

ATLB-1210: CONCRETE PLACEMENT

Cuyahoga Community College

Viewing: ATLB-1210 : Concrete Placement

Board of Trustees:

2012-06-28

Academic Term:

Spring 2019

Subject Code

ATLB - AIT-Construct/Hazard Material

Course Number:

1210

Title:

Concrete Placement

Catalog Description:

History of concrete, its properties and calculation of material quantities. Site preparation, form layout and installation. Placement and consolidation of concrete, and finishing and curing procedures will be discussed, demonstrated and practiced in field application.

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):

1. Identify the properties of concrete, discuss its history and apply math concepts to determine material quantities.

Objective(s):

1. 1. List the basic ingredients of concrete.
2. 2. Identify proper mix ratios that affect the strength of concrete.
3. 3. List the admixtures that are used to accelerate or retard the workability of concrete.
4. 4. Discuss the history of concrete from ancient times to the present.
5. 5. Calculate volumes of various geometric shapes to determine material quantities.
6. 6. Define the terms used in concrete and concrete placement.

Course Outcome(s):

2. Prepare the site for proper base support of concrete and required formwork.

Objective(s):

1. 4. Establish proper form placement and slope using applied math concepts.
2. 5. Install formwork to line and grade.
3. 1. Determine proper site preparations required for establishing sub base.
4. 2. Identify sub base materials required for different soil conditions.
5. 3. Establish proper grade elevations of the sub base and compact to specifications.

Course Outcome(s):

3. Demonstrate the methods and procedures used for placing and consolidating concrete in formwork.

Objective(s):

1. 1. List the various means of concrete conveyances and determined the best application for specific projects.
 2. 2. Identify the hand and power tools and equipment used for placing concrete.
 3. 3. Discuss and apply procedures used for performing slump tests in determining water content and concrete strength.
 4. 4. Discuss methods and materials used to reinforce concrete in slabs, walls, columns and beams.
 5. 5. Operate and use power equipment, power tools and hand tools to place concrete.
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Course Outcome(s):

4. Discuss and incorporate the different finishing and curing techniques and procedures that are used in placing concrete.

Objective(s):

1. 1. Strike concrete to finish grade.
 2. 2. Determine and apply the specified finish using various hand tools.
 3. 3. Differentiate between control and construction joints and demonstrate proper installation as required.
 4. 4. Establish a timeline for finishing concrete based on environmental conditions.
 5. 5. Discuss and apply different types of curing methods.
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Methods of Evaluation:

1. Quizzes
2. Tests
3. Field assignments
4. Class participation

Course Content Outline:

1. History
 - a. Ancient times
 - b. Portland cement
 - c. Reinforcements
 - d. Current time
2. Properties
 - a. Ingredients
 - b. Aggregates
 - c. Mix ratios and admixtures
 - d. Compressive strengths
 - e. Types of concrete
3. Admixtures
 - a. Plasticizers
 - b. Accelerators
 - c. Retarders
 - d. Air entrainment
4. Math Calculation of quantities
 - a. Conversions
 - b. Perimeter
 - c. Area
 - d. Volume
5. Terminology
 - a. Properties of concrete
 - b. Tools and equipment
 - c. Placement and finishing terms
6. Site preparation
 - a. Sub grade
 - i. Excavation
 - ii. Sub grade materials
 - iii. Soils conditions
 - b. Aggregate placement
 - i. Establish grades
 - ii. Compaction
 - c. Formwork

- i. Types of forms
 - ii. Layout
 - iii. Leveling, plumbing and grade setting
 - iv. Bracing
 - v. Placement
7. Placement and consolidation
- a. Conveyance
 - i. Direct
 - ii. Motorized buggies
 - iii. Buckets
 - iv. Pumps
 - b. Hand tools
 - i. Floats
 - ii. Trowels and straight edges
 - iii. Shovels
 - c. Power tools
 - i. Vibrators
 - ii. Screeds
 - iii. Power trowels
 - iv. Profilers
 - d. Slump test
 - i. Purpose
 - ii. Procedure
 - iii. Equipment
 - e. Reinforcement
 - i. Purpose
 - ii. Reinforcing bar
 - iii. Wire mesh
 - iv. Fiber
 - f. Tool selection and operation
8. Finishing and cutting
- a. Finish grade of concrete
 - i. Raking
 - ii. Consolidating
 - iii. Striking
 - b. Finish applications
 - i. Finish selection
 - ii. Hand tools
 - iii. Procedures
 - c. Control joints
 - i. Purpose
 - ii. Layout
 - iii. Control/expansion joint
 - iv. Construction joint
 - d. Time line
 - i. Factors of workability
 - ii. Environmental
 - iii. Visual cues
 - e. Curing
 - i. Types
 - ii. Methods
 - iii. Applications

Resources

LIUNA Training and Education Fund. *Estimating Concrete Quantities*". Pomfret Center, CN: LIUNA Training and Education Fund, 2008.

LIUNA Training and Education Fund. *Concrete Site Preparation*. Pomfret Center, CN: LIUNA Training and Education Fund, 2008.

LIUNA Training and Education Fund. *Concrete Placement and Consolidation*. Pomfret Center, CN: LIUNA Training and Education Fund, 2008.

Resources Other

"ACI Concrete Placement"

<http://www.aciconcreteplacement.com/ACI/Welcome.html>

"Concrete Placement Methods"

<http://www.polysteel.com/manual/ps3000/ps3000m089-094.pdf>

Top of page

Key: 399