

ATPL-1240: UNDERGROUND PLUMBING SYSTEMS; APPLICATION AND INSTALLATION

Cuyahoga Community College

Viewing: ATPL-1240 : Underground Plumbing Systems; Application and Installation

Board of Trustees:

February 2019

Academic Term:

Spring 2019

Subject Code

ATPL - Applied Ind Tech - Plumbers

Course Number:

1240

Title:

Underground Plumbing Systems; Application and Installation

Catalog Description:

Advanced course covering the application and installation of underground plumbing systems including safety requirements. Also covered are installation techniques, applied math, construction tools and equipment and interpretation of mechanical drawings.

Credit Hour(s):

2

Lecture Hour(s):

2

Requisites

Prerequisite and Corequisite

Departmental approval: admission to Plumbers' apprentice program

Outcomes

Course Outcome(s):

Discuss the applications of underground plumbing systems and identify the different types of pipe.

Objective(s):

1. Identify the applications of underground plumbing systems used in the residential, commercial and industrial industries.
2. Explain how the different types of pipe are manufactured and discuss the importance of quality control.
3. List the different types of fittings used to join the different types of pipe.
4. Identify the various vertical and horizontal supports needed.
5. Review the Ohio Plumbing Code relative to the installation and venting of underground plumbing systems.

Course Outcome(s):

Discuss the safety procedures as prescribed by the Occupational Safety and Health Administration (OSHA) and related industry safety standards.

Objective(s):

1. Identify the hazards related to working underground.
 2. Discuss the procedures used to protect the worker and building during underground installations.
 3. List the Personal Protection Equipment (PPE) as prescribed by OSHA required for safe installations.
 4. Explain how gases and contamination in the earth can harm or cause death.
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Course Outcome(s):

Interpret mechanical drawings and schematics and review related math concepts for material estimating, layout procedures and pipe locations.

Objective(s):

1. Identify underground requirements on mechanical drawings.
2. Differentiate between mechanical drawings and schematics.
3. Determine pipe locations in floors, walls and ceilings from floor plans and specifications.
4. Estimate quantities of pipe and pipe fittings required for mechanical installations.
5. Establish different lists required for materials, tools and equipment.
6. Review trade related math concepts necessary for pipe layout and to install underground plumbing systems.

Course Outcome(s):

Follow procedures for locating mechanical requirements for residential and commercial structures.

Objective(s):

1. Locate the work area and position the materials and tools required for mechanical installations.
2. Lay out locations of respective underground plumbing systems using applied math and geometry.
3. Select proper hand and power tools and safely operate to perform installations.
4. Employ safety precautions as prescribed by OSHA and other related industry safety standards.

Methods of Evaluation:

1. Homework
2. Quizzes
3. Shop Exams
4. Final Exams

Course Content Outline:

1. Applications and Pipe
 - a. Residential
 - i. Drainage systems
 - ii. Sewer
 - iii. Venting
 - b. Commercial
 - i. Drainage
 - ii. Storm
 - iii. Sewer
 - iv. Venting
 - c. Pipe Manufacturing
 - i. Seamless
 - ii. Rolled
 - iii. Composition of materials
 - d. Fittings
 - i. Wyes
 - ii. Sanitary tees
 - iii. Bends
 - e. Suspension
 - i. Supports
 - ii. Hangers
 - iii. Clamps
 - iv. Fasteners
 - f. Code standards
 - i. Venting
 - ii. Drainage
 - iii. Storm
2. Safety procedures

- a. Id hazards
 - i. Fires
 - ii. Abrasions
 - iii. Burns
 - iv. Physical strains
 - b. Procedures for protection of worker(s)
 - i. Pre task safety meetings
 - ii. Knowing the safety procedures of job site and employer
 - iii. Understanding OSHA regulations
 - c. PPE – ID and use
 - i. Fire proof/heat resistance materials
 - ii. Proper body, foot and hand protection
 - iii. Eye and face protection
 - d. Respiratory risks
 - i. Breathing air
 - ii. Environmental
 - iii. Protection
3. Material, layout and locations
- a. Id supply and waste on drawings
 - i. Code requirements
 - ii. Interpret water and waste lines
 - iii. Understanding what drawings to look at
 - b. Mechanical drawings vs. schematics
 - i. What is on mechanical drawings
 - ii. What is lacking on mechanical drawings
 - iii. Types of schematics
 - iv. Schematic use in the installation process
 - c. Determine locations of pipes
 - i. Understanding floor plans
 - ii. Using the correct revisions
 - iii. Measurements from common locations
 - iv. Understanding job specifications
 - d. Estimate quantities
 - i. What is estimating
 - ii. How to estimate from drawings and specifications
 - iii. Common procedures
 - e. Making lists
 - i. Tools
 - ii. Safety
 - iii. Equipment
 - iv. Materials
 - f. Review of trade related math
 - i. Types of measurements
 - ii. Geometry related to the installs
 - iii. Using math for quick lay outs
4. Installations for residential and commercial
- a. Location, tools and materials required
 - i. Locate area of installation
 - ii. Stage tools required
 - iii. Gather materials
 - iv. Check PPE
 - b. Layout locations using math
 - i. Drawings for layout
 - ii. Demonstrate use of applied geometry math
 - iii. Waste vs. water supply layouts
 - c. Selection of tools
 - i. Safe tool usage
 - ii. Tool select
 - d. Use of proper safety equipment

- i. PPE
- ii. Jobsite and employer safety regulations
- iii. Worker safety

Resources

Alfred Steel . *Engineered Plumbing Design*. Construction Industry Press, Elmhurst IL., 1982.

United Association . *Drainage*. 3rd ed . Annapolis, MD,

United Association Training Department . *Soldering and Brazing Manual*.

Related Mathematics . I.P.C.J.T.C., 2002.

2007 Ohio Plumbing Code . 1st. International Code Council, Inc., 2006.

Resources Other

1. www.copper.org
2. www.kpsec.freeuk.com/solder.htm
3. www.brazing.com/
4. Our pipe fitting book
5. Cast iron/PVC book
6. Shop drawings, assorted manufacturers recommended literature
7. 2011 Plumbers Local #55 PowerPoint's and Developed Length Diagrams

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