



Trenchless Construction Course: HDD, Microtunnelling and Pipe Jacking



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Introduction:

Trenchless construction course on HDD, microtunnelling and pipe jacking is a 5-day course for utility pipeline, contractor and consultant engineering teams that ends with a Trenchless Crossing Plan for a case utility organisation. Crossings under roads, rail lines and wadis stall when the method is picked from habit, pull-back and jacking loads are guessed and drilling fluid escapes to the surface. Nominees already design, price or supervise buried utility works, and they learn through case studies built on bore logs, drive records and crossing drawings. CoreConcept Training Center delivers this trenchless construction course.

Course Objectives:

- Select between horizontal directional drilling, microtunnelling, pipe jacking, auger boring and pipe ramming for a crossing using diameter, length, ground and accuracy criteria
- Plan an HDD bore profile with entry and exit angles, bend radius and cover, and steer the pilot hole with walkover or gyro guidance
- Calculate HDD pull-back force and combined pipe stress, and microtunnelling jacking force with intermediate jacking station spacing
- Specify launch and reception shafts, thrust walls, drilling fluid pressure limits and settlement monitoring for a crossing
- Allocate ground and installation risk in trenchless contracts using geotechnical baselines, measurement items and contractor method statements
- Prepare a Trenchless Crossing Plan with method choice, calculations, shaft layout and risk register for a utility crossing

Target Audience:

- Utility pipeline engineering teams responsible for routing water, sewer, gas and telecom lines under roads, rail lines and watercourses
 - Trenchless contractor engineering teams responsible for rig selection, bore planning, jacked drives and daily production
 - Design consultant teams responsible for crossing calculations, specifications and method statement reviews
 - Owner's engineer and site supervision teams responsible for witnessing drilling, jacking, fluid control and acceptance
 - Contract and cost engineering teams responsible for pricing trenchless packages and handling ground-related claims
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Course Outline:

Day 1: Trenchless Installation Landscape and Crossing Site Assessment

- New Installation Versus Rehabilitation Method Families Compared
- HDD, Microtunnelling, Pipe Jacking, Auger Boring and Ramming Ranges
- Utility Corridor Survey With Ground-Penetrating Radar and Records
- Geotechnical Borehole Logs and Groundwater Data for Feasibility
- Road, Rail and Wadi Crossing Constraint Register

Day 2: Method Selection Matrix and Trenchless Design References

- Method Selection Matrix by Diameter, Length, Ground and Accuracy
- PRCI HDD Design Guide and ASCE MOP 108 Overview
- Product Pipe Limits for Steel and Polyethylene HDD Pulls
- ISTT and ITA-AITES Guidance for Microtunnelling Drive Planning
- Jacking Pipe Selection for Concrete, Steel, Vitrified Clay and GRP

Day 3: HDD Bore Planning and Jacked Drive Load Calculations

- HDD Bore Profile Entry Angle, Bend Radius and Cover
- Pilot Hole Steering With Walkover and Gyro Guidance Systems
- Pull-Back Force and Combined Pipe Stress Calculation Worksheet
- Microtunnelling Jacking Force From Face Pressure and Skin Friction
- Intermediate Jacking Station Spacing and Bentonite Lubrication Plan

Day 4: Shafts, Ground Risk and Drilling Fluid Problem Cases

- Launch Shaft Thrust Wall and Reception Shaft Eye Design
- Drilling Fluid Pressure Model and Inadvertent Return Control
- Settlement and Heave Monitoring Above Drilled and Jacked Crossings
- Boulder, Mixed Face and Running Sand Recovery Options
- Contract Risk Allocation With Geotechnical Baseline and Unit Rates

Day 5: Case Study Workshop and the Trenchless Crossing Plan

- Case Utility Brief With Water, Sewer and Telecom Crossings
 - Case Method Choice and Bore or Drive Calculation Package
 - Case Shaft Layout, Fluid Management and Monitoring Schedule
 - Case Risk Register and Contractor Method Statement Review
 - Trenchless Crossing Plan Completion and Panel Defence
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Skills You Will Gain:

- Trenchless Method Selection
- HDD Bore Profile Design
- Pull-Back Load Analysis
- Jacking Force Estimation
- Shaft and Thrust Wall Planning
- Drilling Fluid Pressure Control
- Ground Settlement Monitoring
- Trenchless Contract Risk Allocation

Why Attend This Course:

- Deliver a Trenchless Crossing Plan for a case utility crossing to the programme manager and the owner's engineering review team
- Decide whether a crossing should be drilled, jacked, bored or rammed on ground and load evidence rather than rig availability
- Avoid stuck pipes, fluid breakouts to the surface and damaging settlement that follow weak bore plans and missing load checks
- Share the method selection matrix, load worksheets and risk register templates with colleagues planning the next crossing package

Conclusion:

Back at work, the participant gives the Trenchless Crossing Plan to the programme manager and the owner's engineering review team. They use it to approve the installation method, the shaft and rig positions and the fluid and settlement limits before a contractor mobilises, and to agree which ground risks the contractor prices. After the first crossing is installed, the unit should compare recorded pull-back and jacking loads, fluid returns and settlement readings with the plan and update the selection matrix and worksheets.

Frequently Asked Questions FAQ:

What should participants know before the trenchless construction course on HDD, microtunnelling and pipe jacking?

Participants should already work on buried utility design, construction or supervision and be able to read borehole logs and pipeline drawings. Bringing a crossing drawing or ground report from a current project helps them apply the case work.

How does the trenchless construction course on HDD, microtunnelling and pipe jacking differ from a pipe rehabilitation course?

It covers installing new pipes and ducts by drilling and jacking, from method choice to load calculations and shafts. Rehabilitation courses address renewing existing pipes with liners or bursting, and large tunnelling courses address bored tunnels people can enter.

Why does pull-back force matter in trenchless construction with HDD?

Pull-back force decides whether the product pipe survives installation. If friction, fluid drag and bend effects are underestimated, the pipe can be overstressed, collapse or stick, so the rig size, pipe wall and bore profile must all be checked against it.

What do participants take back from the trenchless construction course on HDD, microtunnelling and pipe jacking?

Participants take back a Trenchless Crossing Plan for a case utility crossing, with a method selection matrix, pull-back and jacking force worksheets, a shaft layout checklist and a crossing risk register they can adapt to their own projects.
