections to ensure tension in each suspension rope

1.3.1.8 platform with telescopic ends/sides

platform with end or side extensions giving means of increasing the length or width of the platform

1.3.1.9 traditional steeplejack's seat

an assembly comprising a flat board with holes at the corners with fibre seat board rope and suspended by fibre ropes, for use in the steeplejack industry and rigged by trained steeplejacks for their own use

1.3.1.10 suspended chair

a chair suspended on fibre or steel wire ropes, manually or power operated, for one man to sit in and use

NOTE In the past, known as a bosun's chair.

1.3.1.11 one-man work cage

a short length of individual platform designed to support one man and suspended on one main suspension rope

1.3.1.12**two-man work cage**

a short length of individual platform designed to support two men and suspended on one main suspension rope

NOTE Particular attention needs to be given to load distribution to maintain stability.

1.3.2 Suspension**1.3.2.1****lower suspension point**

the point of connection between the suspended access equipment and the suspension rope or bottom pulley block used in the suspension

1.3.2.2**upper suspension point**

the position where the suspension rope is fixed to the roof rig on the building at the top level

1.3.3 Ropes**1.3.3.1****fibre suspension rope**

a fibre rope passing through one or more pulley blocks for suspending a seat, chair, cage or cradle

NOTE This is sometimes referred to in the industry as a fall rope.

1.3.3.2**wire suspension rope**

a steel wire rope for suspending the suspended access equipment, running from the upper suspension point to the lower suspension point

1.3.3.3**secondary safety rope**

a secondary rope capable of carrying the suspended load in the event of the failure of a suspension rope or part of the suspension and hoisting gear

1.3.3.4**two rope suspension**

a suspension system which has one rope at each end of an independent platform unit and which also has a secondary safety rope at each end

1.3.3.5**four rope suspension**

a suspension system which has two suspension ropes at each end of a platform or at the hinge points of a hinged continuous platform; each rope being capable of supporting the platform by itself or otherwise being supplemented by a secondary safety rope

1.3.3.6**traversing rope**

a rope to control the lateral movement of the suspended access equipment

1.3.3.7**racking rope**

a fibre rope used for securing a seat or chair to the suspension rope

1.3.3.8**rope termination**

means by which a rope is terminated including any treatment of the rope or applied fitting

1.3.3.9**seat board rope (for traditional steeplejack's seat)**

a single continuous fibre rope which forms part of the assembly of a traditional steeplejack's seat (see Figure H.1)

1.3.4 Winches and climbing devices**1.3.4.1****climbing device**

a lifting appliance manually or power operated through which the suspension rope passes, controlled either by friction grips or turns of the rope around drums within the device

NOTE The lower end of the rope is not anchored to the device.

1.3.4.2**winch**

a lifting appliance to raise and lower the suspended access equipment by means of a suspension rope coiled onto a winding drum

1.3.4.3**manual winch**

a winch which is operated manually

1.3.4.4**powered winch**

a winch which is electrically operated or powered by compressed air or hydraulics

1.3.4.5**roof mounted winch**

a winch which is mounted on the roof or the roof rig with the free end of the rope attached to the suspended access equipment

1.3.4.6**cradle mounted winch or climbing device**

a winch or climbing device which is mounted on a cradle, work cage or platform with one end of the rope attached to the roof rig

1.3.4.7**reeling drum**

a drum to reel in the unused portions of a rope or cable

1.3.5 Safety devices**1.3.5.1****arrester block**

a device for stopping the fall of the equipment by clamping to the secondary safety rope

1.3.5.2**brake**

a means of arresting the descent or ascent of the suspended access equipment and capable of then sustaining it in position

1.3.5.3**overload device**

a means of preventing or stopping the movement of the suspended access equipment in the event of a pre-set load being exceeded

1.3.5.4**over-run device**

a means of preventing the over-run of the suspended access equipment at its normal limit of travel

1.3.5.5**overspeed device**

a means of controlling or arresting the suspended access equipment during ascent or descent in the event of a pre-set speed being exceeded

1.3.5.6**restraint system**

equipment mounted on the building and on the suspended access equipment or ropes to restrict lateral movement of the suspended access equipment during use

1.3.5.7**safety harness anchor ring**

a ring attached to the suspended access equipment for the attachment of a safety harness or belt

1.3.5.8**secondary safety device**

an automatically engaging device attached to the main suspension rope or to the secondary safety rope to prevent the free fall of the suspended access equipment in the event of the failure of the winch or climbing device

1.3.6 Other components**1.3.6.1****decking**

the base of a cradle, work cage or platform on which the operatives stand

1.3.6.2**stirrups**

the frames at the suspension points which support the decking

1.3.6.3**top anchor**

a purpose made fixing to support the top of the suspension rope

1.3.7 Loads**1.3.7.1****maximum suspended load**

the summation of all the loads which the whole of the suspended access equipment could apply to the top suspension point or to any stirrup or lower suspension point

1.3.7.2**impact load**

the static equivalent of the loads in excess of the self weight and safe working load which might be applied by the operation of the pulley blocks, winches or climbing devices whether manually or power operated

1.3.7.3**moving loads**

the imposed loads which might become concentrated or assembled under any stirrup or suspension point

1.3.7.4**restraint loads**

the loads which a platform might apply to the building through the restraint system and which the platform sustains from its restraint connections

1.3.7.5**safe working load (SWL)**

the maximum load, in kilograms, that it is permissible to impose on the suspended access equipment

1.3.7.6**wind loads**

the vertical and horizontal loads consequent on the exposure of the suspended access equipment to the wind in the various positions where the equipment may be placed or stored

1.3.7.7**self weight**

the mass of the suspended access equipment without an imposed load

1.3.7.8**minimum breaking load of ropes**

the minimum value which is required to be reached in a tensile test to destruction

1.3.8 Tests**1.3.8.1****type test**

a test carried out on a prototype of the equipment

1.3.8.2**proof test**

a non-destructive test carried out on each unit manufactured

1.3.9 Miscellaneous**1.3.9.1****bay**

the section of the suspended access equipment between two adjacent suspension points

1.3.9.2**clear working space**

the internal dimensions of a platform, cradle or work cage available for the occupants

1.3.9.3**assembly**

the assembly of component parts to provide the complete platform

NOTE Assembly of temporary suspended access equipment is normally carried out on site.

1.3.9.4**nominal speeds**

the rated operating speeds declared by the manufacturer

1.3.9.5**traversing**

moving the suspended access equipment across the face of the building either manually or by power operation

1.3.9.6**user**

any person, firm or organization using the suspended access equipment or having charge thereof

1.3.9.7**roof rig**

that portion of the assembly situated on the building at roof level

1.3.9.8**jib**

the cantilevered portion of the roof rig or trolley projecting from the roof rig or trolley towards and over the side of the building

1.3.9.9**trolley**

a moving roof rig or girder runner operating at the top of the suspension

1.3.9.10**lifting gear**

individual components in the suspension system subjected to line loads. For example, chains, ropes, slings, hooks, shackles, girder clamps, swivels, eyebolts, girder runners and trolleys and similar gear

1.4 Information and requirements to be agreed and to be documented

The following information to be supplied by the purchaser shall be fully documented. Both the definitive requirements specified throughout the standard and any requirements for the following documented items shall be satisfied before a claim of compliance with the standard can be made and verified:

- a) any weights other than persons on platforms of permanent cradles (see 1.6.7);
- b) restraining bar for chairs (see 2.1.2);
- c) tool storage holes (see 2.2.4);
- d) one-off test to destruction (see 2.2.6, 3.5.1, 5.8.1, 5.8.3, 6.7, 7.6.1);
- e) where a work cage is intended to be used by more than one person (see 3.1);
- f) if arrester blocks are to be used (see 3.4 and 5.7);
- g) maximum length of individual suspended platforms without hinges (see 5.1);
- h) storage device for suspension and secondary ropes on platforms (see 5.5);
- i) secondary safety wires (see 6.3);
- j) length of multi-deck rigid platforms (see 7.1);
- k) means of suspension of multi-deck rigid platforms (see 7.4);
- l) any special features of permanently installed suspension equipment (see 9.1).

1.5 Design criteria**1.5.1 General**

Suspended access equipment shall be capable of sustaining *all* loads applied to the completed units (the maximum suspended load; see 1.3.7.1) comprising the self weight of the unit, the safe working load, moving loads, impact loads and wind loads. Testing shall be carried out as specified in the relevant section of this standard.

NOTE The values for safe working loads given in 1.6 are the minima permitted for each type of equipment. Design to greater load capacities is not precluded.

1.5.2 Fail safe design

Each unit shall be so designed that the omission or failure of any individual joint or fixing component will not result in the structural collapse of the complete unit which would endanger the safety of the occupants. Particular attention shall be given to the security and retention of the decking. All fixing components shall be designed to be clearly visible to the erector, operator and inspector.

NOTE A suitable test for establishing fail safe design is given in Annex C.

1.5.3 Construction

All fittings and connections shall be so designed that when assembled no part can become accidentally detached.

1.6 Safe working loads

NOTE Safe working loads have been calculated taking the mass of a person as 115 kg and allowing for the worst possible combination of loads.

1.6.1 Suspended chairs and traditional steeplejack's seats

Suspended chairs and traditional steeplejack's seats shall have a safe working load of 115 kg (allowing for one person plus small tools of 25 kg mass).

1.6.2 Work cages

1.6.2.1 One-man work cages shall have a safe working load of 150 kg (allowing for one person plus tools and materials of 60 kg mass).

1.6.2.2 Two-man work cages shall have a safe working load of 240 kg (allowing for two persons plus tools and materials of 60 kg mass).

1.6.3 Painter's cradles

Painter's cradles shall have a safe working load of 200 kg (allowing for two persons plus tools of 20 kg mass).

1.6.4 Individual suspended platforms

Cradles and platforms other than painter's cradles shall be capable of withstanding a distributed load of one of the following declared ratings:

- a) light duty platforms: 1.5 kN/m²;
- b) medium duty platforms: 2.0 kN/m²;
- c) heavy duty platforms: 2.5 kN/m²;
- d) three persons with hand tools and materials each weighing a total of 115 kg, and all congregated at any point on the platform to give the worst combination of loads.

1.6.5 Multi-deck platforms

Multi-deck platforms shall be capable of withstanding both of the following loads:

- a) a uniformly distributed load on one platform for normal duty in accordance with 1.6.4 b) and any other platforms in the assembly as light duty platforms in accordance with 1.6.4 a);
- b) three persons in accordance with 1.6.4 d) on any platform in the assembly.

1.6.6 Hinged continuous platforms

Hinged continuous platforms shall be capable of carrying the same loads as detailed for individual platforms in items b), c) and d) of 1.6.4. The stirrups and hinges shall be capable of withstanding these loads plus the forces derived from the movement of the hinges.

1.6.7 Permanent cradles

The safe working load shall provide for the number of persons specified to use the platform (rated at 90 kg per person) and any other known weights required on the platform (see 1.4).

1.7 Wind loads

All wind loads shall be calculated in accordance with CP 3:Chapter V-2:1972, with allowance being made for acceleration caused by the shape and positioning of adjacent buildings.

The equipment shall be so designed that when exposed to a wind speed of 30 m/s no part of it shall fail (see Annex D).

NOTE All references to wind velocities and calculations relate only to CP 3:Chapter V-2:1972.

1.8 Dynamic or impact loads

The loads for which the platforms are designed shall include a factor for the additional dynamic load of 25 % resulting from the raising and lowering.

1.9 Materials

1.9.1 Timber

Any timber components shall conform to the following.

- a) Hardwoods shall conform to BS 5756:1980.
- b) Softwoods shall conform to BS 4978:1988.
- c) Laminated timber components shall be of exterior quality conforming to BS 4169:1988.

1.9.2 Metals

All metals shall conform to the relevant British Standards.

1.9.3 Plastics

Plastics and reinforced plastics shall be free from visible defects. Plastics shall be stabilized against ultraviolet deterioration and resistant to the effects of external exposure.

1.10 Corrosion protection

Dissimilar metals shall not be in direct contact with one another. Protection shall be afforded by the use of inert spacers, washers or special paints.

Any timber treatment shall not cover the component in a way which would make inspections for flaws difficult, e.g. painting. Protection against atmospheric corrosion shall be provided where necessary. Any coatings shall conform to the relevant British Standard.

1.11 Manufacture

1.11.1 Suspension stirrups and parts forming the main suspension system shall not contain welded joints when these are in tension unless the joint is supplemented.

Any welded steel joints shall conform in all respects to BS 5135:1984.

Welding shall not be carried out on principal load carrying suspension members of aluminium in tension unless the joint is supplemented. Any welding of secondary components of aluminium shall be in accordance with BS 3019-1:1984 or BS 3571-1:1985.

Aluminium in members shall not be heated for bending, straightening or other purposes except in accordance with BS 8118-2:1991.

Plastics and timber elements shall be firmly attached.

Other materials shall be used in accordance with the relevant British Standard or, where no British Standard exists, in accordance with best practice.

In the case of a work cage or seat suspended from one rope, the restraint or anchor point shall be an integral part of the framework of the work cage or seat.

1.11.2 All the types of equipment specified in this British Standard shall be so designed that operatives can safely enter and leave the working place. Equipment shall be so designed that at no time shall an operative be further from a safety harness anchor ring than the length of the lanyard on his equipment and in no case further than 2 m.

If the means of entering or leaving the platform entails climbing over a guardrail or protective side mesh, footing places shall be provided.

Climbing steps shall be introduced when there are mesh or plated sides to a platform or other hindrances to entry and exit.

Where gates are provided in the meshed or plated sides to a platform they shall be hinged so as to open inwards and be fitted with bolts and have a fail safe arrangement to prevent accidental opening.

Where gates are opened no loss of structural stability within the framework shall occur.

1.11.3 On all suspended equipment, means shall be provided for the attachment of a safety belt or harness, secondary safety lines or other fail safe devices.

The position of anchor points shall be such that the secondary safety device is in a close and convenient position for use in case of emergency.

1.12 Suspension and stability

On work cages, cradles and platforms the height of the restraining point or anchor point on the main suspension rope above the seat shall be not less than 1.67 times the clear width of the equipment and in no case lower than the top of the handrail.

Where fitted, each stirrup shall be so designed that a secondary safety wire can be attached to the platform. The fixings for this wire shall be separate from those of the main suspension.

The tail ends of the main suspended rope and the secondary suspension rope shall be mechanically stored in or under the unit so as to leave no part hanging freely below the platform in a manner which could create a hazard.

Under the most adverse loading conditions, the seat or decking shall not be inclined more than 15° to the horizontal.

1.13 Electrical equipment

All electrical equipment shall conform to BS 2771-1:1986 and to BS 7671:1992.

NOTE 1 Attention is drawn to the Electricity at Work Regulations 1989 [1].

NOTE 2 See also BS 5974 and BS 6037 for recommendations regarding temporarily installed and permanently installed equipment, respectively.

NOTE 3 Advice on electrical installations on platforms is given in Annex E.

1.14 Performance

1.14.1 General

Each type of equipment specified in this British Standard shall be subject to appropriate tests as given in **1.14.2** to **1.14.5**, unless specified otherwise in the relevant section.

1.14.2 Loading: type test (minimum pass level)

NOTE This test is intended to prove the calculations and design of the equipment and is a one-off test for this purpose.

The equipment shall be so designed that when a test load of twice the safe working load is applied with the unit suspended no part shall fail or become permanently distorted.

This test shall be repeated if any change in the manufacturing process or materials takes place.

1.14.3 Resistance to impact: type test

NOTE This test is intended to prove the calculations and design of the equipment and is a one-off test for this purpose.

A steel bar of 300 mm length and 25 mm diameter shall be dropped end-on, onto the decking from a height of 1 m. The decking shall not fracture.

This test shall be repeated if any change in the manufacturing process or materials takes place.

1.14.4 Loading: proof test

Each item of equipment shall be subjected to and satisfy the following proof load test at the manufacturer's works. When suspended from fixed points without winches a load of 1.25 times the safe working load shall be applied uniformly distributed over the equipment. On removal of this load there shall be no deformation, cracks, flaws or other defects.

In the case of a platform which is assembled from prefabricated modules the manufacturer shall carry out tests on each part when assembled to the maximum length to which the platform may be assembled.

1.14.5 Guard rail

No guard rail or top edge of a plated side or access door shall show any permanent deformation when a 50 kg weight is hung at any point on it and the platform is tilted about its longitudinal axis at an angle of 30° from the horizontal.

1.15 Manufacturer's certification

The manufacturer shall issue a certificate describing the tests carried out and giving the results thereof.

NOTE Recommendations concerning the style of the certification are given in Annex F and Annex G.

The manufacturer shall issue a safe working load table for every length of platform which his system permits. He shall also issue a table of the self weights of the various lengths of the platform with its end stops and stirrups and winches so that an assembly can be erected which does not overload the suspensions.

The manufacturer shall also issue a safe working load certificate for the equipment which shall detail the assembly of the components for which the certificate is issued. When the equipment is capable of being assembled with cantilevered extensions or into a continuous platform the limitations of the construction for the stated safe working load shall be stated (see Annex G).

Every unit supplied shall be accompanied by a certificate stating that it complies with BS 2830. Means of identification, name of manufacturer, date of manufacture and the safe working load shall be stated.

1.16 Instruction manual

With each unit of suspended access equipment the manufacturer shall supply an instruction manual giving the following information:

- a) a list of the parts comprising the unit and details of the order and manner in which they are to be assembled, with diagrams of the assembly on which are indicated the mass of each component;
- b) the safe working load;
- c) the maximum suspended load for the complete assembly;
- d) the maximum number of persons permitted on the equipment, and/or on each individual section of the equipment, at any one time;
- e) the maximum number of persons permitted to assemble together at any one point e.g. below a suspension point or at a point of access;
- f) if the equipment is designed for use with a special type of pulley block, hook or other type of lifting appliance, the type of block, hook or lifting appliance required;
- g) a list of the parts which will need periodic replacement, giving full details to ensure that the correct replacement can be identified. This shall include the name and address from which spares may be obtained, the catalogue reference of all components supplied and available as extras such as restraint gear and the specific types and sizes of suspension ropes if these are critical for use with built-in safety devices and coiling drums;
- h) instructions, advice and guidance regarding the maintenance (including the name and address to which the equipment may be returned for maintenance), testing and inspection of equipment manufactured to this British Standard both when erected and dismantled;
- i) instructions on renewal of corrosion protection;

j) operating instructions for the suspended access equipment including the following:

- 1) the maximum permissible inclination of the suspension ropes;
- 2) the maximum permissible angle of slope of the seat or decking;
- 3) how to secure the access gate(s), if provided;
- 4) how to manipulate extension pieces, swivelling pieces, access platforms etc.;
- 5) how to attach safety belts and safety lanyards;
- 6) how to attach the power supply cable and the electrical control gear;
- 7) how to attach the lifting appliances and the secondary safety ropes;
- 8) how to coil or secure the tail end of the suspension and safety ropes;
- 9) details of means of communication, if provided;
- 10) how to attach tools, cleaning equipment, buckets, etc.

k) when lifting appliances are permanently fixed to the platforms, instructions on their maintenance and any particular limitations to their usage.

1.17 Marking and information

1.17.1 All suspended access equipment shall be permanently and legibly marked with the following information:

- a) the number and date of this British Standard, i.e. BS 2830:1994²⁾;
- b) the name of the manufacturer;
- c) the manufacturer's serial number for the equipment;
- d) the safe working load, in kilograms;
- e) the maximum number of persons allowed on the equipment at any one time.

1.17.2 The safe working load shall be marked in characters not less than 100 mm high. All markings shall be so placed that they are readily visible to the operative(s) when gaining access to the equipment.

1.17.3 In the case of platforms which are to be assembled from prefabricated units on site, the information specified in 1.17.1 shall be marked on the decking or toeboard of each unit.

1.17.4 In the case of units supplied ready assembled, the manufacturer shall supply a data sheet with each unit clearly identifying the unit and giving the part numbers of any additional components required for installation and use of the unit.

1.18 The platform and its edge protection

1.18.1 The decking shall be of either plywood of marine quality or metal sheet or other suitable material and shall be positively fixed.

Decking used as a footing only, and not for the deposit of any material, shall be a minimum of 600 mm wide and where materials are to be deposited they shall be a minimum of 800 mm wide.

NOTE 1 Where the work is of such a light nature and the workplace specifically requires it, and the material required is such that the equipment can be used safely, the platform may be not less than 440 mm wide.

NOTE 2 Attention is drawn to the Construction (Working Places) Regulations 1966 [2].

Where a timber deck is used as a structural member, the boarding shall overhang the stirrups by at least 100 mm and be fixed securely to the stirrup.

Except for the provision of at least four drainage holes of 15 mm diameter the decking shall be closely boarded, planked or plated.

Any gaps in the decking shall not exceed 6 mm in width. The platform shall be of sound material (free from visible defects) and shall be supported at each end.

The surface shall be slip resistant.

NOTE 3 Consideration should be given to the easy replacement of the decking or platform units.

1.18.2 Guard rails and toe boards shall be fitted.

NOTE 1 It is advisable for the platform sides to be closed in with mesh or at least be fitted with an intermediate guard rail.

Where the sides of the platform are open, toe boards shall extend around the perimeter of the platform and shall be not less than 150 mm in height from the platform level.

²⁾ Marking BS 2830:1994 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is solely the claimant's responsibility. Such a declaration is not to be confused with third party certification of conformity, which may also be desirable.

Rigid guard rails shall be capable of being securely fixed to the support stirrups and shall be locked into position to prevent accidental removal or distortion during usage. Where the guard rails do not interfere with working, the underside of the guard rails shall be at a height of between 910 mm to 1150 mm from the platform level, except on the working face where, only if the guard rail interferes with working, this height may be reduced to not less than 690 mm above toe board.

NOTE 2 It is preferred that wherever possible the minimum height is 910 mm.

Section 2. Chairs and seats

2.1 Chairs

2.1.1 General

Chairs shall conform to the relevant requirements of section 1 and to the requirements of this section.

NOTE 1 Chairs are illustrated in Figure 1.

NOTE 2 Chairs may be rigged on fibre ropes or wire ropes.

Chairs rigged on fibre ropes should be manually operated through a pulley system with the fall rope tied off onto the chair.

Chairs rigged on wire ropes should be raised and lowered by means of a manually or power operated winch or climbing device. If a power operated climbing device is used this should be fitted overhead or below seat level.

2.1.2 Manufacture

Chairs shall be manufactured from timber, metal plate or moulded plastics. Chairs made from timber or metal plate shall have back and side supports.

Chairs made of moulded plastics shall be shaped to give a base with integral back support and side walls.

If specified by the purchaser at time of order (see 1.4) the chairs shall be fitted with a restraining bar.

The bottom of the chair shall be not less than 450 mm nor more than 610 mm wide and not less than 225 mm from front to back.

Provision shall be made for anchoring safety harnesses or belts to the chairs or an alternative means shall be provided to prevent the occupant falling out.

When manually operated winches or climbing devices are used these shall be so placed that the winch handles or levers can be safely and conveniently operated. The controls for power operated chairs shall be conveniently placed and so fixed that they cannot become out of reach of the operator.

Means shall be provided for secure attachment of small tools, buckets and cleaning gear.

2.1.3 Performance

2.1.3.1 Loading: type test (minimum pass level)

This test shall be performed in place of the test given in 1.14.2. The design of the chair shall be such that when a test load of 300 kg is applied to the suspended seat, distributed over the area of a 400 mm × 225 mm rectangle centred on the following specified points, no load-carrying member of the chair shall fracture.

a) For chairs designed with a single suspension member, the load shall be applied to the seat at a point halfway on plan between the suspension member and the inside face of the back support, measured at the level of the top of the back support.

b) For chairs designed with two or more suspension members, the load shall be applied to the seat immediately under the suspension point.

2.1.3.2 Loading: proof test

This test shall be performed in place of the test given in 1.14.4. Each chair shall be subjected to the following proof load test at the manufacturer's works. An evenly distributed load of 150 kg shall be applied to the seat of the chair when it is suspended on a fixed hook, i.e. not suspended on ropes. On removal of the load, the chair shall be examined by a competent person and all components shall be free from permanent deformation, cracks, flaws and other defects.

2.2 Seats

2.2.1 General

Seats shall conform to the relevant requirements of section 1 and to the relevant requirements of this section.

NOTE Seats are illustrated in Figure 2.

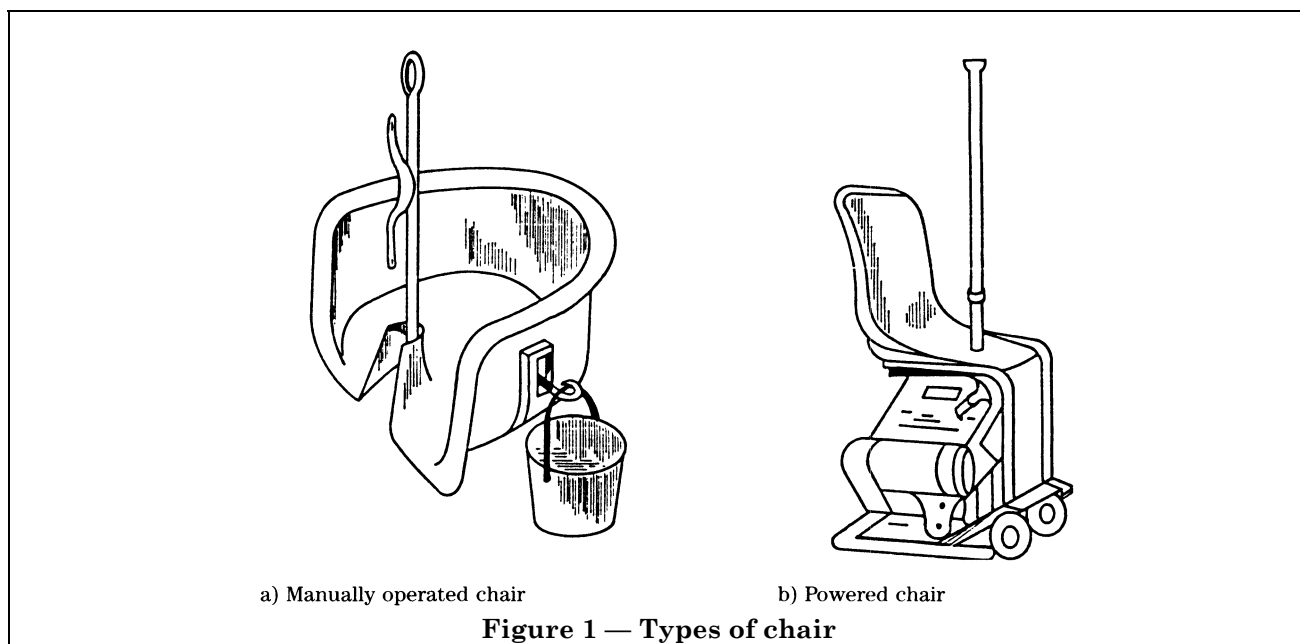
2.2.2 Seats on fibre ropes

NOTE 1 Seats on fibre ropes are intended only for a manually operated suspension system. The seats are fitted with a continuous seat board rope reeved through a hole in each corner and rising to a common suspension point above the occupant's chest level, at which point the main suspension is mounted.

Seats shall be designed for a fibre seat board rope that is not less than 12 mm in diameter. The holes in the corners of the board shall not cause abrasion of the rope, e.g. by ensuring they are smoothed and rounded.

A 75 mm internal diameter stainless steel ring with a safe working load of not less than 90 kg suitable for the attachment of a safety harness or belt shall be provided with the seat.

NOTE 2 Detailed recommendations of the rigging of steeplejack seats are given in Annex H.



2.2.3 Seats on wire ropes

Seats shall be designed to be suspended on wire ropes with a diameter not less than 6 mm.

NOTE 1 The wire should be coupled to the seat at the four corners in the manner specified for fibre rope in 2.2.2.

NOTE 2 Seats on wire ropes may be operated by manual or power operated winches or climbing devices.

2.2.4 Dimensions

The seat board shall be not less than 460 mm in width and not less than 230 mm measured from front to back and not less than 19 mm thick.

Four 25 mm holes shall be drilled, one in each corner, to allow the reeving of the seat lashing. These shall be clear of the edges of the board by 30 mm.

If specified by the purchaser (see 1.4) two holes of 50 mm diameter may be drilled, one at each end, for tool storage. These shall be clear of the edges of the board by 30 mm.

When a seat rope lashing is provided it shall be of such a length that when threaded diagonally across the underside and joined with a reef knot the suspension point shall be approximately 750 mm above the seat board.

2.2.5 Safety device

The safety device shall consist of a stainless steel ring in accordance with 2.2.2, coupled with a recognized safety harness or safety belt.

2.2.6 Performance

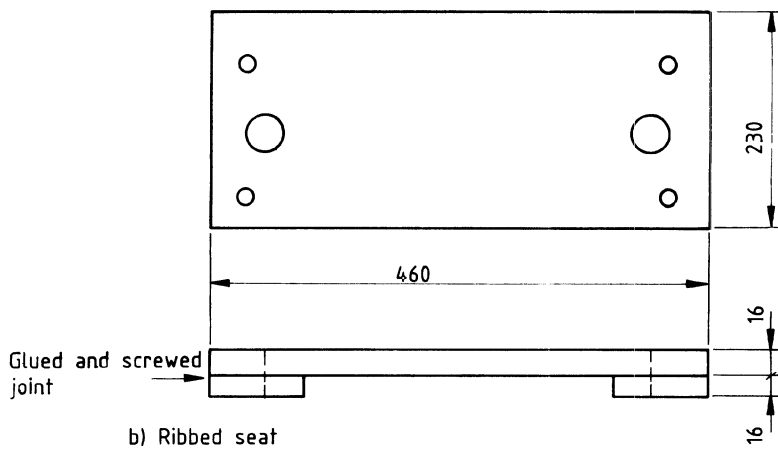
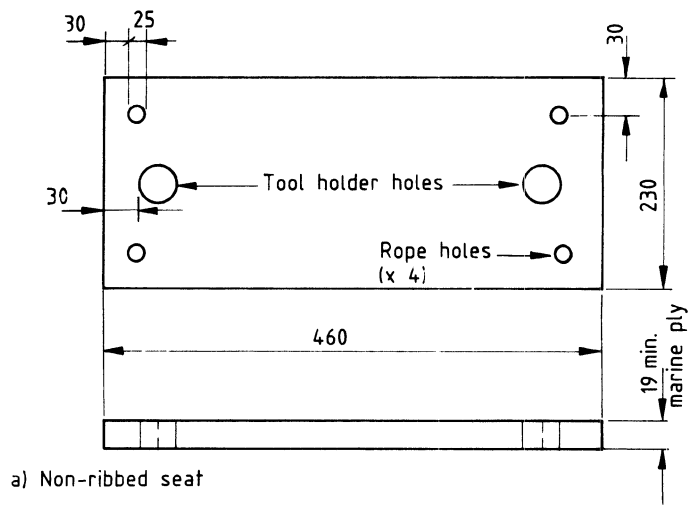
2.2.6.1 Loading: type test (minimum pass level)

This test shall be performed in place of the test given in 1.14.2. Seats for both fibre rope and wire rope suspension shall be so designed that a load of 300 kg distributed over a length of 400 mm at the centre of the board when suspended from its seat board rope shall produce no permanent deformation or defect.

If specified by the purchaser (see 1.4) a one-off test to destruction shall be carried out and recorded, the factor of safety then being related to the stated safe working load.

2.2.6.2 Loading: proof test

This test shall be performed in place of the test given in 1.14.4. Each seat suspended on its ropes shall be subjected to a uniformly distributed load of 150 kg applied over a length of 400 mm at the centre of the board. No permanent deformation or defect shall result from this test.



- NOTE 1 Dimensions are in millimetres.
 NOTE 2 For reeving, see Annex H.
 NOTE 3 Seat board rope is not shown for clarity.

Figure 2 — Typical steeplejack's seat

Section 3. Work cages

3.1 General

Work cages shall conform to the relevant requirements of section 1 and to the requirements of this section.

If specified by the purchaser that the cage is intended for use by more than one man (see 1.4) it shall be specially designed.

NOTE 1 The winch or climbing device may be manually or power operated.

NOTE 2 Work cages are illustrated in Figure 3.

3.2 Dimensions

The platform for a one-man work cage shall not exceed 1 m² in area and the clear working space shall be not less than 600 mm in either direction and not greater than 1.25 m in the longest direction.

The platform for a two-man work cage shall not exceed 1.5 m² in area and the clear working space shall be not less than 600 mm in width nor greater than 1.5 m in length.

Special attention shall be paid to the safe support of the decking.

3.3 Suspension and stability

The work cage shall be designed to be suspended by wire ropes. The suspension member shall be integral with the framework and have a suspension point at such a height above the platform to ensure stability.

In the case of a platform intended to carry two men the design shall be such that under any configuration of the loading pattern the cage and the suspension point height shall be such as to ensure stability.

3.4 Safety devices

Power operated units shall be provided with manually controlled descent in case of power failure.

The cages shall be provided with the means of attachment of a secondary safety device wire rope the fixing of which shall be separate from the suspension wire rope.

If arrester blocks are to be used with work cages, (see 1.4), the design of the cage shall be such that the arrester block is in a close and convenient position for use in case of emergency.

3.5 Performance

3.5.1 Loading: type test

If specified by the purchaser (see 1.4), a one-off test to destruction shall be carried out and recorded, the factor of safety then being related to the stated safe working load.

3.5.2 Loading: proof test

This test shall be performed in place of the test given in 1.14.4. Each one-man work cage shall be subjected to the following proof load test at the manufacturer's works. When suspended on a fixed point a load of 1.25 times the safe working load shall be applied to a central area of the deck 300 mm × 300 mm in size. On removal of the load the unit shall show no deformation, cracks or flaws or other defects. A two-man work cage shall be tested in two areas by dividing the proof load into two equal components.

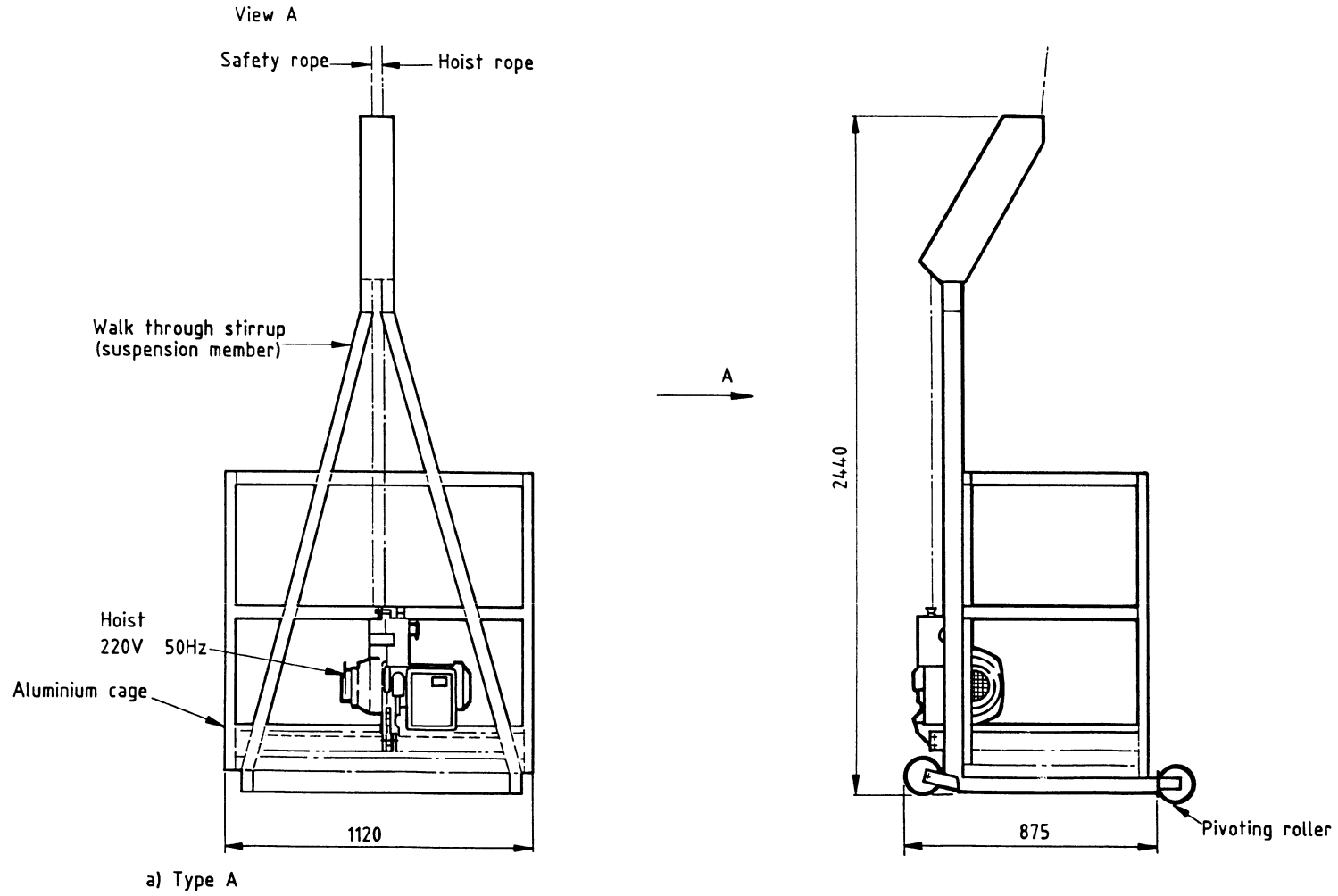
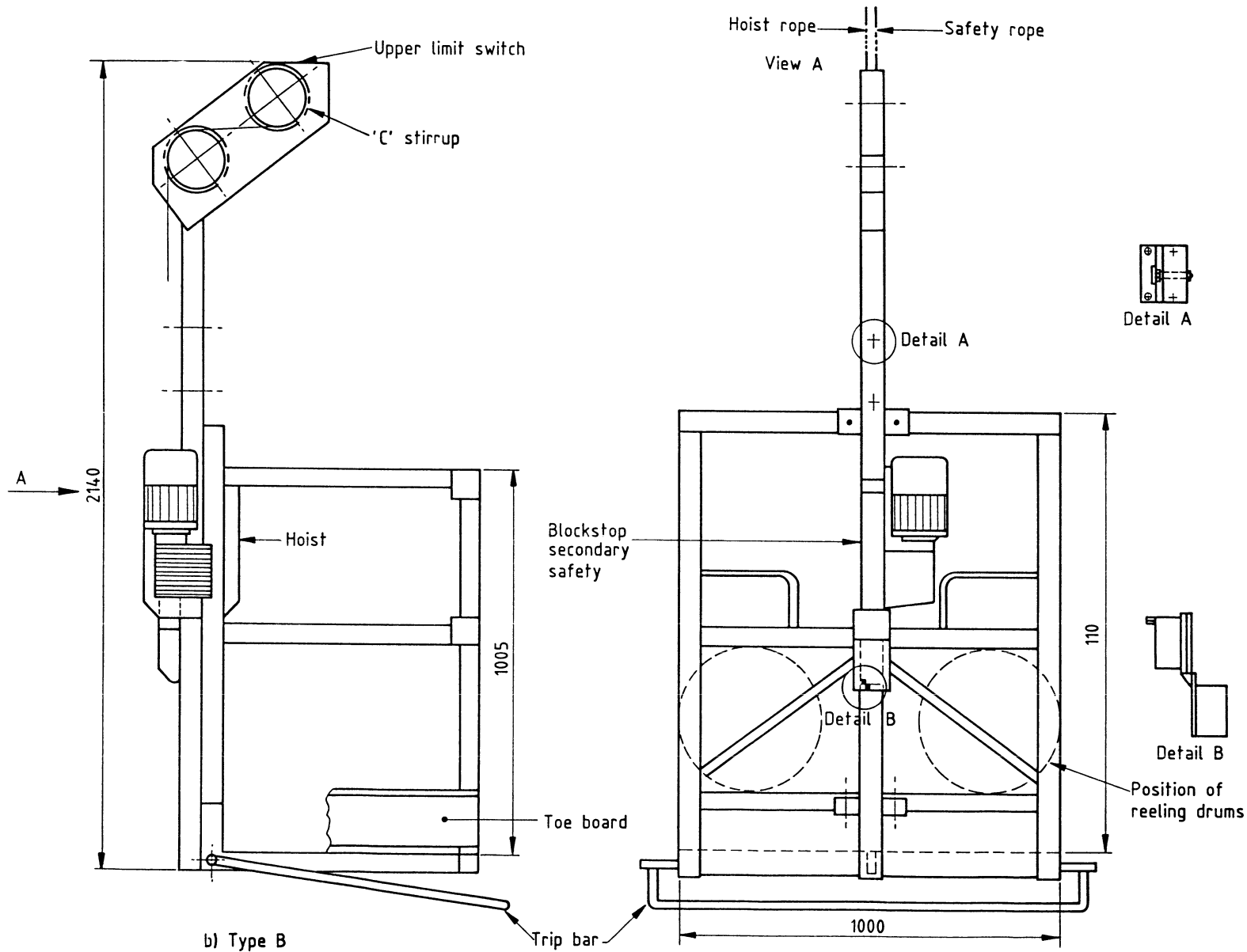


Figure 3 — Typical work cages



b) Type B

Figure 3 — Typical work cages (concluded)

Section 4. Painter's cradles

4.1 General

NOTE 1 Painter's cradles may be suspended on fibre ropes or wire ropes.

Painters cradles shall be no longer than 3.2 m.

Painter's cradles shall conform to the relevant requirements of section 1 and to the requirements of this section.

NOTE 2 Painter's cradles are illustrated in Figure 4. They are used for light access and carry no more than two persons who should be adequately trained in the use of the fall rope system. See Annex J for guidance on natural or man-made fibre ropes for use with such equipment.

4.2 Painter's cradles on wire ropes

Painter's cradles on wire ropes shall incorporate attachments for manual lifting appliances.

4.3 Dimensions

The clear working space of the platforms of painter's cradles on wire ropes shall be not less than 440 mm in width.

No platforms shall extend more than 200 mm beyond the stirrup fixings.

NOTE Consideration should be given to the easy replacement of the decking or platform units.

4.4 Stirrups

Each stirrup shall be manufactured so that the suspension rope, bottom pulley block, winch or climbing device can be securely fastened at the suspension point. Each stirrup shall pass underneath the platform and be secured to it.

If, for transportation reasons, the stirrup is hinged, the pivoted part shall not be detachable and provision shall be made for it to be locked in the vertical position by means of a captive device. There shall also be a strip of metal of equal strength to the stirrup which is fixed to support the underside of the platform.

If the stirrups are demountable, they shall be designed so that they cannot be accidentally detached. In all cases the guard rail connections to demountable or hinged stirrups shall be by captive devices.

4.5 Additional instructions for assembly and use of equipment

Where the equipment can be dismantled, the complete instructions shall include the rules for complete assembly.

If the equipment is designed for use with any special type of pulley block or hook the manufacturer shall specify in his instructions the type of hook and block for which the equipment has been designed.

NOTE It is recommended that the manufacturer supplies the appropriate hooks and pulleys for use with each cradle.

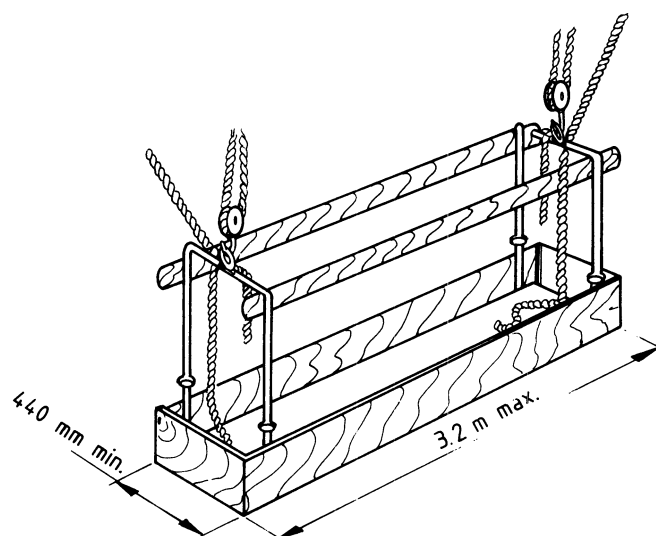


Figure 4 — Painter's cradle

Section 5. Individual suspended platforms without hinges

5.1 General

These units shall conform to the relevant requirements of section 1 and to the requirements of this section. These units shall be fabricated as a single unit or assembled from component parts, to form a platform of a length suitable to each job undertaken from elements of 1 m, 2 m and 3 m lengths. The maximum length agreed by the purchaser on the order (see 1.4) and specified by the manufacturer on his certificate shall not be exceeded.

The platform shall be so manufactured that once assembled it shall be rigid and have a suspension point at or near each end.

NOTE 1 Typical suspended platform modules are illustrated in Figure 5.

NOTE 2 There are two types of individual suspended platforms without hinges. One is a complete unit designed and constructed as such. The other is an assembly of prefabricated parts which can be built up into platforms of various lengths and styles.

Prefabricated assemblies shall be so designed that the parts can be firmly attached to each other and without risk of any part coming free accidentally.

5.2 Manufacture

The equipment shall comprise a decking, toe boards, side and end guard rails. The suspension shall be by two stirrups only, attachable at or near the ends of the platform.

The equipment shall be designed to be suspended on wire ropes and may be designed for manual or power operation.

5.3 Demountable units

Where the platforms are made from prefabricated units they shall be interchangeable with regard to the fact that they are assembled and dismantled repeatedly in miscellaneous arrangements.

The inter-connection of the units shall be such that the assembled platforms behave as rigid structures. The units shall be so designed that they cannot be incorrectly assembled.

The maximum assembled length shall be stated on the manufacturer's certificate.

5.4 Stirrups

Platforms shall have stirrups of one of the following types:

- a) for assembly at the ends where they form the end guard rail;
- b) for assembly at a position close to the end which permits the users to pass the stirrup and a separate end of guard rail is provided.

The strength of the latter stirrups shall be such as to carry the altered load distribution which occurs at a suspension point not at the end of the platform.

All stirrups shall be capable of accommodating stresses which occur when the platform is not suspended horizontally.

5.5 Storage of wire rope

When specified by the purchaser (see 1.4) provision shall be made for the attachment of a storage system for the suspension and secondary ropes below the platform.

5.6 Safe working load and marking

NOTE The safe working load of the platform varies according to the span between suspension points and the capacity of the lifting appliances. There is no single safe working load for a platform made of more than one length of prefabricated units.

The manufacturer shall issue a safe working load table for every length of platform which his system permits. The manufacturer shall also issue a table of the self weights of the various lengths of the platform with its end stops and stirrups and winches so that an assembly can be erected which does not overload the suspensions.

Because it is not possible to mark a safe working load on the components the manufacturer shall devise and supply a marking system which may be temporarily attached to the platform for each length constructed.

5.7 Safety devices

If arrester blocks are to be used with independent suspended platforms (see 1.4), the design of the platform or the assembly of prefabricated parts shall be such that the arrester blocks are in a close and convenient position for use in case of emergency.

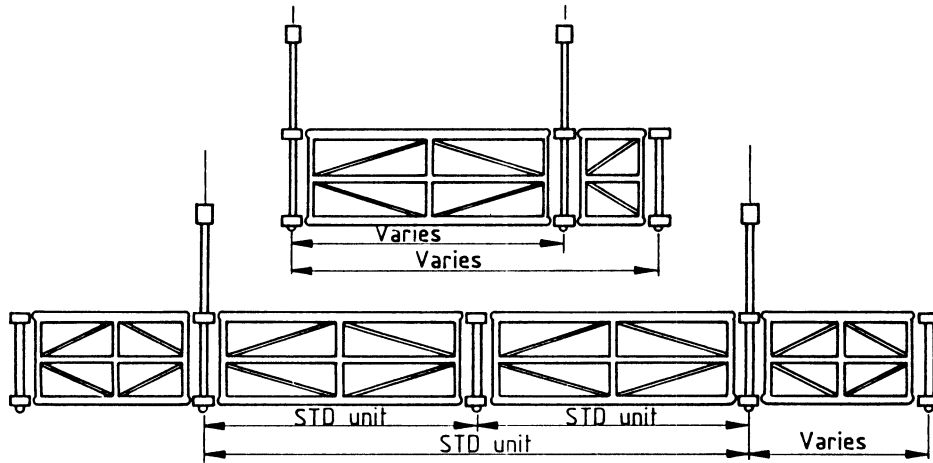
Anchor points for the attachment of safety harnesses shall be provided. There shall be sufficient anchor points for all the occupants to be anchored.

5.8 Performance

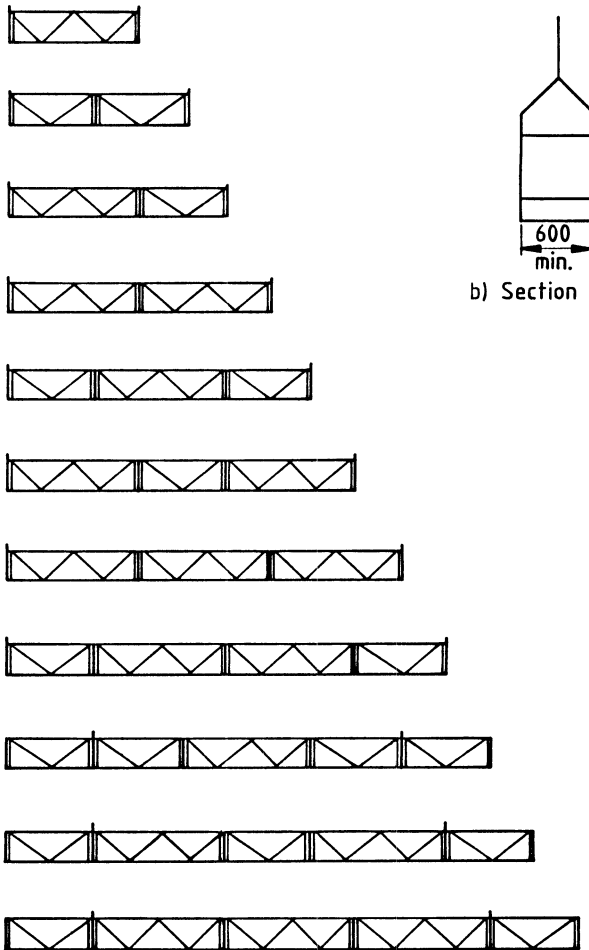
5.8.1 Single units

In the case of a single unit built in one piece the manufacturer shall carry out the tests in accordance with 1.14.2 to 1.14.5.

On removal of the load the centre unit in particular, or any other section shall show no deformation, cracks, flaws or other defects. This unit shall then be considered satisfactory for use and its components certified as having passed the proof test.



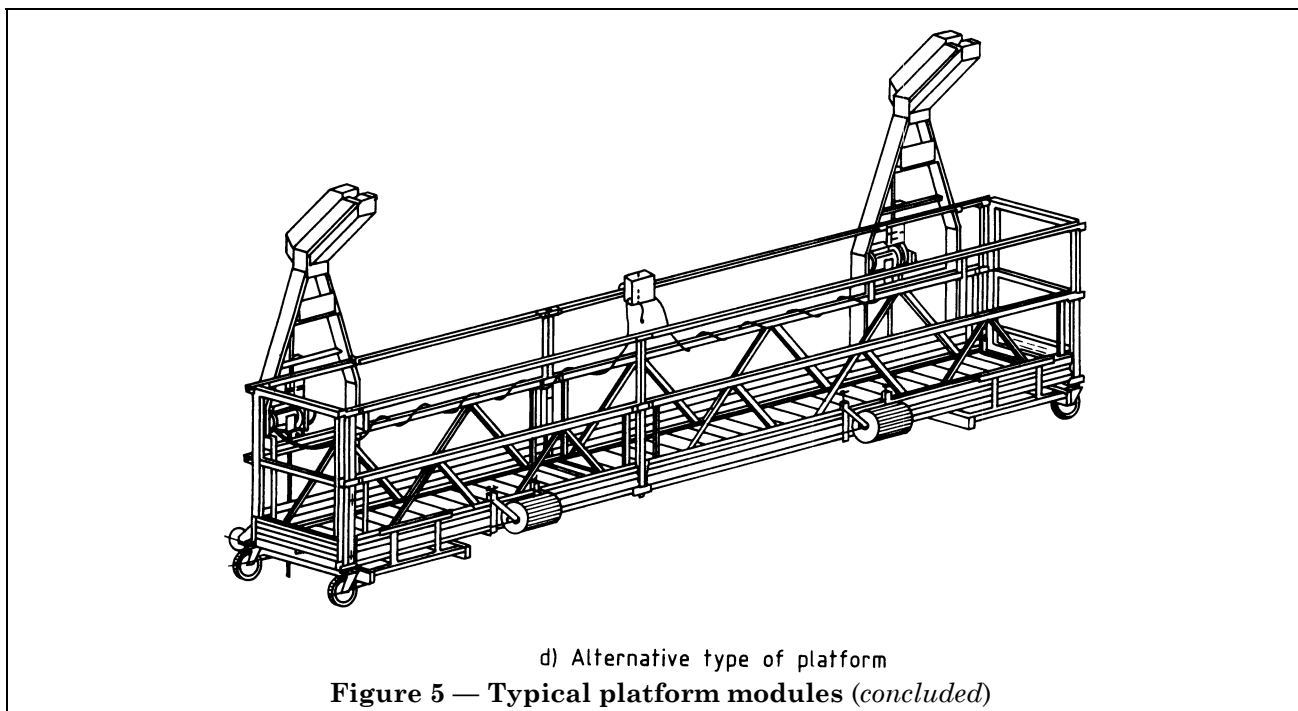
a) Type A system



b) Section through

c) Arrangement of modules

Figure 5 — Typical platform modules



If specified by the purchaser (see 1.4) a one-off loading type test to destruction shall be carried out in accordance with 1.14.2 and recorded, the factor of safety then being related to the stated safe working load.

5.8.2 Units assembled from prefabricated parts

In the case of a platform which is assembled from prefabricated parts the manufacturer shall carry out the tests given in 5.8.3 to 5.8.5 having first declared the maximum length to which the platform may be assembled.

5.8.3 Loading: type test (minimum pass level)

This test shall be performed in place of the test given in 1.14.2. For each length of platform which can be assembled from the prefabricated parts a complete platform shall be assembled including suspension on its means of support. This shall be loaded with twice the load which the manufacturer declares safe for that length evenly distributed over the platform. No part shall fail or become permanently distorted.

If specified by the purchaser (see 1.4) a one-off test to destruction shall be carried out and recorded, the factor of safety then being related to the stated safe working load.

5.8.4 Resistance to impact: type test

The test given in 1.14.3 shall be applied to each individual platform unit. The decking shall not fail.

5.8.5 Loading: proof test

For each length of platform which can be assembled from the prefabricated parts a bending moment shall be calculated for the worst positions based on the safe working load for each assembled length declared by the manufacturer.

The prefabricated parts shall be assembled into a single unit comprising three bays of the system. This shall be loaded with a uniformly distributed load to result in a bending moment of 1.25 times the maximum calculated value.

5.8.6 Certification

The manufacturer shall supply a certificate conforming to 1.15 and relating to the individual sections of the platform tested.

5.9 Additional instructions for assembly and use of equipment

These instructions shall also contain a table of safe working loads which may be applied to various lengths of the assembled platform.

The table of safe working loads shall also include a limitation of the number of men who may assemble in each bay or under each end suspension.

Reference shall be made to Figure 5 a) and Figure 5 c) which show typical assemblies of prefabricated units. The instructions for use shall show diagrams of the assemblies for which the manufacturer has designed the units and the safe working load and the number of persons shall be given for each assembly shown.

The instructions shall also detail the total weight of the various assemblies.

Section 6. Hinged continuous platforms

6.1 General

These platforms shall conform to the relevant requirements of section 1 and to the requirements of this section. Hinged continuous platforms shall be made from complete units or from units assembled from prefabricated parts.

NOTE 1 These may be the same units which can be assembled into individual suspended platforms without hinges detailed in section 5.

NOTE 2 Hinged continuous platforms are illustrated in Figure 6.

The separate bays shall be joined by a hinge. At each hinged location point there shall be a suspension stirrup and means of suspension.

NOTE 3 The objective of the hinged platform is to permit the use of more than two suspension points, providing a walk through system extending over a considerable length of building surface. The hinges also provide the facility of making the platform into a sloping ramp.

The angle of displacement at a hinge point shall not exceed 15° in any type of hinged continuous platform.

NOTE 4 The raising and lowering may be operated by manual or powered winches or by lifting devices.

6.2 Demountable units

Hinged continuous platforms shall conform to 5.3.

6.3 Stirrups

The stirrups for use in hinged continuous platforms shall contain the necessary hinges to enable the bays each side of the stirrup to take up different inclinations. The stirrups shall incorporate a separate hinge system or be so designed that when the bays of the platform are inclined the stirrup shall remain in line with the suspension point.

The stirrups shall be capable of withstanding the types of loads due to the inclination of the platforms and the alteration of the horizontal centre distances between the suspension points occurring when the platforms are not horizontal.

The stirrups shall be so designed that persons may pass easily along the platform.

NOTE These are normally known as walk-through units.

The suspension stirrups shall be capable of accommodating one of the following different methods of suspension:

- a) on a single main suspension wire with its safety wire;
- b) on two main suspension wires attached to each side of the platform and with secondary safety wires if required (see 1.4).

Stirrups for double wire suspensions shall be so designed that if the load is taken on one of the wires and the other one is slack there shall be no deformation of the stirrup.

6.4 Additional instructions for assembly and use of equipment

The manufacturer's instructions shall be in accordance with 5.9 with the addition that limiting slopes shall be detailed together with the safe working loads.

6.5 Safe working load and marking

NOTE The safe working load of the hinged platform varies with the length of the bays, i.e. the spacing of the suspension points and the capacity of the lifting devices. There is no single safe working load for a hinged platform made of more than one length of prefabricated units.

The manufacturer shall issue a safe working load table for every length of platform between the hinged suspension points which his system permits. The manufacturer shall also issue a table of the self weights of the various lengths of the platform and its end stops and stirrups and winches so that an assembly can be erected which does not overload the suspensions.

Because it is not possible to mark a safe working load on the components the manufacturer shall devise and supply a marking system which may be temporarily attached to the platform for each length constructed.

The equipment shall be designed for any of the four different load ratings as detailed in 1.6.4. The manufacturer shall indicate on his marking system, in words, which rating is applicable for each length of bay for which the assembly is designed.

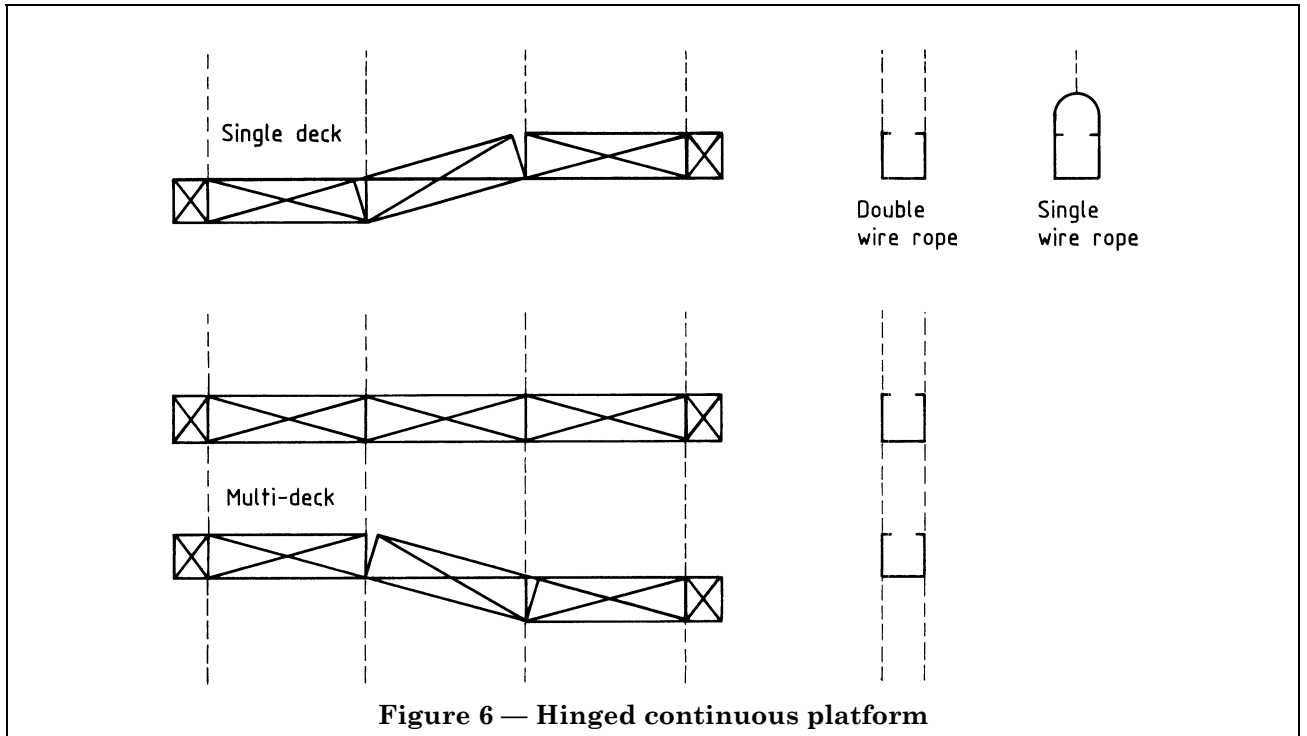
6.6 Safety devices

The safety devices shall be in accordance with 5.7.

6.7 Performance

The manufacturer's tests shall be those specified in 1.14 for the case of single units with the provision that the bay tested shall be suspended at the maximum slope allowed for in the manufacturer's design and instructions for the use of the equipment.

If specified by the purchaser (see 1.4) a one-off test to destruction shall be carried out and recorded, the factor of safety then being related to the stated safe working load.



Section 7. Multi-deck rigid platforms

7.1 General

NOTE 1 The main purpose of multi-deck platforms is to provide two or more working platforms for the fixing of wall cladding sheets in industrial buildings. These platforms are required to be in use at several levels at the same time. The height of the platforms will be fixed according to the work in hand.

Multi-deck platforms shall conform to the relevant requirements of section 1 and to the requirements of this section.

There shall be an internal ladder so that access can be maintained between the platforms. Trap doors shall be installed in the upper platforms as necessary for access between platforms. Each platform shall be considered to be in use and shall be provided with toe boards and guard rails as specified in 1.18.2.

The length of the unit shall be agreed between the manufacturer and the purchaser (see 1.4). The length shall be limited to such that the self weight and the imposed load will not exceed the safe working load of the suspension system.

NOTE 2 Multi-deck rigid platforms are illustrated in Figure 7.

7.2 Additional protection

All the platforms shall be in accordance with 1.18 with the addition that a hand rail shall be provided on the side of built-in ladders sloping up with the ladder to form a hand hold.

Hinged access hatches shall be incorporated in each deck to cover the ladder access holes when the ladders are not in use.

7.3 The end frames and the suspension

The means of suspension shall be agreed between the manufacturer and the purchaser (see 1.4).

NOTE The raising and lowering may be operated by manual winches, lifting devices or by powered winches and these may be mounted on one of the platforms.

7.4 Loads

Careful consideration shall be given to the loads applied taking into account the large size of the assembly and the fact that the persons using the platforms may congregate all at one end of the unit.

NOTE The large weight consequent on the above may also result in a large impact load from the winches.

7.5 Safe working loads and marking

The manufacturer shall issue a safe working load rating for each platform and for the whole unit. Each platform and the whole unit shall have a safe working load notice visibly marked on the unit.

7.6 Performance

7.6.1 Loading: type test

This test shall be performed in place of the test given in 1.14.2. The manufacturer shall suspend the unit and apply a distributed load over each platform of twice the safe working load.

On removal of the loads there shall be no deformation, cracks, flaws or other defects.

If specified by the purchaser (see 1.4), a one-off test to destruction shall be carried out and recorded; the factor of safety then being related to the stated safe working load.

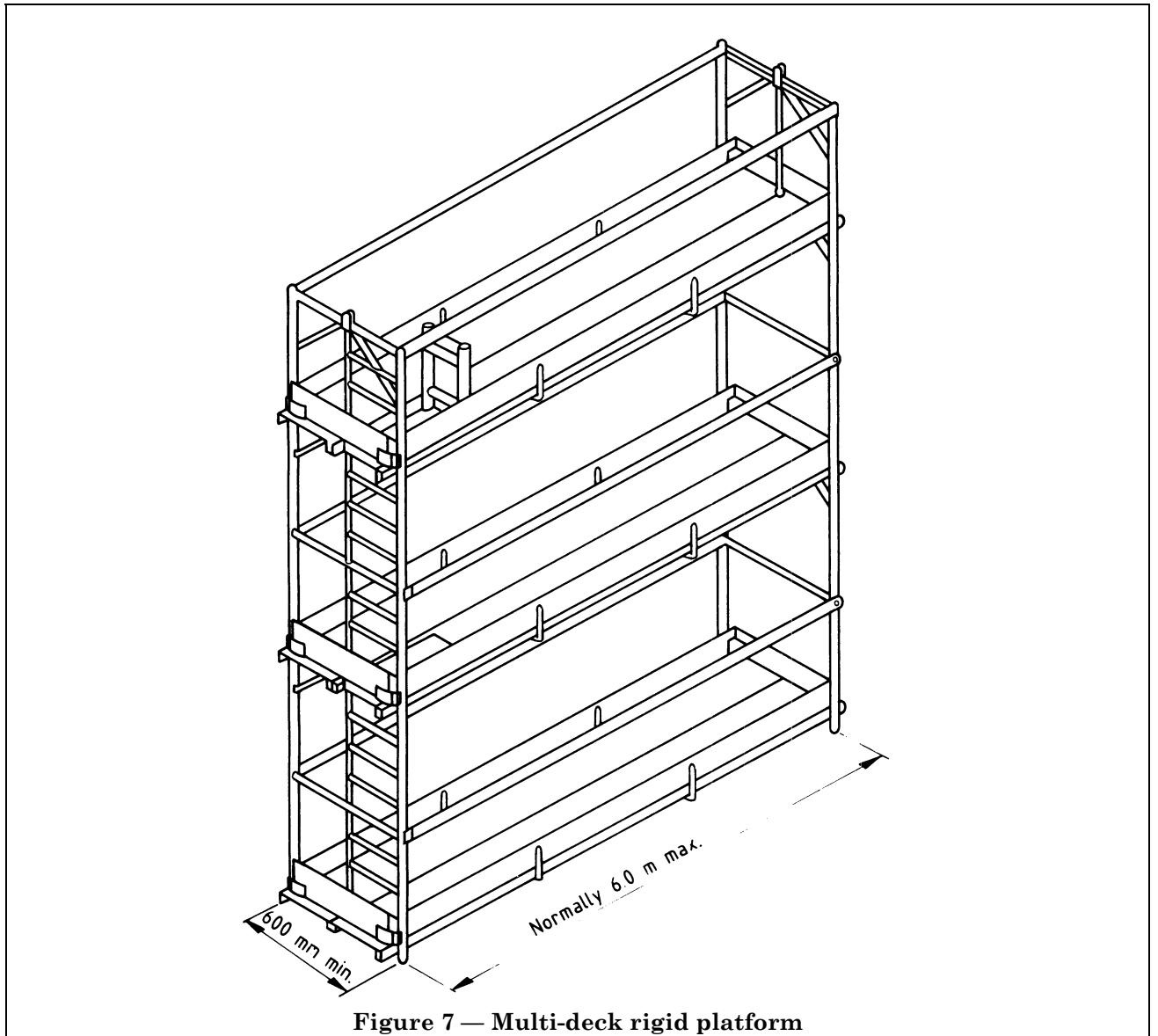
7.6.2 Loading: proof test

This test shall be performed in place of the test given in 1.14.4. The manufacturer shall suspend each unit made and apply a distributed load over each platform separately of 1.25 times the safe working load.

On removal of the loads there shall be no deformation, cracks, flaws or other defects.

7.7 Additional instructions for assembly and use of equipment

The manufacturer shall issue instructions for the means of suspension and the operation of the lifting devices. These instructions shall also contain the value of the safe working load on any platforms and the safe working load of the whole unit. The total self weight of the unit shall also be given.



Section 8. Multi-deck wire suspended extendible platforms

8.1 General

These platforms shall conform to the relevant requirements of section 1 and to the requirements of this section.

NOTE 1 This system is shown in Figure 8. It provides the facility of varying the levels of the two platforms individually.

NOTE 2 These are sometimes referred to as heavy suspended equipment.

Each platform shall be a single unit or a continuous hinged platform.

All the elements of the system shall conform to section 5 for individual platforms, and section 6 for hinged continuous platforms.

NOTE 3 Each platform should have its own winches.

8.2 Access between the decks

Access shall be provided between the decks in a manner suitable to the varying height between the two platforms. Provision shall be made for the removal and storage on the platform of the ladder system during the movement of either or both of the platforms.

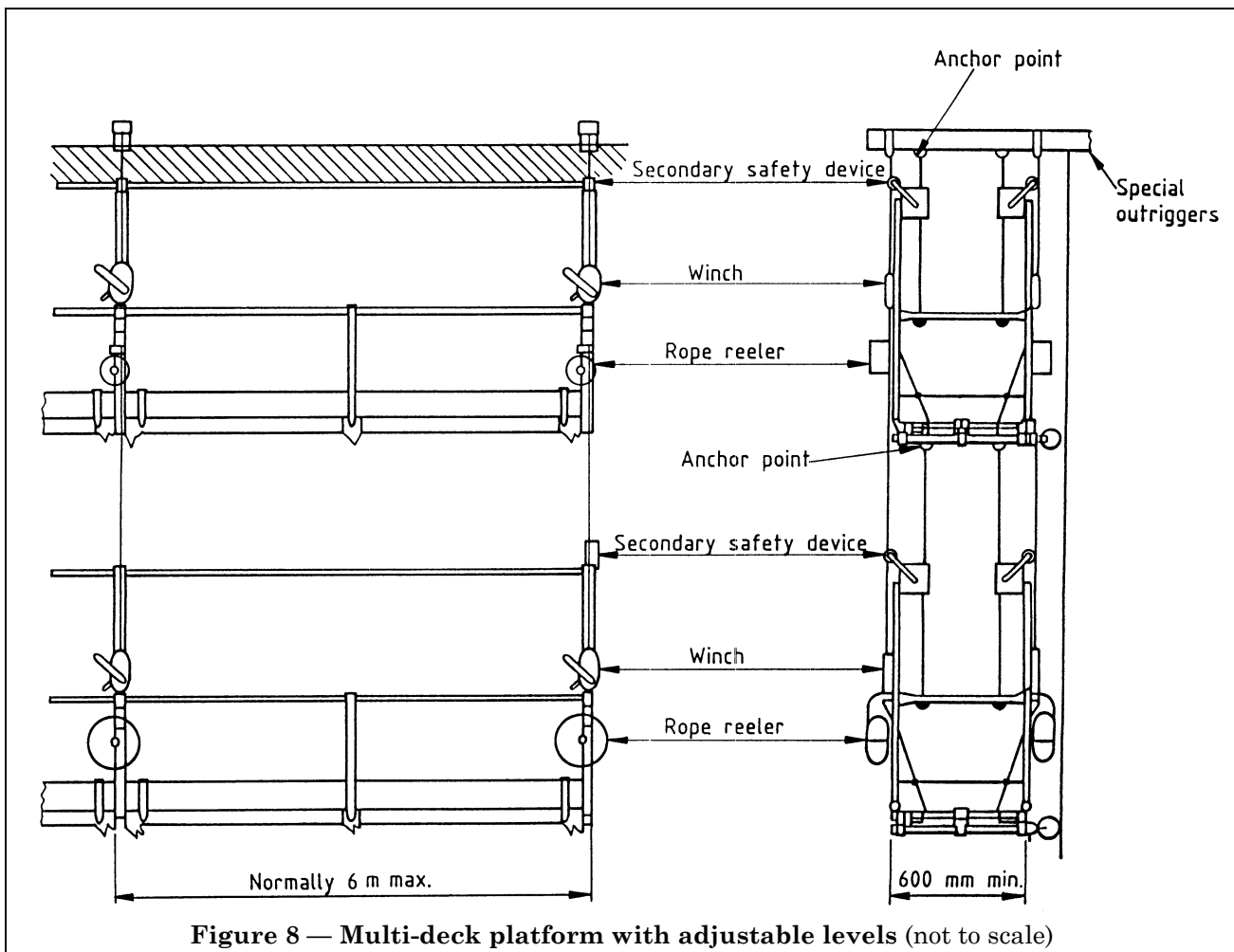


Figure 8 — Multi-deck platform with adjustable levels (not to scale)

Section 9. Permanent cradles which will only be used on the permanent installations for which they are designed

9.1 General

Platforms specified in this section shall conform to the relevant requirements of section 1 and the relevant recommendations of BS 6037:1990 and the requirements of this section.

NOTE 1 These platforms are designed to be detached and reconnected with different roof equipment.

The manufacturer of the platform shall detail in the manual the characteristics of the equipment from which the platforms can be suspended.

NOTE 2 A permanent cradle is illustrated in Figure 9.

Particular attention shall be paid to the following:

- a) the distances between the suspension points on the platforms and to any means of making this variable;
- b) the attachment of the suspension ropes and the secondary safety ropes;
- c) the attachment of the power supply cables and the electrical control systems.

The platforms shall be provided with means of attaching them to any restraint systems on the buildings and instructions for the use of these components shall be given in the manual.

NOTE 3 Platforms may be provided for use with manual or power operated climbing devices mounted on the platform, or may be a platform only, with the hoisting equipment at roof level (see Figure 9).

Where the platform is equipped with climbing devices, provision for the storage of the trailing end of the suspension and safety ropes shall be provided on the platform.

The suspension system shall be wire ropes. The platform shall be designed to suit the permanently installed suspension equipment and incorporate such special features as may be required as specified by the purchaser (see 1.4).

The platform shall be provided with clearly identified attachment points of adequate strength for securing safety harnesses.

NOTE 4 It is preferred that the sides of the platform are fully plated or meshed. Alternatively an intermediate guard rail may be installed.

9.2 Stirrups

The stirrups shall be fabricated as an integral part of the platform or as a specific structural member of its framework.

The secondary safety wire or device shall be attached to the platform, the fixings for which shall be separate from those of the main suspension wire rope.

9.3 Safety devices

In addition to the requirements of 1.12 to enable the cradle to conform to the operational recommendations of BS 6037, provision shall be made to accommodate the following safety devices:

- a) protective cushions/rollers to minimize the risk of damage to the facade;
- b) a lower obstacle detector bar which, when linked to the control system, stops downward motion when an obstruction is encountered;
- c) an upper obstacle detector;
- d) slack rope sensing system;
- e) a device to prevent further movement of the platform if it is unintentionally tilted more than 15° from the horizontal;
- f) components/mounting points suitable for engaging into a facade/cable restraint system;
- g) a device to prevent the traversing or slewing of the platform whilst it is engaged in a restraint system.

9.4 Electrical equipment fitted to the platform

In addition to the requirements of 1.13 all electrical wiring shall be suitably protected and so placed as to be safe from damage.

When control systems are permanently installed on the platform they shall be key operated to prevent unauthorized use. The control panel shall be marked so that there can be no confusion between the various controls and their functions.

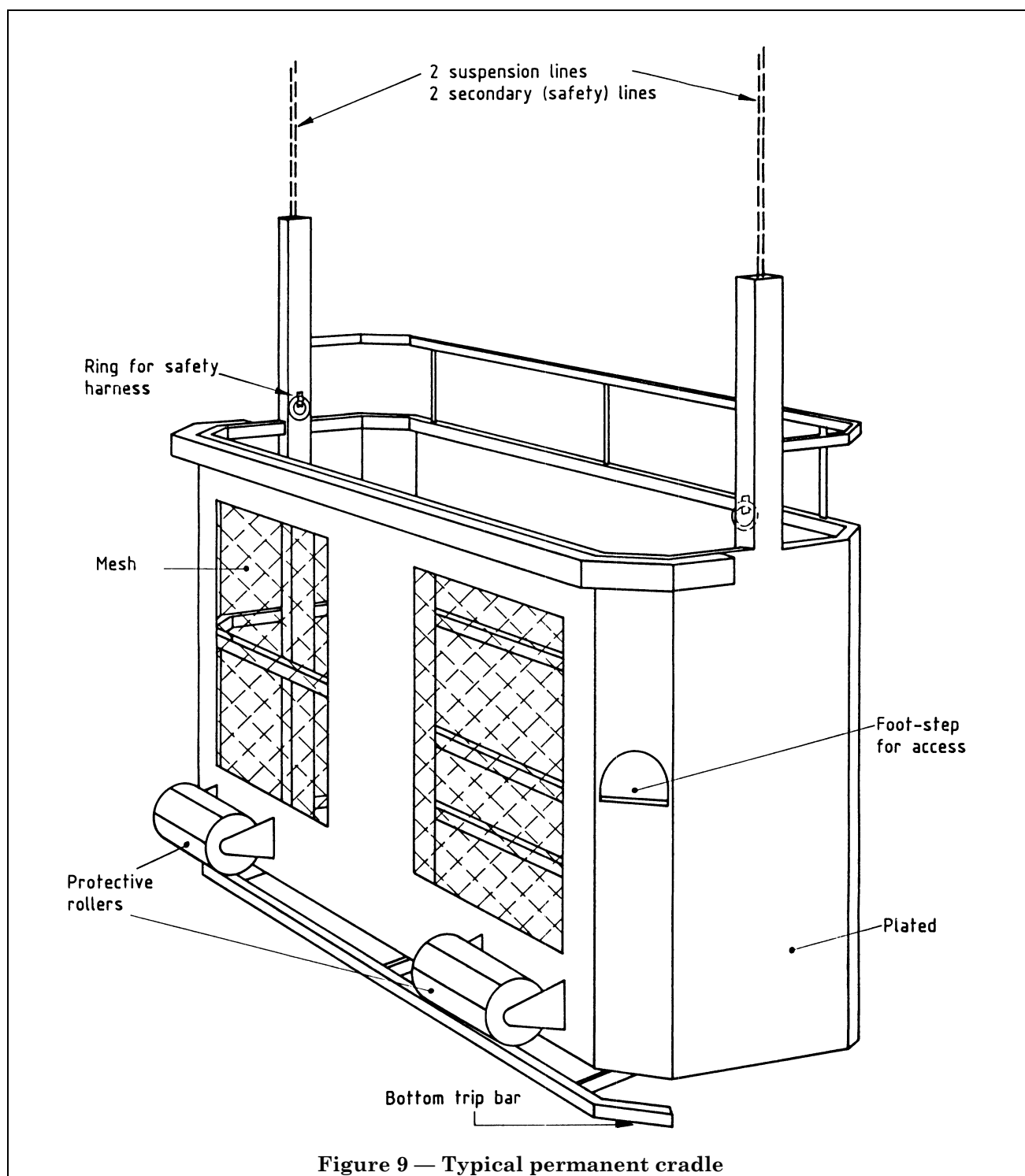
An emergency stop button shall be mounted on the platform to interrupt the power supply. In the event of a power failure or any electrical malfunction the system shall fail to safety.

NOTE See Annex D.

9.5 Additional instructions for assembly and use of equipment

The manufacturer shall issue instructions for the attachment of the platform to the roof rig for which it has been designed.

The instructions shall also detail the safety devices built into the platform and the means of their operation.



Annex A (informative)

Recommendations with regard to winches

The manufacturer of the suspended access equipment specified in this standard may or may not manufacture the winches or climbing devices with which they will be used.

It is advisable that the designer of the suspended access equipment should liaise with the lifting appliance manufacturers to ascertain that the suspension points permanently fixed to the equipment are suitable for the attachment of the various types of lifting appliance.

Where the suspended access equipment has been designed for use with a specific lifting appliance this should be stated in the manual supplied with the equipment by the manufacturer.

Where practicable, adapters should be supplied with the platform on request or otherwise be available for the conversion of the permanently fixed suspension points to various types of lifting appliance.

The climbing devices or winches which will in practice be used with the suspended access equipment should be such that their control equipment and their safety devices are easily reached by an operator in the platform.

When selecting the climbing devices or winches for use with any suspended access equipment the erector should pay particular attention to the safe working load rating of the climbing device or winch and that of the platform and to the possibility that on continuous platforms the imposed load is moving. Imposed loadings could be concentrated at suspension points and at entrance and exit points. These variations in the location and amount of the imposed load should be taken into account in the selection of the suspension equipment as a whole.

Annex B (informative)

The use of temporary platforms with permanent installed roof mounted equipment

Section 9 of this standard specifies platforms which will be attached to suspended ropes from permanently installed roof mounted equipment. The platforms may be detached and reconnected with different roof equipment on the same site. They may also be moved from one building to another building with a different type of roof equipment.

Manufacturers of platforms intended for this type of application should detail in their manuals the characteristics of the roof equipment which is suitable for suspending the platforms.

Particular attention should be paid to the following:

- a) the distances between the suspension points on the platforms and to any means of making this variable;
- b) the attachment of the suspension ropes and the secondary safety ropes;
- c) the attachment of the power feeds and the electrical control systems.

The platforms should be provided with means of attaching them to the restraint systems on the buildings and instructions for the use of these components should be given in the manual.

The user of a platform not specifically designed for use with their permanent roof mounted equipment should ensure that the whole assembly conforms to BS 6037 before it is used.

Annex C (normative)

Type test to verify fail safe design

C.1 Assemble a complete unit to its maximum length and suspend it on a fixed line at each suspension point to simulate its use with the decking of the unit approximately 240 mm (9 in) above the solid floor.

C.2 Remove a single joint pin or connecting component. Distribute evenly a load equivalent to 110 % of the safe working load on the platform.

C.3 Replace the previously removed item and repeat the procedure given in **C.2** twice more, taking away a different connector or pin each time.

C.4 No failure shall occur within the whole assembled system and the centre of the decking shall not deflect to touch the ground.

Annex D (informative)

Recommendations with regard to platform restraint and guidance on wind speeds

NOTE All references to wind velocities and calculations relate only to CP 3:Chapter V-2:1972.

Platforms hanging freely in windy conditions need restraining to prevent swinging away from the building surface and from sideways displacement. Manufacturers should make provision on all types of platform for restraining elements to be attached.

The placing of the restraints on the platform framework in addition to reducing the movement of the whole platform, can alter its stability. The manufacturer is advised to study the location of restraining points with a view to locating special attachments or places where the platform is made more steady in adverse wind conditions.

The fixing points should be suitable for the attachment of either wire or rigid restraining members.

When platforms are used on buildings with permanent roof equipment and built-in means of restraint the platform attachments should be matched with these on each location the platforms are used.

Some guidance on the wind speeds likely to be encountered is given in Table D.1 where the figures represent the maximum gust speed occurring once in 50 years. No reduction in these values should be considered other than the factors S_1 , S_2 and S_3 as defined in CP 3:Chapter V-2:1972.

The conversion of wind speed into pressure P (in kg/m^2) is covered by the formula:

$$P = 0.0625 V^2$$

where

V is the design speed (in m/sec).

The platform designer is recommended to allow for forces as calculated from the above data.

It should be assumed that the basic wind may blow from any horizontal direction.

Table D.1 — Basic wind speed for some cities and towns (taken from CP 3:Chapter V-2:1972)

Speed in metres per second

Aberdeen	49	Leeds	46
Bedford	40	Leicester	44
Belfast	45	Liverpool	46
Birkenhead	46	London	38
Birmingham	43	Londonderry	52
Blackpool	46	Luton	40
Bournemouth	41	Manchester	45
Bradford	47	Middlesborough	45
Brighton	40	Newcastle-Upon-Tyne	45
Bristol	43	Northampton	42
Cambridge	41	Norwich	43
Cardiff	45	Nottingham	45
Carlisle	46	Oxford	40
Coventry	44	Perth	51
Dumfries	47	Plymouth	44
Dundee	50	Portsmouth	40
Edinburgh	50	Preston	45
Exeter	43	Sheffield	46
Glasgow	51	Southampton	40
Great Yarmouth	43	Stoke	43
Huddersfield	46	Swansea	46
Inverness	49	Wolverhampton	43
Ipswich	41	York	45
Kingston-upon-Hull	45		
NOTE These values apply to cities and towns only and not necessarily to the surrounding areas and are unlikely to be exceeded more than once in a 50 year period.			
Channel Islands:			
Alderney	52		
Guernsey	52		
Jersey	52		

Annex E (informative)

Electrical installations on the platforms

As the platforms to which this standard applies may be moved from location to location a wide variety of circumstances are met during use. Power sources and the arrangement of power cables differ from job to job.

The platform designer should provide for the attachment of the power supply cables or control cables to be in a suitable place along the platforms.

It is particularly advisable in prefabricated segmental platforms that when short lengths of platform are used the power and control feeds for long platforms are not used in such a way that they can create a hazard. It is recommended that in some cases, where appropriate, means of storing excess cables should be provided, and that firm places for joint boxes and control pendants are provided.

Annex F (informative)
Certificate of proof load for each unit supplied

The recommended style of the manufacturer's certificate is as follows.

UNIT

Manufacturer

Date of manufacture

Weight of the assembly tested

Description of the assembly tested

Recommended SWL	kg	} These details are stated on the plates attached to the equipment
number of persons		
number of persons per unit		
Test load applied	kg	Behaviour
Dynamic load applied	kg	Behaviour

Signature

Date

Position

Annex G (informative)
Certificate of design proofing tests

The recommended style of the manufacturer's certificate is as follows.

Unit.....

Manufacturer

Date of manufacture

Self weight kg

Component intended for assembly as detailed in Manual No.

Safe working load..... kg

Number of persons.....

Number of persons per unit.....

Serial number.....

or Component type number

Design load test applied

Factor of safety above the recommended SWL

Description of test

.....

Design dynamic test applied

Factor of safety above the specification



Description of dynamic test.....

.....

Description of a load test to failure (if carried out).....

Description of an impact test to failure (if carried out).....

.....

Diagram of the assembly tested

Signature

Date

Position

.....

Annex H (informative) Recommended method of rigging a steeplejack's seat

NOTE This is not yet covered in BS 5974.

Figure H.1 shows the recommended method of rigging a steeplejack's seat.

The two parallel loops above the seat should be at a height of approximately 750 mm above the top of the board. Below the board the rope should be joined diagonally with a splice totalling at least 320 mm and containing at least three tucks on each side of the centre. The spliced rope should be the diagonal one nearest the under surface of the seat.

The recommended rope is 12 mm manila or polypropylene.

As an alternative to the splice a reef knot may be used below the seat with the ends tucked back through the rope lay.

The two chair ropes, above the board, should be grouped together and the suspension ropes attached by the means shown in Figure H.1 with a tailing end at least 0.6 m long.

The recommended suspension rope is fibre film spun/UV colour protected construction, not less than 16 mm in diameter in polypropylene material. It should be terminated with a means of preventing it fraying and should include a serial number for record purposes.

The stop lashing (or racking rope, as it is sometimes called) should be 2.75 m long, 12 mm diameter manila rope, being fixed to the suspension rope by a rolling hitch and then laced into the suspension knot and safety ring as detailed in Figure H.1.

These seats should only be used by the operator who actually rigs the unit, i.e. the manufacturer is the user who should wear a safety harness as recommended in BS 5974.

Further information is given in *Recommended Safe Working Methods for the Steeplejack Industry* [3].

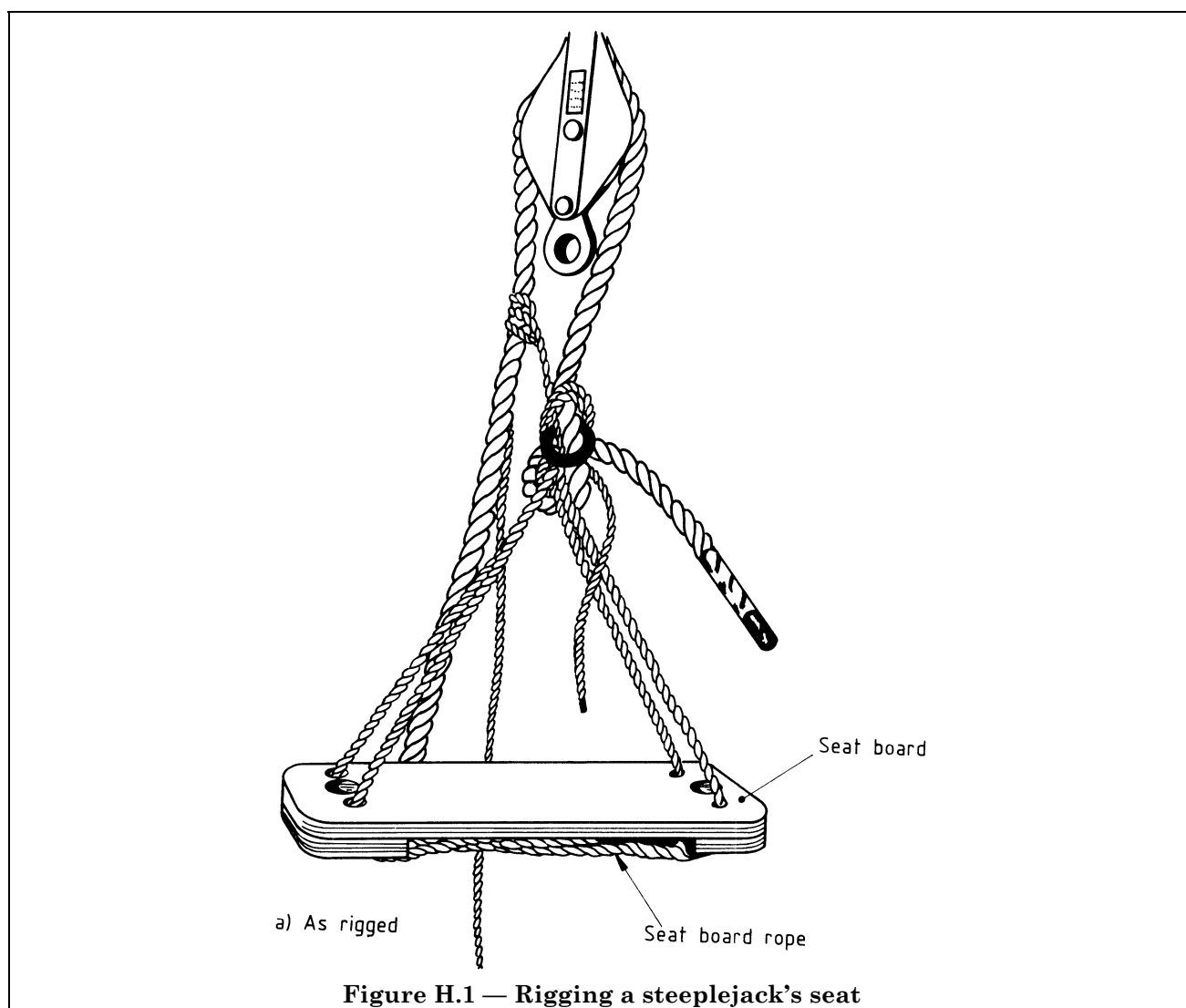


Figure H.1 — Rigging a steeplejack's seat

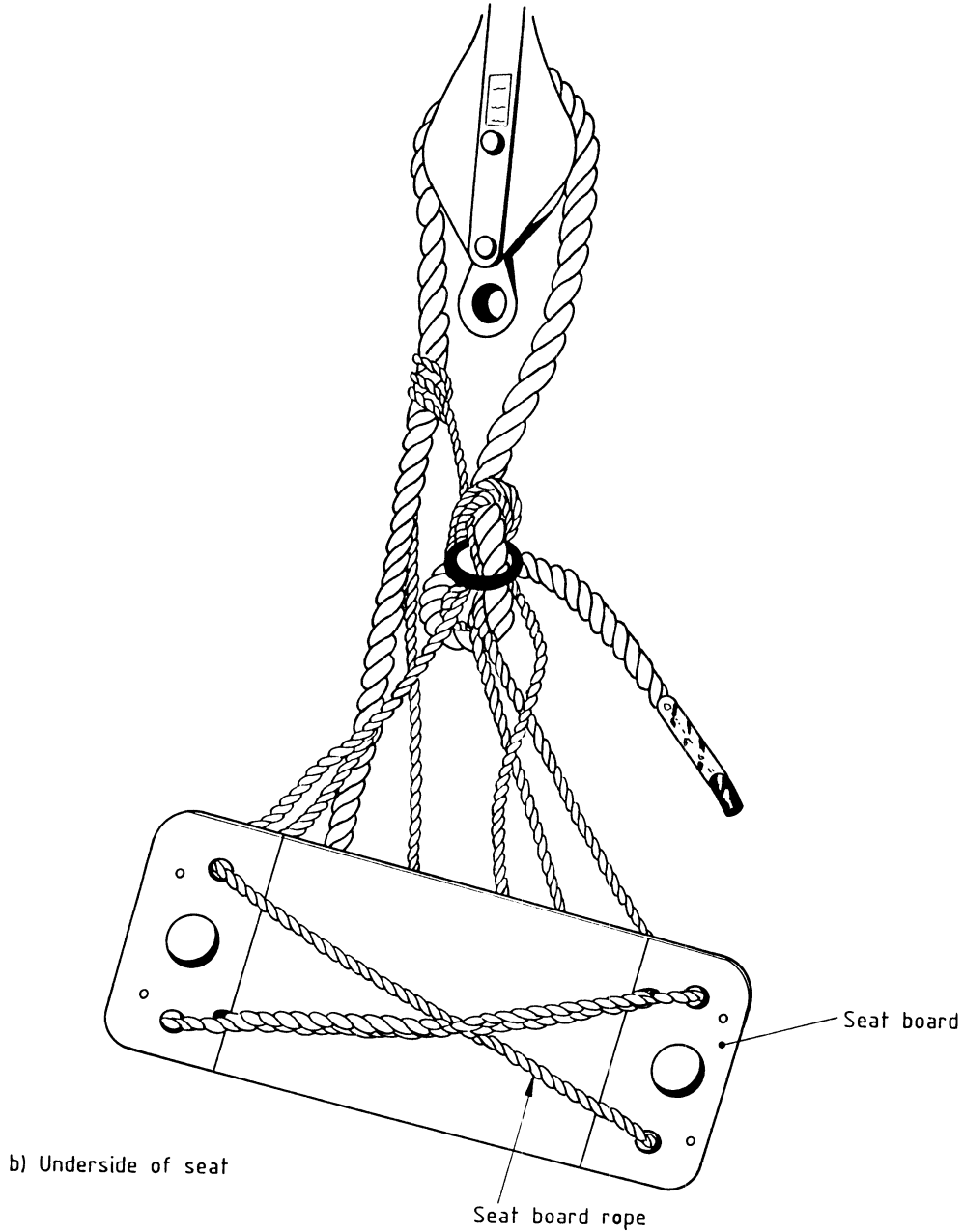


Figure H.1 — Rigging a steplejack's seat (concluded)

Annex J (informative) Recommendations for selection and use of fibre ropes and wire ropes

J.1 General

Selection of rope for any particular application is critical as it may be affected by the environment (see **J.2** and **J.3**).

NOTE Ropes for suspended access are subject to the Construction (Lifting Operations) Regulations [4] when used in building and construction applications. Attention is drawn in particular to the requirement for inspection, testing and certification.

J.2 Fibre ropes

Fibre ropes may only be used to suspend chairs, seats and cradles or platforms less than 3.2 m long.

NOTE A stop lashing on a steeplejack's seat is connected to a fall rope, via a rolling hitch, and both are of man-made fibre, slipping can generate sufficient heat to melt the stop lashing knot. Therefore, stop lashing should be of natural fibre.

The maximum suspended load of the equipment should be ascertained and the rope tension calculated from this. A rope with a guaranteed minimum breaking load of six times the rope tension should be used for the main suspension rope of a suspended seat, chair or cradle.

Fibre suspension ropes should be not less than 16 mm in diameter. They should match the type of pulleys used in the rigging.

Man-made fibre ropes should have a surface which can be safely gripped in either wet or dry conditions.

Where the work in hand involves the use of heat or flames or grit blasting it is preferred to use wire ropes (see **J.3**) which have a longer life when exposed to these conditions.

Natural fibre ropes should not be fitted to the equipment for applications where there may be chemical attack, heat or flames. No natural fibre rope having had a working life or more than 100 weeks should be used.

A register of the periods of operation of the rope with the equipment should be kept. No man-made fibre rope having had a working life of more than 200 weeks should be used.

NOTE 2 The working life of the rope is the summation of the times it has been in use as a suspension member exclusive of its storage time.

J.3 Wire ropes

Wire ropes should be of the type specified by the manufacturer of the winches or climbing devices. They should match the sizes of pulleys used in the suspension system and should not be less than 8.0 mm diameter when power operated.

No rope should be used which has a minimum breaking load of less than eight times the load in the rope.

No secondary safety rope should be less than the design requirement for the main rope.

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List of references (see 1.2)

Normative references

BSI publications

BRITISH STANDARDS INSTITUTION, London

BS 2771, *Electrical equipment of industrial machines.*

BS 2771-1:1986, *Specification for general requirements.*

BS 3019, *TIG welding.*

BS 3019-1:1984, *Specification for TIG welding of aluminium, magnesium and their alloys.*

BS 3571, *MIG welding.*

BS 3571-1:1985, *Specification for MIG welding of aluminium and aluminium alloys.*

BS 4169:1988, *Specification for manufacture of glued-laminated timber structural members.*

BS 4978:1988, *Specification for softwood grades for structural use.*

BS 5135:1984, *Specification for arc welding of carbon and carbon manganese steels.*

BS 5756:1980, *Specification for tropical hardwoods graded for structural use.*

BS 6037:1990, *Code of practice for permanently installed suspended access equipment.*

BS 7671:1992, *Requirements for electrical installations. IEE Wiring Regulations. Sixteenth edition.*

BS 8118, *Structural use of aluminium.*

BS 8118-2:1991, *Specification for materials, workmanship and protection.*

CP 3, *Code of basic data for the design of buildings.*

CP 3:Chapter V, *Loading.*

CP 3:Chapter V-2:1972, *Wind loads.*

Informative references

BSI publications

BRITISH STANDARDS INSTITUTION, London

BS 5974:1990, *Code of practice for temporarily installed suspended scaffolds and access equipment.*

Other references

[1] GREAT BRITAIN. *Electricity at Work Regulations 1989.* London: HMSO.

[2] GREAT BRITAIN. *The Construction (Working Places) Regulations 1966.* London: HMSO.

[3] *Recommended Safe Working Methods for the Steeplejack Industry.* Leicester: National Federation of Master Steeplejacks and Lightning Conductor Engineers: 1991³⁾.

[4] GREAT BRITAIN. *The Construction (Lifting Operations) Regulations 1961.* London: HMSO.

³⁾ Available from the National Federation of Master Steeplejacks and Lightning Conductor Engineers, 6th floor, Epic House, Charles Street, Leicester, LE1 3SH.

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