

**Trenchless Technology Operator Qualification Programme**

Trade (Skill Development) at Competency level – 1

<b>COMPETEENCE:</b>	TTOQP 6	Microtunneling & Pipe Jacking Operator
<b>BASIC COOMPETENCE</b>	BC 6.1	BASIIC OPERATOOR

**Background**

Microtunneling & Pipe Jacking technique provide state-of-art solutions for developing subsurface piped networks in critical grades and alignment at several inaccessible locations where open cut pipe laying is not possible or uneconomical. Present document identifies a set of standards for a qualified professional operating a Microtunneling & Pipejacking Machine system. These sets of vocational qualification standards define the minimum technical qualifications one needs to possess for handling pipe installation through Microtunneling & Pipe Jacking 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 Microtunneling & Pipe Jacking works:

- Understanding of Microtunneling methods technique background, spoil removal and line & grade management, basic consideration for carrying out survey and geotechnical investigation, data interpretation evaluation and planning of the project including mapping and subsurface exploration, flushing fluids equipment and procedures.
- Ability to consider the most important basics of jobsite preparation when planning the complete project.
- Ability to understand the site challenges, shaft condition,
- Assemble and set up the tunneling unit, pipe stack, waste recycling system, jacking system, and other related systems like power supply systems, waste disposal systems, water injection systems etc. correctly under varying job site conditions.

**MINIMUM PERFORMANCE STANDARDS**

While executing the work the operators need to display the following minimum qualifications:

**1. Safety during work**

- i. General precautions necessary for safety of structure and operators;
- ii. General precautions necessary for safety of machine;
- 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 machine 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 parking/storage of equipment and tooling;
- iii. Proper use of consumables;
- iv. Proper use of tools.

#### 4. Knowledge of machine operating procedure and sequence

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

#### 5. Knowledge about defects, their remedy and acceptance limit

- i. Identified the defects of machine.
- 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 machine operator identified the proper tools for work.
4. The machine operator knows the use of specific tool.
5. For a set of approved bore plan drawings comprising type, size and location of all machine 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 HDD Machines 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 different types of cuttings coming out of the drill holes and actions needed to avoid related 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 Microtunneling & Pipe Jacking machines required for site works.

#### 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 bore plan drawings comprising type, size and location of all machine tools demonstrated for all requirements
6. The work is done as per demand of drawings.
7. Operator knows how to make machine ready for use.
8. Proper earthing is given.
9. Loose connections are checked as per performance criteria.
10. All the defects in different type of machine 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 candidate needs to display the following supplementary knowledge evidence for the competency independently:

1. Reading and writing in vernacular language.
2. Ability to conduct area and volume calculations
3. Understanding about flushing fluid mix being permitted to operate
4. Understanding about different types of cuttings coming out of with the flushing fluid and actions needed to avoid related 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 Microtunneling machines required for site works.