

HANDLING KERBS

Introduction

The Health and Safety Executive has highlighted the manual handling of Concrete Highway kerbs in their 'Construction Health and Safety Advice on HSE Priorities 2001 Onwards' document, pointing out that 10,000 lost time injuries occurred during construction work in 1999-2000 caused by trips, slips and manual handling. In response, Interpave commissioned Loughborough University to produce specific guidelines for the industry, which now follow.

Throughout 2003 Loughborough University, as part of its 'ApaCHe' initiative (A Partnership for Construction Health and Safety), carried out research funded by the Construction Health and Safety Group into kerb installation. Numerous sites throughout the UK and Ireland were visited to inspect various alternative methods of manual and mechanical installation for concrete highway kerbs. Drawing on this research, Loughborough University has compiled the following guidelines for Interpave, to assist with the installation of concrete kerbs and flags in a safe and healthy manner.

The following guidelines are intended to help with the reduction of risks resulting from installation of highway kerbs and are relevant for currently available equipment. They do not replace the contractor's obligations to carry out risk assessments in accordance with the Construction (Design and Management) Regulations and work should be carried out in accordance with all relevant, current legislation.

Separate guidance on the design, detailing and installation of concrete kerbs is available from Interpave.

Context

Concrete kerbs and flagstones have been in use for around 70 years - and the stone equivalents for much longer. However, installation of these products by hand has continued despite a plethora of regulations (including the Health and Safety at Work Act, etc., 1974, Manual Handling Operations Regulations 1992 and CDM Regulations 1994). These regulations were introduced to protect workers from risks associated with Musculoskeletal Disorders and Work Related Upper Limb Disorders. There has been a slow introduction of mechanical lifting devices into the UK over recent years but without guidelines to reassure contactors that equipment is safe or to demonstrate how and when it should be used.

Health and Safety Requirements

A meeting of key stakeholders involved in all aspects of kerbs, including kerb manufacturers, contractors, local authorities, government agencies, training organisations and trade bodies, was held in December 2003. At that meeting, a timetable was agreed with the Health and Safety Executive for the industry to move from a situation where the majority of heavy kerbs (20kg or more) and similar products are laid by hand, to one where mechanical handling is the industry norm. The following programme of actions was agreed at the key stakeholders meeting.

Meeting the Requirements

NEW BUILD PROJECTS - LONG STRETCHES OF KERBS

Avoid any manual handling of heavy kerbs. Use mechanical handling solutions for all heavy kerb laying.

Timescale: Immediate

NEW BUILD PROJECTS - SHORT STRECHES OF KERBS

If no mechanical lifting equipment is immediately available, produce a time-bound action plan outlining the control measures which will be used and specify a deadline for implementation.

Timescale: Immediate

Move as soon as practicable to use of mechanical handling solutions for all heavy kerb laying.

Timescale: By end June 2004

SPOT REPAIRS AND MAINTENANCE PROJECTS

It is recognised that much of this work is under term maintenance and that some contracts may be part-way through, so it may take some time for Clients and Contractors to make arrangements for mechanical kerb handling.

If no mechanical lifting devices are immediately available, or contract terms need to be renegotiated, produce a time-bound action plan outlining the control measures to be used and specify a deadline for implementation. *Timescale: Immediate*

Secure mechanical handling solutions for all heavy kerb laying activity.

Timescale: By end Jan 2005

While there may be situations where manual lifting equipment is helpful, 'mechanical handling solutions' are considered to be those where personnel do not need to lift.

Manual Lifting Equipment

Manual lifting equipment should only be used if it is not reasonably practical to use any other methods of installation. This should be determined through a risk assessment of the operation. Equipment is based on either a manually operated clamp in the form of tongues or a vacuum lifter.

Selecting Manual Lifting Equipment

- Check for the appropriate manufacturer's certification /guarantees to ensure that the equipment has been designed for the intended use
- Ensure that the equipment is in good working order and not damaged
- Make sure that it will allow the worker(s) to lift and lower the load without undue bending or twisting
- Workers should be able to hold the equipment comfortably without excessive wrist deviation.

Practical Considerations

- Ensure personnel have received training on team lifting and manual handling, and carry out the work in such a way as to reduce manual handling risks to an absolute minimum.
- Check with the kerb manufacturer that products will be delivered to site packed and loaded in a way that is compatible with manual handling, i.e. with drainage channels the right way up

Use, Maintenance and Testing of the Equipment

- Do not use for loads greater than those specified by the equipment manufacturer
- The equipment must be used, maintained and tested strictly in accordance with the equipment manufacturer's and supplier's requirements.

Manual Lifting Tongues

Also known as ‘scissors clamps’, these use metal clamps to grip the product with a scissors action for lifting and can either clamp onto the ends or the sides of the kerb. Those that grip the sides are used in pairs for two-man operation with one pair per man, one at either end of the kerb. Clamps that grip the ends can have either two handles for two-man operation or four handles in an H-shape (viewed on plan) for two-man operation.

Although the scissors clamps are low maintenance, failure of the equipment during lifting operations could cause serious injuries, and so they should be maintained in good working order. Failure of axis joints of the scissors or slippage due to worn or loose rubber grips may cause the load to drop. Wear and tear on handle padding could cause operatives’ grip on the equipment to slip.

Vacuum Lifting System

These utilise a motorised pump to generate suction through a pad that attaches to the kerb. The suction pad assembly is connected to lifting handles. It is essential to ensure that the suction pad type is suitable for the kerb type to be lifted.

Vacuum equipment may incorporate filters that require cleaning and replacement to ensure efficient running. Vacuum pads will wear and require repair or replacement from time to time. Wear and tear on handle padding could cause operatives’ grip on the equipment to slip.

Mechanical Lifting Equipment Equipment is based on mechanical or hydraulically operated clamps, or vacuum lifting systems.

Selecting Mechanical Lifting Equipment

- Consider the various differences between the equipment available in the context of the proposed work
- Lifting clamps/vacuum pads are available to suit different unit profiles. Care should be taken to ensure that lifting is not carried out using the wrong profiles
- Ensure that the equipment is the most appropriate for the job before purchasing or hiring. If the equipment is used inappropriately or not in accordance with the manufacturer’s recommendations, accidents can occur
- Equipment continues to be developed with increased adoption by the industry and discussions with manufacturers before purchase may allow for modifications needed to suit any specific requirements.

Practical Considerations

- Make sure work is appropriate for powered machines, e.g. that machinery can manoeuvre around the site

- Check with the kerb manufacturer that products will be delivered to site packed and loaded in a way that is compatible with the operational characteristics of the equipment, i.e. with drainage channels the right way up
- Operators of the equipment must complete training as laid down by the equipment supplier. Manual handling training is also required to deal with any unforeseen manual handling of kerbs and pallets.

Use and Maintenance of the Equipment

- The equipment must be used, maintained and tested strictly in accordance with the equipment manufacturer's and supplier's requirements.

Mechanical Clamp Systems

A simple clamping attachment to existing site plant designed for lifting. The clamping action relies on the kerb mass to activate the gripping action. Gripping is assisted by rubber blocks fixed to the clamps.

Hydraulic Clamp Systems

A simple clamping attachment to existing site plant designed for lifting. The clamping action is achieved by a hydraulic device, usually powered by the host machine. Gripping may be assisted by rubber blocks fixed to the clamps.

Vacuum Lifters

A simple lifting system that is either an attachment to existing site plant designed for lifting or mounted on a small lorry or trailer. Vacuum lifters utilise a motorised pump to generate suction through a pad that attaches to the kerb. The suction pad assembly is lifted and lowered by either a vacuum or hydraulic system. It is essential to ensure that the suction pad type is suitable for the kerb type to be lifted.

Vacuum equipment may incorporate filters that require cleaning and replacement to ensure efficient running. Vacuum pads will wear and require repair or replacement from time to time.

General Guidance

It is important that work procedures are drawn up before commencement to identify any hazards. Failure to do this can result in lack of co-ordination of materials and

multiple handling of product. Correct Personal Protective Clothing should be provided.

Planning the work

- Work should be planned and coordinated to avoid unnecessary handling
- For operations where forked vehicles are used, kerbs should be stacked onto timber pallets. Ensure that pallets are robust as the failure of a pallet could allow kerbs to fall
- Strapping and wrapping of packs should only be removed just prior to use of the kerbs
- Care should be taken when splitting packs to avoid kerbs falling onto the feet of personnel
- Accurate placement of the concrete bed will minimise shovelling operations
- Accurate preparation of the concrete bed and any excavated trench will reduce the amount of adjustment to kerbs once laid
- Where power tools are used for cutting, these should be concrete cutters with diamond blades and water flow lubrication for cooling and dust suppression.