



Pembroke Hopkins Park Construction Outreach Program

2598 S. 14000 E. Rd., Pembroke Township, IL

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Competencies / Objectives

Level One

MODULE 30101 - INTRODUCTION TO THE TRADE (5 Hours)

1. Identify the personal qualities that contribute to successful employment.
2. Describe the historical development of the trade.
3. Identify the organization and purpose of apprenticeship training.
4. Identify employer and employee safety obligations.

MODULE 30102 - TRADE SAFETY (7.5 Hours)

1. Describe the consequences of on-the-job accidents.
2. Explain the special responsibilities of the Occupational Safety and Health Administration (OSHA).
3. List potential hazards for the ironworker.
4. Describe safe work practices when near cranes.
5. List major health hazards classified by OSHA.

MODULE 30103 - MEANS AND METHODS OF ACCESS (7.5 Hours)

1. Identify and explain safety considerations regarding personnel lifts.
2. Explain the operation and safe use of aerial work platforms.
3. Explain the operation and safe use of hoists.
4. Discuss the proper use of fall protection systems.

MODULE 30104 - TOOLS AND EQUIPMENT OF THE TRADE (10 Hours)

1. Identify and explain commonly used safety tools and equipment.
2. Identify and describe the proper use of common ironworking hand tools.
3. Identify the power sources for common ironworking tools.
4. Identify and describe the proper use of common ironworking power tools.

MODULE 30105 - CONSTRUCTION CRANES ONE (10 Hours)

1. Identify and describe common lifting equipment.
2. Identify and explain commonly used construction cranes
3. Identify and explain crane manuals, recordkeeping, and safety.



4. Describe the activities involved in assembling construction cranes.

MODULE 30106 - RIGGING FOR IRONWORKING ONE (10 Hours)

1. Explain the history of rigging and the safety concerns for rigging and ironworking.
2. Identify and explain the wire rope that is used for rigging.
3. Explain how to splice wire rope.
4. Identify and explain the fiber rope that is used for rigging.
5. Explain how to splice fiber rope.

MODULE 30107 - RIGGING EQUIPMENT AND HARDWARE (7.5 Hours)

1. Identify the basic equipment and hardware used in rigging.
2. Describe proper lacing and square reeving.
3. Perform a safety inspection of hooks.
4. Identify rigging equipment and types of slings.
5. Explain the safe use and inspection of chains.

MODULE 30108 - TRADE BLUEPRINTS AND PROCESSES (12.5 Hours)

1. Identify the materials used in steel-frame buildings.
2. Name the parts of steel frames.
3. List the advantages of pre-engineered structures.
4. List the components of reinforced steel structures.
5. Describe the process used in post-tensioning concrete.
6. List three uses of precast concrete.
7. Identify the types of blueprints and detailed drawings specific to ornamental ironwork.

MODULE 30109 - MATERIALS HANDLING AND STORAGE (5 Hours)

1. Identify potential hazards in the handling and storage of construction materials.
2. State the general principles for unloading and yarding reinforcing steel.
3. Explain the unloading and yarding of joists.
4. Explain the unloading and yarding of miscellaneous and structural iron.

MODULE 30110 - STRUCTURAL IRONWORKING ONE (7.5 Hours)

1. Identify the types of construction utilizing structural steel.
2. Explain the properties of structural steel.
3. Explain the effects of high and low temperature on the strength of steel.
4. Understand the principles of structural stresses.



MODULE 30111 - PLUMBING, ALIGNING, AND GUYING (5 Hours)

1. Describe the purpose and function of alignment and plumbing of steel structures.
2. Identify the tools and equipment used for aligning and plumbing steel structures.
3. Identify the components of column bases, base plates, and foundation failures.
4. Explain selected plumbing and aligning tasks.

MODULE 30112 – FASTENING (5 Hours)

1. Recognize and identify A-325 and A-490 bolts, washers, and nuts by their identifying marks.
2. Name and describe three types of A-325 bolts.
3. Describe the procedures employed when using the calibrated-wrench method and turn-of-nut method when tightening high-strength bolts.

MODULE 30113 - OXYFUEL CUTTING (17.5 Hours)

1. Explain oxyfuel cutting safety.
2. Identify and explain oxyfuel cutting equipment.
3. Set up oxyfuel equipment.
4. Light and adjust an oxyfuel torch.
5. Shut down oxyfuel cutting equipment.
6. Disassemble oxyfuel equipment.
7. Change empty cylinders.
8. Perform oxyfuel cutting activities:
 - Straight lines and square shapes
 - Piercing and slot cutting
 - Bevels
 - Washing
 - Gouging

MODULE 30114 - INTRODUCTION TO ARC WELDING (15 Hours)

1. List the safety precautions associated with arc welding.
2. Explain welding machines and associated equipment.
3. Explain welding safety equipment and area preparations.
4. Explain how to strike a welding arc and how to position electrodes.
5. Explain how to make basic welds.

MODULE 30115 - STEEL JOISTS AND JOIST GIRDERS ONE (5 Hours)

1. Recognize the various types of bar joists.
2. Explain how bar joists are designated.



3. Describe the proper procedures for rigging and storing steel joists.
4. Describe the proper erection procedures for bar joists.
5. Explain the use of joist girders in steel joist construction systems.

MODULE 30116 - METAL DECKING (10 Hours)

1. Identify and explain types of decking and deck profiles.
2. Describe how decking is packaged, shipped, and stored.
3. Erect decking and observe job site safety.
4. Explain the effects of deck penetrations and damage.
5. Demonstrate how to place concrete.

MODULE 30117 - FIELD FABRICATION ONE (15 Hours)

1. Identify safety hazards associated with ironworking fabrication.
2. Use common layout tools.
3. Fabricate angle iron to given dimensions.
4. Fabricate Channel Iron to given dimensions.
5. Fabricate T-shapes to given dimensions.
6. Fabricate W-shapes to given dimensions.

Level Two

MODULE 30201 - POSITION ARC WELDING (20 Hours)

1. Identify and explain weld joints and positions.
2. Prepare arc welding equipment.
3. Identify and explain open V-butt joints and welds.
4. Perform shielded metal arc welding (SMAW) on open V-butt joints:
 - Flat welds
 - Horizontal welds
 - Vertical welds
 - Overhead welds

MODULE 30202 - INTRODUCTION TO REINFORCING STEEL AND STEEL FABRICATION (10 Hours)

1. Describe the applications of reinforcing bars.
2. Describe the basic work processes of the ironworker involved with placing reinforcing bars.
3. List the tools and equipment needed by a reinforcing ironworker and the types of ties used in securing rebars.
4. Read and interpret bar tags or marks.



5. Identify and demonstrate the bar bends standardized by the American Concrete Institute (ACI) and the methods by which rebars can be cut, bent, or spliced in the field.

MODULE 30203 - MISCELLANEOUS IRONWORKING (7.5 Hours)

1. Identify and explain structures and locations that employ various types of miscellaneous iron.
2. Describe the work processes used in miscellaneous ironwork.
3. Identify several ferrous and nonferrous metals used for miscellaneous ironwork.

MODULE 30204 - TRADE MATH (10 Hours)

1. Demonstrate competency in the use of mathematical processes to estimate and calculate load weights.
2. Demonstrate competency in the use of mathematical processes to compute safe working loads.
3. Demonstrate competency in the use of mathematical processes to calculate reeving efficiency.

MODULE 30205 - BLUEPRINT READING TWO (10 Hours)

1. Name the types of structural plans, and identify the information included on each.
2. Describe the sequences of erection plans for each step of construction.
3. Read and interpret the symbols and abbreviations on erection plans and drawings.

MODULE 30206 - RIGGING TWO (10 Hours)

1. Identify and describe the uses of slings, sling capacities, and sling angles.
2. Explain the mechanical advantage achieved by reeving, and calculate reeving efficiency.
3. Identify and describe the uses of miscellaneous rigging equipment.

MODULE 30207 - STRUCTURAL IRONWORKING TWO (30 Hours)

1. Explain and demonstrate pre-erection activities for structural steel.
2. Explain and demonstrate erecting bearing devices.
3. Explain and demonstrate erecting columns.
4. Explain and demonstrate erecting horizontal members.
5. Explain and demonstrate erecting bracing and bridging.

MODULE 30208 - STEEL JOISTS AND JOIST GIRDERS TWO (15 Hours)

1. Identify types of joists, methods of end support, and types of bridging.



2. Locate and describe the information on a framing plan used by ironworkers.
3. Describe steel joist installation procedures.

MODULE 30209 - CONSTRUCTION CRANES TWO (15 Hours)

1. Identify the types of mobile cranes found on construction sites.
2. Identify mobile crane components.
3. Identify mobile crane reeving patterns.
4. Identify factors affecting mobile crane lifting capacities.
5. Describe special lifting situations.
6. Identify hazards associated with mobile cranes.
7. Describe the qualifications to be a crane operator.

MODULE 30210 - LEVELS, TRANSITS, AND ELECTRONIC SURVEY DEVICES (17.5 Hours)

1. Identify and explain construction industry terms, symbols, and applications associated with surveying activities.
2. Identify and explain construction industry math associated with surveying activities.
3. Explain the surveying tools used in ironworking.
4. Explain and demonstrate how to use surveying tools used in ironworking applications.

Level Three

MODULE 30301 – WELD TESTING (10 Hours)

1. Identify and explain codes governing welding.
2. Identify and explain weld discontinuities and their causes.
3. Identify and explain nondestructive examination practices.
4. Identify and explain performance qualification tests.
5. Explain the importance of quality workmanship.

MODULE 30302 – PRE-ENGINEERED SYSTEMS (7.5 Hours)

1. Describe the work procedures associated with the erection of pre-engineered steel buildings, from the preliminary activities to the actual erection.
2. Identify the structural materials used in pre-engineered buildings.
3. Describe the procedures for the installation of siding, roof sheathing, and insulation.
4. Describe the procedures for installing the following accessories: windows, walk and service doors, vents, louvers, downspouts, and gutters.
5. Explain special safety precautions pertaining to the erection of pre-engineered steel buildings.



MODULE 30303 – ORNAMENTAL IRONWORKING (5 Hours)

1. Identify and explain the types of metals used in ornamental ironworking.
2. Identify and explain the different types of ornamental ironworking applications and components.
3. Explain how to install ornamental ironworking components to specified tolerances.
4. Explain how to finish selected metals used for ornamental ironworking.

MODULE 30304 – STUD WELDING (10 Hours)

1. Identify safety precautions associated with stud welding.
2. Recognize and identify the equipment associated with stud welding.
3. Demonstrate stud welding equipment setup and perform acceptable stud welds with proper stud placement.
4. Explain testing of stud welds.

MODULE 30305 – POST-TENSIONING (5 Hours)

1. Identify the equipment used for strand tendon, wire tendon, and bar tendon post-tensioning systems and the advantages and applications of post-tensioned concrete.
2. Unload and store post-tensioning tendons safely and correctly.
3. Explain procedures for placing strand and wire tendons in slabs and beams and bar tendons in beams.
4. Explain procedures for stressing strand tendons, bar tendons, and both shim-type and locknut-wire tendons.
5. Describe the equipment and procedures used to grout bonded tendons.

MODULE 30306 – PLACING AND TYING REINFORCING STEEL (20 Hours)

1. Identify and explain reinforcing steel.
2. Identify and explain building code requirements related to reinforcing steel.
3. Identify and explain the placement of reinforcing steel in concrete footings and foundations.
4. Identify and explain the placement of reinforcing steel in vertical concrete members.
5. Identify and explain the placement of reinforcing steel in horizontal concrete members.

MODULE 30307 – CONSTRUCTION CRANES THREE (10 Hours)

1. Identify and describe the following types of cranes and explain their uses:
 - Tower
 - Electric overhead traveling
2. Explain crane safety hazards and precautions.



MODULE 30308 – SPECIAL RIGGING (10 Hours)

1. Describe and explain the uses of the following special rigging equipment:

- Air tigger
- Gin pole
- Chicago boom
- A-frame
- Davit
- Balancing beam
- High lines
- Rolling devices

2. Erect or rig the following safely and correctly:

- Gin pole
- Chicago boom
- A-frame
- Balancing beam
- High lines

MODULE 30309 – FIELD FABRICATION TWO (25 Hours)

1. Identify and explain railing systems.
2. Fabricate pipe railings to given specifications.
3. Fabricate a ladder to given specifications.
4. Fabricate a door buck to given specifications.
5. Fabricate steel stairs to given specifications.

MODULE 30310 – DEMOLITION (10 Hours)

1. Apply specific safety precautions to demolition work.
2. Explain specified demolition skills:
 - Removing existing structural steel beams for scrap
 - Removing existing structural steel beams for reinstallation
 - Removing existing structural steel columns
 - Removing existing concrete-reinforced steel columns
3. Explain using demolition tools to remove rivets:
 - Using oxyacetylene equipment
 - Using a rivet buster

MODULE 30311 – PRECAST/TILT-UP ERECTION (20 Hours)

1. Describe structural and architectural precast concrete.
2. Plan for a tilt-up project.
3. Identify and explain lifting inserts.



4. Explain rigging for tilt-up erection.
5. Explain erecting, connecting, and bracing precast columns and wall panels.

MODULE 30312 – STRUCTURAL IRONWORKING THREE (20 Hours)

1. Plumb, align, guy, and make corrections (within tolerances) to erected structural steel frames.
2. Explain and demonstrate assembly and erection of trusses.
3. Explain and demonstrate installation of grating and checkered plate.
4. Explain how to identify unusual hazards associated with structural steel activities and the precautions associated with each.
5. Explain risk management as it applies to structural steel activities:
 - Hazards or risks to others
 - High-level skill
 - Slick paint and special finishes
 - Accountability



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Materials and Equipment

Level One

MODULE 30101 - INTRODUCTION TO THE TRADE

Overhead projector and screen
Whiteboard/chalkboard
Trainee Task Module
Transparencies
Markers/chalk
Module Examination

MODULE 30102 - TRADE SAFETY

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Trainee Task Module
Transparencies
Markers/chalk
Module Examination
Performance Profile Sheets

MODULE 30103 - MEANS AND METHODS OF ACCESS

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Fall protection system
Appropriate lifts and hoists
Aerial work platforms
Trainee Task Module
Transparencies
Markers/chalk
Module Examination
Performance Profile Sheets



MODULE 30104 - TOOLS AND EQUIPMENT OF THE TRADE

Overhead projector and screen

Whiteboard/chalkboard

Appropriate Personal Protective Equipment

Examples of tools and equipment to be covered in module including:

Clear faceshields

Welding helmet faceshields

Protective leathers

Welding gloves

Fall-prevention devices

Respiration devices

Marking devices

Fillet gauges

Fillet joints

Fillet weld blade gauge set

Pocket fillet weld gauge set

Ratchet jacks

Screw jacks

Hydraulic jacks

Bar clamps

Finger clamps

Button punch

Set-screw wrenches

Knocker wrenches

Cleaning tools

Side-cutting pliers

Snips and shears

Bolt cutters

Hacksaw

Thread gauges

Taps and dies

Bull pins

Drift pins

Erection wrenches

Connecting bars

Chipping hammer

Pinch bar

Hickey

Tool belt and tool bag

Friction lighter



Tip cleaner
Air compressors
Generator
Rivet buster
Impact wrench
Powder-actuated tools
Reciprocating saw

MODULE 30104 - TOOLS AND EQUIPMENT OF THE TRADE (Continued)

Trainee Task Module
Transparencies
Markers/chalk
Module Examination
Performance Profile Sheets

MODULE 30105 - CONSTRUCTION CRANES ONE

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Available types of lifting equipment
Trainee Task Module
Transparencies
Markers/chalk
Module Examination
Performance Profile Sheets

MODULE 30106 - RIGGING FOR IRONWORKING ONE

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Wire cutters
Examples of wire rope
Examples of fiber rope
• Manila
• Nylon
• Polyester
• Polypropylene
• Polyethylene
Trainee Task Module
Transparencies



Markers/chalk
Module Examination
Performance Profile Sheets

MODULE 30107 - RIGGING EQUIPMENT AND HARDWARE

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Trainee Task Module
Transparencies
Markers/chalk
Module Examination
Performance Profile Sheets

MODULE 30108 - TRADE BLUEPRINTS AND PROCESSES

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Sample job plans/drawings
Trainee Task Module
Transparencies
Markers/chalk
Module Examination
Performance Profile Sheets

MODULE 30109 - MATERIALS HANDLING AND STORAGE

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Trainee Task Module
Transparencies
Markers/chalk
Module Examination
Performance Profile Sheets

MODULE 30110 - STRUCTURAL IRONWORKING ONE

Overhead projector and screen
Whiteboard/chalkboard



Appropriate Personal Protective Equipment
Trainee Task Module
Transparencies
Markers/chalk
Module Examination
Performance Profile Sheets

MODULE 30111 - PLUMBING, ALIGNING, AND GUYING

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Trainee Task Module
Transparencies
Markers/chalk
Module Examination
Performance Profile Sheets

MODULE 30112 - FASTENING

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
A-325 bolts
A-490 bolts
Impact wrench
Spud wrench
Calibrated torque wrench
Trainee Task Module
Transparencies
Markers/chalk
Module Examination
Performance Profile Sheets

MODULE 30113 - OXYFUEL CUTTING

Equipment
Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Leather gauntlet-type gloves
Oxyfuel cutting equipment



Tip cleaners
Cutting goggles
Chipping hammer
Pliers
Tape measure
Soapstone
Friction lighter
Framing squares
Combination squares with protractor
10-inch crescent wrench
Various sizes of cutting tips for 14-gauge to 1-inch plate
Washing tips
Gouging tips
Trainee Task Module
Transparencies
Steel plate:
Thin (16 to 10 gauge)
Thick (1/2 to 1 inch)
Markers/Chalk
Module Examination
Performance Profile Sheets

MODULE 30114 - INTRODUCTION TO ARC WELDING

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Welding electrodes
• 1/8-inch E6010 electrodes
• 5/32-inch E6010 electrodes
• 3/16-inch mild steel plate
• 1/4-inch mild steel plate
• 3/32-inch spacer wire
Clamps
Chipping hammers
Wire brushes
Pliers
DC welder
Trainee Task Module
Transparencies
Markers/chalk
Module Examination
Performance Profile Sheets



Welding coupons for practice welds

MODULE 30115 - STEEL JOISTS AND JOIST GIRDERS ONE

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Bar joists
Joist girders
Bridging devices
Mounting devices
Trainee Task Module
Transparencies
Markers/chalk
Module Examination
Performance Profile Sheets

MODULE 30116 - METAL DECKING

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Metal decking
Fasteners
Welding equipment
Concrete
Trainee Task Module
Transparencies
Markers/chalk
Module Examination
Performance Profile Sheets

MODULE 30117 - FIELD FABRICATION ONE

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Magnetic drill
Scriber
Combination set
Straightedge
Protractor
Dividers



Trammel points
Tri-square
Steel rule
Steel square
Prick punch
Center punch
Band saw
Oxyfuel cutting equipment
Side grinder
Oxyacetylene torch
Trainee Task Module
Transparencies
Markers/chalk
Module Examination
Performance Profile Sheets

Level Two

MODULE 30201 - POSITION ARC WELDING

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Available samples of welded joints
Available SMAW welding equipment and materials
Trainee Task Module
Transparencies
Markers/chalk
Module Examination
Performance Profile Sheets

MODULE 30202 - INTRODUCTION TO REINFORCING STEEL AND STEEL FABRICATION

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Available rebar tying materials
Available rebar bending tools
Available rebar splicing equipment
Trainee Task Module
Transparencies
Markers/chalk



Module Examination
Performance Profile Sheets

MODULE 30203 - MISCELLANEOUS IRONWORKING

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Trainee Task Module
Transparencies
Markers/chalk
Module Examination
Performance Profile Sheets

MODULE 30204 - TRADE MATH

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Available samples for practice calculations
Calculator
Trainee Task Module
Transparencies
Markers/chalk
Paper and pencil
Module Examination
Performance Profile Sheets

MODULE 30205 - BLUEPRINT READING TWO

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Trainee Task Module
Transparencies
Markers/chalk
Module Examination
Performance Profile Sheets
Blueprints/drawing package

MODULE 30206 - RIGGING TWO

Overhead projector and screen
Whiteboard/chalkboard



Appropriate Personal Protective Equipment
Available rigging components
Calculator
Trainee Task Module
Transparencies
Markers/chalk
Paper and pencils
Module Examination
Performance Profile Sheets

MODULE 30207 - STRUCTURAL IRONWORKING TWO

Overhead projector and screen
Appropriate Personal Protective Equipment
Whiteboard/chalkboard
Standard measuring tapes (minimum of two)
Examples of:
Foundations with different anchor rod arrangements
Leveling plates, bearing plates, and associated hardware
Foundations with and without grouting
Bolts and shims
Column shipping pieces
Horizontal members
Shear connection materials and angle materials
Horizontal and vertical building lines and column lines
Bracing and bridging members
Lifting equipment
Welding equipment
Hand tools for securing bolts and nuts
Trainee Task Module
Transparencies
Markers/chalk
AISC Manual of Steel Construction
Module Examination
Performance Profile Sheets
Typical set of job plans and drawings:

- General Information
- General Site
- Civil
- Architectural
- Structural
- Mechanical
- Electrical



MODULE 30208 - STEEL JOISTS AND JOIST GIRDERS TWO

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Available joists and bridging
Available welding equipment suitable for joist welding
Available rigging and lifting equipment
Available drawings
Trainee Task Module
Transparencies
Markers/chalk
Module Examination
Performance Profile Sheets

MODULE 30209 - CONSTRUCTION CRANES TWO

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Available mobile cranes
Trainee Task Module
Transparencies
Markers/chalk
Module Examination
Performance Profile Sheets

MODULE 30210 - LEVELS, TRANSITS, AND ELECTRONIC SURVEY DEVICES

Overhead projector and screen
Whiteboard/chalkboard
Safety equipment
Appropriate Personal Protective Equipment
Compass
Protractors (one per trainee)
12-inch rulers (one per trainee)
Plumb bobs with string (minimum of two)
Spirit levels (minimum of two)
String levels (minimum of two)
3-foot straightedge (minimum of two)
Short and long measuring tapes (one per two trainees)



Trigonometric table (one set per two trainees)
Scientific calculators (one per two trainees)
Leveling (surveying) rods (minimum of two)
Tripods (minimum of two - preferably with different mounting plates)
Hand-held levels (minimum of two)
Manual instrument levels (minimum of two - preferably with different foot plates)
Automatic-leveling instrument levels (at least one)
Manual theodolites and transits (minimum of two - preferably ones that can be taken apart)
Simple electronic distance-measuring instruments (at least one hand-held EDM)
Total station (at least one)
Laser system and associated sensors or reflectors (at least one system with accessories)
Trainee Task Module
Transparencies
Markers/chalk
Pencils
8 1/2 x 11 plain white paper
Notebooks
Module Examination
Performance Profile Sheets
Typical set of job plans and drawings

- General site
- Civil
- Architectural
- Structural

Survey markers

- Grade stakes
- Hubs
- Bench marks
- Flags

Level Three

MODULE 30301 - WELD TESTING

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Weld samples with and without discontinuities
Weld gauges
Liquid penetrant test samples
Trainee Task Module



Transparencies
Markers/chalk
Examples of welding codes
Module Examination
Performance Profile Sheets

MODULE 30302 - PRE-ENGINEERED SYSTEMS

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Examples of structural members of a pre-engineered building, with proper fasteners
Examples of pre-engineered building materials
Applicable lifting and rigging devices
Trainee Task Module
Transparencies
Markers/chalk
Washers and sealants
Fasteners
Module Examination
Performance Profile Sheets

MODULE 30303 - ORNAMENTAL IRONWORKING

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Examples of metals used for ornamental ironworking
Examples of ornamental ironworking components
Examples of different finishes for ornamental ironworking metals
Trainee Task Module
Transparencies
Markers/chalk
Examples of building codes
Examples of project drawings and plans
Fasteners for ornamental components
Module Examination
Performance Profile Sheets

MODULE 30304 - STUD WELDING

Overhead projector and screen
Whiteboard/chalkboard



Appropriate Personal Protective Equipment
Complete stud welding system and accessories
Assorted types of devices to be secured by stud welding
Assorted tools needed for testing welded studs
Trainee Task Module
Transparencies
Markers/chalk
Assorted types of anchors, studs, and ferrules
Module Examination
Performance Profile Sheets

MODULE 30305 - POST-TENSIONING

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Examples of strand, wire, and bar post-tensioning system equipment
Tools to install, adjust, and remove post-tensioning system equipment
Stressing equipment
Lifting and rigging equipment to unload, store, and place post-tensioning equipment
Forms for slabs and beams
Lengths of #4 rebar
Tendon uncoiler
Examples of anchors used with tendons
Grouting hoses
Tendon splicing equipment
Trainee Task Module
Transparencies
Markers/chalk
Examples of stressing field records
Sample placing drawings
Module Examination

MODULE 30306 - PLACING AND TYING REINFORCING STEEL

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Standard measuring tapes
Reinforcing bars, bar supports, and ties
Trainee Task Module
Transparencies
Markers/chalk



General Information Drawings
General Site Drawings
Civil Drawings
Architectural Drawings
Structural Drawings
Mechanical Drawings
Electrical Drawings
Codes and specifications that apply to reinforcing steel
Module Examination
Performance Profile Sheets

MODULE 30307 - CONSTRUCTION CRANES THREE

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Trainee Task Module
Transparencies
Markers/chalk
Pictures of fixed and slewing cranes
Pictures of mono, telescoping, and inner-outer tower crane configurations
Pictures of luffing, fixed, and saddle jibs used with tower cranes
Pictures of bridge and gantry electric overhead traveling cranes
Module Examination
Performance Profile Sheets

MODULE 30308 - SPECIAL RIGGING

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Gin pole:
Wood or steel mast
Load blocks (2)
Snatch blocks
Guy lines, wire or high-quality manila rope (4)
Anchors (4)
Hoisting engine or hand winch
Chicago boom:
Boom, structural steel or strong pipe
Ink stand
Sheaves (2 or 3)
Snatch block



Load block
Guys, wire rope for boom, fiber rope for sides
A-frame:
Wood frame, 2 □□10s or 2 □□12s
Guy lines, wire or high-quality manila rope (3)
Sheave
Hoisting engine or hand winch
Hook
Balancing beam:
Structural steel beam with welded plate
Lifting lug
Sling
Shackle
Counterweight
Bolts
Ropes
Crane or hoisting engine
High line:
Wire rope
Snatch blocks (at least 2)
Turnbuckles
Anchors, columns or other rigid supports
Hoisting engine
Trainee Task Module
Transparencies
Markers/chalk
Module Examination
Performance Profile Sheets

MODULE 30309 - FIELD FABRICATION TWO

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
13/16 -inch drill bit
4-foot spirit level
5/16-inch pilot bit
9/16-inch drill bit
Adjustable square gauge
Arc welding equipment
Carbide scratch awl or soapstone
Chalk line
C-clamps



Center punch
Drill press or magnetic drill
Framing square
Hammer
Metal-cutting bandsaw
Notcher with 1 1/2-inch die
Oxyacetylene equipment
Pipe cutter
Sander/grinder
Side grinder
Tape measure or rule
Torpedo level
Try square
Wrap-around
Trainee Task Module
Transparencies
Markers/chalk
Module Examination
Performance Profile Sheets

MODULE 30310 - DEMOLITION

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Oxyacetylene equipment
Rivet busters
Trainee Task Module
Transparencies
Markers/chalk
Writing tablets
Pencils
Building materials with countersunk rivets
Building materials with buttonhead rivets
Module Examination
Performance Profile Sheets

MODULE 30311 - PRECAST/TILT-UP ERECTION

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Standard measuring tapes (minimum of two)



Examples of:

Foundations with and without grouting
Foundations with different anchor rod group arrangements
Leveling plates, bearing plates, and associated hardware
Lifting inserts
Bracing
Quick release system
Connecting hardware
Precast members
Lifting equipment
Trade tools
Trainee Task Module
Transparencies
Markers/chalk
Typical set of job plans and drawings:
General Information
General Site
Civil
Architectural
Structural
Mechanical
Electrical
Pictures of:
Structural precast concrete members
Architectural precast concrete members
AISC Manual of Steel Construction
Module Examination
Performance Profile Sheets

MODULE 30312 - STRUCTURAL IRONWORKING THREE

Overhead projector and screen
Whiteboard/chalkboard
Appropriate Personal Protective Equipment
Survey tools needed to check alignments
Lifting devices and rigging materials
Examples of trusses
Examples of structural steel members
Examples of grating and checkered plate panels
Tools needed to align, assemble, erect, and install structural steel members, trusses, grating panels, and checkered plate panels
Trainee Task Module



Transparencies

Markers/chalk

Module Examination

Performance Profile Sheets

Examples of project drawings with General Notes and Material Lists

Examples of project building codes

Copy of AISC's Code of Standard Practice For Steel Buildings and Bridges

Connecting hardware for trusses, grating panels, and checkered plate panels