BRITISH STANDARD

BS 7981:2002

Code of practice for the installation, maintenance, thorough examination and safe use of mast climbing work platforms (MCWPs)

ICS 53.020.99

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by Technical Committee MHE/12, Lifting platforms to panel MHE/12/-/2, Mast climbing work platforms, upon which the following bodies were represented:

Construction Plant Hire Association
Health and Safety Executive
International Powered Access Federation
Co-opted members

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Contents

Foreword

This British Standard has been prepared by Technical Committee MHE/12 as a result of requests from industry. It has been based on proposals from the International Powered Access Federation using their Health and Safety Guidance for Mast Climbing Work Platforms and BS EN 1495, *Lifting platforms — Mast climbing work platforms*.

Mast climbing work platforms (MCWPs) are increasingly being used as temporary working places giving variable height access to specific areas above ground level. In many cases they are more convenient to use than other forms of access equipment such as ladders, scaffolding, staging, or suspended cradles. Examples of MCWPs are shown in Figure 1, Figure 2 and Figure 3.

This standard sets out various guidance and recommendations to ensure that MCWPs are installed, maintained, examined and used in a safe manner.

The Health and Safety Executive (HSE) commend the use of this Code of practice to those who have duties under the Health and Safety at Work etc. Act 1974 and other relevant health and safety legislation. This code was drawn up with the participation of HSE representatives and will be included in the list of "standards significant to health and safety at work" available from The Stationery Office.

As a Code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Annex A and Annex B are informative.

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

Attention is drawn to the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER).

Compliance with this Code of practice does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 25 and a back cover.

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1 Scope

This British Standard provides guidance and recommendations for persons responsible for the installation, maintenance and thorough examination of mast climbing work platforms (MCWPs). It also provides guidance and recommendations on the safe use of MCWPs.

This British Standard gives recommendations for MCWPs, which are temporarily and permanently installed, electrically powered and designed to be used by one or more persons from which to carry out work. The vertical moving components (work platform) are used to move those same persons and their equipment and materials to and from a single boarding point. These restrictions differentiate MCWPs from builder's hoists.

This British Standard gives recommendations for MCWPs including those that meet the requirements of BS EN 1495. These MCWPs typically can be considered to consist of four assemblies, or groups of parts, as follows.

a) At least one mast which is climbed by and which supports the work platform.

b) A work platform capable of supporting persons, equipment, tools and materials, etc.

c) A wheeled chassis or a base frame supporting the mast structure.

NOTE 1 The chassis or base frame can provide stability for MCWPs up to a predetermined free-standing height, above which the mast(s) is tied to the building or other structure.

d) Mast tie assemblies.

NOTE 2 Figure 1 shows a single-mast mobile MCWP. Figure 2 shows a twin mast MCWP that for illustrative purposes shows examples of a fixed base and a mobile base. Twin mast machines on site either have two fixed bases or two mobile chassis'. Figure 3 shows typical mast tie arrangements.

This British Standard does not give recommendations for dealing with the hazards involved in the manoeuvring, erection or dismantling, fixing or removing of any materials or equipment which are not part of the mast climbing work platform. Neither does it deal with the handling of specific hazardous materials.

This British Standard does not give recommendations for delivering persons and materials to fixed landing levels. Such equipment referred to as lifts or hoists are dealt with by other standards including BS EN 12158-1, *Builder's hoists for goods*, BS EN 12159, *Builder's hoists for goods and passengers* and BS EN 81, *Safety rules for the construction and installation of lifts*.

Mobile Elevating Work Platforms (MEWPs) conforming to BS 7171, suspended access equipment defined in accordance with BS EN 1808 and lifting tables defined in accordance with BS EN 1570 are not included within the scope of this Code of practice.

2 Normative references

The following normative document contains provisions which, through reference in this text, constitute provisions of this British Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. For undated references, the latest edition of the publication referred to applies.

BS EN 1495*, Lifting platforms — Mast climbing work platforms.*

3 Terms and definitions

For the purposes of this standard the following terms and definitions apply.

3.1
rated load
load for which an MCWP has been designed for in normal operation as stated in the load diagram/chart

3.2
rated speed
vertical or horizontal speed for which an MCWP has been designed

3.3
transfer
any horizontal movement of an MCWP from one position to another on the same working site

3.4
transport
any movement of an MCWP outside the boundaries of the working site

3.5
base frame
part of an MCWP that provides support for the mast and elevating assembly

3.6
chassis
part of an MCWP that provides mobility and support for the mast and elevating assembly

3.7
outriggers
supports at the base frame level used to maintain or increase the stability of an MCWP within specified conditions

NOTE They may also be used for levelling.

3.8
mast
structure that supports and guides the platform

3.9
guides
parts of the mast, which provide guiding for the work platform

3.10
mast tie
anchorage system used to provide lateral restraint to the mast from the building or other structure

3.11
work platform
vertical travelling part of the installation upon which the persons, equipment and materials are carried, and from which work is carried out

NOTE This is as opposed to an MCWP, which refers to the whole of the installation, among others the work platform, mast, mast ties, base and chassis. The work platform includes the main platform and any platform extension.

3.12
main platform
part of the work platform that is built up using primary structural elements

3.13
buffer
resilient stop at the end of the travel, comprising a means of arresting using fluids, springs or similar means

3.14
overspeed
any speed above rated speed

3.15
safety gear
mechanical device for stopping and maintaining the work platform stationary on the mast in the event of overspeed

3.16
competent person
person having such practical and theoretical knowledge and such experience of MCWPs as is necessary to carry out the task in hand satisfactorily

3.17
supplier-appointed person
person appointed by the MCWP supplier who is responsible for planning the installation, method statements for the erection, safe operation, inspection, maintenance, thorough examination and dismantling of MCWPs

3.18
management/user-appointed person
person appointed by the management or user who is responsible for devising safe systems of work and other aspects of use of MCWPs

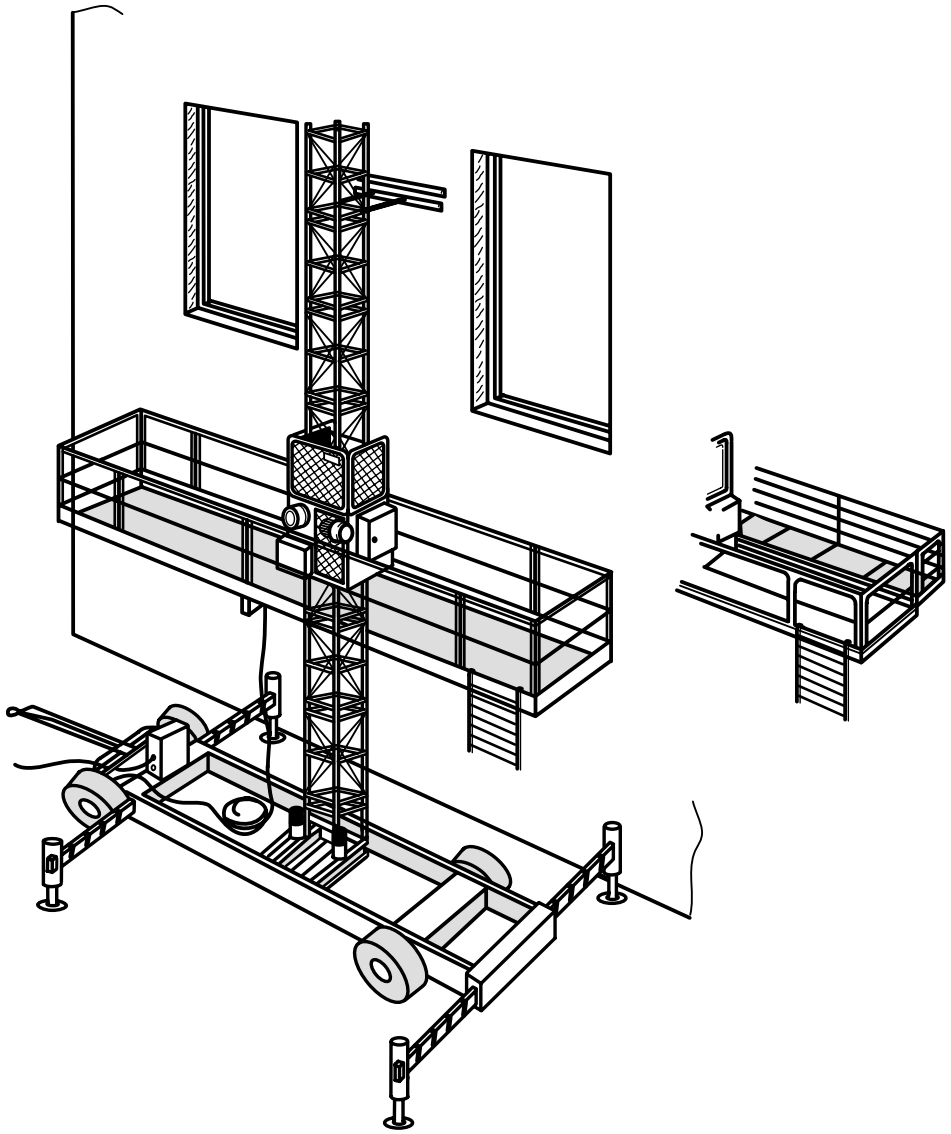
3.19
installer
person(s) responsible for installation, including erection, modification and dismantling of MCWPs

3.20
demonstrator
person(s) responsible for the management of safe use, inspection, servicing and maintenance of MCWPs and the induction of users on the site

3.21
operator
person(s) responsible for the operation and limited transfer on site of mobile MCWPs

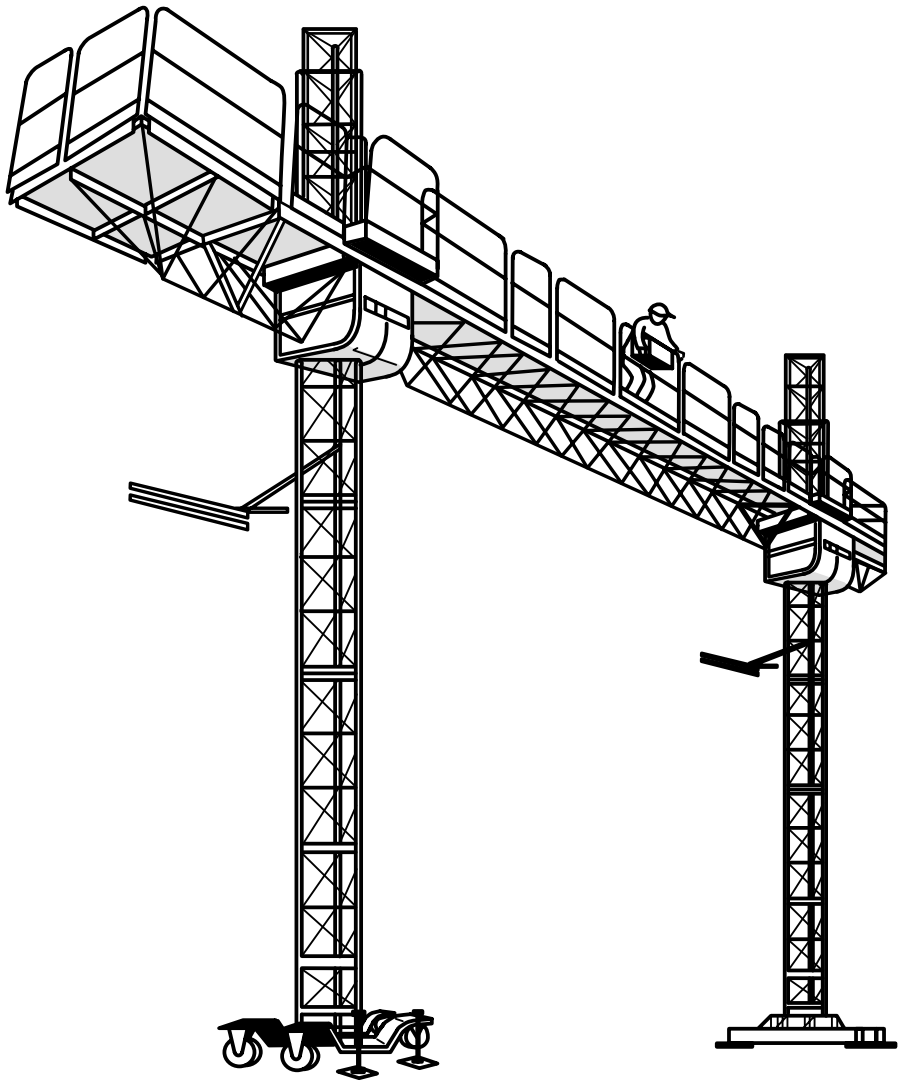
3.22
user
person(s) responsible for the raising or lowering of MCWPs

3.23
mobile MCWP installation
MCWP installation with no more than two ties, which is suitably designed for horizontal transfer on site



NOTE Base protection omitted for clarity.

Figure 1 — Typical single mast mobile MCWP



NOTE Base protection omitted for clarity.

Figure 2 — Twin mast MCWP illustrating one fixed and one mobile chassis

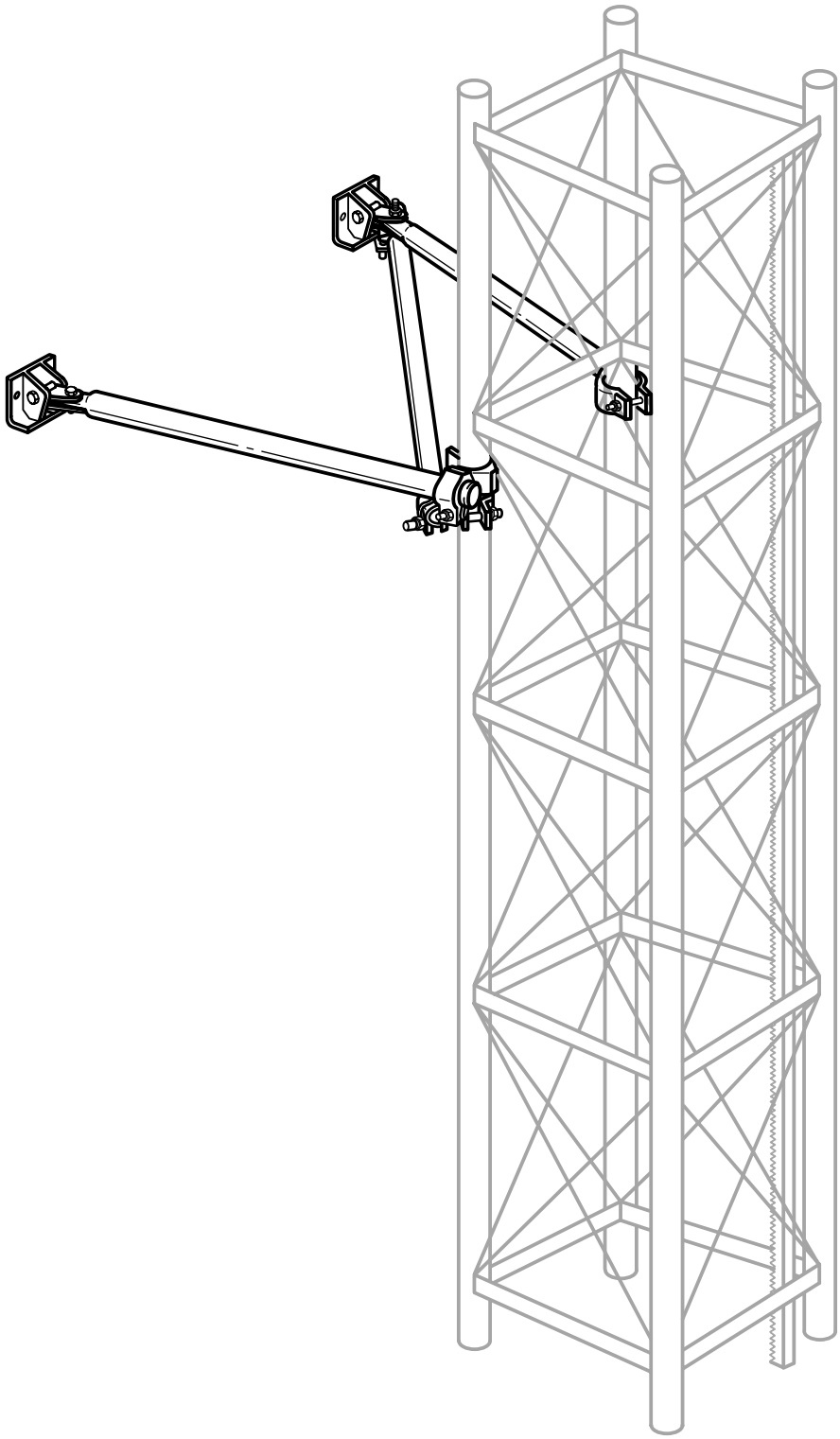


Figure 3 — Typical mast tie arrangements

4 Hazards associated with MCWP working

4.1 General

Clause **4** is intended to assist those persons undertaking risk assessments of the installation planning, erection, dismantling and use of MCWPs.

4.2 Erection and dismantling

The following is a typical, but not exhaustive, list of hazards that should be taken into account when erecting or dismantling MCWPs:

a) the consequences of manually handling heavy items;

b) the consequences of failing to bolt up the mast sections correctly;

c) the danger to ears, nose, throat and eyes from the ingress of material during the drilling of mast tie anchorages;

d) the consequences of failing to secure the mast ties correctly;

e) being on the work platform of an MCWP should it fall over due to the mast or the mast ties failing;

f) trapping of persons in the work platform mechanism;

g) the consequences of being on the work platform when the last ties are released during dismantling, if there is insufficient stability provided by the base frame or chassis alone.

4.3 Use

The following is a typical, but not exhaustive, list of hazards that should be taken into account when using MCWPs:

a) falling from the work platform;

b) being struck by tools, materials, etc. falling from, or on to, the work platform;

c) being underneath an MCWP and being struck or trapped during descent of the work platform;

d) trapping of persons between the work platform and fixed obstructions such as the building or scaffolding;

e) being on the work platform of a free-standing MCWP should it overturn due to lack of basic stability;

f) being stranded on the raised platform, e.g. due to power or control circuit failure;

g) being on the work platform if it descends out of control and hits the ground at overspeed;

h) contact with live electrical conductors;

i) the consequences of failing to properly inspect MCWPs in accordance with the manufacturer's instructions;

j) the possibility of overturn during transfer of mobile MCWPs.

5 Specification, installation planning, erection and dismantling of MCWPs

5.1 General

One person, the supplier-appointed person (see **3.17**), should be appointed to act on behalf of the supplier to have overall control of the specification, installation planning, erection and dismantling of MCWPs. This appointment does not remove any legal responsibility from the management but enables them to use his expertise to fulfil their responsibilities. The person appointed may have other duties and need not be an employee of the supplier organization but he should have adequate training and experience to enable these duties to be carried out competently.

5.2 Responsibilities of supplier-appointed person

The supplier-appointed person should establish and follow a safe system of work for every installation of a mast climbing work platform, whether it is an individual machine or a group of machines. The same principles should be applied to both fixed and mobile MCWPs.

The safe system of work should include the following:

a) risk assessments;

b) planning the installation and providing a suitable MCWP;

c) planning the erection and dismantling of each MCWP;

d) provision of instructions for the operation and maintenance procedures for MCWPs;

e) preparation of a method statement including the requirements for:

1) any necessary preparation of the site;

2) erection;

3) thorough examination and, where necessary, testing;

4) provision of the parameters and instructions for operation;

5) dismantling;

f) provision of properly trained and competent personnel for the installation and demonstration of MCWPs, who have been made aware of their statutory responsibilities;

g) ensuring that all necessary instructions, manuals, test certificates, load charts and other documents are available;

h) effective liaison with the management/user-appointed person.

The safe system of work should be communicated to all parties concerned, and monitored.

6 Management and control of MCWP operation

6.1 General

One person, the management/user-appointed person (see **3.18**), should be appointed to act on behalf of the user organization to have overall control of each specific MCWP operation. This appointment does not remove any legal responsibility from the management but enables them to use his or her expertise to fulfil their responsibilities. The person appointed may have other duties and need not be an employee of the user organization but he should have adequate training and experience to enable these duties to be carried out competently.

The training requirements for the management/user-appointed person are given in Table 1.

6.2 Responsibilities of the management/user-appointed person

The management/user-appointed person should establish and follow a safe system of work for every use of mast climbing work platform, whether it is an individual machine or a group of machines. The same principles should be applied to both fixed and mobile MCWPs.

The safe system of work should include the following:

a) risk assessments;

b) the induction of the users of MCWPs;

c) the preparation of a method statement for the work to be carried out from the work platform, including rescue arrangements for retrieving people trapped at height;

d) the inspection and maintenance of MCWPs in accordance with the suppliers instructions;

e) provide for adequate supervision by properly trained and competent personnel having the necessary authority;

f) prevent unauthorised use or movement of MCWPs at all times;

g) consideration for the safety of persons not involved in MCWP operation;

h) arrangements for the effective monitoring of wind speed;

i) effective liaison with the supplier-appointed person.

The safe system of work should be communicated to all parties concerned, and monitored.

7 Personnel and training

7.1 Selection

Suitable personnel who are competent to carry out all duties required should be selected to carry out the operations safely. Records of training and experience of persons should be consulted to assist in selection.

Persons responsible for selection of personnel should ensure that personnel are efficiently organized to ensure good teamwork. Personnel should not be under the influence of alcohol, drugs or other impairments to efficiency. All personnel should be aware of their duties. Personnel undergoing training should be properly supervised.

NOTE Attention is drawn to The Management of Health and Safety at Work Regulations 1999 [1].

7.2 Minimum attributes of personnel

All personnel should be:

a) competent to perform tasks required of them;

b) trained and/or successfully assessed;

c) able to present a record of training and assessment;

d) physically able to undertake the appointed tasks.

7.3 Training arrangements

The responsibility for determining the training needs of persons in respect of safety, and for making the necessary arrangements for training, rests with the individual employer. In the case of self-employed persons, the responsibility rests with themselves.

The tasks associated with the provision and use of MCWPs at work sites, and for which training should be provided, are as follows:

a) MCWP specification/configuration;

b) installation planning;

c) erection and dismantling;

d) operation, use and inspection;

e) maintenance;

f) testing and examination.

Table 1 gives the training needs analysis relating to the above tasks.

Table 1 — Mast climbing work platform training needs analysis

JOB TITLE	RESPONSIBILITIES	BASIC SKILLS REQUIRED	TRAINING NEEDS
Supplier-appointed person	Technical competence • to undertake appropriate assessment • to specify and design MCWP configurations • to survey site and identify obstacles • to plan installation of MCWPs to site • to specify and design anchors/ties required • to prepare method statements for all aspects of the installation • to induct others in safe operation and use • to induct and instruct others in daily/weekly inspections and servicing	Minimum 2 years practical experience Fully physically fit Basic mechanical/electrical awareness Basic construction and health and safety awareness	Manufacturer's model specific training Complete understanding of manufacturer's training manuals Model specific tie/load chart awareness Awareness and competence to licensed "installer" level of training Health and safety awareness Risk assessment guidance
Management/ user-appointed person	Technical competence • to comprehend basic mechanical/electrical parameters of MCWP installation • to plan all aspects of work scheduled to be done from MCWPs • to prepare method statements for individuals and materials working from MCWPs • to plan for all aspects of general site safety and risk awareness	Minimum 2 years practical experience Fully physically fit Basic mechanical/electrical awareness Basic construction and health and safety awareness	General site (personnel and materials) planning Health and safety awareness Awareness and competence at least to "user" level of training Risk assessment guidance
Installer	Technical competence • to plan job/site • to erect/dismantle safely including anchor/tie technology and pull/torque testing • to understand MCWP configuration parameters (manufacturer/model specific) • of inspection and servicing requirements including motor generator and basic electrics (general and manufacturer/model specific) • of testing requirements after erection (general and manufacturer/model specific) • to operate machine and have thorough knowledge of all emergency/safety systems Instruction competence to induct users in safe operation and use, including all emergency/safety systems	Minimum 2 years practical experience Fully physically fit Basic mechanical/electrical awareness Basic construction and health and safety awareness	Basic erection/dismantle course (model specific) Basic servicing/electrical course (model specific) Basic engineering parameters course (model specific) Basic legislation awareness Health and safety awareness Safety systems and emergency procedures Risk assessment guidance

Table 1 — Mast climbing work platform training needs analysis *(concluded)*

JOB TITLE	RESPONSIBILITIES	BASIC SKILLS REQUIRED	TRAINING NEEDS
Demonstrator	Technical competence • to plan job/site • to understand MCWP configuration parameters (manufacturer/model specific) • of inspection and servicing requirements including motor generator and basic electrics (general and manufacturer/model specific) • of testing requirements after erection (general and manufacturer/model specific) • to operate machine and have thorough knowledge of all emergency/safety systems • Complete knowledge of daily and weekly MCWP inspection procedures and requirements Instruction competence to induct users in safe operation and use, including all emergency/safety systems	Minimum 2 years practical experience Fully physically fit Basic mechanical/electrical awareness Basic construction and health and safety awareness	Basic servicing/electrical course (model specific) Basic engineering parameters course (model specific) Basic legislation awareness Health and safety awareness Safety systems and emergency procedures Risk assessment guidance
Operator (Mobile)	Competent to operate MCWPs and complete familiarity with safety systems Complete knowledge of all emergency and safety descent systems Complete knowledge of SWL and load distribution parameters as defined in load charts Complete knowledge of daily and weekly MCWP inspection procedures and requirements Technical competence • to transfer mobile units on site • dismantle and reinstall masts and ties of mobile MCWPs to original configuration	Physically fit Basic health and safety awareness	Basic operator induction Basic inspection and testing Safety systems and emergency procedures Mechanical instruction on handling components Basic engineering parameter instruction with emphasis on stability and ground conditions Risk assessment guidance
User	Competent to operate each specific MCWP and complete familiarity with safety systems Complete knowledge of all emergency and safety descent systems Complete knowledge of SWL and load distribution parameters as defined in load charts	Physically fit Basic health and safety awareness	Basic operator induction Basic inspection and testing Safety systems and emergency procedures

Confirmation of the training given, including its scope and any attainments or competencies achieved, should be given by the training company to the trainee, and to his/her employer, in writing.

8 Planning of the installation

8.1 General

No-one should be responsible for specifying MCWPs, or planning an installation, or alteration to an installation, unless they are competent in this work. Such competence will have been gained by appropriate training and relevant experience under supervision, and may be verified by entries in their record of attainment.

Plans should be periodically reviewed in the light of changing site circumstances.

8.2 Planning

In selecting an MCWP and planning the installation the supplier-approved person should refer to the MCWP operating specification and installation instructions provided by the manufacturer. A site survey is necessary.

A checklist for a site survey should include the following.

a) Establish primary purpose that MCWPs will be used for with the client at outset, together with any other additional requirements there might be for the unit, e.g. prevention of falling debris.

b) Length of work platform required and the work platform configuration, including any edge extensions, for the full duration of the installation.

c) Mast positions.

d) Maximum height of travel.

e) Work platform loading capacity and method of loading to be agreed with the management/user.

f) Access and egress of personnel and materials.

g) Ground/supporting base conditions (levels and load bearing capacity).

h) Area conditions around base with particular relevance if an MCWP is mobile and is to be moved whilst on site.

i) Tie fixing point strengths and fixing point details on the structure, including suitable means of access to such points for installation and dismantling.

j) An assessment (by the management/user-appointed person) will be necessary of the strength of the structure both horizontally and vertically to support MCWPs.

k) Uninsulated electrical conductors in the vicinity of MCWPs should be adequately shielded/moved.

l) Windows or doors opening into path of work platform. Will an MCWP block any fire escape routes?

m) Balconies or voids that necessitate special guarding methods or create special trapping hazards.

n) Are the power supply and connection arrangements suitably located with adequate earth protection and power capacity?

o) Extent of ground level fencing of MCWP requirements.

p) Access provisions to and from site for MCWPs – details/obstacles. In addition suitable task lighting should be available for these operations.

q) Transfer clearances for mobile MCWP movement.

r) Are there any cable snagging hazards?

s) Access provision for maintenance.

8.3 Method statement

Details gained during the site survey should be used to compile a clear written method statement describing the safe system of work for erection and dismantling. This should be a comprehensive, job specific procedure for the work to be carried out, and should include such information, explanations, detail and diagrams that all concerned with the authorisation, erection and dismantle are clear of their specific duties. It should also include or make reference to the risk assessments for all the work activities connected with the delivery, site handling, erection, use, dismantling and collection of MCWPs. This method statement should be issued and understood by all involved in the installation/dismantling of MCWPs.

9 Siting of MCWPs

9.1 General

MCWPs should only be used on suitable surfaces that are level and firm, and within the tolerances specified by the manufacturer. Where the ground is other than well made concrete (or similar) in good condition, suitable load spreading plates should be used under base, and these should be specified in the method statement. A suitable supply of metal or timber spreaders should be included in the inventory of parts to be sent to site with MCWPs, or agreed for the site to provide.

Special care should be taken in assessing the strength of roof/floor members, and spreading the load adequately, if MCWPs are to be supported other than directly on the ground.

In specifying the base frame or chassis, care should be taken to ensure that it will provide adequate stability before the mast ties are secured during erection, and after the mast ties have been removed during dismantling.

The mast(s) should be tied to structural members of the building unless adequate strength of alternative tie locations can be assured (typical tie fixings are shown in Figure 3). The building or structure should be assessed to ensure that it can withstand the loads imposed by MCWPs, the load parameters to be provided by the supplier-appointed person to the management/user-appointed person.

The possible effects on MCWPs of all reasonably foreseeable weather conditions (i.e. high winds) for the duration of the installation, erection and dismantling should be taken into account. Additionally, MCWPs should not be positioned where it is likely to be struck or damaged by site or other vehicles or by unrestrained swinging loads. Protection of installed MCWPs from interference by unauthorized personnel should also be considered.

If designated fire escapes will be obstructed, this should be reconciled with the Local Fire Authority (see also the section headed “Safety at the Work Site” below).

9.2 Access to the platform at the boarding point

9.2.1 *General*

Safe and convenient means of access should be provided to the work platform. This should be from one level only. If a raised fixed landing is provided for access to the work platform, then care should be taken not to create a foot-trapping hazard. If this landing is at height and the possibility of falling exists then it should be protected when an MCWP is in a remote position.

9.2.2 *Sites accessible to the public*

Where MCWPs are erected in a place accessible to the public, access to the MCWPs should be prevented by fencing at ground level to a height of at least 2 m. The management/user-appointed person shall ensure that the fencing is properly maintained and kept in place.

9.2.3 *Sites not accessible to the public*

9.2.3.1 *General*

Where MCWPs are erected within a construction site bounded by perimeter fencing that prevents public access, the management/user-appointed person with the assistance of the supplier-appointed person shall conduct a risk assessment to determine the safeguarding arrangements required to prevent and/or reduce the risk of injury of:

a) being trapped and/or crushed by the descending platform;

b) being struck by falling debris.

The management/user-appointed person should consult with the supplier-appointed person and review the risk assessment whenever there is any change of work practice at the base of the platform for the duration of the installation.

9.2.3.2 *Risk of crushing and or trapping*

The risk assessment shall take account of the following factors.

a) How frequently is it intended that the platform will descend to ground level?

NOTE If the boarding point is situated at an upper storey then there is no need for a base enclosure.

b) For mobile MCWPs, how frequently will the machine be transferred to a new location?

c) The location of any trapping points between the descending platform and the structure and the severity of injury that could occur.

d) The safety devices provided on an MCWP. MCWPs constructed in accordance with BS EN 1495 are provided either with adequate guarding or where that is not possible, operate an audible alarm during the final descent. The management/user-appointed person's risk assessment should take into account the effectiveness of any such alarms fitted. Will workers at ground level hear the audible alarm above the background noise, such as passing vehicles?

e) Will the MCWP user have good visibility of the area underneath the length of the platform?

Where the risks are assessed to be low, e.g. where the frequency of descent of the platform to ground level is less than once an hour, the machine alarms are assessed as satisfactory, and the MCWP user has unobstructed visibility, then localized low barriers can be provided to deter access. These barriers should be robust such as scaffold frames or proprietary systems similar to those used for protecting around road works. Tapes and bunting are not suitable. Signs warning of the descent of the platform should be erected.

The management/user-appointed person shall ensure that the fencing is properly maintained and kept in place.

9.2.3.3 *Risk of being struck by falling objects*

Prevention of objects falling from the work platform is best addressed in the system of work adopted on the platform and will vary depending upon the application. For example, concrete spraying/chipping would require the platform to be fitted with solid or mesh platform sides.

There can be a risk of falling objects to the personnel working on the platform, which should be assessed. Devices such as nets and fans can be utilised either on the platform or at other levels to collect falling objects.

9.3 Traffic access

If the base of an MCWP is erected in an area accessible to vehicles, arrangements should be made to divert traffic and secure the area against vehicle incursion, if this is reasonably practicable. If not, then suitable kerbs, barriers, cones, lights, signs, etc. should be provided in accordance with the method statement prepared by the management/user-appointed person.

10 Installation

10.1 Installation personnel

No-one should be allowed to erect or dismantle an MCWP unless they are trained and authorized to do so, or are undergoing formal training under supervision. Training and assessment should be carried out to a formally documented scheme, see clause **7**.

All personnel carrying out the erection or dismantling of MCWPs should be physically and mentally fit to undertake the work. This should be assessed at the pre-employment stage with the advice of an occupational health professional.

10.2 Erection

Personnel carrying out the erection of MCWPs should ensure that they obtain a clear method statement produced by the supplier-appointed person who planned the job. They should familiarize themselves with the task to be carried out, raising any areas of concern or lack of clarity with the method statement originator. Before starting work they should also ensure that they have the required information, tools and equipment, and that any safety measures such as exclusion zones around the work area are in place. If any guarding is required to be removed during erection, a safe system of work should be adopted with particular attention to hazards.

The installer must be aware of the maximum load capacity of the work platform during all stages of erection/dismantling and take into account the number of persons, mast sections, ties and other equipment on the deck at any time. It is essential that the maximum load is not exceeded in any circumstances.

If at any stage during the erection process, the installer encounters any problems with the prescribed method or is concerned about any aspect of the method statement, they should consult the method statement originator (usually the supplier-appointed person) before proceeding further. In any case, no significant change to the planned method should be made unless it has been considered and agreed by a person competent to plan MCWP installations.

It is vital that installers do not allow their attention to be distracted from any unsecured mast section on the mast assembly until that section has been bolted (or otherwise fixed) in place. A number of accidents have occurred in the past where mast sections have been left unsecured and the work platform has been subsequently driven onto the unsecured mast with disastrous consequences.

After the installation has been completed and before an MCWP is taken into use, the installer should ensure the following:

a) that the installation is complete;

b) that the MCWP is not fouling the structure anywhere in its travel;

c) that all mast sections and mast ties are secure;

d) that all safety interlocks, including limit switches, are working correctly;

e) that the electricity supply cable is coiling or reeling correctly;

f) that the MCWP is responding correctly to the controls;

g) that the MCWP has been thoroughly examined and tested in accordance with clause **12**;

h) that the correct rated load for the configuration is clearly and durably marked on the work platform;

i) that all guards are reinstated correctly.

10.3 Alteration

Once the initial installation has been completed in accordance with the method statement, no modification to the installation should be allowed without a reassessment by a competent and authorised person (usually the supplier-appointed person). This should include a full study of the proposed modification implications for safety during the remainder of the MCWP's planned use and its subsequent dismantling. Before starting any alterations to the installation the installers should be in possession of written authorization or, where appropriate, a new method statement from the person making the reassessment.

10.4 Dismantling

Before dismantling an MCWP, the persons carrying out the dismantling operation should check the following.

a) That there have been no significant changes from the original installation that might adversely affect the safety of the dismantling operation (e.g. missing or loose mast ties, fixing bolts, changed ground conditions or alterations to the base frame).

b) That there are no visible signs of stress or weakness in the MCWP or ties which might affect the safety of the dismantling operation.

c) That the base frame or chassis will provide sufficient stability, in all directions, when the last mast tie has been released.

d) That the maximum number of mast sections and ancillary equipment that can be carried by the work platform, and their required distribution such as not to exceed the rated load, is known by all those taking part in the dismantling.

During the dismantling, special care should be taken to ensure that the load building up on the work platform from dismantled components does not exceed the rated load (see **3.1**).

11 Operation, use, maintenance and inspection of MCWPs

11.1 Operation and use of MCWPs

No-one should be allowed to operate or work from MCWPs unless they are familiar with its correct operation. In particular, they should be able to:

a) interpret the maximum loading and load chart correctly;

b) estimate with sufficient accuracy for safety, the weight of any loads that they might place on the work platform;

c) lower the work platform safely if the electric power should fail;

d) carry out routine checks and inspections;

e) awareness of wind speed criteria.

MCWP users should be inducted into a formally documented scheme, see clause **7**.

11.2 Transfer

The transfer of MCWPs involves a serious risk of overturning that should be suitably addressed. The following factors should be considered as a minimum:

a) the load bearing capacity and evenness of the ground to be transferred over;

b) the wind speed during this operation;

c) proximity hazards to the path of transfer;

d) whether the outriggers or stabilizers can be correctly positioned during the full distance of transfer;

e) the frequency of movement and the training experience of those undertaking the transfer.

MCWPs should not be transferred unless they are specially designed for that purpose and then only while the work platform is at its lowest position.

NOTE The manufacturer's instructions may require the outriggers or stabilizers to be left wholly or partially extended during transfer and may place restrictions amongst others, on the height of the erected mast or the amount of mast carried on the platform deck itself.

11.3 Daily checks

At the beginning of each shift or working day, the management/user-appointed person should ensure MCWPs are checked to ensure that it is in a fit condition to start work. If the person who conducts the checks is unsure of the effect of a defect to the safety of the machine, they should consult the management/user-appointed person.

NOTE For typical checklists for daily checks see Annex A.

11.4 Weekly inspections

Once a week MCWPs should be inspected to ensure that no damage or wear has occurred and that all safety systems are functioning correctly. This inspection should be carried out by a person who has been assessed as competent to carry out this task.

NOTE For typical checklists for weekly checks see Annex A.

The results of the weekly inspection should be recorded in a retrievable form.

11.5 Maintenance of MCWPs

MCWPs should be maintained in accordance with the manufacturer's instructions. Maintenance should be carried out at intervals that take into account the intensity of use, operating environment, variety of operations and the consequence of malfunction or failure. Maintenance should only be carried out by persons who are both familiar with the equipment and competent to carry out the work, or who are in the process of gaining experience and are working under supervision. Maintenance schedules should be based on the manufacturer's instructions. The schedules should aim to prevent deterioration of safety critical parts and ensure their replacement before failure occurs.

It is generally more appropriate to carry out major maintenance on MCWPs while they are not erected or in use. MCWPs should therefore only be erected if they have recently been serviced and inspected, and any defects rectified and are known to be in good and safe condition. It is however also necessary to properly maintain MCWPs while they are installed and in use and sufficient time should be allowed in the site programme for maintenance to be carried out effectively.

Comprehensive records should be kept of all maintenance and servicing carried out on MCWPs and be made available to the competent person carrying out a thorough examination.

11.6 Use of safety harnesses

The work platform of an MCWP is provided with guard-rails and toe boards to protect the occupants from falling. Consequently the use of harnesses is not required during use of MCWPs unless any part of the guard-rail system has been removed (e.g. to enhance access to the façade of a building), in which case a risk assessment should be carried out to ascertain the need for, and specification of, fall arrest/work restraint equipment. Similarly, the risk of installers falling during erection and dismantling operations should be assessed.

Before attaching fall protection equipment to the work platform it is important that the management/user-appointed person should ascertain both the location and suitability of anchor points.

12 Thorough examination and testing of MCWPs

12.1 General

Thorough examination (including testing) of MCWPs should be carried out by a competent person after erection and before being taken into service, and after the occurrence of a dangerous incident and before being put back into service, and at least once in every six months thereafter.

The thorough examination is to determine whether MCWPs can be taken into service following installation and subsequently used with safety until at least the date of the next thorough examination. It also indicates whether MCWPs are being adequately maintained. While a thorough examination may form an important part in monitoring standards of maintenance, it is not a substitute for such maintenance and it does not relieve the employer of his continuing duty to maintain MCWPs in a safe condition.

The thorough examination should include a visual inspection (see Annex B).

12.2 MCWPs tied to the building or structure

12.2.1 With a test load of 110 % of the rated load, distributed as it would be for the rated load, the work platform should be elevated to the first tie, and then lowered to the base position. Checks should be made to ensure that MCWPs respond properly and show no signs of distress.

NOTE Mast sections may be used as test weights if their weight is accurately known.

12.2.2 The work platform (unloaded, or lightly loaded) should be run through its full range of travel and all limit switches checked to ensure that they are working and are correctly set. Checks should also be made to ensure that the work platform to building clearances are adequate and that there are no voids through which persons could foreseeably fall. The audible alarm (if fitted) should be checked to ensure that it functions with the work platform at the correct elevation, and that there is no indication of structural distress anywhere on an MCWP or with the supporting building or structure.

12.2.3 Tie fixings should be tested in accordance with the instructions in the method statement and manufacturer's recommendations.

12.2.4 A drop test, where deemed appropriate by the supplier-appointed person, should be carried out in accordance with the manufacturer's instructions. This should be carried out with a test load of at least 110 % rated load on the work platform. Before the tests, ensure that the buffers on the base frame are in their correct position, and do not carry out a test with the work platform at an unnecessary height.

12.3 MCWPs free-standing

12.3.1 Ensure that the maximum safe height of mast(s) in respect of stability is accurately known, and is not exceeded.

12.3.2 With a test load of 110 % of the rated load, distributed as it would be for the rated load, the work platform should be elevated to at least 3 m above the ground, and then lowered to the base position. Checks should be made to ensure that MCWPs respond properly and show no signs of distress.

NOTE Mast sections may be used as test weights if their weight is accurately known.

12.3.3 The work platform (unloaded, or lightly loaded) should be run through its full range of travel and all limit switches checked to ensure that they are working and are correctly set. Checks should also be made to ensure that the work platform to building clearances are adequate and that there are no voids through which persons could foreseeably fall. The audible alarm (if fitted) should be checked to ensure that it functions with the work platform at the correct elevation, and that there is no indication of structural distress anywhere on the MCWP or with the supporting building or structure.

12.3.4 A drop test, where deemed appropriate by the supplier-appointed person, should be carried out in accordance with the manufacturer's instructions as soon as sufficient mast sections are assembled.

12.4 Extent of thorough examination

The competent person (see **12.6**) may require the thorough examination to be augmented by additional tests and/or examinations, dismantling or access to, or removal of, hidden parts.

The competent person may employ specialists to carry out specific parts of the thorough examination that the competent person may consider necessary, e.g. NDT or assessment of the safety-related parts of the electrical control system. It is the responsibility of the competent person to specify precisely what is required and to ensure that such work is effectively managed and that the result of such work is assessed accurately in relation to its significance to the MCWP.

12.5 Thorough examination reports

The results of the thorough examination should be reported and recorded in a suitable form.

NOTE See schedule 1 of LOLER [2].

In the report, the competent person (see **12.6**) should state clearly if the installation is safe to be used or to continue in use.

12.6 Competent persons

A person chosen to act as a competent person in the thorough examination of MCWPs should have sufficient practical and theoretical knowledge and actual experience of the machines to enable them to detect any defects or weaknesses, and to assess their importance in relation to the strength, stability and functions of MCWPs.

Further advice is given in LOLER [2].

13 Safety at the work site

13.1 Clearances and warning notices

After erection, a check should be made to ensure that clearances are sufficient and do not create trapping hazards. It should also be checked that windows cannot be opened into the path of the work platform and that warning notices are clearly displayed on balconies etc. where persons could lean into the path of the work platform.

Where two or more MCWPs are operating adjacent to each other or an MCWP is operating adjacent to a hoist, suspended scaffold, or other machine with separate controls, the minimum guaranteed clearance between possible shear points should be 500 mm. Where this is not reasonably practical additional guarding should be provided to prevent entry of the upper body into the crushing zone. Where MCWPs are operating against fixed scaffolding, or where there are possible whole body shear points between a work platform and the building or structure against which an MCWP is working, a minimum clearance of 150 mm should be provided, where this is reasonably practicable. If it is not reasonably practicable to provide such clearance, then physical safeguards against the trapping hazard should be provided. If it is not reasonably practicable to provide reliable physical safeguards, then clear and durable warning notices should be affixed in order to draw attention to the shear hazard.

Suitable, clear and durable notices warning of the danger and instructing persons to keep clear should be conspicuously displayed on ground level enclosures.

13.2 Maintenance of barriers

All barriers, enclosures, notices, etc. should be properly maintained for the duration of the installation.

13.3 Electrical hazards

Adequate precautions should be taken to ensure that persons on the work platform are not at risk from live electrical conductors, (attention is drawn to the Electricity at Work Regulations 1989 [3]).

NOTE HSE Guidance Note GS6 Avoidance of danger from overhead electric lines [4] gives advice regarding overhead conductors on construction sites.

13.4 Use with other plant

Where MCWPs are to operate near to other plant such as cranes, and especially where any part of the plant or load can occupy the same space that is traversed by the work platform of an MCWP, suitable arrangements should be made to ensure safety. In particular, each operator should have an adequate field of vision and be able to communicate reliably with other operators, so far as this is reasonably practicable.

13.5 Removal of guard-rails and toe-boards

The guard-rails adjacent to the structure should only be removed if the building will effectively prevent anyone falling through the gap (see BS EN 1495 for tolerances).

13.6 Use as props or jacks

MCWPs should not be used as props or jacks.

13.7 Rated load

The rated load for MCWPs should be separately calculated (with reference to the manufacturer's instructions) for each installation and then clearly and durably displayed on the MCWP. It should not be exceeded (except during authorized testing). Attention should be paid to the hazard presented by the build up of debris, snow, ice, water etc.

13.8 Alterations and additional fixed loads

MCWPs should not be altered or additional fixed loads (such as advertising signs, etc.) added, unless an authorised and competent person has evaluated the effects of wind loading, etc. and the rated load has been reduced where necessary.

13.9 Restriction

MCWPs are normally operated within the scope of the manufacturer's intended use; they are not designed for the transference of persons, materials or equipment into the structure.

Where the management/user-appointed person, has considered all the alternatives and the risk assessment demonstrates that the use of an MCWP is outside the scope of, but the most practical and safest means of working, he or she should ensure that the following actions are carried out.

a) The supplier-appointed person should consult the MCWP manufacturer to establish whether the platform and masts can withstand the forces, moments and vibration imposed.

b) The supplier-appointed person should ask the manufacturer if any additional maintenance and inspection is required.

c) If an MCWP is used outside of the manufacturer's intended use, the supplier-appointed person should draw up an explicit individual method statement that is communicated to all those involved in carrying out work on or near the platform. Special attention should be given to the provision of safeguards to prevent persons and goods falling during transfer from platform to building.

NOTE Three possible out-of-scope applications could be to use MCWPs to:

a) provide edge protection during roof work on a high rise building;

b) transfer of large awkward materials into the structure;

c) transfer windows and frames into a building prior to fitting from the inside.

13.10 Tandem mountings and bridges between work platforms

Work platforms should not be mounted in tandem or joined with bridges unless:

a) the arrangement has been evaluated by a person competent and authorized to plan MCWP installations, in conjunction with the manufacturer or other competent designer;

b) at all times the control arrangements are such that the work platforms and bridges automatically remain in their correct relative position and are horizontal;

c) bridges are positively connected to both work platforms;

d) all masts are parallel;

e) the MCWPs are de-rated by at least 25 % after account is taken of all loads imposed, e.g. the weight of any bridges etc.;

f) the MCWPs are of identical design and type or are designed for that purpose.

13.11 Emergency contingency

Whilst it is possible that a platform can become stranded at height with persons on board it is strongly recommended that at all times adequate means of communication or signalling are to hand to those persons to alert others to facilitate safe egress. Provision of such means is the management/user-appointed person's responsibility.

Annex A (informative)
Typical check lists for daily and weekly inspections

A.1 Daily checks

At the beginning of each shift or working day, the management/user-appointed person should make certain that MCWPs are checked for obvious defects to ensure that it is in a fit condition to start work. If the person who conducts the checks is unsure of the effect of a defect to the safety of the machine, they should consult the management/user-appointed person.

Daily checks should encompass the following:

a) cleanliness and general indications of damage;

b) functioning of controls and safety devices (emergency stops, anemometers, two-way communication systems, overload/moment detecting and indicating devices, if fitted);

c) the means for emergency lowering and/or raising the work platform;

d) condition of rack and pinion drive system;

e) condition of guards;

f) ground-support conditions, including packing beneath stabilizers;

g) electric (trailing) cables, load information plates;

h) work platform gates, guard-rails, toe-boards and floor;

i) guide rollers between work platform and mast(s);

j) any additional checks as specified in the manufacturer's manual and/or during training by the competent person.

Check for possible obstructions in the path of MCWPs, e.g. scaffolding or newly erected structures.

A.2 Weekly inspections

Once a week the management/user-appointed person should make certain that the MCWP is inspected to ensure that no damage or wear has occurred and that all safety systems are functioning correctly. This inspection should be carried out by a person who has been assessed as competent to carry out this task.

Weekly inspections should include all those listed above for daily checks plus the following:

a) efficiency of chassis brakes (when fitted);

b) pressures and condition of tyres (when fitted);

c) safety gear (when fitted);

d) condition of mast(s) and racks, including the presence and effectiveness of the devices used to lock together adjacent mast sections;

e) correct functioning of limit switches, and interlocks on work platform gates and stabilizers;

f) any additional inspections as specified in the manufacturer's manual and/or during training by the competent person.

Annex B (informative)
Typical check lists for thorough examinations

The following items should be examined for integrity, condition and correct functioning (see definitions after list).

a) Base frame/chassis:
   1) enclosure fencing/barriers;
   2) outriggers.

b) Work platform:
   1) basic structure;
   2) floor;
   3) guard-rails;
   4) toe-boards;
   5) access gates;
   6) edge extensions;
   7) debris collection devices.

c) Drive system:
   1) motors/brake unit;
   2) gear boxes;
   3) racks and pinions;
   4) counter rollers;
   5) guide rollers;
   6) guards.

d) Control system:
   1) control panels;
   2) limit switches/proximity switches;
   3) cabling;
   4) trailing cable;
   5) overload monitoring system (when fitted);
   6) control station (when fitted).

e) Mast:
   1) rack security;
   2) connecting bolts;
   3) top section (rack removed);
   4) upper/lower travel limit switches.

f) Mast ties:
   1) tie member;
   2) mast fixing;
   3) supporting structure fixing.

g) Safety devices:
   1) safety gear;
   2) twin mast levelling system;
   3) emergency descent system;
   4) load chart/diagram information;
   5) other safety devices.

h) Mobile MCWP:
   1) brakes;
   2) tyres and wheels;
   3) steering;
   4) drive system;
   5) control system.

Integrity

Is the item in position, secure and complete?

Condition

Is the item free from excessive corrosion, wear, cracks or deformation?

Correct function

Does the item function correctly over its full range of operating parameters?

blank

Bibliography

BS 7171, *Specification for mobile elevating platforms.*

BS EN 12158-1, *Builder's hoists for goods.*

BS EN 12159, *Builder's hoists for goods and passengers.*

BS EN 81, *Safety rules for the construction and installation of lifts.*

BS EN 1570, *Safety requirements for lifting tables.*

BS EN 1808, *Safety requirements on suspended access equipment — Design calculations, stability criteria, construction — Tests.*

Other documents

[1] GREAT BRITAIN. The Management of Health and Safety at Work Regulations 1999. London: The Stationery Office.

[2] GREAT BRITAIN. Lifting Operations and Lifting Equipment Regulations (LOLER) 1998. London: The Stationery Office.

[3] GREAT BRITAIN. Electricity at Work Regulations 1989. London: The Stationery Office.

[4] GREAT BRITAIN. HSE Guidance Note GS6, Avoidance of danger from overhead electric lines 1997. Sudbury: HSE Books. (HSE GS6W is also available, which is the Welsh language version).

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