

NOCC-A21 Electrician: Competence Package

Relevant Occupation/trade title: Electrician			SAQA ID: 91761		
Learning Area 11: Install, maintain and troubleshoot low voltage <u>alternative power supply systems and associated equipment</u>			Total Hours:	64	
Learning Project 1: <u>Install power generators and transfer switches</u>			Total Hours:	16	
Requisite learning areas/projects to be in place (Pre-requisite and co-requisite):		<ul style="list-style-type: none"> Phase 1 completed 			
Learning project description: Apprentices learn to install power generators and transfer switches.					
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-01 (PS-01, 02, 03) PM-02 (PS 01, 02, 03) PM-03 (PS01, 02, 03) PM-04 (PS01, 02, 03) PM-05 (PS 01 – 06) PM-06 (PS 1-2) PM-07 (PS 01 – 03)	KM-06-KT03 KM-07 (KT02, 05) KM-09 (KT01)	WM-01 (WE1-3) WM-02 (WE1-3) WM-03 (WE1-3) WM-04 (WE01-03)		
Planning/Preparation	<p>Provide access to (Given): Motor driven generators, Automatic Mains Failure, change over switch, cables, conductors, wire-ways, protection, metering, trunking, cable tray, power skirting and materials and equipment as per last column;</p> <p>Apprentices must be able to do/perform the following (hard and soft) skills:</p> <ul style="list-style-type: none"> Wear correct PPE Complete work permit Conduct risk assessment Select the correct tools and equipment Transport all materials and equipment safely to 	<p>Knowledge of:</p> <ul style="list-style-type: none"> Basic operating principles of generator systems Company's standard operating procedures Electrical earthing requirements according to SANS 10142-1 Installation procedures SANS 10142-1 Annex S Example of emergency power installations configurations; <ul style="list-style-type: none"> Changeover switch connections where a standby power generator feeds in at main supply Changeover switch connections where a standby power generator feeds into a 	<p>Under supervision: <i>If workplace allows for this exposure:</i></p> <ul style="list-style-type: none"> Perform lockout procedures Design, install and wire an MG set according to statutory requirements Conduct power-off and power-on tests on MG set Commission the motor generator system and check operation of alternative supply and utility supply 	Lecture, presentations DVDs, audio-visual Group and individual work Training models Internet	<p>Print materials, electronic files, software applications incl.:</p> <ul style="list-style-type: none"> Training manuals for trainers and apprentices incl. multimedia software Set of presentation aids (videos, slides) for overhead or LED/LCD projectors <p>Tools, equipment and materials incl.:</p> <p>Electricians toolbox</p> <p>Materials</p> <ul style="list-style-type: none"> OHS Act

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	<p>workstation</p> <ul style="list-style-type: none"> • Design the electrical circuit • Draw a single line diagram • Design the layout of electrical installation • Lockout electrical installation • Display notice board 	<p>section of the mains distribution board.</p> <ul style="list-style-type: none"> • Electrical cabling and current carrying capacities of conductors • Work procedures and work documents related to installations and wiring and manufacturer's specifications 			<ul style="list-style-type: none"> • SANS 10142-1 • Local Authority requirements • Manufactures specifications • Work-site procedures
<p>Implementation/ Execution Repair</p>	<ul style="list-style-type: none"> • Wire a motor generator set according to circuit diagram and manufactures specification. • Install and wire a changeover/AMF (automatic main failure) switch to the main distribution board • Conduct a power-off test to ensure that the installation adheres to statutory requirements • Conduct a power-on test to check the operation of the system by changing it over to alternative supply (motor generator) or utility supply (municipal supply) 	<ul style="list-style-type: none"> • Read and interpret electrical drawings and sketches with regards to motor generators • Terminology regarding MG sets (refer to annex S) • Working principles of MG sets and its components/protection devices. • Change over switches and different configurations as per annex S 			<ul style="list-style-type: none"> • Electrical drawings include but is not limited to: • Schematic diagrams • Wiring diagrams • Connection / terminal schedules • Cable schedules • Layout drawings <p>Electrical equipment</p> <ul style="list-style-type: none"> • Single phase generator • Three phase generator • Contactors • Timers • Relays • Indication lights • Switches • Protective devices (fuses, circuit breakers, earth leakage units, etc.) • Connection terminals • Manual change over switch • Pre-wired AMF panel (Automatic Mains Failure) • Variety of conductors • Manual change over switch • Controllers • Labelling and notice boards
<p>Evaluation/ Documentation</p>	<ul style="list-style-type: none"> • Evaluates the correct usage of the electrical equipment according to set criteria • Report work progress to appropriate personnel • Inspect and clean tools • Store and secure tools and materials • Complete applicable work documentation • Perform housekeeping 				

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					PPE: <ul style="list-style-type: none"> • Safety overall • Safety boots
Total	Hours: 16				
Specialisation additions	Equipment that requires authorisation				
Assessment guidance					
<ul style="list-style-type: none"> • Self assessment • Group assessment • Theory test <p>Criteria for assessment:</p> <ul style="list-style-type: none"> • Correct use of PPE and tools/equipment • Safety procedures are followed • The circuit is designed and wired correctly • The circuit functions correctly • Power-on and off test is undertaken • Over-current devices selected are at the correct rating • Commission the system to ensure functionality • Settings on AMF controller are set according to generators requirements • Housekeeping is performed 					

Work 1