

# NOCC-A21 Electrician: Competence Package

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|---|--|--|--|---|---|
| Relevant Occupation/trade title: Electrician  |  |  | SAQA ID: 91761   |   |   |
| Learning Area 16: Apply basic renewable energy technologies in electrical installations                         |  |  | Total Hours:   |   | 56  |
| Learning Project 4: Solve basic problems in PV energy apparatus and stand-alone renewable energy systems        |  |  | Total Hours:   |   | 16  |
| Requisite learning areas/projects to be in place (Pre-requisite and co-requisite):                              |  | <ul style="list-style-type: none"><li>Phase 2 completed</li><li>LA 16 LP 1-3</li></ul>   |  |   |   |
| Learning project description: Apprentices learn to maintain and repair stand-alone PV systems (basic problems). |  |  |  |   |   |
| 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-None  | KM-07 (KT01, 02, 04, 05,06)<br>KM-08 (KT01)  | WM-05 (WE01-03)  |   |   |
| Planning/Preparation  | <p><b><u>Provide access to (Given):</u></b><br/>Photovoltaic system which includes panels, batteries, invertors, controller, DC and AC circuit breakers, cabling, specialized connectors, distribution board.</p> <p><b><u>Apprentices must be able to do/perform the following (hard and soft) skills:</u></b></p> <ul style="list-style-type: none"><li>Wear correct PPE</li><li>Complete necessary documentation</li><li>Conduct risk assessment</li><li>Select the correct tools and equipment</li><li>Transport all materials and equipment safely to workstation</li></ul> | <p><b><u>Knowledge of:</u></b></p> <ul style="list-style-type: none"><li>Faults that can occur on a photovoltaic system</li><li>Maintenance that must be performed on a photovoltaic system</li><li>Correct isolation procedures</li></ul> | <p><b><u>Under supervision:</u></b><br/><i>If the workplace allows for this exposure:</i></p> <ul style="list-style-type: none"><li>Clean photovoltaic panels</li><li>Checks photovoltaic system for hot spots (dead cell), shading, dirt and loose connections</li><li>Maintain batteries on PV systems according to manufacturer specifications</li><li>Maintain inverter according to manufacturer specifications</li><li>Maintain electrical connections on PV systems</li></ul> | Lecture, presentations<br>DVDs, audio-visual<br>Group/Individual work, Internet | <p><b>Print materials, electronic files, software applications incl.:</b></p> <ul style="list-style-type: none"><li>Training manuals for trainers and apprentices incl. multimedia software</li><li>Set of presentation aids (videos, slides) for overhead or LED/LCD projectors</li></ul> <p><b>Tools, equipment and materials incl.:</b><br/>Electrical toolbox</p> <p><b>Equipment</b></p> <ul style="list-style-type: none"><li>Invertors</li><li>Batteries</li><li>Distribution board</li><li>Photovoltaic system which includes:<ul style="list-style-type: none"><li>controller,</li><li>DC and AC circuit breakers, cabling</li></ul></li></ul> |
| Implementation/Execution<br><br>(5Hours)  | <ul style="list-style-type: none"><li>Clean photovoltaic panels</li><li>Checks photovoltaic system for hot spots (dead cell), shading, dirt and loose connections</li><li>Maintain batteries according to manufacturer specifications</li></ul>  |  |  |   |   |

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|  | <ul style="list-style-type: none"> <li>• Maintain inverter according to manufacturer specifications</li> <li>• Maintain electrical connections</li> </ul>  |  |  |  | <ul style="list-style-type: none"> <li>○ Specialized connectors</li> <li>○ Batteries</li> <li>○ DB board</li> <li>○ Circuit breakers or fuses</li> </ul>  |
| <b>Evaluation/Documentation</b><br><br><b>(2Hours)</b>   | <ul style="list-style-type: none"> <li>• Evaluate work to ensure that maintenance has been done to required standards</li> <li>• Test the photovoltaic system for correct functionality</li> <li>• Report work progress to appropriate personnel</li> <li>• Inspect and clean tools</li> <li>• Store and secure tools and materials</li> <li>• Complete applicable work documentation</li> <li>• Perform housekeeping</li> </ul> |  |  |  | <ul style="list-style-type: none"> <li>• Step ladder</li> <li>• Safety harness</li> <li>• Scaffolding</li> <li>• High pressure hose</li> </ul> <p><b>Tools</b></p> <ul style="list-style-type: none"> <li>• Radiation meter</li> <li>• Multi-meter</li> <li>• </li> </ul> <p><b>PPE:</b></p> <ul style="list-style-type: none"> <li>• Safety overall</li> <li>• Safety boots</li> </ul> |
| <b>Total</b>   | Hours: 16  |  |  |  |   |
| <b>Specialisation additions</b>  |  |  |  |  |   |
| <b>Assessment guidance</b>   |  |  |  |  |   |
| <ul style="list-style-type: none"> <li>• <b>Self assessment</b></li> <li>• <b>Group assessment</b></li> <li>• <b>Theory test</b></li> </ul> <p><b>Criteria for assessment:</b></p> <ul style="list-style-type: none"> <li>• Correct PPE is worn</li> <li>• Risk assessment undertaken</li> <li>• Necessary documentation completed</li> <li>• Safety procedures are followed</li> <li>• Photovoltaic system tested to ensure functionality</li> <li>• Photovoltaic system is maintained according to manufacturer specifications</li> <li>• Faults on the system are identified</li> <li>• Task is completed as per job card</li> <li>• Housekeeping undertaken</li> </ul> |  |  |  |  |   |