

Trade Profile

Construction Electrician



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Trade profile

Construction Electrician



Structure of the 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 standard

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

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.

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, agricultural, commercial, institutional, industrial, transportation and entertainment environments. Construction electricians may also perform the installation and maintenance of building automation systems. 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.

It is important to note that the work performed by construction electricians is not performed in isolation. This standard recognizes similarities or overlaps with the work of industrial electricians, powerline technicians, instrumentation and control technicians, and refrigeration and air conditioning mechanics. In addition, construction electricians work collaboratively with other trades such as plumbers, steamfitter/pipefitters, sprinkler fitters, industrial mechanic (millwright), sheet metal workers, bricklayers, carpenters and other skilled trades. Construction electricians also work with a wide variety of 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 and Weightings

A – Performs common occupational skills

11%

Task A-1 Performs safety-related functions 20%	A-1.01 Uses personal protective equipment (PPE) and safety equipment	A-1.02 Maintains safe work environment	A-1.03 Performs lock-out and tag-out procedures
Task A-2 Uses tools and equipment 19%	A-2.01 Uses common and specialty tools and equipment	A-2.02 Uses access equipment	A-2.03 Uses rigging, hoisting and lifting equipment
Task A-3 Organizes work 19%	A-3.01 Interprets plans, drawings and specifications	A-3.02 Organizes materials and supplies	A-3.03 Plans project tasks and procedures
	A-3.04 Prepares worksite	A-3.05 Finalizes required documentation	
Task A-4 Fabricates and installs support components 20%	A-4.01 Fabricates support structures	A-4.02 Installs brackets, hangers and fasteners	A-4.03 Installs seismic restraint systems
Task A-5 Commissions and decommissions electrical systems 16%	A-5.01. Performs startup and shutdown procedures	A-5.02 Performs commissioning and decommissioning of systems	
Task A-6 Uses communication and mentoring techniques 6%	A-6.01 Uses communication techniques	A-6.02 Uses mentoring techniques	

B – Installs, services and maintains generating, distribution and service systems

28%

<p>Task B-7 Installs, services and maintains consumer/supply services and metering equipment 14%</p>	<p>B-7.01 Installs single-phase consumer/supply services and metering equipment</p>	<p>B-7.02 Installs three-phase consumer/supply services and metering equipment</p>	<p>B-7.03 Performs servicing and maintenance of single-phase consumer/supply services and metering equipment</p>
	<p>B-7.04 Performs servicing and maintenance of three-phase consumer/supply services and metering equipment</p>		
<p>Task B-8 Installs, services and maintains protection devices 15%</p>	<p>B-8.01 Installs overcurrent protection devices</p>	<p>B-8.02 Installs ground fault, arc fault and surge protection devices</p>	<p>B-8.03 Performs servicing and maintenance of protection devices</p>
<p>Task B-9 Installs, services and maintains power distribution equipment 15%</p>	<p>B-9.01 Installs power distribution equipment</p>	<p>B-9.02 Performs servicing and maintenance of power distribution equipment</p>	
<p>Task B-10 Installs, services and maintains power conditioning, uninterruptible power supply (UPS) and surge suppression systems 8%</p>	<p>B-10.01 Installs power conditioning, UPS and surge suppression systems</p>	<p>B-10.02 Performs servicing and maintenance of power conditioning, UPS and surge suppression systems</p>	
<p>Task B-11 Installs, services and maintains bonding and grounding, and ground fault protection and detection systems 13%</p>	<p>B-11.01 Installs bonding and grounding systems</p>	<p>B-11.02 Installs ground fault protection and detection systems</p>	<p>B-11.03 Installs lightning protection systems</p>
	<p>B-11.04 Performs servicing and maintenance of bonding and grounding systems</p>		

Task B-12 Installs, services and maintains power generation and conversion systems 8%	B-12.01 Installs alternating current (AC) generating systems	B-12.02 Performs servicing and maintenance of AC generating systems	B-12.03 Installs direct current (DC) generating and conversion systems
Task B-13 Installs, services and maintains renewable energy generating and storage systems 8%	B-12.04 Performs servicing and maintenance of DC generating and conversion systems	B-13.02 Performs servicing and maintenance of renewable energy generating and storage systems	
Task B-14 Installs, services and maintains high-voltage systems 7%	B-13.01 Installs renewable energy generating and storage systems	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 12%	B-14.01 Installs high-voltage equipment	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

31%

Task C-16 Installs, services and maintains raceways, conductors, cables and enclosures 29%	C-16.01 Installs conductors and cables	C-16.02 Installs conduit and fittings	C-16.03 Installs raceways
	C-16.04 Installs boxes and enclosures	C-16.05 Performs servicing and maintenance of raceways, conductors, cables and enclosures	
Task C-17 Installs, services and maintains branch circuitry and devices 28%	C-17.01 Installs luminaires	C-17.02 Installs wiring devices	C-17.03 Installs lighting controls
	C-17.04 Installs lighting standards	C-17.05 Performs servicing of branch circuitry	C-17.06 Installs, services and maintains airport visual aid systems
	C-17.07 Installs, services and maintains traffic signal lights and controls		
	C-18.01 Connects HVAC systems and associated equipment	C-18.02 Installs HVAC controls	C-18.03 Performs servicing and maintenance of HVAC systems and controls
Task C-19 Installs, services and maintains electric heating systems 14%	C-19.01 Installs electric heating systems	C-19.02 Installs electric heating system controls	C-19.03 Performs servicing and maintenance of electric heating systems and controls
Task C-20 Installs, services and maintains exit and emergency lighting systems 11%	C-20.01 Installs exit and emergency lighting	C-20.02 Performs servicing and maintenance of exit and emergency lighting systems	
Task C-21 Installs, services and maintains cathodic protection systems 4%	C-21.01 Installs cathodic protection systems	C-21.02 Performs servicing and maintenance of cathodic protection systems	

D – Installs, services and maintains motors and control systems

20%

Task D-22 Installs, services and maintains motor starters and controls 38%	D-22.01 Installs motor starters	D-22.02 Performs servicing and maintenance of motor starters	D-22.03 Installs motor control devices
	D-22.04 Performs servicing and maintenance of motor controls		
Task D-23 Installs, services and maintains drives 18%	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		
Task D-24 Installs, services and maintains motors 28%	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
Task D-25 Installs, programs, services and maintains automated control systems 16%	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

10%

Task E-26
 Installs, services and maintains signalling systems
44%

E-26.01 Installs fire alarm systems

E-26.02 Performs servicing and maintenance of fire alarm systems

E-26.03 Installs security and surveillance systems

E-26.04 Performs servicing and maintenance of security and surveillance systems

Task E-27
 Installs, services and maintains communication systems
26%

E-27.01 Installs voice/data/video (VDV) and community antenna television (CATV) systems

E-27.02 Installs public address (PA) and intercom systems

E-27.03 Installs nurse call systems

E-27.04 Performs servicing and maintenance of communication systems

Task E-28
 Installs, services and maintains integrated control systems
30%

E-28.01 Installs building automation systems

E-28.02 Installs building control systems

E-28.03 Performs servicing and maintenance of integrated control systems