

Construction site transport safety: Safe use of site dumpers

HSE information sheet

Construction Information Sheet No 52 (Revision 1)

Introduction

This information sheet outlines the precautions necessary to ensure the safe use of forward tipping dumpers (commonly known as site dumpers) in the construction industry. It is aimed at managers and drivers and all those who influence the use of site dumpers. The term 'site dumper' includes both articulated and rigid-frame machines, with two- or four-wheel drive, and with front, rotary, side-tipping or high-lift skips.

Site dumpers are involved in around a third of construction transport accidents, causing many deaths and serious injuries, particularly to drivers. The main causes of dumper accidents are:

- overturning on slopes and rough ground and at the edges of excavations, embankments etc;
- travelling when a high-lift skip is in its raised position;
- incidents where a pedestrian is run over by the front wheels of the dumper;
- driver thrown from vehicle while travelling over rough ground;
- driver error due to lack of experience and training, eg accidental operation of controls.



Figure 1

What the law requires

Hirers and users of site dumpers both have legal duties which aim to prevent accidents. Work

equipment should be safe when supplied and the risks arising during use need to be controlled. Those in control of work should assess risks, plan safe systems of work and make sure workers on site know what they are and follow them. Drivers should always follow safe systems of work and refrain from taking shortcuts.

Site management

Ensure traffic routes used by site dumpers are safe:

- Maintain the routes to minimise potholes, ruts, debris and other obstructions.
- Avoid slopes, including slopes across the direction of travel. If slopes cannot be avoided, check with the vehicle supplier that the dumper can negotiate the slopes safely.
- Dumper overturns often occur due to a combination of slope and rough ground, so manufacturer's guidance on the capability of a vehicle to negotiate a slope should be reduced where rough ground must be negotiated. Speed should be kept to a minimum on rough ground.
- Where traffic routes pass close to the edge of an excavation, embankment or other drop, make sure that the edge of the roadway is supported where necessary and provide a suitable barrier to prevent vehicles running off the roadway.
- Position stop blocks a safe distance from the edges of excavations, pits, spoil heaps etc to prevent dumpers falling during tipping.
- The stability of high-lift skip dumpers is greatly reduced when the skip is in the elevated position. At locations where such dumpers need to have their skips raised, eg to tip into a waste container, ensure that the ground is substantially flat, level and free from debris.
- Keep pedestrians and site vehicles such as dumpers apart. Wherever possible, provide pedestrian-only routes. If it is necessary for traffic and pedestrians to share the same route, provide a segregated walkway alongside the vehicle route.
- Ensure that dumpers are not loaded to a level that would prevent the driver from safely seeing the route ahead.

Managers should make regular checks to ensure that precautions remain in place and are effective.

Vehicle safety

Selection

Managers should ensure that all site dumpers are capable of safely performing the tasks they are expected to undertake. They should consider:

- Size and capacity – a dumper that is too small is likely to be overloaded, increasing the risks of overturning and reducing its ability to stop safely. A dumper that is bigger than necessary will be more difficult to manoeuvre safely and may have less vision from the driver's position.
- Stability – choose dumpers that are sufficiently stable in all of the site conditions. If you need to use narrow track or high-lift dumpers, assess their stability carefully. Consider the use of alternative types (such as tracked dumpers) in locations with significant slopes or poor ground.

Driver protection

Drivers need protection from the risks associated with dumpers rolling over and from being hit by falling materials. Roll-over protective structures (ROPS) and seat restraints (eg seat belts) should be fitted to all dumpers having a seated operator.

The correct use of the seat restraint is an essential part of the ROPS protection system and is designed to hold the driver in position when the vehicle tips over. A ROPS bar on its own will not adequately protect the driver in the event of a roll-over. Drivers will instinctively try to jump clear of the vehicle as it tips, but often this is only partially successful and they suffer serious injuries from being trapped by the vehicle as it comes to rest. It is safer to be held by the seat restraint within the area protected by the ROPS. The driver of the dumper shown in Figure 1 was correctly wearing his seat belt and walked away unhurt after his dumper rolled end-over-end while descending a steep slope.

Where a dumper has to frequently pass through a doorway (or similar), the ROPS frame may be folded down, but it is important to replace the ROPS frame in its normal position as soon as practicable when the work in this area is complete, ensuring that the ROPS frame is properly locked in position.

Maintenance

Managers should:

- ensure that all vehicles are properly maintained and safe to operate;
- undertake regular maintenance and vehicle checks in accordance with the manufacturer's recommendations;
- operate an effective system for reporting, and taking any required action on, any defects that occur.

It is useful to maintain a vehicle log that records these checks, maintenance and repairs.

Security

Ensure that all vehicles are securely immobilised whenever the site is unoccupied.

Drivers

Many accidents are the result of untrained or inexperienced workers driving construction vehicles. The use of any site plant or vehicle should be restricted to competent drivers who have been authorised to operate that vehicle. Help prevent any unauthorised use by:

- only allowing authorised drivers to hold vehicle keys. Drivers should not loan keys to other workers;
- instructing drivers to turn off a vehicle's engine and remove the key whenever they leave that vehicle.

Driver competence may be judged on the basis of experience, recognised training and testing of knowledge and ability. Certificates of training from recognised training schemes help demonstrate competence in operating a general class of plant or vehicle. Training certificates should be checked for validity.

Drivers should also be trained in the safe operation of the specific dumpers that they are required to drive. This may include, for example:

- layout and operation of the controls;
- stability limits;
- daily checks, and how to do them safely.

Driver training records should be kept up to date.

No one unfit to drive through the influence of alcohol, drugs or medication should be permitted to drive any vehicle.

Safe driving practices

Drivers have a key role to play in ensuring the safe use of site dumpers. Drivers should always:

- read the manufacturer's instruction book before operating an unfamiliar vehicle;
- understand the differences in performance when loaded and unloaded, particularly relating to braking and stability on slopes;
- know the different handling and braking characteristics of the vehicle in wet or icy conditions;
- check tyres, brakes etc to ensure dumpers are safe to use at the start of the working day;
- wear appropriate protective equipment, eg ear defenders, high-visibility jacket etc;
- use seat belts where ROPS are fitted;
- check that nobody is at risk of injury before moving off, particularly in the area obscured by the skip when going forward, and behind the vehicle when reversing;
- keep to designated vehicle routes and follow site rules and safe systems of work;
- drive at appropriate speeds for site conditions;
- follow directions given by traffic signs and signallers;
- load only on level ground with the parking brake applied;
- get off the dumper when it is being loaded and ensure that the skip is not overloaded;
- check that loads are evenly distributed and that they do not obscure visibility from the driving position;
- stop, select neutral gear and apply the parking brake when the machine is tipping into excavations while stationary;
- use proper towing pins with jump-out restraints (not bent pieces of reinforcement bar); and
- apply the parking brake, switch off the engine and remove the key when leaving the driver's seat.

Drivers need to take extra care when moving on sloping ground and particularly if the ground is rough or uneven. Avoid slopes that exceed the vehicle's capability. When travelling with the skip loaded, reverse down slopes to ensure good stability and traction. If turning is unavoidable when travelling across slopes, turn uphill, not downhill.

Drivers should not:

- drive on gradients steeper than those specified as safe for the specific dumper in the manufacturer's instructions;
- operate the site dumper's controls unless seated in the driving position;
- carry passengers unless purpose-built seats are provided;

- drive around site with the skip in the vertical discharge position;
- operate with tyre pressures outside the manufacturer's specifications;
- drive a high-lift skip dumper with the skip in its raised position.

Case study

A contractor was fined a total of £150 000 and ordered to pay costs of £7500 for two separate accidents involving site dumpers. As the offences were so serious, the magistrates refused to hear the matters and transferred them to the Crown Court. The accidents happened on consecutive days. The access ramp on the site was dangerous because of the steep slope and loose surface. The downward slope averaged 1 in 3.5, which was steeper than the maximum permissible gradient for the safe use of the dumper of 1 in 4.

Workers had been hired from an agency as extra dumper drivers and labourers to help complete a contract on time. No checks were made to find out if the drivers had the necessary experience and training. After some minor incidents, such as punctured tyres and dumpers running out of diesel, it was obvious to the site foreman that the men supplied were inexperienced and he requested new drivers. When they arrived, again no checks were made on the drivers' competence.

One of these drivers appeared to lack confidence and was replaced by a labourer who said he could drive. The following day, the foreman gave the new driver an incorrect demonstration of how to operate the dumper on the slope. Shortly after this demonstration, the same driver lost control of the vehicle and it overturned, throwing him clear. Luckily he only received minor injuries. He did not drive on site again.

The next day, the same men reported for work. A man who had previously worked on site as a labourer, and who had no experience of driving a dumper (he didn't even possess a provisional driver's licence) was asked to drive a dumper. This he did, but tragically the dumper overturned on the slope and the young man was killed.

The accidents could have been prevented if:

- only people with appropriate skills, knowledge and training were allowed to drive dumpers;
- dumpers were not driven on or across slopes that were steeper than the recommended maximum for the vehicle;

- there had been better communication between the agency and site management;
- the management had taken positive action to identify and remedy causes of the minor incidents that had occurred before the dumpers overturned.

The contractor was convicted under Section 3(1) of the Health and Safety at Work etc Act 1974 for failing to ensure that people not in their employment were not exposed to risks to their health and safety. No proceedings were taken against the agency.

Legislation

Health and Safety at Work etc Act 1974 (c.37)
The Stationery Office 1974 ISBN 0 10 543774 3

Supply of Machinery (Safety) Regulations 1992
SI 1992/3073 The Stationery Office 1992
ISBN 0 11 025719 7

Management of Health and Safety at Work Regulations 1999 SI 1999/3242 The Stationery Office 1999 ISBN 0 11 085625 2

Construction (Design and Management) Regulations 1994 SI 1994/3140 The Stationery Office 1994 ISBN 0 11 043845 0 (as amended)

Construction (Health, Safety and Welfare) Regulations 1996 SI 1996/1592 The Stationery Office 1996 ISBN 0 11 035904 6

Provision and Use of Work Equipment Regulations 1998 SI 1998/2306 The Stationery Office 1998 ISBN 0 11 079599 7

References and further reading

Safe use of vehicles on construction sites: A guide for clients, designers, contractors, managers and workers involved with construction transport HSG144 HSE Books 1998 ISBN 0 7176 1610 X

Workplace transport safety: An employers' guide HSG136 (Second edition) HSE Books 2005 ISBN 0 7176 6154 7

Reversing vehicles Leaflet INDG148 HSE Books 1993 (single copy free or priced packs of 15 ISBN 0 7176 1063 2)

Hiring and leasing out of plant: Application of PUWER 98, regulations 26 and 27 Information Sheet MISC156 HSE Books 1998

Health and safety in construction HSG150 (Third edition) HSE Books 2006 ISBN 0 7176 6182 2

Retrofitting of roll-over protective structures, restraining systems and their attachment points to mobile work equipment Information Sheet MISC175 HSE Books 1999

BS EN 13510-1: 2000 *Earth moving machinery. Roll-over protective structures. Laboratory tests and performance requirements* British Standards Institution ISBN 0 580 36561 1

BS EN ISO 6683: 2005 *Earth-moving machinery. Seat belt and seat belt anchorages. Performance requirements and tests* British Standards Institution ISBN 0 580 46808 9

Further advice

Construction Industry Training Board (CITB)
Bircham Newton, Kings Lynn, Norfolk PE31 6RH
Tel: 01485 577577

Construction Plant-hire Association
52 Rochester Row, London SW1P 1JU
Tel: 0171 630 6868

Hire Association Europe
2 Holland Road West, Birmingham B6 4DW
Tel: 0121 380 4600

Further information

HSE priced and free publications are available by mail order from HSE Books, PO Box 1999, Sudbury, Suffolk CO10 2WA Tel: 01787 881165 Fax: 01787 313995 Website: www.hsebooks.co.uk (HSE priced publications are also available from bookshops and free leaflets can be downloaded from HSE's website: www.hse.gov.uk.)

For information about health and safety ring HSE's Infoline Tel: 0845 345 0055 Fax: 0845 408 9566 Textphone: 0845 408 9577 e-mail: hse.infoline@natbrit.com or write to HSE Information Services, Caerphilly Business Park, Caerphilly CF83 3GG.

This leaflet contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.

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