BRITISH STANDARD

BS ISO
15513:2000

Cranes — Competency requirements for crane drivers (operators), slingers, signallers and assessors

ICS 53.020.20

National foreword

This British Standard reproduces verbatim ISO 15513:2000 and implements it as the UK national standard.

The UK participation in its preparation was entrusted to Technical Committee MHE/3/11, Crane safety and testing, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled "International Standards Correspondence Index", or by using the "Find" facility of the BSI Standards Electronic Catalogue.

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Summary of pages

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Cranes — Competency requirements for crane drivers (operators), slingers, signallers and assessors

Appareils de levage à charge suspendue — Compétences requises pour les conducteurs (opérateurs), les élingueurs, les signaleurs et les contrôleurs

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 15513 was prepared by Technical Committee ISO/TC 96, *Cranes*, Subcommittee SC 5, *Use, operation and maintenance*.

Annexes A, B and C of this International Standard are for information only.

Introduction

The objective of this International Standard is to achieve uniform competency standards for work involving crane drivers (operator) slingers, signallers and their assessors.

Cranes — Competency requirements for crane drivers (operators), slingers, signallers and assessors

1 Scope

This International Standard gives competency requirements applicable for the selection, training, assessment and verification of crane drivers (operators), slingers, signallers and their assessors.

This International Standard does not cover additional competency requirements needed for special operations, e.g. man-lifting, pile-driving or pile-pulling.

NOTE 1 Responsibilities for the performance of tasks are given in ISO 12480-1. However, personnel need to be aware of the responsibilities of others; inclusion in the training programme should not infer any changes in responsibilities.

NOTE 2 For training of drivers (operators), see ISO 9926.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 4306-1:1990, *Cranes — Vocabulary — Part 1: General*.

ISO 4306-2: 1994, *Cranes — Vocabulary — Part 2: Mobile cranes*.

ISO 4306-3:1991, *Cranes — Vocabulary — Part 3: Tower cranes*.

ISO 9926 (all parts), *Cranes — Training of drivers*.

ISO 12480-1:1997, *Cranes — Safe use — Part 1: General*.

3 Terms and definitions

For the purposes of this International Standard, the definitions of crane types given in ISO 4306-1, ISO 4306-2, ISO 4306-3 and ISO 12480-1 apply, together with the following definitions. For definitions of crane personnel see also ISO 12480-1.

3.1
accreditation
process of granting official formal recognition to assessors and other successful candidates of competency assessments

NOTE Accreditation normally involves the provision of a statement of competency, an award or some other formal credit arrangement by a training authority, a vocational educational institution or an accreditation body.

3.2
accreditation body
organization which oversees the assessment of candidates to prescribed competency standards

3.3
assessment
process of judging competency against prescribed standards of performance

3.4
assessor
person who makes judgements of skills and knowledge of a crane driver (operator), slinger and/or signaller

NOTE The assessment process ensures that the outcome of the training and educational programmes presented to trainees provides the required standard of competency. The accreditation body manages the assessment system and ongoing accreditation.

3.5
competency
ability to perform the activities within an occupation or function to the standard expected in the task

NOTE Competent use and operation of industrial equipment is defined in terms of core knowledge and skills and applications required for particular types of work associated with the use and application of different classes of equipment. It covers demonstrated knowledge and skills in identifying hazards and eliminating or minimizing risks arising from hazards, safe and healthy work practices, and employer and employee responsibilities as defined in the general duties of care, occupational health and safety legislation.

3.5.1
competency standard
standard which reflects the specification of knowledge and skill, and the application of that knowledge and skill to the standard of performance required in the task

NOTE Competency standards are developed by the interested parties, based upon the organization of work, expressed in terms of workplace results, and should be regularly reviewed to ensure their continuing relevance to the workplace.

3.5.2
element of competency
basic building block of the unit of competency which describes an action or outcome which is demonstrable and assessable

3.5.3
unit of competency
discrete product comprising a title, a short description of purpose where appropriate, and the elements of competency, together with their associated performance criteria

NOTE Elements of competency describe the lowest logical, identifiable and discrete subgrouping of actions and knowledge which contribute to and build a unit of competency.

3.6
crane driver [operator]
person who operates the crane for the purpose of positioning loads or erecting the crane

NOTE 1 Adapted from ISO 12480-1.

NOTE 2 For mobile cranes, the term “operator’’ is often used instead of “driver’’, and the term “driver” is then used to refer to that person who operates only those controls which move the crane from place to place.

3.7
crane shut-down
preparation for leaving the crane unattended

3.8
performance criterion
evaluative statement which specifies what is to be assessed and the required level of performance

NOTE The performance criteria specify the activities, skills, knowledge and understanding which are evidenced by competent performance.

3.9
signaller
person responsible for relaying the signal from the slinger to the crane driver

NOTE The signaller may be given the responsibility for directing movements of the crane and load instead of the slinger, provided that only one person has the responsibility at any one time. For further information on signallers' duties, etc. see 5.5.1 and 5.5.2 in ISO 12480-1:1997.

3.10
slinger
person responsible for attaching and detaching the load to and from the crane load-lifting attachment and for the use of the correct lifting gear and equipment in accordance with the operating plan for proper positioning of loads

NOTE According to 5.4.1 in ISO 12480-1:1997, the slinger is responsible for initiating the planned movement of the crane and load. If there is more than one slinger, only one of them should have this responsibility at any one time, depending on their positions relative to the crane. For further information on slingers' duties, etc. see 5.4.1 and 5.4.2 in ISO 12480-1:1997.

4 Assessment

4.1 General

4.1.1 An assessment shall be made of the following persons:

a) assessor;

b) operator/driver;

c) slinger;

d) signaller.

4.1.2 The competencies which an assessor shall possess before being authorized as an assessor for the purposes of this International Standard are:

a) technical knowledge relating to the operation and management of the particular type of crane or slinging techniques for which the person is to be authorized to assess applicants; and

b) ability to judge competencies against prescribed standards.

4.1.3 The competencies which an operator/driver shall possess before being authorized to operate a crane or hoist are a technical knowledge and practical capability relating to the correct and safe operation of the particular type of crane (see 5.3.1 in ISO 12480-1:1997).

4.1.4 The competencies which a slinger shall possess before being authorized as a slinger are:

a) the application of slinging techniques and

b) the capability to direct the crane driver (operator).

4.1.5 The competency which a signaller shall possess before being authorized as a signaller is the application of signalling methods.

4.2 Written assessment

Where the assessment process includes a written assessment paper, the following criteria shall be observed.

a) The written assessment should be constructed to not exceed a duration of 60 min.

b) Sufficient time shall be given to a candidate to complete the test.

NOTE If the assessor becomes aware the candidate has a written-language deficiency, additional time may be permitted to complete the paper.

c) Assistance may be given to the candidate with a written-language deficiency. Any person rendering such assistance shall not prompt the candidate nor help the candidate in any other way. If the candidate has limited literacy skills, the answers may be accepted orally. In this case the assessor shall record all answers. In some certificate classes, specific literacy skills are required to meet the competencies, i.e. estimation or calculation of loads or reading of a load chart. In these situations, oral assistance shall not be rendered.

d) The candidate shall be suitably proficient in the language to be able to read the questions set in the assessment without assistance.

e) The candidate shall express the technical requirements for the assessment in a manner in which they can be correctly interpreted. Incorrect spelling or grammar shall not prejudice the result of the assessment.

f) If additional time or assistance has been permitted, this shall be clearly stated, with the reason, on the Assessment Report.

4.3 Oral assessment

Where the candidate has limited spoken ability of the language of the assessment, the assessor should provide additional explanation, without compromising the assessment, at a level appropriate to the work and equipment.

4.4 Results

In order to be considered “Competent”, the candidates shall achieve sufficient marks in every area and section to demonstrate competence. A candidate who does not attain such a result shall be considered “Not Yet Competent” and marked accordingly.

4.5 Reassessment

Where an assessment indicates “Not Yet Competent” in an area or section of the paper, the candidate may be reassessed for that area or section only after additional training in that area or section.

5 Competency requirements

5.1 General

Subclauses 5.2, 5.3 and 5.4 detail the parameters for assessing the skills and knowledge of the crane driver (operator), slinger and signaller.

5.2 Competency requirements for the crane driver (operator)

5.2.1 General

The requirements are subdivided into the following competency units:

a) Competency unit 1 — Access and secure equipment and work area

— Plan work,

— conduct routine checks and inspections,

— test controls and safety devices,

— shut down the crane.

b) Competency unit 2 — Secure and transfer load

— Secure load,

— conduct trial lift,

— transfer load.

c) Competency unit 3 — Set-up, assembly and disassembly of cranes where such operations are carried out by the crane driver

— Plan assembly/disassembly,

— set up crane,

— disassemble crane.

d) Competency unit 4 — Carry out special operations

— Displace crane,

— carry out multiple-crane lift.

5.2.2 Competency unit 1 — Assess and secure equipment and work area

5.2.2.1 Element of competence — Plan work

Performance criteria:

a) a workplace operations plan is developed in consultation with the relevant authorized workplace personnel. The plan takes into account job requirements, priorities, workplace rules and procedures, identified hazards and hazard control measures;

b) site hazards, such as those listed below, are identified and correct hazard control strategies developed in accordance with the appropriate standard:

   — overhead power lines;

   — trees;

   — overhead service lines such as steam, gas, water, telephone;

   — underground services;

   — uneven and/or unstable ground;

   — allowable floor loading as appropriate;

   — presence of other workers and persons;

— surrounding buildings/vessels/structures/equipment;

— hazardous materials;

— corrosive substances;

— barricades;

— inadequate lighting;

— radio interference;

— inclement weather;

— other equipment

c) emergency procedures are planned to take into account the location of first-aid and fire-fighting equipment, amenities and access/exit points in the workplace for emergency vehicles and emergency personnel. This includes, where necessary, deciding to abort crane operations where levels of illumination are inadequate;

d) precautions are taken to accommodate the effects of weather conditions in accordance with the appropriate standard. This includes, where necessary, deciding to abort crane operations where weather conditions exceed acceptable limits;

e) the operations plan ensures that the work area is correctly illuminated and restricted to authorized personnel only;

f) the crane load chart is located and information on permissible loads, radii, weights, boom and jib configurations noted and taken into account in operational plans;

g) the signals and signalling systems to be used are confirmed with associated personnel, in accordance with the appropriate standard;

h) the use of safety tags on electrical switches/isolators (where relevant) is noted and correct hazard control procedures developed in consultation with authorized personnel.

5.2.2.2 Element of competence — Conduct routine checks and inspections

Performance criteria:

a) routine pre-operational equipment checks are carried out in accordance with the checklist provided for the crane and all lifting attachments fitted to the crane;

b) the service log book for the cranes is checked to ensure all service requirements have been met and action taken as required;

c) prior to operation, equipment and site area are visually checked for any evidence of damage, structural weakness or interference, and any faults reported to an authorized person for corrective action. All defects shall be correctly recorded in the relevant log book.

5.2.2.3 Element of competence — Test controls and safety devices

Performance criteria:

a) the crane is started in accordance with equipment procedures and checks made for any abnormal noise or movement. Any abnormal operation is reported to an authorized person for corrective action;

b) the operating and emergency controls and safety devices are located and identified, and their correct operation tested in accordance with prescribed procedures;

c) all communication equipment, lighting and alarm systems are checked for correct operation;

d) damaged or inoperative controls, communication equipment, safety devices, guards, lighting or alarms, etc. are reported to authorized personnel for corrective action, and all defects entered into the crane´s service log book;

e) the operation radii of the crane for intended operations is/are verified and measured, taking into account the estimated increase in radius due to boom deflection. The boom is slewed at the planned radii to check that there are no unanticipated complications or obstructions of boom/load or tail-swing equipment.

5.2.2.4 Element of competence — Shut down crane

Performance criteria:

a) the crane is shut down using the correct sequence of procedures in accordance with manufacturer´s instructions;

b) routine post-operational equipment checks are carried out in accordance with the checklist provided for the crane;

c) the relevant motion locks and brakes are applied;

d) all lifting equipment is checked in consultation with associated personnel for any signs of wear or damage in accordance with the appropriate standard. All defects shall be correctly recorded in the relevant log book;

e) all damaged equipment is segregated and reported to an authorized person for corrective action or replacement. All defects shall be correctly recorded in the relevant log book;

f) the crane and equipment are correctly stowed and secured in accordance with manufacturer´s instructions and the appropriate standard.

5.2.3 Competency unit 2 — Secure and transfer load

5.2.3.1 Element of competence — Secure load

Performance criteria:

a) the mass of the load and rigging in use is correctly assessed in consultation with associated personnel;

b) the sling configuration and choice of lifting gear are checked, in consultation with associated personnel, to ensure:

   — they are appropriate for safe operation,

   — they will not damage the load,

   — they satisfy the requirements of the appropriate standard,

   — corrective action is taken when required,

   — all defects are correctly recorded in the relevant log book.

c) the use of packing or dunnage to protect the load or to facilitate the connection of lifting gear is checked for correct application in consultation with associated personnel. Corrective action is taken if required;

d) cranes fitted with lifting attachments (e.g. grabs, forks, clamps) shall be operated in accordance with the instructions of the lifting attachment manufacturer.

5.2.3.2 Element of competence — Conduct trial lift

Performance criteria:

a) a trial lift, particularly for near-capacity loads or loads of unusual weight distribution or shape, is carried out according to workplace procedures;

b) with the load just suspended off the lifting plane, checks are made in consultation with associated personnel that:

   — the load is correctly slung,

   — all crane equipment is functioning properly,

   — hydraulic or pneumatic systems (where relevant) are at the required operating pressure;

c) where a trial lift reveals an unacceptable operational situation, the load is lowered and appropriate corrective action taken;

d) where load-measuring devices are fitted, the assessed weight is verified and load/radius calculations are revised as required;

e) planned hazard control strategies are implemented.

5.2.3.3 Element of competence — Transfer load

Performance criteria:

a) load is hoisted and lowered into position using all relevant crane movements in accordance with the appropriate standard. The necessary movements may include:

   — luffing;

   — slewing;

   — hoisting (raising and lowering);

   — telescoping boom;

   — travelling.

b) jib is positioned to ensure load to be lifted is vertically under hook;

c) each load is assessed in consultation with associated personnel for the need for a tag handline. Where control of the load is critical, a decision is made to attach a suitable tagline;

d) all required signals are correctly given and interpreted in accordance with the appropriate standard;

e) planned hazard-control strategies are implemented.

5.2.3.4 Range statement for competency units 5.2.2 and 5.2.3

This range statement applies to competency units 5.2.2 and 5.2.3.

All elements are to be satisfied in the normal workplace environment(s) or equivalent.

The performance criteria for these units of competence is applicable to all configurations of the following cranes:

— tower cranes;

— derrick cranes;

— slewing cranes;

— bridge or gantry cranes;

— loader cranes;

— non-slewing mobile cranes;

— slewing mobile cranes.

5.2.4 Competency unit 3 — Set-up, assembly and disassembly where such operations are carried out by the crane driver

5.2.4.1 Element of competence — Plan assembly/disassembly

Performance criteria:

a) a suitable unobstructed level workplace site is selected for the assembly of the boom or jib;

b) a suitable firm and level standing is correctly chosen and prepared for the location of the crane;

c) the qualification of person(s) authorized to supervise the crane erection/dismantling are checked to verify they hold the required certificates/experience;

d) planned procedures for both the assembly and disassembly of the crane are developed in accordance with the appropriate standard and other statutory regulations.

5.2.4.2 Element of competence — Set up crane

Performance criteria:

a) the planned procedures for the assembly of the boom/jib are carried out in accordance with the manufacturer´s instructions and the requirements of the appropriate standard and other relevant statutory regulations;

b) the outriggers and stabilizers are correctly deployed in accordance with manufacturer´s instructions and the appropriate standard and other relevant statutory regulations;

c) plate packing is correctly used under the footplates to adequately distribute the load to ensure that the load capacity of the standing crane is not exceeded;

d) the block is reeved and the boom raised in accordance with the manufacturer´s instructions;

e) set operator's aids and confirm that they complement the crane configuration.

5.2.4.3 Element of competence — Disassemble crane

Performance criteria:

a) the planned procedure for the disassembling of the boom/jib are carried out in accordance with manufacturer´s instructions and the requirements of the appropriate standard and other relevant statutory regulations;

b) the outriggers and stabilizer are secured and stowed in accordance with manufacturer´s instructions;

c) planned hazard control measures are implemented.

5.2.4.4 Range statement for elements 5.2.4.1 to 5.2.4.3

This range statement applies to elements 5.2.4.1 to 5.2.4.3.

All elements shall be satisfied in the normal workplace environment(s) or equivalent.

The performance criteria for these elements of competence are applicable to all configurations of crane for which assembly/disassembly is performed or normally supervised by the crane driver/operator.

5.2.4.5 Element of competence — Erect and disassemble tower crane

Performance criteria:

a) plans are developed and/or interpreted for the erection, climbing and disassembly of tower cranes, in conjunction with associated personnel, in accordance with the appropriate standard;

b) certification/experience of associated personnel for the erection of tower cranes is confirmed;

c) planned procedures for the erection, climbing and disassembly of tower cranes are carried out in cooperation with associated personnel and in accordance with manufacturer's instructions and relevant requirements;

d) planned hazard control measures are implemented.

5.2.4.6 Range statement for element 5.2.4.5

This range statement applies to element 5.2.4.5.

All elements shall be satisfied in the normal workplace environment(s) or equivalent.

The performance criteria for this element of competence are applicable to all configurations of tower crane.

5.2.5 Competency unit 4 — Carry out special operations with mobile or tower cranes

5.2.5.1 Element of competence — Displacement of crane with or without load

Performance criteria:

a) route to be travelled is planned to ensure that the crane traverses firm and level surfaces;

b) where slopes are unavoidable, an authorized person is consulted to ensure the feasibility of operation and that the necessary hazard-control measures are in place;

c) the crane is displaced in accordance with the appropriate standard. This includes:

   — maintaining minimum speed;

   — gentle acceleration and braking (to minimize load swing);

   — carrying the load near to the ground surface;

   — use of tagline ropes.

5.2.5.2 Element of competence — Carry out multiple-crane lift

Performance criteria:

a) approval to carry out a multiple-crane lift is obtained from the appropriate authority.

b) the multiple lift is planned and approved by an authorized person, including:

— assessment of the share of the load to be carried by each crane;

— determination of the types of crane suitable for use;

— safety margins and hazard-control measures to be used in the lift;

— sequence of operations.

c) the previously planned operations are carried out under supervision of an authorized person in accordance with the appropriate standards, code of practice and other regulations.

5.2.5.3 Range statement for competency unit 5.2.5

This range statement applies to the competency unit 5.2.5.

All elements shall be satisfied in the normal workplace environment(s) or equivalent.

The performance criteria for this unit of competence apply to all configurations of crane.

5.2.5.2 is not applicable to tower cranes.

5.2.6 Evidence of competence for crane operation

Evidence of competence for crane operation includes the satisfactory application of:

— current legislation, standards and code of practice, and

— the hierarchy of hazard-control measures, with elimination, substitution, isolation and engineering control measures being selected before safe work practices and personal protective equipment.

5.3 Competence requirements for the slinger

5.3.1 General

The requirements are subdivided into the following competency units:

a) Competency unit 1 — Plan and prepare work

— Plan job,

— select and inspect materials and tools.

b) Competency unit 2 — Complete slinger's work

— Move loads

5.3.2 Competency unit 1 — Plan and prepare work

5.3.2.1 Element of competence — Plan job

Performance criteria:

a) potential hazards associated with the use of cranes and other load moving equipment are identified and measures to eliminate or control these hazards are planned;

b) site information is obtained as necessary.

c) potential hazards are identified, such as:

- overhead power lines;
- trees;
- overhead service lines, such as for steam, gas, water, telephone;
- underground services;
- uneven and/or unstable ground;
- allowable floor loading as appropriate;
- presence of other workers and persons;
- surrounding buildings/vessels/structures/equipment;
- hazardous materials;
- corrosive substances;
- barricades:
- inadequate lighting;
- radio interference;
- inclement weather.

d) optimum accident prevention and hazard control measures are selected;

e) adequate site access and exit is identified;

f) coordination requirements with other site personnel are determined;

g) appropriate mass, centre of gravity and dimensions of load are determined or confirmed, so that the method of slinging can be established.

h) appropriate lifting gear equipment is identified including:

- slings;
- rope;
- shackles;
- eye bolts;
- spreader beams.

i) appropriate approvals for work and for personnel are checked;

j) job method and sequence are developed to include hazard removal, control measures and safety procedures;

k) job feasibility and schedule are checked with the client, and other persons as necessary;

l) job plan is developed to include hazard prevention/control measures and to applicable standards, codes of practice and to equipment manufacturer´s specifications;

m) existence of appropriate instructions from the load designer is checked. The designer is consulted for appropriate instructions for more complex load-movement tasks where written instructions are not provided.

5.3.2.2 Element of competence — Select and inspect materials and tools

Performance criteria:

a) appropriate lifting gear equipment are selected according to 5.3.2.1 g) and h);

b) appropriate lifting gear and tools are inspected. Damaged or worn items are labelled and rejected;

c) sets of lifting gear are selected and assembled according to standards and code of practice where appropriate;

d) where appropriate, rated capacity is calculated according to standards.

5.3.3 Competency unit 2 — Complete slingers work

5.3.3.1 Element of competence — Move loads

Performance criteria:

a) load moving is performed in accordance with planned hazard removal and control measures to acceptable safe work practices and appropriate standards, codes of practice, guides and manufacturer´s specifications;

b) lifting gear is connected to load to manufacturer´s specifications, guides and standards, where appropriate;

c) load is connected to movement device with appropriate techniques using appropriate equipment, including all types of:

   — slings;

   — rope;

   — shackles;

   — eye bolts;

   — spreader beams.

d) appropriate communication and signal methods are used to coordinate the load movement with safety, including signals to:

   — stop/emergency stop;

   — raise;

   — lower

   — slew left and right;

   — luff jib up and down;

   — extend jib;

   — retract jib.

Signals are given for loads both within sight and out of sight of the crane driver/operator.

e) the load is moved with due regard for load centre of gravity, access, obstacles, wind conditions and final resting position(s);

f) any specifications given by the designer relative to the load are followed;

g) the stability of the load is ensured throughout the load movement procedure.

5.3.4 Range statement for slinger's competency

This range statement applies to the whole unit.

All elements shall be satisfied in the normal workplace environment(s) or equivalent.

Equipment is to include slingers work only, i.e. the application of slinging techniques including the selection and inspection of lifting gear and the direction of the crane/hoist operator in the movement of the load, including when the load is out of view of the driver (operator).

Signals for load moving are given using any of the following methods:

— verbally with correct vocabulary;

— with hand signals in accordance with standards;

— with flag signals in accordance with standards;

— with whistles/hooters in accordance with standards;

— with two-way radios/telephones, and

— with light signals in accordance with standards.

5.3.5 Evidence of competency of slinger's duties

Evidence of competency of slinger's duties includes the satisfactory application of:

— current legislation, standards and code of practice, and

— the hierarchy of hazard-control measures, with elimination, substitution, isolation and engineering control measures being selected before safe work practices and personal protective equipment.

5.4 Competency requirements for the signaller

5.4.1 Plan and prepare work

5.4.1.1 Element of competence — Plan work

Performance criteria:

a) a workplace operations plan is developed in consultation with the relevant authorized workplace personnel. The plan takes into account job requirements, priorities, workplace rules and procedures, identified hazards and hazard-control measures.

b) site hazards, such as those listed below, are identified and correct hazard-control strategies developed in accordance with the appropriate standard:

— overhead power lines:

— trees;

— overhead service lines, such as for steam, gas, water, telephone;

— underground services;

— bridges;

— surrounding buildings;

— obstructions;

— structures,

— facilities;

— other equipment;

— dangerous materials;

— recently filled trenches;

c) plans for emergency procedures take into account the location of first aid and fire fighting equipment, amenities and access/egress points in the workplace for emergency vehicles and emergency personnel;

d) precautions are taken to accommodate the effects of weather conditions in accordance with the appropriate standard. This includes, where necessary, deciding to abort crane operations where weather conditions exceed acceptable limits;

e) the operations plan ensures that the work area is correctly illuminated;

f) the signals and signalling systems to be used are confirmed with associated personnel, in accordance with the appropriate standard.

5.4.1.2 Element of competence — Check communication

Performance criteria:

All communication equipment lighting, alarm systems lighting, alarm and alarm systems, and safety systems, etc. are checked for correct operation.

Defective equipment is reported to the authorized person for corrective action and all defects recorded in the plant log book.

5.4.1.3 Element of competence — Move loads

Performance criteria:

Appropriate communication and signal methods are used to coordinate the load movement with safety, including signals to:

— stop/emergency stop;

— raise;

— lower

— slew left and right;

— luff jib up and down;

— extend jib;

— retract jib;

Signals are given for loads both within sight and out of sight of the crane driver/operator.

5.4.2 Range statement for signaller's competency

This range statement applies to the whole unit.

All elements shall be satisfied in the normal workplace environment(s) or equivalent.

Equipment shall include signaller's work only, i.e. directions given to the crane driver/operator in the movement of the load, including when the load is out of view of the driver/operator.

Signals for load moving are given using any of the following methods:

— verbally with correct vocabulary;

— with hand signals in accordance with standards;

— with flag signals in accordance with standards;

— with whistles/hooters in accordance with standards;

— with two-way radios/telephones, and

— with light signals in accordance with standards.

5.4.3 Evidence of competency of signaller's duties

Evidence of competency of signaller's duties includes the satisfactory application of:

— current legislation, standards and code of practice, and

— the hierarchy of hazard-control measures, with elimination, substitution, isolation and engineering control measures being selected before safe work practices and personal protective equipment.

5.5 Evidence of assessments

5.5.1 General

5.5.1.1 The results of each section of the assessment shall be collated in an Assessment Summary.

5.5.1.2 The summary shall be discussed with the candidate, when any deficiency is brought to attention.

5.5.1.3 The Assessment Summary shall be signed by the assessor and the candidate.

5.5.1.4 A copy of the Summary shall be retained by the assessor and the candidate. A copy shall be forwarded to the accreditation body, which may issue a statement of competency when competency has been achieved.

5.5.2 Statement issuing

5.5.2.1 Where competency has been achieved, the statement issued by the accreditation body shall indicate that the assessment is in accordance with this International Standard and that competency has been achieved.

5.5.2.2 Where competency has not been achieved, a statement is not issued.

5.5.3 Further assessment

5.5.3.1 The candidate may undertake further assessment on those parts for which a deficiency was recorded in the Assessment Summary after 21 days have elapsed from the last day of the assessment.

5.5.3.2 When making a request for further assessment, the candidate shall present to an assessor a copy of the Assessment Summary and proof that the required additional training has been undertaken.

5.5.4 Parameters for the assessment

5.5.4.1 The purpose of the assessment is judgement of performance and a statement of attainment of competence.

5.5.4.2 The accreditation body (see 6.2) shall establish the parameters for the assessment in an assessment instrument which shall be available to all those interested. This instrument shall include the manner and criteria by which the assessment is to be completed.

NOTE See annex A for an example of an Assessment Summary of a slinger and annex B for an example of an Assessment Summary for a jib crane operator.

5.5.4.3 The assessment techniques shall include direct observation, practical tasks, written and oral questioning, simulation and a combination of these techniques.

NOTE Guidelines for performance assessment of crane drivers/operators, slingers and signallers are given in annex C.

5.5.4.4 The assessment should normally take place in a one-to-one context (assessor to candidate).

5.5.4.5 The location should be the workplace environment where possible, or a simulator for the practical components, a training room for the written component.

5.5.4.6 A review of the assessment shall follow immediately on completion of the assessment.

6 Assessors, accreditation body and verification of assessment

6.1 Assessors

6.1.1 The assessor shall be appointed by the accreditation body from among persons who request such appointment.

6.1.2 When selecting assessors for a specific assessment, the accreditation body shall ensure that the skills brought to each assignment are sufficient. Assessors shall:

a) be familiar with the relevant legal regulations, specific regulations, standards and safe use, assessment procedures and assessment requirements;

b) have a thorough knowledge of the relevant assessment methods and assessment documents;

c) have appropriate technical knowledge of the activities which are to be assessed. The function may also be fulfilled by persons who have not been assessed for the particular class or category assessment;

d) have industry experience in the use and operation of the relevant equipment;

e) have an overall degree of understanding sufficient to carry out a reliable and proper assessment regarding the competence of the personnel within its scope;

f) be able to communicate effectively both in writing and orally in the required languages;

g) be free from any conflicting interest so that they can make impartial and non-discriminatory decisions, e.g. assessors shall not have been involved in training the candidate for the assessment.

6.2 Accreditation body

The accreditation body may be any organization with an interest in uniformity of safety standards. It will accredit assessors, slingers, crane drivers (operators) and signallers to this Standard, and may accredit other occupations as it sees fit.

NOTE Appointment of an accreditation body may be subject to national legislation.

6.2.1 Structure of accreditation body

The structure of the accreditation body shall be such as to give confidence.

In particular, the accreditation body shall:

a) be independent and impartial;

b) be responsible for its decisions relating to the granting, maintaining, extending, restricting, suspending and withdrawal of accreditations issued by the accreditation body;

c) identify the management (the committee, group or person) which shall have overall responsibility for all of the following:

- performance of assessment, accreditation and surveillance as defined in this International Standard and by standards and normative documents applicable to the activity performed;
- the formulation of policy matters relating to the operation of the accreditation body;
- decisions on accreditation;
- supervision of the implementation of its policies;
- supervision of the finances of the accreditation body;
- the delegation of authority to committees or individuals, as required, to undertake defined activities;

d) have documents establishing it as a legal entity or part of a legal entity;

e) have a documented organization. This organization shall enable the participation of all parties concerned in the development of principles regarding the content and functioning of the accreditation system;

f) ensure that each decision on accreditation is taken by person(s) different from those who carried out the assessment;

g) be financially stable;

h) be appropriately and adequately staffed;

i) have a quality system giving confidence in its ability to operate an accreditation system for personnel;

j) have policies and procedures that distinguish between the accreditation section staff and the staff engaged on other activities of the organization;

k) ensure that the activity of bodies related to it do not compromise the confidentiality, objectivity or impartiality of its accreditation;

l) ensure that assessment and accreditation are performed independent of the training service;

m) define policies and procedures for the resolution of complaints, appeals and disputes received from suppliers or other parties about the accreditation process or any other matters.

NOTE An organization which fills the positions in its committees in such a way that a balance of interests exists without a particular interest predominating may be regarded being suitable to fulfil the requirement.

6.3 Verification of assessment

6.3.1 The assessor shall be subject to an audit by the accreditation body at a minimum of three-yearly intervals or as the relevant body prescribes.

6.3.2 For the audit, the assessor shall retain the assessment record papers for the oral, written and practical sections as applicable, and the Assessment Summary of the assessments completed.

6.4 Requirements for assessors

6.4.1 General

The assessor shall demonstrate competence for the category they are accredited to assess. See 6.1.2.

They shall also meet the competency standards for industry assessors as shown in 6.4.2.

6.4.2 Criteria for competence of assessment techniques of an assessor

6.4.2.1 Plan assessment

6.4.2.1.1 Element of competence — Identify assessment content

Performance criteria:

a) purpose of assessment is discussed and confirmed with the candidate;

b) current endorsed competency standards, judgements, or performance measures relevant to the assessment are identified according to industry, enterprise or training establishment agreement, and are communicated to the candidate;

c) industry, enterprise or training establishment policy is discussed with the candidate.

6.4.2.1.2 Element of competence — Establish evidence required

Performance criteria:

a) evidence sought is consistent with this competency standard;

b) amount and type of evidence specified is sufficient to enable a valid assessment decision to be made;

c) evidence required is discussed and confirmed with the candidate.

6.4.2.1.3 Element of competence — Select and explain assessment procedure

Performance criteria:

a) assessment techniques are selected which are appropriate for the skill and knowledge to be assessed;

b) requirements, rule or guidelines for assessment are explained to the candidate;

c) assessment procedures and appeal mechanisms are discussed and confirmed with the candidate.

6.4.2.1.4 Element of competence — Organize assessment

Performance criteria:

a) resources are organized consistent with assessment requirements;

b) relevant people are informed of assessment according to industry or enterprise or training establishment policy;

c) costs of assessment procedures is estimated and submitted, if and when required;

d) assessment environment is prepared to facilitate a fair and reliable assessment;

e) assessors competence to perform assessment in terms of content, knowledge and experience is discussed and confirmed with relevant people;

f) assessment arrangements are discussed and confirmed with the candidate.

6.4.2.2 Carry out assessment

6.4.2.2.1 Element of competence — Gather evidence

Performance criteria:

a) evidence gathered is consistent with agreed competency standards and performance measures;

b) evidence gathered is valid, reliable and consistent with agreed requirements and assessment techniques used;

c) evidence gathered is documented according to the accreditation body requirement;

d) receive evidence for recognition of prior learning.

6.4.2.2.2 Element of competence — Makes the assessment decision

Performance criteria:

a) assessment decision is based on evidence gathered;

b) assessment decision is made in accordance with goals specified in the competency standards or performance measures identified, discussed and confirmed with the candidate;

c) assessment decision is made in accordance with requirements of assessment technique(s) used.

6.4.2.2.3 Element of competence — Provide feedback during assessment

Performance criteria:

a) action is taken to put assessment candidate at ease, as appropriate for assessment procedures being used.

b) progress is discussed with the candidate, at completion of any section of the assessment.

c) encouragement is given to the candidate based on progress, as appropriate for the assessment procedures being used.

6.4.2.3 Record assessment results and review the procedure

6.4.2.3.1 Element of competence — Record assessment results

Performance criteria:

a) assessment results are recorded and reported to the candidate, and in accordance with the required procedure;

b) three copies of the assessment report shall be prepared. These shall each be an original without erasures and changes. One original shall be provided to the candidate, one original to the assessment body and the other original retained by the assessor;

c) assessment records are archived to ensure timely access only to candidates and persons authorized by the assessment body.

6.4.2.3.2 Element of competence — Provide feedback to the candidate

Performance criteria:

a) noteworthy performance is commended to the candidate;

b) results are provided to the candidate;

c) clear and constructive feedback on assessment procedures and results is given to the candidate;

d) candidates who have been assessed are encouraged to explore the available ways of overcoming any gaps in their competence revealed by the assessment;

e) candidates are given guidance on further goals and opportunities dependent on industry requirements.

6.4.2.3.3 Element of competence — Review the procedure

a) The assessment procedure is reviewed in cooperation with the candidate, and relevant persons in industry and the training establishment or the accreditation body;

b) changes are made in the assessment procedure, at the industry or training establishment level, in light of the review results.

Annex A
(informative)

Assessment summary for slinger certificate

Form of assessment	Completed within allowed time (Yes, No or NA)[a]	Sections 1	2	3	4	Overall result (C or NYC)[a]
Practical skills						
Assignment						
Knowledge						

[a] C = competent NYC = not yet competent NA = not applicable

Summary

Candidate is: **Date:** .....
(circle the result obtained)

□ **COMPETENT**

□ **NOT YET COMPETENT**

Name of assessor: …… **Name of candidate:** ……

Signature: …… **Signature:** ……

Comments/feedback
(assessor to make any additional comments which clarify the assessment)

……

……

……

Annex B
(informative)

Assessment summary for jib crane operator

Form of assessment	Total number of items in the assessment	Number of items given ✓ or NA	Number of items required to meet standard	Were all critical boxes given ✓ or NA?		Assessment standard requirements achieved [a]	
Performance	14		11	Yes	No	Yes	No
Oral/Written	31		27	Yes	No	Yes	No
Written	22		17	Yes	No	Yes	No
Assessment completed within time allowed						Yes	No NA

[a] Performance standard = Number of items required to meet standard (including all critical boxes)

Knowledge standard = Number of questions required to meet standard (including all critical boxes)

Summary

Candidate is: **Date:** ……
(circle the result obtained)

□ **COMPETENT**

□ **NOT YET COMPETENT**

Name of assessor: …… **Name of candidate:** ……

Signature: …… **Signature:** ……

Comments/feedback
(assessor to make any additional comments which clarify the assessment)

……

……

……

Annex C
(informative)

Assessment of crane drivers (operators), slingers and signallers

C.1 Purpose of the assessment

To assess the candidate's skill and knowledge for safe operation of the category of crane, as nominated for assessment, or for slinger's work, as appropriate.

C.2 Methods of assessment

C.2.1 A written assessment as per subclause 4.2 of this International Standard.

Written assessment may be carried out in a classroom environment.

The time permitted should be 2 h 30 min. Where an exemption from a section is granted, the time should be reduced proportionally.

C.2.2 The oral assessment consists of oral questions related to the competency standards to assist the assessor in determining the extent of the candidate's knowledge. This may be supplemented by a second written paper if more than two candidates are to be assessed simultaneously for the same qualification.

C.2.3 A practical demonstration should demonstrate the application of the skill and knowledge of the candidate.

C.2.4 The oral and practical methods of assessment should normally be carried out in a one-on-one context (assessor to candidate).

C.3 Scope of assessment for crane drivers (operators)

C.3.1 Each of the three methods of assessment evaluates the skill and knowledge of the candidate in the following units of competency and elements of competence.

C.3.2 The distribution of questions shall be in proportion to the points as indicated below.

C.3.2.1	**Assess and secure equipment and work area**	**100 points**
	Plan work	25 points
	Conduct routine checks and inspections	25 points
	Test controls and safety devices	40 points
	Shut down crane	10 points
C.3.2.2	**Secure and transfer the load**	**100 points**
	Secure the load	33 1/3 points
	Conduct trial lift	33 1/3 points
	Transfer the load	33 1/3 points

C.3.2.3	**Set up and disassemble mobile or tower cranes**	**100 points**
	Plan assembly/disassembly	20 points
	Disassemble crane	40 points
	Erect and disassemble tower crane	40 points
C.3.2.4	**Other operations**	**300 points**
	Plan displacement to/from site	30 points
	Displace crane	70 points
	Plan a mobile lift	30 points
	Carry out a mobile lift	70 points
	Plan multiple-crane lift	30 points
	Carry out multiple-crane lift	70 points

C.4 Score required to be graded competent

The score required to be graded competent is 80 % of the points in each element of competence. Where recognition of prior learning has been granted for an element of competence, then the full score is awarded and marked “RPL”, and the time permitted reduced according to the number of points for the section.

C.5 Guide for practical assessment of crane drivers

C.5.1 General

The crane used in the practical assessment shall be of the category for which assessment has been requested.

The assessment shall be terminated should a dangerous condition occur due to the operation by the candidate.

C.5.2 Operating bridge or gantry crane

C.5.2.1 Test course

C.5.2.1.1 Set up the test course according to Figure C.1.

C.5.2.1.2 The length of the course should not be less than 45 m.

C.5.2.1.3 Provide the following obstacles, altering the obstacle and layout of the course as necessary, see Figure C.2.

a) six oblique travel sections;

b) at least one wall obstacle in each oblique section;

c) horizontal obstacles at two locations in the course;

d) pole obstacles at locations where the course changes direction.

C.5.2.1.4 The test course should be clearly marked and the direction of movement marked with arrows.

C.5.2.1.5 The starting and finishing points should be marked with a circle of diameter 1,5 times that of the load.

C.5.2.2 Test load

The test load should be greater than 500 kg and cylindrical in shape.

C.5.2.3 Demonstration

The demonstration of competence for assessment purposes should include the following.

a) Confirm the mass of the load.

b) Confirm that the height from the ground level to the bottom of the load is 2 m. Where the height is greater than 2,3 m or less than 1,8 m, have the candidate adjust the load height to 2 m.

c) With the guidance of signals as required, have the candidate travel the course as follows, then return to the starting position:

   1) pass the load between the pole obstacles with the bottom of load at 2 m above ground level;

   2) pass the load over the bar obstacles with the load at a height between the bar and the top of the poles for a distance of 1 m before and after the bar;

   3) pass the load over the wall obstacles with the bottom of the load at a height of 2 m above the wall;

   4) while travelling the course, maintain the height of the load at 2 m above ground level when not traversing an obstacle;

   5) the load should not drag on or touch any obstacle or other object, including the ground, while traversing the course.

d) Simultaneous operation of three controls is not permitted, two controls may be operated when travelling on the oblique sections of the course.

e) Measurement of the time to complete the demonstration shall commence with the load positioned at 2 m above the starting point and end with the return of the load landed on the starting point and all obstacles on the course traversed. Due to differences among crane models, experience of the driver (operator), speed of operation of the crane and course layout, a 30 % deviation from the time specified is permitted.

f) The candidate should complete the demonstration and be marked according to merit.

C.5.3 Operating mobile and tower cranes

C.5.3.1 Test course

C.5.3.1.1 The course to be travelled should follow Figure C.3, with minor modifications if the location demands. The slewing arc should be approximately twice the boom length, preferably approximately 45 m. The direction of travel should be clearly indicated. The load should be moved, with the boom at constant length (including hydraulic cranes) by luffing, slewing and hoisting.

C.5.3.1.2 The layout of the course may be altered as location requires and the assessor consider desirable. Provide the following obstacles as shown in Figure C.2:

a) a horizontal wall obstacle on both forward and return routes;

b) three pole obstacles; for hydraulic jib cranes place two obstacles at the positions indicated, the third at the return point for forward and return routes of the course.

C.5.3.2 Demonstration

Demonstration of competence shall be carried out in accordance with C 5.2.2 and C 5.2.3.

C.6 Slingers

C.6.1 Scope of assessment for slingers

C.6.1.1 General

Each of the three methods of assessment given in C.2 shall be used to assess the skill and knowledge of the candidate in the following units of competency and elements of competence.

C.6.1.2 Distribution of questions

Distribution of questions shall be in proportion to the points as indicated below.

a)	**Plan and prepare work**	**100 points**
	Plan the job	50 points
	Select and inspect materials and tools	50 points
b)	**Complete slinger's work**	**100 points**
	Move the load	100 points

C.6.2 Guide for assessment of slingers

C.6.2.1 The written paper shall have questions distributed in proportion to the points awarded.

C.6.2.2 The oral questions shall supplement the details of the practical assessment as the assessor deems appropriate.

C.6.2.3 The practical assessment shall include at least three lifts and a maximum of five lifts, which together encompass all the skills, materials and tools normally used in slinging work.

A mobile crane shall be used for the majority of the lifts.

A bridge or gantry crane shall be used for some of the lifts.

The maximum time allowed is 2 h.

C.7 Signallers

C.7.1 Scope of assessment for signallers

C.7.1.1 General

The methods of assessment shall be oral and by demonstration. The assessment shall be related to the following units of competency and elements of competence.

C.7.1.2 Distribution of questions.

The distribution of questions shall be in proportion to the points as indicated below.

a)	**Plan and prepare work**	**100 points**
	Plan the job	50 points
	Select and inspect the equipment	50 points
b)	**Transmit signals**	**100 points**
	Use of hand signals	25 points
	Use of whistles	25 points
	Use of radio with correct vocabulary	25 points
	Application of occupational safety and health requirements	25 points

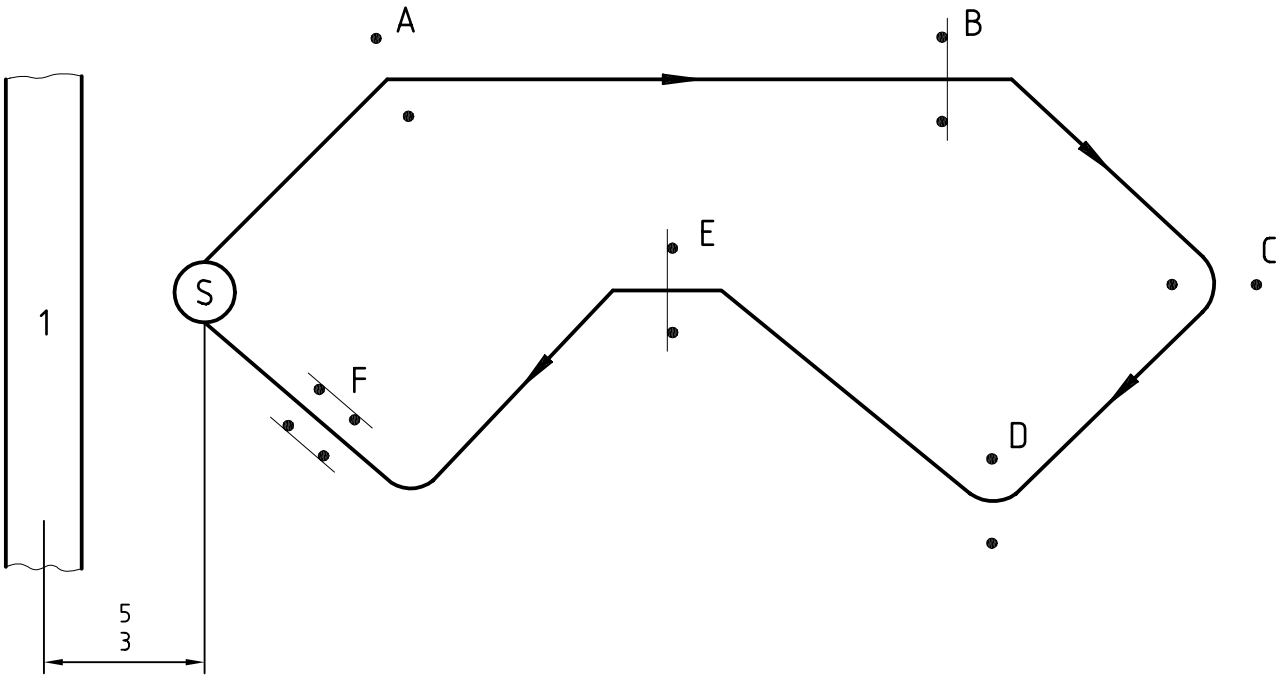
C.7.2 Guide for assessment of signallers

C.7.2.1 Oral questions shall supplement the practical demonstration.

C.7.2.2 The practical demonstration shall include at least three lifts and a maximum of five lifts which together encompass all the skills, materials and safety equipment normally used in signallers' work.

A slewing and luffing crane shall be used for some of the lifts.

Dimensions in metres

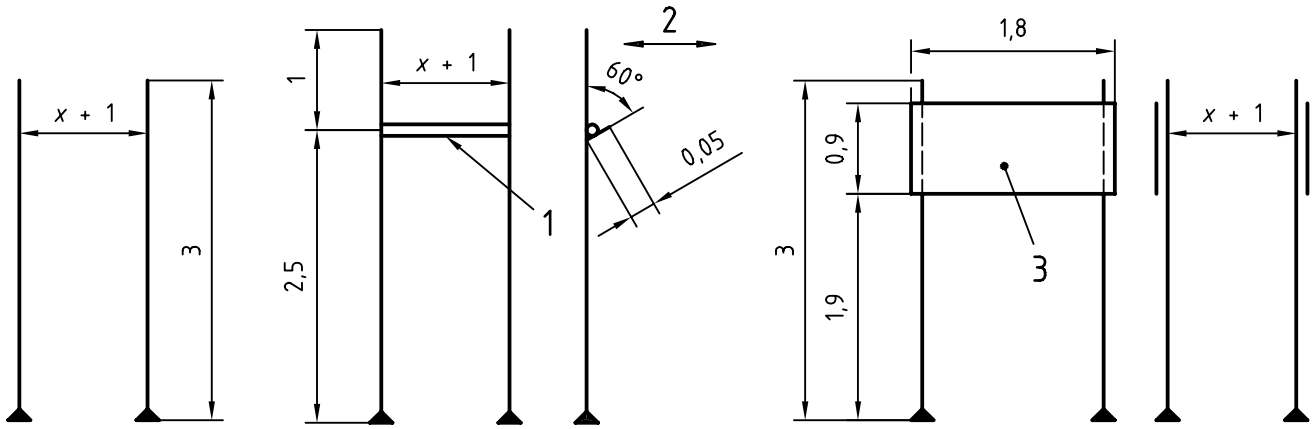


Key

1	Crane	F	Wall obstacle
A, C, D	Pole obstacles	S	Starting/finishing point of load
B, E	Bar obstacles		

Figure C.1 — Test course for bridge or gantry cranes

Dimensions in metres



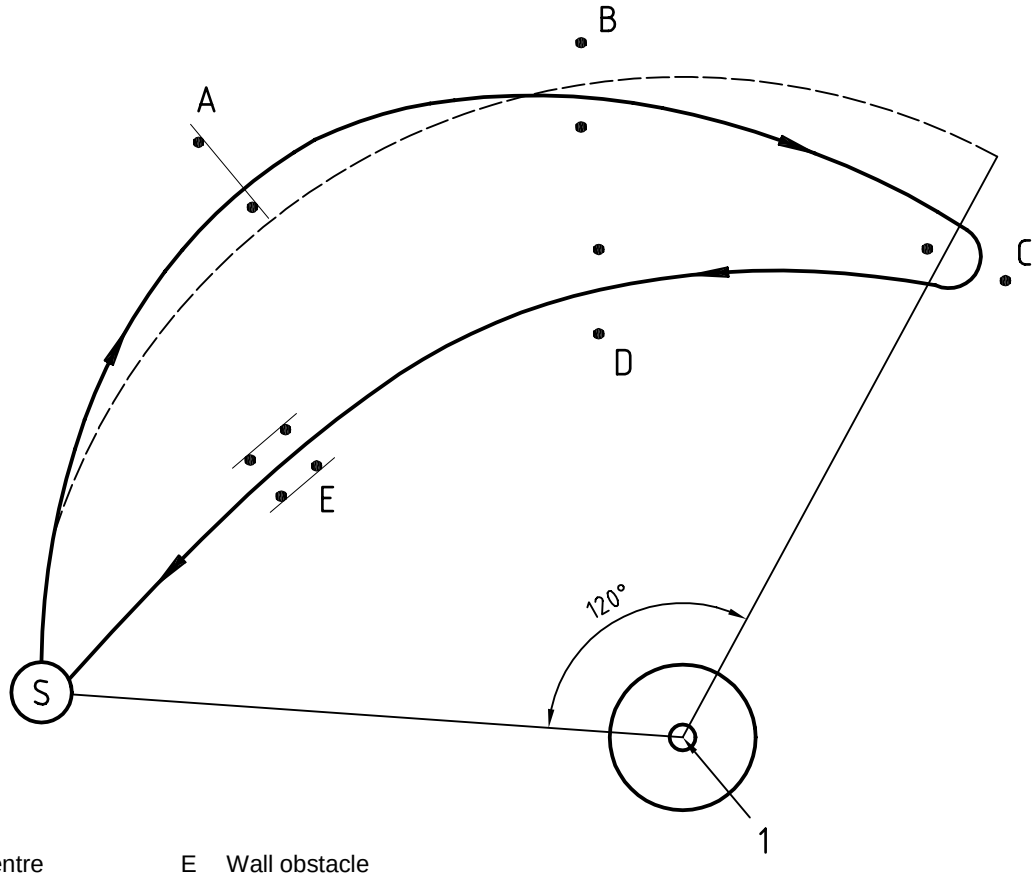
a) Pole obstacle **b) Bar obstacle** **c) Wall obstacle**

Key

x = load width

1 Bar
2 Travel direction
3 Wooden or mesh plate

Figure C.2 — Obstacles



Key

1 Slewing centre
A Bar obstacle
B, C, D Pole obstacles
E Wall obstacle
S Starting/finishing point of load

Figure C.3 — Test course for jib and mobile cranes

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