



FE004

Pipeline & Piping Technology

Course Introduction:

Central to the maintenance of human health is the supply of safe drinking water and the disposal of wastewater. Much of our water supply and water removal infrastructure is now in poor condition, and civil engineers and the society they serve face an increasing challenge to maintain these basic services. Aging infrastructure can however be renewed using “Trench less” techniques that minimize the disruption associated with trench excavation and buried pipe replacement. This course will focus on three technologies: pipe lining, pipe bursting, and horizontal directional drilling. While these operations are generally conducted by specialist contractors, the selection of the pipes to be installed depends on knowledge of the loads and load capacity of the pipe or pipe liner to be used. The course instructor builds of these three Trench less Technologies over the past decade. The important limit states for these systems are explained, methods of estimating pipe and soil response are outlined, and pipe and installation design procedures are explained.

Course Objectives:

Upon successful completion of this course, the delegates will be able to:

- ✓ Calculate length of pipe systems using the metric and inch system
- ✓ Calculate the Volume of cylindrical forms
- ✓ Interpret drawings to fabricate pipe systems
- ✓ Identify typically used materials, tools and equipment used in Pipe Fitting & Pipe Bending
- ✓ Identify common fittings, valves, pressure gauges, flow meters
- ✓ Know the common methods to fit pipes together
- ✓ Layout, cut thread and install pipes for water supply systems
- ✓ Know different possibilities on how to bend pipes (hydraulic pipe bender and hot bending)
- ✓ Know the basics about installing a building water supply system (circular pump, different valves, flow meter, pressure gauge etc.)

Who Should Attend?

This course is suitable for consultants, municipal and transportation engineers, technologists and contractors in related industries.

Course Certificate:

International Center for Training & Development (ICTD) will award an internationally recognized certificate(s) for each delegate on completion of training.

Course Outline:

Day 1:

Introduction

- Lining, drilling, and bursting
- Soil-structure interaction and the buried pipe environment
- Practical questions associated with Trench less repair and replacement

Day 2:

Pipe Liners

- Lining processes and characteristics
- Limit states for gravity flow pipes
- Limit states for pressure pipes
- Buckling and the effect of imperfections
- Earth loads and local bending stress and strain
- Pressure pipe liner design

Day 3:

Pipe Bursting

- Pipe bursting and pipe splitting
- Ground disturbance
- Pressures during pipe bursting
- Pulling forces

Day 4:

Directional Drilling

- Processes during horizontal directional drilling
- Estimating and controlling pulling force
- Pipe strains and long term pipe performance
- Hydraulic fracture, blowout and control of ground disturbance

Day 5:

Example Problems

- Cast in place sewer liners
- HDPE slip-liner
- Directional drilling project through clay
- Ground response, earth pressures and pulling pipe replacement and upsizing projects (in sand and clay)

Field Projects

- Delegates are invited to describe specific fields projects

Course Methodology:

A variety of methodologies will be used during the course that includes:

- (30%) Based on Case Studies
- (30%) Techniques
- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionnaires
- Group Work
- Discussion
- Presentation

Course Fees:

To be advised as per the course location. This rate includes participant's manual, Hand-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Timings:

Daily Course Timings:

08:00 - 08:20	Morning Coffee / Tea
08:20 - 10:00	First Session
10:00 - 10:20	Coffee / Tea / Snacks
10:20 - 12:20	Second Session
12:20 - 13:30	Lunch Break & Prayer Break
13:30 - 15:00	Last Session

