Trenchless Project Supervision & Conclusion Guidelines

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A Presentation by

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Lecture Overview

In this module we shall be discussing Site Supervision & Project Conclusion Guidelines for Trenchless Projects

Project Supervision Terms of Reference

- Project Implementation
- Quality Assurance
- Cost Control
- Monitoring, Timely completion and commissioning

Project Implementation

- To ensure construction as per Contract Specifications, BOQ (Bill of Quantities) and detailed drawings.

Quality Assurance

- To approve setting out of work and order its commencement.

- To issue working drawing in conformity with the method statement.

- To ensure that the construction is in accordance with Technical Specifications and drawings, to check BOQ items and suggest modifications to competent authority for approval, if required.

- To ensure Quality Assurance through pre-delivery inspection of material, factory acceptance test, regular field and lab tests.
- To keep all records on quality control test.
- To order removal of improper material and / or works, as required.

Cost Control

- To make measurements and check all quantity measurements for payment purposes.
- To vet and process interim bills for release of payment to contractor. All measurements to be recorded in specified manner.
- To provide assistance to project stakeholders with respect to claims of contractor, arbitration, litigation etc.

- Prepare quarterly cash flow requirement.
- To carry out cost control exercise / checks.
- Update cost estimates regularly and advise stakeholders.

Monitoring, Timely Completion & Commissioning

- To approve contractor's work programme including resource scheduling.
- To prepare periodic progress report bringing out bottle-necks and remedial measures.
- To advise stakeholders for advance action to be taken for operationalization of structures.

- To assist project owners in taking over of various facilities / utilities / section / elements of project.
- To prepare Maintenance Manual and to impart training as necessary.
- To ensure timely completion of project without diluting quality standards.
- To carry out any other duty relevant to project's timely completion.

Construction Monitoring

Construction monitoring requires careful attention and responsiveness by the project supervisors and construction managers. Once the pipe or casing is placed into the ground, it is not possible to change its position even if the problem is the result of the contractor's installation procedures.

Monitoring Requirements

The important construction monitoring requirements relative to Trenchless Technology projects include:

- Job site safety,
- Preconstruction surveys,
- Pipe materials testing,
- Trenchless operations, and
- Instrumentation provisions.

Job Site Safety

- Air monitoring and monitoring for hazardous gases;
- Ventilation and lighting;
- Protection during lifting and hoisting operations for equipment and materials;
- Safety provisions for shaft/entry or exit pit entry and exit, including ladders, stairs, walkways, and hoists;

- Protection for shaft excavations, including traffic control and prevention of accidental or unauthorized entry;
- Protection against flooding;
- Communications systems;
- Fire prevention and protection;
- Emergency procedures including evacuation plans.

Preconstruction Surveys

- In urban areas existing conditions should be documented prior to construction.
- Documentation should consist of:
    - All visual reconnaissance,
    - Sketches,
    - Photographs, and
    - Videotapes
- Document the existing condition of all structures, pavements, utilities, and any other improvements within about 30 m of the pipeline centerline prior to construction.

Pipe materials

The pipe materials used in the project often require laboratory test data to be submitted for specified material properties to demonstrate compliance with the specifications. The specifications should outline the minimum acceptable standards required, and the test data to indicate compliance.

Trenchless Operations

- Trenchless projects should be executed only after appropriate method statement detailing the complete sets of inputs & deliverables has been prepared and approved.

- Trenchless Equipment operations require appropriate skill sets of the operators. Unskilled or non-certified operators must not be allowed to operate the equipment.

- Equipment capacities must be in accordance with the execution method statement developed prior to the execution work initiation.

- During trenchless operations, installation stresses and temperatures, if the technique is based on thermal curing effects, should be closely monitored to check that the rated capacity of the pipe is not exceeded.

- Method statements should be supported by approved Health Safety and Environment plans.

- Trenchless operations generate substantial quantity of construction waste which may be environmentally hazardous. Its disposal after appropriate treatment must be ensured.

- Line-and-grade of the pipe or casing should also be monitored continuously to check that it is maintained within project tolerances.

- It is important to check that steering adjustments are within specified tolerances.

- If steering adjustments are made at too tight an angle, the deflection of the pipe joints may exceed the capabilities of the joint, leading to leakage or damage to the pipe.

- In a new installation work quality of the effluent demonstrates the physical characteristics of strata under excavation/tunneling on a real time basis. Its monitoring must be ensured.

Instrumentation Provisions

- The instrumentation program needs to have well defined purposes, and be supported by appropriately trained staff during construction.
- The key tasks generally include defining the purpose of the monitoring program, installing the monitoring instruments, performing the monitoring, and interpreting the monitoring data.
- It is critical that the data collected in the field be interpreted and used in assessing the performance of the work.

Surface Settlement Monitoring

- Arrays of surface settlement monitoring points should be established and maintained to monitor surface settlement or heave during trenchless operations.
- A typical array of surface settlement points for an urban site might consist of (3 points per array) spaced every 15 m along the alignment centerline and additional points located on adjacent structures to be monitored.

Groundwater Observation Wells

- If dewatering is a part of operations, directly or indirectly, groundwater levels should be monitored.
- Level monitoring becomes more important if lowering the groundwater table can cause surface settlement.
- The data from the groundwater observation wells can be very useful for evaluating the effectiveness of dewatering systems.

Project Conclusion

- Project Cleanup
- Commissioning Process
- Tests and Certifications
- Owner's Manuals, Parts Lists, Equipment Warranties, and Spare Parts
- Owner Training
- Developing Final Documentation
- Change Orders Finalization

- As-Built Drawings
- Punch list Process
- Closing Out Subcontractors and Suppliers
- Subcontractors
- Suppliers
- Final Request for Payment
- Asset Handing-Taking Over
- Certificate of Substantial Completion
- Project Review

Concluding Remarks

- Trenchless Project are challenging.
- Success depends on proper supervision of activities.
- Activities need to conform to sound engineering practices and through supervision it is ensured.
- Project conclusion stage is quite important in the utility lifecycle as this is the phase transition point and the maximum data is available at this stage. Such data can assist the future repair & maintenance activities and therefore must be preserved properly.
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For more details

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Thanks you for your kind consideration and looks forward to developing a fruitful and lasting relationship with you.