CORE CONCEPT

Underground Utility Detection Course: EM Locators, GPR and Excavation Damage Prevention

16 – 20 August 2027
Barcelona - Eixample district four-star

Underground Utility Detection Course: EM Locators, GPR and Excavation Damage Prevention

Ref: 1941_28922 **Date:** 16 – 20 August 2027 **Location:** Barcelona - Eixample district four-star **Fees:** 23500 SAR

Introduction:

Underground utility detection with EM locators, GPR and excavation damage prevention is a 1-week course for utility network, municipal permitting, excavation contractor and utility survey teams that ends with an Excavation Damage Prevention Plan for a case organisation. Utility strikes cause outages, gas escapes, flooding and injuries when excavation proceeds on incomplete records, unverified ground marks and machine digging close to live services. Nominees already request, issue or carry out locates and digs at work, and learn through case studies built on utility records, radargrams and strike reports. CoreConcept Training Center delivers this underground utility detection course.

Course Objectives:

- Classify utility records and site evidence against ASCE 38 quality levels and PAS 128 survey categories to set the survey scope a project needs
- Operate electromagnetic locators in direct connection, signal clamp, induction and passive modes to trace metallic cables and pipes and estimate their depth
- Plan ground-penetrating radar grid surveys, choose antenna frequency for the ground conditions and interpret reflections from non-metallic pipes and ducts
- Record locate results as CAD and GIS layers with confidence attributes and build a utility conflict matrix against the proposed design
- Run one-call notification, dig permit, ground marking and tolerance zone controls using hand digging, vacuum excavation and trial holes
- Investigate utility strikes to root cause and assemble an Excavation Damage Prevention Plan for a case organisation

Target Audience:

- Utility network engineering teams responsible for asset records, locate requests and service protection on water, power, gas and telecom networks
- Municipal street works and right-of-way teams responsible for issuing dig permits and coordinating excavations in public roads
- Excavation contractor site teams responsible for pre-dig checks, safe-dig methods and plant operation near buried services
- Utility survey and detection teams responsible for electromagnetic locating, radar scanning and delivering utility maps
- Design and project engineering teams responsible for checking new works against existing underground services

Course Outline:

Day 1: Buried Utility Strike Landscape and Records Baseline

- Excavation Damage Consequences for Gas, Power, Water and Telecom Assets
- Utility Strike Root Cause Categories From Damage Reporting Data
- Existing Utility Records Review for Age, Scale and Reliability
- Active, Abandoned, Redundant and Unknown Service Classification
- Organisational Locate and Dig Process Current-State Assessment

Day 2: Survey Quality Levels, Detection Principles and Notification Processes

- ASCE 38 Quality Levels D, C, B and A Compared
- PAS 128 Survey Categories With Detection and Verification Levels
- Electromagnetic Field Principles Behind Cable and Pipe Locating
- Ground-Penetrating Radar Dielectric Contrast and Antenna Frequency Selection
- One-Call Notification and Dig Permit Workflow Mapping

Day 3: Field Locating, Ground Marking and Locate Data Capture

- EM Locator Direct Connection, Signal Clamp and Induction Modes
- Passive Power and Radio Sweeps With Depth Estimate Checks
- GPR Grid Survey Design and Radargram Reflection Interpretation
- Colour-Coded Ground Marking and White-Lining of Proposed Excavation
- Locate Data Capture Into CAD and GIS Confidence Layers

Day 4: Difficult Ground, Safe-Dig Controls and Strike Investigation

- GPR Signal Loss in Clay, Moist and Saline Soils
- Tracer Wire, Sondes and Detectable Tape for Plastic Pipes
- Tolerance Zone Hand Digging and Vacuum Excavation Methods
- Trial Hole Verification and Exposed Service Support Measures
- Utility Strike Investigation With Evidence Capture and Root Cause

Day 5: Case Study Workshop and the Excavation Damage Prevention Plan

- Case Street Works Package Records Review and Survey Scoping
- Case Quality Level Choice and Utility Conflict Matrix Build
- Case Dig Permit, Marking and Safe-Dig Method Statement Review
- Case Strike Scenario Investigation and Corrective Action Register
- Excavation Damage Prevention Plan Completion and Panel Review

Skills You Will Gain:

- Survey Quality Level Scoping
- Electromagnetic Cable and Pipe Tracing
- Radargram Interpretation
- Utility Conflict Matrix Development
- Locate Marking and White-Lining
- Vacuum Excavation Planning
- Utility Strike Root Cause Analysis
- Damage Prevention Performance Tracking

Why Attend This Course:

- Deliver an Excavation Damage Prevention Plan for a case organisation to the network asset manager and the works permitting team
- Decide which survey quality level a project or dig needs, and when records alone are too weak to excavate against
- Avoid service outages, gas escapes, flooding, injuries and repair claims that follow unmarked lines and machine digging inside the tolerance zone
- Pass locate checklists, marking conventions and strike investigation templates to field crews and contractors on the next works package

Conclusion:

Back at work, the participant presents the Excavation Damage Prevention Plan to the network asset manager, the works permitting team and the contractors who dig on the network. They use it to agree the survey quality level each works package must reach, the locate and marking routine before any permit is released, and the safe-dig methods allowed near live services. After the first works season under the plan, the unit should review strike and near-miss records, locate accuracy found in trial holes and permit turnaround, then revise the plan.

Frequently Asked Questions FAQ:

What should participants know before the underground utility detection and excavation damage prevention course?

Participants should already request, issue or carry out locates, dig permits or excavations near buried services. Bringing anonymised utility records, a locate request or a strike report from their own organisation lets the case work reflect real conditions.

How does the underground utility detection course differ from a construction surveying or trenchless installation course?

It focuses on finding, verifying and recording existing buried services and preventing strikes during excavation. Construction surveying courses cover control networks and setting out new works, while trenchless courses cover installing new pipes by drilling and jacking.

Why can GPR and EM locators give different results in underground utility detection?

They respond to different properties. EM locators trace current on metallic cables and pipes, while GPR detects contrasts in dielectric properties, so it can find plastic and concrete pipes but loses signal in conductive clay, moist or saline ground.

What do participants take back from the underground utility detection and excavation damage prevention course?

Participants take back an Excavation Damage Prevention Plan for a case organisation, with a survey quality level scoping sheet, a utility conflict matrix, a safe-dig method checklist and a strike investigation template they can adapt to their own works.