

Title: Surveying

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1. Introduction

This Safety Code of Practice details some of the hazards and risks which are encountered during surveying and associated activities both on and off the highway. As in all health and safety issues it is impossible to foresee all eventualities and staff must be vigilant at all times during survey work. It is important also to refer to other relevant Safety Codes of Practice which provide further guidance regarding certain aspects.

2. Definitions

A “competent person” is someone who has received formal training in surveying activities and traffic management or who has extensive experience in this type of work and an understanding of the risks and relevant health and safety requirements and considerations.

3. Hazards

Potential hazards associated with surveying are:-

- (i) Hazard of being struck by traffic whilst on, or adjacent to the carriageway. Particular danger exists when surveying the centre line of a road or when walking along the road. The danger arises not only from being struck by any one vehicle, but also from moving out of the path of the first vehicle (or being blown) into the path of the second vehicle.
- (ii) Hazard of electrocution from underground or overhead electric cables. The danger of contact with underground cables exists particularly when installing ground markers and with overhead cables when using a levelling staff. Similar hazards exist with British Telecom cables, gas and water pipelines.
- (iii) Hazard due to the nature of the ground being surveyed. Whilst a quarry face is an obvious danger, less obvious dangers exist such as unstable riverbanks or unseen debris on highway verges.
- (iv) Hazard arising from construction work on site. Not only do dangers of being struck by contractor’s plant exist but also dangers from materials in use (e.g. danger of burning by hot blacktop material or chemical burns from wet concrete).
- (v) Hazard to other road users or members of the public. E.g. an instrument on a footway causing a pedestrian to step onto the carriageway and being struck by a vehicle.
- (vi) Environmental hazards such as leptospirosis, hypodermic needles (particularly in urban environments), tetanus, toxic blue-green algae, animal and human faeces may be encountered during routine surveys.

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4. Protective Equipment

Requirements of CPA5 shall be followed. [Link to CPA 5](#)

5. Responsibilities and Survey Planning

A competent person shall take responsibility for planning each individual survey to ensure that it is carried out in a safe manner with minimal risks. He/she will carry out an appropriate risk assessment to identify the hazards and to ensure that risks are reduced by:-

- (i) Proper planning of survey operations.
- (ii) Ensuring that personnel are trained in their duties.
- (iii) Ensuring that personnel are aware of potential hazards.
- (iv) Ensuring that the appropriate number of staff undertake the survey, taking into account the nature of the work, its location and potential hazards.
- (v) Ensuring that personnel are clearly visible at all times.
- (vi) Provision of clear warning to road users of any obstruction to the highway.
- (vii) Adequate provision and use of proper equipment for the operation.
- (viii) Ensuring that safety instructions and regulations are complied with.
- (ix) Assessing the risks associated with the work.
- (x) Permission is gained from landowners to enter any private land.

6. General Precautions and Accident Reporting

In addition to the precautions detailed in this Code of Practice in respect of particular types of survey work, the following precautions must be observed:-

- A first aid kit is to be available on survey sites.
- Check for underground or overhead services in advance of visiting site.
- If installing stakes or pins in the ground ensure these are located away from underground services by following the guidance below:
 - o a set of current service plans shall be available on site. Service plans can give a good indication of where underground services exist however they are rarely completely accurate and should not be relied upon on their own.
 - o A competent person shall undertake a visual assessment of the area for obvious signs of electrical equipment, phone boxes, street lighting, marker

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- posts etc. These areas shall be avoided.
- A competent person shall use cable avoidance tools (CAT) and Genny to confirm the location of services. When using detection equipment the absence of a positive reading shall not be taken as proof that a service is not present.
- Remember that individual services to properties are not shown on records and that plastic water and gas pipes cannot be located by CAT and Genny.
- Always wear appropriate clothing.
- Ensure tapes do not cause a tripping danger.
- Walk at all times, do not run. Beware of underfoot conditions, tripping hazards etc particularly in long grass or undergrowth.
- Beware of dangerous livestock, dogs or other wild animals.
- Beware of chemical spraying operations on or near agricultural land.
- If the survey is over or on water, the requirements of Safety Code of Practice CPC3 'Working on or over Water' must be followed
- Surveying by a lone surveyor may only be carried out in exceptional circumstances such as carriageway width measurement by measuring wheel or traversing measurements by total instrument station where all survey stations are sited well away from the carriageway. In these circumstances an appropriate lone worker system must be utilised.
- Do not enter confined spaces such as wells, sewers, manholes, cofferdams, long or enclosed culverts, deep cofferdams, caissons, deep excavations, tunnels, shafts, tanks or silos. In the event that survey information is required for such locations, then this should be obtained using a competent contractor (see Safety Code of Practice CPA10 'Working in Confined Spaces').
- Be vigilant for the presence of apparent or concealed shafts or mine workings or other overgrown cavities.
- Do not venture onto unstable or boggy ground.
- Do not enter derelict buildings.
- All accidents, injuries and dangerous occurrences must be reported in accordance with the requirements given in the relevant Safety Code of Practice.
- Dog bites, cuts from rusty barbed wire, nails through the foot etc can have serious consequences and proper treatment must be obtained as early as is reasonably possible.
- Survey work shall be abandoned if there is any question of the need of

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treatment for injured staff which is not available on site.

- Surveyors are issued with POEL17 card and should present them to their doctor/hospital in the event of flu like illness. Basic hygiene such as washing hands before eating and covering cuts with waterproof plasters should be followed to prevent infection.
- Beware of hypodermic needles and other environmental hazards. Needle sweeps should be undertaken by specialist contractors prior to surveying where these are prevalent.

7. Surveying On Or Near The Highway

In addition to the general precautions in Section 6 above, the following notes detail those necessary when working on or in proximity to a highway which is open to traffic.

Vehicles taken to site shall be parked off the carriageway wherever possible so that they do not obscure vision of road users, including pedestrians. Owner's permission shall be obtained prior to parking on private land.

When it is not possible to park off the carriageway great care must be taken to reduce any obstruction and the vehicle should be parked inside a coned off area with hazard lights or flashing amber beacon operating and advance signing.

For short duration stops on the highway, further guidance is given in Safety Code of Practice CPA6 (Short Duration Stops on Public Roads).

When planning a survey on or near to the highway, the following possible hazards should be identified:-

- (a) Surveying equipment to be used on the carriageway (e.g. levelling staff).
- (b) Poor visibility along the road due to bends, hills, crests, hedges or other obstruction.
- (c) Dual carriageway road.
- (d) Road narrower than 5.5 metres.
- (e) High traffic flow (all Class A roads and other busy roads).
- (f) Other special hazard.

If two of these hazards are present, consideration should be given to deployment of a lookout, possibly with an air horn or whistle to give warning to the person working on the carriageway of an approaching vehicle. In these circumstances care must be taken to ensure that the warning signal does not result in someone stepping backwards into the path of a vehicle approaching from behind. Any system of signals must be clear, simple, discussed and fully understood by all members of the survey

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team before work commences

If three or more of these hazards are present, special precautions including traffic management will generally be required.

Always wear high visibility clothing.

Surveying on or adjacent to the highway shall be planned and carried out so that the need for personnel to stand on the carriageway is avoided where at all possible.

Survey stations should be sited away from the carriageway and where they will not cause an obstruction to pedestrians if at all possible. Pedestrians must not be forced to walk in the road without protection.

Where it is unavoidable for a surveyor to stand in the carriageway, they shall, wherever possible, be facing in the direction of oncoming traffic. This may require repositioning of survey equipment as the survey proceeds.

Survey staffs should always be carried in a near upright position and never carried over the shoulder. Beware of overhead lines, and keep the staff well clear.

When measuring across the carriageway, the tape shall be kept close to the ground and tight. Employees shall never bend over the footway or verge with their head projecting into the carriageway.

Where a suitable verge is available this must be used for the setting up and operating equipment and for walking from location to location carrying equipment.

When no verge is available persons should walk as close as possible to the carriageway edge and facing oncoming traffic.

Face oncoming traffic whenever possible.

Try to arrange to carry out the survey when traffic density is at its lowest level. Traffic density varies according to the season, day of the week, time of day, local events etc and on some roads this variation is sufficient to permit safe surveying on, for example, summer evenings or Sunday mornings.

8. Traffic Management

All signing and traffic control shall be in accordance with the principles laid down in the following:

- "The Traffic Signs Manual Chapter 8" (Traffic Safety Measures and Signs for Road Works and Temporary Situations)" on dual carriageway with a speed limit of 50mph or more.
- The "Safety at Street Works and Road Works A Code of Practice" issued under section 65 of NRSWA for all other circumstances.

For further guidance refer also to Safety Code of Practices CPC9 (Traffic Management for Tidal Flow Operations), CPE7 (Traffic Management) and CPF3

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(Traffic Management for Site Testing).

Signs should generally be removed when survey work stops for any period greater than one hour.

9. Surveying in the Vicinity of Overhead Cables

Overhead power lines pose a serious danger to those undertaking surveying activities. The clearance above the ground may be less than 5 metres and extreme caution must be exercised when surveying in the vicinity of any power lines

Levelling staffs must be of insulating material and be kept dry during use.

Overhead cables should be identified through NRSWA enquires prior to undertaking any survey. Exclusion zones should be confirmed and recorded by a competent person either prior to or at the start of the survey. Staffs should be collapsed to ensure they do not enter within any exclusion zone when carried.

Further guidance is available in CPE2 (Danger from Overhead Power Lines (Works)).

10. Surveying Over or Adjacent to Water

Where working in the vicinity of water, the requirements of CPC3 must be adhered to. [Link to CPC 3](#)

Where there is a risk of entering deep or fast flowing water, the Survey Supervisor shall ensure that all personnel engaged on that work wear life jackets.

11. Surveying on Construction Sites

When visiting construction sites to carry out surveys, staff must report to the Site Supervisor and comply with all procedures and requirements of the site with regard to health and safety matters, including requirements for site induction.

Staff shall ensure that:-

they are clearly visible at all times;

plant operators are aware of their presence.

Instrument stations are to be situated away from danger and be adequately protected and marked.

Do not approach plant without confirmation from the operator that it is safe to do so. Excavator buckets should be lowered and engines turned off. The operator's visibility is often highly restricted and plant should only be approached from a direction where there is a clear line of sight with the operator.

For surveys which involve more than a single visit to a site, the Survey Supervisor shall check with the Site Supervisor for any changes in the site operations that may create hazards and the Survey Supervisor shall inform the Site Supervisor of any

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changes of his intended method of working.

Care must be taken when climbing ladders, walking on scaffolding etc especially when carrying instruments. Ensure that at least one hand is available for stability at all times. Request assistance if needed.

All staff shall ensure that all accesses, scaffolds, walkways etc are safe before using them.

The particular hazards associated with working on sites and the necessary precautions are detailed in the relevant Section E Safety Codes of Practice. [Link to CPEs](#)

12. Surveys On Or Near Railways

Any work of any nature on railway property or which may affect the operation of a railway or railway property will require approval and permits from Network Rail. This includes work which may impede road traffic using a level crossing.

it is essential that the procedures described in Safety Code of Practice CPA8 (Working in Proximity to Railways) are followed. [Link to CPA 8](#)

13. Surveying on Waste Management Site

Special care shall be taken when surveying on reclamation and waste disposal sites.

Particular hazards associated with these sites are:-

unstable and boggy ground conditions;

the presence of noxious and dangerous fumes;

burning waste materials;

dangerous and sharp items;

operating construction plant;

frequent changes of topography and conditions.

The surveyor shall consult the managing authority and obtain instructions and guidance appropriate to each case, which must be followed.

Further guidance can be found in Safety Code of Practice CPH5 (Visits to Waste Management Facilities).

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14. Surveys on Industrial Premises

Permission shall be obtained to enter and carry out work on privately owned land and the powers of entry conferred by the Highways Act 1980 shall not be used without full compliance with the procedures for notice.

In addition to the hazards detailed elsewhere in this Safety Code of Practice, industrial premises may present potential additional problems.

The authority which grants permission for entry will make its own stipulations on safe working practices; all of these must be complied with.

15. Sewer Investigations

It is of paramount importance that surveys or investigations requiring entry into sewers are carried out by properly trained and equipped personnel who are familiar with local conditions. Under no circumstances shall staff enter sewers or manholes without full compliance with the procedures laid down in Safety Code of Practice CPA10 (Working in Confined Spaces). Survey work shall otherwise be restricted to operations conducted from the surface.

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