

# **Staying Safe When Operating Forward Tipping Dumpers**





# Operational Safety Guidance

## Introduction

This guidance is for all types of forward tipping dumper and must be read in conjunction with information supplied by the manufacturer. This guidance is divided into three parts:

- Part 1 is a list of what the operator should do to stay safe;
- Part 2 describes learning information that supports the stay safe message and designed to provide assistance for tool box talks and one-to-one familiarisation activities;
- Part 3 identifies planning and supervision requirements for the operation of dumpers.

Annex A provides an example of unsafe operational practices.

## Additional Information Sources

- Provision and Use of Work Equipment Regulations 1998.
- Construction site safety: Safe use of site dumpers. Published by the Health and Safety Executive (CIS 52).
- The safe use of vehicles on construction sites. Published by the Health and Safety Executive (HSG144).

## Acknowledgements

CPA acknowledge that the content in Part 2 is taken from the Construction Plant Competence Scheme's (CPCS) refresher material and used with the kind permission of CITB.

## Notes

- These Construction Plant-hire Association-issued safety guidance only contains basic safety information and should not be the sole source of information to the user of dumpers. The user should also have a copy of the manufacturer's operator's manual, and have relayed to them safe operation and its dangers together with any specific Personal Protective Equipment (PPE) that should be worn. This should be through a familiarisation process by someone who has comprehensive knowledge and capability with the dumper.
- Persons without suitable and sufficient training should not use dumpers. For use within the workplace, the Health and Safety at Work Act 1974 applies to plant and it is the responsibility of the employer, employee and the organisation supplying this equipment to comply with the Act and all relevant regulations.
- Any opinion, information and/or advice given in this guidance is not, nor should it be construed as being, legal, specialist and/or expert advice and it should not be relied upon as such. The Construction Plant-hire Association shall have no liability for any damage, liability, cost, loss and/or expense which the reader of the guidance, or any other person, incurs as a result of relying upon the content of the guidance as legal, specialist and/or expert advice. Information within the guidance was correct at the time of writing.
- The Construction Plant-hire Association continually updates the information contained in this document and reserve the right to withdraw at any time pending review.



# Operational Safety Guidance

## Part 1 – For operators, how to stay safe

### Pre-work knowledge

Stay safe by knowing...

- How to stop the engine before starting it.
- How safety aids that may be fitted on the dumper work, such as cameras, reversing and collision warning systems etc.
- What the correct and authorised routes are between the parking, loading and tipping areas.
- What is being used to load the dumper and with what materials.
- The maximum gradients or slopes that the dumper can travel on, both up, down and across.
- That dumpers with a full or overloaded skip are prone to overturning on uneven or soft ground.
- That travelling on a stockpile can cause the dumper to become very unstable and prone to overturning.
- If the travel route to the tipping area is able to bear the weight of the loaded dumper.
- That travelling on wet surfaces can increase the stopping distance and/or cause skidding.
- The conditions and configuration for setting up the dumper if towing a trailer.
- Where the exclusion zones are for the site.

### Preparation

Stay safe by...

- Getting trained and/or be formally assessed so that you have demonstrated you can operate dumpers correctly and safely.
- Being familiarised on the actual dumper you are going to operate.
- Checking the dumper for correct function before work starts in accordance with the manufacturer's instructions.
- Checking that the steering, brakes (foot and hand) and skip-tipping function are all working correctly.
- Checking that the tyres are correctly inflated, are in good condition and have sufficient tread.
- Checking the condition of the seatbelt, that it is clean and undamaged, retracts when disconnected (*inertia types*) and is adjusted correctly so that you are secure in the seat.
- Informing your relevant supervisor or manager (or hire company where applicable) if a fault is found.
- Putting the dumper out of service until any fault is corrected.
- Using the correct hand holds and steps to climb up to the driving seat.
- Adjusting the seat so you can comfortably reach the controls and if it is a suspension seat, that it is set for your weight.
- Wearing the appropriate safety equipment (PPE) specific for dumper driving which should include suitable footwear, head protection and eye protection as a minimum.
- Wearing the correct clothing for the weather, especially when it is wet and/or cold.
- Only using dumpers that are fitted with, as a minimum, a ROPS frame.
- Checking with your supervisor that it is safe to stay in the seat when being loaded if the dumper is fitted with a cab (*Note: Not all cabs are designed to allow the operator to remain seated during loading.*)



# Operational Safety Guidance

## Travelling and Manoeuvring

Stay safe by...

- Wearing the seatbelt at all times when sitting in the seat and ensuring that it is adjusted correctly - it could save your life.
- Checking that the area around the dumper is clear of hazards and people before moving away.
- Maintaining all-round observation at all times.
- Constantly using vision aids such as cameras and taking immediate action on warnings given by reversing or collision avoidance systems.
- Staying in the seat and holding the steering wheel with both hands if the dumper rolls over.
- Travelling only on firm, compacted ground and on surfaces that are stable.
- Travelling on level ground and only driving up or down and not across inclines
- Keeping the dumper away from open trenches, gullies and ground where there are buried services.
- Keeping the dumper well away from the edges of banks and trenches.
- Travelling in the correct direction when driving up and down slopes with an empty skip.
- Keeping the skip in the fully lowered position unless discharging or tipping the load.
- Keeping passengers off the dumper.
- Complying with the law if travelling on the public highway.
- Travelling according to site conditions and any site speed limits.
- Stopping, applying the parking brake and switching off the engine if being approached by and talking to a co-worker.
- Following directions given by a plant marshaller/banksman.

## Being Loaded

Stay safe by...

- Following the directions given by the loading machine operator, or marshaller, when driving towards the machine that is loading the dumper.
- Ensuring that the dumper is parked on firm and level ground.
- Parking away from the edge of trenches, gullies and slopes.
- Applying the handbrake first followed by placing the transmission in neutral.
- Switching off the engine every time before climbing down off the dumper.
- Climbing off the dumper before loading commences (*unless authorised to stay seated if cab-equipped*)
- Climbing off the dumper facing the machine, using the steps and hand holds without jumping off.
- Standing in a safe place so that there is no risk of being struck by the material being loaded or by another machine nearby.
- Informing the loading machine operator if the skip is being overloaded.
- Ensuring that the seat, the area around the pedals and steps are clear of any overspill.



# Operational Safety Guidance

## Transporting a load

Stay safe by...

- Not driving off if the material to be transported is above the level of the skip as forward visibility may have been restricted by the load.
- Ensuring you have good all-round visibility when the dumper is loaded.
- Using the correct direction of travel when going up and down slopes when loaded.
- Braking early when slowing down as braking distances can increase dramatically when loaded.
- Keeping to the designated travel routes.

## Discharging a load

Stay safe by...

- Ensuring edge protection such as stop blocks or an earth bank are in place before approaching a trench or edge.
- Approaching the tipping point at low speed with the dumper in a straight line.
- Only tipping on ground that is level and firm.
- Stopping the dumper, applying the handbrake and placing the transmission in neutral before discharging any load.
- Slowly raising the skip and controlling the discharge from the skip.
- Ensuring that the direction of travel is clear of people and other dumpers before reversing away from the tipping area.
- Keeping reversing to a minimum.
- Fully lowering the skip before moving away from the tipping area.
- Maintaining the minimum safe distance from overhead power lines particularly when on spoil heaps or with high-tip types.

## On completion of work

Stay safe by...

- Parking the dumper in the correct place away from pedestrian, vehicle and emergency access routes.
- Parking on firm level ground (or across a slope only when not possible).
- Applying the handbrake, placing the transmission in neutral and switching the engine off.
- Securing and isolating the dumper when leaving it and removing the key.
- Informing your supervisor of any defects or issues encountered during work.

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# Operational Safety Guidance

## Part 2 – Supporting Information

### Preparing to and completing work

- Forward tipping dumpers are commonly used on many construction and related sites and are responsible for transporting materials safely and efficiently. The large number of forward tipping dumpers in use means that incorrect operation often occurs and is responsible for many accidents and incidents, which cause serious injuries and deaths. Operating a fully loaded dumper can be hazardous without proper planning or training, and without taking proper care and paying attention.
- Correct and thorough preparation is essential to forward tipping dumper operations to ensure that the dumper is able to work safely and efficiently. Failure to properly check the dumper before work could result in incidents because faults can affect both the performance and safety of the dumper.
- Defects noted by the operator, even if they consider them to be insignificant, must be reported otherwise the fault could get rapidly worse during the working day. For example, if the operator notices an oil leak from underneath the dumper, they must report it immediately as they may not be sufficiently qualified or experienced to decide whether it is safe to use.
- Seatbelts are fitted to dumpers to restrain the operator in the seat. The seatbelt must be clean and undamaged, the securing bolts secure and the securing mechanism must not be able to be disconnected unintentionally. If an inertia retractable type is fitted, it needs to provide some pretension to the body when worn. An inertia locking mechanism is fitted to prevent loosening of the belt when a large movement is detected, and this can be checked by pulling the belt sharply which should lock the belt. If the seatbelt is the non-retractable type, it must be adjusted so it minimises body movement when worn.
- On many dumpers, access to the engine compartment is gained by opening the top canopy on which the seat is situated. On completing the checks, the operator must ensure the canopy is properly closed and locked; otherwise the seating position is unsecure and can move when the dumper is being operated.

### Working safely and with others

- All dumpers should be supplied with a roll over protective structure (also known as a ROPS frame or bar), or a fully enclosed cab. The seat belt which must be worn at all times when using the dumper. In many cases, the dumper cannot be started unless the seatbelt is being worn. Operating the dumper when not wearing the seatbelt can lead to serious injuries or death if the dumper becomes unstable, such as driving too fast on uneven terrain or during an overturn. Furthermore, many employers consider the non-wearing of a seatbelt a disciplinary issue with operators having been removed from the dumper or even from the site if breaking this rule. Many employers are aware that some operators for convenience purposes connects the seatbelt to start the engine but sits on the seatbelt when driving.
- Dumpers are available in many sizes and the planning of work needs to take into account the optimum size of dumper required. Using the wrong size dumper can cause problems. For example, sometimes a smaller dumper is specified in order to reduce hire costs, but can often be overloaded which may cause an incident as overloading a dumper affects its stability.
- Where a dumper is considered too big for the work or is working in a restricted area, particularly on smaller sites, the operator may need to undertake additional manoeuvring, which is inefficient, can damage the ground, cause the dumper to strike other dumpers or structures and limit potential visibility.
- Dumpers are commonly fitted with forward-facing vision aid cameras and collision avoidance systems such as a radar. Cameras provide a real-time image of the areas which cannot be seen from the operator's seat. Collision avoidance systems, usually rear and forward-mounted, provide a warning alarm if either a person or structure comes within the range of the radar. When the alarm sounds, the operator must immediately stop all dumper movements and determine why the alarm sounded, for example reversing too close to an object or someone walking in front of or behind a reversing dumper etc.
- Dumpers are required to transport materials over a wide variety of terrain, including soft ground, inclines and rough terrain which can present hazards for the dumper operator. Therefore the work site should be planned so that travel routes from the loading point to the tipping point minimise, so as far as is reasonably practical, the need to travel on poor terrain or inclines.
- Travelling on uncompacted ground can cause instability of the dumper. Dumpers should not travel on spoil heaps unless authorisation has been given by a competent person as they are uncompacted ground and unstable, particularly near to the edges. This can produce severe tilting of the dumper and cause an overturn.



# Operational Safety Guidance

## Working safely and with others (cont'd)

- The planning of travel routes also needs to take into account other factors, such as pedestrians, who if using the same route, need to be segregated from the dumper's travel route to avoid a collision.
- Planning should also take into account changes to the ground, particularly in wet weather as the travel routes can become slippery and firm ground can turn into soft ground which can cause an overturn.
- Where the travel route passes near to the edge of an embankment, a suitable barrier should be provided to prevent a dumper from travelling over the edge.
- Tipping loads into a trench or over an edge is a particular hazard for dumper operators, and dumpers have fallen into open trenches when a suitable barrier system, such as the correct size stop blocks, have not been used.
- Although stop blocks or an earth berm should be used when tipping over an edge, operators should not rely on the stop blocks from being able to stop the dumper, as they can only minimise the risk of the dumper going over the edge.
- Dumpers are usually loaded by another machine such as an excavator and therefore the dumper operator needs to work with other plant operators as well as general site operatives when travelling with and unloading materials.
- The dumper operator needs to ensure that the skip is not overloaded by the loading machine, otherwise safety issues can occur such as the operator having restricted visibility in front of the dumper. Serious injuries and deaths have occurred to those who have been struck by a moving dumper where the operator has had a lack of forward visibility due to the amount of material in the skip. Industry good practice recommends that material is not above the top level of the skip.
- When the operator needs to leave the seat of the dumper, even when it is being loaded, they must ensure the parking brake is applied, the transmission is in neutral and the engine is switched off. This ensures that the dumper cannot move unintentionally. Accidents have occurred where the operator has unintentionally moved a transmission or gear lever into drive, and dumper movement has occurred.
- If an engine is left running near to an open trench, the exhaust fumes - which can be toxic, may enter the trench. This can be a safety hazard for anyone working, or going to work, in the trench.
- Where a forward tipping dumper is not equipped with a cab and is being loaded by another machine, such as an excavator, conveyor etc. it is essential that the operator leaves the driving seat and stands in a safe place where they cannot be struck either by any part of, or from any overspill from, the loading machine, or by other plant in the area.
- Tipping loads requires care on the part of dumper operators. When loads are being discharged from the skip it is important that the dumper is parked on firm, flat and level ground and that the handbrake is applied.
- If the dumper is either tilted forward or to one side, instability can occur as the centre of gravity rises when a loaded skip is raised.
- It has been known for dumper drivers, when travelling to and approaching the tipping area, to apply the handbrake instead of the footbrake to stop the dumper. This can lead to excessive wear of the handbrake system meaning it may become ineffective when it is required to hold the dumper, for example, when on an incline.

## Operating requirements

- Dumpers sometimes tow equipment such as compressors and small bowsers. Where this is undertaken, the operator must check the operator's manual first to ensure that the dumper is approved for towing and what the criteria is for towing. Many dumpers are equipped with a recovery bracket which are normally not approved for towing purposes.
- The correct towing pin for the towing bracket must be used and that the safety pin is located correctly in the towing pin, as this prevents the towing pin from jumping out of the towing bracket. Using the wrong size pin for the bracket has meant the pin has fallen out of the bracket, which can cause the trailer to become detached.
- Nearly all dumpers are now equipped with a hydraulically (clutch-less) operated transmission and it is possible to pull away in any gear. Operators need to select the correct ratio for the type of manoeuvring or driving being undertaken, as driving using too high a gear can cause overheating and damage to the transmission, particularly when manoeuvring in tight or restricted areas.
- Some dumpers are fitted with a rotating skip where loads can be discharged side-on to the dumper. Although tipping loads with any dumper requires care, tipping side-on is more hazardous as the dumper is less stable in this position. Therefore the operator needs to ensure that the load is tipped both slowly and under control, to prevent a side overturn.





# Operational Safety Guidance

## Stability and overturning

- Dumpers fitted with a ROPS frame or fully enclosed cab provides protection to the operator during an overturn. These can however only minimise but not eliminate any injuries, providing the seatbelt is being worn.
- If an overturn does occur, the operator must stay in the seat, hold both hands on the steering wheel, keeping limbs and feet within the operator station.
- In a number of cases when an overturn occurs, operators have attempted to jump clear. The speed of the overturn however means that operators have not been able to react quickly enough or have the required level of fitness to jump well clear of the overturning dumper, with the sad result that the operators have been crushed by the dumper or the ROPS frame, causing severe injury or death. There is also a tendency where operators have jumped into the path of the overturn and crushed by their machine.
- In some circumstances, the ROPS frame can be lowered when the dumper needs to work in areas where there is restricted headroom. This must however be properly planned so that the work area is level and has firm ground. The ROPS frame must be raised and locked when away from the area of restricted headroom.
- Dumpers can be unstable during operation and requires planning and care by the operator both before and during work. In principle the dumper's weight, particularly to the rear, counteracts or is heavier than the load in the skip. As a skip is raised to discharge a load, the load centre shifts towards the front of the dumper, making it less stable. This means that the operator must take care when discharging loads and needs to operate all controls smoothly and whilst on firm, level ground.
- Gradients and inclines are a particular hazard, and manufacturers issue guidance on the maximum gradient that the dumper can travel on (both up and down as well as across a slope) and on how the dumper should be travelled up and down the slope.
- In principle, a loaded dumper must drive forward up a steep slope but reverse down a steep slope. The opposite generally applies when the dumper is unladen – the dumper should be reversed up the slope and driven down the slope. It is important that the operator consults the operator's manual on each type of dumper they are operating before starting work.
- Travelling on stockpiles is extremely hazardous as the surface may not be fully compacted, which can cause the dumper to both lean excessively as a void is encountered and creating a risk of overturning. In principle, dumpers should not travel on stockpiles and only discharge the load at the foot of the stockpile.
- Care must be taken when travelling between the loading and tipping points, even on well-maintained haul roads, by avoiding potholes and raised bumps because even small ones, particularly when travelling at speed, can cause the dumper to become unstable as well as being uncomfortable for the operator.
- A loaded dumper will generally be less stable than an unladen one because of the higher centre of gravity. This means that steering and braking actions need to be smooth, particularly when on inclines and turning sharply around tight corners.
- High-tip dumpers, as the name suggests, allow material to be tipped at height but extreme care must be taken because travelling, even slowly, with a raised skip can make the dumper unstable. This is due to a raised centre of gravity.
- Dumpers with a narrow track (the width between the wheels on an axle) also have a higher centre of gravity relative to the dumper's size. Travelling these types of dumpers on soft or uneven ground should be avoided as the high centre of gravity means that leaning to one side whilst travelling can cause them to tip over sideways.



# Operational Safety Guidance

## Part 3 – Planning and supervision

### Introduction

Correct and effective selection, planning and supervision is essential for the safe use of forward tipping dumpers but the large number in use means that incorrect operation often occurs and is responsible for many accidents and incidents, causing serious injuries and death.

Dumpers should not be specified where more effective or safer equipment or methods can be used (*ref Regulation 4 of the Provision and Use of Work Equipment Regulations 1998*). Forward tipping dumpers are designed to principally carry loads that are contained within the dumper's skip. Other types of use, or where loads exceed the confines of the skip, should be checked with the manufacturer.

Dumper operations can be hazardous without proper planning, and managers and supervisors need to understand safe operating aspects and the potential issues that can exist. Managers and supervisors have personal and legal responsibility to ensure that all forward tipping dumpers are used safely. Serious misuse of forward tipping dumpers should be treated as potential gross misconduct which could well lead to dismissal or individual prosecution.

Before work, managers and supervisors should ensure that the operator:

- knows that if it is not safe to start work - They must inform you;
- knows that if it is not safe to carry on working - They must stop and inform you;
- wears the seat belt which reduces the risk of injury should the forward tipping dumper overturn. It could save their life;
- operates in accordance with the manufacturer's instructions.

Managers and supervisors need to understand that dumpers, particularly when loaded, have a high centre of gravity and can be prone to overturning on steep inclines or very uneven ground, and that a fully loaded dumper causes a lack of forward visibility meaning that nearby pedestrians are at risk of being struck. Furthermore, the lack of visibility can cause the dumper to strike objects, structures or other plant.

The non-wearing of the seatbelt when operating the dumper should be considered a disciplinary issue with continual breaching of this requirement treated as gross misconduct in line with other forms of misuse.

Managers and supervisors further need to ensure that those working around and near to dumpers are aware of the potential risks of dumper operations, particularly that the operator's all-round vision can be limited when being driven.

Spoil heaps are un-compacted ground for which are a cause of instability as severe levels of tilt can be produced, creating overturns. Industry safety initiatives are advocating banning or strongly controlling the travelling of dumpers on spoil heaps. If there is a need to travel on spoil heaps, designated routes that have been pre-compacted and are away from the edges of the spoil heap must be provided.

The use of dumpers fitted with a cab is becoming common and an aid to providing a comfortable environment for the operator during operation. Cabs however may restrict all round visibility compared to non-cabbed versions and not all cabs may provide the full required impact protection in all scenarios. This means that managers and supervisors need to check the level of protection afforded by the cab against operating circumstances e.g. the size and type of loading machine against manufacturers specifications before allowing the operator to remain seated during the loading process.

These notes for managers and supervisors are in addition to the information within Parts 1 and 2, they should be conversant with the content of these other sections.



# Operational Safety Guidance

**Managers and supervisors should:**

## Dumper selection

- Ensure that a forward tipping dumper is the most suitable type of dumper for the tasks to be undertaken and the environment it is to work in.
- Ensure that the size and carrying capacity of the selected dumper or dumpers is sufficient to prevent for example; overloading if too small for the activities, or too large for sites having physical restrictions or limited space.
- Ensure that additional safety equipment such as proximity sensors, reversing alarms/cameras, mirrors, high visibility seatbelts, beacons, operator station weather protection etc. is specified for high-risk sites or for seasonal weather periods.
- Consider dumpers that are fitted with a protective cab with the right impact protection which allows the operator to stay within the seat during loading. This provides a safer option to the operator continually climbing on and off the dumper and seeking a safe place to stand, and provides more efficient operation earthmoving operations. This needs to be offset against potential visibility issues with cabled dumper.

## Before Starting

- Ensure that the forward tipping dumper has been suitably maintained, confirm that daily checks - including safety devices - are carried out before the start of each shift and that all defects are recorded and rectified.
- Ensure that the operator is trained to operate forward tipping dumpers and has been familiarised with the specific make and model of dumper they are to operate.
- Assess site conditions and check that there is adequate segregation of pedestrians and plant/vehicles in place and that travel routes are safe for the travelling of a loaded dumper.
- Ensure that in areas where other workers and pedestrians are present, plant marshallers are utilised to control the loading, travel and discharging areas.
- Ensure that the operator has been briefed on the task, hazards, control measures, site and ground conditions that may affect the safe operation of forward tipping dumpers, particularly when travelling on uneven, un-compacted or sloping ground.
- Ensure that the operator is aware of the need to have and maintain full visibility of the travel direction, pedestrians, other plant and of potential hazards that may affect the safe operation of the dumper.
- Ensure that tipping areas such as into trenches or over edges have suitable edge protection that prevents a dumper from overrunning.
- Confirm that the operator understands the forward tipping dumper's limitations and that they should never overload the forward tipping dumper as this can cause serious visibility issues and potential overturning.
- Ensure that the operator of the machine loading the dumper knows it is unsafe to overload the dumper.
- Confirm that the operator is comfortable with and has been authorised to carry out the tasks.

## Informing Others

- Carry out a briefing activity before operations start to those working with or near to dumper operations informing them of the dangers of being around moving dumpers, and particularly that the operator may have limited visibility and cannot see fully around the whole of the dumper.



# Operational Safety Guidance

## During Use

- Regularly monitor dumpers operations to ensure safe working practices are maintained including exclusion zones, travel routes and for the wearing of the seatbelt.
- Continually check that dumpers are not overloaded and the material in the skip is not above the height of the skip.
- Ensure that the operator is off the seat and standing in a safe place when the dumper is being loaded, and that the engine is switched off and handbrake applied when they leave the seat.
- Check for changes to weather conditions such as cold, rain, heat or dusty conditions which can have a significant effect on the operator and their ability to operate effectively. A small reduction in body temperature can have an effect on a person's ability to react to emergency situations. Appropriate clothing and rest breaks should be actioned accordingly.
- Regularly check that discharging areas remain safe as the volume of discharged material increases.
- Ensure that if driving on the public highway, that the dumper complies with the Construction and Use Regulations and the Road Traffic Act, including operator licencing, the carrying of loads and the use of rebated (red) diesel.

## After Use

- Check that when leaving the dumper, the operator parks on level ground, applies the parking brake, leaves the transmission in neutral, switches off and removes the ignition key.

## Annex A

### Case Study



Figure 1. Example of unsafe dumper operations

An actual event occurred on a construction site and represented by the above illustration, where the loading excavator operator had placed excess material into the dumper's skip, severely masking the operator's forward vision. After reversing away from the loading area, the dumper operator proceeded to drive in a forward direction over some distance to the tipping area.

The following are some factors indicating why this is unsafe and potentially dangerous:

- a. The excess material adds additional weight which places extra strain on the dumper's components, particularly the tyres and further makes the dumper harder to steer;
- b. The additional weight could strain the dumper's hydraulic system when raising the skip to discharge the load and if the load binds together, can move the centre of gravity forward which can overturn the dumper in a forward direction;
- c. The dumper's centre of gravity has been raised which will make it more unstable, particularly on inclines, uneven ground and when turning around corners;
- d. The excess weight creates higher ground pressure through the tyres which on soft ground can cause the dumper to lean either forward and/or to one side, increasing the risk of instability;
- e. The excess weight can excessively compact the ground, potentially damaging underground services and the haul routes, particularly in wet conditions;
- f. Excessive speed when cornering or harsh braking can cause the material to be thrown from the skip;
- g. The operator's forward vision is severely restricted and they are arguably driving 'blind' and risking a collision with other structures, people, other plant etc. or risking an overturn by driving into large voids, potholes or trenches.



# Operational Safety Guidance

## How could this have been prevented?

- a. The excavator operator knowing the dangers of overloading;
- b. The dumper driver knowing the dangers of overloading;
- c. The dumper driver being more assertive and informing the excavator operator not to overload;
- d. Better selection of dumper for carrying spoil for this task;
- e. Effective supervision by site management.