



ONTARIO COLLEGE OF TRADES

ORDRE DES MÉTIERS DE L'ONTARIO

Apprenticeship
Training Standard

Electrician –
Construction and Maintenance

Trade Code: 309A

Development Date: 2003

CONSTRUCTION & MAINTENANCE ELECTRICIAN

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SKILL SETS

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CONSTRUCTION & MAINTENANCE ELECTRICIAN

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SKILL SETS



**COMPETENCY ANALYSIS PROFILE
CONSTRUCTION & MAINTENACE ELECTRICIAN
ON-THE-JOB TRAINING STANDARDS**

←SKILLS→

PROTECT SELF AND OTHERS U 1.0	Identify, interpret and apply applicable Acts, regulations, codes and directives 1.01	Recognize, assess and control hazards and hazardous conditions, equipment and material 1 . 0 2	Identify and use fire extinguishers and fire fighting equipment 1.03	Perform housekeeping duties to ensure a safe working environment 1.04	Practice first aid in emergency situations 1.05
	Select, wear, adjust, use and maintain personal protective apparel and equipment 1.06	Perform lock-out, tagging and hold-off procedures 1.07			
READ, INTERPRET AND REVISE SCHEMATIC DRAWINGS AND DOCUMENTATION U 2.0	Identify, read and interpret architectural drawings and specifications 2.01	Create, maintain and modify drawings and sketches 2.02	Identify, read and interpret mechanical drawings and specifications 2.03	Identify, read and interpret power distribution drawings and specifications 2.03	Identify, read and interpret instrumentation and communication drawings and specifications 2.05
	Identify, read and interpret electrical drawings and specifications 2.06	Identify, read and interpret relay, solid state and logic drawings and specifications 2.07			
SELECT, MAINTAIN AND USE TOOLS AND EQUIPMENT U3.0	Select, maintain, use and repair hand tools 3.01	Select, maintain, use and repair electric power tools and accessories 3 02	Select, use, inspect and maintain rigging and hoisting equipment 3.03	Select, inspect, and maintain scaffolds, lifting devices and elevating platforms 3.04	Assemble, erect and locate, scaffolds, lifting devices and elevating platforms 3 05
	Dismantle and store scaffolds, lifting devices and elevating platforms 3.06	Select and perform trade specific oxy-fuel cutting welding procedures 3 07	Schedule electrical job site materials and equipment requirements 3.08		

SKILL SETS



**COMPETENCY ANALYSIS PROFILE
CONSTRUCTION & MAINTENACE ELECTRICIAN
ON-THE-JOB TRAINING STANDARDS**

←SKILLS→

INSTALL, MAINTAIN AND REPAIR WIRING SYSTEMS U4.0	Select and install busway systems for rural, institutional, commercial and industrial installations	Maintain and repair busway systems for rural, institutional, commercial and industrial installations	Select, layout and install branch circuit wiring for power and lighting branch circuits 4.03	Troubleshoot branch circuit wiring for power and lighting branch 4.04	Select, layout and install cable trays for power, data and communication cable wiring systems 4.05
	Select, lay out and install feeder cables for single and multi conductor cables, metallic and non-metallic cables	Select, lay out and install rigid Poly Vinyl Chloride (PVC) 4.07	Select, lay out and install electric heating systems 4.08	Select, lay out and install wiring for hazardous locations 4.09	Select, lay out and install overhead distribution systems 4.10
	Select, lay out and install underground distribution systems 4.11				
SELECT, INSTALL, MAINTAIN AND TROUBLESHOOT POWER DISTRIBUTION EQUIPMENT SYSTEMS U5.0	Lay out and install secondary services 5.01	Maintain secondary services 5.02	Select and install high voltage protection and control devices 5.03	Maintain high voltage protection and control devices 5.04	Calculate requirements for secondary service loads, fuses and feeders 5.05
	Select and install oil and dry type distribution transformers 5.06	Test and maintain oil and dry type distribution transformers 5.07	Select and layout power distribution panels 5.08	Test and maintain power distribution panels 5.09	Lay out and install ground fault circuit interrupters 5.10
	Test and maintain ground fault circuit interrupters 5.11	Layout and install power factor correction equipment 5.12	Test and maintain power factor correction equipment 5.13	Install low voltage power distribution systems 5.14	Troubleshoot and maintain low voltage power distribution systems 5.15
	Install direct current (DC) power distribution systems 5.16	Troubleshoot and maintain direct current (DC) power distribution systems 5.17	Select and install AC/DC protective devices 5.18	Troubleshoot and maintain AC?DC protective devices 5.19	

SKILL SETS



**COMPETENCY ANALYSIS PROFILE
CONSTRUCTION & MAINTENACE ELECTRICIAN
ON-THE-JOB TRAINING STANDARDS**

⇐SKILLS⇒

SELECT, INSTALL, MAINTAIN AND TROUBLESHOOT LIGHTING SYSTEMS U6.0	Layout and install incandescent lighting 6.01	Maintain and troubleshoot incandescent lighting 6.02	Layout and install fluorescent lighting 6.03	Maintain and troubleshoot fluorescent lighting 6.04	Layout and install high intensity discharge lighting 6.05
	Maintain and troubleshoot high intensity discharge lighting 6.06	Layout and install light dimming and control systems 6.07	Maintain and troubleshoot light dimming and control systems 6.08	Layout, install and maintain exit and emergency lighting 6.09	Measure, record and report illumination levels 6.10
INSTALL, MAINTAIN AND TROUBLESHOOT ROTATING EQUIPMENT AND ASSOCIATED CONTROL SYSTEMS U7.0	Inspect, maintain and troubleshoot brush assemblies, slip rings and commutators 7.01	Inspect, maintain and troubleshoot DC motors and generators 7.02	Inspect, maintain and troubleshoot AC motors and generators 7.03	Install and test mechanical, electrical alignment and auxiliary protective equipment 7.04	Maintain and troubleshoot mechanical, electrical alignment and auxiliary protective equipment 7.05
	Maintain and troubleshoot lubrication systems 7.06	Maintain and troubleshoot braking and clutch systems 7.07	Start-up and shut-down rotating equipment 7.08	Select and install relays, solid state devices and controls 7.09	Maintain relays, solid state devices and controls 7.10
	Select and install protective devices 7.11	Maintain protective devices 7.12	Select, assemble and wire control panels, enclosures and control devices 7.13	Select and install field devices such as mechanical/remote field devices 7.14	
INSTALL, MAINTAIN AND TROUBLESHOOT MOTOR DRIVES AND ASSOCIATED CONTROL SYSTEMS U8.0	Install, maintain and troubleshoot DC constant voltage drives 8.01	Install, maintain and troubleshoot solid state and variable DC drives 8.02	Install, maintain and troubleshoot AC constant voltage drives 8.03	Install, maintain and troubleshoot solid state and variable AC drives 8.04	Install, maintain and troubleshoot computer based interface systems 8.05

SKILL SETS



**COMPETENCY ANALYSIS PROFILE
CONSTRUCTION & MAINTENACE ELECTRICIAN
ON-THE-JOB TRAINING STANDARDS**

⇐SKILLS⇒

	Install, maintain and troubleshoot programmable logic controller systems 8 06	Install, maintain and troubleshoot computerized numerical control systems 8.07	Install, maintain and troubleshoot robotic systems 8.08		
INSTALL, MAINTAIN AND TROUBLESHOOT STANB-BY POWER SYSTEMS AND ASSOCIATED EQUIPMENT U9.0	Layout, install and maintain uninterruptible power supply systems 9.01	Layout and install battery stand-by systems 9.02	Maintain and troubleshoot battery stand-by systems 9.03	Layout and install stand-by generation equipment 9.04	
INSTALL, MAINTAIN AND TROUBLESHOOT COMMUNICATIONS SYSTEMS U10.0	Install and test fibre optic cabling and terminations 10.01	Select, install and terminate test data and communication cables 10.02	Maintain, repair and test data and communication cables 10.03	Install, maintain and troubleshoot fire alarm systems 10.04	Install said test communication system components 10.05
	Install, maintain and troubleshoot audio-visual systems 10.06	Determine layout, install and test patient care systems 10.07	Determine layout, install and test security systems 10.08	Determine layout, install and test paging systems 10.09	Determine layout, install a clock system 10.10
	Test and verify the operation of a clock system 10.11	Determine layout, installing, testing and verifying the operation of automation systems 10.12			
SELECT, MAINTAIN AND OPERATE TEST AND MEASURING EQUIPMENT U11.0	Layout and install power and energy metering equipment 11.01	Select, operate and maintain analog and digital multimeters 11.02	Select, operate and maintain electronic test equipment 11.03	Select, operate and maintain insulation testers 11.04	Select, operate and maintain oscilloscopes 11.05
	Select, operate and maintain fault locators 11.06	Select, operate and maintain high voltage test equipment 11.07	Select, operate and maintain computer-based test equipment 11.08	Select, operate and maintain chart recorders 11.09	Select, operate and maintain electrical test equipment 11.10

SKILL SETS



**COMPETENCY ANALYSIS PROFILE
CONSTRUCTION & MAINTENACE ELECTRICIAN
ON-THE-JOB TRAINING STANDARDS**

←SKILLS→

Select, operate and maintain special test equipment 11.11				
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INSTALL, MAINTAIN AND TROUBLESHOOT INSTRUMENTATION DEVICES AND SYSTEMS

U12.0

Select, install and maintain instrumentation devices 12.01	Install, maintain and troubleshoot distributed control systems (DCS) 12.02			
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COMMUNICATE IN THE WORKPLACE

U13.0

Write job related documents 13.01	Give, receive and convey instructions to and from others 13.02	Demonstrate effective interpersonal relations 13.03	Present professional image 13.04	Interact effectively with computers 13.05
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Interact effectively through communication devices 13.06				
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PREFACE

This training document was developed by the Workplace Support Services Branch of the Ministry of Training, Colleges and Universities (MTCU) in consultation with representatives from the industry. These Training Standards are intended to be used by the apprentice, trainers and employers as a "blueprint" for training or as a prerequisite for government accreditation/certification.

The care and maintenance of this book is the joint responsibility of the apprentice and the employer. The Training Standards were developed specifically for documenting the apprentice's acquisition of skills.

The book becomes the only record of an apprentice's training.

Please Note: Apprenticeship Training and Curriculum Standards were developed by the Ministry of Training, Colleges and Universities (MTCU). As of April 8th, 2013, the Ontario College of Trades (College) has become responsible for the development and maintenance of these standards. The College is carrying over existing standards without any changes.

However, because the Apprenticeship Training and Curriculum Standards documents were developed under either the Trades Qualification and Apprenticeship Act (TQAA) or the Apprenticeship and Certification Act, 1998 (ACA), the definitions contained in these documents may no longer be accurate and may not be reflective of the Ontario College of Trades and Apprenticeship Act, 2009 (OCTAA) as the new trades legislation in the province. The College will update these definitions in the future.

Meanwhile, please refer to the College's website (<http://www.collegeoftrades.ca>) for the most accurate and up-to-date information about the College. For information on OCTAA and its regulations, please visit: <http://www.collegeoftrades.ca/about/legislation-and-regulations>

CONSTRUCTION & MAINTENANCE ELECTRICIAN

IMPORTANT DIRECTIONS TO EMPLOYERS

The Training Standards identify skills required for this occupation and its related training program.

These Training Standards have been written in concise statements which describe how well an apprentice must perform each skill in order to become competent. Competence means being able to do the performance to the required standard on request.

In using these Training Standards, trainers will be able to ensure that the apprentice is developing skills detailed for the occupation.

Employers are required to sign off and date the skills following each successful acquisition.

Employers participating in this training program will be designated as the Signing Authority and are required to attest to successful achievement by signing the appropriate box included at the end of each skill set.

IMPORTANT DIRECTIONS TO THE APPRENTICE

1. All hours working for each employer should be recorded in the Employer Information section. All Performance Objectives and skills completed while working for each Employer should be recorded.
2. The "Summary of Training" should be completed, signed and dated by both the apprentice and employer when either all terms of the training agreement have been completed or the apprentice leaves the employer.
3. It is the responsibility of the apprentice to inform the local Apprenticeship Client Services office regarding the following changes:
 - change of employer address;
 - change of apprentice name or address;
 - transfer to a new employer.
4. At the fulfilment of all terms of a Contract of Apprenticeship, the Apprentice Completion Form must be completed and signed by the current employer. Present these completed and authorized Training Standards and the Apprentice Completion Form to your local Apprenticeship Client Services office.

CONSTRUCTION & MAINTENANCE ELECTRICIAN

NOTICE OF COLLECTION OF PERSONAL INFORMATION

1. At any time during your apprenticeship training, you may be required to show this training standard to the Ministry of Training, Colleges and Universities (the Ministry). You will be required to disclose the signed Apprenticeship Completion form to the Ministry in order to complete your program. The Ministry will use your personal information to administer and finance Ontario's apprenticeship training system, including confirming your completion and issuing your certificate of apprenticeship.
2. The Ministry will disclose information about your program completion and your certificate of apprenticeship to the Ontario College of Trades, as it is necessary for the College to carry out its responsibilities.
3. Your personal information is collected, used and disclosed by the Ministry under the authority of the Ontario College of Trades and Apprenticeship Act, 2009.
4. Questions about the collection, use and disclosure of your personal information by the Ministry may be addressed to the:

Manager, Employment Ontario Contact Centre
Ministry of Training, Colleges and Universities
33 Bloor St. E, 2nd floor, Toronto, Ontario M7A 2S3
Toll-free: 1-800-387-5656; Toronto: 416-326-5656
TTY: 1-866-533-6339 or 416-325-4084.

CONSTRUCTION & MAINTENANCE ELECTRICIAN

APPRENTICE RECORD

Apprentice Name: _____

Contract Number: _____
(If applicable)

EMPLOYER INFORMATION

Name: _____

Address: _____

Telephone: _____

Summary of Training:

Dates of Employment: _____
From To

Performance Objectives signed off:

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Employer Signature Date Apprentice Signature Date

CONSTRUCTION & MAINTENANCE ELECTRICIAN

APPRENTICE RECORD

Apprentice Name: _____

Contract Number: _____
(If applicable)

EMPLOYER INFORMATION

Name: _____

Address: _____

Telephone: _____

Summary of Training:

Dates of Employment: _____
From To

Performance Objectives signed off:

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Employer Signature

Date

Apprentice Signature

Date

CONSTRUCTION & MAINTENANCE ELECTRICIAN

APPRENTICE RECORD

Apprentice Name: _____

Contract Number: _____
(If applicable)

EMPLOYER INFORMATION

Name: _____

Address: _____

Telephone: _____

Summary of Training:

Dates of Employment: _____
From To

Performance Objectives signed off:

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Employer Signature

Date

Apprentice Signature

Date

CONSTRUCTION & MAINTENANCE ELECTRICIAN

APPRENTICE COMPLETION FORM

Apprentice Name: _____

Print

Signature

Social Insurance Number: _____

Skill Sets when completed should be signed off by the Employer on the following page and presented with this completion form to your local Apprenticeship Client Services office. Any supporting documentation should also be attached.

In-School Completed: Yes () No () Not Applicable ()
(proof to be provided)

Hours completed as Yes () No () Not Applicable ()
per Contract:

Employer Name: _____

Address: _____

Telephone: _____

Signature

MTCU USE ONLY:

Recommended for Exam: Yes () No ()

Signature

Consultant/Office Code

You will be required to disclose this signed form to the Ministry of Training, Colleges and Universities in order to complete your program. The Ministry will use your personal information to administer and finance Ontario's apprenticeship training system.

For further information please see the notice/declaration for collection of personal information that is referenced in the table of contents of this training standard.

CONSTRUCTION & MAINTENANCE ELECTRICIAN

SKILL SETS COMPLETION FORM

SKILL SETS	TITLE	SIGNING AUTHORITY
U1.0	Protect Self and Others	_____
U2.0	Read, Interpret and Revise Schematic Drawings and Documentation	_____
U3.0	Select, Maintain and Use Tools and Equipment	_____
U4.0	Install, Maintain and Repair Wiring Systems	_____
U5.0	Select, Install, Maintain and Troubleshoot Power Distribution Equipment Systems	_____
U6.0	Select, Install, Maintain and Troubleshoot Lighting Systems	_____
U7.0	Install, Maintain and Troubleshoot Rotating Equipment and Associated Control Systems	_____
U8.0	Install, Maintain and Troubleshoot Motor Drives and Associated Control Systems	_____
U9.0	Install, Maintain and Troubleshoot Stand-by Power Systems and Associated Equipment	_____
U10.0	Install, Maintain and Troubleshoot Communications Systems	_____
U11.0	Select, Maintain and Operate Test and Measuring Equipment	_____
U12.0	Install, Maintain and Troubleshoot Instrumentation Devices and Systems	_____
U13.0	Communicate in the Workplace	_____

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U1.0 PROTECT SELF AND OTHERS

GENERAL PERFORMANCE OBJECTIVE

Protect self and others by: identifying, interpreting and applying applicable Acts, regulations, codes and directives; recognizing, assessing and controlling hazards and hazardous conditions, equipment and material; identifying and using fire extinguishers and firefighting equipment; performing housekeeping duties to ensure a safe working environment; practising first aid in emergency situations; selecting, wearing, adjusting, using and maintaining personal protective apparel and equipment; and, performing lockout, tagging and hold-off procedures

PERFORMANCE OBJECTIVES

SKILLS

- 1.01 **Identify, interpret and apply applicable Acts, regulations, codes and directives** including the Occupational Health and Safety Act (OHSA); Environmental Protection Act (EPA); Dangerous Goods Transportation Act (DGTA); Workplace Safety Insurance Act (WSIA); Ontario Building Code (OBC); Canadian Electrical Code (CEC); Ontario Electrical Code (OEC); Ontario Fire Code (OFC); Workplace Hazardous Materials Information System (WHMIS); Construction Safety Association of Ontario (CSAO); Canadian Welding Bureau (CWB); National Fire Protection Association (NFPA); American Society of Mechanical Engineers (ASME); Institute of Electrical and Electronic Engineers (IEEE); Illumination Engineering Society Standards (IESS); Technical Standards and Safety Authority (TSSA); Electrical Safety Authority (ESA); Canadian Standards Association (CSA); municipal requirements and company policies.

Date Completed

Trainer Signature

Apprentice Signature

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U1.0 PROTECT SELF AND OTHERS - Cont'd

1.02 **Recognize, assess and control hazards and hazardous conditions, equipment and material** including work site conditions, heavy equipment operations, crane hoisting and lifting operations, overhead and trenching operations, material handling and storage, and welding operations, ensuring that procedures are in compliance with OHSA, WHMIS, applicable codes, regulations and policies and procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

1.03 **Identify and use fire extinguishers and fire fighting equipment** including portable Class A, B and C extinguishers to suppress fires in accordance with OHSA, CSAO, OFC, NFPA , site procedures and company policy.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

1.04 **Perform housekeeping duties to ensure a safe working environment** by: removing and disposing excess or unwanted materials; positioning equipment; identifying the location of First Aid supplies and equipment; maintaining adequate heat, light and ventilation; ensuring the work site meets customer's expectations of cleanliness; and, erecting protective barriers and signs in accordance with OHSA, EPA, TSSA, ESA, site procedures and company policy.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

1.05 **Practise first aid in emergency situations** to treat conditions, including burns, abrasions, bleeding, cuts, wounds, chemical inhalation and contamination of eyes, so that the condition of the victim is stabilized and prepared for further treatment , according to employer standards and first aid procedures

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U1.0 PROTECT SELF AND OTHERS - Cont'd

1.06 **Select, wear, adjust, use and maintain personal protective apparel and equipment** including hard hats, gloves, glasses, goggles, masks, face shields, ear protectors/plugs, coveralls, reflector vests, safety footwear, fall protection equipment, respirators, harnesses, breathing apparatus, air samplers, gas detectors and radiation badges to ensure the safety of self and others in accordance with OHSa, CSAO, company policy and manufacturer's instructions.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

1.07 **Perform lock out, tagging and hold-off procedures** to isolate hazardous or defective equipment by: advising the appropriate authorities holding jurisdiction (AHJ): installing lock out device and retaining the key; attaching tags; repairing the problem if required, and removing the lockout device on completion of work in accordance with OHSa, manufacturer's instructions, CEC OEC, and company policy and procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

Employer Name	Employer Signature
_____	_____

U2.0 READ, INTERPRET AND REVISE SCHEMATIC DRAWINGS AND DOCUMENTATION

GENERAL PERFORMANCE OBJECTIVE

Read, interpret and revise schematics, drawings and documentation by identifying, reading and interpreting architectural drawings and specifications; creating, maintaining and modifying drawings and sketches; identifying, reading and interpreting mechanical drawings and specifications; identifying, reading and interpreting power distribution drawings and specifications; identifying, reading and interpreting instrumentation and communication drawings and specifications; identifying, reading and interpreting electrical drawings and specifications; and, identifying, reading and interpreting relay, solid state and logic drawings and specifications.

PERFORMANCE OBJECTIVES

SKILLS

2.01 **Identify, read and interpret architectural drawings and specifications** by: reading the drawing title block and/or title page; determining the logical sequence of the architectural and shop drawings; cross-checking to ensure that the set is complete; identifying and interpreting symbols used on drawings, charts, guides and schedules ensuring the interpretations are correct and in accordance with industry standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

2.02 **Create, maintain and modify drawings and sketches** including schematics, elevations, isometric, interference and as built, using available tools and technology to ensure that the drawing set is complete and up-to-date in order to facilitate the completion of the work to the requirements of the approving authorities and in accordance with industry and company standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U2.0 READ, INTERPRET AND REVISE SCHEMATIC DRAWINGS AND DOCUMENTATION - Cont'd

2.03 **Identify, read and interpret mechanical drawings and specifications** by: reading the drawing title block and/or title page; determining the logical sequence of mechanical and shop drawings; cross checking to ensure the set is complete; identifying and interpreting symbols used on drawings, charts, guides and schedules ensuring the interpretations are correct and in accordance with industry standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

2.04 **Identify, read and interpret power distribution drawings and specifications** by: reading the drawing title block and/or title page; determining the logical sequence of architectural and shop drawings; cross checking to ensure the set is complete; and, identifying and interpreting the symbols used on the drawings, charts, guides and schedules ensuring the interpretations are correct and in accordance with industry standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

2.05 **Identify, read and interpret instrumentation and communication drawings and specifications** by: reading the drawing block title and/or title page; determining the logical sequence of the instrumentation, communication and shop drawings; cross checking to ensure the set is complete; identifying and interpreting symbols used on drawings, charts, guides and schedules ensuring the interpretations are correct and in accordance with industry standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U2.0 READ, INTERPRET AND REVISE SCHEMATIC DRAWINGS AND DOCUMENTATION - Cont'd

2.06 **Identify, read and interpret electrical drawings and specifications** by: reading the drawing title block and/or title page; determining the logical sequence of architectural and shop drawings; cross checking to ensure the set is complete; and, identifying and interpreting the symbols used on the drawings, charts, guides and schedules ensuring the interpretations are correct and in accordance with industry standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

2.07 **Identify, read and interpret relay, solid state and logic drawings and specifications** by: determining the logical sequence of architectural and shop drawings; cross checking to ensure the set is complete; and, identifying and interpreting the symbols used on the drawings, charts, guides and schedules ensuring the interpretations are correct and in accordance with industry standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____
	Employer Name	Employer Signature
	_____	_____

U3.0 SELECT, MAINTAIN AND USE TOOLS AND EQUIPMENT

GENERAL PERFORMANCE OBJECTIVE

Select, maintain and use tools and equipment by: selecting, maintaining, using and repairing hand tools; selecting, maintaining, using and repairing electric power tools and accessories; selecting, using, inspecting and maintaining rigging and hoisting equipment; selecting, inspecting and maintaining scaffolds, lifting devices and elevating platforms; assembling, erecting and locating scaffolds, lifting devices and elevating platforms; dismantling and storing scaffolds, lifting devices and elevating platforms; selecting and performing basic oxy-fuel cutting and welding procedures; and, scheduling electrical job-site material and equipment requirements.

PERFORMANCE OBJECTIVES

SKILLS

3.01 **Select, maintain, use and repair hand tools** including wrenches, fastening tools, measuring tools, cutting tools, joining tools, grinding tools, levelling tools, rigging tools, A-frame and other material handling equipment in accordance with manufacturer’s recommendations, OHSA, WHMIS and company policy.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

3.02 **Select, maintain, use and repair electric power tools and accessories** including drills, grinders, circular saws, drill press, pedestal grinder, cut-off saw, hole saw, soldering equipment, drill bits, saw blades, and grinding wheels, ensuring that the power tool and accessory is the correct one for the application, is in good working condition including cords, connecting devices, housings, control devices and lubrication, so that no damage is caused to the power tool or operator in accordance with OHSA, CSAO, manufacturer’s specifications and company standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U3.0 SELECT, MAINTAIN AND USE TOOLS AND EQUIPMENT - Cont'd

3.03 **Select, use, inspect and maintain rigging and hoisting equipment** of the correct size and type for the site location, operation and conditions, ensuring the equipment is in good working order and that the operation is controlled by use of hand and/or voice signals in accordance with OHSA, CSAO, manufacturer's instructions and specifications and company safety standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

3.04 **Select, inspect and maintain scaffolds, lifting devices and elevating platforms** including personnel lifts, scissor lifts, bucket lifts, swing stages and bosun's chairs, to install and repair electrical installations according to engineering drawings, site conditions, OHSA, CSAO manufacturer's recommendations and company safety standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

3.05 **Assemble, erect and locate scaffolds, lifting devices and elevating platforms** including personnel lifts, scissor lifts, bucket lifts, swing stages and bosun's chairs, to install and repair electrical installations according to engineering drawings, site conditions, OHSA, CSAO manufacturer's recommendations and company safety standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

3.06 **Dismantle and store scaffolds, lifting devices and elevating platforms** including personnel lifts, scissor lifts, bucket lifts, swing stages and bosun's chairs, to install and repair electrical installations according to engineering drawings, site conditions, OHSA, CSAO manufacturer's recommendations and company safety standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U3.0 SELECT, MAINTAIN AND USE TOOLS AND EQUIPMENT - Cont'd

3.07 **Select and perform trade-specific oxy-fuel cutting and welding procedures** to install brackets, hangers and struts using applicable safety equipment and ensuring strength of weld in accordance with OHSA, CSAO, CWB, CSA, manufacturer's specifications and company standards

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

3.08 **Schedule electrical job site materials and equipment requirements** by: locating and sequencing the material requirements, reviewing delivery schedules, ensuring storage space is available, keeping a complete record of inventory of on-site materials, maintaining an adequate supply on hand of basic items in accordance with site specifications, government regulations and company standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

Employer Name	Employer Signature
_____	_____

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U4.0 INSTALL, MAINTAIN AND REPAIR WIRING SYSTEMS - Cont'd

4.11 **Select, lay out and install underground distribution systems** for single-phase and three-phase power, data, communication and fibre optic systems including depth of coverage, mechanical protection, spacing in trench, backfill, frost, cable or raceway types, support, bonding to ground and overcurrent protection in accordance with the plans and specifications, environmental conditions, OHSA, CSAO, CEC, OEC, manufacturer's specifications, customer's and company standards.

Date Completed

Trainer Signature

Apprentice Signature

Employer Name

Employer Signature

U5.0 SELECT, INSTALL, MAINTAIN AND TROUBLESHOOT POWER DISTRIBUTION EQUIPMENT SYSTEMS

GENERAL PERFORMANCE OBJECTIVE:

Select, install, maintain and troubleshoot power distribution equipment systems by: laying out and installing secondary services; maintaining secondary services; selecting and installing high voltage protection and control devices; maintaining high voltage protection and control devices; calculating the requirements for secondary service loads, fuses and feeders; selecting and installing oil and dry type distribution transformers; testing and maintaining oil and dry type distribution transformers; selecting and laying out power distribution panels; testing and maintaining power distribution panels; laying out and installing ground fault circuit interrupters; testing and maintaining ground fault circuit interrupters; laying out and installing power factor correction equipment; testing and maintaining power factor correction equipment; installing low voltage power distribution systems; troubleshooting and maintaining low voltage power distribution systems; installing direct current power distribution systems; troubleshooting and maintaining direct current power distribution systems; selecting and installing AC/DC protective devices; and, troubleshooting and maintaining AC/DC protective devices.

PERFORMANCE OBJECTIVES

SKILLS

5.01 **Lay out and install secondary services** including high voltage switchgear and cabling such as stress cones, pot heads and testing to verify quality in accordance with CEC, OEC, IEEE standards, manufacturer's specifications, local supply authority and customer's requirements.

Date Completed

Trainer Signature

Apprentice Signature

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U5.0 SELECT, INSTALL, MAINTAIN AND TROUBLESHOOT POWER DISTRIBUTION EQUIPMENT SYSTEMS - Cont'd

5.02 **Maintain secondary services** including high voltage switchgear and cabling such as stress cones, pot heads and testing to verify quality in accordance with CEC, OEC, IEEE standards, manufacturer's specifications, local supply authority and customer's requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

5.03 **Select and install high voltage protection and control devices** to quality standards in accordance with the CEC, OEC, manufacturer's specifications, local supply authority and customer's requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

5.04 **Maintain high voltage protection and control devices**, providing test and verification to quality standards in accordance with the CEC, OEC, manufacturer's specifications, local supply authority and customer's requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

5.05 **Calculate requirements for secondary service loads, fuses and feeders** in accordance with CEC, OEC, manufacturer's specifications, local supply authority and customer's requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

5.06 **Select and install oil and dry type distribution transformers** by determining loads, size and type; verifying installation requirements; and, testing the operation of the equipment in accordance with CEC, OEC, manufacturer's and customer's requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U5.0 SELECT, INSTALL, MAINTAIN AND TROUBLESHOOT POWER DISTRIBUTION EQUIPMENT SYSTEMS - Cont'd

5.07 **Test and maintain oil and dry type distribution transformers** by determining loads, size and type; and, testing the operation of the equipment in accordance with CEC, OEC, manufacturer's and customer's requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

5.08 **Select and layout power distribution panels** by: determining loads, size, and type required; verification of installation requirements; and, testing the operation of equipment installed in accordance with the CEC, OEC, manufacturer's specifications and instructions, and customer's requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

5.09 **Test and maintain power distribution panels** by: determining loads, size, and type required; verification of installation requirements; and, testing the operation of equipment in accordance with the CEC, OEC, manufacturer's specifications and instructions, and customer's requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

5.10 **Lay out and install ground fault circuit interrupters** by: determining loads, size and type; verifying installation requirements; and, testing the operation of the equipment in accordance with CEC, OEC, manufacturer's specifications and instructions, and customer's requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U5.0 SELECT, INSTALL, MAINTAIN AND TROUBLESHOOT POWER DISTRIBUTION EQUIPMENT SYSTEMS - Cont'd

5.16 **Install direct current (DC) power distribution systems** including testing, metering and emergency procedures in accordance with CEC, OEC, government regulations and company standards and procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

5.17 **Troubleshoot and maintain direct current (DC) power distribution systems** including testing, metering and emergency procedures in accordance with CEC, OEC, government regulations and company standards and procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

5.18 **Select and install AC/DC protective devices** in accordance with CEC, OEC, government regulations and company standards and procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

5.19 **Troubleshoot and maintain AC/DC protective devices** in accordance with CEC, OEC, government regulations and company standards and procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

Employer Name	Employer Signature
_____	_____

U6.0 SELECT, INSTALL, MAINTAIN AND TROUBLESHOOT LIGHTING SYSTEMS

GENERAL PERFORMANCE OBJECTIVE

Select, install, maintain and troubleshoot lighting systems by: laying out and installing incandescent lighting; maintaining and troubleshooting incandescent lighting; laying out and installing fluorescent lighting; maintaining and troubleshooting fluorescent lighting; laying out and installing high intensity discharge lighting; maintaining and troubleshooting high intensity discharge lighting; laying out and installing light dimming and control systems; maintaining and troubleshooting light dimming and control systems; laying out, installing and maintaining exit and emergency lighting; and, measuring, recording and reporting illumination levels.

PERFORMANCE OBJECTIVES

SKILLS

6.01 **Layout and install incandescent lighting** by: determining location, quality, type and wiring requirements; and performing installation in accordance with CEC, OEC, IESS, manufacturer’s instructions, company and customer’s requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

6.02 **Maintain and troubleshoot incandescent lighting** by: determining quality, type and wiring requirements; troubleshooting; and following maintenance procedures in accordance with CEC, OEC, IESS, manufacturer’s instructions, company and customer’s requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U6.0 SELECT, INSTALL, MAINTAIN AND TROUBLESHOOT LIGHTING SYSTEMS - Cont

6.07 **Layout and install light dimming and control systems** to quality standards in accordance with CEC, OEC, supply authorities', manufacturers' specifications, customer's standards and company procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

6.08 **Maintain and troubleshoot light dimming and control systems** to quality standards in accordance with CEC, OEC, supply authorities', manufacturers' specifications, customer's standards and company procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

6.09 **Layout, install and maintain exit and emergency lighting** to quality standards in accordance with CEC, OEC, local supply authorities', manufacturers' specifications, customer's standards and company procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

6.10 **Measure, record and report illumination levels** in accordance with company procedures and standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

Employer Name	Employer Signature
_____	_____

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U7.0 INSTALL, MAINTAIN AND TROUBLESHOOT ROTATING EQUIPMENT AND ASSOCIATED CONTROL SYSTEMS - Cont'd

7.03 **Inspect, maintain and troubleshoot AC motors and generators** to ensure correct equipment operation in accordance with the CEC, OEC, manufacturer's specifications and instructions, and company procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

7.04 **Install and test mechanical, electrical alignment and auxiliary protective equipment** in accordance with standard safety requirements, government regulations, the CEC, OEC, manufacturer's specifications and instructions, and company standards and procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

7.05 **Maintain and troubleshoot mechanical, electrical alignment and auxiliary protective equipment** in accordance with standard safety requirements, government regulations, the CEC, OEC, manufacturer's specifications and instructions, and company standards and procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

7.06 **Maintain and troubleshoot lubrication systems** in accordance with standard safety requirements, manufacturer's specifications and instructions and company procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U7.0 INSTALL, MAINTAIN AND TROUBLESHOOT ROTATING EQUIPMENT AND ASSOCIATED CONTROL SYSTEMS - Cont'd

7.07 **Maintain and troubleshoot braking and clutch systems** in accordance with standard safety requirements, government regulations, the CEC, OEC, manufacturer's specifications and instructions, and company procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

7.08 **Start-up and shut-down rotating equipment** in accordance with standard safety requirements, manufacturer's specifications and instructions, and company procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

7.09 **Select and install relays, solid state devices and controls** by determining the control requirements, selecting, laying out and installing relays and solid state devices; in accordance with the CEC, OEC, manufacturer's specifications and instructions, company and customer standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

7.10 **Maintain relays, solid state devices and controls** by determining the control requirements and performing maintenance and troubleshooting sequence for control systems in accordance with the CEC, OEC, manufacturer's specifications and instructions, company and customer standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U7.0 INSTALL, MAINTAIN AND TROUBLESHOOT ROTATING EQUIPMENT AND ASSOCIATED CONTROL SYSTEMS - Cont'd

7.11 **Select and install protective devices** by determining the control requirements, selecting, laying out and installing protective devices in accordance with the CEC, OEC, manufacturer's requirements, company and customer standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

7.12 **Maintain protective devices** by determining the control requirements and performing maintenance and troubleshooting sequence for control systems in accordance with the CEC, OEC, manufacturer's requirements, company and customer standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

7.13 **Select, assemble and wire control panels, enclosures and control devices** to verify the operation and ensure that the installation meets the CEC OEC, requirements, manufacturer's specifications and instructions, and company and customer standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

7.14 **Select and install field devices such as mechanical/remote field devices** to verify the operation and ensure the installation meets the CEC OEC, requirements and in accordance with manufacturer's specifications and instructions, company and customer standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

Employer Name	Employer Signature
_____	_____

U8.0 INSTALL, MAINTAIN AND TROUBLESHOOT MOTOR DRIVES AND ASSOCIATED CONTROL SYSTEMS

GENERAL PERFORMANCE OBJECTIVE

Install, maintain and troubleshoot motor drives and associated control systems by: installing, maintaining and troubleshooting DC constant voltage drives; installing, maintaining and troubleshooting solid state and variable DC drives; installing, maintaining and troubleshooting AC constant voltage drives; installing, maintaining and troubleshooting solid state and variable AC drives; installing, maintaining and troubleshooting computer based interface systems; installing, maintaining and troubleshooting programmable logic controller systems; installing, maintaining and troubleshooting computerized numerical control systems; and, installing, maintaining and troubleshooting robotic systems.

PERFORMANCE OBJECTIVES

SKILLS

8.01 **Install, maintain and troubleshoot DC constant voltage drives** in accordance with standard safety requirements, government regulations, manufacturer’s specifications and company procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

8.02 **Install, maintain and troubleshoot solid state and variable DC drives** to ensure correct equipment operation in accordance with the CEC, OEC, government procedures, manufacturer’s specifications and instructions and company standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U8.0 INSTALL, MAINTAIN AND TROUBLESHOOT MOTOR DRIVES AND ASSOCIATED CONTROL SYSTEMS - Cont'd

8.03 **Install, maintain and troubleshoot AC constant voltage drives** in accordance with standard safety requirements, government regulations, manufacturer's specifications and company procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

8.04 **Install, maintain and troubleshoot solid state and variable AC drives** to ensure correct equipment operation in accordance with the CEC, OEC, manufacturer's specifications and instructions, government procedures and company standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

8.05 **Install, maintain and troubleshoot computer based interface systems** to maintain correct operation in accordance with the CEC, OEC, manufacturer's specifications and instructions, and company procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

8.06 **Install, maintain and troubleshoot programmable logic controller systems** to ensure correct operation in accordance with the CEC, OEC, manufacturer's specifications and instructions and company procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

8.07 **Install, maintain and troubleshoot computerized numerical control systems** to ensure correct operation in accordance with the CEC, OEC, manufacturer's specifications and instructions, and company procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U8.0 INSTALL, MAINTAIN AND TROUBLESHOOT MOTOR DRIVES AND ASSOCIATED CONTROL SYSTEMS - Cont'd

8.08 **Install, maintain and troubleshoot robotic systems** to ensure correct operation in accordance with the CEC, OEC, manufacturer's specifications and instructions, and company procedures.

Date Completed

Trainer Signature

Apprentice Signature

Employer Name

Employer Signature

U9.0 INSTALL, MAINTAIN AND TROUBLESHOOT STAND-BY POWER SYSTEMS AND ASSOCIATED EQUIPMENT

GENERAL PERFORMANCE OBJECTIVE

Install, maintain and troubleshoot stand-by power systems and associated equipment by: laying out, installing and maintaining uninterruptible power supply systems; laying out and installing battery stand-by systems; maintaining and troubleshooting battery stand-by systems; and, laying out and installing stand-by power generation equipment.

PERFORMANCE OBJECTIVES

SKILLS

9.01 **Layout, install and maintain uninterruptible power supply systems** to provide emergency power and illumination by: checking drawings of system and equipment to determine type of fuel, location, starting and control of system, transfer switch(es), testing, maintenance and instructing, in accordance with the CEC, OEC, OBC, Underwriters' Laboratories of Canada (ULC) standards, manufacturer's specifications and instructions and customer's requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

9.02 **Layout and install battery stand-by systems** to provide emergency power and illumination by checking drawings of system and equipment, type of fuel, location of system, starting and control of system, transfer switch(es), testing, maintenance and instructing in accordance with CEC, OEC, OBC, ULC standards, manufacturer's specifications and instructions and customer's requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U9.0 INSTALL, MAINTAIN AND TROUBLESHOOT STAND-BY POWER SYSTEMS AND ASSOCIATED EQUIPMENT - Cont'd

9.03 **Maintain and troubleshoot battery stand-by systems** to provide emergency power and illumination by checking drawings of system and equipment, type of fuel, location of system, starting and control of system, transfer switch(es), testing, maintenance and instructing in accordance with CEC, OEC, OBC, ULC standards, manufacturer's specifications and instructions and customer's requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

9.04 **Layout and install stand-by generation equipment** to provide emergency power and illumination by checking drawings of system and equipment, type of fuel, location of generators, starting and control of generators, transfer switch(es), testing, maintenance and instructing in accordance with CEC, OEC, OBC, ULC standards, manufacturer's specifications and instructions and customer's requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

Employer Name	Employer Signature
_____	_____

U10.0 INSTALL, MAINTAIN AND TROUBLESHOOT COMMUNICATIONS SYSTEMS

GENERAL PERFORMANCE OBJECTIVE

Install, maintain and troubleshoot communications systems by: installing and testing fibre optic cabling and terminations; selecting, installing and terminating data and communication cables; maintaining, repairing and testing data and communication cables; installing, maintaining and troubleshooting alarm systems; installing and testing communication system components; installing, maintaining and troubleshooting audio-visual systems; determining layout, installing and testing patient care systems; determining layout, installing and testing security systems; determining layout, installing and testing paging systems; determining layout and installing a clock system; testing and verifying the operation of a clock system; and, determining the layout, installing, testing and verifying the operation of automation systems.

PERFORMANCE OBJECTIVES

SKILLS

10.01 **Install and test fibre optic cabling and terminations** by: reading and interpreting job reference material and drawings; selecting hand and power tools and testing equipment; selecting and verifying cable pathway; and, installing and testing in accordance with the CEC, OEC, OBC, site plans, manufacturer’s specifications and instructions, company standards and customer requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

10.02 **Select, install and terminate data and communication cables** by: reading and interpreting plans and specifications; selecting hand/power tools and materials; testing equipment; and, verifying cable pathway in accordance with the CEC, OEC, OBC, site plans, manufacturer’s specifications and instructions, company standards and customer requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U10.0 INSTALL, MAINTAIN AND TROUBLESHOOT COMMUNICATIONS SYSTEMS - Cont'd

10.03 **Maintain, repair and test data and communication cables** by: reading and interpreting plans and specifications; selecting hand/power tools and materials; testing equipment; and, verifying cable pathway in accordance with the CEC, OEC, OBC, site plans, manufacturer's specifications and instructions, company standards and customer requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

10.04 **Install, maintain and troubleshoot fire alarm systems** to provide all necessary interconnections such as supply, signal wiring, detection wiring, door monitoring, fan/air control, elevator homing, sprinkler detection and monitoring, raceway and wiring, voice communication and E-Vac systems in accordance with the CEC, OEC, OBC, ULC standards, local requirements, company standards and customer requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

10.05 **Install and test communication system components** by: determining layout and location; selecting tools and equipment; installing conduit, wiring system components and devices; and, providing tests and verification in accordance with the CEC, OEC, OBC, site plans, manufacturer's instructions and specifications, company standards and customer's requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

10.06 **Install, maintain and troubleshoot audio-visual systems** by: determining layout and location; selecting tools and equipment; installing wiring system to interconnect components; and testing in accordance with plans and drawings, the CEC, OEC, OBC, manufacturer's instructions and specifications, local requirements, company standards and customer's requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U10.0 INSTALL, MAINTAIN AND TROUBLESHOOT COMMUNICATIONS SYSTEMS - Cont'd

10.07 **Determine layout, install and test patient care systems** by: installing conduit, wiring system components and devices; and testing and verifying operation of the system in accordance with CEC, OEC, OBC, site plans, local and customer requirements, manufacturer's specifications and instructions.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

10.08 **Determine layout, install and test security systems** to provide all interconnections such as supply, signal wiring, detection wiring and entry/exit monitoring by installing conduit, wiring systems components and devices, testing and verifying operation in accordance with the CEC, OEC, OBC, ULC standards, manufacturer's specifications and instructions, local and customer's requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

10.09 **Determine layout, install and test paging systems** by: installing conduit, wiring systems components and devices; and, testing and verifying system operation in accordance with CEC, OEC, OBC, manufacturer's specifications and instructions, site plans and customer's requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

10.10 **Determine layout and install a clock system** by: installing conduit, wiring system components and devices; and, testing and verifying the operation of the system in accordance with the CEC, OEC, OBC, manufacturer's specifications and instructions, and customer's requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U10.0 INSTALL, MAINTAIN AND TROUBLESHOOT COMMUNICATIONS SYSTEMS - Cont'd

10.11 **Test and verify the operation of a clock system** by: testing wiring system components and devices; and, testing and verifying the operation of the system in accordance with the CEC, OEC, OBC, manufacturer's specifications and instructions, and customer's requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

10.12 **Determine layout, installing, testing and verifying the operation of automation systems** by: installing conduit, wiring system components and devices; and, testing and verifying the operation of the system in accordance with the CEC, OEC, OBC, ULC standards, manufacturer's specifications and instructions, and customer requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____
	Employer Name	Employer Signature
	_____	_____

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U11.0 SELECT, MAINTAIN AND OPERATE TEST AND MEASURING EQUIPMENT - Cont'd

11.03 **Select, operate and maintain electronic test equipment** including logic probes and signal generators ensuring that the item selected is the correct device for the application required in accordance with manufacturer's specifications and instructions, and company standards and procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

11.04 **Select, operate and maintain insulation testers** ensuring that the tester selected is correct for the application required in accordance with manufacturer's specifications and instructions, and company standards and procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

11.05 **Select, operate and maintain oscilloscopes** ensuring the device is correct for the application required in accordance with manufacturer's specifications and instructions, and company standards and procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

11.06 **Select, operate and maintain fault locators** ensuring the device is correct for the application required in accordance with manufacturer's specifications and instructions, and company standards and procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

11.07 **Select, operate and maintain high voltage test equipment** ensuring the device is correct for the application required in accordance with manufacturer's specifications and instructions, and company standards and procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U11.0 SELECT, MAINTAIN AND OPERATE TEST AND MEASURING EQUIPMENT - Cont'd

11.08 **Select, operate and maintain computer-based test equipment** including personal computers, ensuring the device is correct for the application required in accordance with manufacturer's specifications and instructions, and company standards and procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

11.09 **Select, operate and maintain chart recorders** ensuring the device is correct for the application required in accordance with manufacturer's specifications and instructions, and company standards and procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

11.10 **Select, operate and maintain electrical test equipment** including phase rotation meters and power meters, ensuring the device is correct for the application required in accordance with manufacturer's specifications and instructions, and company standards and procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

11.11 **Select, operate and maintain special test equipment** including infrared and laser devices, ensuring the device is correct for the application required in accordance with manufacturer's specifications and instructions, and company standards and procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____
	Employer Name	Employer Signature
	_____	_____

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U12.0 INSTALL, MAINTAIN AND TROUBLESHOOT INSTRUMENTATION DEVICES AND SYSTEMS

GENERAL PERFORMANCE OBJECTIVE

Install, maintain, operate and troubleshoot instrumentation devices and systems by: selecting, installing and maintaining instrumentation devices; and, installing, maintaining and troubleshooting distributed control systems.

PERFORMANCE OBJECTIVES

SKILLS

12.01 **Select, install and maintain instrumentation devices** to ensure digital readouts, choosing the testing equipment, calibration procedures, type of wiring network and verification procedures in accordance with the manufacturer’s specifications and instructions, site conditions/requirements, CEC,OEC and other governing requirements, customer and company standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

12.02 **Install, maintain and troubleshoot distributed control systems (DCS)** to maintain correct operation in accordance with the CEC, OEC, manufacturer’s specifications and instructions, and company procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

Employer Name	Employer Signature
_____	_____

U13.0 COMMUNICATE IN THE WORKPLACE

GENERAL PERFORMANCE OBJECTIVE

Communicate in the workplace by: writing job related documents; giving, receiving and conveying instructions to and from others; demonstrating effective interpersonal relations; presenting a professional image; interacting effectively with computers; and, interacting effectively through communication devices.

PERFORMANCE OBJECTIVES

SKILLS

13.01 **Write job related documents** including work orders, change orders, office memoranda, letters, accident reports and forms, ensuring that documents are written clearly, legibly and completely in accordance with official guidelines and company standards.

Date Completed

Trainer Signature

Apprentice Signature

13.02 **Give, receive and convey instructions to and from others** by: clearly identifying steps to be followed; setting out conditions under which the instructions are to be completed; and, determining time frames, ensuring that the recipient can complete the assigned task and clearly understands the instructions given in accordance with industry standards and company procedures.

Date Completed

Trainer Signature

Apprentice Signature

CONSTRUCTION & MAINTENANCE ELECTRICIAN

U13.0 COMMUNICATE IN THE WORKPLACE - Cont'd

13.03 **Demonstrate effective interpersonal relations**, recognizing human rights, equality and customer relations by: listening attentively to customers and co-workers; using verbal and non-verbal signals to convey messages; using language acceptable in the work place; recognizing the chain of command on a work site; explaining problems and procedures; identifying alternate solutions and obtaining approvals from customers in accordance with company policy and procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

13.04 **Present professional image** by: wearing appropriate apparel; observing personal hygiene standards; and, maintaining clean clothing and following a hygiene regimen so that personal appearance and hygiene are not offensive to clients or co-workers according to employer standards and requirements.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

13.05 **Interact effectively with computers** using basic inputting skills, including understanding computer technologies; keyboarding; and the use of touch screens, so that required computer tasks may be performed in accordance with manufacturers' instructions and to company standards and procedures.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____

13.06 **Interact effectively through communication devices** including public address systems, telephones, pagers, radios and wireless devices to ensure that correct and accurate instruction and procedures are conveyed safely and efficiently in accordance with government regulations and company procedures and standards.

Date Completed	Trainer Signature	Apprentice Signature
_____	_____	_____
	Employer Name	Employer Signature
	_____	_____