

Issued: August 22, 2016

Program: Welder

**To:** ITA Training Providers  
Articulation Chair  
System Liaison Person  
School Districts

**Subject** Pan-Canadian Harmonization and Welder Program Update

**OPSN No.:** OPSN 2016-014

**Effective Date:** March 31, 2017

**Summary of Changes:** Please be advised that changes have occurred to the Welder program as result of the Pan-Canadian Harmonization Initiative and will be implemented effective March 31, 2017.

These changes are as follows:

- Welder Program Outline Update
- Technical Training Duration Increase - Level 3, 10 weeks (from 8 weeks)
- Increased Work Based Training Hours – 4,620 hours (from 4,500 hours)

**Rationale:** At the request of industry, the Canadian Council of Directors of Apprenticeship (CCDA)'s Harmonization Initiative was launched in Fall 2013, and endorsed by the Forum of Labour Market Ministers (FLMM) in 2014. The goal of Harmonization is to *substantively align* apprenticeship systems across Canada by making apprenticeship training requirements more consistent in Red Seal trades.

In consultation with stakeholders, the CCDA identified four harmonization priorities:

1. Use of Red Seal **trade name**
2. Consistent **total training hours** (in-school and on-the-job)
3. Same number of **training levels**
4. Consistent **sequencing** of training content, including use of most recent National Occupational Analysis.

Phase One sought to harmonize ten trades, which included Welder. After a series of consultations and pan-Canadian webinars, the finalized priorities for Welder were as follows:

1. Trade name – Welder (no change)
2. Total training hours – 5,400 (minor change)
3. Number of levels – 3 (no change)
4. Sequencing of content – (changed – see ***Outline Review Details*** attached or the Program Outline at [http://www.itabc.ca/program/welder.](http://www.itabc.ca/program/welder))

The changes to the sequencing of technical training prompted a review of the BC Welder Program to align it to the harmonized sequencing.

**Details: Welder Program Outline Update**

A Welder Program Review was conducted in November 2015 to align the ITA Welder Program to the Harmonized Sequencing. The review process resulted in several changes to the sequence of technical training.

ITA will work with the BCATTA Harmonization Implementation group to identify transition strategies for training providers. ITA is also working on a communication plan to inform apprentices and employers of the changes to the program

**Technical Training Duration Increase - Level 3, 10 weeks**

During the realignment of the Welder Program Outline, there was an analysis of Training Time Allocation.

ITA has approved an additional 2 weeks of technical training for Level 3 of the Welder program effective March 31, 2017.

**Increased Work Based Training Hours**

Due to national consensus of 5,400 total training hours for the Harmonized Welder program, the work based training hours required to complete the program will increase from 4,500 to 4,620 hours effective March 31, 2017. This increase will apply only to new apprenticeship registration on or after March 31, 2017.

**Attachments: *Welder Program Outline Review Details***

This attachment provides details of the revisions made to the Welder Program Outline during the review process.

**For more information contact:** Angela Caughy  
Program Development Officer  
email: [acaughy@itabc.ca](mailto:acaughy@itabc.ca)

**cc:** All Staff

**Welder Program Outline Review Details - Harmonization**

**Summary - Competency Migration  
Details of Changes**

	<b>Current Level 1</b>		<b>Harmonized Level 1</b>	<b>Description of Changes</b>
<b>Line A</b>	<b>Occupational Skills</b>	<b>Line A</b>	<b>Occupational Skills</b>	
A1	Describe the welder apprenticeship and scope of the trade in BC			Removed from Level 1, will remain in Foundation only
A2	Describe safe working practices	A2	Describe safe working practices	No change
A3	Perform basic trade related mathematical calculations	A3	Perform basic trade related mathematical calculations	No change
A4	Use measuring and layout tools	A4	Use and maintain measuring and layout tools	Re-word
A5	Use hand tools	A5	Use and maintain hand tools	Re-word
A6	Use power tools (electric and pneumatic)	A6	Use and maintain power tools (electric and pneumatic)	Re-word
		A7	Describe shop materials	New: to meet NOA content
		A8	Apply lifting, hoisting and rigging procedures	Split between level 1 & 2 (was level 2 only)
<b>Line B</b>	<b>Oxy-Fuel Cutting and Gouging Processes (OFC and OFG)</b>	<b>Line B</b>	<b>Cutting and Gouging Processes</b>	<b>Title Change/merge former Line E</b>
B1	Describe OFC and OFG processes and their applications	B1	Describe Oxy-Fuel Cutting (OFC) processes and their applications	Re-word
B2	Describe OFC and OFG equipment and its operation	B2	Describe Oxy-Fuel Cutting (OFC) equipment and its operation	Re-word
B3	Perform freehand and guided cuts on low carbon steel	B3	Perform freehand and guided cuts on low carbon steel (OFC)	Re-word
B4	Use automatic and semi-automatic cutting machines	B4	Use automatic and semi-automatic cutting machines (OFC)	Re-word
		B5	Describe CAC-C and PAC processes, equipment and their application	Formerly line E, removed SMAC
		B6	Use CAC-A and PAC cutting and gouging processes and equipment	Formerly line E
<b>Line C</b>	<b>Fusion and Braze Welding (TB) Using the Oxy-Fuel (OFW) Process</b>	<b>Line C</b>	<b>Fusion and Braze Welding (TB) Using the Oxy-Fuel (OFW) Process</b>	<b>Will remain in Foundation, Level 1: Theory required, practical OPTIONAL</b>
C1	Describe fusion welding, braze welding and brazing processes	C1	Describe fusion welding, braze welding and brazing processes	No change

**Welder Program Outline Review Details - Harmonization**

	Current Level 1		Harmonized Level 1	Description of Changes
	and their applications		and their applications	
C2	Describe fusion welding, braze welding and brazing equipment and its operation	C2	Describe fusion welding, braze welding and brazing equipment and its operation	No change
C3	Describe filler metals, fluxes and tips used for fusion welding, braze welding and brazing	C3	Describe filler metals, fluxes and tips used for fusion welding, braze welding and brazing	No change
C4	Describe joint design and weld positions	C4	Describe joint design and weld positions for OFW	Re-word
C5	Fusion weld on low carbon steel sheet	C5	Fusion weld on low carbon steel sheet	Optional Level 1, still remains in Foundation
C6	Braze weld (TB) using the OFW process	C6	Braze weld (TB) using the OFW process	Optional Level 1, still remains in Foundation
C7	Silver alloy braze on similar and dissimilar metals	C7	Silver alloy braze on similar and dissimilar metals	Optional Level 1, still remains in Foundation
<b>Line D</b>	<b>Shielded Metal Arc Welding (SMAW)</b>	<b>Line D</b>	<b>Shielded Metal Arc Welding (SMAW)</b>	
D1	Describe the SMAW process	D1	Describe the SMAW process	No change
D2	Describe SMAW equipment and its operation	D2	Describe SMAW equipment and its operation	No change
D3	Select and use electrodes for SMAW	D3	Select electrodes for SMAW	Re-word
D4	Describe basic joint design and weld positions	D4	Describe basic joint design and weld positions for SMAW	Re-word
D5	Describe weld faults and distortion in fabrication	D5	Describe weld faults and distortion in fabrication in SMAW	Re-word
D6	Use the SMAW process on low carbon steel plate and pipe	D6	Use the SMAW process on low carbon steel plate and pipe	No change
		D7	Use the hard surfacing process on low carbon steel	Moved from level 2/re-worded
		D9	Use the SMAW process on stainless steel and/or low carbon steel plate and pipe	Moved from level 2/re-worded
<b>Line E</b>	<b>Electric Arc Cutting, Gouging and Related Processes</b>			<b>Line Change &amp; now merged with Harmonized Line B</b>
E1	Describe CAC-A, PAC and SMAC processes, equipment and their applications			Merged with harmonized Line B and remove SMAC
E2	Use CAC-A and PAC cutting and gouging processes and equipment			Merged with harmonized Line B
		<b>Line E</b>	<b>Semi-Automatic and Automatic Welding</b>	<b>Line Change former Line F/Title change/merge former line M</b>

**Welder Program Outline Review Details - Harmonization**

	<b>Current Level 1</b>		<b>Harmonized Level 1</b>	<b>Description of Changes</b>
		E1	Describe GMAW, GMAW-P, FCAW, MCAW and SAW processes and their applications	Re-numbered and merge former line M
		E2	Describe semi-automatic and automatic welding equipment and its operation	Re-numbered/re-word and merge former line M
		E3	Describe filler metal and shielding gases for semi-automatic and automatic processes	Re-numbered/re-word and merge former line M
		E4	Use the GMAW and GMAW-P process	Re-numbered
		E5	Use the FCAW process	Re-numbered
<b>Line F</b>	<b>Semi-Automatic Welding</b>			<b>Line Change &amp; now merged with Harmonized Line E</b>
F1	Describe GMAW, GMAW-P, FCAW, and MCAW processes and their applications			Re-numbered and merged with harmonized Line E
F2	Describe semi-automatic welding equipment and its operation			Re-numbered and merged with harmonized Line E
F3	Describe filler metal and shielding gases for GMAW			Re-numbered and merged with harmonized Line E
F4	Use the GMAW process			Re-numbered and merged with harmonized Line E
F6	Use the FCAW process			Re-numbered and merged with harmonized Line E
		<b>Line I</b>	<b>Welding Drawings, Layout and Fabrication</b>	<b>Merge former Line I and Line J</b>
		I1	Identify common welding symbols and bolted connections	Moved from Level 2

	Current Level 2		Harmonized Level 2	Description of Changes
<b>Line A</b>	<b>Occupational Skills</b>	<b>Line A</b>	<b>Occupational Skills</b>	
A7	Describe hoisting, rigging and material handling	A8	Apply lifting, hoisting and rigging procedures	Re-numbered and split between level 1 & 2
<b>Line D</b>	<b>Shielded Metal Arc Welding (SMAW)</b>	<b>Line D</b>	<b>Shielded Metal Arc Welding (SMAW)</b>	
D3	Select and use electrodes for SMAW	D3	Select electrodes for SMAW	Re-worded
D6	Use the SMAW process on low carbon steel plate and pipe	D6	Use the SMAW process on low carbon steel plate and pipe	No change
D7	Describe using the hardsurfacing process on mild steel			Moved to Level 1/re-worded
D8	Describe using the SMAW process on grey cast iron	D8	Describe the SMAW process on grey cast iron	Re-worded, practical component removed
D9	Describe and use the SMAW process on stainless steel and/or mild steel plate			Moved to Level 1/re-worded
		<b>Line E</b>	<b>Semi-Automatic and Automatic Welding</b>	<b>Line Change former Line F/Title change/merge former line M</b>
		E4	Use the GMAW and GMAW-P process	Re-numbered
		E5	Use the FCAW process	Re-numbered
		E6	Use the MCAW process	Re-numbered
		E7	Use the SAW process	New
<b>Line F</b>	<b>Semi-Automatic Welding</b>			<b>Line Change now Harmonized Line E</b>
F4	Use the GMAW process			Re-numbered harmonized Line E
F5	Use the GMAW-P process			Re-numbered harmonized Line E
F6	Use the FCAW process			Re-numbered harmonized Line E
F7	Use the MCAW process			Re-numbered harmonized Line E

**Welder Program Outline Review Details - Harmonization**

		Line F	Gas Tungsten Arc Welding (GTAW)	Line Change former Line H and Split Between Level 2 & 3
		F1	Describe the GTAW process and its application	Moved from Level 3
		F2	Describe GTAW equipment and its operation	Moved from Level 3
		F3	Describe the application of GTAW for ferrous metals	Moved from Level 3 and re-worded
		F4	Use the GTAW process for ferrous metals	Moved from Level 3
		F5	Use the GTAW process for stainless steel	Moved from Level 3
Line G	Basic Metallurgy			Line Change now Harmonized Line H
G1	Describe production processes for manufacturing metals			Re-numbered harmonized Line H
G2	Describe mechanical and physical properties of ferrous and non-ferrous metals			Re-numbered harmonized Line H
G3	Describe common non-ferrous, reactive metals and their weldability			Re-numbered harmonized Line H and split between Level 2 and 3
		Line H	Basic Metallurgy	Line Change former Line G
		H1	Describe production processes for manufacturing metals	Re-numbered
		H2	Describe mechanical and physical properties of ferrous and non-ferrous metals	Re-numbered
		H3	Describe common ferrous, non-ferrous, reactive metals and their weldability	Split between Level 2 and 3, re-worded
Line I	Welding Drawings	Line I	Welding Drawings, Layout and Fabrication	Merge former Line I and Line J
I1	Perform mathematical calculations involving formulas, angles, triangles and geometric construction	I4	Perform mathematical calculations	Re-numbered and re-worded
I2	Perform basic drafting	I3	Perform basic drafting	Re-numbered
I3	Read and interpret drawings	I2	Read and interpret drawings	Re-numbered
I4	Identify common welding symbols and bolted connections	I5	Interpret and apply mechanical drawings and layout components	Re-numbered and re-worded
		I6	Fabricate weldments	Re-numbered



**Welder Program Outline Review Details - Harmonization**

		I7	Costing and Estimating	New: to meet NOA content
<b>Line J</b>	<b>Layout and Fabricate Components</b>			<b>Merged with Harmonized Line I</b>
J1	Interpret and apply mechanical drawings			Merged with Harmonized Line I
J2	Fabricate weldments			Merged with Harmonized Line I
<b>Line M</b>	<b>Submerged Arc Welding (SAW)</b>			<b>Merged with Harmonized Line E – Level 1</b>
M1	Describe SAW process and its applications			Merged with Harmonized Line E – Level 1
M2	Select operating parameters for the SAW process			Merged with Harmonized Line E – Level 1
M3	Describe filler metals and fluxes for SAW			Merged with Harmonized Line E – Level 1

	Current Level 3		Harmonized Level 3	Description of Changes
<b>Line D</b>	<b>Shielded Metal Arc Welding (SMAW)</b>	<b>Line D</b>	<b>Shielded Metal Arc Welding (SMAW)</b>	
		D3	Select electrodes for SMAW	New
D6	Use the SMAW process on low carbon steel plate and pipe	D6	Use the SMAW process on low carbon steel plate and pipe	No change
		<b>Line E</b>	<b>Semi-Automatic and Automatic Welding</b>	<b>Line Change former Line F/Title change/merge Line M</b>
		E4	Use the GMAW and GMAW-P process	Re-numbered
		E8	Use combined GMAW, FCAW and MCAW processes	New, was a learning task, now a competency on its own
<b>Line F</b>	<b>Semi-Automatic Welding</b>	<b>Line F</b>	<b>Gas Tungsten Arc Welding (GTAW)</b>	<b>Line Change former Line H and and split between 2 &amp; 3</b>
F4	Use the GMAW process	F4	Use the GTAW process for ferrous metals	Split between level 2 & 3
		F6	Use the GTAW process for aluminum	Re-numbered
<b>Line G</b>	<b>Basic Metallurgy</b>			<b>Line Change now Harmonized Line H</b>
G2	Describe mechanical and physical properties of ferrous and non-ferrous metals			Line change now Harmonized Line H
G4	Describe the grain structure of metals			Line change now Harmonized Line H
G6	Describe aluminum, aluminum alloys and their weldability			Line change now Harmonized Line H
		<b>Line H</b>	<b>Basic Metallurgy</b>	<b>Line Change former Line G</b>
		H2	Describe mechanical and physical properties of ferrous and non-ferrous metals	Re-numbered
		H3	Describe common ferrous, non-ferrous, reactive metals and their weldability	Split between level 2 & 3, re-worded
		H4	Describe the grain structure of metals	Re-numbered
		H5	Describe aluminum, aluminum alloys and their weldability	Re-numbered
<b>Line H</b>	<b>Gas Tungsten Arc Welding</b>			<b>Line Change now Harmonized Line F</b>



Welder Program Outline Review Details - Harmonization

	Current Level 3		Harmonized Level 3	Description of Changes
H1	Describe the GTAW process and its application			Moved to Level 2
H2	Describe GTAW equipment and its operation			Moved to Level 2
H3	Describe the application of GTAW for ferrous and non-ferrous metals			Moved to Level 2
H4	Use the GTAW process for ferrous metals			Split between level 2 & 3 and re-numbered
H5	Use the GTAW process for stainless steel			Moved to Level 2
H6	Use the GTAW process for aluminum			Re-numbered
<b>Line I</b>	<b>Welding Drawings</b>	<b>Line I</b>	<b>Welding Drawings, Layout and Fabrication</b>	<b>Merge former Line I and Line J</b>
I3	Read and interpret drawings	I2	Read and interpret drawings	Re-numbered
		I5	Interpret and apply mechanical drawings and layout components	Re-numbered/merged
		I6	Fabricate weldments	Re-numbered/merged
		<b>I7</b>	<b>Costing and estimating</b>	<b>New</b>
<b>Line J</b>	<b>Layout and Fabricate Components</b>			<b>Merged with Harmonized Line I</b>
J1	Interpret and apply mechanical drawings			Merged with Harmonized Line I
J2	Fabricate weldments			Merged with Harmonized Line I
		<b>Line J</b>	<b>Quality Control and Inspection</b>	<b>Line Change former Line K</b>
		J1	Describe basic welding quality control and inspection requirements	Re-numbered
		J2	Describe inspection and testing procedures	Re-numbered
		J3	Describe the scope of the welding supervisor and inspector responsibilities	Re-numbered
<b>Line K</b>	<b>Quality Control and Inspection</b>			<b>Line Change now Harmonized Line J</b>
K1	Describe basic welding quality control and inspection requirements			Re-numbered



**Welder Program Outline Review Details - Harmonization**

	<b>Current Level 3</b>		<b>Harmonized Level 3</b>	<b>Description of Changes</b>
K2	Perform inspections and testing procedures			Re-numbered
K3	Describe the scope of the welding supervisor and inspector responsibilities			Re-numbered
		<b>Line K</b>	<b>Standards, Codes, Specifications and Welder Qualifications</b>	<b>Line Change former Line L</b>
		K1	Identify applicable standards, codes, specifications and jurisdictional bodies	Re-numbered
		K2	Describe compliance with weld procedure specifications (WPS) and data sheets	Re-numbered
<b>Line L</b>	<b>Standards, Codes, Specifications and Welder Qualifications</b>			<b>Line Change now Harmonized Line K</b>
L1	Identify applicable standards, codes, specifications and jurisdictional bodies			Re-numbered
L2	Comply with weld procedure specifications (WPS) and data sheets			Re-numbered
<b>Line N</b>	<b>Specialized Processes</b>			<b>Line Change now new Line G in MPAW</b>
<b>N1</b>	<b>Describe specialized welding processes</b>			<b>Moved to MPAW</b>

	Current MPAW		New MPAW	Description of Changes
Line D	Shielded Metal Arc Welding (SMAW)	Line D	Shielded Metal Arc Welding (SMAW)	
		D3	Select and use electrodes	New
D6	Use the SMAW process on low carbon steel plate and pipe	D6	Use the SMAW process on low carbon steel plate and pipe	No change
		D9	Use the SMAW process on stainless steel and/or low carbon steel plate	New
		Line F	Gas Tungsten Arc Welding (GTAW)	Line Change former Line H
		F5	Use the GTAW process for stainless steel	Re-numbered
Line G	Basic Metallurgy			Line Change now new Line H
G3	Describe common non-ferrous, reactive metals and their weldability			Re-numbered
G5	Describe die castings and their weldability			Re-numbered
		Line G	Specialized Processes	Moved from Level 3 and Line Change former Line N
		G1	Describe specialized welding processes	Moved from Level 3 and re-numbered
Line H	Gas Tungsten Arc Welding (GTAW)			Line Change now new Line F
H4	Use the GTAW process for ferrous metals			Moved to Level 3 and re-numbered
H5	Use the GTAW process for stainless steel			Re-numbered
		Line H	Basic Metallurgy	Line Change former Line G
		H3	Describe common ferrous, non-ferrous, reactive metals and their weldability	Re-numbered/re-worded
		H6	Describe die castings and their weldability	Re-numbered



**Welder Program Outline Review Details - Harmonization**

		<b>Line I</b>	<b>Welding Drawings, Layout and Fabrication</b>	<b>Merge former Line I and Line J</b>
		I5	Interpret and apply mechanical drawings and layout components	Re-numbered
		I6	Fabricate weldments	Re-numbered
<b>Line J</b>	<b>Layout and Fabricate Components</b>			<b>Merged with Harmonized Line I</b>
J1	Interpret and apply mechanical drawings			Re-numbered
J2	Fabricate weldments			Re-numbered