SHE006 - Excavations

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Introduction

The undertaking of any activity which involves breaking ground or excavations is a high risk activity. Every year people are killed or seriously injured when working in excavations, when services are struck or from collapse.

This information sheet is designed to detail the mandatory requirements that anyone undertaking excavations on an Arqiva site should follow. A number of guidance sheets are available on a variety of subjects. This information should be read in conjunction with the other guidance sheets applicable to the activities you are undertaking.

General Requirements

- Any excavation must have an appropriate level of survey undertaken in accordance with British Standards Institution PAS 128 - Specification for underground utility detection, verification and location. Basic details and expectations of the requirements Arqiva expects is provided in Appendix A.
- The persons appointed to carry out the excavation must be conversant with HSG47 Avoiding Danger from Underground Services 2000, or an equivalent approved standard. At all stages of the excavation a competent person must supervise the work and workers given clear instructions on working safely in the excavation.
- Temporary Works are defined in the British Standard BS5975: 2008 as parts of the works that allow or enable construction of, protect, support or provide access to, the permanent works and which might or might not remain in place at the completion of the works. The Health and Safety Executive consider excavations not exceeding 1.2m as “simple / low risk”. Any excavation exceeding 1.2m must be treated as temporary works.
- No excavations are permitted to take place and no permits will be issued without a suitable and sufficient risk assessment and/or method statement covering the proposed work from the contractor.
- Example risks that should be included in the risk assessment:
    - Emergency arrangements – rescue from excavation
    - Work at height – access arrangements
    - Collapse of the sides
    - Underground services
    - Contaminated ground
    - Fall of materials, persons, plant or equipment into the excavation
    - Confined spaces – poisonous or explosive atmospheres or lack of oxygen
    - Flooding
    - Overhead services
    - Moving plant – injury to person
    - Lifting operations
    - Undermining adjacent structures or services
    - Traffic Management
    - Environmental impacts
- Before work commences an emergency, rescue plan must be provided. The plan should include as a minimum – rescue equipment, emergency response steps, location plan for isolation of any services within the excavation. It is not acceptable to state that emergency services will undertake rescue, HSE guidance clearly states emergency services are not to be relied on for rescue.
- All excavations must have a Permit to Work and this is to be issued by a competent person.
- The contractor will be required to use locating devices to trace any services (CAT4E or equivalent standard) and mark the ground accordingly. A scan would need to be carried out by someone who is competent and has received relevant training in using the equipment and in interpreting any data obtained.
- Ensure those involved in the task are adequately briefed and fully understand service locations, any permit to dig constraints and safe digging practices in accordance with HSG47 Avoiding Danger from Underground Services
- Plan work effectively to ensure maximum use of safe digging techniques i.e., vacuum excavation to identify all services. Minimise mechanical excavation wherever possible

- Copies of documentation i.e., RAMS, service and design drawings (A3) etc must be available in hardcopy on site
- Due to the potential risk of HV / LV cable strikes arc clothing rated according to IEC61482 should be worn by all persons undertaking excavation work
- Ensure that there are suitable barriers in place to prevent unauthorised persons gaining access. The standard of the barriers will depend on the work involved and the location.
- Safe access and egress from the excavation is essential. Whenever possible the workings should be covered, or suitable warning notices and barriers placed around it.
- Excavations which are supported to prevent any person being buried or trapped by a collapse or fall of material should be regularly inspected at the start of every shift – before work commences and after any event likely to have affected the strength or stability of the excavation. Inspections should also be carried out after any accidental fall of material.
- Where trial holes are to be dug, this must be done by hand-digging to confirm the position of services. Use safe digging practices, i.e., locate and dig trial holes by hand – no machines permitted within 500mm of a service. This is particularly important if there are plastic pipes or fibre-optics which cannot be found by a cable locator. Insulated spades and shovels are safer and should be used in preference to picks, pins or forks.
- Services are frequently buried on Arqiva sites at a lesser depth than that required by relevant standards; also, previous works on the site may have reduced surface levels.
- Where possible services must be isolated before any works commence. If services cannot be isolated, then an appropriate Safe System of Work is required (for working around live services) and approved by the Arqiva project manager.
- Back filling – Backfilling of any excavation should be done carefully to make sure that services are not damaged. Put back warning tiles, tape etc in their original position above the services. Backfill materials containing items likely to damage the services, such as large pieces of rock and hard core, should not be used. The excavation shall be back filled and compacted flat and even, not causing a trip hazard. Any excess spoil shall be removed from site.
- In the event of the discovery of an uncharted/ unmarked service, work should be stopped immediately, and the operative must contact the Arqiva Project Manager for further instruction on how to proceed.
- If a service is damaged:
    - STOP work immediately. Under no circumstances are unauthorised repairs to be attempted. Work must cease and the area must be made safe.
    - REPORT immediately any damage to any service (cables, feeders or there coating) to the Project Manager and Arqiva accident report line. Even if there are no visible signs of damage, then the service should be inspected as a precaution.
    - DO NOT resume work until the utility provider and or competent persons deems the area safe

Appendix A – Excavation Surveys

During the design stage a comprehensive site survey is required to be undertaken if excavation works are required. The survey must be carried out in accordance with requirements of PAS128 stages of survey, elements D - B are required to be undertaken. Stage A is required as a minimum if a service has been identified within 500mm of the proposed excavation:

Survey D - Desktop utility records search

- Underground utilities are approximately identified through the collation and analysis of existing paper and digital utility records via a thorough search of potential asset owners
- The survey should also include a review of relevant databases i.e., https://www.digdat.co.uk/

Survey C – Site reconnaissance.

- Existing records are supported and validated by the visual inspection of above-ground physical evidence observed or recorded during a site visit. Features of interest including trench lines, inspection covers, feeder runs etc should be noted and investigated during the survey.

Survey B Detection – At a minimum the following must be undertaken:

- Utility detection using EML (Electro Magnetic Location) and GPR (Ground Penetrating Radar)
- Use the CAT and genny to establish and identify which services can be detected by EML methods and mark accordingly
- Manually lift covers where possible to assist in determining services, barrier off open covers and close on completion
- Direct connections are to be made where practicable and safe. Cables are clamped and their routes traced across the area of interest.
- Temporary signal generator connections are made to the outside casing of lighting columns, lit signage, cabinets, other street furniture etc.
- Sweep the site using the EML over an orthogonal grid in passive and active modes
- If required use a CCTV camera to trace and prove drainage routes
- Use different colour sprays to differentiate the type of service
- Take photos of area showing services identified and locations

A full written report of the findings of the survey, site CAD drawing showing location of identified services must be included in the pre-construction information pack.

Survey A – Verification via intrusive inspection.

- The process of exposing a utility and subsequently measuring its accurate location, this can be achieved by lifting inspection covers, duct covers or by excavating the utility / service through a trial hole

Report

A report shall accompany any survey output. This shall contain the following as a minimum:

- Written description of the survey project requirements and defined survey area
- List of the detection methodologies used during the survey
- Survey outcomes including:
    - Description of how successful each detection methodology was and a plan showing any areas where the detection methodologies were not successful
    - List of any utilities expected to be present based on the desktop utility records search that were not detectable using the detection methodologies. These should be referenced to the plan above
    - A list of buried features and obstructions other than utilities detected during the execution of the survey
    - Plans showing all areas of conflict between record information, site information and detected utilities
    - Photographs as specified or were taken to support understanding
    - Recommendations for any further survey work provided during the execution of the works
    - Information on how GPR was calibrated and how many calibrations have been conducted around the site
    - What post-processing software has been used to post-process the GPR results
    - The variations in depth of the GPR penetration achieved around the site
    - The conditions on site at the time of the survey and any issues that might generically affect the survey outputs, for example rain.