

# TRADE PROFILE

## Construction Electrician



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**CONSTRUCTION  
ELECTRICIAN**

**RED SEAL  
TRADE PROFILE**



# 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 Construction 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](http://www.red-seal.ca)

# DESCRIPTION OF THE CONSTRUCTION ELECTRICIAN TRADE

“Construction Electrician” is this trade’s official Red Seal occupational title approved by the CCDA. This standard covers tasks performed by a construction 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
Construction Electrician	■	■	■	■			■	■				■	
Electrician									■				
Electrician (Construction)					■					■	■		■
Electrician Construction and Maintenance						■							

Construction electricians plan, design, assemble, install, alter, repair, inspect, verify, commission, connect, operate, maintain and decommission electrical systems. Electrical systems provide heating, lighting, power, alarm, security, communication and control in residential, commercial, institutional, industrial, transportation and entertainment environments. Construction electricians may be self-employed or employed by electrical contractors, utilities, and operations and maintenance departments of various facilities and municipalities.

Construction electricians must read and interpret electrical, mechanical, civil and architectural drawings and specifications such as electrical, building, fire, and jurisdictional codes to complete electrical installations. They use electrical test equipment and digital technology to ensure system safety, functionality and compatibility.

Construction electricians require good communication skills to negotiate, coordinate and facilitate work with clients, co-workers, jurisdictional authorities and other trades. Organizational skills are required to successfully plan and execute their work. They also require strong analytical and problem-solving skills in order to read and interpret diagrams, drawings and specifications. They require mechanical aptitude to install, diagnose and repair systems and components. It is beneficial for construction electricians to have good vision, the ability to distinguish colours, manual dexterity and a willingness to keep up with new developments in the trade. With changing technologies, digital and computer skills are necessary to this trade for job performance, learning methods and updating skills.

Their work may be performed indoors or outdoors, at heights, in confined spaces and in hazardous environments. They require stamina as construction electricians spend much of their time performing static and physical tasks such as climbing. Occupational risks include shocks, industrial diseases, arc flashes, falls and injury from repetitive motion, lifting and kneeling.

This standard recognizes similarities or overlaps with the work of industrial electricians, powerline technicians, instrumentation and control technicians, and refrigeration and air conditioning mechanics. Construction electricians work with a wide variety of construction tradespeople, engineers and inspectors.

Construction electricians play a crucial role as mentors and trainers to apprentices in the trade. They may also advance to positions such as foremen, instructors, project managers, superintendents, estimators, technicians, system designers, electrical inspectors or start their own contracting business. Construction electricians may enhance their skills in different fields such as restorative, service or retrofit work rather than new construction.

# CONSTRUCTION ELECTRICIAN

## TASK MATRIX

### A - PERFORMS COMMON OCCUPATIONAL SKILLS

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

## **B - INSTALLS, SERVICES AND MAINTAINS GENERATING, DISTRIBUTION AND SERVICE SYSTEMS**

<b>Task B-7</b> Installs, services and maintains consumer/supply services and metering equipment.	<b>B-7.01</b> Installs single-phase consumer/supply services and metering equipment.	<b>B-7.02</b> Installs three-phase consumer/supply services and metering equipment.	<b>B-7.03</b> Performs servicing and maintenance of single-phase services and metering equipment.
	<b>B-7.04</b> Performs servicing and maintenance of three-phase services and metering equipment.		
<b>Task B-8</b> Installs, services and maintains protection devices.	<b>B-8.01</b> Installs overcurrent protection devices.	<b>B-8.02</b> Installs ground fault, arc fault and surge protection devices.	<b>B-8.03</b> Performs servicing and maintenance of protection devices.
<b>Task B-9</b> Installs, services and maintains distribution equipment.	<b>B-9.01</b> Installs power distribution equipment.	<b>B-9.02</b> Performs servicing and maintenance of power distribution equipment.	
<b>Task B-10</b> Installs, services and maintains power conditioning, uninterruptible power supply (UPS) and surge suppression systems.	<b>B-10.01</b> Installs power conditioning, UPS and surge suppression systems.	<b>B-10.02</b> Performs servicing and maintenance of power conditioning, UPS and surge suppression systems.	
<b>Task B-11</b> Installs, services and maintains bonding and grounding protection systems.	<b>B-11.01</b> Installs grounding and bonding systems.	<b>B-11.02</b> Installs ground fault systems.	<b>B-11.03</b> Installs lightning protection systems.
	<b>B-11.04</b> Performs servicing and maintenance of bonding and grounding systems.		
<b>Task B-12</b> Installs, services and maintains power generation systems.	<b>B-12.01</b> Installs AC (alternating current) generating systems.	<b>B-12.02</b> Performs servicing and maintenance of AC generating systems.	<b>B-12.03</b> Installs DC (direct current) generating systems.
	<b>B-12.04</b> Performs servicing and maintenance of DC generating systems.		

**Task B-13**  
 Installs, services and maintains renewable energy systems.

**B-13.01** Installs renewable energy systems.

**B-13.02** Performs servicing and maintenance of renewable energy systems.

**Task B-14**  
 Installs, services and maintains high voltage systems.

**B-14.01** Installs high voltage equipment.

**B-14.02** Installs high voltage cables.

**B-14.03** Performs servicing and maintenance of high voltage systems.

**Task B-15**  
 Installs, services and maintains transformers.

**B-15.01** Installs extra-low voltage transformers.

**B-15.02** Installs low-voltage single-phase transformers.

**B-15.03** Installs low-voltage three-phase transformers.

**B-15.04** Installs high voltage transformers.

**B-15.05** Performs servicing and maintenance of transformers.

## C - INSTALLS, SERVICES AND MAINTAINS WIRING SYSTEMS

<b>Task C-16</b> Installs, services and maintains raceways, cables and enclosures.	<b>C-16.01</b> Installs conductors and cables.	<b>C-16.02</b> Installs conduit, tubing and fittings.	<b>C-16.03</b> Installs raceways.
	<b>C-16.04</b> Installs boxes and enclosures.	<b>C-16.05</b> Performs servicing and maintenance of raceways, cables and enclosures.	
<b>Task C-17</b> Installs, services and maintains branch circuitry.	<b>C-17.01</b> Installs luminaires.	<b>C-17.02</b> Installs wiring devices.	<b>C-17.03</b> Installs lighting controls.
	<b>C-17.04</b> Installs lighting standards.	<b>C-17.05</b> Performs servicing of branch circuitry.	<b>C-17.06</b> Installs, services and maintains airport runway lighting systems.
	<b>C-17.07</b> Installs, services and maintains traffic signal lights and controls.		
<b>Task C-18</b> Installs, services and maintains heating, ventilating and air-conditioning (HVAC) systems.	<b>C-18.01</b> Connects HVAC systems.	<b>C-18.02</b> Installs HVAC controls.	<b>C-18.03</b> Performs servicing and maintenance of HVAC systems and controls.
<b>Task C-19</b> Installs, services and maintains electric heating systems.	<b>C-19.01</b> Installs electric heating systems.	<b>C-19.02</b> Installs electric heating system controls.	<b>C-19.03</b> Performs servicing and maintenance of electric heating systems and controls.
<b>Task C-20</b> Installs, services and maintains exit and emergency lighting systems.	<b>C-20.01</b> Installs exit and emergency lighting.	<b>C-20.02</b> Performs servicing and maintenance of exit and emergency lighting systems.	
<b>Task C-21.</b> Installs, services and maintains cathodic protection systems.	<b>C-21.01</b> Installs cathodic protection systems.	<b>C-21.02</b> Performs servicing and maintenance of cathodic protection systems.	



## D - INSTALLS, SERVICES AND MAINTAINS MOTORS AND CONTROL SYSTEMS

<b>Task D-22</b> Installs, services and maintains motor starters and controls.	D-22.01 Installs motor starters.	D-22.02 Performs servicing and maintenance of motor starters.	D-22.03 Installs motor controls.
	D-22.04 Performs servicing and maintenance of motor controls.		
<b>Task D-23</b> Installs, services and maintains drives.	D-23.01 Installs AC drives.	D-23.02 Performs servicing and maintenance of AC drives.	D-23.03 Installs DC drives.
	D-23.04 Performs servicing and maintenance of DC drives.		
<b>Task D-24</b> Installs, services and maintains motors.	D-24.01 Installs single-phase motors.	D-24.02 Performs servicing and maintenance of single-phase motors.	D-24.03 Installs three-phase motors.
	D-24.04 Performs servicing and maintenance of three-phase motors.	D-24.05 Installs DC motors.	D-24.06 Performs servicing and maintenance of DC motors.
<b>Task D-25</b> Installs, programs, services and maintains automated control systems.	D-25.01 Installs automated control systems.	D-25.02 Performs servicing and maintenance of automated control systems.	D-25.03 Programs and configures automated control systems.

## **E - INSTALLS, SERVICES AND MAINTAINS SIGNALLING AND COMMUNICATION SYSTEMS**

<p><b>Task E-26</b> Installs, services and maintains signaling systems.</p>	<p><b>E-26.01</b> Installs fire alarm systems.</p>	<p><b>E-26.02</b> Performs servicing and maintenance of fire alarm systems.</p>	<p><b>E-26.03</b> Installs security and surveillance systems.</p>
	<p><b>E-26.04</b> Performs servicing and maintenance of security and surveillance systems.</p>		
<p><b>Task E-27</b> Installs, services and maintains communication systems.</p>	<p><b>E-27.01</b> Installs voice/data/video (VDV) and community antenna television (CATV) systems.</p>	<p><b>E-27.02</b> Installs public address (PA) and intercom systems.</p>	<p><b>E-27.03</b> Installs nurse call systems.</p>
	<p><b>E-27.04</b> Performs servicing and maintenance of communication systems.</p>		
<p><b>Task E-28</b> Installs, services and maintains integrated control systems.</p>	<p><b>E-28.01</b> Installs building automation systems.</p>	<p><b>E-28.02</b> Installs building control systems.</p>	<p><b>E-28.03</b> Performs servicing and maintenance of integrated control systems.</p>