

ATLB-1040: PIPELAYING

Cuyahoga Community College

Viewing: ATLB-1040 : Pipelaying

Board of Trustees:

March 2020

Academic Term:

Fall 2020

Subject Code

ATLB - AIT-Construct/Hazard Material

Course Number:

1040

Title:

Pipelaying

Catalog Description:

Calculation and application of grades, distances and elevations of storm water and sanitary sewer piping. Procedures for preparing the site for the pipe and its installation. Safety regulations and practices.

Credit Hour(s):

2

Lecture Hour(s):

2

Requisites

Prerequisite and Corequisite

Departmental approval: admission to the Construction Tending and Hazardous Material Abatement program.

Outcomes

Course Outcome(s):

A. Interpret civil site drawings to identify water discharge systems and calculate required slopes and elevations of pipe.

Objective(s):

1. Recognize storm and sanitary piping, including manholes and stations required to correctly install pipe.
2. Calculate elevations of various pipes, including sub-grade flow line and top of pipe.
3. Establish pipe elevations at various distances to verify calculations.
4. Record elevations and field rod readings in a field notebook.
5. Create a cut sheet for sub-grade preparation.

Course Outcome(s):

B. Develop a sequence of events, including equipment, sub-grade materials and communication methods that are required for site preparation.

Objective(s):

1. List the various types of layout equipment needed for pipe installation.
2. Distinguish between various sub-grade materials as specified by local municipalities.
3. Lay out a story pole for a bedding elevations and respective slopes.
4. Set up a pipe laser according to calculated elevations and respective slopes.
5. Communicate with heavy equipment operator using proper hand signals.

Course Outcome(s):

C. Establish procedure for pipe installation including all components, calculations and backfilling requirements.

Objective(s):

1. Identify and arrange the pipe, pipe fittings and gaskets, lubricants and seals.
2. Recognize all safety requirements for working in a trench.
3. Communicate with the operator to begin trenching operations and establish calculated elevations.
4. Install and grade required bedding to establish elevations.
5. Install pipe and pipe fittings.
6. Backfill according to local specifications.

Course Outcome(s):

D. Discuss all aspects of trenching safety, including personal protection equipment and preventative procedure that are required for worker safety.

Objective(s):

1. Identify soil types and conditions.
2. List the different types of trench worker protection.
3. Select the proper type of preventative measures to safe guard against trench failure.
4. Identify safety measures for special installation including traffic vibrations, foundations, and soil moisture content.
5. Provide means of access and regress into and out of trench.

Methods of Evaluation:

1. Test
2. Quizzes
3. Field application
4. Class participation

Course Content Outline:

1. Slope and elevations
 - a. Terminology
 - b. Water discharge systems
 - i. Storm water
 - ii. Sanitary
 - iii. Sub drains
 - iv. Manholes
 - v. Laterals
 - vi. Catch basins
 - c. Calculations
 - i. Elevations
 - ii. Rise and fall
 - iii. Distances
 - d. Conversions
 - i. Decimals
 - ii. Percentages
 - e. Verification
 - i. Calculations
 - ii. Drawing interpretation
 - f. Recordkeeping
 - i. Calculations
 - ii. Rod readings
 - iii. Pipe nomenclatures
 - g. Cut sheet
 - i. Sub grade
 - ii. Flow line
 - iii. Top of pipe
 - h. Stationing
2. Site Preparations

- a. Equipment
 - i. Transit
 - ii. Pipe laser
 - iii. Engineer rod
 - iv. Heavy equipment
 - 1. Back hoe
 - 2. Loader
 - 3. Compaction equipment
- b. Sub-grade materials
 - i. Gravel
 - ii. Sand
 - iii. Native material
 - iv. Flow fill
 - v. Premium
- c. Story
 - i. Flow line
 - ii. Sub-grade
 - iii. Bottom of pipe
 - iv. Centerline
- d. Communication
 - i. Personal identification
 - ii. Hand signals
- e. Pipe laser
 - i. Set up
 - ii. Alignment
 - iii. Safety
- 3. Pipe installation
 - a. Components
 - i. Pipe
 - ii. Fittings
 - iii. Seals
 - a. Safety
 - b. Communication
 - c. Bedding
 - i. Grade
 - ii. Placement
 - iii. Type
 - d. Pipe and pipe fittings
 - i. Identification
 - ii. Installation
 - iii. Set to line and grade
 - e. Backfill
- 4. Safety
 - a. Soil
 - i. Identification
 - ii. Conditions
 - a. Equipment
 - i. Trench box
 - ii. Hydraulic shores
 - iii. Timber shore
 - b. Preventative measures
 - i. Bank sloping
 - ii. Trench encumbrances
 - c. Special considerations
 - i. Water
 - ii. Vibrations

1. Traffic
2. Equipment
- iii. Shear planes
- d. Egress
 - i. Ladders
 - ii. Ramp
 - iii. Distances

Resources

LIUNA Training and Education Fund. *Math for Pipelayers*. Pomfret Center, CN: LIUNA Training and Education Fund, 2010.

LIUNA Training and Education Fund. *Basic Construction Math*. Pomfret Center, CN: Liuna Training and Education Fund, 2010.

LIUNA Training and Education Fund. *Gravity Flow Piping Systems*. Pomfret Center, CN: LIUNA Training and Education Fund, 2010.

Schmitt, Robert, Clifford Schexnayder, Aaron Cohen, Herbert Nichols, and David Day . *Moving the Earth: The Workbook of Excavation*. 7th ed. McGraw-Hill Professional, 2018.

Resources Other

1. http://plasticpipe.org/pdf/chapter-6_installation_construction.pdf
2. Installation and Construction. http://plasticpipe.org/pdf/chapter-6_installation_construction.pdf

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