Underground Electrical Hazards for Municipalities Meeting Kit



WHAT´S AT STAKE

Underground Utilities means any below-ground line, structure, facility or installation used by a utility or service provider including, but not limited to, telephone company lines, cable and conduit; cable television lines, cable and conduit; internet lines, cable and conduit; sewer lines and water lines, including individual sewer and water service lines; stormwater lines; gas lines; electrical lines, cables and conduit; and traffic signal lines, cable and conduit.

WHAT’S THE DANGER

MAIN MUNICIPAL UNDERGROUND ELECTRICAL HAZARDS

1. **Buried power lines:** Underground power lines can pose a serious danger to people and equipment if they are accidentally hit or dug up. Municipalities should have accurate maps of buried power lines to avoid accidental damage during construction or excavation work.
2. **Substations:** Electrical substations are used to distribute power throughout an area and can pose a hazard if there is a malfunction or equipment failure. Municipalities should ensure that substations are properly maintained and have adequate safety features in place.
3. **Electrical vaults:** Electrical vaults are underground chambers that contain electrical equipment. They can be found in sidewalks, parking lots, and other public areas. Municipalities should ensure that electrical vaults are properly secured, and that access is restricted to authorized personnel only.
4. **Streetlights:** Streetlights are often powered by underground electrical lines and can pose a hazard if they are damaged or improperly maintained. Municipalities should ensure that streetlights are regularly inspected and maintained to prevent electrical hazards.
5. **Communication lines:** In addition to power lines, underground communication lines such as fiber optic cables and telephone lines may pose a risk if accidentally hit or dug up. Municipalities should have accurate maps of these lines to avoid accidental damage.

Electrical Hazards Associated with Underground Cables

Hazards when working in proximity to, or exposing low-voltage and high-voltage underground cables may result in:

- Electrocution.
- Damage to underground electrical assets.
- Disruption of the electricity supply.

Underground Cable Damage

When underground cables are damaged, people can be killed and injured by electric shock, electrical arcs (causing an explosion), and flames. This often results in severe burns to hands, face, and body, even if protective clothing is being worn.

Damage can be caused when a cable is:

- cut through by a sharp object such as the point of a tool; or crushed by a heavy object or powerful machine.

HOW TO PROTECT YOURSELF

UNDERGROUND ELECTRICAL PROCEDURES FOR MUNICIPALITIES TO ENSURE SAFETY OF WORKERS AND PUBLIC

- **Obtain necessary permits:** Before any work can begin, municipalities must obtain the necessary permits from the relevant regulatory authorities. These may include permits from local zoning boards, building departments, and electrical safety authorities.
- **Conduct a site survey**: Before any underground electrical work can begin, a site survey must be conducted to assess the existing infrastructure and determine the best course of action. This may include identifying the location of existing underground utilities, such as gas, water, and sewer lines.
- **Develop a plan:** Once the site survey is complete, a plan can be developed that outlines the scope of work, timeline, and budget. This plan should be reviewed and approved by all relevant stakeholders before work begins.
- **Excavate the site:** The first step in the actual installation of underground electrical infrastructure is to excavate the site. This may involve digging trenches, removing soil and debris, and installing temporary barriers.
- **Install conduit and cables:** Once the site is prepared, conduit and cables can be installed underground. This may involve using heavy machinery to lay and bury conduit, and then threading electrical cables through the conduit.
- **Install electrical equipment:** After the conduit and cables have been installed, electrical equipment such as transformers, switchgear, and circuit breakers can be installed. This equipment should be properly grounded and installed in accordance with all relevant safety codes and regulations.
- **Conduct testing and commissioning:** Once the equipment is installed, it must be tested and commissioned to ensure that it is functioning properly and safely. This may involve conducting insulation tests, grounding tests, and load testing.
- **Close the site:** Finally, the site can be closed and restored to its original condition. This may involve backfilling trenches, reseeding grass, and removing temporary fencing or barriers.

PPE FOR THE UNDERGROUND ELECTRICAL SAFETY OF MUNICIPAL WORKERS

1. **Hard Hat:** A hard hat is an essential piece of PPE for any worker who will be working underground. It provides protection from falling debris and other hazards.
2. **Safety Glasses:** Safety glasses are important to protect the eyes from dust and debris that can be kicked up during underground work.
3. **Gloves:** Gloves should be worn to protect the hands from electrical shock, cuts, and abrasions. Rubber gloves are often used as they provide electrical

insulation.
4. **Safety Boots:** Safety boots should be worn to protect the feet from falling objects and other hazards.
5. **High-Visibility Clothing:** Workers should wear high-visibility clothing so that they can be easily seen by other workers and motorists.
6. **Respirators:** Respirators should be used when working in dusty or confined spaces. This will help to protect the lungs from harmful particles.
7. **Earplugs or Earmuffs:** Hearing protection should be used when working in noisy environments.

FINAL WORD

The process of installing underground electrical infrastructure in municipalities is complex and requires careful planning and execution to ensure safety, efficiency, and compliance with regulations.