

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. Cured in Place Pipe Units

- General operation techniques;
- CIPP units and basic selection criteria;
- Liner insertion system;
- Pipeline condition assessment system;
- Curing 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;

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

G. CIPP Materials & Design Considerations

Liner materials;

- Liner materials
 - ⇒ Unsaturated polyester resins;
 - ⇒ Vinyl ester and epoxy resin system;
 - ⇒ Polyethylene-felt tube;
- 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

H. Curing

- Methods of curing;
- Precautions during curing;
- Purpose of curing;
- Advantages of curing.

I. CIPP Tools

CIPP tools;

- Winch;
 - ⇒ Set-up;
 - ⇒ Mode of operation.
- Boilers;
 - ⇒ Component and mode of operation;
 - ⇒ Field of application.
- Blowers;
 - ⇒ Component and mode of operation;
 - ⇒ Field of application
- Pumps, regulators, valves, hoses;
 - ⇒ 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.

J. Recording and Monitoring

- Recording every manhole and structure;
- Lining length;
- Recording of measured thickness of the liner;
- Recording of physical properties of the installed material
- Monitoring and recording defects, cracks, holes, open joints;
- Inclination and position;
- Rate of installation.

K. 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.