

TEST COVERAGE

In order to verify the above competencies, the test is aimed to evaluate the workers' knowledge in the following fields:

A. Basics of Mathematics / Natural Sciences

- Units and their conversion
- Calculation of cross-section and volumes (i.e. annuli, pits)
- Basic of technical mechanics (power, torque, tension)
- Work, energy, capacity
- Basics of fluid mechanics (hydrostatic pressure, flow-rate, viscosity, pressure loss in fluids)

B. Sliplining Units

- General operation techniques;
- Sliplining units and basic selection criteria;
- Pipe Fusion system;
- Pipeline condition assessment system;
- Pipe Grouting system;

C. Project Basics

- Location plans and terrain profiles;
- Basics of classification of soils and physical characteristics of subsoil;
- Basics of detection techniques like cable locator, GPR.
- Classification of the subsoil;
- Ground water conditions;
- Line installation plans (overhead lines, lines installed underground);
- Basics of subsurface investigation (geo-radar);
- Practical training.
- Pollution hazards and remedial measures / precautions;

D. Project Realization

- Pipeline failures and performance requirements;
- Consequences of pipeline failure and management of failure;
- Defects identification and evaluation of the causes;
- Pipeline material specifications;
- Pipeline failure detection & location techniques;
- Job site set-up;
- Documentation of system basics;
- Daily job reports.

E. Pipeline Inspection and Condition Assessment

- Preliminary pipeline system analysis and evaluation;
- Assessment of condition and material of existing pipeline;
- Assessment of defects, cracks, holes, open joints etc;
- Inflow and infiltration analysis;

F. Pipeline Cleaning

- Control and diversion of flows;

- Cleaning encrustation, scales, deposits of silt and blockages;
- Pipeline cleaning precautions;
- Pollution control measures;
- Removal of intruding materials;
- Disposal of waste.

G. Entry and Exit Pits

- Sizing pits;
- Location of the pits;
- Groundwater control methods;
- Lateral earth, groundwater and surcharge pressure considerations;
- Entry and exit seal requirements.

H. Liner Materials & Design Considerations

Liner materials;

- Liner materials
 - ⇒ Glass Reinforced Plastic (GRP) liner
 - ⇒ Polyethylene (PE) liner
 - ⇒ High Density Polyethylene (HDPE) liner
 - ⇒ PolyVinyl Chloride (PVC) liner
 - ⇒ Ethylene Polypelene Diene Monomer (EPDM) liner
- Basics of the technical standards and norms
- Special handling features

Liner Design considerations;

- Host pipe material and condition
- Depth of existing pipeline
- Length of Lining
- Need for bypassing
- Number of Services
- Groundwater conditions

I. Grouting of annular space

- Grouting materials;
- Methods of grouting;
- Precautions during grouting;
- Purpose of grouting;
- Advantages of grouting.

J. Sliplining Tools

Installation tools;

- Winch;
 - ⇒ Set-up;
 - ⇒ Mode of operation.
- Nose cone;
 - ⇒ Set-up;
 - ⇒ Mode of operation.

Investigation tools;

- Survey/inspection Vehicle;
 - ⇒ Assembly and mode of operation;

- ⇒ Field of application.
- CCTV operation equipment;
- ⇒ Component and mode of operation;
- ⇒ Field of application.

K. Recording and Monitoring

- Recording every manhole and structure;
- Lining length;
- Recording of winding force;
- Monitoring and recording defects, cracks, holes, open joints;
- Inclination and position;
- Rate of installation.

L. Authority regulations / Safety at work / Environmental protection / Work sheets

- Responsible persons;
- Work safety;
- Water protection;
- Pollutant and noise emission;
- Regulations for handling dangerous materials and agents;
- Basics of working and civil laws for drilling operations (liability, negligence etc.);
- Regulatory guidelines;
- Relevant laws, rules and regulations;
- Work sheet standards.