

TRADE PROFILE

Industrial Electrician

2016



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PROGRAM  PROGRAMME
EXCELLENCE
RED SEAL · SCEAU ROUGE

RED SEAL
TRADE PROFILE
INDUSTRIAL
ELECTRICIAN



STRUCTURE OF THE RED SEAL TRADE PROFILE

This profile has two sections that provide a snapshot of the trade's description, and all trade activities as they are organized in the Red Seal Occupational Standard:

Description of the Industrial Electrician trade: An overview of the trade's duties, work environment, job requirements, similar occupations and career progression

Task Matrix: a chart which outlines graphically the major work activities, tasks and sub-tasks of this trade

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

A complete version of the occupational standard, which provides additional detail for the trade activities, skills and knowledge can be found at www.red-seal.ca

DESCRIPTION OF THE INDUSTRIAL ELECTRICIAN TRADE

“Industrial Electrician” is this trade’s official Red Seal occupational title approved by the CCDA. This standard covers tasks performed by an industrial electrician whose occupational title has been identified by some provinces and territories of Canada under the following names:

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
Electrician (Non-Construction)					■								
Industrial Electrician	■	■	■	■		■	■			■	■	■	

Industrial electricians install, maintain, test, troubleshoot, service and repair industrial electrical equipment and associated electrical controls. These include equipment or components directly or indirectly exposed to electrical power such as motors, generators, pumps and lighting systems. Industrial electricians are employed by electrical contractors and maintenance departments of plants, mines, manufacturing facilities, government, and other industrial establishments.

Industrial electricians must read and interpret prints, drawings and codes for layout and installation of electrical equipment. They install, service and maintain electrical components such as lighting fixtures, switches, conduit and electrical controls. They test electrical systems and continuity of circuits using test equipment to ensure system safety and compatibility. They conduct preventative and predictive maintenance programs and keep maintenance records. Industrial electricians may specialize in maintenance functions in areas such as high voltage and process control.

Industrial electricians must possess manual dexterity, and good planning, organizational and communication skills. They also require strong analytical, mathematical and problem-solving skills in order to read and interpret schematics, drawings and specifications. They should have good mechanical aptitude to install, troubleshoot and repair equipment. It is important for industrial electricians to have a good grasp of digital technology because many of the skills and technology for an industrial electrician are computer based. They must also have good vision and hearing, the ability to distinguish colours and a willingness to upgrade their skills to adapt to new developments in the trade.

The work environment of industrial electricians can expose them to hazards. Their work is performed indoors or outdoors in extreme climate conditions, and may be at variable heights or in confined spaces. Occupational risks include electrical shocks, arc flashes, falls, and injury from lifting and kneeling.

This occupational standard recognizes similarities or overlaps with the work of construction electricians, powerline technicians, instrumentation and control technicians, electric motor systems technicians, heating, ventilation and air conditioning (HVAC) technicians, telecommunications technicians and industrial mechanics (millwrights). Industrial electricians also work with process operators, engineers and inspectors.

With experience, industrial electricians may act as mentors and trainers to apprentices in the trade. They may also advance to managerial, inspection, facilitation or teaching positions.

INDUSTRIAL ELECTRICIAN

TASK MATRIX

A - PERFORMS COMMON OCCUPATIONAL SKILLS

11%

<p>Task A-1 Performs safety-related functions 25%</p>	<p>A-1.01 Maintains safe work environment</p>	<p>A-1.02 Uses personal protective equipment (PPE) and safety equipment</p>	<p>A-1.03 Performs lock-out and tag-out procedures</p>
	<p>A-1.04 Identifies environmental conditions</p>		
<p>Task A-2 Uses tools and equipment 20%</p>	<p>A-2.01 Uses common and specialty tools and equipment</p>	<p>A-2.02 Uses access equipment</p>	<p>A-2.03 Uses rigging, hoisting and lifting equipment</p>
<p>Task A-3 Organizes work 16%</p>	<p>A-3.01 Interprets plans, drawings and specifications</p>	<p>A-3.02 Identifies hazardous locations</p>	<p>A-3.03 Organizes materials and supplies</p>
	<p>A-3.04 Plans project tasks and procedures</p>	<p>A-3.05 Prepares worksite</p>	<p>A-3.06 Finalizes required documentation</p>
<p>Task A-4 Fabricates and installs support components 15%</p>	<p>A-4.01 Fabricates support structures</p>	<p>A-4.02 Installs brackets, hangers and fasteners</p>	<p>A-4.03 Installs seismic restraint systems</p>
<p>Task A-5 Commissions and decommissions electrical systems 18%</p>	<p>A-5.01 Commissions systems</p>	<p>A-5.02 Performs shutdown and startup procedures</p>	<p>A-5.03 Decommissions systems</p>
<p>Task A-6 Uses communication and mentoring techniques 6%</p>	<p>A-6.01 Uses communication techniques</p>	<p>A-6.02 Uses mentoring techniques</p>	

B - INSTALLS AND MAINTAINS GENERATING, DISTRIBUTION AND SERVICE SYSTEMS

25%

Task B-7
 Installs and maintains consumer/supply services and metering equipment
13%

B-7.01 Installs single-phase consumer/supply services and metering equipment

B-7.02 Maintains single-phase consumer/supply services and metering equipment

B-7.03 Installs three-phase consumer/supply services and metering equipment

B-7.04 Maintains three-phase consumer/supply services and metering equipment

Task B-8
 Installs and maintains protection devices
14%

B-8.01 Installs overcurrent protection devices

B-8.02 Maintains overcurrent protection devices

B-8.03 Installs ground fault, arc fault and surge protection devices

B-8.04 Maintains ground fault, arc fault and surge protection devices

B-8.05 Installs under and over voltage protection devices

B-8.06 Maintains under and over voltage protection devices

Task B-9
 Installs and maintains low voltage distribution systems
11%

B-9.01 Installs low voltage distribution equipment

B-9.02 Maintains low voltage distribution equipment

Task B-10
 Installs and maintains power conditioning systems
10%

B-10.01 Installs power conditioning systems

B-10.02 Maintains power conditioning systems

Task B-11
 Installs and maintains bonding, grounding and ground fault detection systems
14%

B-11.01 Installs grounding systems

B-11.02 Maintains grounding systems

B-11.03 Installs bonding systems

B-11.04 Maintains bonding systems

B-11.05 Installs ground fault detection systems

B-11.06 Maintains ground fault detection systems

Task B-12
 Installs and maintains power generating systems
9%

B-12.01 Installs alternating current (AC) generating systems

B-12.02 Maintains AC generating systems

B-12.03 Installs direct current (DC) generating systems

Task B-13
Installs and maintains renewable energy generating and storage systems
7%

Task B-14
Installs and maintains high voltage systems
9%

Task B-15
Installs and maintains transformers
13%

B-12.04 Maintains DC generating systems

B-13.01 Installs renewable energy generating and storage systems

B-13.02 Maintains renewable energy generating and storage systems

B-14.01 Installs high voltage systems

B-14.02 Maintains high voltage systems

B-15.01 Installs extra-low voltage transformers

B-15.02 Maintains extra-low voltage transformers

B-15.03 Installs low voltage single-phase transformers

B-15.04 Maintains low voltage single-phase transformers

B-15.05 Installs low voltage three-phase transformers

B-15.06 Maintains low voltage three-phase transformers

B-15.07 Installs high voltage transformers

B-15.08 Maintains high voltage transformers

C - INSTALLS AND MAINTAINS WIRING SYSTEMS

19%

<p>Task C-16 Installs and maintains raceways, cables, conductors and enclosures 31%</p>	<p>C-16.01 Installs conductors and cables</p>	<p>C-16.02 Maintains conductors and cables</p>	<p>C-16.03 Installs conduit, tubing and fittings</p>
<p>Task C-17 Installs and maintains branch circuitry and devices 26%</p>	<p>C-16.04 Installs raceways</p>	<p>C-16.05 Installs boxes and enclosures</p>	<p>C-16.06 Maintains conduit, tubing, fittings, raceways, boxes and enclosures</p>
<p>Task C-18 Installs and maintains heating, ventilation and air-conditioning (HVAC) electrical components 13%</p>	<p>C-17.01 Installs luminaires</p>	<p>C-17.02 Maintains luminaires</p>	<p>C-17.03 Installs wiring devices</p>
<p>Task C-19 Installs and maintains electric heating systems and controls 14%</p>	<p>C-17.04 Maintains wiring devices</p>	<p>C-18.01 Connects power to HVAC systems and associated equipment</p>	<p>C-18.02 Installs HVAC controls</p>
<p>Task C-20 Installs and maintains exit and emergency lighting systems 9%</p>	<p>C-19.01 Installs electric heating systems and controls</p>	<p>C-19.02 Maintains electric heating systems and controls</p>	<p>C-18.03 Maintains HVAC electrical components</p>
<p>Task C-21 Installs and maintains cathodic protection systems 7%</p>	<p>C-20.01 Installs exit and emergency lighting systems</p>	<p>C-20.02 Maintains exit and emergency lighting systems</p>	
	<p>C-21.01 Installs cathodic protection systems</p>	<p>C-21.02 Maintains cathodic protection systems</p>	

D - INSTALLS AND MAINTAINS ROTATING AND NON-ROTATING EQUIPMENT AND CONTROL SYSTEMS

18%

Task D-22
Installs and maintains motor starters and control devices
32%

D-22.01 Installs motor starters

D-22.02 Maintains motor starters

D-22.03 Installs motor control devices

D-22.04 Maintains motor control devices

Task D-23
Installs and maintains drives
26%

D-23.01 Installs AC drives

D-23.02 Maintains AC drives

D-23.03 Installs DC drives

D-23.04 Maintains DC drives

Task D-24
Installs and maintains non-rotating equipment and associated controls
15%

D-24.01 Installs non-rotating equipment and associated controls

D-24.02 Maintains non-rotating equipment and associated controls

Task D-25
Installs and maintains motors
27%

D-25.01 Installs single-phase motors

D-25.02 Maintains single-phase motors

D-25.03 Installs three-phase motors

D-25.04 Maintains three-phase motors

D-25.05 Installs DC motors

D-25.06 Maintains DC motors

E - INSTALLS AND MAINTAINS SIGNALLING AND COMMUNICATION SYSTEMS

9%

<p>Task E-26 Installs and maintains signalling systems 37%</p>	<p>E-26.01 Installs fire alarm systems</p>	<p>E-26.02 Maintains fire alarm systems</p>	<p>E-26.03 Installs security and surveillance systems</p>
	<p>E-26.04 Maintains security and surveillance systems</p>		
<p>Task E-27 Installs and maintains communication systems 32%</p>	<p>E-27.01 Installs communication systems</p>	<p>E-27.02 Maintains communication systems</p>	
<p>Task E-28 Installs and maintains building automation systems 31%</p>	<p>E-28.01 Installs building automation systems</p>	<p>E-28.02 Maintains building automation systems</p>	

F - INSTALLS AND MAINTAINS PROCESS CONTROL SYSTEMS

18%

<p>Task F-29 Installs and maintains input/output (I/O) devices 41%</p>	<p>F-29.01 Installs discrete input/output (I/O) devices</p>	<p>F-29.02 Maintains discrete input/output (I/O) devices</p>	<p>F-29.03 Installs analog input/output (I/O) devices</p>
	<p>F-29.04 Maintains analog input/output (I/O) devices</p>		
<p>Task F-30 Installs, programs and maintains automated control systems 37%</p>	<p>F-30.01 Installs automated control systems</p>	<p>F-30.02 Maintains automated control systems</p>	<p>F-30.03 Programs automated control systems</p>
	<p>F-30.04 Optimizes system performance</p>		
<p>Task F-31 Installs and maintains pneumatic and hydraulic control systems 22%</p>	<p>F-31.01 Installs pneumatic control systems</p>	<p>F-31.02 Maintains pneumatic control systems</p>	<p>F-31.03 Installs hydraulic control systems</p>
	<p>F-31.04 Maintains hydraulic control systems</p>		

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