

BOILERMAKER (CONSTRUCTION)

Appendix A

O*NET CODE 47-2011.00

This training outline is a minimum standard for Work Processes and Related Instruction. Changes in technology and regulations may result in the need for additional on-the-job or classroom training.

The term of the apprenticeship shall be a period of four (4) years – not less than 6,000 hours of on-the-job training.

WORK PROCESSES

	Approximate Hours
A. Care and Maintenance of Tools and Equipment	100
1. Learning names of tools and equipment	
2. Learning the use of tools and equipment	
3. Care and maintenance	
4. Handing out tools and inventory	
B. Rigging and Bull Gang	1,000
1. Unloading and handling	
2. Use of hoisting equipment	
a. come-along	
b. chain falls	
c. erecting and dismantling derricks and cranes	
d. working with derricks and cranes	
e. use of signals and safety	
3. Use of tackle	
a. block and tackle	
b. chokers, cables and slings	
c. proper use of knots and splicing	
d. proper use of clamps	
e. safety	
4. Moving pieces	

- a. rollers
- b. levers
- c. use of tackle, come-alongs and chain-falls
- d. safety

C. General Erection

1,100

- 1. Steel erection in this trade's jurisdiction
 - a. designating location of members
 - b. raising in place
 - c. use of spud-wrench, bull, and drift-pins, jacks, wedges, clips, and saddles
 - d. alignment
 - 1. use of level, plumb, tape and rule
 - e. connecting
 - 1. drilling, reaming, chipping, caulking and grinding
 - 2. bolting up
 - 3. welding (tack)
 - 4. riveting
- 2. Setting drums and headers
 - a. use of hoisting equipment and tackle
 - b. use of water level, plumb and measuring devices

D. Tube Installations

400

- 1. Entering
 - a. use of come-alongs and entering devices
 - b. lipping
- 2. Setting and aligning
 - a. use of spacers
 - b. use of strong-backs
- 3. Getting proper stock
 - a. signals (sound and light)
 - b. come-alongs
 - c. piece of stock
 - d. boiler code

4. Rolling
 - a. use of erectors' guides, or
 - b. proper selection of the following:
 1. expanders, rollers, pins, and mandrels
 - c. use of rolling machines
 1. pneumatic, electric and ratchet
 2. lubricants
 - d. use of gauges and signals
 - e. heavy tube sheets
 - f. entering and connecting baffles
 - g. testing
 1. visual
 2. water (use of hydrostatic pump)
 3. air
 4. use of gauges

E. Use of Blueprint and Layout

400

1. Use of prints to designate the following:
 - a. locating parts at unloading
 - b. moving parts to job location
 - c. parts to be hoisted into position
 - d. use of bench mark
 - e. symbols
2. Layout
 - a. use of precision measuring devices
 - b. marking for correction, re-cutting and fitting
 - c. directing, cutting, and fitting of parts
 - d. geometric measuring of parts, tube holes, etc.
 - e. working with foreperson

F. Welding and Burning

3,000

1. Electric welding, heli-arc or other methods of machine welding
 - a. proper adjustment of machines

- b. application and use of electrodes on all metals, ferrous and non-ferrous
- c. metal spraying and hard facing
- 2. Acetylene
 - a. proper adjustment, gauges and torch
 - b. selection of tips
 - c. handling of torch and application
 - 1. ferrous and non-ferrous metals
- 3. Burning
 - a. acetylene
 - b. arc (cutting and gouging)
 - c. machine methods
 - d. adjusting and operating of equipment
 - 1. ferrous
 - 2. non-ferrous

Approximate Total Hours 6,000

Apprenticeship work processes are applicable only to training curricula for apprentices in approved programs. Apprenticeship work processes have no impact on classification determinations under Article 8 or 9 of the Labor Law. For guidance regarding classification for purposes of Article 8 or 9 of the Labor Law, please refer to <https://dol.ny.gov/public-work-and-prevailing-wage>

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APPENDIX B

RELATED INSTRUCTION

YEAR 1 (144 hours minimum)

1. Applied Math I - V
2. Applied Metric Math
3. Rigging
 - a. Basic Principles
 - b. Ropes
 - c. Tools
 - d. Cranes and Other Lifting Equipment
 - e. Equalizing and Distributing Loads
4. Rigging and Boilermaker Safety
5. OSHA 10-Hour Construction Course – if required for Public Work
6. Asbestos Safety – course approved by NYS Department of Health for “Asbestos Handler” certificate (32 hours). Annual refresher training required.
 - a. Handler” certificate (32 hours). Annual refresher training required.
7. Sexual Harassment Prevention Training – minimum 3 hours

YEAR 2 (144 hours minimum)

1. Mechanical Drawing
 - a. Tools and Lettering
 - b. Geometric Construction
 - c. Orthographic
 - d. Isometric and Oblique
 - e. Dimensioning
 - f. Field Sketching
2. Layout Procedures and Techniques
3. Boilermaker Hand Tools

4. Boilermaker Power Tools
5. Construction Materials I and II
6. Blueprint Reading: Structural
7. Industrial and Labor Relations (20 hours)
 - a. History and background (6 hours)
 - b. Current laws and practices (14 hours)

YEAR 3 (144 hours minimum)

1. Boiler Systems and Components I and II
2. Nuclear Power
 - a. Theory
 - b. Types of Nuclear Power Plants
 - c. Safety
 - d. Radiation YEAR
 - e. Radiation Protection
 - f. Requirements for Joints of High Integrity
3. Tanks, Vessels, and Other Components
4. Blueprint Reading: Boilermaker
5. Boiler
 - a. Installation
 - b. Repair and Maintenance
6. Welding and Cutting
 - a. Basic
 - b. Blueprint Reading
 - c. Safety (including First Aid – minimum 6.5 hours every 3 years)
7. Metallurgy
 - a. Welding
 - b. Weldability of Metals

YEAR 4 (144 hours minimum)

1. ARC Welding
 - a. Equipment
 - b. Shielded Metal I and II

- c. Gas Tungsten (TIG)
- d. Gas Metal (MIG)
- e. Other Processes
- 2. Cutting
 - a. Oxyfuel I and II
 - b. ARC
- 3. Welding
 - a. Special Applications and Techniques
 - b. Design, Testing, and Inspection
 - c. Performance Qualifications

A minimum of 144 hours per year for each of the four years of the apprenticeship is required for each apprentice.

Appendix B topics are approved by New York State Education Department.