

Trenchless Technology Operator Qualification Programme

Trade Skill Evaluation at Competency level – 1

**COMPETENCE:
BASIC COMPETENCE**

TTOQP 1
GO 1.1

SUBSURFACE SURVEY
GEOPHYSICAL OPERATORS

Background

Sub-surface geophysical investigation to detect changes in soil and rock stratigraphy, locate buried utilities and map fracture zones is essential for below-ground activities where the risk of encountering something unforeseen is at its highest. The various investigation techniques, like Ground Penetrating Radar, Seismic Refraction, Electrical Tomography and Seismic Reflection, reduce the chances of encountering major surprises in the course of trenchless installation, renewal or repair.

Geophysical investigation demand highly precise and accurate survey, hence taking quality measurements and adhering to quality control standards are necessary. The geophysical operator, therefore, should be aware of various techniques of geophysics and methods of installation and calibration of equipment to get quick and accurate information on subsurface conditions. Present document identifies a set of standards for a qualified professional operating the scientific/geophysical equipment for subsurface survey. These sets of vocational qualification standards define the minimum technical qualifications one needs to possess for handling machines/equipments for geophysical investigations successfully.

PRIOR ACHIEVEMENT EVIDENCE

The geophysical operators should have minimum 10+2 qualifications with science discipline, and must possess valid training certificate on use of particular technique from a recognized institute.

PERFORMANCE STANDARD

Qualified candidate should be able to display competence in the following sections of geophysical investigation:

- Ability to consider the most important basics of jobsite preparation when planning the complete project.
- Awareness of general safety precautions.
- Awareness of electrical safety precautions and ability to use them at site.
- Ability to understand maps, plans and reports on existing networks.
- Aware of the use of scientific/geophysical equipment.
- Ability for Field Data Acquisition
- Ability to use Computer software in geophysical investigations
- Ability to anticipate problems in equipment.
- Ability to carry out common maintenance and problem solving measurements independently.

MINIMUM PERFORMANCE STANDARDS

While performing the subsurface geophysical investigation the operators need to display the following minimum qualifications:

1. Safety during work

- i. General precautions necessary for safety of the operators;
- ii. General precautions necessary for safety of equipment;
- iii. Necessary Aids for safety are used without fail;

2. Read working drawings / Sketches and proceed with work

- i. Given a set of drawings / sketch requirement of the equipment and related tooling worked out and the scope of work understood;
- ii. The work is executed as per drawings / sketches;

3. Knowledge and use of equipment and tooling

- i. Proper identification of equipment/tools.
- ii. Proper storage of equipment and tooling;
- iii. Proper use of tools.

4. Knowledge of machine operating procedure and sequence

- i. Equipment is properly connected to desired power points and all related accessories are connected properly.
- ii. Voltage, frequency, current potential, and polarity are checked.
- iii. Instrument is properly calibrated to get accurate reading.

5. Knowledge about defects, their remedy and acceptance limit

- i. Identified the defects of equipment.
- ii. Remedy to the defects is known.
- iii. Acceptance limit as per standard code is known.

PERFORMANCE EVIDENCE

1. Helmet, Hand Shields, Safety Goggles, Gloves etc. are used.
2. Operator's health is fit before he goes to job.
3. The geophysical operator identified the proper tools for work.
4. The geophysical operator knows the use of specific tool.
5. The work is done as per demand of drawings.
6. Operator knows how to make equipment/ instrument ready for use.
7. Proper earthing is provided.
8. Proper polarity is confirmed.
9. Loose connections are checked.
10. All the defects in different type of equipment/ instrument are clearly identified.
11. Possible remedy to the defects identified is given.
12. Variation allowed as per codes are very well known.

SUPPLEMENTARY (KNOWLEDGE) EVIDENCE

In addition to the prior achievement evidence a trainee needs to display the following supplementary knowledge evidence for the course completion and being permitted to operate the geophysical investigation equipment independently:

1. Reading and writing in vernacular language.
2. Ability to conduct area and volume calculations.
3. Understanding about subsurface investigation requirements.
4. Understanding about different types subsurface investigation techniques
5. Possession of knowledge of various basic construction norms;
6. Possession of knowledge of basic electrical hazard prevention methods;
7. Awareness about basic operator's manual for geophysical investigation equipment required for the job.