

The Safe off-loading of Reinforcement Fabric



A code of practice for users, hauliers and suppliers

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Introduction

This document is intended for the use of Suppliers, Hauliers (and drivers), and Customers (Stockists and Construction Sites) in order to ensure that those involved in the off-loading of reinforcement fabric from delivery vehicles are aware of the safe working practices.

The primary objective of this Code of Practice is to provide information and guidance that should ensure the safe removal of bundles of reinforcement fabric from delivery vehicles.

To achieve this objective, information is provided about:-

- The preparation of the load for off-loading by the delivery driver.
- Various alternative safe working procedures available to site staff for the off-loading of the bundles of fabric from the vehicle.

Due to the potential risks involved, the movement of reinforcement fabric should be the subject of Risk Assessments and a Safe System of Work. This document should assist duty holders in fulfilling that obligation – it is not a substitute for assessment as many important factors will vary between off-loading locations.

The information contained in this Code of Practice has been compiled by representatives from the following reinforcement fabric manufacturers:-

ArcelorMittal Kent Wire	Chatham
BRC Limited	Barnsley
ROM Limited	Litchfield

And in consultation with the Health and Safety Executive and the UK Certification Authority for Reinforcing Steels (CARES)

Introduction (continued)

For the attention of the directors/managers responsible for health and safety

These procedures have been drawn up by the British Association of Reinforcement (BAR) in consultation with representatives from the HSE.

This has been done with the knowledge that in recent years, whilst off-loading at construction sites and stockists, there have been accidents and near misses. The procedures cover off-loading using a range of equipment known to be in regular use.

As the person with responsibility for Health and Safety within your Company, we trust that you will find this guidance helpful in meeting your obligations to complete risk assessments and provide safe working conditions at your sites. Copies of this booklet have been distributed among hauliers and stockists to draw attention to the dangers associated with off-loading reinforcement fabric and to encourage safe working practices.

This guidance covers lifting equipment and attachment methods only. Other statutory safety requirements will also apply i.e. never lift over persons. wear suitable PPE, boots, gloves, helmets etc.

Please note that the safe procedures as described in this guidance prohibit the use of bundle ties for lifting with the exception of raising a corner of the bundle to insert dunnage.

If reinforcement fabric bundles 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 reinforcement fabric carries the risk of serious injury if safe working practices are not adopted. Key hazards are persons falling from vehicles while preparing loads for lifting i.e. placing dunnage or attaching lifting slings.

Also: Loads falling due to:

- i Loss of bundle integrity i.e. by lifting on bundle ties
- ii Unsafe lifting equipment i.e crane of insufficient lifting capacity, lift truck with inadequate fork span or length, defective slings etc.
- iii Unsafe lifting methods.
- iv Being struck by a swinging load, site transport/lift trucks etc.

Other potential hazards could be:

Puncture wounds from the bundle wire ends and musculoskeletal injuries from twisting bundle tying wire.

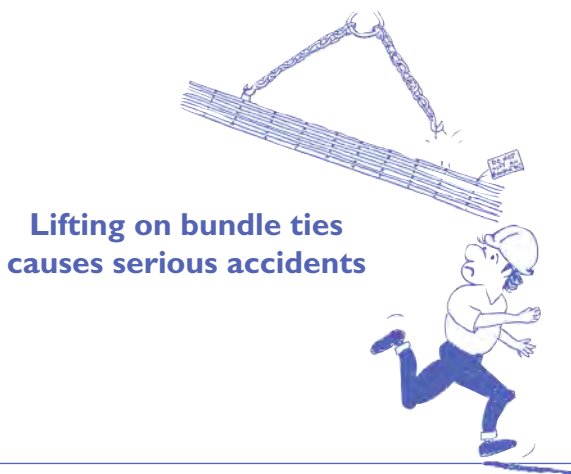
The examples detailed above are hazards but the underlying cause of accidents often lies with inadequate training and poorly planned lifting operations and not the hazard itself.

**DO NOT LIFT BUNDLES USING THE BUNDLE TIES
THEY ARE NOT TESTED AS LIFTING EQUIPMENT
AND ARE THEREFORE UNSAFE FOR LIFTING PURPOSES**

Accidents

There have been serious accidents including fatalities during the off-loading and storage of bundles of reinforcement fabric, typical accidents have included:-

- Vehicle movement accidents– people struck by a lorry or fork lift truck. Prevent by cordoning off the work area: page 7 iv.
- Falls from load / lorry– often using unsafe methods of access. Prevent by avoiding work at height where possible: page 7 i.
- Sharp edges– puncture wounds from the exposed wire ends. Prevent by wearing appropriate PPE i.e. gloves, safety glasses etc.
- Lifting on ties– despite warnings carried on bundle labels. Prevent by adhering to instructions.
- Lifting other than on 4 secure points– involved in many of the most severe accidents. Prevent by using correct lifting equipment and adhere to the off-loading plan.
- Poor planning of lift / inadequate supervision – no risk assessment or clear plan of action.
- Bad practice– people under load, unstable ground, poor environment
- Lack of training – leading to incorrect use of lifting equipment and/or any of the above errors.
- Accidents are preventable if working procedures are adhered to, suitable PPE is issued, suitable training and adequate supervision is provided. Combined with an attitude of ‘THINK SAFETY’, the number of accidents can be substantially reduced.



Lifting on bundle ties causes serious 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 could fall a distance liable to cause personal injury.

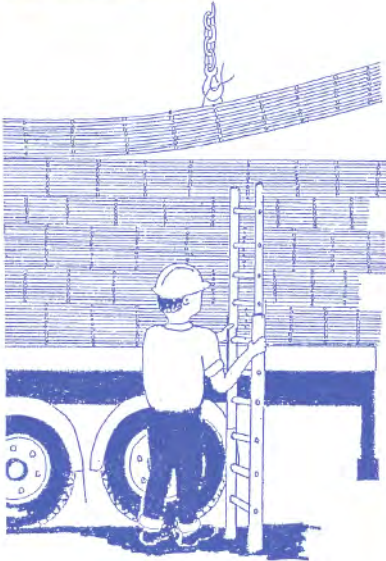
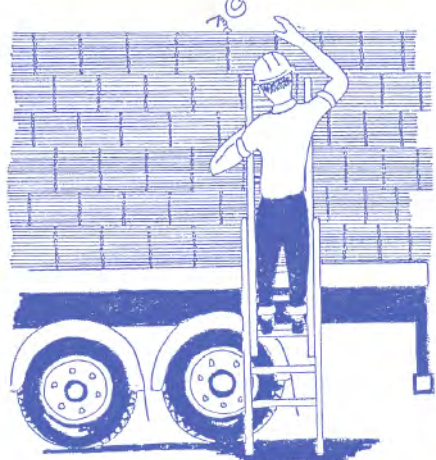
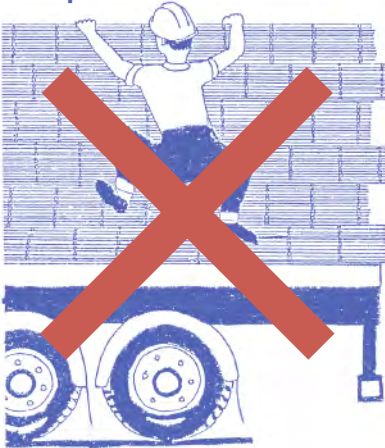
There is a hierarchy of control measures for determining how to work at height safely in the Work at Height Regulation 2005. The hierarchy has to be followed systematically and only when one level is not reasonably practicable may the next level be considered, HSG 150 (Health and Safety in Construction) offers practicable advice on the measures that should be followed.

Those in control of the work must;

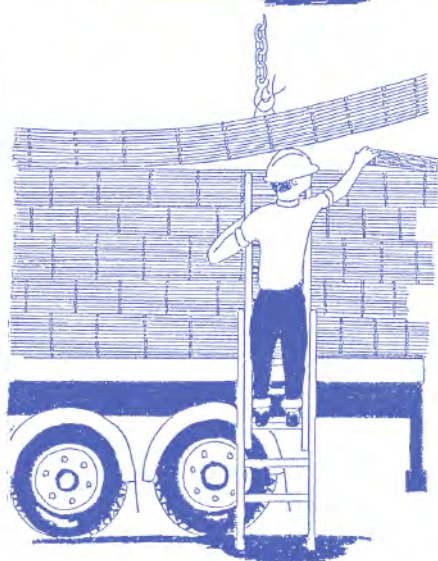
- i **Avoid** working at height if possible. If the load can be unloaded without climbing onto the lorry, then do so.
- ii Use work equipment to **prevent** falls where work at height cannot be avoided.
- iii Where the risk of a fall cannot be eliminated, use work equipment to **minimise** the **distance** and the **consequences** of a fall should one occur.
- iv Cordon off the work area and erect appropriate warning signs.
- v If, for example, a MEWP is to be used, consider the space that the vehicle will require and the ground conditions that it is being used on.
- vi Always consider collective measures that protect all those at risk i.e. nets, gantries, scaffolds etc before considering measures that only protect the individual i.e. harnesses which are personal.
- vii Ensure work is carried out only when the weather conditions do not jeopardise the health and safety of the workers.
- viii Ensure that workers are trained and are competent in the jobs that they have to do.
- ix Have emergency and rescue procedures in place should someone fall and require aid.
- x 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 you have, you should refer to the advice given in the HSE documents INDG402, INDG403 and INDG405.
- xi Always inspect ladders before use. Ensure that the workers have suitable footwear.

Dunnage

DO NOT climb up the fabric on the vehicle – use a ladder or another appropriate means of access i.e. gantry platform. If a ladder is to be used ensure the ladder is secured.



Move the ladder away from the vehicle before lifting the bundle



Reposition ladder to place dunnage under corner of bundle

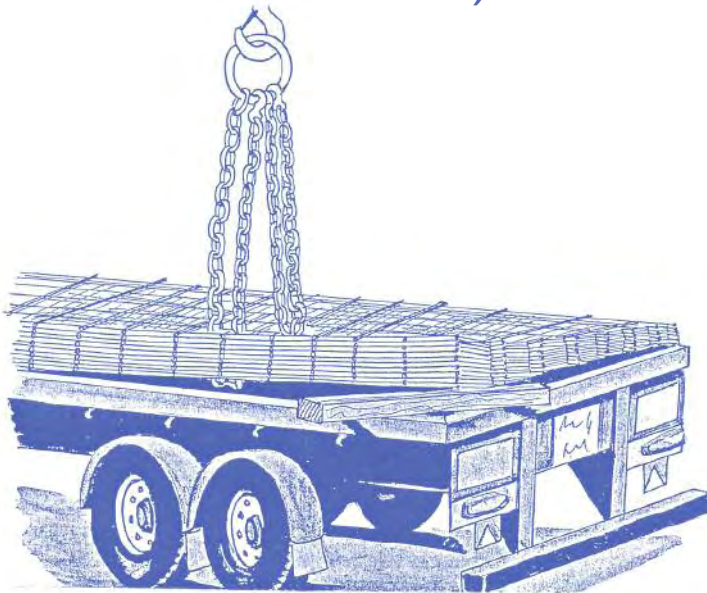
WHEN USING LADDERS, ALWAYS MAINTAIN THREE POINTS OF CONTACT WHERE POSSIBLE

Lift one corner at a time a sufficient height to allow dunnage to be placed under bundle

NEVER PUT HANDS UNDER A RAISED BUNDLE!



Pass the chain through the bundle and put the hook back into the O ring (or pass a strop through and attach the eyes to the crane hook)



Planning for a Safe Delivery

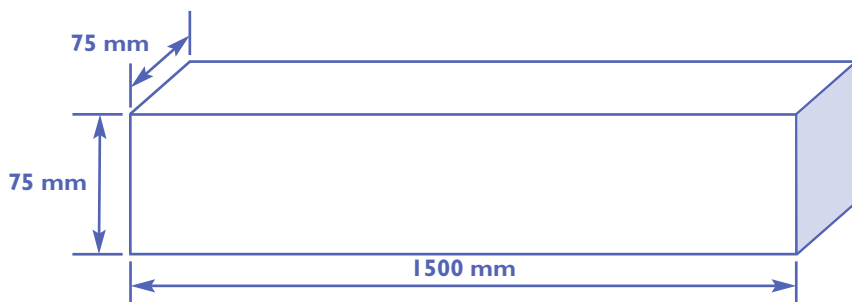
Safe delivery is the joint responsibility of the customer, haulier and supplier. There should be agreement between all parties in advance of the delivery as to the system of work, equipment needed, who will supply this and management arrangements. This information should form the basis of a delivery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

The supplier should:

- i Provide information and instruction on safe handling procedures (for example this booklet).
- ii Ensure that each bundle is securely tied and well presented in accordance with the manufacturers safe tying system.
- iii Ensure that each bundle has a product information label attached which details the bundle weight.

The haulier should:

- i Ensure the safe planning, positioning and securing of the load for transit to site.
- ii Prepare the load on site for safe unloading.
- iii Provide suitable and sufficient dunnage for use when raising the bundle corners prior to off-loading (p8-9).



(Example of a typical piece of dunnage)

The customer should:

- i Carry out risk assessment for the unloading operations.
- ii Prepare a basic lifting plan in accordance with BS7121 - Series (Codes of Practice for Safe Use of Cranes) that will ensure safe off-loading on site.

This will include:

- i Ensuring availability of suitable off-loading equipment.
- ii Ensuring safe access to the site is available.
- iii Identifying a suitable location for depositing the load.
- iv Ensuring the availability of appropriately trained personnel to unload the vehicle.
- v Providing safe access to the load for placing dunnage under the lifted corners to facilitate the fitting of chains/strops.
- vi Provision of adequate training for personnel who will plan and undertake lifting operations.
- vii Emergency rescue procedures where necessary i.e. if harnesses are in use.

Note – the driver should not be involved in the lifting operations related to the off-loading other than when a driver operated attachment e.g Hiab, is to be used or when preparing the load for un-loading e.g. removing the load securing straps. Drivers should then be located in a safe area away from the off-loading operations in a rest room, a canteen or a specifically designated safe place.

FURTHER MOVEMENT

If bundles are to be moved around the site after delivery, then the customer should note the following advice:–

- i Store the fabric with dunnage between each bundle to facilitate future lifts.
- ii Plan the lifts before moving bundles i.e. risk assessments, correct equipment and personnel.
- iii Before moving bundles, ensure that the bundle ties are tied correctly, particularly where bundles have been split (p12/13).

DO NOT USE BUNDLE TIES TO LIFT FULL OR SPLIT BUNDLES

Safe System of Bundle Tying

Bundle ties hold together sheets of reinforcement fabric as a bundle. Bundle ties are **NOT** to be used for lifting as there is a risk of injury to producers, hauliers and customers if the bundle tie fails during a lift.

Bundles requiring re-tying should be tied in accordance with the information on pages 12-13.

BUNDLE TYING WIRE

All bundle tying wire should be a minimum of 5.5 diameter round mild steel rod as originally supplied by the fabric manufacturer.

BUNDLE TIE POSITIONS

Type A & B Fabric

Locate the tie at the intersection of the fifth (5) cross wire and outside line wire.

Type C Fabric

Locate the tie at the intersection of the second (2) crosswire and outside line wire.

(For added stability on C type fabric, a fifth tie may be located through the centre of the reinforcement fabric at the intersection of the 6th crosswire and 12th line wire.)

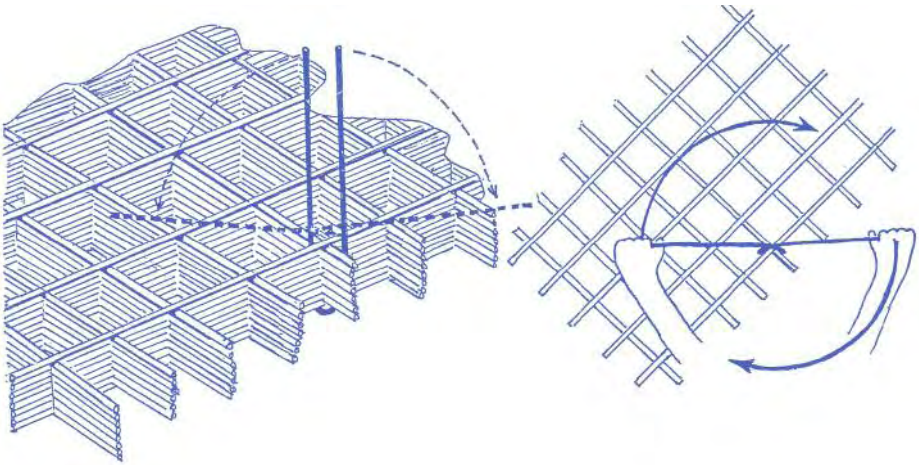
METHOD OF TYING

The wire shall be wrapped around the intersection of the cross and line wires and twisted five (5) times, each twist being turned a full 180°.

Care must be taken to ensure that both ends of the wire are rotated when carrying out this operation.

After twisting, the ends of the wire shall be folded in a downward manner towards the reinforcement fabric.

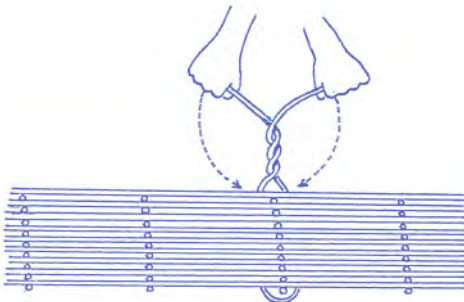
The resulting twisted tie wire should then be pushed down and folded inwards towards the centre of the reinforcement fabric.



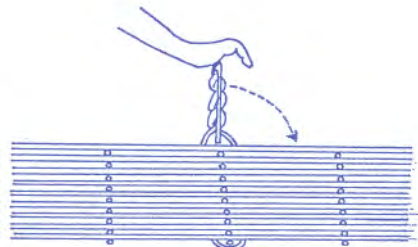
Loop tying wire through bundle at intersection of first line wire and fifth crosswire. Bend ends down.

Apply five twists, each twist being 180 degrees.

PICTURES SHOW HANDS FOR CLARITY BUT GLOVES MUST BE WORN WHEN BUNDLE TYING



Bend the ends of the wire down towards the fabric.



Push the twisted wire down and inwards towards centre of fabric.

TIES MUST BE APPLIED IN THIS MANNER FOR FULL AND SPLIT BUNDLES

Recommended Safe Off-loading Procedures

It is recognised that some end users/hauliers will have specialised lifting equipment i.e. overhead cranes and/or spreader beams designed for off-loading on site and that other end users/hauliers will have non-specialised equipment. To reduce the risk of accidents occurring whilst removing reinforcement fabric from vehicles, the following recommendations should be adhered to, whether on site or in a stockists yard.

SAFETY MATTERS

Before lifting or moving reinforcement fabric, users of lifting equipment must be competent to undertake the task and use the lifting equipment required. The lifting equipment used should be suitable for site conditions. In all cases, before lifting, visually check the bundle ties to ensure they are secure: each must have a minimum of five twists (including split bundles) and be folded down and inwards towards the centre of the bundle.

DO NOT LIFT BUNDLES USING THE BUNDLE TIES

The bundle ties must not be used to lift bundles but may be used to raise one corner of a bundle at a time. This allows for the placement of dunnage thus creating clearance for chains/slings to be looped through the reinforcement fabric.

Reinforcement fabric should be lifted using one of the recommended methods detailed below, following all normal safety precautions applicable when using lifting equipment.

USE OF CHAINS OR SLINGS

1. An **OVERHEAD CRANE, VEHICLE MOUNTED CRANE** or a **FORK LIFT TRUCK** fitted with 4 each of either: Chains, Full Steel Wire Slings or Web Slings, may be used for the safe off-loading or movement of reinforcement fabric. But, whether using a crane or fork lift truck and which ever type of sling is being used, the chains/slings must be looped through the bundle at the intersection of the 5th cross wire and 3rd line wire, thereby giving an equally balanced weight distribution lift.
2. The Chains, Full Steel Wire Slings or Web Slings must be of sufficient and equal length to allow an appropriate angle between the legs when lifting the reinforcement fabric and must be rated at an appropriate Safe Working Load (SWL).

USE OF HYDRAULIC GRABS

1. **A FORK LIFT** or a **VEHICLE MOUNTED CRANE** fitted with certified lifting equipment with 4 lifting legs that is specifically designed for lifting reinforcement fabric may be used for the safe off-loading or movement of fabric. With the grabs located as centrally as possible in the bundle, this allows an equally balanced lift and also ensures that the reinforcement fabric is held securely.

USE OF FORKS

1. **A FORK LIFT TRUCK WITH FORKS** of adequate length and width may lift a bundle provided the forks are located under the bottom sheet of the bundle; therefore the fork lift truck is lifting the full bundle. When lifting bundles, the forks should be of a suitable length to ensure that stability is maintained when lifting and when moving the load. Lifts should be in line with the guidance laid down by the Fork Lift Truck Association.
2. Dunnage may be placed between bundles by lifting each corner of the reinforcement fabric to a suitable height thus allowing the forklift driver to get the vehicle forks under the bottom sheet (p8/9).
3. **This method is suitable only for off-loading reinforcement fabric a short distance, and, where possible, in an unloading exclusion zone where the ground is as level as possible.**

SPLIT BUNDLES

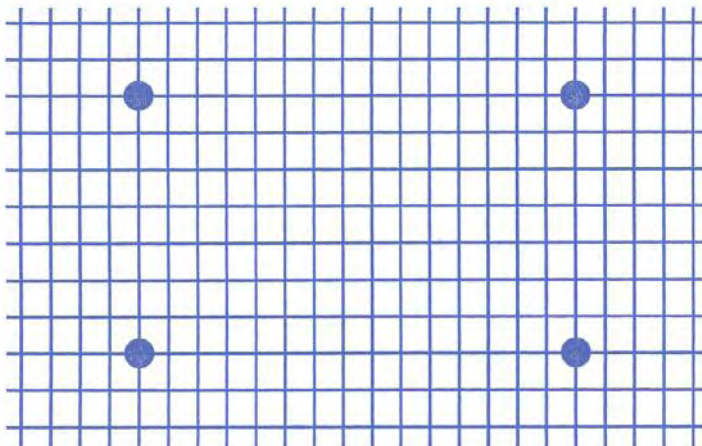
The above procedures also apply when working with split bundles.

Split bundles delivered from reinforcement fabric manufacturers are treated the same as full bundles where the bundle ties have five twists and are folded down and inwards towards the centre of the bundle.

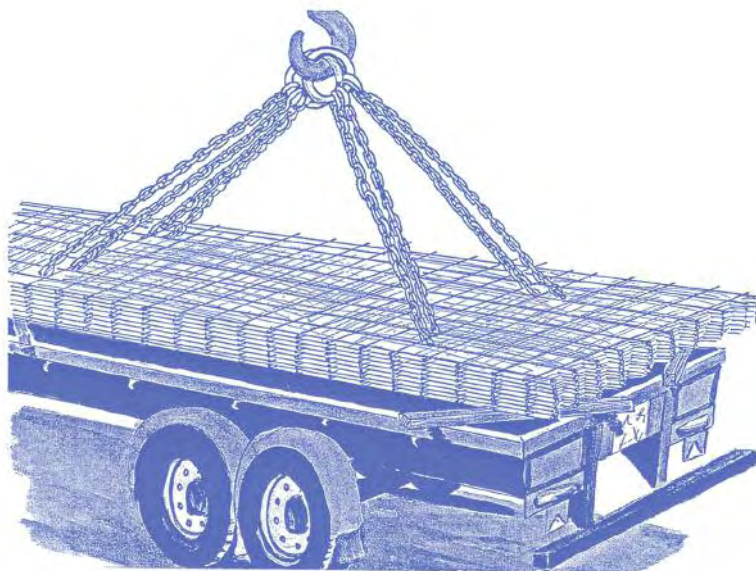
Users of the reinforcement fabric, when they open a bundle, must retie the bundles following the procedures on pages 12/13 of this booklet.

Typical sheet of fabric

Circles indicate lifting position i.e. intersection of 5th cross wire and 3rd line wire



Lift on all four corners
with chains positioned as indicated



THINK SAFETY

The “RECOMMENDED SAFE HANDLING PROCEDURES FOR REINFORCEMENT FABRIC” booklet describes the methods which may be followed for the safe off-loading of bundles of reinforcement fabric.

You should find and follow the method of handling for the equipment that you will be using.

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

Working at height

Working with cranes and lifting equipment

Handling steel

Construction site work

i.e. Stand clear of the lift

Do not lift over people

Wear the appropriate protective equipment

Do not exceed the Safe Working Load of your equipment

**BUNDLE TIES MUST NOT BE USED FOR LIFTS
OR FOR MOVING BUNDLES AROUND THE SITE**

Legislation

Several areas of Health and Safety legislation, Codes of Practice and Guidance Notes are applicable to the problems of off-loading reinforcement fabric including:-

Health and Safety at Work etc. Act 1974

Sect 2 – The provision of safe plant and safe systems of work. Also, information, instruction, training and supervision.

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 e.g. ladders which are maintained in an efficient state of repair (Reg. 5-1).

The Work at Height Regulations 2005

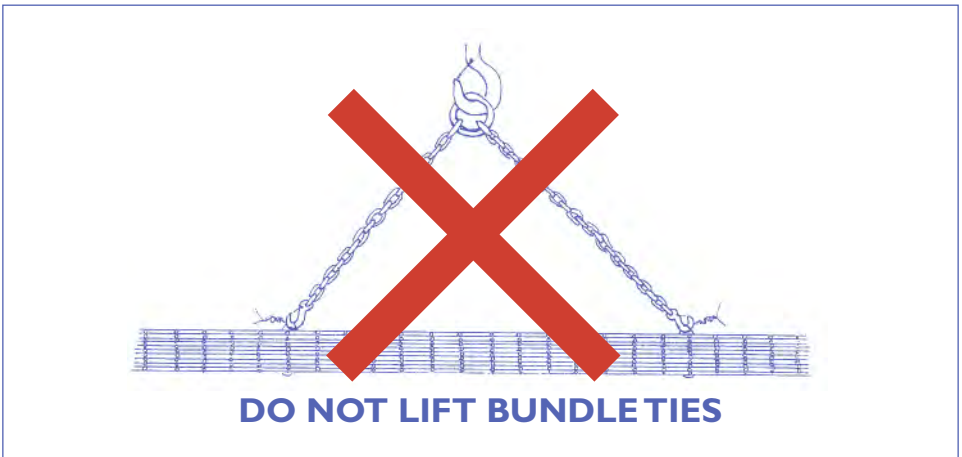
Regulation 3 – These regulations apply where there is a risk of fall liable to cause personal injury.

(All of the above are current at the time of publication)

Safety label attached to bundles of reinforcement fabric at time of manufacture



Front of label



Back of label

LISTING OF BAR MEMBERS WITH FULL CONTACT DETAILS

ArcelorMittal Kent Wire

Chatham Dock, Chatham
Kent ME4 4SW
Tel: 01634 830964
Fax: 01634 830967
Email: sales@arcelormittalkentwire.co.uk
Web: www.arcelormittalkentwire.co.uk

BRC Reinforcement

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Timothy's Bridge Road
Stratford upon Avon
Warwickshire CV37 9NR
Tel: 01789 403090
Fax: 01789 403099
Email: enquiries@brc.ltd.uk
Web: www.brc-reinforcement.co.uk

Bromford Iron and Steel Co Ltd

Bromford Lane, West Bromwich
West Midlands B70 7JJ
Tel: 0121 553 6121
Fax: 0121 525 0913
Email: enquiries@bisteel.co.uk
Web: www.bromfordsteels.co.uk

Celsa Steel (UK) Limited

Building 58
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Cardiff CF24 5NN
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Clwyd Reinforcements

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Collins Reinforcements Limited

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Fax: 01942 820380
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Express Reinforcements Ltd

Eaglebush Works
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West Glamorgan, Wales SA11 1NJ
Tel: 01639 645555
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commercial@expressreinforcements.co.uk
Web: www.expressreinforcements.co.uk

Grip Steel Reinforcements

Atlas Works
Robinson Street, Stalybridge
Cheshire SK15 1TH
Tel: 0161 338 2607
Email: gripsteel@boltblue.com

HY-TEN Ltd

12 The Green, Richmond
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Web: www.kierbeck.com

Lemon Groundwork Supplies

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West Midlands B69 3EX
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Fax: 0121 544 4571
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Radius Reinforcements Ltd

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Email: radiusrebar1@freeuk.com

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Web: www.rom.co.uk

RSJ Steels (Lincoln) Ltd

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Web: www.rsj-steels.co.uk

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