



# Subsurface Utility Engineering

**With a seasoned team of registered professionals, combined with cutting-edge technology and equipment, CEC offers a full range of subsurface utility engineering services that meet the changing needs of our clients.**

CEC's Subsurface Utility Engineering (SUE) team can help minimize the risks presented by projects that involve areas near underground utilities. We identify, mark, and contact underground and aboveground utilities affected by the project, including power companies, communication companies, cable providers, water and sewer providers, and departments of transportation. The utilities can then be surveyed and mapped into the planimetric information for a project, allowing our clients to have accurate information.

The project SUE team will work closely with utility companies and affected organizations to minimize utility "surprises." CEC offers full-service SUE, including quality levels A,B,C, and D, which represent degrees of risk and how much information is needed to adequately design and construct a project.

## UTILITY LOCATION AND MAPPING

CEC can provide Quality Level B utility marking and mapping through:

- Record research: Identifying any requested utilities along the project site, meeting with representative operating facilities within the project area, and collecting copies of utility records
- Designation: Utilizing geophysical prospecting techniques to determine the existence and horizontal position of underground utilities.

Qualified as Certified Professional Utility Locators (CPUL), CEC's technicians are trained to use advanced technology to provide these services.

## ELECTROMAGNETIC LOCATION

CEC can use electromagnetic location to identify conductive utilities, such as telephone cables and cable television lines. It employs a single generator, used to apply a radio signal to a targeted buried cable, and a hand-held receiver to locate signals from the transmitter or those occurring naturally on buried lines.





Civil & Environmental Consultants, Inc.

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## GROUND PENETRATING RADAR (GPR)

CEC's Ground Penetrating Radar (GPR) units can assist in identifying nonmetallic utilities and other structures that are unidentifiable using traditional electromagnetic techniques. Once found, utilities will be marked using universally recognized American Public Works Association (APWA) markings along the utility and along bends in the line. Identified utilities, including private services, will be marked to the limits of the projects.

CEC has multiple multi-frequency GPR units, each with a differing characteristics and antennae frequencies. The frequencies allow CEC to locate and image objects at greater depths and with higher resolution. Our GPR units can also be used for:

- Void detection
- Grave site location
- Tank location
- Underground 3D mapping
- Geotechnical investigations
- Ice thickness surveys

## CONCRETE SCANNING

As part of our GPR fleet, CEC also uses high-frequency concrete scanning radar units to image existing structural reinforcement like mesh, rebar, and post tension cables. It will also image utility structure through concrete walls, floors, roadways, and bridge decks. CEC's concrete scanning service is safer than traditional X-ray scanning. We can provide a 3D picture of the area of interest by accessing only one side of the area.



## PIPE CAMERA SERVICES

Our SUE teams can provide minor-pipe camera services with a push rod camera. Using the camera and a powered sonde, CEC can trace lines and uncover hard-to-find junction boxes and bends in storm and sanitary sewer pipe runs. This allows CEC to provide a more accurate mapping of sanitary and storm structures that prevent surprises during construction.

