

BS 7121-4:2010



BSI Standards Publication

Code of practice for safe use of cranes –

Part 4: Lorry loaders

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ISBN 978 0 580 53622 9

ICS 53.020.20

The following BSI references relate to the work on this standard:

Committee reference MHE/3/11

Draft for comment 09/30082939 DC

Publication history

First published May 1997

Second edition, February 2010

Amendments issued since publication

Date	Text affected
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Contents

Foreword *iii*

1	Scope	1
2	Normative references	1
3	Terms and definitions	1
4	Management of the lifting operation	5
5	Contract lift or lorry loader hire	15
6	Planning of the lifting operation	19
7	Selection and duties of personnel	21
8	Minimum attributes of personnel	24
9	Selection of lorry loaders	26
10	Safety	27
11	Lorry loader documentation	29
12	Siting of the lorry loader	30
13	Maintenance and inspection	34
14	Operating conditions	37
15	Weather conditions	41
16	Slings and handling of loads	42
17	Thorough examination including testing	47
18	Special applications of lorry loaders	58
19	Special attachments	69

Annexes

Annex A (normative)	Training of appointed persons for lorry loader operations	73
Annex B (normative)	Training of lorry loader operators and slingers	79
Annex C (informative)	Background to the BS 7121 series	87
Annex D (informative)	Beaufort scale	88
Annex E (informative)	Lorry loader pre-use check sheet	89
Annex F (normative)	Radio communication for lifting operations	90
Bibliography		93

List of figures

Figure 1	Relationship between Complexity Index and lift category	8
Figure 2	Contract options	16
Figure 3	Adverse effect of sloping ground on the load radius and stabilizers	32
Figure 4	Example of a warning plate for overhead electric cables	33
Figure 5	Travelling under electric lines and cables	34
Figure 6	Adverse effect of a swinging load on the load radius	38
Figure 7	Operation using the hoist rope or slewing motion which would impose side loading on the boom	39
Figure 8	Recommended hand signals	46
Figure 9	Use of a pole extraction jack to extract poles/lamp standards	68
Figure 10	Typical manipulator	71
Figure 11	Typical pallet forks with debris net	72
Figure E.1	Lorry loader pre-use check sheet	89

List of tables

Table 1	Examples of the categorization of lifts based on environmental and load complexities	11
Table 2	Combination of lifting team roles	23
Table 3	Weight of materials	43
Table 4	Recommendations for periodic testing of lorry loaders as a supplement to thorough examination	48

Table B.1 – Lorry loader categories for training purposes	84
Table D.1 – Beaufort scale wind conditions	88
Table F.1 – Voice commands for lifting operations	91

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 94, an inside back cover and a back cover.

Foreword

Publishing information

This part of BS 7121 is published by BSI and came into effect on 28 February 2010. It was prepared by Subcommittee MHE/3/11, *Crane safety and testing*, under the authority of Technical Committee MHE/3, *Cranes and derricks*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

This part of BS 7121 supersedes BS 7121-4:1997, which is withdrawn.

Relationship with other publications

The Lifting Operations and Lifting Equipment Regulations (LOLER) [1] and the Provision and Use of Work Equipment Regulations (PUWER) [2] came into force in December 1998. Details of the Regulations, an Approved Code of Practice plus Health and Safety Executive (HSE) guidance can be found in the HSE books *Safe use of lifting equipment* [3] and *Safe use of work equipment* [4].

BS 7121-1 provides general recommendations for crane types not covered in an additional part of BS 7121. BS 7121-2 covers in-service inspection, thorough examination and, where appropriate, testing for the safe use of all types of crane. Subsequent parts of BS 7121 deal with the specific crane types as follows:

- a) Part 3: Mobile cranes;
- b) Part 4: Lorry loaders;
- c) Part 5: Tower cranes;
- d) Part 6: Derrick cranes;
- e) Part 7: Overhead/under-hung travelling and goliath cranes;
- f) Part 8: High pedestal and portal jib dockside cranes;
- g) Part 9: Container handling cranes;
- h) Part 10: Rail mounted cranes;
- i) Part 11: Offshore cranes;
- j) Part 12: Recovery vehicles and equipment;
- k) Part 13: Hydraulic gantry lifting systems;
- l) Part 14: Side boom pipelayers.

When all parts of BS 7121 have been published, CP 3010 will be withdrawn and BS 5744 will be revised to cover manually operated and light cranes only.

Information on the background to the development and use of BS 7121 since the initial publication of BS 7121-1 in 1989 is given in Annex C.

The BS 7121 series has been accepted as representing the consensus of practical experience for safety on cranes.

Information about this document

This is a full revision of the standard. It is intended to be used in conjunction with other parts of BS 7121 to ensure, so far as is reasonably practicable, that lifting operations are carried out safely.

The Health and Safety Executive (HSE) commends the use of this British Standard to those who have duties under the Health and Safety at Work etc. Act 1974 [5]. This standard was drawn up with the participation of HSE representatives and will be referred to in relevant HSE publications.

Use of this document

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.

Any user claiming compliance with this British Standard is expected to be able to justify any course of action that deviates from its recommendations.

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The provisions in this standard are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is “should”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

1 Scope

This part of BS 7121 gives recommendations for the safe use of lorry loaders. Subjects covered include management, selection of equipment, selection and training of personnel, procedures and precautions, testing, inspection, maintenance and examination.

This part of BS 7121 is intended to be used in conjunction with BS 7121-2, which provides general guidance on the inspection, testing and examination of all types of cranes.

NOTE Annex A and Annex B give detailed recommendations on the training of personnel for lorry loader operations. Annex C provides background information on the BS 7121 series.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Standards publications

BS 7121 (all parts), *Code of practice for safe use of cranes*

Other publications

HSE Guidance Note HS G 118, *Electrical safety in arc welding*. Sudbury: HSE Books, 1994

HSE Guidance Note GS 6, *Avoidance of danger from overhead power lines*. Sudbury: HSE Books, 1997

3 Terms and definitions

For the purposes of this part of BS 7121, the following terms and definitions apply.

3.1 additional sheave blocks

sheave blocks which can be used to increase the number of falls of rope and hence the lifting capacity of a hoist

3.2 appointed person

person nominated (typically by the employing organization) to plan, and to have overall control of, the lifting operations

3.3 bob weight

weight permanently fixed to the hook block of a hoist rope to ensure that the rope remains tensioned even under no load conditions

3.4 carrier

device that supports persons during lifting and lowering

NOTE This is also known as a "manrider".

3.5 competent engineer

person who has such theoretical knowledge and experience of the design of the lifting equipment as enables them to assess the design of loader crane bases and supporting structure connections, together with the adequacy of supporting structures to take the loads imposed by the loader crane

3.6 competent person

person who has such practical and theoretical knowledge and experience of the lorry loader and the equipment used in the lifting operation as is necessary to carry out the function to which the term relates in each particular context

3.7 crane coordinator

person who plans and directs the sequence of operations of cranes (including lorry loaders) to ensure that they do not collide with other cranes, loads and other plant (e.g. concrete-placing booms, telehandlers, piling rigs)

3.8 lorry loader/crane supervisor

person who controls the lifting operation, and is responsible for ensuring that it is carried out in accordance with the appointed person's safe system of work

3.9 employing organization

person or organization who requires a lifting operation to be carried out and is responsible for the safe use of the lorry loader

NOTE In the case of a hired lorry loader, the degree of the employing organization's responsibility for the safe use of the lorry loader depends on whether the lorry loader is being supplied under a lorry loader hire contract or a part of a contract lift. See Clause 5.

3.10 indicator

device which provides warnings and/or data to facilitate the competent control of the lorry loader within its design parameters

3.11 intermediate inspection

inspection carried out at appropriate intervals between thorough examinations to identify potential faults and deterioration (so that appropriate action can be taken to ensure that the lorry loader remains safe to use)

3.12 lifting

any movement of loads or persons that includes a change of height

3.13 lifting equipment

work equipment (lorry loader) for lifting or lowering loads, including attachments used for anchoring, fixing or supporting the load

3.14 lifting accessory

equipment from which the load can be suspended

NOTE These are also known as "accessories for lifting".

3.15 lifting eye

designated point for the attachment of lifting accessories to a load

3.16 lifts**3.16.1 basic lift**

lifting operation where the weight of the load(s) can be simply established, and there are no significant hazards within the working area or on the access route to the working area

3.16.2 intermediate lift

lifting operation where there are significant hazards, either within the working area of the lorry loader or on the access route to the working area

NOTE Formally known as a "standard lift".

3.16.3 complex lift

lifting operation where the lorry loader is used to lift complex loads or persons, where two or more lorry loaders are used to lift the load or where the lifting operation is carried out at a location with exceptional hazards

NOTE An example of a location with exceptional hazards is a chemical plant.

3.17 load

weight which is lifted by the lorry loader

NOTE If lorry loaders are used to lift loads from water, the load could also include forces due to water flow or suction.

3.18 loader crane

powered crane comprising a column which slews about a base, and a boom system which is attached onto the top of the column

3.19 lorry loaders**3.19.1 lorry loader**

commercial vehicle or trailer, fitted with a loader crane, which normally has a load-carrying capability

3.19.2 single boom lorry loader

commercial vehicle or trailer, fitted with a loader crane, which has a single boom only

NOTE These are also known as "stiff booms" or "T-booms".

3.20 lorry loader operator

person preparing the lorry loader for operation, or operating the lorry loader for the purpose of positioning loads

3.21 method statement

document produced by the appointed person to describe how the lorry loader set up or lifting operation is to be carried out

3.22 plant

equipment which might enter the path of the loader crane boom(s) or collide with the vehicle on which the loader crane is mounted

3.23 pre-use checks

visual checks carried out by the lorry loader operator at the start of each shift to ensure that the lorry loader has not suffered any damage or failure, and is safe to go to work

3.24 radius

horizontal distance between the point at which the axis of rotation meets the ground and the vertical centreline passing through the hook or attachment

3.25 radius indicator

device that shows the radius at which the lorry loader is operating

3.26 rated capacity

load that the lorry loader is designed to lift for a given operating condition (e.g. configuration, position of the load)

NOTE The rated capacity was formerly known as the "safe working load".

3.27 rated capacity indicator/limiter (RCI/L)

device that warns of the approach to overload and prevents the lorry loader from being overloaded

3.28 service conditions**3.28.1 in-service**

condition where the lorry loader is handling loads not exceeding the rated capacities within permissible wind speeds and other conditions as specified by the manufacturer

3.28.2 out-of-service

condition where the lorry loader is either not required for use or out of use, without a load on the hook and in conditions as specified by the manufacturer

3.29 signaller

person responsible for directing the lorry loader operator to ensure safe movement of the lorry loader and load

3.30 slinger

person responsible for attaching and detaching the load to and from the lorry loader, for correct selection and use of lifting accessories in accordance with the specifications of the appointed person and for initiating the movement of the load

3.31 slinger/signaller

person combining the duties of both slinger and signaller

3.32 tag line

light rope attached to an object being lifted by a lorry loader, used to guide the object while it is lifted or lowered

3.33 testing**3.33.1 functional testing**

operation of each motion of the lorry loader without a load applied in order to determine whether the equipment performs in accordance with the manufacturer's specification

3.33.2 performance testing

operation of each motion of the lorry loader with the rated load applied in order to determine whether the equipment performs to the manufacturer's specification, including checking of the rated capacity indicator/limiter

3.33.3 overload testing

<dynamic> operation of each motion of the lorry loader with a load that exceeds the rated load applied in order to determine whether the equipment is structurally sound and fit for the use for which it was designed

3.33.4 overload testing

<static> operation of the lorry loader with a load exceeding the rated load applied but without operating the full range of motions of the lorry loader in order to determine whether the equipment is structurally sound and fit for the use for which it was designed

3.33.5 non-destructive testing (NDT)

testing carried out on the structure of the lorry loader to establish the presence, location and extent of any defects that could affect the integrity of that structure

NOTE The techniques employed for non-destructive testing are such that they do not damage or alter the material under test. NDT is also known as "non-destructive examination (NDE)".

3.33.6 stability testing

testing to verify the stability of the loader crane mounted on the unloaded vehicle

3.34 thorough examination

examination by a competent person in such depth and detail as the competent person considers necessary to enable them to determine whether the equipment being examined is safe to continue in use

NOTE The thorough examination is not part of the maintenance regime for the equipment but provides owners with information which could be used to determine the effectiveness of the regime. The competent person might require supplementary tests as part of thorough examination. See BS 7121-2.

3.35 timber handling crane

loader crane specifically designed, manufactured and equipped with a grapple for the loading/unloading of unprepared timber (e.g. tree trunks, branches)

NOTE The operator controls the crane from a high seat or from a cabin.

3.36 use

<of work equipment> activity of any kind involving work equipment

NOTE This includes starting, stopping, programming, setting, transporting, repairing, modifying, servicing and cleaning.

3.37 user

person or organization that has control of the lifting operation and the lorry loader operator, and is responsible for ensuring that the lorry loader is properly maintained and thoroughly examined by a competent person

3.38 weight

vertical force exerted by a mass as a result of gravity

4 Management of the lifting operation

4.1 Safe system of work

A safe system of work should be established and followed for every lorry loader operation or lifting operation, whether it be an individual lift or a group of repetitive operations. The safe system of work should include:

- a) planning of the operation;
- b) selection, provision and use of a suitable lorry loader(s) and work equipment;
NOTE Lorry loader specifiers have a duty to ensure that lorry loaders are selected with sufficient capacity for the intended use. Lorry loader users have a duty to ensure that the lorry loader is only used for its intended purpose.
- c) any necessary preparation of the site;
- d) any setting up of the lorry loader(s), e.g. manual boom extensions or stabilizers;
- e) maintenance (including inspection), thorough examination and, where necessary, testing of the lorry loader(s) and equipment;

- f) the provision of properly trained and competent personnel who have been made aware of their relevant responsibilities under the Health and Safety at Work etc. Act 1974 [5];
- g) adequate supervision by properly trained and competent personnel having the necessary authority;
- h) ensuring that all necessary reports of thorough examination and other documents are available;
- i) preventing unauthorized movement or use at all times;
- j) the safety of persons not involved in the lorry loader setting up or lifting operation;
- k) the need for the operator, unless in imminent danger, to remain in control of the lorry loader throughout the lifting operation.

The safe system of work should be communicated to all parties concerned with the lifting operation.

It is essential for the safety of the operation to ensure that all personnel can communicate clearly in the same language.

Lorry loaders are work equipment and it is essential that they are not used for the lifting of persons for entertainment purposes, including joyriding, bungee jumping and stunts.

4.2 Control of the lifting operation

4.2.1 General

In order to implement the safe system of work effectively, one person should be appointed to have overall control of the lifting operation to act on behalf of the management of the employing organization. The appointment of the person does not remove any legal responsibility from the management but enables them to use the appointed person's expertise, the better to fulfil their responsibilities. The person appointed may have other duties and need not be an employee of the employing organization. The appointed person should have adequate training and experience to enable these duties to be carried out competently.

On large construction sites where multiple lifting operations are carried out by various subcontractors, the principal contractor should appoint the appointed person for the site. Each of the sub-contractors on site may employ individuals who have undergone appointed person training but they should remain subservient to the principal contractor's appointed person. The principal contractor's appointed person should ensure that the crane coordinator is advised of all lifting operations in order that they can perform their duties.

NOTE In the case of a lorry loader delivering to a construction or industrial site, two appointed persons may be involved – the person appointed by the employer of the lorry loader operator and the person appointed by the person in control of the site where the lifting operation is being carried out.

4.2.2 Selection of appointed person

When selecting an appointed person, the employing organization should take into account the variety and complexity of the operation, as well as all the problems that could arise from proximity hazards

and environmental courses. The appointed person should be notified formally in writing of their appointment. The appointed person should be given authority to carry out the duties involved, including consulting others with specialist knowledge and experience, and should be able to delegate duties and tasks for any part of the safe system of work to suitably qualified individuals.

NOTE To assist in the selection of an appointed person, some examples of lifting operations that require different levels of expertise, training and experience, and that impose different duties on the appointed person, are given in 4.3.2.

The employing organization should review and assess the performance of the appointed person periodically. Different lifting operations might entail the selection of a new appointed person, as appropriate, or the provision of additional training to the existing appointed person.

4.2.3 Avoidance of collisions

On sites where there is a possibility of collision between the lorry loader and other plant (e.g. tower cranes, mobile cranes, mobile elevating work platforms (MEWPs) or concrete booms), the crane coordinator (see 7.2.5) should plan the sequence of lorry loader and plant movements to prevent collisions. Any corresponding instructions from the crane coordinator to the lorry loader operator and other plant operators should be given in an agreed format. In such circumstances the operators should obtain the agreement of the crane coordinator before carrying out any operation.

During pauses in the lifting operation or on completion of the lifting operation, the lorry loader and its components should be positioned to ensure that collisions cannot take place.

4.3 Duties of the person appointed to control the lifting operation

4.3.1 General

The appointed person's duties should include the following:

- a) assessing the lifting operation to provide such planning (including approval of all risk assessments, lift categorization and method statements), selection of lorry loader(s) and lifting accessories, instruction and supervision as is necessary for the task to be undertaken safely. This might include consultation with other responsible bodies to ensure effective collaboration;
 - b) ensuring that adequate pre-operational checks, intermediate inspections, maintenance and thorough examination of the equipment have been carried out;
- NOTE For further information, see BS 7121-2.*
- c) ensuring that there is an effective procedure for reporting defects and incidents and taking any necessary corrective action;
 - d) taking responsibility for the organization and control of the lifting operation;

- e) ensuring that the crane supervisor and other members of the lifting team are fully briefed on the contents, scope and limits of the method statement (see 6.3);
- f) being familiar with the relevant parts of the project Health and Safety Plan where the lifting operation is being carried out on a site where the Construction (Design and Management) Regulations [6] apply.

The appointed person should be given the necessary authority for the performance of all these duties and, in particular, the authority to stop the operation whenever they consider that danger is likely to arise if the operation were to continue.

Duties, but not responsibilities, may be delegated to another person where considered appropriate.

The duties of appointed persons for lorry loader operations can vary according to the complexity of the operation. The duties for a basic lift are considerably fewer and less demanding than for a complex lift. An appointed person employed for a basic lift might not be suitably trained or experienced for a more complicated operation, and another appointment could be required for this. The information given in 4.3.2 can be used so that an appropriate appointment is made and a suitable method statement produced for each lifting operation.

4.3.2 Lift categories

4.3.2.1 General

To enable lifts to be planned, supervised and carried out effectively, three categories of lift are detailed in 4.3.2.2, 4.3.2.3 and 4.3.2.4. The category into which a particular lift falls depends on the assessment of the hazards associated with both the environment in which the lift is to be carried out and the load and lifting equipment. As demonstrated in Figure 1, increases in either or both environmental complexity or load complexity (the Complexity Index) lead to the lift being allocated a higher category. Having identified the hazards associated with a particular lift, a hierarchy of control measures should be applied to eliminate or control those hazards and reduce the complexity.

Figure 1 Relationship between Complexity Index and lift category

Environmental complexity (E)	3	Complex	Complex	Complex
	2	Intermediate	Intermediate	Complex
	1	Basic	Intermediate	Complex
		1	2	3
Load complexity (L)				

NOTE 1 Table 1 shows examples of where the same basic lifting task falls into different lift categories depending on differing environmental or load complexities.

NOTE 2 "Intermediate" was formally known as "standard".

4.3.2.2 Basic lift

For a basic lift, the duties of the appointed person should include the following:

- a) establishing the complexity of the lifting operation, including environmental and load complexity;

NOTE 1 Consideration of environmental hazards at the location of the operation includes the access and egress required for the lorry loader and the suitability of the ground to take the loads imposed by the lorry loader during preparation for the lift and during the lift itself.

NOTE 2 Load complexity includes characteristics such as weight, centre of gravity and presence of suitable lifting points. This can be established by a reliable source of information, measuring and weighing the load, or calculation (with allowance for possible inaccuracies).

- b) selecting the lorry loader, based on: the load characteristics, including weight of the load and any lifting accessories; the maximum height of lift and the maximum radius required. The rated capacity of the lorry loader is generally specified by the manufacturer/installer in the information for use supplied with the lorry loader. In cases where the lorry loader has been de-rated at time of thorough examination, the rated capacity stated on the current report of thorough examination, issued by the competent person, should be used. The manufacturer's sales leaflets should not be relied on for the rated capacity for a specific lorry loader;
- c) ensuring that the lorry loader is not operated in wind speeds in excess of those given in the instruction manual for the lorry loader. The wind area of the load should also be taken into account to ensure that its movement in the wind does not present a hazard (see Annex D for information on the Beaufort Scale);
- d) ensuring that the lorry loader has been thoroughly examined at least within the previous six months (for lifting of persons) or 12 months, inspected and checked before use. It is essential that the report of thorough examination, which confirms that the equipment is safe to use, is available;

NOTE 3 The report of thorough examination for the lorry loader should be carried with the vehicle.

- e) selecting appropriate lifting accessories, including their method of attachment to the load, configuration and any protection used to prevent damage;
- f) ensuring that lifting accessories are thoroughly examined, at least within the previous six months, inspected and checked before use. It is essential that the report of thorough examination is available to confirm that the lifting accessories are safe to use;
- g) ensuring that a system for reporting and rectifying defects is in place;
- h) designating a suitable person to check that the lifting accessories and any lifting points that are provided on the load are free from any obvious defects before attaching the load to the lorry loader;

- i) ensuring that the outcomes of the planning process are recorded in a risk assessment and method statement which should be signed by the appointed person;

NOTE 4 In many instances, a basic lift may be covered by a generic risk assessment and a generic method statement provided that no additional hazards are identified on site.

- j) briefing all persons involved in the lifting operation to ensure that the safe system of work described in the method statement is understood. All persons involved in the lifting operation should be instructed to seek advice from the appointed person if any change is required to the lifting operation, or if any doubts about safety arise. If one or more hand lines/tag lines are required to give more control of the load, the appointed person should designate persons to handle the lines;
- k) checking that no changes are required in the safe system of work if numerous loads are to be lifted over a long period;
- l) ensuring that there is a crane supervisor designated to direct personnel and that the operation is carried out in accordance with the method statement.

The appointed person and crane supervisor should be aware of the limits of their knowledge and experience concerning lifting operations, and, when conditions exceed these limits, further advice should be sought.

NOTE 5 For guidance on the combination of roles during a basic lift, see 7.3.

4.3.2.3 Intermediate lift

For an intermediate lift, the duties of the appointed person should include the following, in addition to the duties listed in 4.3.2.2:

- a) identifying all significant hazards in the operating area, including any areas required for access or setting up of the lorry loader;
NOTE This might involve the appointed person visiting the site if he/she has any doubts about the quality of the information which has been provided.
- b) ensuring that a site-specific risk assessment and method statement, detailing control measures for the identified risks, are prepared;
- c) liaising with any other person or authority, as required to overcome any hazard, by including any necessary corrective action or special measures in the safe system of work;
- d) determining any requirement for personnel in addition to the lorry loader operator, such as a slinger, signaller or dedicated crane supervisor;
- e) considering the effect of the lifting operation on surrounding property or persons, including the general public. This should lead to arranging for appropriate action to minimize any adverse effects, and to giving appropriate notice to all persons concerned.

4.3.2.4 Complex lift

For a complex lift, the duties of the appointed person should include the following, in addition to the duties listed in 4.3.2.2 and 4.3.2.3:

- a) identifying all exceptional hazards in the operating area, including any areas required for access or setting up of the lorry loader. This requires the appointed person to visit the location of the planned lifting operation as part of the planning process;
- b) ensuring that the method statement includes access, ground conditions, setting up, etc., as well as the exact sequence of operations when lifting the load;
- c) preparing a detailed and dimensioned drawing of the site, the lorry loader and the load, identifying the load path, pick-up and set-down areas, together with the position of any exceptional hazards in the area. The information provided should be sufficient to enable the operator to position the lorry loader accurately;
- d) ensuring that, where persons are being lifted, the requirements of 18.1 are met;
- e) ensuring that, where the lifting operation requires more than one lorry loader or other crane to lift the load, the requirements of 18.2 are met.

NOTE 1 This does not apply to purpose-designed, vehicle-mounted container handling cranes with twin lifting units.

NOTE 2 It is good practice for the appointed person to be present on the site during a complex lift.

Table 1 Examples of the categorization of lifts based on environmental and load complexities

Task	Lift category		
	Basic	Intermediate	Complex
Unloading a pallet of goods using forks	The lorry loader operator has clear sight of the load path and the load is to be placed on the ground. Complexity Index E1:L1	The load is to be placed over an obstruction such that the lorry loader operator might not have clear sight of the landing area from the control position. Complexity Index E2:L1	The load is to be placed on a partially completed building at height, without line of sight, and with proximity hazards, such as scaffolding or overhead power lines. Complexity Index E2:L2
Delivering standard house roof trusses	The lorry loader operator has clear sight of the load path and the load is to be placed on the ground. Complexity Index E1:L1	The roof trusses are to be placed on a partially completed building at height, without line of sight. Complexity Index E2:L1	The roof trusses are to be placed on a partially completed building at height, without line of sight, and with proximity hazards, such as scaffolding or overhead power lines. Complexity Index E3:L1

Table 1 Examples of the categorization of lifts based on environmental and load complexities (*continued*)

Task	Lift category		
	Basic	Intermediate	Complex
Delivering temporary buildings and placing in position	The lorry loader operator has clear sight of the load path (buildings and stairs) and the load is to be placed on the ground or double stacked with a lorry loader with sufficient reach and height.	The lorry loader operator does not have a clear sight of the load path (buildings and stairs) and the load is to be placed on the ground or double stacked with a lorry loader with sufficient reach and height.	Rows of linked temporary buildings are to be triple stacked, and additional hazards are present, such as persons working at height, no line of sight between the lorry loader operator and the load or other personnel, and limitations of outreach and height of the lorry loader.
	Complexity Index E1:L1	Complexity Index E2:L1	Complexity Index E3:L2
		Rows of linked temporary buildings are to be double stacked, and additional hazards are present, such as persons working at height or no line of sight between the lorry loader operator and the load or other personnel.	
		Complexity Index E2:L1	
		Stair/landing assemblies are to be lifted/installed into multi-cabin complexes. The load is unstable.	
		Complexity Index E2:L2	
Delivering a loading platform to a construction site and unloading	The lorry loader operator has clear sight of the load path and the load is to be placed on the ground.	The loading platform is to be unloaded and assembled on a construction site, and additional hazards owing to the assembly are present. These might include instability of the load during assembly and the proximity of people involved in the assembly.	The loading platform is to be unloaded, assembled and lifted into position on a construction site, and additional hazards are present owing to both the assembly and the installation of the structure at height. These might include instability of the load during assembly, the proximity of people involved in the assembly, people working at height close to an unprotected edge and proximity hazards, such as scaffolding.
	Complexity Index E1:L1	Complexity Index E2:L2	Complexity Index E3:L2

Table 1 Examples of the categorization of lifts based on environmental and load complexities (*continued*)

Task	Lift category		
	Basic	Intermediate	Complex
Lifting persons	The persons are to be lifted using a loader crane with an integrated work platform conforming to BS EN 280 and operating in an environment with no significant hazards. Complexity Index E1:L1		The persons are to be lifted in a man-riding basket suspended from a loader crane not specially designed for the purpose. Complexity Index E1:L3 The persons are to be lifted in a non-integrated basket attached to the boom of a loader crane. Complexity Index E2:L3 The persons are to be lifted in a man-riding basket suspended from a loader crane not specially designed for the purpose with additional hazards, such as the lowering of a person into a deep shaft in a man-riding basket attached to hoisting winch hook. Complexity Index E3:L3
Grabs	Spoil from an excavation is to be handled with a clear view of the load path. Complexity Index E1:L1	An object in an excavation is to be handled with people in proximity and clear view of load path. Complexity Index E2:L1	An object in an excavation is to be handled with people in proximity without a clear view of load path. Complexity Index E3:L1
Delivering and placing a grand piano		The piano is to be delivered and unloaded to the side of the vehicle at street level. The load is without lifting points and hazards include the proximity of the public. Complexity Index E2:L2	The piano is to be delivered, unloaded and placed into a third-storey apartment building through a window opening. Additional hazards might include the presence of the public, trees or traffic, the load itself, the location of cellars and basements, access into the building (window), or overhead power and telephone lines. Complexity Index E3:L2

Table 1 Examples of the categorization of lifts based on environmental and load complexities (*continued*)

Task	Lift category		
	Basic	Intermediate	Complex
Delivering and collecting a large rectangular tank	The lorry loader operator has clear sight of the load path, the tank is to be placed on the ground, the tank is empty and it has integral lifting points.	An empty tank is to be placed over an obstruction such that the lorry loader operator might not have clear site of the landing area.	A partially full tank is to be lifted from a position above ground level, the weight of the load is not accurately known and the centre of gravity is likely to shift during lifting. There are no integral lifting points.
	Complexity Index E1:L1	Complexity Index E2:L1	Complexity Index E2:L3
Lifting a boat	The lorry loader operator has clear sight of the load path and the load is to be placed on the ground.	The boat is to be lifted into water and additional hazards are present owing to the presence of water and the need to release slings adjacent to water.	The boat is to be lifted from water, the weight of the load is not accurately known and the centre of gravity is likely to shift during lifting.
	Complexity Index E1:L1	Complexity Index E2:L1	Complexity Index E2:L3
Handling forestry timber	A vehicle is to be loaded with felled timber in a forestry environment using a timber handling crane.	Felled timber is to be unloaded from a vehicle in a saw mill using a timber handling crane.	Felled timber is to be loaded onto a rail wagon using a timber handling crane.
	Complexity Index E1:L1	Complexity Index E2:L1	Complexity Index E3:L1
Lifting lamp standards	A vehicle is to be loaded with new lamp standards in a depot.	Old lamp standards are to be unloaded in a depot with a risk that the standard will collapse owing to age and corrosion.	Old lamp standards are to be extracted adjacent to a live carriageway.
	Complexity Index E1:L1	Complexity Index E1:L2	Complexity Index E3:L2
Delivering and collecting refuse and recycling containers	A vehicle is to be loaded with a container in a depot.	A container is to be loaded or unloaded in a supermarket car park.	A container is to be loaded or unloaded adjacent to a children's playground.
	Complexity Index E1:L1	Complexity Index E2:L1	Complexity Index E3:L1

NOTE This list is not exhaustive and the examples are given as illustrations of the lift categorization. It is the responsibility of the appointed person to ensure that all risks have been identified, assessed and eliminated or controlled.

4.4 Duties of the persons involved in construction projects

The Construction (Design and Management) (CDM) Regulations [6] require that designers, CDM coordinators, principal contractors, sub-contractors and clients consider health and safety matters throughout all stages of a construction project from conception, design and planning through to carrying out the work, including maintenance, repair and/or demolition.

Lifting operations are commonly carried out using cranes (including lorry loaders) and they should be included in the Health and Safety

Plan required by the Regulations [6] so that factors influencing crane and lorry loader safety can be assessed at a sufficiently early stage.

When constructing the Plan, the ways in which the cranes (including lorry loaders) are intended to be used, i.e. by the manufacturer and hirer, and any limitations in the conditions expected on site that would affect safety should be taken into account.

The Plan should include information to allow all parties involved in the specification, installation or use of cranes (including lorry loaders) to be made aware of the fundamental criteria and planning issues needed to ensure that lifting operations are initiated and proceed in a logical and safe manner.

Designers should obtain and make available to the CDM coordinator, information relating to the site and type(s) of lorry loader to be used.

When designing a structure to be assembled by cranes (including lorry loaders), designers should consult an appropriate appointed person at the design stage to ensure compatibility between structure components and the cranes (including lorry loaders) that are likely to be lifting them into position. Further advice is given in the Construction Industry Council General Information Note I 002 [7].

NOTE Contractors have a duty to operate cranes (including lorry loaders) safely, and this can be made extremely difficult by thoughtless design which puts pressure on them to use lorry loaders at their operating limits and sometimes encourages improper use.

5 Contract lift or lorry loader hire

5.1 General

Given the wide variety of contractual arrangements, it is important that the planning, organization control and management of lifting operations are not compromised. In general, any organization requiring a load to be moved by lorry loader, which does not have its own lifting equipment, has two basic options: hiring a lorry loader (hired lorry loader) or employing a contractor to carry out the lifting operation (contract lift). The difference between the two options is summarized in Figure 2.

In the case of lorry loaders, the contract lift includes three possibilities:

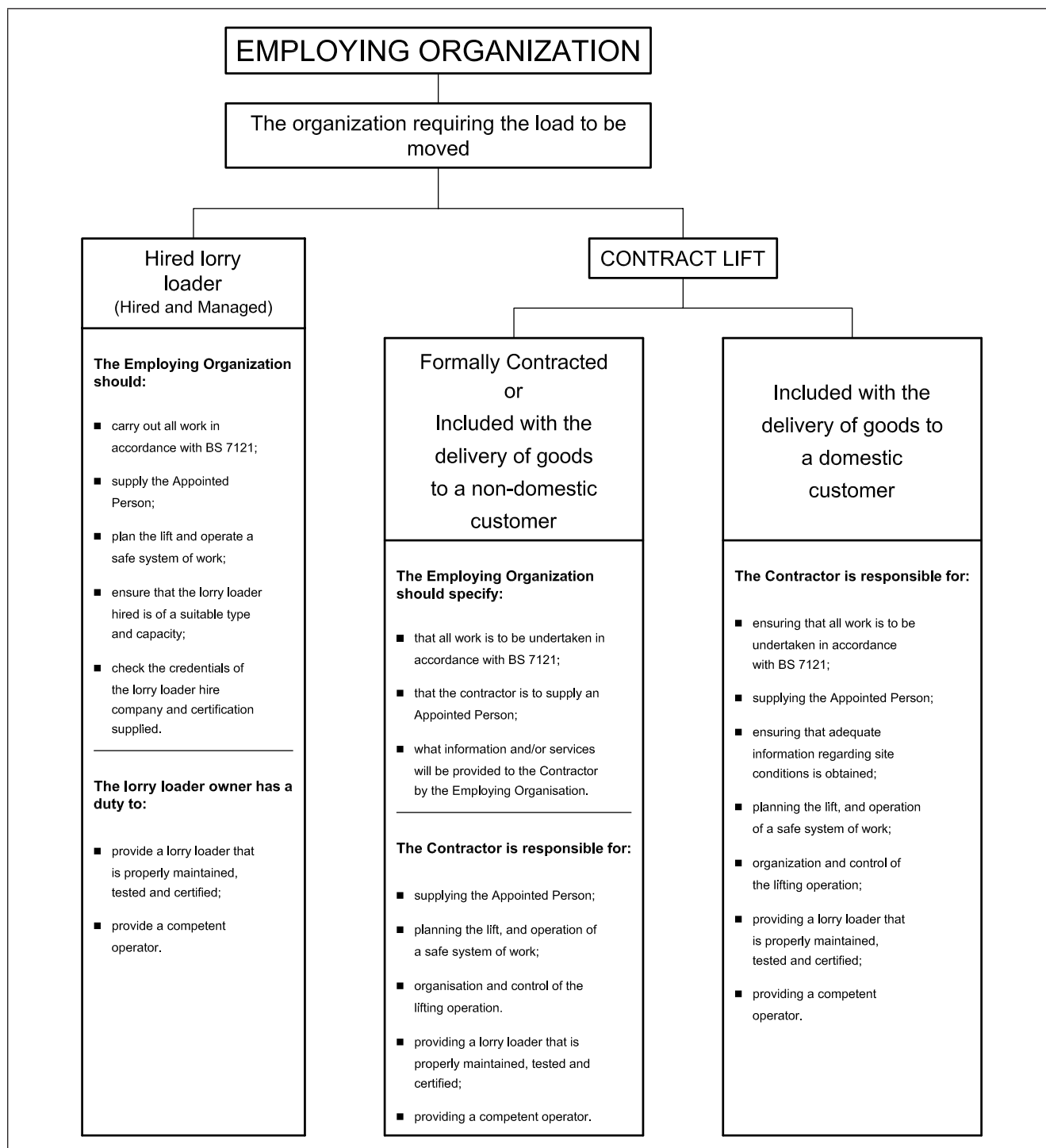
- a) a formal contract lift, as with a mobile crane, where a lorry loader owner is contracted by an employing organization to move a load on their behalf using a lorry loader;
- b) lifting operations as part of the supply and delivery of goods to a non-domestic customer, e.g. where a builder's merchant is delivering packs of blocks to a construction site on a vehicle and unloads the blocks using a loader crane mounted on the delivery vehicle;
- c) lifting operations as part of the supply and delivery of goods to a domestic customer, e.g. where a builder's merchant is delivering packs of blocks to a householder on a vehicle and unloads the blocks using a lorry loader.

NOTE 1 In option c), the lorry loader supplier assumes full responsibility for all aspects of the lifting operation as the householder would not be expected to have sufficient knowledge to advise the supplier of any significant hazards or be aware of the requirements of LOLER [1] and BS 7121.

If an individual or organization does not have expertise in lifting operations, they should not hire lorry loaders but should opt for a contract lift. Before entering into a contract, employing organizations should satisfy themselves that the contractor has the necessary competence to carry out the work.

NOTE 2 Responsibilities for insurance in terms of the lorry loader, personnel, the load and third parties might also need to be clarified.

Figure 2 Contract options



5.2 Contract lifting operations

5.2.1 Formally contracted lifting

The employing organization may enter into a contract with a contractor who undertakes the work on their behalf.

The parties to the contract should ensure that:

- a) all work is carried out in accordance with the BS 7121 series;
- b) the contractor appoints a person, in accordance with 4.3, to the satisfaction of the employing organization;
- c) all information or services provided by the employing organization to facilitate compliance with the BS 7121 series are notified to the contractor in writing.

The contractor should carry out lifting operations in accordance with the BS 7121 series. The contractor should be given full authority by the employing organization to work in accordance with the BS 7121 series including, where appropriate, authority to control and instruct the employing organization's personnel.

NOTE Although the BS 7121 series is intended to assist organizations to comply with their statutory and common law obligations, it does not relieve them from these obligations.

Before entering into a contract, employing organizations should confirm that the contractor has the necessary competence to carry out the work in accordance with the BS 7121 series.

5.2.2 Contract lifting as part of the supply and delivery of goods to a non-domestic customer

An organization requesting the supply and delivery of goods (the employing organization) which involves a lifting operation with a lorry loader to unload the goods from the delivery vehicle, is entering into a de facto contract lift agreement with the person delivering the goods (the contractor).

The parties to the contract for supply should ensure that:

- a) all work is carried out in accordance with the BS 7121 series;
- b) the contractor appoints a person, in accordance with 4.3, to the satisfaction of the employing organization;
- c) all information or services provided by the employing organization to facilitate compliance with the BS 7121 series are notified to the contractor in writing.

The contractor should carry out lifting operations in accordance with the BS 7121 series. The contractor should be given full authority by the employing organization to work in accordance with the BS 7121 series including, where appropriate, authority to control and instruct the employing organization's personnel.

NOTE Although the BS 7121 series is intended to assist organizations to comply with their statutory and common law obligations, it does not relieve them from these obligations.

Before entering into a contract, employing organizations should confirm that the contractor has the necessary competence to carry out the work in accordance with the BS 7121 series.

5.2.3 Contract lifting as part of the supply and delivery of goods to a domestic customer

The domestic customer requesting the supply and delivery of goods which involves a lifting operation with a lorry loader to unload the goods from the delivery vehicle is entering into a de facto contract lift agreement with the person delivering the goods (the contractor).

The contractor should ensure that:

- a) a person is appointed, in accordance with 4.3;
- b) adequate information regarding site conditions is obtained;
- c) the lift is planned and a safe system of work is followed;
- d) the lifting operation is appropriately supervised and carried out in a safe manner;
- e) the lorry loader provided is properly maintained, inspected and thoroughly examined;
- f) a competent operator is provided.

The contractor should carry out lifting operations in accordance with the BS 7121 series.

NOTE 1 Although the BS 7121 series is intended to assist organizations to comply with their statutory and common law obligations, it does not relieve them from these obligations.

NOTE 2 The lorry loader supplier will assume full responsibility for all aspects of the lifting operation as the householder would not be expected to have sufficient knowledge to advise the supplier of any significant hazards or be aware of the requirements of LOLER [1] and BS 7121.

5.3 User's duties when using hired lorry loaders

When a lorry loader is hired out together with an operator to the user organization, the lorry loader owner should provide a competent operator and a lorry loader that is properly maintained, inspected and tested in accordance with BS 7121-2, and has a current report of thorough examination.

The user organization retains the responsibility for nominating the appointed person in accordance with 4.3 and for following the recommendations given in the BS 7121 series. Notwithstanding any advice the lorry loader owner might have offered concerning the selection of a particular lorry loader or any other relevant matter (e.g. clearances or ground conditions), the responsibility for ensuring that the lorry loader is of a suitable type, size and capacity for the task being undertaken and for planning the operation remains with the user organization.

Therefore, if an individual or organization does not have expertise in lifting operations, they should not hire lorry loaders but should opt for a contract lift.

NOTE In the event that a lorry loader is hired without an operator, all of the these points apply.

6 Planning of the lifting operation

6.1 General

All lifting operations should be planned so that they can be carried out safely and all foreseeable risks are taken into account. Planning should be carried out by an appointed person who has the appropriate knowledge for the lift being undertaken (see 4.3.2).

In cases of repetitive or routine basic lifting operations, this planning might only be necessary in the first instance, with periodic reviews to confirm that no factors have changed.

NOTE 1 For lifting operations carried out on construction projects, further information on the duties of personnel is given in 4.4.

Planning of the lifting operation should take into account:

- a) the load, its characteristics and the method of lifting paying particular attention when loads are lifted out of water, e.g. flow, suction and loss of buoyancy;

NOTE 2 It might also be necessary to make allowance for any adhesion between the load and its support.

- b) the stability of the load when being lifted and set down;
- c) the selection of a suitable lorry loader(s) appropriate to the operation so that adequate clearances are maintained between the load(s) and the lorry loader structure (see Clause 9);
- d) the selection of lifting accessories/attachments, the weight to be taken into account when assessing the load on the lorry loader(s);
- e) the position of the lorry loader(s) and of the load before, during and after the operation;
- f) the site of the operation including proximity hazards, space availability, suitability of the ground or foundations and other environmental conditions;
- g) any necessary set up of the lorry loader(s);
- h) the identification and selection of personnel for the lifting operation.

NOTE 3 Lone working is to be avoided wherever possible. Where this is not possible, it is essential that suitable measures are put in place to minimize risk to the lone worker.

6.2 Risk assessment

The risk assessment carried out by the appointed person as part of the planning process should identify the hazards associated with the proposed lifting operation. The assessment should evaluate the risks involved and the nature and extent of any measures required to mitigate those risks. The assessment should also take into consideration hazards identified by the overall site risk assessments.

NOTE 1 Attention is drawn to the Management of Health and Safety at Work Regulations [8] which require a risk assessment to be carried out.

Generic risk assessments are unlikely to be sufficient, other than for basic lifts (see 4.3.2.2), since most sites have unique hazards which should be taken into account in the separate site-specific assessment.

The results of the risk assessment should be recorded in writing and used in the preparation of the method statement (see 6.3).

NOTE 2 The employing organization needs to inform the appointed person of hazards identified by the overall site risk assessments.

6.3 Method statements

6.3.1 General

Once the risk assessment has been carried out, the appointed person should ensure that a method statement is prepared, detailing the safe system of work (see 4.1) for the lifting operation and including the risk assessment.

The appointed person should, when necessary, consult with others with specialized knowledge and experience to assist in the planning process for which the appointed person retains responsibility.

The method statement should include:

- a) the tasks to be achieved;
- b) details of the steps to be taken to eliminate danger to personnel not involved in the lifting operation, and, where necessary, prevent their entry into danger zones, e.g. by organizing for road closures;

NOTE Exclusion zones require the agreement of the employing organization (site owner or principal contractor) which is responsible for the enforcement of these zones.

- c) the requirement for pre-use checks to be completed;
- d) a clear statement of the allocation of tasks to all parties involved in the lifting operation.

The crane supervisor should ensure that the lifting team are inducted in the general site precautions and the specific features of the method statement at the start of the job.

A copy of the method statement and associated operating instructions should be made available to all those involved in the lifting operation.

6.3.2 Team briefing/induction

It is essential that the method statement is sufficient to provide the basis of a briefing or induction for each member of the team. This should include:

- a) a description of the item to be lifted;
- b) its weight;
- c) its dimensions;
- d) lifting points/method;
- e) type of lifting accessories to be used and configuration;
- f) pick up and landing points referenced to the site plan;
- g) the height of the lift and the maximum radius;

- h) the model and configuration of lorry loader to be used;
- i) stabilizer support arrangements;
- j) overhead hazards;
- k) underground hazards;
- l) personnel involved.

The crane supervisor, site owner or principal contractor's representative should normally take the opportunity during the site induction to seek the views of the team about any arrangements for health and safety that might be relevant to them.

To be effective, the method statement needs to specify clear roles for each member of the team. Arrangements for effective communication among the team (and if necessary with adjacent lorry loader operators in case of danger) should be available.

7 Selection and duties of personnel

NOTE See 4.3 for the selection and duties of the appointed person.

7.1 Selection of personnel

Safe lifting operations depend upon the selection of suitable personnel who are competent to carry out the required duties. Records of training and experience of persons, such as the lorry loader operator, assist in the selection of suitable personnel. The appointed person should be trained in accordance with Annex A. The lorry loader operator and slinger(s) should be trained in accordance with Annex B.

Those responsible for the selection of personnel should ensure that the personnel involved in the operation are efficiently organized so that there is good teamwork in the working situation.

Work associated with lifting operations should not be carried out by personnel whose efficiency is impaired by alcohol, drugs or other influences. It is essential that all personnel in the team are made aware of both this fact and their other duties (see 7.2).

Where personnel are undergoing training, they should be supervised by appropriate personnel.

7.2 Duties of personnel

7.2.1 Lorry loader operator

The lorry loader operator should be responsible for the correct operation of the lorry loader in accordance with the manufacturer's instructions and within the safe system of work (see 4.1), as detailed in the method statement.

The lorry loader operator should at any one time respond only to the signals from one slinger/signaller (in the case where separate slingers/signallers are provided), who should be clearly identified (see 10.3).

NOTE It is essential that the lorry loader operator responds immediately to an emergency stop signal from any person.

7.2.2 Slinger

The slinger should be responsible for:

- a) attaching and detaching the load to and from the lorry loader load lifting attachment;
- b) using the correct lifting accessories and other equipment in accordance with the planning of the operation.

The slinger should also be responsible for initiating and directing the safe movement of the lorry loader [see 8.3h)]. 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 lorry loader. Where continuity of signalling is required and this slinger is not visible to the lorry loader operator, another slinger or signaller might be necessary to relay signals to the lorry loader operator. Alternatively, other audio or visual methods may be used.

Where audio or visual methods are used, the equipment or its means of use should be such that the operator is immediately aware of failure of the equipment, to enable the operator to stop lorry loader movements.

Typical examples of audio or visual methods used are as follows.

- 1) A blank screen on a monitor immediately indicates that the operator needs to stop all lorry loader movements.
- 2) A slinger using a radio continuously instructs the operator to lower a load, e.g. by saying "Lower-lower-lower...", and failure of this continuous instruction from the slinger indicates that the operator needs to stop all lorry loader movements.

If, during the lifting operation, responsibility for directing the lorry loader and load is to be transferred to another nominated person, the slinger should clearly indicate to the lorry loader operator that this responsibility is being transferred and to whom, and the slinger should clearly indicate to the new nominated person that this transfer is taking place. Furthermore, the lorry loader operator and the new nominated person should clearly indicate that they accept the transfer of responsibility.

7.2.3 Signaller

The signaller should be responsible for relaying the signal from the slinger to the lorry loader operator. The signaller may be given the responsibility for directing movement of the lorry loader and load, instead of the slinger, provided that only one person has the responsibility.

7.2.4 Crane supervisor

The crane supervisor should direct and supervise the lifting operation, ensuring that it is carried out in accordance with the method statement. The crane supervisor should be competent and suitably trained and should have sufficient experience to carry out all relevant duties. The crane supervisor should also have sufficient authority to stop the lifting operation if they consider it dangerous to proceed.

NOTE The appointed person may decide to undertake the duties of the crane supervisor or to delegate these to another person with appropriate expertise for the lifting operation, such as the lorry loader operator, where appropriate for basic and intermediate lifts.

7.2.5 Crane coordinator

The crane coordinator should plan and direct the sequence of operations of cranes, including lorry loaders, so that they do not collide with other cranes, loads and other equipment (e.g. concrete placing booms, telehandlers, piling rigs).

7.2.6 Maintenance personnel

The maintenance personnel should be responsible for maintaining the lorry loader and enabling its safe and satisfactory operation. They should carry out all necessary maintenance in accordance with the manufacturer's maintenance manual and within the safe system of work (see 4.1).

7.3 Combination of roles

In certain circumstances, it might be possible to combine some of the roles of members of the lifting team (see Table 2). However, the combination of roles should only take place following a review of the lifting operation by the appointed person.

It should be noted that an appointed person is required to plan all lifting operations. It is also good practice for the appointed person to be present on site during a complex lift.

It might be appropriate for the appointed person to assume other roles such as crane supervisor, lorry loader operator or slinger/signaller.

The combination of roles should only be considered if the person undertaking the combined role has achieved the necessary competence for each role.

Table 2 Combination of lifting team roles^{A)}

Activity	Role	Lift category		
		Basic	Intermediate	Complex
Planning	Appointed person	Required	Required	Required
Site visit	Appointed person	Not essential	Might be required	Required
Lifting operation	Appointed person	Not essential	Might be required	Required
	Crane supervisor			Required
	Lorry loader operator	Roles may be combined	Roles may be combined	Required
	Slinger/signaller			Required

^{A)} This table is for guidance and should not be taken as definitive for every circumstance. It is the responsibility of the appointed person to determine the combination of roles for each lifting operation.

8 Minimum attributes of personnel

8.1 General

All personnel should be:

- a) competent to perform the tasks required of them;
- b) adequately trained and/or successfully assessed;
- c) able to present a record of training and assessment;
- d) physically able to carry out the work.

NOTE Competency requirements for lorry loader operators, slingers, signallers and assessors are given in BS ISO 15513.

8.2 Lorry loader operator

The lorry loader operator should be:

- a) fit, with particular regard to eyesight, hearing, reflexes and mobility;
- b) physically able to operate the lorry loader safely;
- c) able to judge distances, heights and clearances;
- d) adequately trained and assessed for the specific model of lorry loader and its accessories, and have sufficient knowledge of the lorry loader, its operating instructions and its safety devices;
- e) adequately trained and assessed by their employer in job-specific duties, including any generic risk assessments and method statements;
- f) fully conversant with the duties of the slinger and signaller, and with the signal code shown in **16.4**, and any alternative methods of relaying the signals that are to be used, in order to implement safely the instruction of the slinger or signaller;
- g) authorized to operate the lorry loader.

Evidence that the operator is medically fit to operate a lorry loader should be obtained on employment and, subsequently, at yearly intervals. The type of evidence obtained is dependent on the type of lorry loader being operated and the risks to the operator and others involved in the operation. Based on this evidence, a supplementary medical examination might be required.

8.3 Slinger

The slinger should have been assessed as competent unless they are undergoing training and are under the direct supervision of a person competent for the purpose of training.

The slinger should also be:

- a) fit, with particular regard to eyesight, hearing, reflexes and mobility;
- b) physically able to handle lifting accessories and equipment;

- c) able to establish weights, balance loads and judge distances, heights and clearances;
- d) trained in the techniques of slinging;
- e) capable of selecting lifting accessories and equipment in suitable condition for the load to be lifted;
- f) trained in the techniques of signalling and the signal code shown in **16.4**;
- g) capable of giving precise and clear verbal instructions where audio equipment (e.g. radio) is used and capable of operating the equipment in accordance with **16.4**;
- h) capable of initiating and directing the safe movement of the lorry loader and the load;
- i) authorized to carry out slinging duties.

8.4 Signaller

The signaller should have been assessed as competent unless they are undergoing training and are under the direct supervision of a person competent for the purpose of training.

The signaller should also be:

- a) fit, with particular regard to eyesight, hearing, reflexes and mobility;
- b) able to judge distances, heights and clearances;
- c) trained in the techniques of signalling and the signal code shown in **16.4**;
- d) capable of giving precise and clear verbal instructions where audio equipment (e.g. radio) is employed and capable of operating the equipment in accordance with **16.4**;
- e) capable of directing the safe movement of the lorry loader and the load;
- f) authorized to carry out signalling duties;
- g) aware of the responsibilities allocated by the appointed person to the lorry loader operator and slinger.

8.5 Crane supervisor

The crane supervisor should be:

- a) authorized to carry out the duties listed in **7.2.4**;
- b) fully conversant with the duties of all persons involved in the lifting operation;
- c) able to give clear, unambiguous instructions to all other members of the team;
- d) able to assess danger to the lifting operation from changed circumstances on site, and to call a halt to the operation if the risk becomes unacceptable, so that the appointed person can be referred to for further instructions if necessary.