Water and Wastewater PVC Piping Design and Installation

Course Outline

Course Description

This 1 day course provides information on design and installation of PVC piping and fittings for use in the water and wastewater industry.

Course Pre-requisites

There are no specific pre-requisites for this course. However, Grade 12 (or equivalent) math skills are an asset. Math upgrades are available –contact us.

CEU Credit

This course is not registered with EOCP at this time.

Course Duration

- 1 day
- 8:30 am to 4:00 pm
- 1 hour lunch break
- Morning and afternoon break (15 minutes each)

Course Agenda and Learning Outcomes

By the end of the course, the student will:

Overview

- Understand some brief history about PVC.
- Become familiar with common uses and benefits of PVC.

Manufacturing

- General understanding of the manufacturing process of PVC piping including receiving PVC resin, resin blending, extrusion, cooling, haul off, chamfer and cut off, and bell forming.

- Comprehend the quality assurance testing required for PVC piping which are hydro testing, joint off set, cold impact testing, pressure testing, and flattening testing.

Fabricated Fittings

- Become familiar with the many different configurations and sizes of PVC fittings.
- Know the different manufacturing methods of PVC fittings such as mold injecting, hot air gun welding, butt fusion, fibreglass reinforcement, and bending.

Recycling

- Understand which pipes and fittings are allowed to be manufactured with recycled PVC.

CSA/NSF/ULC/AWWA/ASTM

- Understand the abbreviations CSA/NSF/ULC/AWWA/ASTM relevant for PVC piping and their implications

Pressure Pipe (Water Pipe)

- Comprehend how internal and external forces work on PVC piping under pressure and buried in the ground.
- Understand how short and long term stress affects PVC Piping over time.
- Evaluate correct pipe size (wall thickness) for specific pressure requirement.

Gravity Pipe (Sewer Pipe)

- Recognize the flexibility of gravity pipe based on pipe and soil stiffness as well as load on pipe.
- Understand the impacts of soil stiffness on pipe when filling trench.
- Comprehend the problems associated with improperly back filling a trench with a gravity pipe.
- Understand the concept of pipe deflection.

Inspection & Installation

- Recognize proper gasket joint installations for underground piping and fittings.
- Understand proper handling of PVC on-site.
- Comprehend requirements for trenching, laying pipe in the trench, and the correct steps for properly backfilling the trench.
- Understand the methods for joining pipe of various sizes.
- Become familiar with tapping PVC pipe.
- Identity the need to inspect and/or pressure test piping once installed.

Joining Techniques

- Identify the differences for solvent welding between ABS, PVC, and CPVC.
- Understand the proper procedures for solvent welding.
- Recognize some of the difficulties in threaded joints.
- Determine proper applications for using flanged joints.
- Know general information on butt fusion joints.

Trenchless Construction

- Understand the concept of trenchless construction.
- Identify the reasons why CPVC is a better pipe selection for trenchless construction.

Delivery Methods/Format

Instructional Method	Percentage of Class Time
Lecture/Slides	86%
Demonstration	11%
Video/DVD	3%

Materials/Handouts

Course booklet provided for curriculum.
For demonstration purpose: pipe and equipment to tap PVC and PVCO.

Course Requirements

Attendance and participation in class are required. CEUs will be allocated based on attendance and course completion; Yukon University records will show a pass or fail result. If the participant doesn't attend the class, Yukon University records will show a "no show" result and no CEUs will be allocated.

Evaluation

There will be a quantifiable evaluation at the end of this course with a passing mark of 70%. If anyone fails this evaluation, arrangements can be made for a re-assessment. Please note that this evaluation is for self-assessment purpose only.

Topic Outline

Topic	Time Allocation
Overview	20 min
Manufacturing	45 min
Fabricated Fittings	20 min
Recycling	10 min
Morning Break	15 min
CSA/NSF/ULC/AWWA/ASTM	10 min
Pressure Pipe (Water Pipe)	25 min
Gravity Pipe (Sewer Pipe)	35 min
Video: Air Testing PVC	5 min
Lunch Break	60 min
Inspection & Installation	55 min
Tapping Demo on PVC & PVCO	40 min
Afternoon Break	15 min
Inspection & Installation (cont…)	20 min
Joining Techniques	15 min
Trenchless Construction & PVCO	55 min
Video: Bionax (PVCO)	5 min