

NOCC-A21 Electrician: Competence Package

Relevant Occupation/trade title: Electrician				SAQA ID: 91761	
Learning Area 2: Identify, care and use of basic, trade-specific hand- & power tools and equipment				Total Hours:	192
Learning Project 8: Use hand tools to prepare for the termination of cables and conductors for installation (glanding and crimping)				Total Hours:	16
Requisite learning areas/projects to be in place (Pre-requisite and co-requisite):		<ul style="list-style-type: none"> • LA 1 (LP 3, 7, 9, 12) • LA 2 (LP 2) 			
Learning project description: Use hand tools to terminate cables and wires for installation (e.g. crimping, stripping, glanding)					
Activity phase	Practical Skills Modules Content	Underpinning Knowledge Module Content	Work Experience Module Content (Exposure to be given)	Didactical-methodological advice	Learning materials/Tools and Equipment
Reference to QCTO Curriculum	PM01-PS01 PM-01-PS02	KM02-KT01 KM05-KT01	WM-None		
Planning/Preparation	<p>Provide access to (Given): Applicable hand tools to terminate cables and wires for installation and applicable materials</p> <p>Apprentices must be able to do/perform the following (hard and soft) skills:</p> <p>Prepare to terminate cables and wires</p> <ul style="list-style-type: none"> • Identify, obtain and understand OHSA procedures for a given work area • Identify health and safety risks and follow established risk control measures and procedures in preparation for the work 	<p>Knowledge of:</p> <ul style="list-style-type: none"> • Applicable hand tools for terminating cables and wires • Safety precautions regarding the use of applicable hand tools • Methods of risk assessment on the use of applicable hand tools • Material used in terminating cables and wires • Standard operating procedures in terminating cables and wires <p>Cable types for preparation and for terminations encompassing:</p> <ul style="list-style-type: none"> • Techniques of terminating cables 	<p>Under supervision:</p> <ul style="list-style-type: none"> • Prepare termination of cables and wires • Perform risk assessment • Inspect equipment and check registers • Terminate different types of cables and wires • Terminate cords and plugs • Mark, label and tag cables and wire • Prepare a wire/cable pre-installation assembly/harness • Engage in regular housekeeping activities, tool and equipment maintenance • Provide work 	<ul style="list-style-type: none"> • Research /Desk study • Case studies /scenarios • Technical discussions • Group work • Lecture/ instructions • Presentations • Textbook work 	<p>Print materials, electronic files, software applications incl.:</p> <ul style="list-style-type: none"> • OHS Act • Text books • Training manuals for trainers and apprentices incl. multimedia software • Worksheets for termination of cables and wires projects • Set of presentation aids (videos, slides) for overhead or Data projectors <p>Hand- & power tools and PPE incl.:</p>

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	<ul style="list-style-type: none"> • Identify appropriate PPE • Determine the scope and location of the termination work to be undertaken from documentation or other appropriate personnel • Prepare and sequence termination of cables and conductors • Identify appropriate methods for terminating cables and conductors • Determine correct cable and conductor type, size and quality • Obtain and check material needed for terminating work against job requirements • Obtain tools, equipment and devices needed to for the terminating work and check them for correct operation and safety 	<ul style="list-style-type: none"> • Cable variants (single core cables, flexible cables, armoured cables, other similar and like cables) • Structural components of cables and their purpose (conductor material, stranding, insulation type, voltage rating, screening, sheathing, armour and serving) • International/SANS colour standards for cords and cables • Construction of common cables • Identification of cords and cables by conductor size, type and rating • Application of various cords and cables types • Identification of hardware used in terminating cords and cables • Preparation and termination of cords and cables 	<p>documentation, verbal and written reports as required by the company</p>		<ul style="list-style-type: none"> • Electrician's tool box with standard tool set • Wire and cable strippers • Cable/wire cutters • Crimp tools • Hydraulic crimper • Soldering iron • Cable/wire dispenser • Utility/cable knife, hacksaw, screw drivers, pliers • Safety gloves <p>Measuring and testing instruments incl.:</p> <ul style="list-style-type: none"> • Tape measure • Wire gauge • Continuity tester <p>Training workshop and laboratory equipment incl.:</p> <ul style="list-style-type: none"> • Workbenches for practical exercises with hardwood top, metal under frame and lockable set of drawers incl. power supply unit and parallel vice (125mm)
<p>Implementation/ Execution</p>	<p>Terminate cables and wires</p> <ul style="list-style-type: none"> • Correctly use appropriate personal protective equipment (PPE) • Acquire the materials and tools required to complete the work assignment • Locate and hold in place material needed for hand- and power tool application • Operate hand- and power tools appropriately in 	<ul style="list-style-type: none"> • Termination of cords and cables using crimp lugs, tunnel connectors, soldering and solder less lugs • Requirements to protect and support cables adequately (protection against mechanical damage, protection from adverse temperatures and corrosion 			

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	<p>accordance with work requirements</p> <ul style="list-style-type: none"> • Safely locate hand- and power tools when not in immediate use • Cut cables and wires to the specified length • Strip cable/wire sheath/insulation with sufficient length to prevent stain on terminations and without waste • Prepare conductors to suit the type of terminal at which there are to be connected • Select and use hand- and power tools appropriately in accordance with termination type, conductor size and material requirements • Terminate conductors by applying appropriate techniques for the respective termination types • Secure and tighten all termination connections • Inspect termination assemblies for proper fit and alignment to ensure terminal insulation and continuity across the terminal • Prepare a wire/cable pre-installation assembly/harness by binding/tying, 	<p>and protection from magnetic field that may affect the performance of the cable)</p> <p>Cord and plug termination encompassing:</p> <ul style="list-style-type: none"> • Selection of flexible cords for given applications • Preparation of cord ends for connection • Fitting standard three pin plugs to flexible cords • Fitting standard three pin extension sockets to flexible cords • Connecting variety of plugs to different flexible cord types • Requirements of SANS for flexible cords and plugs • Using test equipment to test and locate various faults in flexible cords • Reporting requirements and work documents related to the termination of cables and wires • Housekeeping procedures 			
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	<p>forming and grouping related wires/cables to electrical and environmental requirements</p> <ul style="list-style-type: none"> • Mark, label and tag wires/cables to specifications 				
Evaluation/ Documentation	<p>Complete work and conduct housekeeping activities</p> <ul style="list-style-type: none"> • Evaluate the correct completion of the work assignment according to drawings and / or work instructions • Report work progress/ completion to appropriate personnel • Clean up work area • Inspect and clean hand- and power tools • Store and secure tools and finished products appropriately in designated areas • Dispose of waste materials following work site and environmental requirements • Complete applicable work documentation 				
Total	Hours: 16				
Specialisation additions	Equipment that requires authorisation				
Assessment guidance					
<ul style="list-style-type: none"> • Self assessment 					

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- **Group assessment**
- **Theory test**

Criteria for assessment:

- Safe using of hand tools
- Using of appropriate PPE
- Selecting correct tools as required for the task
- Terminating cables and wires as instructed and according to specifications
- Inspecting tools and identifying and report unsafe or defective equipment in accordance to worksite procedures.
- Caring and storing of tools and equipment

Work in progress