



Systemic Safety Alert **Excavation in the Vicinity of Underground Electricity Cables**

Major systemic safety problems

Excavation work may damage underground electricity cables nearby if proper safety precautions have not been taken. In the past, there were accidents involving workers who were injured or even killed as a result of the arcing current, fire or explosions that occurred when a live cable was inadvertently contacted and damaged in the course of excavation. The following are the major systemic safety problems attributed to the relevant accidents:-

- improper planning or lack of planning for working on or near underground electricity cables;
- failure to conduct task-specific risk assessments to identify hazards;
- failure to formulate appropriate and adequate risk control measures for safe excavation;
- slack in control and monitoring to ensure that risk control measures stay effective and are fully implemented; and
- failure to provide workers with adequate safety information, instruction, training and supervision.

Accident prevention measures

Registered Safety Officers (RSOs) should advise their employers/ clients to:

- (i) properly plan for the work, including the underground cable detection work:
 - obtaining drawings, including cable plans, from utilities companies and other relevant organisations to understand the underground services around the workplace prior to the commencement of work;
 - conducting task-specific risk assessments in identifying all potential hazards associated with the excavation work;



- appointing a competent person¹ for underground cable detection including carrying out passive cable detection to detect the most probable alignment of each underground cable and proposing trial hole locations to locate the most probable alignment of each underground cable –
 - digging trial holes by using hand tools² to expose the target underground cables and carrying out toroidal active cable detection to ascertain the alignment and depth of the unexposed cables under the supervision of the competent person;
 - marking the alignment and depth of underground cables based on common reference points (e.g. lamp pole, traffic light post or hydrant, etc.) on the ground;
- recording the findings in a Competent Person Written Report³ after the completion of cable detection;
- arranging site briefing given by the competent person to ensure the site personnel are conversant with the contents of the Competent Person Written Report including the meanings of markings at site, aware of the potential danger as a result of cable damage and the required safety precautions; and
- following strictly the requirements as stipulated in the latest “Code of Practice on Working near Electricity Supply Line” published by the Electrical and Mechanical Services Department.

(ii) formulate safe work methods/ procedures and adequate risk control measures for safe excavation. Among others, the following control measures should be strictly adhered to:

- detailing the methods, plant to be employed and the safety precautionary

¹ A competent person shall be approved by the Director of Electrical and Mechanical Services Department under section 3 of the Electricity Supply Lines (Protection) Regulation, Cap. 406H.

² Hand-held power tools can only be used to break the paved surface up to a depth of 150 mm in a footpath or 600 mm in a carriageway with at least 250 mm clearance from any cable alignment in any case.

³ For details, please refer to the latest “Code of Practice on Working near Electricity Supply Lines” issued by the Electrical and Mechanical Services Department.



measures in the safe work methods/ procedures;

- ensuring the adoption of the Competent Person Written Report and be vigilant for markings, alignment and depth of the underground cables;
- ensuring that the live underground cables located within the area to be excavated are rendered dead and securely isolated before and during the excavation work;
- in case rendering the cables dead is not reasonably practicable, ensuring that the excavation work should only be done under a stringent permit-to-work system with adequate and appropriate safety measures established and taken to prevent workers against electrical hazards;
- ensuring that no mechanical equipment or heavy power tools are used for digging in the close vicinity of underground pipes and cables, and maintaining adequate minimum safe working distance from underground cables when use of such equipment/ tools are unavoidable;
- providing proper support to any underground electricity cables exposed in an excavation and providing proper backfilling where appropriate; and
- stopping excavation immediately in case any unidentified utilities are found during the excavation, re-conducting risk assessment, and reviewing and adjusting where necessary the original safe work methods/ procedures.

(iii) implement effective proactive safety inspection programme and arrange stringent on-site supervision:

- ensuring that the safe work methods/ procedures are in place through the appointment of a supervisor who possesses adequate safety knowledge and work experience to oversee the performance of workers;
- arranging site briefing and ensure that workers understand the contents of the Competent Person Written Report including the safety precautions required before they perform the excavation work;
- ensuring that the risk control measures concerning work for excavating in the vicinity of underground electricity cables are fully implemented; and



- regularly monitoring and reviewing the condition of the workplace to make sure the risk assessment is still valid.

- (iv) provide all workers involved in excavation work with necessary safety information, instruction and training to ensure that they are familiar with the safe work methods/ procedures, including information about the location and nature of underground services, safety precautions/ measures and emergency procedures.
- (v) review the system of work periodically to ensure its workability and effectiveness whenever there is a significant change in work method, team composition, use of equipment, working environment, etc.

Registered Safety Auditors (RSAs) should take into account these systemic safety problems and accident prevention measures in executing safety audit functions.

DISCLAIMER

This Systemic Safety Alert is issued to draw the attention of interested parties to the relevant systemic safety problems and accident prevention measures necessary to protect people engaging in similar works activities. The material contained in this Alert constitutes general guidance only. It does not reduce, limit, or replace, any legal obligations upon any person to comply with any statutory duties under relevant legislation. Users such as Managers and Supervisors should make their own evaluation of the information contained in this Alert to determine if it can be applied to their own situations and practices. The Labour Department does NOT accept any responsibilities for any loss or damage resulting from the use of or failure to use the information contained herein.