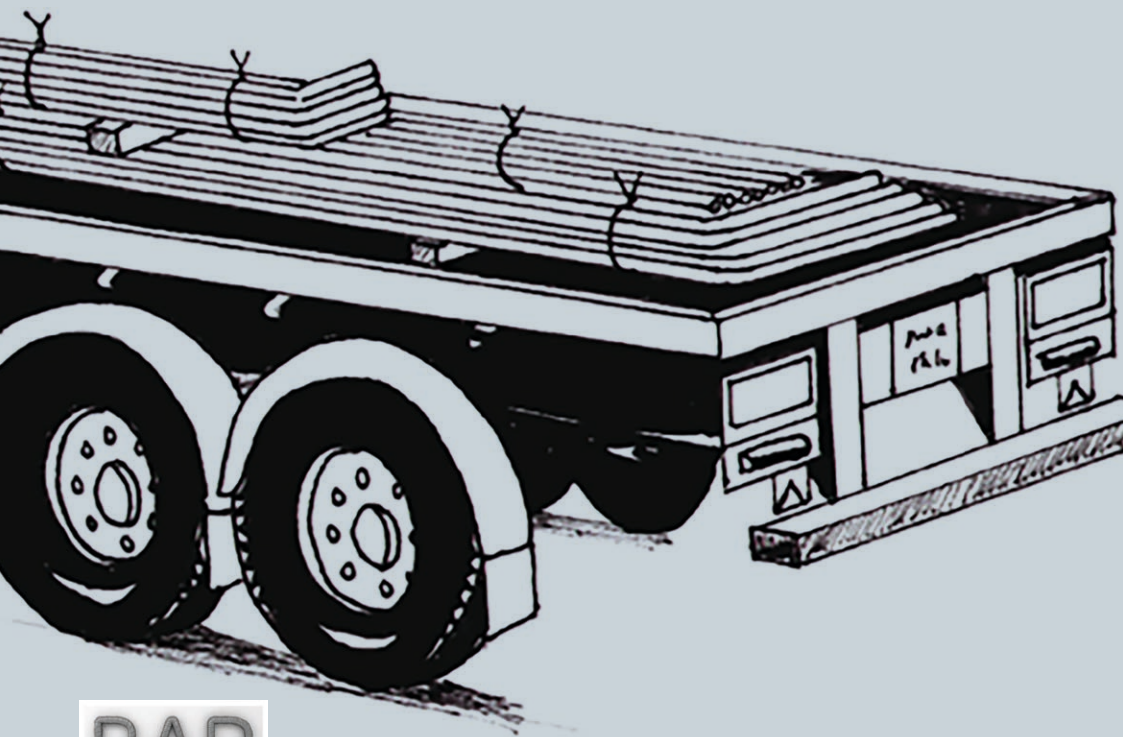


BEST PRACTICE GUIDANCE

THE SAFE OFF-LOADING OF CUT AND BENT REINFORCEMENT

A code of practice for users, hauliers and suppliers



BAR

BRITISH
ASSOCIATION OF
REINFORCEMENT

www.uk-bar.org

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Disclaimer

This document has been prepared by the British Association of Reinforcement (BAR) to provide best practice guidance for the safe off-loading of cut and bent reinforcement. All advice and information herein is intended for those who will evaluate the significance and limitations of its contents and take responsibility for their use and application. No liability (including that for negligence) for any loss resulting from such advice and information is accepted by BAR. Readers should note that this publication is subject to revision from time-to-time and they should, therefore, ensure that they are in possession of the latest version.

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The British Association of Reinforcement (BAR) is the trade association of UK manufacturers and fabricators of steel reinforcement products including cut and bent, reinforcement fabric and mesh.

BAR aims to add value to the reinforcement industry through market and product development, promotion of good industry and health and safety practices and forwarding the development of the reinforced concrete as a whole.

BAR is member of CARES and all BAR members are CARES approved.

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INTRODUCTION

This best practice guidance is intended for the use of reinforcement suppliers, hauliers and drivers, and stockist and construction site customers. It aims to forward awareness of best safe working practices amongst all those involved with the off-loading of cut-and-bent reinforcement bundles from delivery vehicles. Such awareness will avoid the potential for accidents while off-loading at stockists and construction sites. The procedures outlined cover off-loading using a range of equipment known to be in regular use.

The best practice guidance includes:

- Preparation for safe off-loading – the delivery plan
- Preparation of the load for off-loading

Due to the potential risks involved, the movement of cut-and-bent reinforcement should subject to risk assessments and safe system of work appraisals. Whilst this document provides guidance for the safe off-loading of cut-and-bent reinforcement, it is not a substitute for risk assessment as many important factors will vary between off-loading locations.

This best practice guidance has been compiled by representatives of the following BAR members:

- BRC Limited, Barnsley,
- ROM Limited, Lichfield,

It has been peer reviewed by CONSTRUCT, the concrete structures group.

DIRECTORS/MANAGERS RESPONSIBLE FOR HEALTH AND SAFETY: TAKE NOTE

This guidance is aimed at those with the responsibility for health and safety within a company to enable them to meet their obligations to complete risk assessments and provide a safe working environment.

This guidance covers lifting equipment and attachment methods only. Other statutory safety requirements will also apply. These include: never lift over people; wear suitable PPE such as safety boots, gloves, helmets and hi-viz clothing.

Please note, the safe procedures as described in this guidance prohibit then use of bundling wire for lifting. If bundles of cut-and-bent reinforcement are to be moved from the original delivery point, placing dunnage between the bundles as they are stacked will facilitate the fitting of chains/slings for subsequent lifts.

HAZARDS

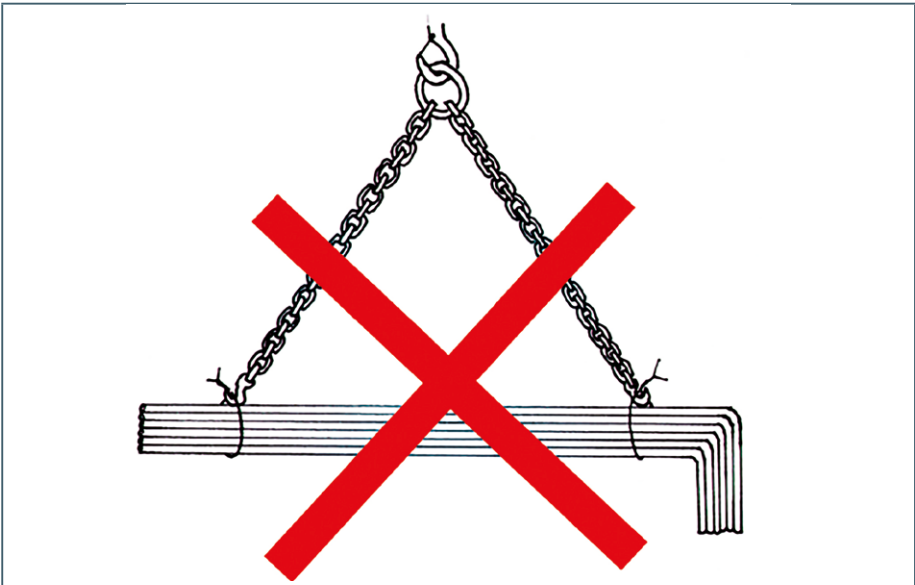
The handling of cut-and-bent reinforcement carries the risk of serious injury if safe working practices are not adopted. A key hazard is persons falling from vehicles while preparing loads of lifting, for example, placing dunnage or attaching lifting chains/slings.

Other potential hazards include:

- Loss of bundle integrity, for example settling or bars during transportation,
- Unsafe lifting equipment such as a crane of insufficient lifting capacity or lift truck with inadequate fork span or length,
- Defective slings,
- Unsafe lifting methods,
- Being struck by a swinging load, sit transport/lift truck
- Puncture wounds from bundle wire ends and musculoskeletal injuries from twisting bundle tying wire
- Manual handling.

The hazards highlighted above can be avoided with proper training and well-planned lifting operations.

NEVER LIFT CUT-AND-BENT BUNDLES USING THE BUNDLE TIES. THEY ARE NOT TESTED AS LIFTING EQUIPMENT AND ARE UNSAFE FOR LIFTING PURPOSES.

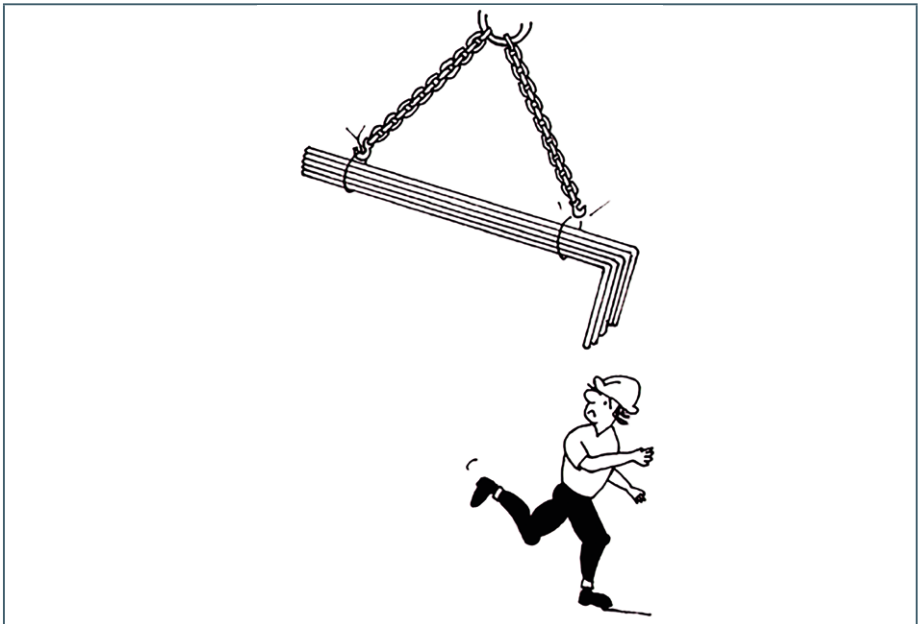


ACCIDENTS

The risk of potential accidents may be avoided by following the guidance below:

- Cordoning off an area should prevent accidents such as personnel being struck by vehicles,
- Falls from load/lorry due to unsafe access methods. Prevent by avoiding working at height where possible,
- Sharp edges – puncture wounds from exposed bundle wire ends. Preventable by wearing appropriate PPE equipment such as gloves and safety glasses,
- Ties snapping can be avoided by following the lifting instructions on the warnings carried on the bundle labels,
- Poor planning of lift/inadequate supervision – no risk assessment or clear plan of action,
- Bad practice – persons under load, unstable ground, poor lighting,
- Lack of training – resulting in incorrect use of lifting equipment and/or any of the above errors.

ALL ACCIDENTS ARE PREVENTABLE IF BEST PRACTICE WORKING PROCEDURES ARE ADHERED TO, SUITABLE PPE IS ISSUED, AND PROPER TRAINING AND CORRECT SUPERVISION ARE PROVIDED. THESE, COMBINED WITH A 'THINK SAFETY' ATTITUDE, CAN SUBSTANTIALLY REDUCE THE POTENTIAL FOR ACCIDENTS.



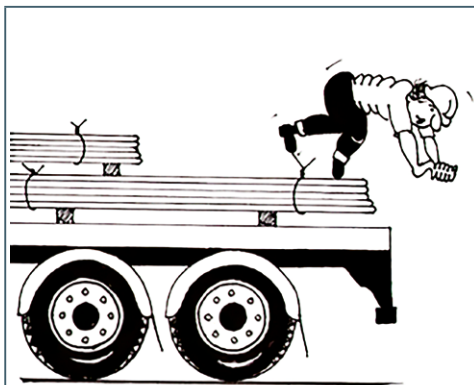
WORKING AT HEIGHT

Working at height means work in any place at or below ground level where, if measures are not taken, a person can fall a distance that is liable to cause personal injury.

There is a hierarchy of control measures for determining how to work at height safely in the Work at Height Regulations 2005. This hierarchy has to be followed systematically and only when one level is not reasonably practical may the next level be considered. The Health and Safety Executive's '*HSG150 Health and Safety in Construction*' offers practical advice on the measures that should be followed.

Those overseeing the off-loading operations should:

- Only use trained, competent workers
- Avoid working at height if possible. If the load can be unloaded without climbing onto the lorry then do so,
- Always use suitable equipment to prevent falls where working at height cannot be avoided,
- Where the risk of a fall cannot be eliminated, use suitable equipment to minimise the distance and consequences of a potential fall,
- Cordon off the work area and erect appropriate warning signs,
- If a Mobile Elevating Working Platform (MEWP) is to be used, consider the space that the vehicle will require and the ground conditions that it to be used on,
- Always consider collective measures that will protect all those at risks, such as nets, gantries and scaffolds, before considering measures that protect only the individual, for example a harness,
- Ensure that work is carried out only when weather conditions do not jeopardise the health and safety of workers,
- Have emergency and rescue procedures in place should someone fall and require aid,
- Ladders are at the bottom of the hierarchy because they do not prevent or mitigate a fall. If ladders are the final and only method to be used, refer to the advice given in the HSE documents INDG401 and INDG455.
- Always inspect ladders before use. Ensure that workers have suitable footwear.



DO NOT climb up the fabric on the vehicle. Use a ladder or another appropriate means of access, such as a gantry platform. If a ladder is used, ensure that it is secured.

DO NOT CLIMB UP THE REINFORCEMENT ON THE VEHICLE. USE A LADDER OR OTHER APPROPRIATE MEANS OF ACCESS, SUCH AS A GANTRY PLATFORM. WHEN USING LADDERS, ALWAYS MAINTAIN THREE POINTS OF CONTACT

PLANNING FOR A SAFE DELIVERY

Safe delivery is the joint responsibility of the customer, haulier and supplier. There should be agreement between all parties in advance of the delivery as to the system of work, the equipment needed, who will supply this and management arrangements. This information should form the basis of a delivery plan where responsibilities are clear to all parties and all site specific issues and solutions are identified. For an example of a delivery plan see Appendix 1. Key responsibilities include:

Supplier:

- Provide access to information and instruction on safe handling procedures,
- Ensure that each bundle is securely tied and well presented in accordance with the manufacturer's safe tying system,
- Ensure that each bundle has a product information label attached which details the bundle weight.

Haulier:

- Ensure the safe planning, positioning and securing of the load for transit to site,
- Prepare the load on site for safe unloading,
- Provide suitable and sufficient dunnage for use when raising the bundle corners prior to off-loading.
- Ensure that the driver is trained and competent and that the vehicle/hiab is roadworthy and up to date with inspections/examinations.
- Ensure that the vehicle has all the necessary safety devices fitted: audible warning systems; flashing beacons; reversing alarms; etc.

Customer:

- Carry out a risk assessment for the unloading operations as part of the delivery plan,
- Prepare a basic lifting plan in accordance to BS2172: 2012: Code of Practice for Safe Use of Cranes in order to assist with the safe off-loading on site. This includes:
 - Ensuring availability of suitable off-loading equipment,
 - Ensuring availability of safe access to the site,
 - Identifying the suitable location for depositing the load
 - Ensuring the availability of appropriately trained personnel to unload the vehicle,
 - Providing safe access to the load for placing dunnage under the lifted corners to facilitate the fitting of chains/strops,
 - Providing adequate training for personnel who with plan and undertake the lifting operations,
 - Providing emergency rescue procedures where necessary,
 - Provide information on any special requirements regarding how the cut-and-bent reinforcement should arrive on site, for example: bulk bags; pallets; slings; stillages.

AT NO TIME SHOULD THE DRIVER BE INVOLVED IN THE LIFTING OPERATIONS OTHER THAN WHEN A DRIVER OPERATED ATTACHMENT, SUCH AS A HIAB, IS TO BE USED OR WHEN PREPARING THE LOAD OF OFF-LOADING, SUCH AS REMOVING THE LOAD SECURING STRAPS. DRIVERS SHOULD MOVE TO A SAFE AREA AWAY FROM THE OFF-LOADING OPERATIONS.

SUBSEQUENT BUNDLE MOVEMENT

If cut-and-bent bundles are to be moved around the site after delivery, then the customer should note the following advice:

- Store the bundles with dunnage to facilitate future lifts,
- Plan the lifts before moving bundles including risk assessments and provision of correct equipment and trained personnel,
- Ensure that the bundle ties are tied correctly, particularly where the bundles have been split.

DO NOT USE BUNDLE TIES TO LIFT OR SPLIT BUNDLES.

RECOMMENDED SAFE OFF-LOADING PROCEDURES

It is the responsibility of the customer to ensure that method statement for the safe off-loading of cut-and-bent reinforcement is strictly followed.

The details of the delivery plan must be communicated to the driver before arrival on site to ensure awareness of any special site delivery requirements. The area off-loading must be checked for suitability before delivery.

Hazards to check for include:

- Access suitability. Reversing to be avoided or only undertaken with the assistance of a trained banksman with appropriate vehicle warning systems
- Suitability of the ground for vehicle and load stability
- Potential obstructions such as parked cars or site plant
- Pedestrian movements
- Poorly lit areas
- Overhead cables/power lines
- Weather conditions: wind, rain, electrical storms, etc.

ACCESS ONTO THE VEHICLE

To comply with the requirements of the Work at Height (WAH) Regulations 2005, the following hierarchy must be followed:

Avoid any need to access the vehicle by using:

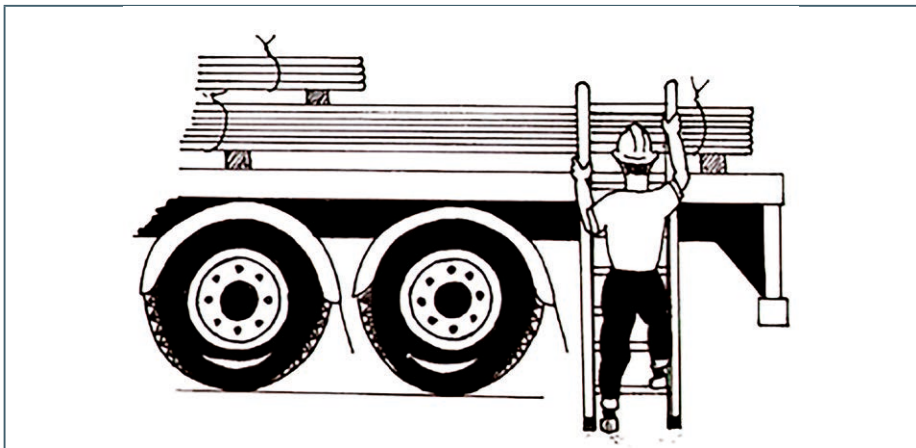
- Demountable vehicle beds or cradles
- Pre-slung loads – remember that slings will need to be visually inspected prior to the lift to ensure that they are undamaged
- Increased use of prefabricated steel which can be easily pre-slung or supplied in cradles.

If access cannot be avoided then provide the following:

- Specifically designed edge protection systems that allow safe access onto the trailer bed
- Docking stations – u-shaped platforms accommodating the vehicle's length with suitable access points such as steps or ramps with double handrails. This can be a drive-through station move moveable sections that lock into place around the trailer
- Demountable edge protection systems with double handrail and kickboards. These can be fitted on site using clamping systems and proprietary hand railing
- Fall arrest systems such as nets or air bags to prevent injuries due to falls. It is important to be aware that injury can still occur due to net entanglement, bouncing off the air bags or the by the air bags not being properly inflated.

Individual protection systems:

- Individual arrest systems usually involve a harness and inertia reel system fixed to a suitable point such as the rail of the goal post system. The inertia reel must operate before the individual hits the ground. Please refer to the HSE Research Report 302 'A technical guide to the selection and use of fall prevention and arrest equipment' 2005.
- Take full account of weather conditions as ice or water will make the steel slippery and could contribute to a fall. High winds may also make the use of post and rail systems hazardous.

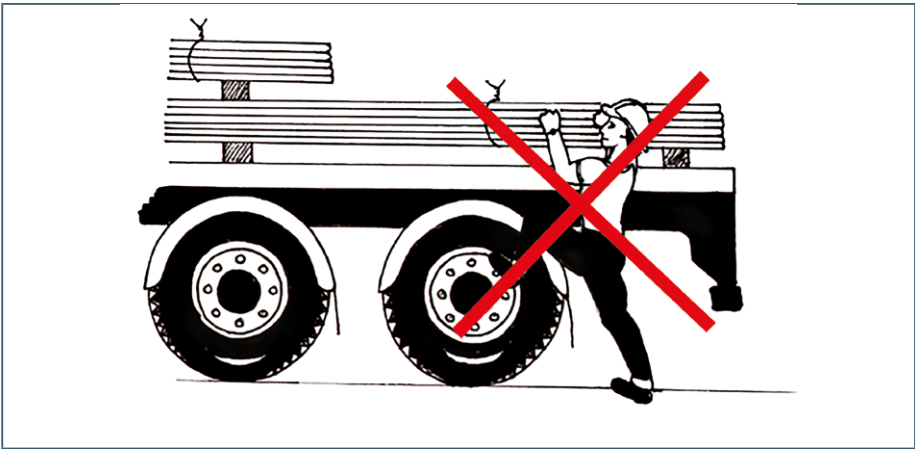


Inspection, suitability and training

Under Regulation 8 and Schedules 2 to 6 of the Work at Height Regulations 2005, all systems used to access the vehicle must be inspected by a competent person as required. The access equipment must be suitable and fit for purpose taking into account loadings, working environments, weather conditions and the needs of ground and individual site personnel.

Anyone using the access systems should be suitably trained and have full access to information on potential associated risk.

Only authorised trained personnel should have access onto the back of a vehicle if there is no other workable alternative.



THINK SAFETY:

SUMMARY OF THE GUIDE

This guide describes the methods which should be followed for the safe off-loading of bundles of cut-and-bent reinforcement.

In addition to following your chosen method, you should continue to observe routine safety precautions for:

- Working at height
- Working with cranes and lifting equipment
- Handling steel
- Safe construction site work including:
 - Stand clear of the lift
 - Never lift over people
 - Always wear appropriate protective equipment
 - Never exceed the safe working load of your equipment

LEGISLATION AND GUIDANCE

Several areas of Health and Safety legislation, codes of practice and guidance notes are applicable to the addressing the potential risks associated with off-loading cut and bent reinforcement.

These include*:

Health and Safety at Work Act 1974;

Section 2 – General duties of employers to their employees; the provision of safe plant and safe systems or work

Management of Health and Safety at Work Regulations 1999;

Regulation 3 - Risk assessments

Lifting Operations and Lifting Equipment Regulations 1998 (LOLER);

Regulation 4 – the suitability of lifting equipment;

Regulation 8 – the organisation of lifting operations

Provision and Use of Work Equipment Regulations 1998 (PUWER II),

Regulation 2 – 62e Provision of suitable ancillary equipment such as ladders which are maintained in an efficient state of repair

The work at Height Regulations 2005;

Regulation 3 - these regulations apply where there is a risk of fall liable to cause personal injury

HSE; INDG379; Health and safety in road haulage; 2003

HSE; INDG397; Avoiding falls from vehicles; 2004

British Association of Reinforcement; Best practice guidance – The safe off-loading of reinforcement fabric; 2017

(current at the time of publication)*

APPENDIX 1:

THE DELIVERY PLAN

To ensure that deliveries can be completed safely the following details must be agreed before deliveries commence:

FULL SITE ADDRESS

SITE / CONTACT NAME

TEL NO

NO.	INFORMATION REQUIRED	DETAILS
1.	What lifting equipment is available on site – cranes, chains, forklifts etc.	
2.	Capacity of lifting equipment available on site – maximum bundle size / tonnage.	
3.	Access / egress / height restrictions – maximum size of vehicle – are artics acceptable – overhead cables etc.	
4.	Will vehicles have to reverse onto site or whilst onsite – availability of banks men?	
5.	Unloading on site – area suitable for vehicles to off-load – means of access – W.A.H.R. - loading platform etc.	
6.	Delivery times – earliest, latest - are there any prohibited times?	
7.	Name of persons on site to report to.	
8.	If lorry loader is used – will a competent person be available to help off-load the vehicle safely?	
9.	What safe area is available for drivers to use whilst Off-loading is taking place? [Drivers are not to remain in cab or standing alongside their vehicles whilst Off-loading is taking place.]	
10.	Personal protective equipment required by drivers whilst on site – hard hat, hi-viz, safety boots, gloves, safety glasses/goggles etc.	

SPECIAL DELIVERY REQUIREMENT DETAILS

PLEASE SEND COPY OF COMPLETED FORM TO THE RELEVANT DELIVERY DEPOT / DEPOTS.

NAME POSITION DATE

APPENDIX 2: LORRY LOADERS AND LIFTING PLANS

Vehicle Mounted Cranes (Lorry Loaders)

There are various bodies such as those listed below that provide training courses for vehicle mounted crane operators.

- **R.T.I.T.B – ROAD TRANSPORT INDUSTRY TRAINING BOARD**
- **C.I.T.B – CONSTRUCTION INDUSTRY TRAINING BOARD**
- **A.L.L.M.I – ASSOCIATION OF LORRY LOADER MANUFACTURERS AND INSTALLERS**

All such operators should be capable of completing a job specific lifting plan as detailed below.

LIFTING PLAN: to be completed before off-loading starts.

Example:

Name of operator.	
Date and time.	
Name and address of site.	
Name of site representative / Banksman.	
Material type to be off-loaded.	
Weight of each bundle.	
Date of test of vehicle mounted crane.	
Test date for chain / sling.	
Weather conditions.	
Ground conditions.	
Obstacles / items to be aware of.	
Overhead cables / power lines.	
Any other comments / observations.	

APPENDIX 3: BULK BAGS

THESE PROVIDE A SAFE MEANS OF LOADING A VEHICLE WHERE THERE IS A MIX OF SMALL OR LARGE LINKS AND STRAIGHTS BARS. STILLAGES, WHICH ARE SOMETIMES REQUESTED ARE UNSTABLE WHEN PLACED ON STEEL BUNDLES AND HAVE AN INCREASED POTENTIAL TO FALL FROM THE VEHICLE IN TRANSIT.

If customers require the use of stillages then the following should be considered:

1. A dedicated vehicle carrying only stillages that are loaded directly onto the bed of the lorry / trailer.
2. Stillages held on site and bulk bags placed directly in them for movement around site.

There is some confusion with bulk bags as to their use as they are labelled "single trip" this does not mean they can only be lifted once – this means that they can only be filled and emptied once and when this has been completed they must be disposed of - refer to ICHA International Ltd document on Safe Use of Bulk Bags.

All bulk bags within the European Union are tested to EN ISO 21898 – if they are made outside of the EU then the label will say the bag complies with FIBCA Single Trip so has been tested to the equivalent of EN ISO 21898. Each bag has a safety factor of 5:1. Currently no bag carries a CE Mark though it is anticipated this will change in 2009.

All bags should be lifted off the wagon in accordance with the information shown on the bag label and the handles should never be gathered together.

Before undertaking any lift the bags should be examined by the slinger / signaller to ensure that the integrity of the bag is still intact.

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