

# Construction Skills Certification Scheme

## Safe Lifting Operations



## Slinger/Signaller

# **Construction Skills Certification Scheme**

## **Safe Lifting Operations**

### **Slinger/Signaller**

Published by  
The Construction Skills Certification Scheme Unit  
27/33 Upper Baggot Street  
Dublin 4

First published 2008

© SOLAS

ISBN

The Construction Skills Certification Scheme Unit has made every effort to ensure that the information contained within this publication is accurate. Its content should be used as guidance material and not as a replacement for current regulations.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission in writing from SOLAS.

Printed in 2013



# Receipt

I have received a copy of the CSCS Safe Lifting Operations – Slinger/Signaller notes and agree to read it carefully and comply with all the guidance and advice on safety and good working practices which it contains.

Signature	
Full Name	
Date	

Name of Company or Organisation	
Address	

# Contents

Introduction	1
1. Safety, the law and you	2
2. Accident prevention and control	6
3. Selection and use of lifting gear	8
4. Safe slinging and signalling	9
5. Slinging and signalling safety checklist	12

## Appendices

A Types of lifting gear	14
B Use of hand/tag lines	15
C Recommended crane signals	16
D Statutory forms	18

## Acknowledgements

Extracts from BS 7121: Part 1 are reproduced with the kind permission of the British Standards Institution. Complete copies can be obtained by post from B.S.I. Sales, 389 Chiswick High Road, London W4 4AL.

Extracts and illustration by kind permission of:

- CITB-ConstructionSkills
- Construction Plant-hire Association.

## Introduction

This guide for safe slinging and signalling operations has been produced for operatives involved in the movement and controlling of loads. It sets out to provide guidance in an easy to read form, paying particular attention to the duties of the slinger/signaller. It covers a wide range of lifting conditions and activities, and aims to promote safe working practices which comply with current legislation and the precautions to be taken if accidents are to be avoided.

Specific sections on the inspection and use of lifting gear and the safe slinging and signalling of loads contain readily accessible information in a checklist format with a simple **Do's** and **Don'ts** message.

This guide complements manufacturers' instructions and recommendations with regard to:

- general safety legislation and safe working procedures for slingers/signallers
- selection and use of lifting gear
- safe and efficient use of lifting gear.

Manufacturer/company information, sling charts and safe working load tables should always be used for the relevant lifting gear and referred to as and when required.

This guide does not attempt to try to cover every aspect of working conditions when selecting and using lifting gear and carrying out slinging and signalling operations.

# 1. Safety, the law and you

This section provides guidance for employers, employees and the self-employed who use mobile plant equipment. Minimum legal requirements are outlined which relate to the safe use of mobile plant. Various Acts of the Oireachtas and statutory requirements, examples of which are listed below, provide the definitive legislation to be followed.

## Legislation

Legislation to be followed includes the Safety, Health and Welfare at Work Act 2005 (SHAWWA). Parts of the Act and other regulations connected with the operation of plant include:

- *General Duties of Employer*
- *General Duties of Employee and Persons in Control of Places of Work*
- Protective and Preventive Measures
- Safety Representatives and Safety Consultation
- The Health and Safety Authority
- Offences and Penalties

*All Health and Safety rules also apply to self-employed persons.*

## Regulations and Codes of Practice

Regulations made under an Act of the Oireachtas are mandatory

### **Safety, Health and Welfare at Work (Construction) Regulations 2013 S.I No. 291 of 2013 include**

- Design and Management
- General Duties of Contractors and others
- General Safety Provisions
- Excavations, Shafts, Earthworks, Underground Works and Tunnels
- Cofferdams and Caissons
- Compressed Air
- Explosives
- General Health Hazards
- Construction Work on or Adjacent to Water
- Transport, Earthmoving and Materials-Handling Machinery and Locomotives
- Demolition
- Roads
- Construction Site Welfare Facilities
- SCHEDULE 4 - Safety Awareness Scheme
- SCHEDULE 5 - Construction Skills Certification Scheme
- SCHEDULE 6 - Procedure for Selection of Site Safety Representatives
- SCHEDULE 7 - List of Machinery

- **The Safety, Health and Welfare at Work (General Application) Regulations 2007 S.I. No. 299** include:
  - Workplace and Work Equipment
  - Use of Work Equipment
  - Personal Protective Equipment
  - Manual Handling of Loads
  - Display Screen Equipment
  - Electricity
  - Work at Height
  - Control of Noise at Work
  - Control of Vibration at Work
  - Safety Signs at Places of Work
  - First-aid
  - Explosive Atmosphere at Places of Work

The introduction of the above legislation, which protects people at work and those who may be affected by their actions, has helped to improve our working environment.

The legislation concerns employers, employees and the self-employed, and makes people responsible for their actions, as well as their omissions, including others affected by their actions.

Regulations made under an Act of the Oireachtas are mandatory and may be supplemented by an Approved Code of Practice (ACoP), which advises organisations and their staff on how to comply with the law.

If the advice of the ACoP is followed then generally you are meeting the requirements and complying with the law. If you, or your organisation, are prosecuted for breaking a health and safety law and it is proven you did not follow the advice in the ACoP, you must prove you have complied with the law in another way.

*Penalties can be imposed on persons who are found guilty of a Health and Safety Offence (on summary conviction), which may include:*

- a fine
- a term of imprisonment.

*Penalties may be imposed for:*

- disobeying a Prohibition notice
- unauthorised disclosure of information
- a breach of the conditions of a licence.

## Duties of personnel

It is in the interest of every employer and employee involved in the use of plant and equipment to promote safety within their workplace.

### Legal duties of employers

*'Every employer shall ensure, so far as is reasonably practicable, the safety, health and welfare at work of his or her employees.'* \*

Employers have a duty to:

- provide a safe working environment that is without risk to health
- provide and maintain safe plant and equipment and ensure it has been designed, constructed, tested and examined to be safe
- carry out risk assessments and provide their employees with clear and appropriate information on any risks that exist in the workplace and how they intend to reduce those risks
- prepare a safety statement based on the risk assessment
- provide suitable protective clothing and equipment (PPE) to ensure the health and safety at work of their employees. *'Every employer shall ensure that any measure taken by him or her relating to safety, health and welfare at work do not involve financial cost to his or her employees'* \*
- provide employees with any necessary information, including legal requirements, adequate instruction, training and supervision *'in a form, and manner and, as appropriate, language that is reasonably likely to be understood by the employee concerned'* \*
- obtain the services of a competent person for Health and Safety purposes
- provide adequate welfare facilities

**\*Source:** *Safety, Health and Welfare at Work Act 2005*

## **Legal duties of employees**

In general terms, the law says that you must:

- be responsible and as safe and careful as possible in your work, so as not to put the health and safety of yourself or others at risk, including members of the public
- co-operate with and assist your employer or any other person, as far as necessary, to enable them to carry out their legal duties in health and safety
- not interfere with or misuse any safety devices or equipment
- not intentionally or recklessly interfere with anything provided in the interest of health, safety and welfare
- follow your employer's procedures and the manufacturer's instructions which apply to the care and safe operation of the machine you are responsible for
- inform your employer, without unreasonable delay, of any work situation that you are aware of which presents a risk to the health and safety of yourself and others
- report (without delay) any defects in plant and equipment which might endanger safety.

All Health and Safety rules also apply to self-employed persons.

## 2. Accident prevention and control

Accidents are unplanned, unwanted events which can injure or kill people. Industry also pays a price with loss of working hours, loss of production and damage to plant and equipment and extra costs.

Remember that **you** as a slinger/signaller **are the key to safety**: good safety practices not only protect you but also protect others around you.

Accidents can be caused by unsafe working practices and attitudes of people in the workplace. By following a safety programme and adopting safe working practices, unsafe conditions can be avoided. This contributes to improving safety in the workplace.

Prevention can remove or reduce the likelihood of an accident by following some basic rules, for example:

### Do

- Protect yourself – wear all protective clothing and personal safety equipment issued to you or required by your working conditions
- Follow a safety programme – understand and follow safety procedures when working on site and using plant and work equipment
- Assess your ability to do the job – ensure you are fully aware of the job requirements and how they need to be carried out
- Stay alert – know where to get help. Know the first aid and emergency procedures
- Make yourself aware – study the manufacturer's information and your company's operating instructions and procedures for using your plant and equipment. If the information is not provided, ask your supervisor or the suppliers of the plant/equipment to supply it
- Report faulty/unsafe plant or equipment and any dangerous occurrences and incidents
- Use the equipment safely so as not to affect its condition or use
- Be careful – human error is caused by carelessness, fatigue, preoccupation and lack of concentration. Ensure you watch out for others who are affected by your actions
- Ensure all personal injuries, no matter how slight, are reported and entered in the accident book (or equivalent)
- Take advantage of any training programme offered by your employer or contractor. You are never too old to learn new practices or techniques

## **Don't**

- Use plant or work equipment that you have not been trained to use
- Overload any plant or work equipment either by lifting or loading
- Use or treat equipment carelessly or in an unsafe manner
- Throw or drop objects from plant or work equipment
- Attempt to carry out work on moving parts of plant or work equipment with the safety guards removed
- Indulge in horseplay on plant or work equipment
- Attempt to use any type of plant or work equipment if you are under the influence of drugs, alcohol or any other substance which affects your health or judgement
- Ignore warning instructions or safety signs

### 3. Selecting and using lifting gear

Your duties as a slinger/signaller require you to be responsible for the selection and use of lifting gear and accessories and the loads to be lifted by them. The slinging of the loads to be lifted by a crane/lifting appliance is in your hands. You should know the rules of good slinging and the conditions and suitability of the lifting gear to be used.

The examination, marking and use of lifting gear is subject to a number of Regulations (see Appendix D for statutory certification requirements). However, since you select and use lifting gear on a regular basis and depend on its suitability, proper attachment and safe working condition, this section has been included to give you some guidance on important points which affect you.

#### Identification and selection of lifting gear

All chains, ropes and accessories for lifting, used for raising or lowering and as a means of suspension, must be examined by a competent person prior to their first use and subsequently thoroughly examined every six months by a competent person, or as defined in a schedule devised by a competent person, and a record kept.

There are many different types of lifting gear and accessories which are available to use such as wire rope slings, chain slings, fibre rope slings, flat lifting slings, hooks, shackles, eyebolts, spreader beams to name a few. See Appendix B for illustrations of slinging arrangements, chains, hooks and shackles.

You will need to ensure that you select the right item of lifting gear or accessory to suit the specific lifting operation being undertaken.

Great care needs to be taken with the handling and storing of lifting gear, which should be stored correctly in a designated storage area to keep it safe, dry and secure.

Every item of lifting gear which you select and use must:

- be properly constructed and of the correct capacity, length and size for the load to be lifted
- be marked to show the safe working load and identification
- have a current, thorough examination report, and when appropriate, a current test certificate
- be suitable for the intended purpose.

**Important: You must inspect every item of lifting gear before use. Any item of lifting gear which shows visible signs of damage must not be used.**

If you are in any doubt about the condition of any lifting gear or accessory report it immediately.

**Never attempt to carry out repairs to any item of lifting gear. This should be done by a competent and authorised person.**

Follow your company's procedures for discarding lifting gear which is unsuitable for use.

## 4. Safe slinging and signalling

As a slinger/signaller you are responsible for ensuring that the correct methods are used to lift, move and control loads under your supervision. You will have been delegated duties from an appointed person or, in some instances, you may be the appointed person.

Simple measures taken by yourself and your employer and following some basic rules can remove or reduce the possibility of risk, for example:

### Do

- Comply fully with instructions given by site managers/supervisors/appointed persons
- Check that slings, chains and other accessories are not shortened by tying knots in them or wrapping them around the crane hook
- Check that chains are not joined by bolts or wire
- Check that wire ropes are not sharply bent at any point
- Check that wire ropes are never used singly when hooked by a spliced eye: the cable is liable to untwist, allowing splices to open and slip
- Check that the proper pins are used in all types of shackles
- Check that all end kinks, rings or shackles ride freely upon any hook on which they are used
- Use spreader beams when necessary

### Don't

- Use any slings of insufficient length, which create a wide angle between legs
- Use extra long slings, which reduce the headroom considerably
- Use any wire ropes or slings that have become damaged or rusty

## When loading

### Do

- Protect slings from sharp-edged loads by packing suitable material between the load and the sling
- Ensure the load is evenly distributed to avoid excessive stress on one side of the sling

### Don't

- Let any load rest on a wire rope, it may crush the strands and render the rope unsafe

## When unloading

### Do

- Make sure there is firm foundation for the load and make provision for the removal of all slings and chains
- Stack material securely and provide safe access for subsequent removal

### Don't

- Stack materials where they will cause an obstruction
- Balance loads which could fall or become unstable as a result of changes in weather conditions

## Before lifting

### Do

- Ensure hooks are 'c' type, or fitted with a safety catch
- Ensure that the loads to be lifted are known in advance and that load weights are established and clearly marked
- Ensure the combined weight of the load and all lifting gear *does not exceed the safe working load of the crane*
- Ensure that the methods of communication to be used for carrying out the lift are understood by everyone i.e. hand signals, radio signals or other
- Ensure that radios are fully charged at the start of the shift
- Check that the crane's/lifting appliance's hook is placed centrally over the load to prevent the load swinging when it is being raised, and that the load is balanced
- Ensure you can see the crane driver/lifting appliance operator – if you can't use radios
- Take your hands away from any chains, slings or ropes before the crane takes the strain of the load
- Give warning to all persons to keep clear of the load prior to lifting

### Don't

- Attempt to lift a load without establishing its weight. If in doubt ask your supervisor or a competent person

## During lifting

### Do

- Use approved hand signals clearly and distinctly (see Appendix C for recommended hand signals)
- Protect wire ropes and slings from sharp edges of the load with soft wood or other suitable packing
- Ensure the load is lifted off the ground and is free and correctly slung before hoisting
- When signalling, stand in a position so as to:
  - see the load
  - be seen clearly by the crane driver
  - face the driver of the crane/lifting appliance if possible
- Use hand/tag lines to guide loads wherever practicable (see Appendix B for the use of hand/tag lines)
- Keep all persons not involved in lifting operations away from the vicinity – especially children and the general public

### Don't

- Allow the load to be carried over the heads of other persons. If necessary, give warning to persons to keep clear of the load
- Drag chains, slings, hooks or loads along the ground
- Ride on a crane load or allow any other person to do so
- Use lifting gear for other purposes e.g. towing
- Tie knots in chains to shorten them
- Double up slings. ***This does not double the safe working load!***

### Notes

*Only the person responsible for the lift must give signals, except in an emergency.*

*Hooks and slings not in use should not be placed on the carrying hook. They may cause the sling carrying the load to ride on the nose of the hook.*

*Hooks should be left free when not in use.*

## 5. Slinging and signalling safety checklist

**S**afety starts with you. Remember! You, as a slinger are the key to safety. You are legally responsible for your own safety and that of others working nearby.

**A**ccidents are unplanned, unwanted events, which can injure or kill people. Simple measures taken by your employer and yourself can reduce the risk of them happening.

**F**ines can be imposed on your employer and yourself for breaching Health and Safety Regulations. In some instances it can also lead to imprisonment.

**E**nsure you have determined the weight of the load before attempting to sling it or lift it.

**L**ifting gear and accessories must not be used unless they are certified and suitably marked, identifying the safe working load.

**I**rregular shaped loads should be treated with care. Their centre of gravity will need to be established to ensure safe and secure lifting.

**F**irm foundations should be sought/provided for landing loads.

**T**ravel the route the load will be taking before carrying out lifting operations, checking for any hazards, obstructions etc.

**I**n addition to the compulsory check, see that the lifting gear is checked for defects each time it is put into service. Reject any lifting gear/accessories that are unsafe.

**N**ever attempt to exceed the safe working load of any item of lifting gear.

**G**ive warnings to all persons to keep clear of the load prior to the start of the lift and during the movement of the load. Use appropriate methods of communication. Use approved hand and radio signals and ensure they are agreed and understood by everybody involved. Ensure that radio equipment to be used is fully charged at the start of every shift.

**O**bserve all warning/safety signs traffic regulations and other activities on site – you are the eyes and ears of the crane driver/lifting appliance operator.

**P**ersonal protective equipment (PPE) should be worn at all times. Ensure high visibility recognised clothing is worn to distinguish you from others during lifting operations.

**E**nsure you use packing to prevent lifting gear being damaged by sharp edged loads.

**R**adio equipment to be used for lifting operations should be checked for serviceability and be fully charged at the start of every shift.

**A**lways keep the load under control during lifting operations. Where necessary use hand or tag lines.

**T**ake your hands away from chains, slings and ropes before the crane/lifting appliance takes the strain.

**I**nspect the areas where the loads and materials are to be placed or landed. Where necessary, make provision for safe access and subsequent removal.

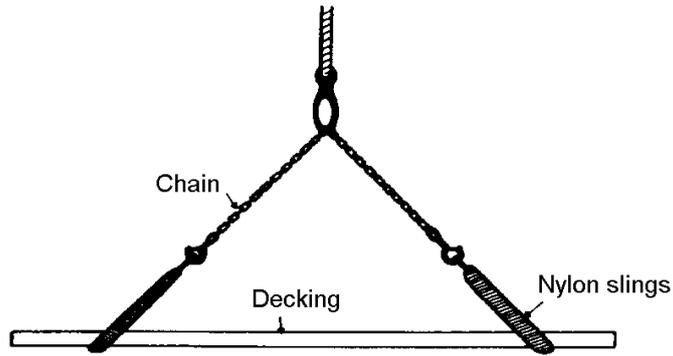
**O**nly the person responsible for the lift must give signals, except in an emergency.

**N**ever carry out a lifting operation if it is likely to endanger yourself and others (even if requested by work colleagues to try and cut corners on a job). If in any doubt seek guidance from your supervisor.

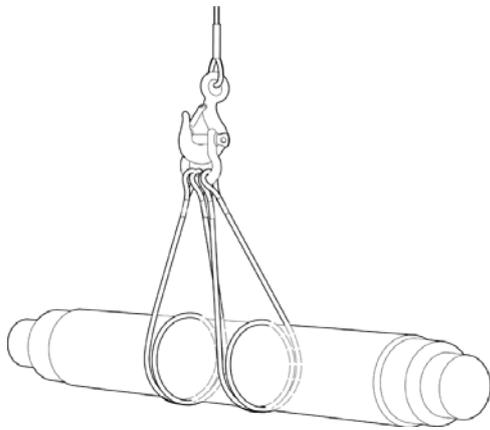
**S**ore and secure lifting gear and accessories in accordance with your company's instructions and procedures.

# APPENDIX A

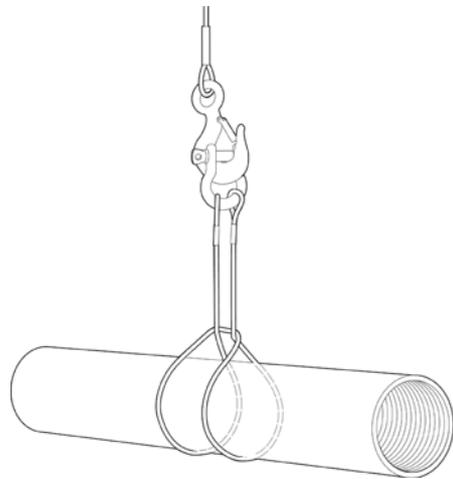
## Types of lifting gear



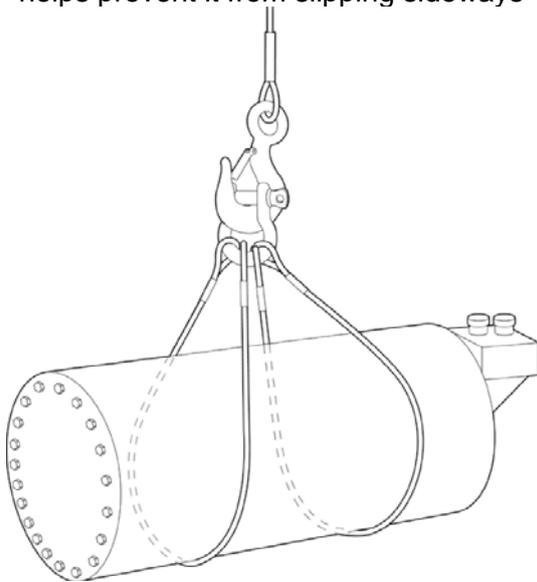
**Nylon sling used to lift decking**



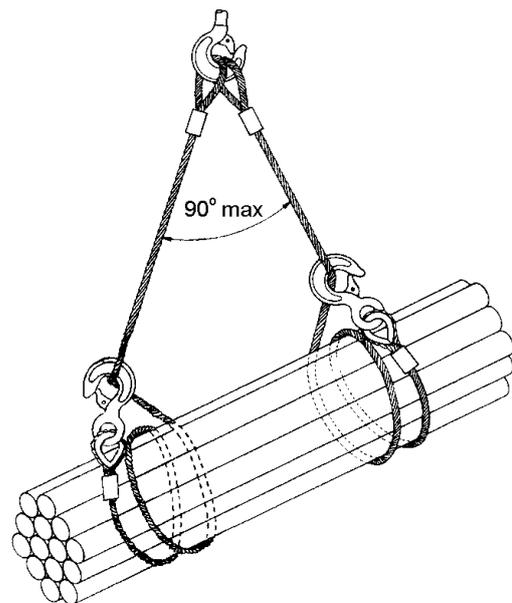
**Double wrap sling** grips the load and helps prevent it from slipping sideways



**Choker sling** (not recommended for long loads or loose bundles)



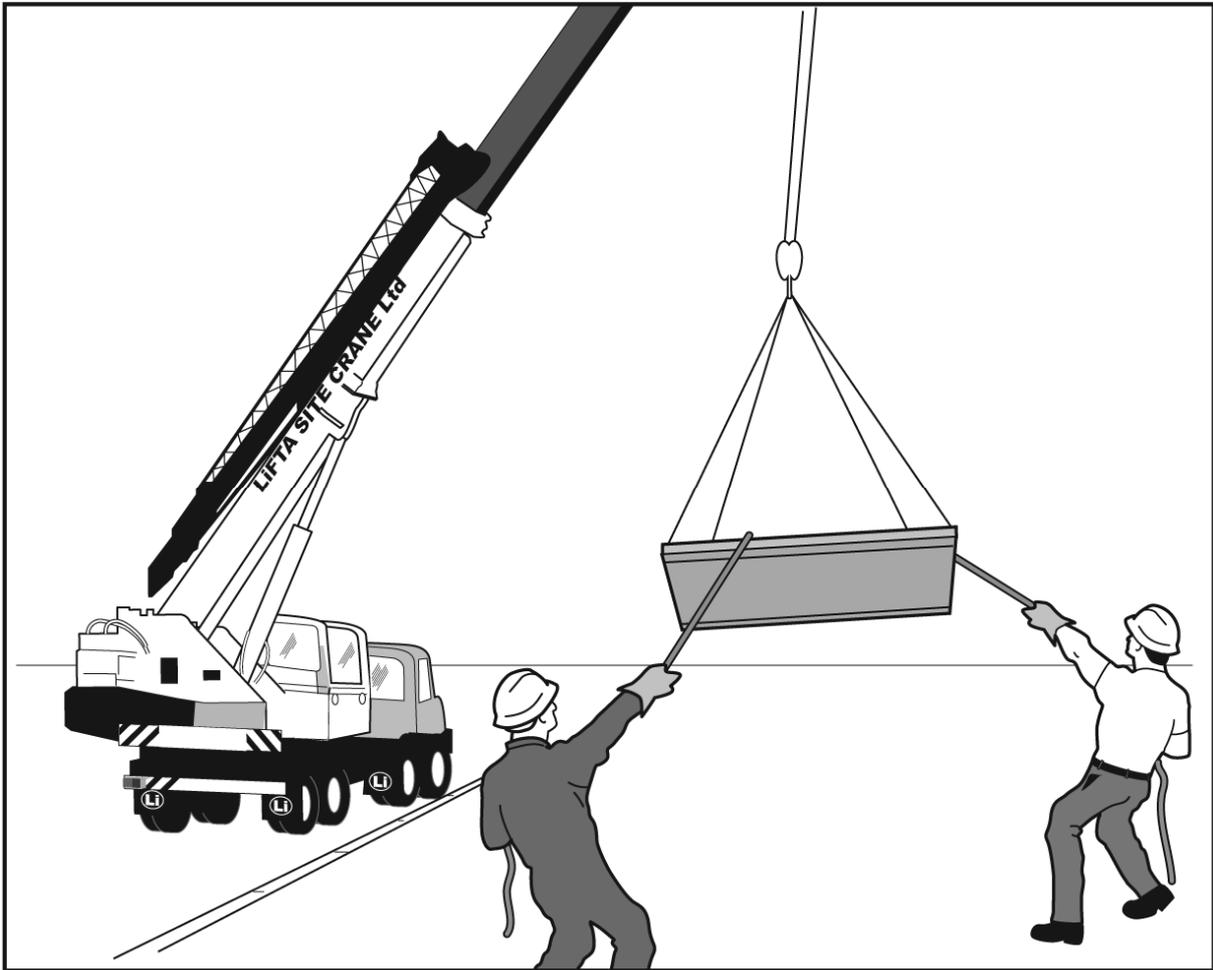
**Cradle sling** (Note: care must be taken to prevent slings sliding in towards each other)



**Double choker**

## APPENDIX B

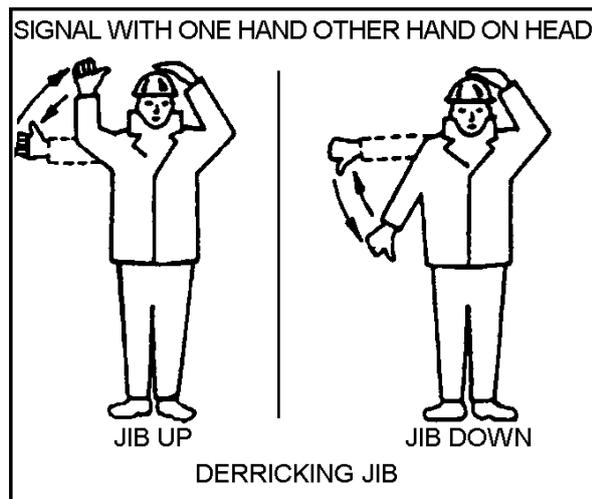
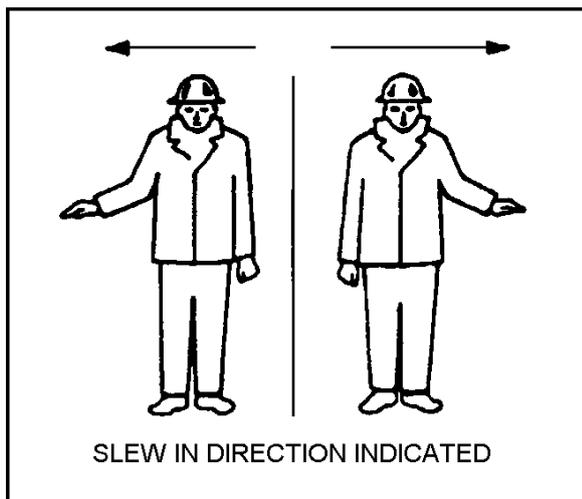
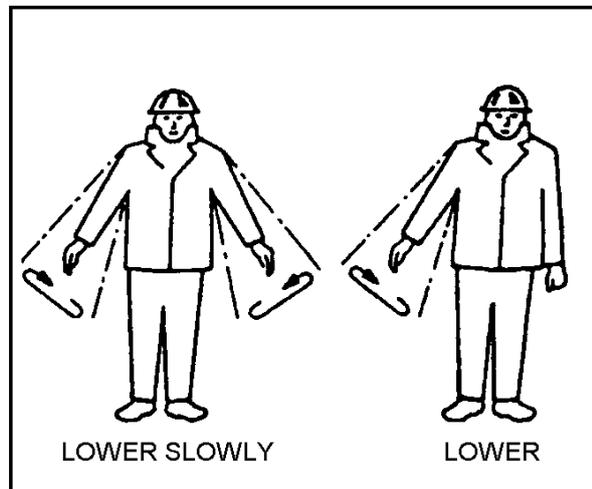
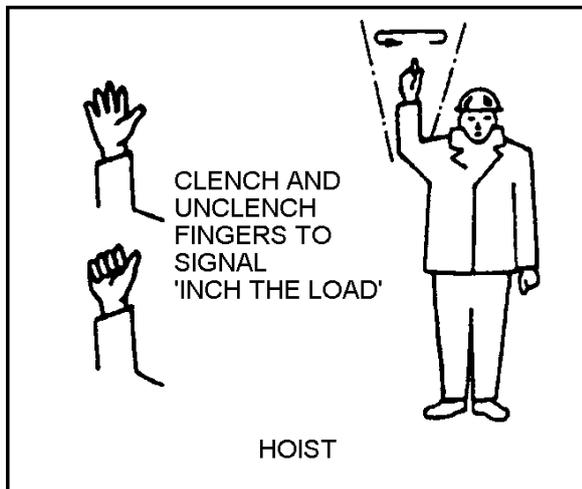
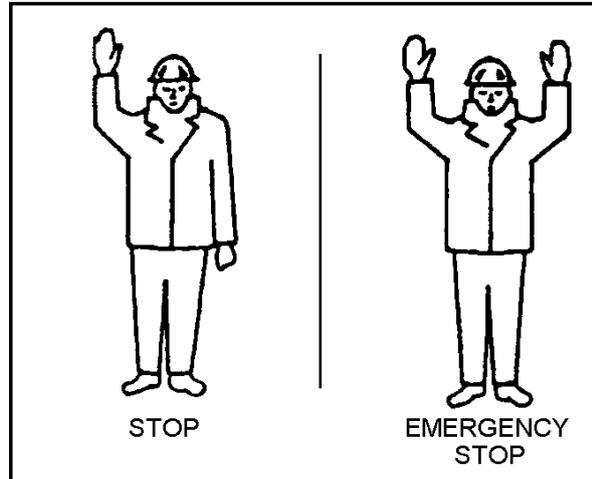
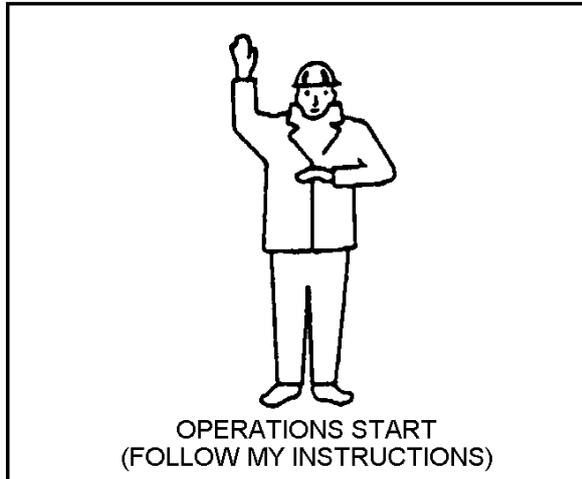
### Use of hand/tag lines



Use of hand lines for controlling the movement of a load

# APPENDIX C

## Recommended crane signals

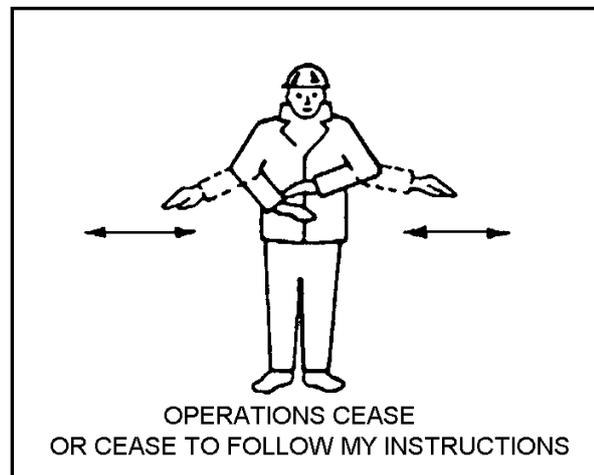
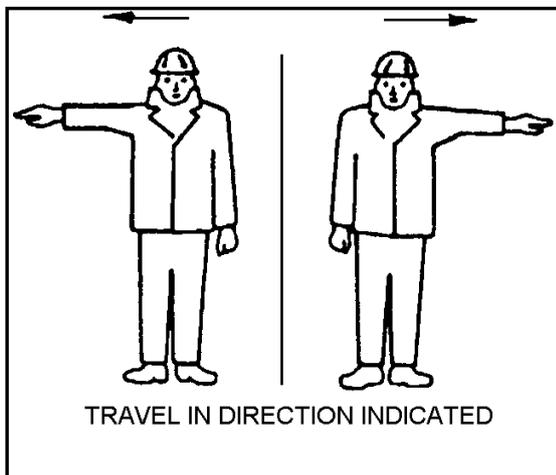
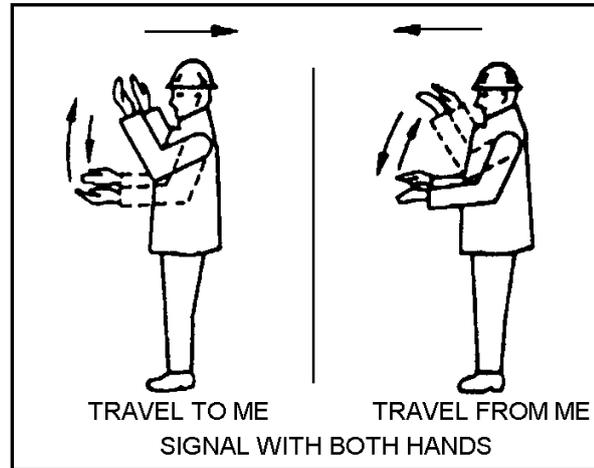
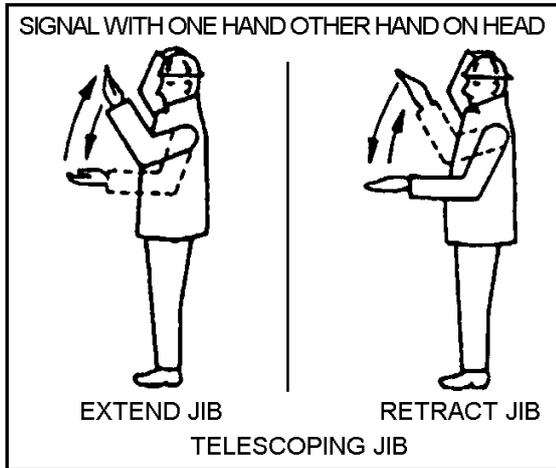


**Note:**

*The signaller should stand in a secure position where he/she can see the load and can be seen clearly by the driver and should face the driver if possible. Each signal should be distinct and clear.*

# APPENDIX C

## Recommended crane signals (continued)



## APPENDIX D Statutory Certification required for Lifting Accessories

- The Safety Health and Welfare at Work (General Applications) Regulations 2007 came into operation on 1<sup>st</sup> November 2007 and are quite clear on what items of plant require certification.
- Forms for recording Tests/Inspections are no longer prescribed. Any form can be used provided it contains the information specified in Part E of Schedule 1 of the Regulations

### Lifting Gear

Regulation No	What is it	Who completes it	When is it required
57. [1] (a) (v)	Certificate of Test & Examination	Manufacturer / Supplier.	When supplied and while Lifting Gear is in use.
57. [1] (a) (v)	Report of Results of thorough examination of: <b>Chains, Ropes and Lifting Gear</b>	Competent Person.	Every six months.
57. [1] (i)	Report of annealing or appropriate heat treatment of: <b>Chains and Lifting Gear</b>	Competent Person.	When Heat Treated and at intervals as specified by the Competent Person.

#### . Notes:

- Lifting accessories include: chains, chain slings, rope slings (except a fibre rope sling), or similar gear, rings, links, hooks, plate clamps, shackles, swivels and spreader beams etc.
- A Certificate of Test and Examination is not required for a fibre rope or a fibre rope sling. Regulation 57 states "in the case of a fibre rope or a fibre rope sling, information from the manufacturer on its safe working load is available" and "it is marked in plain legible figures and letters with a Safe Working Load and a means of identification.