

NOCC-A21 Electrician: Competence Package

Relevant Occupation/trade title: Electrician			SAQA ID: 91761		
Learning Area 5: Install wiring systems and accessories (low voltage) in domestic buildings and premises (incl. earthing and bonding)			Total Hours:	128	
Learning Project 7: Test and maintain low voltage systems and components in domestic buildings and premises			Total Hours:	16	
Requisite learning areas/projects to be in place (Pre-requisite and co-requisite):		LA 4 – LP6			
Learning project description: Testing and maintaining of low voltage systems and accessories should be carried out in domestic buildings and premises.					
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	PM-05-PS06, PM-06-PS01-02, PM-07-PS01-03 PM-08-PS01-05	KM03-KT01, KM-05-KT01 KM-05-KT02 KM-05-KT03	WM-01-WE01-03 WM-02-WE01-03 WM-03-WE01-03 WM05-WE01-03		
Planning/ Preparation	<p><u>Provide access to (Given):</u> Work tasks/job requests and material and equipment as specified in last column;</p> <p><u>Apprentices must be able to do/perform the following (hard and soft) skills:</u></p> <p>Prepare for testing, maintenance and upgrading of domestic installation systems</p> <ul style="list-style-type: none"> Obtain, identify and understand statutory requirements for an installation Identify and establish health and safety risks and follow risk control measures and 	<p><u>Knowledge of:</u></p> <ul style="list-style-type: none"> Types of tests for low voltage electrical systems (Visual inspection, continuity test, voltage test...) – power off and on Measuring of electrical values in the circuits Common faults in domestic installations Basic methods to maintain low voltage systems and accessories Procedures of handing over of low voltage 	<p><u>Under supervision:</u></p> <ul style="list-style-type: none"> Interpret maintenance task instructions interpreted and sequence required work tasks Conduct recommissioning after maintenance, upgrading and necessary corrective action is taken Perform maintaining and upgrading low voltage systems and accessories to other installations in ceilings/walls/floors under direct and constant supervision until competent 	<ul style="list-style-type: none"> Self-study assignments Using of internet sources, text books and work sheets Instruction on selection of appropriate installation system components and the application of SANS standards. Inspection of a construction site with assignments Observation method Case studies 	<p>Print materials, electronic files, software applications incl.:</p> <ul style="list-style-type: none"> OHS Act SANS 10142-1 Text books Manufacturer maintenance manuals Training manuals for trainers and apprentices incl. multimedia software Fault simulation software for electrical installations

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	<p>procedures in preparation for the work</p> <ul style="list-style-type: none"> • Prepare for testing, maintenance and upgrade work in consultation with others affected • Determine the scope and location of the testing, maintenance and upgrade work to be undertaken from documentation • Identify and check tools, equipment and material needed for the testing, maintenance and upgrade work against job requirements 	<p>systems and accessories</p>	<ul style="list-style-type: none"> • Maintain low voltage systems and accessories without assistance but regular supervision • Test and repair maintained low voltage systems and accessories under close supervision until work can be done on a more autonomous basis. • Engage in regular housekeeping activities, tool and equipment maintenance 		<ul style="list-style-type: none"> • Set of presentation aids (videos, slides) for overhead or LED/LCD projectors <p>Access equipment incl.:</p> <ul style="list-style-type: none"> • Ladders <p>Hand- & power tools incl.:</p> <ul style="list-style-type: none"> • Standard electrician's toolbox • Electrical drilling machine/hammer with set of drill bits and chisels • Conduit benders <p>Appropriate PPE incl.:</p> <ul style="list-style-type: none"> • Hand gloves • Protective goggles • Safety clothing <p>Measuring and testing instruments incl.:</p> <ul style="list-style-type: none"> • Insulation tester • Plug Polarity (Socket) Tester • True RMS Digital Multimeter • Clamp meter • AC Leakage current clamp meter <p>Training workshop incl.:</p>
<p>Implementation/ Execution</p>	<p>Conduct testing, maintenance and upgrading of domestic installation systems</p> <p>Perform testing (power off)</p> <ul style="list-style-type: none"> • Ensure that the circuit/installation is isolated and locked out • Perform continuity and insulation resistance tests • Identify any defects/faults • Rectify any identified faults <p>Perform testing (power on)</p> <ul style="list-style-type: none"> • Perform functionality, polarity, earth leakage, voltage, current tests to evaluate system • Identify any defects/faults • Rectify any identified faults <p>Maintain:</p> <ul style="list-style-type: none"> • Evaluate current system 				

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	<p>performance against expected performance (inspection/fault finding)</p> <ul style="list-style-type: none"> • Test suspected fault scenarios as being the source of system problems • Identify and appropriately document source of the fault/defect • Dismantle installation system and components where necessary to gain access • Source and obtain materials/ replacement components required to rectify faults/defects • Replace, adjust and secure faulty/defect components and equipment • Reset and/or adjust to ensure equipment operates within parameters • Reassemble system components, finally test and prepare them to go back into service • Follow risk control measures and procedures for carrying out the work 				<ul style="list-style-type: none"> • Training packages for fault finding in conventional domestic wiring installations • Installation cabins/ cubicles • Set of various domestic appliances, lighting circuits and systems, socket outlet circuits, equipped distribution boards for fault finding exercises
<p>Evaluation/ Documentation</p>	<p>Complete the testing and maintenance of domestic installation Systems</p> <ul style="list-style-type: none"> • Complete work and notify appropriate personnel • Conduct housekeeping activities • Clean and check tools, 				

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	<p>equipment and return to store</p> <ul style="list-style-type: none"> • Return to storage or dispose of any surplus resources and materials • Process and finalise works completion records, reports, modified drawing and/or documentation and information • Hand over maintained electrical system and components 				
Total	Hours: 16				
Specialisation additions					
Assessment guidance					
<p>Criteria for assessment:</p> <ul style="list-style-type: none"> • Recognising early warning signs of equipment needing attention or having potential problems • Identifying and analysing the range of possible causes of faulty installations and determining the most likely cause • Taking appropriate action to ensure functionality • Interpreting a range of electrical drawings and schematics and of manufacturer specifications in order to undertake required maintenance or identified repairs/modifications to electrical systems • Using methodical fault finding techniques • Finding and rectifying faults efficiently • Replacing of faulty system components to meet customer demands and to facilitate a sustainable and efficient system operation • Completing documentation correctly 					