Course Information Form (CIF)

Course Code: IRW 115
Course Title: Post Tensioning

Department: Applied Sciences and Technologies
PCS Code: 1.2 - Occupational/Technical Instruction
CIP Code: 48.0506
Repeatability: 0

Effective Date: Summer 2026

Credit Hours

Catalog Notation: 3-3-4
Credit Hour Distribution:

Lecture: 3	Lab: 3	Clinical: 0	**Total: 4**

General Course Information

Catalog Description

History of post tensioning; prestressing; advantages of post tensioning; post tensioning systems; anchors; placing drawings and supports, and unloading, handling, and placing tendons, wire, and bars. Stressing of strand tendons and wire tendons, grouting of bonded tendons, bridges, and the threadbar post tensioning system.

General Course Objectives

Students will be able to safely and effectively apply post tensioning systems.

Minimum Placement Levels

English	Reading	Math
None	None	None

Prerequisites

Credit in IRW 114

Methods of Evaluation

The minimum methods of evaluation include 5 written and 3 practical exams.

Instructional Materials and Additional Supplies

Reinforcing Post Tension, International Association of Ironworkers Joint Apprenticeship Council, latest edition

Course Content

General Learning Outcomes (GLOs)

- Technology: Students will demonstrate the ability to evaluate, select, and appropriately use current and emerging tools.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
History of Post-Tensioning	1. Briefly describe the historical development of post-tensioning as a means of reinforcing concrete.	1	0	0
Pre-Stressing: a) Pre-Stressing vs. Post-Tensioning, b) Stresses, c) Force, and d) Types of Pre-Stressed Concrete	1. Distinguish between pre-stressing and post-tensioning concrete.	3	3	0
Advantages of Post-Tensioning: a) Longer Spans, b) Shallower Structural Members, c) Control, d) Economy, and e) Skills and Labor	1. List and describe the advantages of post-tensioning over conventional reinforcing.	3	3	0
Post-Tensioning Systems: a) Strand Post-Tensioning, b) Wire Post-Tensioning, and c) Bar Post-Tensioning Systems	1. List the three categories of post-tensioning systems used in construction and the situational characteristics for which they are best suited. 2. Identify the parts of a post-tensioning system.	3	3	0
Post-Tensioning Anchors: a) Arrangements, b) Types, and c) Application	1. Define moveable-fixed (MF) and moveable-moveable (MM) post-tensioning arrangements. 2. Describe four types of anchors used in post-tensioning and where they are appropriately used.	3	3	0
Placing Drawings and Supports: a) Placing Drawings, b) Support, c) Tools, and d) Clothing	1. Read and interpret placing drawings in order to select and place the appropriate supports, tendons, and anchors indicated on the drawing.	3	3	0
Unloading and Handling Tendons: a) Types, b) Slings, c) Receipt Checking, d) Storing, and e) Hand Signals	1. Identify and use the appropriate sling for unloading tendons from a delivery truck. 2. Inspect delivery receipt against the load delivered to ensure that all items have been received, and store tendons properly at the job site. 3. Identify and demonstrate proper hand signals to direct and communicate with cranes, booms, crawlers, and helicopters.	3	4	0
Placing Strand Tendons: a) Checking Information, b) Anchors, c) Placing, d) Plastic, e) Slabs, and f) Beams	1. Inspect appropriate information before placing strand tendons, then place strand tendons with the appropriate anchors as indicated on placing drawings. 2. Inspect for rips and tears in protective plastic and repair as necessary.	3	4	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Placing Wire Tendons: a) Anchor, b) Uncoiling, c) Inspection, and d) Splicing	1. Place wire tendons with the appropriate anchors as indicated on placing drawings. 2. Operate a field tendon uncoiler or power rigging to uncoil wire tendon. 3. Inspect sheathing for dents and repair as necessary. 4. Demonstrate proficiency in splicing new tendons to existing tendons.	3	3	0
Placing Bar Tendons: a) Description, b) Application, c) Anchors, and d) Placing	1. Describe bar tendons and where they are usually used. 2. Select, place, and anchor bar tendons as indicated on placing drawings.	3	3	0
Stressing of Strand Tendons: a) Hydraulic Pump and Jack, b) Safety, c) Field Records, d) Stressing, e) Cutting Excess Strands, and f) Inconsistencies and Correction	1. Describe the operating principles of a hydraulic pump and jack. 2. Operate hydraulic stressing equipment safely. 3. Read, interpret, and complete post-tensioning field records accurately. 4. Identify the appropriate gauge pressure listed on the field record. 5. Demonstrate proficiency in stressing strands and cutting excess strands after stressing. 6. Analyze inconsistencies between field record recommendations and actual conditions, and correct the situation as necessary.	3	3	0
Stressing of Wire Tendons: a) Stressing System, and b) Overstress Measurement	1. Identify the parts of a stressing system. 2. Stress wire tendons safely. 3. Measure overstress conditions in wire tendon systems.	3	1	0
Grouting of Bonded Tendons: a) Grout Mixer and Pump, b) Grout Mixture Preparation, c) Pumping, and d) Equipment Cleaning	1. Identify the parts of a grout mixer and pump. 2. Operate a grout mixer safely. 3. Prepare grout mixture. 4. Demonstrate proficiency in pumping grout into tendons. 5. Demonstrate proficiency in cleaning grouting equipment.	3	3	0
Bridges: a) Types, b) Stressing, c) Plans, d) Layout, and e) Details	1. Identify four types of bridge construction. 2. Describe the variation in stressing use in each type of bridge construction.	3	3	0
Threadbar Post-Tensioning System: a) Dywidag Threadbar System, b) Threadbar Tendon vs. Reinforcing Bars, c) Application, and d) Modular Systems	1. Assemble, install, stress, and grout the Dywidag threadbar system. 2. Distinguish between Dywidag threadbar tendon and reinforcing bars. 3. Describe where Dywidag threadbar systems are used. 4. Define modular systems.	3	3	0
Exams	1. Complete all required examinations.	2	3	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
45	45	0