

NOCC-A21 Electrician: Competence Package

Relevant Occupation/trade title: Electrician				SAQA ID: 91761	
Learning Area 10: Install, maintain and troubleshoot electrical transformers and associated controls				Total Hours:	72
Learning Project 3: Select and install low voltage (three phase) transformers				Total Hours:	40
Requisite learning areas/projects to be in place (Pre-requisite and co-requisite):		<ul style="list-style-type: none">• Phase 1 completed• LA 8 LP 3• LA 10 LP 1-2			
Learning project description: Apprentices learn to select and install low voltage (three phase) transformers.					
Activity phase	Practical Skills Modules Content	Underpinning Knowledge Module Content	Work Experience Module Content	Didactical-methodological advice	Learning materials/Tools and Equipment
Reference to QCTO Curriculum	PM05-PS04	KM07-KT03	WM-None		
Planning/ Preparation	<p><u>Provide access to (Given):</u> Scenario with a load (VA rating and voltage), multiple single and/three phase transformers, electrical wiring diagram, materials and equipment as identified in last column;</p> <p><u>Apprentices must be able to do/perform the following (hard and soft) skills:</u></p> <ul style="list-style-type: none">• Read and interpret the scenario given• Perform relevant calculations• Select correct single and or three phase transformer based on calculations• Select correct configuration• Identify transformer protection• Read and interpret electrical diagram	<p><u>Knowledge of:</u></p> <ul style="list-style-type: none">• Theory of three phase transformers (function and operation, safety)• Transformer calculations• Types and application of three phase power transformers• Configurations of three phase transformers• Transformer protection• Cooling systems for three phase transformers• Specific safety procedures related to	<p><u>Under supervision:</u></p> <ul style="list-style-type: none">• Select, install and wire single and three phase transformers (in a variety of contexts)• Have structured discussion on the selection of a three phase transformer for specific scenarios	Lecture, presentations DVDs, audio-visual Demonstrations Practical applications	<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• Statutory requirements:• SANS 10142-Part1• Municipal by-laws <p>Tools, equipment and materials incl.: Range of materials and tools to be covered (minimum):</p> <ul style="list-style-type: none">• Electrical hand tools standard toolbox

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	<ul style="list-style-type: none">Perform a risk assessment on the taskPlan positioning of transformer(s)Plan wiring as per diagramIdentify the tools and materials requiredIdentify obstacles and necessary precautions in relation to taskPlan sequence of tasks	<ul style="list-style-type: none">three phase transformersStatutory requirements as per work conductedLabelling of three phase transformers			<ul style="list-style-type: none">Associated PowertoolsMeasuring instruments <p>Materials:</p> <ul style="list-style-type: none">Surface to mount transformerSingle and three phase transformersLugsCable tiesConductorsCablesSlotted trunkingMetering instruments (voltmeter, ammeter)Labelling <p>PPE:</p> <ul style="list-style-type: none">Hard hatSafety bootsGlovesSafety glasses
Implementation/ Execution <u>Repair</u>	<ul style="list-style-type: none">Transport materials and tools safely to siteFit transformer(s) as per diagramInsert slotted trunking where applicableComplete wiring of transformer(s)Fit lugs where applicableLabel transformer(s) according to drawingTest installation (power on)				
Evaluation/ Documentation	<ul style="list-style-type: none">Clean work area after completion of task in accordance with work site procedures and housekeeping standardsDispose of waste materials in accordance with safety standards and environmental requirementsComplete necessary documentation and submit to designated personnel.				
Total	Hours: 40				
Specialisation additions					
Assessment guidance					
<ul style="list-style-type: none">Self assessmentGroup assessmentTheory test <p>Criteria for assessment:</p> <ul style="list-style-type: none">Planning and calculations for task					

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- Interpretation of electrical calculations and diagram
- Identification of risks
- Correct selection, positioning and operation of transformer(s)
- Transformer(s) wired as per given diagram and labelled accordingly
- Transformers configured as required
- Transformer protection applied
- Use of appropriate equipment and tools
- Clean worksite after completion of task and equipment returned safely to store

Work in progress