



Boilermaker

On-the-Job Training Guide

2024

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Recognition:

To promote transparency and consistency, portions of this document has been adapted from the 2016 Boilermaker Red Seal Occupational Standard (Employment and Social Development Canada).

A complete version of the Occupational Standard can be found at www.red-seal.ca

STRUCTURE OF THE ON-THE-JOB TRAINING GUIDE

To facilitate understanding of the occupation, this on-the-job training guide contains the following sections:

Task Matrix: a chart which outlines graphically the major work activities, tasks and sub-tasks of this standard detailing the essential skills and the level of training where the content is covered.

Major Work Activity (MWA): the largest division within the standard that is comprised of a distinct set of trade activities.

Task: distinct actions that describe the activities within a major work activity.

Sub-task: distinct actions that describe the activities within a task.

On-the-Job and In-school Training Content for the Boilermaker Trade: a chart which outlines the topics of technical training with on-the-job examples for apprentices to achieve relevant experience at work.

TRAINING REQUIREMENTS FOR THE BOILERMAKER TRADE

To graduate from each level of the apprenticeship program, an apprentice must successfully complete the required technical training and compile enough on-the-job experience to total at least 1800 hours each year. Total trade time required is 5400 hours and at least 3 years in the trade.

Journeyman to apprentice ratio for this trade is: 2:1

The information contained in this document serves as a guide for employers and apprentices. Apprenticeship training is mutually beneficial to both employer and apprentice. The employer's investment in training apprentice's results in skilled and certified workers. The document summarizes the tasks to be covered by the apprentice during their on-the-job portion of apprenticeship training. An apprentice spends approximately 85% of their apprenticeship term training on-the-job.

It is the employer's or journeyman's responsibility to supervise an apprentice's practical skills development until a satisfactory level of proficiency has been reached.

EMPLOYER TRAINING RESPONSIBILITY

- promote a safety-conscious workplace
- provide mentored, hands-on practice in the use of tools and equipment
- expose apprentices to all appropriate tools, equipment and trade practices
- provide guided, hands-on practice in rigging and hoisting techniques
- provide and maintain safety equipment, and protective devices and clothing
- further the apprentice's ability to interpret technical drawings
- ensure that the apprentice can evaluate the end product.

Employers should make every effort to expose their apprentices to work experience in as many areas of the trade as possible.

In the On-the-Job Training Guide, in-school instruction is listed first; on-the-job suggestions to help employers assist the apprentice to prepare for in-school training are listed next.

The content of the training components is subject to change without notice.

BOILERMAKER TASK MATRIX CHART

This chart outlines the major work activities, tasks and sub-tasks from the 2016 Boilermaker Red Seal Occupational Standard. Each sub-task details the corresponding essential skill and level of training where the content is covered. *

* Sub-tasks with numbers in the boxes is where the content will be delivered in training.

A - Performs Common Occupational Skills

26%

A-1 Performs safety-related functions	1.01 Uses personal protective equipment (PPE) and safety equipment 1 (In Context 2, 3)	1.02 Maintains safe work environment 1 (In Context 2, 3)	1.03 Monitors confined spaces 1 (In Context 2, 3)		
A-2 Uses tools, equipment and work platforms	2.01 Uses hand tools 1	2.02 Uses power tools 1, 2, 3	2.03 Uses shop equipment 1, 2, 3	2.04 Uses cutting and welding tools and equipment 1, 2, 3	2.05 Uses work platforms and access equipment 1, 2, 3
	2.06 Uses aerial work platforms 1, 2, 3				
A-3 Organizes work	3.01 Organizes project tasks and procedures 1, 2, 3	3.02 Uses drawings and specifications 1, 2, 3	3.03 Handles materials and components 1, 2, 3	3.04 Demobilizes site 1, 2	

A-4 Uses communication and mentoring techniques	4.01 Uses communication techniques 1 (In Context 2)	4.02 Uses mentoring techniques 3 (In Context 2)			
A-5 Performs cutting and welding activities	5.01 Cuts material 1, 2	5.02 Prepares joints for fitting 1, 2, 3	5.03 Fits joints 1, 2, 3	5.04 Performs tack welds 1	5.05 Performs basic welding 1, 2, 3
	5.06 Performs advanced welding 3				

B – Performs Rigging and Hoisting

29%

B-6 Plans lift	6.01 Determines load 1, 2, 3	6.02 Performs pre-lift analysis 3	6.03 Selects rigging and hoisting equipment 1, 2, 3	6.04 Secures lift area 1
B-7 Rigs load	7.01 Inspects rigging equipment 1, 2	7.02 Fabricates rigging equipment 3	7.03 Attaches rigging equipment to load 1, 2	

B-8 Hoists load	8.01 Inspects hoisting equipment 1, 2	8.02 Assembles hoisting equipment 2, 3	8.03 Performs hoisting operations 1, 2, 3	8.04 Secures load before rigging removal 2
B-9 Performs post-lift activities	9.01 Conducts post-lift inspection 1, 2	9.02 Disassembles hoisting equipment 1, 2, 3	9.03 Maintains rigging equipment 1	

C – Completes New Construction

22%

C-10 Performs fabrication	10.01 Lays out components for fabrication 1, 2, 3	10.02 Cuts components for fabrication 1, 2	10.03 Forms components for fabrication 2, 3	10.04 Constructs components 1, 2, 3
C-11 Assembles and fits vessels and components	11.01 Aligns vessels and components 2, 3	11.02 Fits vessels and components 2, 3		

D – Performs Repairs, Maintenance, Upgrading and Testing

21%

D-13 Services vessels and components	13.01 Inspects vessels and components for defects 2	13.02 Prepares vessels and components for servicing 1, 2, 3	13.03 Repairs vessels and components 2, 3	13.04 Performs preventative maintenance and upgrades 2, 3	13.05 Tests materials, vessels and components 2, 3
D-14 Removes vessels and components	14.01 Dismantles vessels and components 2, 3	14.02 Removes materials 3			

TRAINING PROFILE CHART

This Training Profile Chart represents Saskatchewan Apprenticeship and Trade Certification Commission (SATCC) technical training at the topic level.

Level One	Unit Title	Hours
General Safety	Trade Safety Awareness	7
	Orientation I: Structure/Scope of Trade	7
	Common Hazards	14
	Safety Equipment, W.C.B. and Interpersonal and Essential Skills	11
	Emergency First Aid and C.P.R.	8
Basic Rigging	Ropes	19
	Hoisting	12
	Wire Rope and Attachments	10
Tools, Cutting and Welding	Hand and Power Tools	15
	Basic Materials	12
	Materials Preparation and Assembly	8
	Basic Drafting	24
	Introduction to Layout	8
Materials Knowledge	Electric Arc Welding	35
	Oxy-fuel Cutting	30
Drawing Interpretation	Trade Mathematics One	25
	Metallurgy One	15
	Trade Related Components	10
	Identification of Pressure Vessels	10
		280

Level Two	Unit Title	Hours
Tools, Cutting and Welding	Cutting, Welding and Related Processes	67
	Power Tools (Electric and Pneumatic)	15
	Instruments and Shop Equipment	25
	Metallurgy Two	7
Layout and Fitting	Drawing Interpretation One	24
	Layout and Fabricating	42
	Fibreglass Fitting	12
	Trade Mathematics Two	25
General Rigging	Block and Tackle	20
	Wire Rope Drums, Aerial Access and Equipment, and Scaffolds	15
	Lifting Practices	20
Materials and Related Knowledge	Heat Treatment	8
		280

Level Three	Unit Title	Hours
Materials and Related Knowledge	Business Practices	10
	Orientation II: Journeywork	7
	Advanced Metallurgy	10
	Inspection / Testing of Materials	20
Advanced Rigging	Hoisting and Jacking Equipment and Engineered Lifts	13
	Advanced Block and Tackle	12
	Advanced Cranes	10
Layout and Fitting	Drawing Interpretation Two	7
	Trade Mathematics	20
	Layout	30
	Fitting	30
Trade Related Components	Boilers	30
	Condensers and Exchangers	30
	Tanks	30
	Introductions to Other Heavy Industries	10
	Pre-IP Review: Examination Review	11
		280

ON-THE JOB AND IN-SCHOOL TRAINING

CONTENT FOR THE BOILERMAKER TRADE

This chart outlines on-the-job examples for apprentices to achieve relevant work experience to prepare for the topics of technical training. Topics of technical training are provided with the associated learning outcomes.

Level One	8 weeks	280 hours
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General Safety		47 hours
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- Trade Safety Awareness
- Common Hazards
- proper use of safety equipment
- Workers' Compensation Board
- Interpersonal and Essential Skills
- Emergency First Aid and CPR

Mentors can assist the apprentice to prepare for this section of technical training by:

- *the practice and promotion of safety in the workplace including proper use of PPE*
- *assisting in the interpretation of safety legislation*
- *demonstrating the safe use of scaffolds, walkways and ladders*

Basic Rigging		41 hours
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- Ropes
- Hoisting
- Wire Ropes and Attachments

Mentors can assist the apprentice to prepare for this section of technical training by:

- *demonstrating the safe and proper use of crane and rigging equipment at the workplace*
- *reviewing rigging, hoisting and turning of loads, and OH&S requirements for crane operation*
- *offering hands-on opportunities to be a signalman*

Tools, Cutting and Welding		67 hours
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- Hand and Power Tools
- Basic Materials
- Materials Preparation and Assembly
- Basic Drafting
- Introduction to Layout

Mentors can assist the apprentice to prepare for this section of technical training by:

- *training and supervising in the use of hand tools*
- *offering hands-on opportunities to perform cutting, welding and related processes*
- *providing awareness of company policies and procedures such as quality standards*

Materials Knowledge**65 hours**

- Electric Arc Welding
- Oxy-fuel Cutting

Mentors can assist the apprentice to prepare for this section of technical training by:

- *developing further their knowledge of metal identification and physical properties*
 - *explaining the selection of structural shapes, plate, expanded mesh, grating, hollow structural shapes, and specialty tubes*
 - *allowing apprentices to demonstrate identification and use of various materials*
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Drawing Interpretation**75 hours**

- Trade Mathematics One
- Metallurgy One
- Trade Related Components
- Identification of Pressure Vessels

Mentors can assist the apprentice to prepare for this section of technical training by:

- *encouraging apprentices to utilize drawings where possible and demonstrate proper interpretation*
- *exposing apprentices to trades math where possible*
- *providing instruction regarding lines, projections, views and dimensioning*

Level Two

8 weeks

280 hours

Tools, Cutting and Welding

114 hours

- Cutting, Welding and Related Processes
- Power tools (electric and pneumatic)
- Instruments and Shop Equipment
- Metallurgy Two

Mentors can assist the apprentice to prepare for this section of technical training by:

- *offering hands-on opportunities in the related tools and shop equipment*
 - *providing instruction on awareness and identification various types of alloys used in industry*
 - *reviewing 90° and bevel cuts using manual oxy-fuel equipment*
 - *explaining how to cut structural shapes*
 - *providing instruction on using the motorized cutting carriage cut plate using plasma arc cutting*
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Layout and Fitting

103 hours

- Drawing Interpretation One
- Layout and Fabricating
- Fibreglass Fitting
- Trade Mathematics Two

Mentors can assist the apprentice to prepare for this section of technical training by:

- *explaining the interpretation of intermediate drawings*
 - *identifying joint and weld types, welding symbols and technical abbreviations*
 - *explaining material take-off*
 - *encouraging apprentices to perform general layout reading and interpreting drawings*
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General Rigging

55 hours

- Block and Tackle
- Wire Rope Drums, Aerial Access and Equipment, and Scaffolds
- Lifting Practices

Mentors can assist the apprentice to prepare for this section of technical training by:

- *ensuring the safe and proper use of crane and rigging equipment at the workplace*
 - *explaining the selection of aerial work platforms and describing their characteristics, limitations and applications*
 - *reviewing rigging, hoisting and turning of loads, and OH&S requirements for crane operation*
 - *offering hands-on opportunities to be a signaller*
 - *offering hands-on on experience with rigging loads using general rigging techniques*
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Materials and Related Knowledge

8 hours

- Heat Treatment

Mentors can assist the apprentice to prepare for this section of technical training by:

- *furthering their knowledge of metal identification and physical properties*

Level Three

8 weeks

280 hours

Materials and Related Knowledge

47 hours

- Business Practices
- Orientation ii: Journeywork
- Advanced Metallurgy
- Inspection / Testing of Materials

Mentors can assist the apprentice to prepare for this section of technical training by:

- *furthering their knowledge of metal identification and physical properties*
 - *explaining the selection of structural shapes, plate, expanded mesh, grating, hollow structural shapes, and specialty tubes*
 - *allowing apprentices to identify and use of various materials*
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Advanced Rigging

35 hours

- Hoisting and Jacking Equipment and Engineered Lifts
- Advanced Block and Tackle
- Advanced Cranes

Mentors can assist the apprentice to prepare for this section of technical training by:

- *reviewing rigging, hoisting and turning of loads, and OH&S requirements for crane operation*
 - *demonstrating the safe use of wire rope, chains, attachments, and lifting and jacking devices*
 - *offering hands-on opportunities to be a signalman*
 - *offering hands-on experience with rigging loads using general rigging techniques*
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Layout and Fitting

50 hours

- Drawing Interpretation Two
- Trade Mathematics
- Layout
- Fitting

Mentors can assist the apprentice to prepare for this section of technical training by:

- *explaining the interpretation of intermediate drawings*
 - *identifying joint and weld types, welding symbols and technical abbreviations*
 - *explaining material take-off*
 - *encouraging apprentices to perform general layout reading and interpreting drawings*
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Trade Related Components

50 hours

- Boilers
- Condensers and Exchangers
- Tanks
- Introductions to Other Heavy Industries
- Pre-IP Review: Examination Review

Mentors can assist the apprentice to prepare for this section of technical training by:

- *orient apprentices on components associated with different trade related equipment*
- *offering apprentices the widest variety of work experience available*

Consider apprenticeship training as an investment in the future of your company and in the future of your workforce. Ultimately, skilled and certified workers increase your bottom line.

Get involved in the apprenticeship training system. Your commitment to training helps to maintain the integrity of the trade.

Do you have employees who have been working in the trade for a number of years but don't have trade certification? Contact your local apprenticeship office for details on how they might obtain the certification they need.

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