Skilled Trades Ontario | Métiers spécialisés Ontario

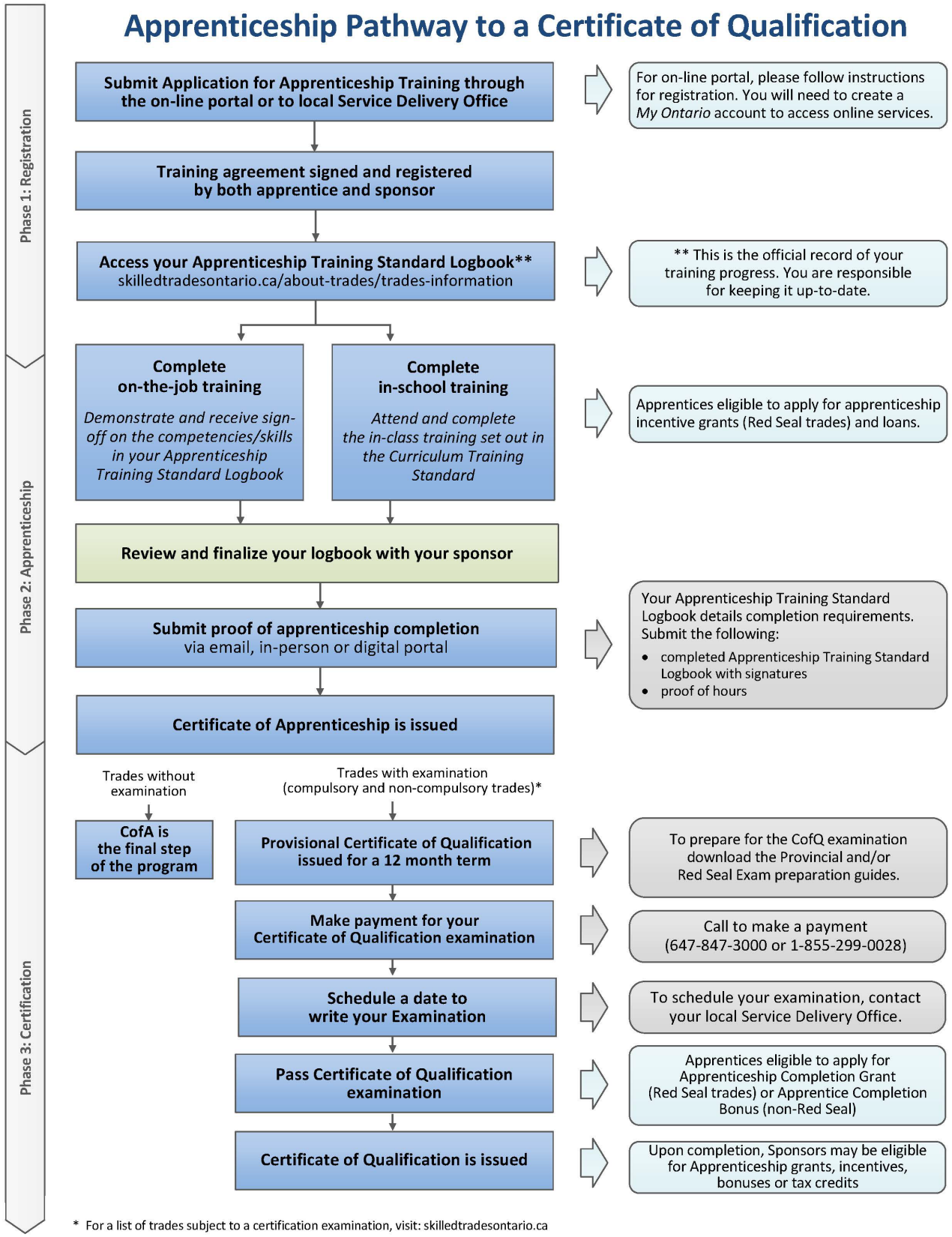
Apprenticeship Curriculum Standard

Powerline Technician

434A

2007

Apprenticeship Pathway to a Certificate of Qualification



* For a list of trades subject to a certification examination, visit: skilledtradesontario.ca

Draft version: 2022-03-16

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Please Note: This Standard has been revised to reflect the visual identity of Skilled Trades Ontario (STO) which replaced the Ontario College of Trades on January 1, 2022. The content of this Standard may refer to the former organization; however, all trade specific information or content remains relevant and accurate based on the original date of publishing.

Please refer to STO's website: **skilledtradesontario.ca** for the most accurate and up to date information. For information about BOSTA and its regulations, please visit ***Building Opportunities in the Skilled Trades Act, 2021* (BOSTA).**

Any updates to this publication are available on-line; to download this document in PDF format, please follow the link: Skilled Trades Ontario.ca.

Maintained with transfer to Skilled Trades Ontario 2007 (V100)

Preface

This new curriculum standard for the **Powerline Technician 434A** trade program is based upon the on-the-job performance objectives, located in the industry-approved training standard.

The Reportable Subjects Summary chart (located on page 3) summarizes the training hours for each reportable subject.

The curriculum identifies the learning that takes place in-school. The in-school program focuses primarily on the theoretical knowledge and the essential skills required to support the performance objectives of the Apprenticeship Training Standards. Employers/Sponsors are expected to extend the apprentice's knowledge and skills through practical training on a work site. Regular evaluations of the apprentice's knowledge and skills are conducted throughout training to verify that all apprentices have achieved the learning outcomes identified in the curriculum standard.

It is not the intent of the in-school curriculum to perfect on-the-job skills. The practical portion of the in-school program is used to reinforce theoretical knowledge. Skill training is provided on the job.

Please refer to Skilled Trades Ontario website (www.skilledtradesontario.ca) for the most accurate and up-to-date information about Skilled Trades Ontario. For information on *Building Opportunities in the Skilled Trades Act, 2021 (BOSTA)*) and its regulations, please visit
Building Opportunities in the Skilled Trades Act, 2021, S.O. 2021, c. 28 - Bill 288 (ontario.ca)

Introduction

This new curriculum standard for the Powerline Technician trade is derived from learning outcomes which were developed from the industry-approved training standard.

The reportable subjects are cross-referenced to the training standard for ease of comparison.

Each reportable subject and learning outcome identifies a recommended of training hours. This hour allotment is broken into hours for instruction in theory and practical application. The division of the curriculum into reportable subjects that follow a natural progression of learning through the levels and branches of training will allow training centres and apprentices' flexibility in program delivery while still observing the importance of sequencing learning in a logical progression.

The curriculum is framed by and includes specific references to terminal performance objectives in the Apprenticeship Training Standards for Powerline Technician. However, it identifies only the learning that takes place off the job, in a training centre. The in-school program focuses primarily on the theoretical knowledge required to master the performance objectives of the Training Standards. Employers are expected to extend the apprentice's knowledge and skills through appropriate practical training on the work site. Regular evaluations of the apprentice's knowledge and skills is conducted throughout training to assure that all apprentices have achieved the learning outcomes identified in the curriculum standard. The balance between theoretical and practical evaluation is identified for each unit of learning outcomes.

Reportable Subject Summary

Number	Reportable Subjects	Hours Total	Hours Theory	Hours Practical
S0121	Demonstrate safe work practices	44	12	32
S0122	Communicate with customers and staff	9	2	7
S0123	Prepare job plan	23	8	15
S0124	Select, operate, and maintain tools and equipment	19	9	10
S0125	Install, maintain, and remove power pole systems	21	5	16
S0126	Maintain transmission towers and structures	12	4	8
S0127	Install, maintain overhead power systems	66	21	45
S0128	Troubleshoot overhead and underground power systems	15	15	0
S0129	Install, maintain underground distributions systems.	35	17	18
S0130	Install, maintain, and remove transformers	32	23	9
S0131	Install, operate, and maintain system protection, control, and instrumentation equipment	27	16	11
S0132	Handle energized lines, using rubber protective equipment	33	11	22
S0133	Handle energized lines, using live line tool methods	27	9	18
S0134	Select, maintain, and operate rigging equipment.	20	11	9
	Total	**383***	**163**	**220**

***While the hours total for the above reportable subjects is 383 hours, only 320 are funded**

Number:	S0121		
Title:	**Demonstrate Safe Work Practices**		
Duration:	Total Hours: 44	Theory: 12	Practical: 32
Prerequisites:	2.1, 2.3, 2.4		
Co-requisites:	N/A		

General Learning Outcomes

Upon successful completion, the apprentice is able to demonstrate safe work practices by identifying, controlling, and eliminating all potential health and safety hazards; selecting, wearing, adjusting, using, and maintaining personal protective devices; performing evacuation and rescue procedures; practicing good housekeeping; working within safe physical limits and applying correct body mechanics and applying the principles of induction, grounding, and bonding.

Learning Outcomes and Content

Upon successful completion the apprentice is able to:

S0121.01 Identify, control, and eliminate potential health and safety hazards

- Identify all hazards associated with a specific task.
- Select and apply the most effective method and / or barriers to eliminate or control the hazard.
- Demonstrate knowledge of equipment and material to be used.
- Document all hazards and actions taken to reduce, eliminate or control the hazard.
- Demonstrate knowledge of work to be performed.
- Identify applicable acts, codes, regulations, and directives.

S0121.02 Select, wear, adjust, use, and maintain protective devices.

- Identify the correct personal protective equipment required for the specific task.
- Select the appropriate personal protective equipment required to work in a variety of environments.
- Wear, adjust, use, and maintain protective devices.
- Identify deficiencies in protective equipment and replace with approved equipment.

S0121.03 **Perform evacuation & rescue procedures**.

- Ensure personal safety prior to commencing any rescue.
- Demonstrate successful completion of pole top rescue.
- Demonstrate successful completion of tower rescue.
- Demonstrate successful completion of aerial device rescue.
- Demonstrate bucket evacuation from an aerial device simulating no-functional conditions.

S0121.04 **Practice good housekeeping.**

- Store tools and equipment in designated location after use.
- Clean up job site, eliminating debris.
- Clean all equipment properly after use.
- Store all equipment properly after use.
- Keep work area clear of obstructions.

S0121.05 **Work within safe physical limits and apply correct body mechanics**.

- Position body into best possible location while working aloft.
- Apply correct lifting techniques.
- Assess the task to identify whether additional mechanical or other assistance is required.
- Identify safe physical limits.
- Use correct methods to transport heavy material.

S0121.06 **Apply the principles of induction, grounding and bonding.**

- Apply the theory associated with the fundamentals of AC generation.
- Apply the theory associated with the hazards of induction.
- Apply the theory associated with the hazards of backfeed.
- Establish a zone of equipotential by applying bonding principles.
- Ensure adequate grounding of personnel and equipment by selecting the most appropriate ground electrode.

Number:	S0122		
Title:	**Communicate with Customers and Staff**		
Duration:	Total Hours: 9	Theory: 2	Practical: 7
Prerequisites:	N/A		
Co-requisites:	N/A		

General Learning Outcomes

Upon successful completion, the apprentice is able to the apprentice will communicate in a clear, effective, and concise manner with co-workers, supervisors, and the public.

Learning Outcomes and Content

Upon successful completion the apprentice is able to:

S0122.01 Communicate with co-workers.

- Complete the required documentation.
- Speak in a clear and legible fashion.
- Interpret direction.
- Demonstrate correct use of hand signals.
- Use electronic communication equipment.
- Demonstrate effective verbal, physical (body language) and listening skills.

S0122.02 Communicate with customers and external organizations.

- Complete the required documentation.
- Speak in a clear and legible fashion.
- Interpret direction.
- Demonstrate correct use of hand signals.
- Us electronic communication equipment.
- Convey technical information.

S0122.03 Report hazards, injuries, and environmental impacts

- Report hazards, injuries, and environmental impacts immediately
- Complete necessary documentation.
- Use the most appropriate device for reporting hazards, injuries, and environmental impacts.

Number:	S0123		
Title:	**Prepare Job Plan**		
Duration:	Total Hours: 23	Theory: 8 Hours	Practical: 15
Prerequisites:	N/A		
Co-requisites:	N/A		

General Learning Outcomes

Upon successful completion, the apprentice is able to demonstrate the ability to prepare a job plan by identifying work site; determining job methods, assignments, and process; determining material and equipment and establishing lockout, tagging and hold-off procedures as per the utility Work Protection Code.

Learning Outcomes and Content

Upon successful completion the apprentice is able to:

S0123.01 Identify worksite considerations.

- Assess job site requirements.
- Interpret maps and feeder prints to determine action or process required.
- Notify required authorities having jurisdiction.
- Assess the time of interruption for customer to determine most practical and economic solution.
- Assess resources available to determine action or process required.

S0123.02 Determine the job methods, assignments, and process.

- Complete a detailed written document on the job process.
- Hold a thorough tailboard conference with fellow workers.
- Identify hazards associated with the job.
- Determine work method required to complete the job.
- Assign job tasks.

S0123.03 Determine material and equipment.

- Select the material required for the job.
- Select the equipment necessary to complete the job.
- Interpret the work orders for installation purposes.

S0123.04 Establish lockout, tagging and hold-ff procedures as per the Utility Work Protection Code

- Describe how to lock out mechanical and electrical equipment according to all applicable codes and company policies and procedures.
- Describe the tagging procedures of mechanical and electrical equipment according to applicable codes and company policies and procedures.
- Demonstrate knowledge of applicable codes and company policies and procedures.
- Determine which conditions cause mechanical and electrical equipment to be tagged and locked out.
- Interpret maps and feeder prints to determine what action or process is required.
- Identify the need for and demonstrate the ability to obtain a hold off and tag accordingly.
- Record or document the necessary action prior to de-energizing and establishing the applicable procedures as per code.

Number:	S0124
Title:	**Select, Operate, and Maintain Tools and Equipment**
Duration:	Total Hours: 19 Theory: 9 Hours Practical: 10 Hours
Prerequisites:	N/A
Co-requisites:	N/A

General Learning Outcomes

Upon successful completion, the apprentice is able to select, operate and maintain tools and equipment by inspecting, maintaining and using hand, power tools and explosive actuated tools, inspecting, operating and maintaining vehicles and auxiliary equipment and ensuring setup of mobile equipment.

Learning Outcomes and Content

Upon successful completion the apprentice is able to**:**

S0124.01 Inspect, maintain and use hand, small power tools and explosive activated tools.

- Identify and describe the correct application of the tools.
- Identify and document defects or deficiencies.
- Perform minor adjustments.
- Select tools and equipment for their tasks according to efficiency and safety.
- Perform tool maintenance.

S0124.02 Inspect, operate, and maintain vehicles and auxiliary equipment.

- Identify the basic components of a hydraulic system and their functions.
- Identify the basic components of an air brake system.
- Perform regular vehicle and equipment inspection.
- Clean, lubricate and perform minor repairs and adjustments.
- Perform pre-operational checks and functional checks of equipment.
- Identify defects or deficiencies and report to appropriate party.
- Ensure defective equipment is repaired or taken out of service.
- Ensure the equipment is used properly.

S0124.03 Ensure stability and setup mobile equipment.

- Ground equipment in accordance with safety rules.
- Determine traffic control requirements as per MTO guidelines and demonstrate their correct application.
- Describe and demonstrate the setup of mobile equipment.
- Describe and demonstrate stability checks and tests.
- Interpret load capacity charts and ensure vehicles are within load limitations.
- Ensure vehicle and equipment is used properly.

Number:	S0125		
Title:	**Install, Maintain and Remove Power Pole Systems**		
Duration:	Total Hours: 21	Theory: 5 Hours	Practical: 16
Prerequisites:	N/A		
Co-requisites:	N/A		

General Learning Outcomes

Upon successful completion, the apprentice is able to install, maintain and remove power pole systems by identifying type, size, and location of pole; framing and erecting pole; straightening pole; removing pole and testing pole for integrity.

Learning Outcomes and Content

S0125.01 Identify and determine the type, size, and location of pole.

- Select the correct pole sizing, classification, and type.
- Select the location for pole installation.
- Interpret the job staking data documents.
- Interpret verbal instructions specific to job requirements.

S0125.02 Frame and erect poles.

- Interpret the framing standards and install hardware as per documentation.
- Identify methods of excavating pole holes and anchors.
- Dig hole to prescribed depth.
- Install pole in a safe and efficient manner.
- Use approved work methods to install pole in an electrical environment.
- Backfill the hole and clean up work site to customer satisfaction.
- Complete required documentation.
- Install protective barriers and devices.

S0125.03 Straighten Poles

- Visually inspect the condition of the pole.
- Identify and demonstrate the method of straightening a pole.
- Identify and demonstrate the correct use of equipment to straighten a pole.
- Demonstrate that the pole will remain in a true vertical position.
- Demonstrate the correct application of temporary or permanent guying systems to ensure true vertical position.
- Install adequate protective barriers and devices.

S0125.04 Remove Poles

- Identify and demonstrate the method of removing the pole.
- Identify and demonstrate the correct use of equipment to remove the pole.
- Backfill the hole and clean up work site to customer satisfaction.
- Install protective barriers and devices.

S0125.05 Test poles for integrity

- Visually inspect condition of pole.
- Perform conditional test of the pole’s integrity.
- Identify and describe the various stress points that the pole is subjected to
- Perform temporary guying or supporting techniques when altering strain.

Number:	S0126		
Title:	**Maintain Transmission Towers and Structures**		
Duration:	Total Hours: 12	Theory: 4 Hours	Practical: 8
Prerequisites:	N/A		
Co-requisites:	N/A		

General Learning Outcomes

Upon successful completion, the apprentice is able to maintain transmission towers and structures by conducting visual inspections of transmission towers and structures and maintaining transmission towers and structures.

Learning Outcomes and Content

S0126.01 Conduct visual inspections on transmission towers and structures.

- Visually inspect transmission structure components.
- Complete visual inspection documentation.

S0126.02 Maintain transmission towers and structures.

- Ascend, descend, and work at an elevated height while using fall protection devices.
- Select the appropriate tools and material required to make repairs.
- Select and apply the correct barriers.
- Perform a visual inspection.
- Demonstrate concepts of equipotential grounding and bonding and applying the principles.
- Perform equipment loading calculations.
- Apply rigging principles with moving loads.
- Explain fundamentals of AC power and the hazards of induction.
- Raise and lower equipment, tools, and hardware to varying height.

Number:	S0127		
Title:	**Install and Maintain Overhead Power Systems**		
Duration:	Total Hours: 66	Theory: 21 Hours	Practical: 45 Hours
Prerequisites:	N/A		
Co-requisites:	N/A		

General Learning Outcomes

Upon successful completion, the apprentice is able to install and maintain overhead power systems by installing and removing conductors; splicing or repairing conductors; installing spacers, conductor measurement equipment and markers; installing or removing switches; installing or removing service/secondary conductors; inspecting overhead power systems; upgrading overhead structures; installing anchoring and guying systems and installing, maintaining, and troubleshooting street light systems.

Learning Outcomes and Content

Upon successful completion the apprentice is able to:

S0127.01 Install and remove conductors.

- Identify and describe the differences or similarities in conventional and tension stringing methods.
- Calculate conductor weights and tensions.
- Identify and describe the equipment required for stringing conductors.
- Untie, tie in, clamp, unclamp and sleeve conductors.
- Relocate conductors into an alternate position for stringing purposes.
- Ensure adequate grounding of personnel and equipment.
- Perform equipment loading calculations.
- Ensure proper use of tools and equipment.
- Install protective barriers and devices.
- Work directly from the pole.

S0127.02 Splice or repair conductors

- Relocate conductors into an alternate position for repair purposes.
- Ensure adequate grounding of personnel and equipment.
- Perform equipment loading calculations.
- Ensure the proper use of tools and equipment.
- Select the appropriate tools, equipment, and hardware.
- Install protective barriers and devices.
- Work directly from the pole.

S0127.03 Install spacers, conductor measurement equipment and markers.

- Ensure adequate grounding for personnel and equipment.
- Perform equipment loading calculations.
- Ensure proper use of tools and equipment.
- Select the appropriate tools, equipment, and hardware.
- Install protective barriers and devices.
- Work from an insulated aerial device, insulated pole platform or directly from the pole.

S0127.04 Install or remove switching devices.

- Ensure adequate grounding for personnel and equipment.
- Perform equipment loading calculations.
- Ensure proper use of tools and equipment.
- Select the appropriate tools, equipment, and hardware.
- Install protective barriers and devices.
- Work from an insulated aerial device, insulated pole platform or directly from the pole.
- Install, maintain, and remove switching devices.

S0127.05 Install or remove service/secondary conductors.

- Ensure adequate grounding for personnel and equipment.
- Perform equipment loading calculations.
- Ensure the proper use of tools and equipment.
- Select the appropriate tools, equipment, and hardware.
- Install protective barriers and devices.
- Work from an insulated aerial device, or directly from the pole.
- Install or remove secondary service wires and make connections.
- Interpret test meter readings.

S0127.06 Inspect overhead power systems.

- Demonstrate the knowledge of an inspection program.
- Perform a pole inspection.
- Perform a condition criteria assessment.
- Report and document defective conditions.
- Identify causes of television, radio interference.

S0127.07 Upgrade overhead structures.

- Ensure adequate grounding for personnel and equipment.
- Perform equipment loading calculations.
- Ensure the proper use of tools and equipment.
- Select the appropriate tools, equipment, and hardware.
- Install protective barriers and devices.
- Work from an insulated aerial device, insulated pole platform or directly from the pole.
- Interpret company design standards and apply information during the upgrade process.

S0127.08 Install anchoring and guying systems.

- Perform equipment loading calculations.
- Ensure proper use of tools and equipment.
- Select the appropriate tools, equipment, and hardware.
- Install protective barriers and devices.
- Install guying and anchoring systems either manually or with a radial boom derrick.
- Select the most suitable anchoring system as determined by soil conditions.
- Interpret company design standards and apply information for the installation process.
- Work directly from the pole.

S0127.09 Install, maintain and troubleshoot street light systems.

- Ensure adequate grounding for personnel and equipment.
- Perform equipment loading calculations.
- Ensure the proper use of tools and equipment.
- Select the appropriate tools, equipment, and hardware.
- Install protective barriers and devices.
- Work from an insulated aerial device, or directly from the pole.
- Identify and describe the components of a street light system.
- Test and troubleshoot components of a street light system.

Number:	S0128		
Title:	**Troubleshoot Overhead and Underground Power System**		
Duration:	Total Hours: 15	Theory: 15 Hours	Practical: 0
Prerequisites:	N/A		
Co-requisites:	N/A		

General Learning Outcomes

Upon successful completion, the apprentice is able to assess and determine power system problems by diagnosing and repairing single and three phase transformers and isolating, making repairs and/or restoring problem areas.

Learning Outcomes and Content

Upon successful completion the apprentice is able to:

S0128.01 Assess and determine power system problems.

- Understand theory associated with the fundamentals of AC generation.
- Communicate with customers and staff.
- Assess system problems by interpreting available information.
- Select the appropriate tools, equipment, and hardware.
- Work from an insulated aerial device, or directly from the pole.

S0128.02 Diagnose and three phase transformer problems.

- Understand theory associated with the fundamentals of AC generation.
- Understand theory associated with single phase transformers at an intermediate level.
- Perform voltage and current checks.
- Determine causes of transformer failure at an intermediate level.
- Diagnose and verify defective power system equipment at an intermediate level.
- Perform soil resistivity tests and ensure soil meets design standards.
- Use correct tools and equipment.

S0128.03 Isolate, make repairs and/or restore the problem area.

- Understand theory associated with single phase.
- Sectionalize, parallel feeders, operate switching devices.
- Perform voltage and current checks.
- Determine the causes of equipment failure.
- Use the correct tools and equipment.
- Perform temporary repairs to restore power to the system
- Work from an insulated aerial device or directly from the pole.
- Apply approved grounding techniques to ensure a safe working environment.

Number:	S0129		
Title:	**Install, maintain underground distribution systems**		
Duration:	Total Hours: 35	Theory: 17 Hours	Practical: 18
Prerequisites:	S0121-S0124		
Co-requisites:	N/A		

General Learning Outcomes

Upon successful completion, the apprentice is able to install and maintain underground distribution systems by inspecting, trenching, and installing ducts, cement, and fiberglass foundations; terminating and splicing primary/secondary underground cables.

Learning Outcomes and Content

Upon successful completion the apprentice is able to:

S0129.01 Inspect, trench, and install ducts, cement, fiberglass foundations.

- Knowledge of rigging and equipment loading calculations.
- Select the appropriate tools, equipment, and hardware.
- Install protective barriers and devices.
- Read maps, work order prints and trenching profile information.
- Communicate with internal and external parties.
- Interpret and apply company standards.

S0129.02 Terminate and splice primary/secondary underground cables.

- Ensure adequate grounding for equipment and personnel.
- Select the appropriate tools, equipment, and hardware.
- Install protective barriers and devices.
- Terminate and splice secondary power conductors by interpreting manufacturers or company specifications.

Number:	S0130		
Title:	**Install, maintain and remove transformers**		
Duration:	Total Hours: 32	Theory: 9 Hours	Practical: 23
Prerequisites:	S0121, S0125		
Co-requisites:	N/A		

General Learning Outcomes

Upon successful completion, the apprentice is able to install, maintain and remove transformers by identifying transformer and voltage requirements; installing and energizing transformer; installing on base, connecting, and energizing padmount transformer; performing maintenance checks on transformer and removing transformer.

Learning Outcomes and Content

Upon successful completion the apprentice is able to:

S0130.01 Identify transformer and voltage requirements.

- Understand theory component of the fundamentals of AC generation.
- Understand theory component of single-phase transformers.
- Interpret information from transformer nameplate or nomenclature.
- Follow design standards for installation requirements of single-phase transformers.
- Read and interpret voltage and system maps and diagrams.

S0130.02 Install and energize transformer.

- Ensure adequate grounding of personnel and equipment.
- Demonstrate the knowledge of rigging by performing equipment loading calculations.
- Select the appropriate tools, equipment, and hardware.
- Install protective barriers and devices.
- Work from an insulated aerial device, or directly from the pole.
- Install a single-phase transformer and relevant hardware to specified standards.
- Ensure no possible secondary back feed hazard is present while work is in progress.
- Perform soil resistivity test.
- Perform a functional in-service test.

S0130.03 Install on base, connect, and energize padmount transformer.

- Demonstrate knowledge of rigging by performing equipment loading calculations.
- Select the appropriate tools, equipment, and hardware.
- Install protective barriers and devices.
- Install transformer and relevant hardware to specified standards.
- Ensure no possible secondary back feed hazard is present while work is in progress.
- Perform soil resistivity test.
- Perform primary and secondary terminations on live front and dead front equipment.
- Perform a functional in-service test on a single phase padmount transformer.

S0130.04 Perform maintenance checks on transformer.

- Understand theory component associated with the fundamentals of AC generation.
- Understand theory component associated with single phase transformers.
- Ensure adequate grounding for personnel and equipment.
- Select the appropriate tools, equipment, and hardware.
- Install protective barriers and devices.
- Work from an insulated aerial device or directly from the pole.
- Identify and control environmental hazards associated with PCB content and oil spills.
- Ensure no possible secondary backfeed hazard is present.

S0130.05 Remove transformer.

- Ensure adequate grounding of personnel and equipment.
- Knowledge of rigging by performing equipment loading calculations.
- Select the appropriate tools, equipment, and hardware.
- Install protective barriers and devices.
- Work from an insulated aerial device or directly from the pole.
- Ensure no possible secondary backfeed hazard is present.
- Secure transformer for transportation.

Number:	S0131		
Title:	**Install, Operate and Maintain System Protection, Control, and Instrumentation Equipment**		
Duration:	Total Hours: 27	Theory: 16 Hours	Practical: 11
Prerequisites:	S0121, S0124		
Co-requisites:	N/A		

General Learning Outcomes

Upon successful completion, the apprentice is able to install, operate and maintain system protection control and instrumentation equipment by installing, operating and removing power interrupting devices; ensuring system power quality improvement; selecting, installing and removing meters, metering transformers and associated components; conducting current, voltage and phase rotation checks and surveys.

Learning Outcomes and Content

\Upon successful completion the apprentice is able to:

S0131.01 Install, operate and remove power interrupting devices.

- Ensure adequate grounding of equipment.
- Select the appropriate tools, equipment, and hardware.
- Install protective barriers and devices.
- Work directly from the pole.
- Demonstrate knowledge of power interrupting devices

S0131.02 Ensure system power quality improvement.

- Understand theory associated with the generation of three phase AC power.
- Demonstrate knowledge of improving system power quality.
- Perform power factor calculations with the demo training aids.

S0131.03 Select, install, and remove meters, metering transformers and associated components.

- Demonstrate an in-service functional check.
- Select the appropriate tools, equipment, and hardware.
- Install protective barriers and devices.
- Install and remove single-phase self-contained meters.
- Demonstrate awareness of hazards associated with metering devices.

S0131.04 Conduct current, voltage and phase rotation checks, and surveys.

- Understand basic electrical theory.
- Demonstrate the operation of voltmeters, amp meters.
- Interpret and document readings from the metering devices.

Number:	S0132		
Title:	**Handle Energized Lines Using Rubber Protective Equipment**		
Duration:	Total Hours: 33	Theory: 11 Hours	Practical: 22
Prerequisites:	S0121-S0125		
Co-requisites:	N/A		

General Learning Outcomes

Upon successful completion, the apprentice is able to handle energized lines using rubber protective equipment by selecting, testing, inspecting, and maintaining rubber protective equipment and barriers; installing and removing rubber protective equipment; tying, clamping and relocating energized conductors using the rubber glove method; Installing and removing openers, insulators and switches on energized conductors using rubber gloves.

Learning Outcomes and Content

Upon successful completion the apprentice is able to:

S0132.01 Select, test, inspect and maintain rubber protective equipment and barriers.

- Select, test, inspect and maintain rubber protective equipment.
- Identify the equipment and its application.
- Store equipment in a preferred location.
- Identify defects and ensure that the equipment is removed from service.

S0132.02 Install/remover rubber protective equipment

- Ensure adequate grounding of the equipment.
- Install and remove rubber protective equipment.
- Select the appropriate tools and rubber protective equipment.
- Install protective barriers and devices to eliminate second points of contact.
- Work from an insulated aerial device, insulated pole platform or directly from the pole at the appropriate voltage level.

S0132.03 Tie, untie, clamp, and relocate energized conductors using rubber glove methods.

- Ensure adequate grounding of the equipment.
- Knowledge of conductor weights and tensions by performing loading calculations.
- Select the appropriate tools, equipment, and hardware.
- Install protective barriers and devices up to 15Kv.
- Work from an insulated aerial device, insulated pole platform or directly from the pole at the appropriate voltage level.

S0132.04 Install and remove openers, insulators or switches on energized conductors using rubber gloves.

- Ensure adequate grounding of personnel and equipment.
- Knowledge of conductor weights and tensions by performing loading calculation.
- Select the appropriate tools, equipment, and hardware.
- Install adequate barriers and devices.
- Work from an insulated aerial device, insulated pole platform.
- Demonstrate the correct sequence of the job.

Number:	S0133		
Title:	**Handle Energized Lines Using Live Line Tool Methods**		
Duration:	Total Hours: 27	Theory: 9 Hours	Practical: 18
Prerequisites:	S0121-S0125		
Co-requisites:	N/A		

General Learning Outcomes

Upon successful completion, the apprentice is able to handle energized lines using live line tool methods by selecting, testing, inspecting and maintaining live line tools and barriers; installing, and removing protective barriers using live line tools; tying, clamping and relocating energized conductors using live line tool method; installing, removing and operating connectors, jumpers, and equipment on energized apparatus using live line tool methods.

Learning Outcomes and Content

Upon successful completion the apprentice is able to:

S0133.01 Select, test, inspect, and maintain live line tools and barriers.

- Select, test, inspect and maintain live line tools.
- Identify equipment and its application.
- Store the equipment in a preferred location.
- Identify defects and ensure the equipment is removed from service.

S0133.02 Install, remove protective barriers using live line tools.

- Ensure adequate grounding of personnel and equipment.
- Select the appropriate tools, equipment, and hardware.
- Install protective barriers and devices.
- Work from an insulated aerial device, insulated pole platform or directly from the pole.

S0133.03 Tie, clamp and relocate energized conductors using live line tools method.

- Ensure adequate grounding of equipment.
- Knowledge of rigging by performing equipment loading calculations.
- Knowledge of conductor weights and tensions by performing loading calculations.
- Select the appropriate tools, equipment, and hardware.
- Install protective barriers and devices.
- Work from an insulated aerial device, or directly from the pole.

S0133.04 Install, remove and operate connectors, jumpers, equipment on energized apparatus using live line tools methods.

- Ensure adequate grounding of equipment.
- Select the appropriate tools, equipment, and hardware.
- Install protective barriers and devices.
- Work from an insulated aerial device, insulated pole platform or directly from the pole.

Number:	S0134		
Title:	**Select, Maintain and Operate Rigging Equipment**		
Duration:	Total Hours: 20	Theory: 11 Hours	Practical: 9
Prerequisites:	2.1, 2.3, 2.4		
Co-requisites:	N/A		

General Learning Outcomes

Upon successful completion, the apprentice is able to select, maintain and operate rigging equipment by selecting rigging and hoisting equipment; inspecting and maintaining hoisting and rigging equipment; using appropriate rigging and hoisting equipment.

Learning Outcomes and Content

Upon successful completion the apprentice is able to:

S0134.01 Selecting rigging and hoisting equipment.

- Select various types of rigging and hoisting equipment.
- Perform equipment loading calculations.
- Assess and determine tensions, size, weight, and center of gravity of loads to be handled.

S0134.02 Inspect and maintain hoisting and rigging equipment.

- Demonstrate the inspection and maintenance process.
- Document inspection and maintenance process.
- Report equipment deficiencies and remove from service according to company policies.
- Knowledge of rigging and hoisting equipment safety procedures.

S0134.03 Use appropriate rigging and hoisting equipment.

- Use various types of rigging and hoisting equipment.
- Ensure tension, size, weight, and center of gravity of loads to be handled is within the working load limits established.
- Review safe procedures to move material on-site.
- Identify hazards when using rigging and hoisting equipment.
- Demonstrate the application of safety regulations regarding locations, work heights, traffic control procedures, personal protective devices and fall arrest systems.
- Demonstrate specific hand signals and radio communication.
- Demonstrate co-ordination with other work groups to ensure a safe and efficient process.

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Powerline Technician