

Overhead Protection Campaign Notes

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Overhead Protection Campaign Notes

Introduction (Background)

In summary (Key focus)

- This campaign has sought to look at legislation in place relating to safe travelling of plant and equipment, case studies produced following incidents, and systems available for deployment on construction sites and for use with items of mobile plant equipment and vehicles. The latter as an aide and reminder to driver/operators, both visual and audible, to ensure that:
 - Prior to travelling beneath overhead hazards, all items have been safely stowed
 - When working beneath or adjacent to overhead hazards, incidents (hits) and near misses are avoided

Background info:

- When the 1st campaign to raise awareness about “Overhead protection” was run in April 2016, full details of which can be found on the Highways England Hub H&S web site”, focus was on provision of a safe infrastructure, including use of warning systems, to prevent injuries, incidents and near misses associated with the striking of overhead services and structures.
- Historically, these have been result of a combination of strikes (hits) and near misses attributed to mobile plant equipment and vehicles and their respective loads, travelling beneath or working adjacent to and beneath overhead hazards.
- Research by the writer into establishing details re frequency and numbers of incidents (hits) and near misses associated with construction works on highways schemes, and key learning from same, has proved difficult, however, there is much documentation available on service avoidance. Typically;
 - HSE Guidance GS6 “Avoidance Of Danger From Overhead Electric Power Lines”
 - HE Raising the bar 1 “Plant and Equipment”
 - HE Raising the bar 7 “Overhead Structures and Services protection”
 - HE Raising the bar 20 “Transportation and logistics management”
- These notes provide examples of videos, case studies and SSOW documentation, as well as aides and reminders to driver/operators, including systems and devices that are either already provided or can be retro fitted.
- It should be noted however, that irrespective of systems and devices, without the presence of inspection and monitoring regimes in places, they can be defeated and/or simply not used, with issues, many of them repeat, only identified through investigation after incidents (hits), and near misses that have been reported

Text extract from – Prevention of bridge strikes: A good practical guide for transport managers ([Appendix A01](#))

Bridge strikes continue to be a significant problem to rail and highway/road authorities across the country. Between April 2011 and March 2012, there were more than 1500 bridge strikes at railway bridges over roads reported to Rail Authorities.

A survey in 2011 indicated that drivers believed causes of bridge strikes include:

- Drivers not knowing vehicle height (32%)
- Poor route planning (22%)
- Drivers not understanding signs (15%)
- Poor information about low bridges when planning a route (11%)
- Inadequate signing (9%)
- Drivers not believing signs (8%)

Overhead Protection Campaign Notes

Look Up, Look Out Campaign

Overhead lines have the advantage that they can easily be seen, so before you set **up** your vehicle or plant always: **STOP AND LOOK UP!**

Every year in the UK on average, two people are killed and many more are injured when mechanical plant and machinery comes into contact or close proximity to overhead electrical lines.

The booklet attached ([Appendix A02](#)) has been produced for anyone who uses mobile plant (such as HIAB's, MEWP's, Tipper Lorries and Trailers, Grab Lorries, Concrete Conveyors and Excavators) for short duration work and provides general guidance on how to avoid becoming part of statistics referred to in the booklet

Will you please click on the following link to view a short safety film “Look Out Look Up - Overhead Lines”:

<https://www.youtube.com/watch?v=V9b1WmFeQvs>

Example campaign poster produced by Aone+:



Overhead Protection Campaign Notes

Working Safely Near Electrical Installations – Reminders (page 1 of 2)

Treat all lines as live

- To the untrained eye, or without reference to plans, it is often not possible to be sure which lines contain electricity and which are phone lines.
- The safe approach is to treat all overhead lines as dangerous and seek expert advice.
- Please see below for our three recommended steps to working safely near to overhead electricity lines.

1. Request a guide

- Use the Health and Safety Executive Guidance note GS6 - Avoidance of danger from overhead electric power lines as a guide.
- To request a copy, please quote book reference ISBN 0717613488 at a bookshop or write to: *HSE Books, P.O. Box 1999, Sudbury Suffolk*
- This leaflet can also be downloaded free of charge from the [Health and Safety Executive website](#).

2. Contact the operator of the line

- You must consult the operator of the line if you will be working:
 - Within 15 metres of overhead lines on steel towers
 - Within nine metres of wood pole beneath an overhead power line.
- The owner's name will often be posted on the support pole or tower and will usually be the local regional distribution company or National Grid.
- If in doubt, call the local regional electricity company office.
- All distances should be measured at ground level from a position estimated by eye to be vertically under the outer most conductor at a tower or pole position.

Remember:

- Electricity can kill! Never move poles or other long objects up towards overhead lines as sighting or measuring aids
- Never assume an overhead line is carrying telephone wires - some electricity lines look very similar to communication cables and some poles carry both electricity and telephone lines.

3. Request a visit from the operator

- If your work will encroach upon the areas stated previously, you will need to request a visit to meet a representative of the electricity company on site.
- The representative will:
 - recommend a minimum clearance distance to the overhead line
 - Have other recommendations and advice on how to fulfill the requirements of GS6 and avoid danger
 - Discuss and confirm arrangements with you in writing, to switch out the line if required.
- Make sure that you understand the recommendations given in terms of minimum clearances to lines and the precautions necessary while erecting barriers and during work activities.
- All overhead lines and other electrical apparatus can be extremely dangerous. If you need to work near them, get competent advice.

Overhead Protection Campaign Notes

Working Safely Near Electrical Installations - Reminders (page 2 of 2)

Controlling the work

If work beneath live overhead power lines cannot be avoided, barriers, goal posts and warning notices should be provided

Where field work is taking place it may be impractical to erect barriers and goal posts around the overhead lines - these are more appropriate for use at gateways, on tracks and at access points.

The following precautions may also be needed to manage the risk:

- **Clearance** – the safe clearance required beneath the overhead lines should be found by contacting the Distribution Network Operator (DNO)
- **Exclusion** – vehicles, plant, machinery, equipment, or materials that could reach beyond the safe clearance distance should not be taken near the line
- **Modifications** – Vehicles such as cranes, excavators and tele-handlers should be modified by the addition of suitable physical restraints so that they cannot reach beyond the safe clearance distances, measures should be put in place to ensure these restraints are effective and cannot be altered or tampered with
- **Maintenance** – operators of high machinery should be instructed not carry out any work on top of the machinery near overhead power lines
- **Supervision** – access for plant and materials and the working of plant should be under the direct supervision of a suitable person appointed to ensure that safety precautions are observed

Overhead power lines – general rule

- As a general rule, no part of any machine should be brought closer than 15 metres to overhead power lines suspended from steel towers or 9 metres to overhead lines supported on wooden poles
- In case of doubt the electricity supply authority should be consulted
- Further advice is given in HSE Publication GS6 - Avoidance of Danger from Overhead Electric Power Lines ([See appendix A03](#))

Overhead utility hazards – “Look Up and Live”

- “Look Up and Live” is a catchphrase used by a utility provider that may prove useful to educate the public about how to identify overhead utility hazards
- However, the phrase isn’t just useful for members of the public
- Given the number of overhead incidents that have occurred on utility-related jobs, “Look Up and Live” is a phrase that should be used by all utility companies and workers in order to encourage awareness of overhead hazards
- The following is a case study of an overhead incident with focus on what can be done to avoid similar incidents in the future

Overhead Protection Campaign Notes

Case study (2015): Excavator Incident (page 1 of 2)

A utility crew working in a remote mountainous location used a dozer to clear ice and snow that were obstructing an access road.

After completing the task, the crew began moving a large piece of equipment – an exca-drill – in order to begin drilling foundation holes.

While moving the drill down the access road, the edge of the road gave way and slid down an embankment.

When this happened, the operator swung the boom around to the lower side, using it as a support leg to keep the drill from turning over.

The foreman then assessed the situation and decided to hook the dozer to the drill to give it extra support.

The crew tried to pull the drill back onto a more stable section of the road, but the dozer could not pull it back because the weight of the drill was more than the dozer could safely handle.

The foreman then called another foreman who was on a nearby job and asked him to find an excavator to assist in pulling the drill.

After picking up the excavator and unloading it at the start of the access road, the operator, followed by the foreman in a pickup truck, began driving the excavator in to help relieve the drill.

While driving down the access road, the knuckle of the excavator hit a 20-pair telephone cable, causing it to break and jar the utility poles to which it was attached.

This also caused the primary and neutral conductors on the single-phase line to touch, resulting in an outage.

Not only were the communication and electric utility lines damaged, but this was also a situation that very likely could have caused the excavator to become energised, created dangerous step and touch potential, and possibly resulted in serious injury or death.

Room for Improvement

As a utility industry, we have done a great job of training our employees to ensure that underground and buried hazards are identified and mitigated before performing any excavation or digging work.

In a typical utility, crews are taught to request information for buried utilities, to ensure that locate markings are visible and current, and then to use hand or air methods to dig if the located utilities are within the specified distance of the excavation.

Crews are also trained to identify any additional underground hazards while digging, and to stop work to determine the type, owner and route of any unmarked utilities.

In the incident described above, the crew members were working in a very remote and information provided identified that no underground utility hazards were present.

However, they failed to recognise an overhead hazard on an access road that they had travelled approximately 20 times when the incident occurred.

Not only that, but they had already moved a couple of pieces of heavy equipment into the area.

Overhead Protection Campaign Notes

Case study (2015): Excavator Incident (page 2 of 2)

Pre-Work Planning and Hazard Mitigation

When we are training workers about the importance of locating buried utilities and other possible hazards, let's make sure that we also cover the importance of locating and recognising overhead hazards.

Pre-work planning and work site inspection are critical;

- a) For example, in the excavator incident discussed earlier, the crew should have pre-inspected the access road – as well as any other access roads they were planning to travel – before bringing any equipment onto the site
- b) Additionally, overhead hazards need to be identified and discussed before work begins and documented on written pre-job briefings
- c) Job and task hazard analyses are excellent ways to identify, discuss and document overhead hazards and mitigation steps
- d) In any situation where overhead hazards are present, there are a variety of mitigation steps that should be followed
- e) Warning signs should be placed at each site below the overhead utility or hazard where ground workers and equipment operators can observe them
- f) When moving equipment in these areas, the utility lines should be guarded, and a spotter who has direct communication with the operator should be in place to assure the necessary clearance is maintained as the equipment travels beneath the utility lines or hazard
- g) In some situations it may be necessary to mitigate a hazard by de-energizing an electric circuit for the work duration, re-routing a utility line away from the work area or possibly replacing existing overhead electric lines with underground electric cables
- h) By identifying the overhead hazards and then using a combination of the mitigation steps above, as well as any additional steps deemed necessary by the crew, the previously discussed excavator incident could have been prevented
- i) Thankfully no one was hurt during this incident, but that might not always be the case, so once again I urge you to always look up and live

Overhead Protection Campaign Notes

Video Footage - ADT Cable Strike *(not linked to the case study described above)*

Below is a link to a video (and photo) that shows an articulated dumper truck overhead cable strike;

http://www.highwayssafetyhub.com/uploads/5/1/2/9/51294565/dumper_cable_strike.mp4



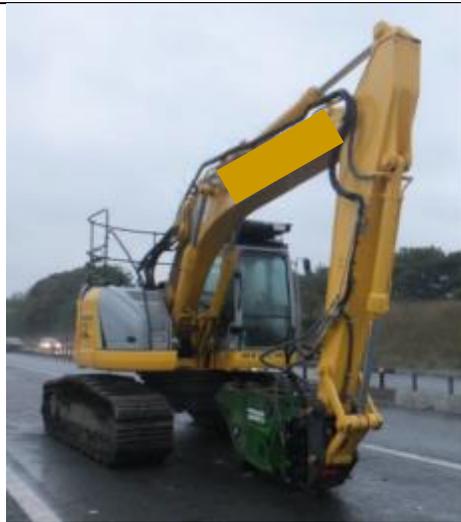
Overhead Protection Campaign Notes

Case study (2013) – page 1 of 2

Electrical discharge from overhead cables that occurred on a Smart Motorway scheme in 2013



Photos (left) show the Excavator travelling at the point immediately prior to and 3 seconds after the overhead cable discharge. Top knuckle of the Boom was estimated to be 6.0m above carriageway level.



In detail:

Height to the top knuckle of the Excavator involved in the incident, pictured above, was measured as 4.6 m in this position, i.e. the travelling position.

This was the same as the safe working clearance shown on the yellow coloured information signage in place

The actual height of overhead cables at this location, were measured at 7.5m above carriageway level.

Height of the top knuckle of the Excavator at point (time) of electrical discharge was estimated to be 6.0m

Immediate causation:

Procedures

- Working adjacent to and beneath overhead cables was covered by specific safe systems of work for all tasks however travelling along the haul route beneath overhead cables or structures was not managed as a work activity

Human Factors

- The Plant and Vehicle Banksman in place to work with the Excavator was not in close attendance and had not been given clarity on his role during the travelling operation
- The Excavator operator has been previously aware of the overhead cables and was clear on the appropriate action and passing arrangements
- The Excavator operator had "switched off" so far as taking cognisance of signage etc

Underlying causes:

- Safe system of work docs did not consider the arrangements for excavators travelling
- The size of the excavator travelling beneath the overhead cables left little room for error when measured against the safe working height signed as 4.6m
- The Plant and Vehicle Banksman was not present in close proximity at the time
- The induction covered the general approach taken for managing overhead cables
- No specific communication has been held as no work has been planned under cables at this stage - travelling was not fully considered
- Supervision - Adequate supervision in place, but hazards associated with the task, and route of travel by the excavator, had not been fully considered
- Monitoring - Daily briefing sheets were in use and evidence of risk review is available – these did not consider the proximity of overhead cables

Overhead Protection Campaign Notes

Case study (2013) – page 2 of 2

Electrical discharge from overhead cables that occurred on a Smart Motorway scheme in 2013

Key learning

- Overhead cable clearance signs were improved to further clarify safe travelling and working heights
- All actual cable heights were surveyed and put onto cross sections. This information was linked to Motorway Chainage markings, produced in tabular format (Excel File) for cross-referencing against existing TM layout drawings
- A review of GS6 Safe Clearance Assessment reports was undertaken with Northern Power to:
 - Check requirements for passage of vehicles beneath overhead cables was carried out
 - Insulating overhead cables to reduce risks was considered [but not progressed]
 - Identify any opportunities to turn off electrical supply to remove safety risk during work periods [this was not progressed]
 - Speed ramps were sited prior to each overhead location, on both north and southbound carriageways (within construction area)
 - This was repeated in verge work areas, and provided (provides) additional reminder to all plant and vehicle drivers that they are passing beneath overhead cables
 - A review of goal posts and warning protection in place at adjacent to all overhead cable and structure locations was undertaken, with controls measures corrected as required
 - A combination of goal posts, signage, road markings, blue coloured road cones (and speed ramps before O/H cables) were re-produced at each location
- High Voltage Detection Systems [HVDS] were trialled by the drainage sub-contractor. This was not progressed (following review), with physical controls implemented and monitored, post incident, deemed to be sufficient
- A schedule of heights of vehicles and mobile plant items was produced, to establish if specific Risk Assessments are required, as additional control during travelling beneath overhead cables or structure
- To this end, a maximum travelling height across all work areas of 4.9m was established, with signage erected (and maintained) at all locations
- A “permit to travel” form was also introduced for use by large sized mobile plant items
- Height restrictors were fitted to Excavators in preparation for planned works beneath and adjacent to overhead cables.
- Safe systems of work documentation (Activity plans) include a “Named person” for responsibility to set and lock restrictors in place
- Laser alarm systems (Intellicone), initially trialled in the project compound, have been used successfully, as an additional control for vehicular traffic, including member of public vehicles, travelling beneath motorway under-bridges, whilst improvement and modification works have been undertaken
- All operations to be checked for appropriate consideration and management of the risks associated with overhead cables – including but not restricted to;
 - Installation and removal of temporary vehicle restraint systems (i.e. Varioguard barrier),
 - Use of IPV’s, loading and unloading of equipment and materials, travelling of mobile plant equipment fitted with GPS equipment (i.e. aerials),
 - Mobile plant equipment that have the ability to travel with part of their body that is not safely stowed (i.e. boom, hydraulic arm or tipper body in a raised position)
- Systems to improve communication between operator of mobile plant item / vehicle and Vehicle Banksman have been explored, including;
- Use of hearing protection from Peltor Protection systems, that allows verbal communication between operator and Banksman, without a loss of the sense of hearing to other activities in and around the immediate work area

Overhead Protection Campaign Notes

Over-height detection systems – Proximity Height Warning System

Many over-height detection systems are now available for use

By way of example, a **Proximity Height Warning System** that was used successfully on a B road leading to an under-bridge during the construction phase of works on the M1/J39-42 Smart Motorway scheme in West Yorkshire in 2015.

Detection sensor equipment fitted to existing street furniture (i.e. lamp post) at required height immediately prior to the structure (Lawns Lane Bridge), to alert personnel working above the stringcourse soffit if high vehicles approach.

A short duration video is available using the following link:

<https://www.intellicone.co.uk/single-post/2015/10/01/BAM-Morgan-Sindall-Safeguard-Workforce-Against-Overheight-Vehicles>



Overhead Protection Campaign Notes

Over-height detection systems –

Prototype system to be trialled on the M5 Oldbury Viaduct scheme during June 2018

HRS Prototype Over-height Detection System

Beam Head (note there is a receiver and transmitter for each pair – A & B)



Battery box with 5 metre lead

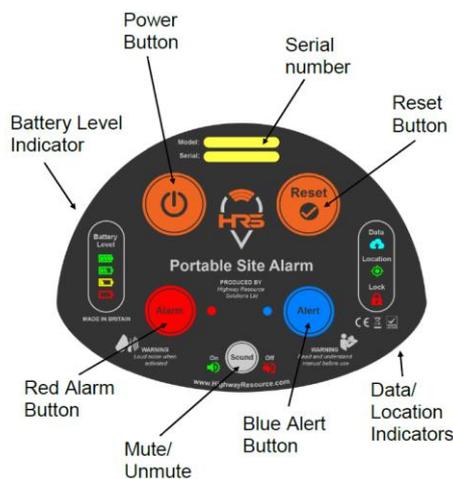
Mounting brackets (will be supplied with jubilee clips for tightening)



Power button

HRS Portable Site Alarm

- The Portable Site Alarm will be activated (Sounders and flashing LEDs) by the Beams (when laser beams are broken).
- The PSA only needs to be turned on/off using the power button. An additional power pack needs to be plugged into the power socket to provide up to 500 hours of use without charging or battery replacement. Once plugged in the battery pack needs to be turned on using the button on the top.



Overhead Protection Campaign Notes

Over-height detection systems –

Prototype system to be trialled on the M5 Oldbury Viaduct scheme during June 2018

Deployment Guidance:

- Attach beam heads A and B on opposite poles and fasten using jubilee clips
- Align beam heads A and B
- Connect yellow lead to provided Battery Boxes (Yellow Boxes)
- The system will boot up which will take a few minutes
- Place Portable Site Alarm (PSA) onto a cone in an easy to see but safe location
- Plug in Battery Box (Yellow)
- Turn PSA on using power button
- The PSA will boot up which will take a few minutes
- Test system by breaking the beam
- Reset PSA if required using reset button

Cable Height Meter (the example shown below is supplied by Suparule)

The Suparule Cable Height Meter is a handheld meter for measurement of cable sag, cable height, and overhead clearance, a safe alternative to telescopic ranging sticks.

The Suparule Cable Height Meter utilises ultrasonic signals to determine the height of overhead cables up to 23m (75feet).

The optional DT80 Dynamic Target enables the CHM300DT version Cable Height Meter to also measure horizontal distances to a diameter of more than 80m (260ft).



Used by Utility, Telecom, Cable TV Installers, Heavy Construction, Contractors, Haulage Companies to measure:

- Cable sag
- Cable height, lowest cable and spacing between cables, up to six cables
- Overhead clearance

Overhead Protection Campaign Notes

Safe travelling of mobile plant equipment and vehicles – Introduction and general notes

Introduction

- Whilst a key focus for all highways schemes remains on safe planning and preparation, including risk assessment, training of personnel, reduction and removal of risk and danger, control of access, and to control and manage the work effectively. Refer to Raising the bar 20 for further details.
- Arrangements should also be in place to manage and control the **safe travelling** of mobile plant equipment and vehicles, including vehicles those used to deliver and collect, plant, equipment and materials

Overhead power lines – general rule

- As a general rule, no part of any machine should be brought closer than 15 metres to overhead power lines suspended from steel towers or 9 metres to overhead lines supported on wooden poles
- In case of doubt the electricity supply authority should be consulted.
- Further advice is given in HSE Publication GS6 - Avoidance of Danger from Overhead Electric Power Lines ([See appendix A03](#))

Monitoring by the contractor/principal contractor

- Where the organisation directly supervising the works is not the main contractor or, principal contractor, the contractor/principal contractor must undertake suitable monitoring to enforce the safe use of mobile plant equipment. This should include, before a task or individual starts on site, the review of:-
 - Any safe systems of work before work commences.
 - The training and competency of supervisors and operators.
 - A report of thorough examination before the equipment is put to use.
- The contractor/principal contractor should also monitor the following, which may be done during normal management site inspections / tours;
 - That safe systems of work are being implemented
 - That plant coming onto site is entered into a register to enable the checking and monitoring to be undertaken
 - That only competent and authorised operators are using the equipment

The management of change

- Through the construction phase of any scheme, overhead protection needs to be reviewed on a regular basis, with emphasis placed on maintaining visual controls, including signage and barriers, to identify;
 - Overhead hazards following installation of new structures, i.e. bridges and overhead gantries, that may not have been present on the previous day / shift
 - Changes in existing overhead hazard, including the lowering of travelling and working heights, following amendments to temporary works and falsework
 - New and amended overhead hazards should be included as “hold points” in the safe system of work for respective elements of work

Overhead Protection Campaign Notes

Safe travelling of mobile plant equipment and vehicles –
Know the height of your vehicle “and load”

Extract - Code of Practice for Loading Vehicles (DfT)

- Loading and unloading should be carried out by trained staff who are aware of the risks involved
- Drivers should also be aware of the additional risk of the load, or part of the load, moving when the vehicle is being driven
- This applies to all vehicles and to all types of load
- The driver is ultimately responsible for the load carried on their vehicle, whether or not they were involved in the securing of the load
- This Code of Practice is not restricted only to the load being carried by the vehicle; it also covers any equipment on the vehicle such as loader cranes, landing legs, tailgates etc.
- All of these must be stowed and secured to manufacturer instructions so not to be a danger to other road users and pedestrians.

High Loads

- Particular attention should be paid to the dangers of high loads that might have to pass under bridges or other structures across roads
- Every year several hundred bridges are hit by Lorries which are loaded too high or which are themselves too high to pass underneath
- In some cases this has resulted in the drivers of the vehicles and other people being killed or injured
- Any impact on a railway bridge has the potential to dislodge the rails, which can result in the derailment of a train and the possibility of a serious railway accident
- All vehicles with an overall travelling height above 3 metres must have the maximum height of the vehicle in feet and inches displayed inside the cab so that it is clearly visible to the driver.
- Any vehicle fitted with high level equipment that is capable of exceeding a height of 3 metres must be fitted with a visual warning device
- This device must tell the driver if the equipment has been left in the extended position. (Regulation 10A of The Road Vehicles (Construction and Use) Regulations 1986 as amended by S.I. 1997 No 530)

Examples of notices displayed in the cabs of vehicles, when the overall travelling height is more than 3 metres, are shown below:



Overhead Protection Campaign Notes

Safe travelling of mobile plant equipment and vehicles –
Know the height of your vehicle “and load”

Vehicle height checks

- Check the maximum height of the vehicle, its load or its equipment before commencing a journey
- Advise you if the measured height is different from the height shown on the notice in the cab of the vehicle
- Check the maximum height again after loading, unloading or reloading if the trailer suspension characteristics can change the height of the vehicle
- Display the correct height in the cab at the start of every journey and following any change in the load
- Are aware that at bridge arches the signed height is only available through part of the bridge and the vehicle width must be considered
- Give special consideration to wide loads over 3m at arch bridges, as the maximum height available will be less than the signed height limit
- The maximum height of any vehicle, its load or equipment can be checked using simple hand held devices or fixed depot installations
- The roadworthiness checklist provided to the driver should include:
 - The maximum height of the vehicle
 - Confirmation that the vehicle height is correctly displayed in the driving cab



Visitors

- Drivers of vehicles delivering and collecting are at risk when overhead hazards are present
- Make sure they know where the overhead hazards are and tell them the precautions they need to take
- Routes can be marked with safety signs and barriers to warn all visitors of the dangers.
- *Refer to Raising the bar 20 for further guidance and examples*

Vehicle checks

- Check of mobile plant equipment and vehicles by PC/contractor upon arrival at site
- Familiarisation training
- Driver/operator must have knowledge of height of vehicle if in excess of 3m, in metric and imperial, marked in cab
- Driver/operator must have knowledge of height of load being carried, prior to transportation
- Briefing of driver/operator in site/project specific hazards
- Identification of site specific hazards
- Competence of driver/operator
- Monitoring of driver/operator

Schedule of vehicle heights

- Consider producing (and maintaining) a schedule of vehicle heights of regular vehicles / plant

Overhead Protection Campaign Notes

Safe travelling of mobile plant equipment and vehicles –

Indication of overall travelling height

Extract from The Road Vehicles (Construction and Use) Regulations 1986 Regulation reads –

(1) This regulation applies to every motor vehicle which is —

- a) Constructed or adapted so as to be capable of hoisting and carrying a skip;
- b) Carrying a container;
- c) Drawing a trailer or semi-trailer carrying a container;
- d) Engineering plant;
- e) Carrying engineering equipment; or
- f) Drawing a trailer or semi-trailer carrying engineering equipment.

(2) No person shall use or cause or permit to be used on a road a vehicle to which this regulation applies if the overall travelling height exceeds 3.66 m unless there is carried in the vehicle in the manner specified in paragraph (3) a notice clearly indicating in feet and inches and in figures not less than 40 mm tall, the overall travelling height.

(3) The notice referred to in paragraph (2) shall be attached to the vehicle in such a manner that it can be read by the driver when in the driving position.

(4) In this regulation -

- “engineering equipment” means engineering plant and any other plant or equipment designed and constructed for the purpose of engineering operations;
- “overall travelling height” means not less than and not above 25 mm more than the distance between the ground and the point on the motor vehicle, or on any trailer drawn by it, or on any load which is being carried by or any equipment which is fitted to the said motor vehicle or trailer, which is farthest from the ground, and for the purpose of determining the overall travelling height
 - a) The tyres of the motor vehicle and of any trailer which it is drawing shall be suitably inflated for the use to which the vehicle or combination of vehicles is being put; and
 - b) The surface under the motor vehicle and any trailer which it is drawing and any load which is being carried on and any equipment which is fitted to any part of the said vehicle or combination of vehicles and which projects beyond any part of the said vehicle or combination of vehicles shall be reasonably flat; and
 - c) any equipment which is fitted to the motor vehicle or any trailer which it is drawing shall be stowed in the position in which it is to proceed on the road;
- “skip” means an article of equipment designed and constructed to be carried on a road vehicle and to be placed on a road or other land for the storage of materials, or for the removal and disposal of rubble, waste, household or other rubbish or earth

Hub H&S Campaign – Overhead Protection (June 18)

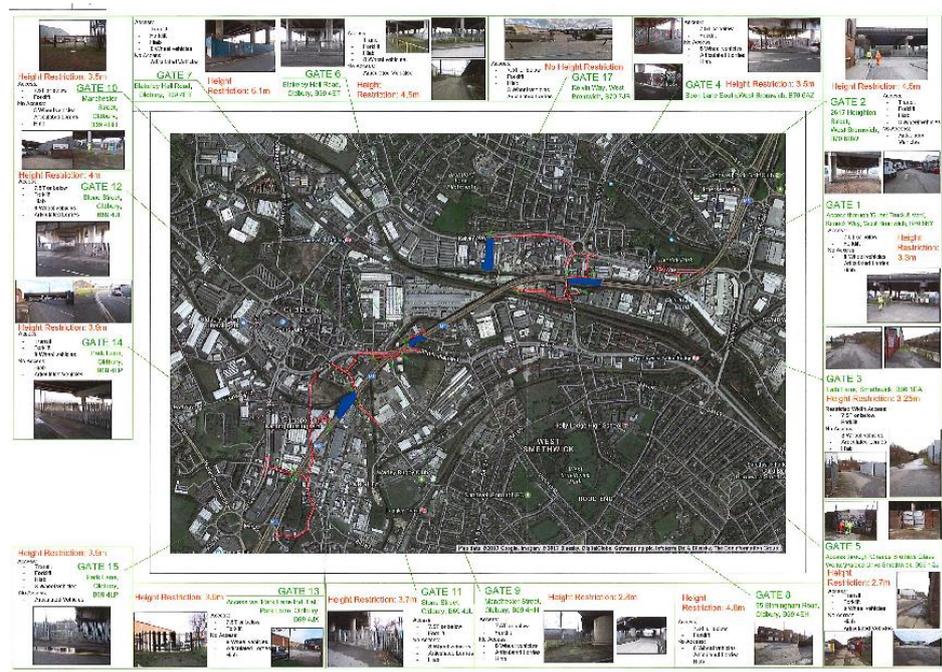
Overhead Protection Campaign Notes

Safe travelling of mobile plant equipment and vehicles – Route planning

- The risk of overhead structure and overhead service strikes (overhead strikes) should be assessed based on the height and width of each vehicle and item of mobile plant equipment
- It is good practice to display the trailer height on the trailer headboard and the coupler height on the cab in a position easily visible to the driver
- Routes should be planned in advance, and routes selected to eliminate the risk of overhead strikes
- Routes for vehicles under maintenance or on test or diversion should be planned to avoid low structures
- Delivery schedules should not cause the driver pressure, stress or fatigue as this may increase the risk of overhead strikes
- Make use of LGV specific satellite navigation systems that include information on vehicle height limits under low structures
- Atlases and site drawings can be a valuable source of information for vehicle height limits under bridges and structures
- Advice on vehicle height limits under bridges may also be obtained from local highway or road authorities
- Routes for vehicles with a travelling height over 16'3" (4.95 metres) should be checked with the relevant highway or road authorities



Example layout showing location of structures with low headroom



M5 Oldbury Viaduct scheme - Layout drawing produced to identify access points and travelling heights
(See Appendix A04)

Overhead Protection Campaign Notes

Safe travelling of mobile plant equipment and vehicles – **Route planning** ([Appendix A05](#))

Professional drivers' route and vehicle check

Date		Drivers name	
Vehicle No.		Trailer fleet / Serial Number	
Route	From	To	Via
Load type	Box	Container	Curtainsider
	Plant and machinery	Skip	Waste
	Car transporter	Other (specify):	

Route and vehicle check		
Have low bridges on your route been identified?	Yes	No
What is (are) the location(s) of the lowest bridge(s) on the route?		
What is the limit on vehicle height under bridges on your route? feet inches metric
Is the load and equipment properly secured and safe?	Yes	No
What is the maximum travelling height of your vehicle? feet inches metric
Is the maximum height of your vehicle less than the limit on vehicle height under bridges on your route?	Yes	No
What is the maximum width of your vehicle? feet inches metric



Know your vehicle height and width.
Know your route. Obey traffic signs.
Don't hit and run.



Overall travelling height conversion chart

Feet / inches	Metric
16' 3"	4.95
16' 0"	4.88
15' 9"	4.80
15' 6"	4.72
15' 3"	4.65
15' 0"	4.57
14' 9"	4.50
14' 6"	4.42
14' 3"	4.35
14' 0"	4.27
13' 9"	4.19
13' 6"	4.11

Feet / inches	Metric
13' 3"	4.04
13' 0"	3.96
12' 9"	3.89
12' 6"	3.81
12' 3"	3.73
12' 0"	3.66
11' 9"	3.58
11' 6"	3.51
11' 3"	3.43
11' 0"	3.35
10' 0"	3.05
9' 0"	2.75

Overhead Protection Campaign Notes

Safe travelling of mobile plant equipment and vehicles – Low Bridge Signs

Every year within the UK, there are hundreds of accidents, some leading to death or serious injury due to high sided vehicles attempting to pass through a bridge that is too low!

Bridges that have a clearance of less than 16 feet and 6 inches, or around 5 metres will usually have signs, either regulatory order signs (those with a circular red ring) or the triangular warning sign, warning drivers of high sided vehicles.

The types of sign used depends on the type of bridge.

This section details the various low bridge height signs along with their meanings.

REGULATORY LOW BRIDGE SIGNS

Regulatory road signs are often used at non-arch bridges.

Regulatory signs, or road signs that give orders provide mandatory instruction and it's therefore illegal for vehicles that exceed the height displayed on the sign to proceed and pass one of these signs.

Regulatory low bridge height signs are placed on the bridge and at the roadside in front of the bridge.

ADVANCED WARNING AND LOCATION OF MANDATORY HEIGHT RESTRICTION SIGNS

Some low height bridges may have an advance warning of a mandatory height restriction up ahead.

Directional arrows may be placed on the sign if the restriction is on a side road.

Other signs may include the location of the mandatory height restriction with a suggestion of a safe alternative route.



Overhead Protection Campaign Notes

Safe travelling of mobile plant equipment and vehicles – Security of load and equipment

You should:

- Ensure that drivers check that loads and equipment are properly secured before starting a journey
- Ensure that all drivers are adequately trained in load security
- Guidance to minimise the risk of bridge strikes due to unsecured loads and equipment can be found in the Department of Transport Code of Practice “Safety of Loads on Vehicles”

All equipment fixed or to be carried on the vehicle must be secured and transported in accordance with the Code of Practice



Photo (left): Result of Tipper equipment not correctly loaded after striking a bridge



Photos (left): Result of an ADT travelling along a haul road with the Tipper equipment not correctly stowed, striking an existing footbridge, on a highways scheme in 2005.

No-one was injured and the bridge that was not in use, and was to be demolished as part of the contract works, had to be inspected prior to removal of the Tipper vehicle safely.

Overhead Protection Campaign Notes

Safe travelling of mobile plant equipment and vehicles – Guidance to plant operators

Excavators

- Travelling with a suspended load is particularly hazardous
 - The pre-lifting risk assessment should ensure that the hazards associated with this operation are fully considered, particularly the presence of personnel adjacent to the machine's travel path
- Transportation by trailer
 - Excavators are often transported by trailers to different work sites
 - They are loaded onto or unloaded from the trailers by self-drive, without the need for disassembly
 - To carry out transportation of an excavator, the procedures recommended in the manufacturer's manual should always be followed
- Excavators should be fitted with illumination lights to provide sufficient lighting for travelling and working purposes

Lorry loaders (HIAB's)

- Lorry loaders (HIAB's) are used widely on highways schemes as a work horse for delivery and collection of equipment, materials, cabins and containers etc.
- They can be used with a crane hook, clam shell bucket, grab etc.
- Driver/operators must be trained and competent before operating these items of plant and must follow Employers procedures in relation to maintenance, slinging and crane use
- Safe stowing of components, prior to travelling
 - An audible and visual warning must be provided in cab as a warning to the driver/operator if items are not safely stowed prior to travelling
 - These must be checked by the driver/operator at least on a daily basis
 - An example checklist "Delivery Plan, Lorry Loader Checking Form" is shown on [Appendix A06](#)
- The following should be remembered;
 - Look out for overhead cables and bridges
 - Make sure that both stabilisers are deployed and returned to the correct position for travelling
 - Use proper care if work is in a restricted space
 - Be aware of other personnel and members of public in the vicinity, ensuring that the immediate work area is cleared, with barriers and signage erected, and/or trained personnel used, to prevent mistaken or unauthorised entry
 - Make sure that the boom is locked in its lowest position or on the deck of the trailer if an attachment is fitted
 - You must understand the safe working load of your loader in the different positions, the further out you extend the load the less weight you can lift
 - Machines have overturned whilst lifting loads due to incorrect procedures being followed
 - Look out for danger and drive safely with care at all times

Overhead Protection Campaign Notes

Safe travelling of mobile plant equipment and vehicles – **Guidance to plant operators**

Visibility (all vehicles and items of plant)

- Restricted visibility from vehicles and items of mobile plant can cause accidents, especially when part of the vehicle or item of plant is raised when travelling
- From the seated position the vehicle or cab, the driver/operator's view may be masked or obstructed by pillars and any other parts of the structure that may be in the way
- Typically, with a Tele-handler, certain parts of a loading or unloading cycle will place the boom in the operator's line of sight and consequently prevent a clear view
- Driver/operators should always ensure by appropriate means, prior to commencing a task, that personnel are clear of the area immediately adjacent to the machine, and that overhead hazards presented have been identified
- This may involve exiting the driver's seat or cab and walking around the vehicle or item of plant to ensure that activities and hazards, including those above, are identified
- Operator visibility is aided by clean vehicle and cab windows
- Window cleanliness should form part of driver/operator pre-use checks.

Overhead Protection Campaign Notes

Appendices

Appendices documents

- A01 – Prevention of bridge strikes [Network Rail]
- A02 – Look out look up booklet [Energy Networks Association]
- A03 – GS6 Avoiding danger from overhead power lines [HSE]
- A04 – M5 Oldbury location and access plan drawing, Oct 17 [BMV]
- A05 – Professional drivers' route and vehicle check [BMV]
- A06 – Delivery Plan, Lorry Loader Checking Form [MVM]

Highways England Raising the bar guidance documentation

- B01 – Plant and equipment [Version 1, Sep 2013]
- B07 – Overhead structure and services protection [Issued Nov 12, revised May 15]
- B20 – Transportation and logistics management [Version 1, Nov 2013]
- B25 – Loading and unloading vehicles [Version 1, Jul 2014]

Video links

Page 3 - Look Out Look Up Overhead Lines short film –

<https://www.youtube.com/watch?v=V9b1WmFeQvs>

Page 8 - Articulated dumper truck overhead cable strike;

http://www.highwaysafetyhub.com/uploads/5/1/2/9/51294565/dumper_cable_strike.mp4

Page 11 - Proximity Height Warning System

<https://www.intellicone.co.uk/single-post/2015/10/01/BAM-Morgan-Sindall-Safeguard-Workforce-Against-Overheight-Vehicles>