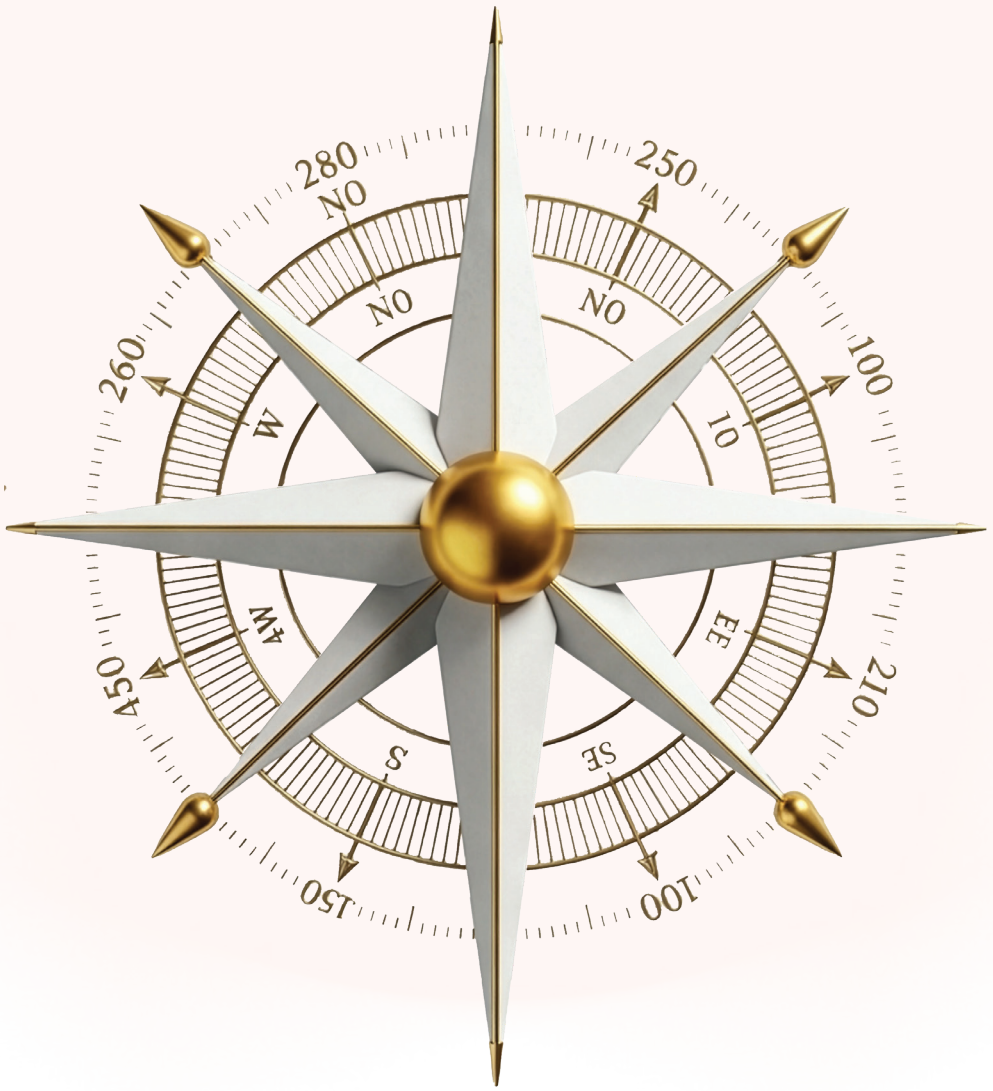
CONCEPT

Trenchless Rehabilitation of Water and Sewer Pipes: CIPP Lining, Pipe Bursting and Renewal Planning



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Introduction:

Trenchless rehabilitation lets utilities renew cracked, leaking and root-infested water mains and sewers without digging up busy streets, yet many schemes fail because the liner was chosen before the host pipe was surveyed, the design ignored groundwater or ovality, or nobody tested the cured sample. This Core Concept course trains network engineers, planners and contractor supervisors to grade buried pipe condition from CCTV and leak surveys, rank renewal, select between CIPP lining, sliplining, pipe bursting, spray linings and spot repairs, check liner design and control installation. Participants produce a Trenchless Rehabilitation Programme for a case network section.

Course Objectives:

- Grade the structural and service condition of buried sewers and water mains from CCTV footage, defect codes, leak surveys and manhole inspection records
- Rank pipe renewal candidates by likelihood and consequence of failure and convert the ranking into a phased rehabilitation budget
- Select CIPP lining, sliplining, pipe bursting, spray lining, spot repair or directional drilling for a pipe run by size, host material, host condition, groundwater and traffic
- Check CIPP liner wall thickness and specification clauses for partially and fully deteriorated host pipes and set resin, cure and sample test requirements
- Supervise liner installation, lateral reinstatement and manhole renewal with hold points, bypass pumping plans, post-lining CCTV and acceptance tests
- Prepare a Trenchless Rehabilitation Programme with method choice, cost comparison against open-cut, contract packaging and traffic staging for a network section

Target Audience:

- Sewer and water network engineers who decide which buried pipes to reline, replace or leave in service
- Asset planners who build multi-year renewal lists and capital budgets for underground pipe networks
- Rehabilitation contractor engineers who price, plan and deliver lining, bursting and sliplining works
- Site supervisors and inspectors who witness liner wet-out, curing, reinstatement and final CCTV acceptance
- Consultant engineers who write trenchless specifications and review liner design submittals for utilities

Course Outline:

Day 1: Buried Pipe Deterioration and Condition Survey Techniques

- Deterioration Mechanisms in Clay, Concrete, Asbestos Cement, Cast Iron and Plastic Pipes
- Hydrogen Sulphide Corrosion, Root Intrusion, Infiltration and Exfiltration in Gravity Sewers
- CCTV Crawler Survey Procedure and Defect Coding With Structural and Service Grades
- Acoustic Leak Survey, Sonar Profiling and Laser Ovality Scans for Pressure Mains
- Manhole Inspection Sheets, Flow Monitoring and Sewer Record Gaps

Day 2: Renewal Prioritisation and Trenchless Method Families

- Likelihood and Consequence of Failure Scoring for Pipe Criticality Ranking
- Renewal Candidate Register From Burst History, Blockage Logs and Survey Grades
- Rehabilitation Method Families: Lining, Replacement, Spot Repair and New Installation
- Cured-in-Place Pipe: Felt and Glass-Fibre Tubes, Inversion, Pull-In and Hot Water, Steam or UV Curing
- Sliplining, Fold-and-Form Pipe, Spiral Wound Lining and Pipe Bursting With Upsizing Principles

Day 3: Method Selection and Liner Design Checks

- Method Selection Matrix by Pipe Size, Host Material, Host Condition, Groundwater and Street Traffic
- Partially Versus Fully Deteriorated Host Pipe Design Conditions for CIPP Wall Thickness
- ASTM F1216 and EN ISO 11296-4 Flexural Property Requirements for Liner Samples
- Sliplining Annulus Grouting and Flow Capacity Check After Cross-Section Loss
- Spray-Applied Cementitious and Epoxy Linings and Mechanical Spot Repair Packers for Water Mains

Day 4: Installation Control, Laterals, Manholes and Failure Cases

- Bypass Pumping, Pipe Cleaning, Root Cutting and Pre-Lining CCTV Hold Points
- Resin Wet-Out Records, Cure Temperature Logs and Cured Sample Testing at a Third-Party Laboratory
- Lateral Reinstatement Cutting, Lateral Connection Seals and Manhole Chamber Relining
- Liner Defects: Wrinkles, Fins, Delamination, Incomplete Cure and Styrene Odour Complaints
- Pipe Bursting Risks: Adjacent Utilities, Ground Heave and Launch and Receiving Pit Design

Day 5: Case Study: Trenchless Rehabilitation Programme

- Case Network Section File: CCTV Grades, Leak Records, Traffic Constraints and Service Connections
- Pipe-by-Pipe Method Choice With Liner Design Summary and Test Plan
- Unit Rate Build-Up and Whole-Life Cost Comparison Against Open-Cut Replacement
- Contract Packaging, Measurement Items, Warranty Inspection and Payment Milestones
- Trenchless Rehabilitation Programme Presentation and Panel Challenge

Skills You Will Gain:

- Sewer CCTV Defect Grading
- Pipe Criticality Ranking
- Trenchless Method Selection
- CIPP Liner Design Checking
- Lining Installation Supervision
- Lateral and Manhole Renewal
- Rehabilitation Cost Estimating
- Renewal Programme Planning

Why Attend This Course:

- Leave with a Trenchless Rehabilitation Programme for a case network section, defended before a review panel
- Avoid relining pipes that should be burst or replaced by reading host condition correctly before choosing a method
- Reject a defective liner at handover using cure logs, sample results and post-lining CCTV rather than visual impressions
- Compare relining and bursting practice with engineers from water utilities, municipal drainage departments, industrial estates and contractors

Conclusion:

Underground pipes are renewed well only when survey data, method choice, liner design and site control are linked in one programme. The one week move from deterioration mechanisms and CCTV, leak and sonar surveys, through criticality ranking and the trenchless method families, to method selection, liner wall thickness and sample test requirements, and then installation control, laterals, manholes and failure cases. The final day produces a Trenchless Rehabilitation Programme with method choices, costs and contract packaging for a case network section.