

ATIW-1410: PRACTICAL APPLICATIONS OF REINFORCING STEEL

Cuyahoga Community College

Viewing: ATIW-1410 : Practical Applications of Reinforcing Steel

Board of Trustees:

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Academic Term:

Fall 2020

Subject Code

ATIW - Appld Indus Tech - Ironworking

Course Number:

1410

Title:

Practical Applications of Reinforcing Steel

Catalog Description:

Applications relating to placement of reinforcing steel in footings, walls, columns, beams, girders, joists and slabs and to bar splicing. Continued study of highway structures, including airport paving. Introduction to reinforcing accessories, dowels, and mechanical couplers.

Credit Hour(s):

1

Lecture Hour(s):

1

Requisites

Prerequisite and Corequisite

ATIW-1300 Structural Steel Concepts or concurrent enrollment, and ATIW-1310 Safety for Ironworkers or concurrent enrollment; or departmental approval.

Outcomes

Course Outcome(s):

A. Demonstrate procedures for placement of reinforcing steel in footings, walls, columns, beams, girders, joists and slabs.

Objective(s):

1. Demonstrate the ability to layout bars to be tied.
2. Demonstrate the ability to frame out and fill in the rebar structure.
3. Demonstrate the ability to perform the correct ties to be used for the individual structure.
4. Demonstrate the ability to correctly splice and tie the splice bars together.

Course Outcome(s):

B. Identify various types of reinforcing accessories, dowels, and mechanical couplers.

Objective(s):

1. Identify the different types of bar supports.
 2. Place supports and bars in the correct sequence.
 3. Use dowels to provide support for columns and walls.
 4. Identify and apply various types of mechanical couplings.
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Course Outcome(s):

C. Describe and demonstrate procedure for placement of reinforcing steel in highway and airport paving/ construction.

Objective(s):

1. Evaluate and use proper supports for bottom and top mat in bridge deck.
2. Evaluate and use the proper supports for the substructure.
3. Place rebar in the proper sequence.
4. Interpret tags and identify the structure to where it is assigned.
5. Formulate and apply the correct percentage to tie a bridge deck.

Course Outcome(s):

D. Describe and demonstrate procedure for placement of reinforcing steel in highway. and airport paving.

Objective(s):

1. Evaluate whether pavement is continuously reinforced, reinforced concrete pavement with transverse joints, or plain concrete with weakened plane or sawed transverse joint.
2. Discuss the different types of joints: longitudinal, sawed, thin ribbon, and transverse joints.
3. Demonstrate the ability to correctly identify and place the various types of dowel assemblies.

Methods of Evaluation:

1. Quizzes
2. Exams
3. Classroom participation
4. Demonstration of project assignments

Course Content Outline:

1. Reinforcing steel
 - a. Placement procedures
 - i. beams and girders
 1. types
 - a. simple
 - b. continuous
 - c. cantilever
 2. measurements
 3. built-in-place
 4. hook bars
 - ii. joists and slabs
 1. one-way slab
 2. two-way flat slab
 3. two-way waffle slab
 4. stairs
 5. wire reinforcement
 6. slab on grade
 7. folded plates
 8. slip forming
 - iii. walls
 1. types
 - a. curtain
 - b. shear
 - c. retaining
 2. bar spacing
 3. ties
 4. safety
 - iv. columns
 1. parts
 2. ties

3. configurations
 4. splices
 5. pre-assembled
 6. built-in-place
 7. spiral
 8. round
 - v. footings
 1. individual
 2. continuous wall
 3. pile caps
 4. combined
 5. mat
 6. stepped
 - b. Dowels
 - i. column
 - ii. wall
 - c. Reinforcing accessories
 - i. types
 - ii. uses
 - iii. plans and specifications
 - iv. placement procedures
 - d. Mechanical couplers
2. Highway construction
 - a. Drawings
 - b. Bar supports
 - c. Cover
 - d. Bar list
 - e. Bundling
 3. Highway and airport pavements
 - a. Types
 - i. continuously reinforced concrete
 - ii. reinforced concrete
 1. contraction joint
 2. expansion joint
 - iii. plain concrete
 - b. Traffic lanes
 - i. longitudinal joints
 - ii. sawed joint
 - iii. thin ribbon joint
 - iv. transverse joints
 4. Bar splicing
 - a. Uses
 - i. compression
 - ii. tension-compression
 - b. Systems
 - i. Speed-Loc
 1. parts
 2. installation equipment
 3. bar end preparation
 4. transition splices
 5. end bearing splice
 6. installation procedure
 - ii. G-Loc
 1. parts
 2. installation equipment
 3. bar end preparation
 4. reducer inserts
 5. end bearing splice
 6. installation procedure

- iii. Lenton Bar-Splice
 1. couplers
 2. installation equipment
 3. bar end preparation
 4. uses
 5. installation procedure
- iv. Dayton Bar-Grip
 1. parts
 2. installation equipment
 3. bar end preparation
 4. uses
 5. installation procedure
- v. CAD-welding
 1. safety
 2. parts
 3. equipment
 4. bar end preparation
 5. uses
 6. installation procedures
 - a. vertical
 - b. horizontal
 7. safety

Resources

Dobrowolski, Joseph A. *Concrete Construction Handbook*. 4th ed. New York: McGraw Hill, 1998.

Everard, Noel J. *Schaum's Outline of Theory and Problems of Reinforced Concrete Design*. 3rd ed. New York: McGraw-Hill, 1993.

International Association of Bridge, Structural and Ornamental Iron Workers. *Reinforcing Manual for Ironworkers VII, Volume 7*. Washington, D.C.: AFL-CIO, 1999.

Resources Other

International Association of Bridge, Structural, Ornamental and Reinforcing IronWorkers, Instructor Materials. <http://www.ironworkers.org/training/for-instructors> (<http://www.ironworkers.org/training/for-instructors/>)

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