



Trenchless Technology Operator Qualification Programme

Trade Skill Evaluation at Competency level – 1

COMPETENCE:	TTOQP 9	SPRAYED LINING
BASIC COMPETENCE	BC 9.1	BASIC OPERATOR

Background

Rehabilitation of small diameter underground pipes through Spray lining is the cost-effective and widely used method for restoring flow capacity of the existing utility. The method involves the deposition of a thin layer of cement mortar or epoxy resin on the clean inner surface of the pipe by a robotic spraying machine which is winched through the pipe at a constant, predetermined rate. Spray lining materials and machines have to be used carefully by a qualified operator because improper handling of materials and machines may further damage the utility. Present document identifies a set of standards for a qualified professional performing Spray lining operation. These sets of qualification standards define the minimum technical qualifications one needs to possess for renewal of existing utility successfully.

PRIOR ACHIEVEMENT EVIDENCE

Persons undergoing this certification should have a Degree/Diploma in Civil, Electrical, Mechanical or Trenchless Engineering from any recognized institution or 10th + 4 years relevant experience.

PERFORMANCE STANDARD

Qualified candidate should be able to display competence in the following sections of Spray lining works:

- Ability to consider the most important basics of jobsite preparation when planning the complete project.
- Awareness of general safety precautions and ability to use them at site.
- Awareness of electrical safety precautions and ability to use them at site.
- Capacity to assemble and set up the Spray lining unit correctly under varying conditions.
- Ability to understand maps, plans and reports on existing networks such as GPR report
- Ability to ascertain the pipeline conditions considered to be unsafe.
- Ability to identify the build-up and encrustation on pipes such as silt, fatty products, calcification.
- Ability to assess defects, cracks, holes, open joints, infiltration, exfiltration.
- Ability to evaluate the compatibility of the material used with the renovation process
- Awareness of the pressure cleaning process.
- Ability to conduct curing process as per specifications
- Ability to anticipate problems in setup.
- Ability to carry out common maintenance and problem solving measurements independently.

MINIMUM PERFORMANCE STANDARDS

While doing the renovation work the operators need to display the following minimum qualifications:

1. Safety during work

1. General precautions necessary for safety of structure and operators;
2. General precautions necessary for safety of machine;
3. Necessary Aids for safety are used without fail;

2. Read working drawings / Sketches and proceed with work



Indian Society for Trenchless Technology

TTOQP 9

Operators

Level Structure Sprayed Lining

1. Given a set of drawings / sketch requirement of machine and related tooling worked out and the scope of work understood;
2. The work is executed as per drawings / sketches;

3. Knowledge and use of equipment and tooling

1. Proper identification of equipment tools.
2. Proper parking/storage of equipment and tooling;
3. Proper use of materials;
4. Proper use of tools.

4. Knowledge of machine operating procedure and sequence

1. Machine is properly connected to desired power points and all related accessories are connected properly.
2. Voltage, frequency, current potential, and polarity are checked.

5. Knowledge about defects, their remedy and acceptance limit

1. Identified the defects of machine.
2. Remedy to the defects is known.
3. 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 machine operator identified the proper tools for work.
4. The machine operator knows the use of specific tool.
5. For a set of approved spray lining plan drawings comprising type, size and location of all machine and tools demonstrated for all requirements as per performance criteria.
6. The work is done as per demand of drawings.
7. Operator knows how to make machine ready for use.
8. Proper earthing is provided.
9. Proper polarity is confirmed.
10. Loose connections are checked.
11. All the defects in different type of machine are clearly identified.
12. Possible remedy to the defects identified is given.
13. 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 spray lining machine for renovation work independently:

1. Reading and writing in vernacular language.
2. Ability to conduct area and volume calculations.
3. Understanding about drilling fluid mix.
4. Understanding about sewage bypass system required to avoid hindrance in the work and accidents.
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 machine required for the spray lining work.