ATLB-2400: PIPELAYING TECHNIQUES

Cuyahoga Community College

Viewing: ATLB-2400 : Pipelaying Techniques

Board of Trustees:
2003-05-22

Academic Term:
Spring 2019

Subject Code
ATLB - AIT-Construct/Hazard Material

Course Number:
2400

Title:
Pipelaying Techniques

Catalog Description:
Study of standard pipelaying techniques, practices, and procedures. Includes trenching, excavation safety, line and grade determination, and gravity flow systems.

Credit Hour(s):
2

Lecture Hour(s):
2

Requisites

Prerequisite and Corequisite
Completion of 6 credit hours in ATLB, ATCT, ATBL, or ATCM coursework.

Outcomes

Course Outcome(s):
N/A

Objective(s):
1. Identify mechanics of trench collapse.
2. Conduct a normal installation of pipe, including laying, assembly, and backfill.
3. Demonstrate knowledge safety practices, including bracing and shoring techniques.
4. Analyze a normal site and determine slope, percent of grade, and line elevations.
5. Demonstrate knowledge of gravity flow piping systems, using installation techniques.
6. Discuss compliance requirements of gravity flow systems to Ohio EPA requirements.
7. Analyze testing requirements and conduct a testing report.

Methods of Evaluation:
1. Quizzes
2. Exams
3. Classroom participation
4. Demonstration of assigned projects

Course Content Outline:

1. Trenching and excavation safety
   a. Mechanics of trench collapse
      i. soil weights
      ii. vertical stresses
      iii. horizontal stresses
      iv. system equilibrium
      v. cracks and unconfined compression tests
   b. Bracing and shoring safety
      i. trenching machines
      ii. shields and cages
      iii. inspections
      iv. portable trench boxes
   c. Laying, assembly, and backfill of pipe
      i. width of trench
      ii. excavation of trench
      iii. assembly of pipe
      iv. backfilling procedures
   d. Soil characteristics
      i. clay consistency
      ii. texture classifications
      iii. sedimentation tests
      iv. soils analysis
   e. Protection systems
      i. trench shields
      ii. tight sheet shoring
      iii. screw jacks
      iv. hydraulic shoring
      v. maximum allowable slopes
      vi. inspections
      vii. hazardous atmospheres
      viii. OSHA confined space rulings
   f. Back injury prevention
      i. prevention techniques
      ii. lifting techniques
2. Line and grade
   a. Batterboards
      i. batterboard measurements
      ii. double string batterboards
   b. Slope and percent of grade
      i. calculating rise and fall
      ii. rate per foot
      iii. calculating rates
      iv. hub and flow line elevations
3. Gravity flow piping dystems
   a. Sanitary sewer systems
      i. accuracy requirements
      ii. pipe types
      iii. gradients
      iv. reinforced concrete pipes
      v. installation techniques
      vi. haunching of pipes
   b. P.V.C. sanitary sewer pipe
      i. uses
      ii. characteristics
      iii. installation techniques
      iv. Ohio EPA
   c. Testing of sewers

i. low pressure testing
ii. television testing
iii. Weir tests
iv. Mandrel inspections

d. Storm drain systems
i. pipe types
ii. corrugated metal pipe
iii. perforated PVC installation
iv. installation techniques
v. testing reports

Resources

Ohio Laborers' Training and Upgrading Trust Fund. *Pipelating.* Howard, Ohio: Ohio Laborers' Training and Upgrading Trust Fund, 2001.

U.S. Dept. of Labor. *Excavating and Trenching Operations.* Washington: U.S. Dept. of Labor, Occupational Safety and Health Administration, 1985.

Macnab, Alan. *Earth Retention Systems.* New York/London, 2002.

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