

NOCC-A21 Electrician: Competence Package

Relevant Occupation/trade title: Electrician			SAQA ID: 91761		
Learning Area 6: Install wiring systems and accessories for low voltage in <u>industrial & commercial</u> buildings and premises (incl. earthing and bonding)			Total Hours:	168	
Learning Project 4: Install internal and external industrial lighting systems including termination and testing			Total Hours:	24	
Requisite learning areas/projects to be in place (Pre-requisite and co-requisite):		<ul style="list-style-type: none"> • LA 1 (LP 2, 3, 5, 7, 9, 10) • LA 2 (LP 1-7) • LA4 (LP1-3) • LA5 (LP 1-4) • LA6 (LP 1-3) 			
Learning project description: Install internal and external industrial lighting systems (street lighting, sodium & mercury vapour, metal halide, emergency lighting) including termination and testing					
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	KM-05-KT01 KM-05-KT02 KM-05-KT03	WM-01-WE01-03 WM-02-WE01-03 WM03-WE01-03		
Planning/ Preparation	<p>Provide access to (Given): Work tasks/job cards, installation cubicles and materials and equipment as listed in last column;</p> <p>Apprentices must be able to do/perform the following (hard and soft) skills:</p> <p>Prepare for the installation of industrial/ public/ emergency lighting systems</p> <ul style="list-style-type: none"> • Receive, analyse and confirm work schedule, including drawings, plans, requirements, 	<p>Knowledge of:</p> <ul style="list-style-type: none"> • Occupational health and safety requirements (OHS Act) • Accident prevention & first aid • Schematic drawings and manufacturers specifications • SABS Standards, codes, legislation, supply authority regulations, and company requirements pertaining to the 	<p>Under supervision:</p> <ul style="list-style-type: none"> • Participate in talks with clients and briefings with appropriate personnel to determine system specifications • Access schematic drawings and documentations to analyse simple and gradually more complex industrial lighting system 	<ul style="list-style-type: none"> • Research /Desk study • Case studies /scenarios • Technical discussions • Lecture/ instructions • Textbook work • Mind mapping • Practical simulation work 	<p>Print materials, electronic files, software applications incl.:</p> <ul style="list-style-type: none"> • OHS Act • SANS 10142-1 • Text books • Manuals for trainers and apprentices incl. multimedia software • Set of presentation aids (videos, slides) for overhead or LED/LCD projectors

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	<p>established procedures, and material lists if needed, by site inspection</p> <ul style="list-style-type: none"> • Communicate relevant requirements and established procedures for the work to all personnel • Obtain and confirm OHS policies and procedures for the installation of industrial/public/emergency lighting systems • Prioritise and sequence work following consultation with others for completion within acceptable timeframes • Identify hazards, assess OHS risks and prioritise control measures • Obtain relevant work permits to access and perform work • Obtain and confirm resources including personnel, equipment, tools and PPE required for the job • Resolve liaison issues with other/authorised personnel, authorities, clients and owners, where necessary, to carry out work • Prepare site according to the work schedule and to minimise risk and damage to property • Brief all personnel participating in the work, including machine operators and contractors and confirm respective responsibilities 	<p>installation of industrial/public lighting systems and associated equipment</p> <ul style="list-style-type: none"> • Types of lighting systems (Overhead and underground) • Safety precautions specific to working on public lighting • Basic industrial/public lighting principles (Electromagnetic spectrum, Principles of colour Behaviour of light, Factors that affect illumination) • Requirements for the use of company construction manuals, system, diagrams/ plans and drawings • Types of tools and equipment used for installation • Types and function of lanterns/luminaries/lamp s, control equipment, poles/studs and associated hardware used for public/industrial lighting (HP mercury vapour, LP and HP sodium vapour, fluorescent, quartz-halogen; wood-, concrete-, steel-, composite materials; choke boxes, photo-electric cells, time 	<p>installations</p> <ul style="list-style-type: none"> • Develop work plans for industrial lighting systems starting from one shop floor/component to the whole factory/system • Familiarise with the range of installation materials needed for industrial lighting installations • Conduct regular OHS instructions and talks as required by law • Source needed installation materials, tools, measuring instruments and equipment for given jobs • Initially perform preparatory works under direct and constant supervision of qualified personnel • Undertake all preparatory installation activities without assistance but regular supervision • Practice general safety rules and safe work procedures • Provide input on the lamp type options for intended purposes 		<p>Stationary machinery, mobile plants, transport, access and lifting equipment incl.:</p> <ul style="list-style-type: none"> • Hoisting and lifting gear • Ladders and scaffolds <p>Hand- & power tools and PPE incl.:</p> <ul style="list-style-type: none"> • Electrical drilling machine • Standard electrician's toolbox <p>Measuring and testing instruments incl.:</p> <ul style="list-style-type: none"> • Measuring tape (tool box) • Steel ruler (tool box) • Steel square (tool box) • LED Voltage/continuity tester (tool box) • LV detectors • Insulation resistance testers • Clamp-on ammeters • Fault indicators <p>Training workshop and laboratory equipment incl.:</p> <ul style="list-style-type: none"> • Heavy workbench
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	<ul style="list-style-type: none"> Obtain and check tools, equipment and testing devices needed to for the lighting system installation work for correct operation and safety Obtain and check material needed for the lighting installation work against the job requirements 	<p>switches, contactor boxes, brackets, street lights standards)</p> <ul style="list-style-type: none"> Energy consumption of different lighting types and systems Emergency lighting luminaires and exit signs Emergency lighting control systems 	<ul style="list-style-type: none"> Perform various industrial lighting system installations in ceilings/walls/floors under direct and constant supervision until competent Install industrial lighting systems without assistance but regular supervision Test and repair lighting systems under close supervision until work can be done on a more autonomous basis 		<p>with stool, power supply and assembly vice</p> <ul style="list-style-type: none"> Bench mountable interchangeable training panel frame Mountable punched hole frame and front panel frame Basic panel systems for conventional wiring installations in buildings exercises Training package for lighting circuits and systems Installation cabins/ cubicles with solid brick walls or interchangeable plaster-/chip board walls or punched hole grid panels (potentially covering wall, ceiling and under floor installations) Set of various types and sizes of reusable lighting fixtures for ceiling/ wall, indoor/outdoor, socket types and IP ratings Set of various types of lighting control devices and switches
<p>Implementation/ Execution</p>	<p>Carry out installation of industrial/public and emergency lighting systems.</p> <ul style="list-style-type: none"> Monitor and follow OHS, sustainable energy and environmental principles and practices to reduce the incidents of accidents and minimise waste Follow and confirm the safe practice of lifting, climbing, working in confined spaces and aloft, and the use of power tools/equipment and techniques Inspect excavation/ foundation and ceiling/ roof/ wall/ pole/ studs construction Observe installation zones, routes and installation types Set-out and install respective wire ways and enclosing components in line with lighting system requirements Install associated hardware, fittings and control gear Install earthing system and lighting circuits as required 	<ul style="list-style-type: none"> Arrangements and labelling of emergency lighting operation of emergency lighting systems Emergency power supplies for centrally supplied systems (emergency power source, batteries and their installation, battery charger assembly, inverters, alarm systems) Design of emergency escape luminaire installation Requirements for self-contained emergency escape luminaires and exit signs Battery systems used in emergency lighting (types of batteries and their characteristics, recharging arrangements, procedures for testing emergency lighting) Techniques for the 	<ul style="list-style-type: none"> Engage in regular housekeeping activities, tool and equipment maintenance Provide work documentation, verbal and written reports as required by the company 		

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	<ul style="list-style-type: none"> • Terminate wiring at light sockets and associated equipment • Conduct inspection and testing of industrial/ public/ emergency lighting and associated hardware to ascertain that it conforms to requirements • Report OHS risks to the immediate authorised personnel for directions • Deal with unexpected situations safely and with the approval of an authorised person • Undertake regular checks of work quality in line with requirements 	<p>installation of industrial/ public lighting systems</p> <ul style="list-style-type: none"> • Techniques for the inspection, testing and commissioning of industrial/public lighting systems • Techniques for the installation of electrical wiring and equipment for centrally supplied emergency systems • Inspection and testing requirements and procedures • Work procedures and work documents related to the installation of industrial/ public/ emergency lighting 			<ul style="list-style-type: none"> • Set of various types of industrial lamps including: HP mercury vapour LP and HP sodium vapour, Fluorescent, Quartz-halogen LED Lighting, Tungsten halogen, Emergency lighting
<p>Evaluation/ Documentation</p>	<p>Complete the installation of industrial/ public/ emergency lighting system</p> <ul style="list-style-type: none"> • Report accidents and/or injuries where applicable • Rehabilitate, clean up and secure work site • Clean, check and return tools, equipment and any surplus resources and materials, where appropriate, to storage • Dispose of waste appropriately in line with environmental friendly practices • Sign off relevant work permit(s) and put the industrial/ public/ emergency lighting system into service 				

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	<ul style="list-style-type: none"> Finalise and process work completion records and notify appropriate personnel 				
Total	Hours: 24				
Specialisation additions					
Assessment guidance					
<p>Criteria for assessment:</p> <ul style="list-style-type: none"> Reading and interpreting drawings related to Install internal and external industrial lighting systems including termination and testing Planning the Installing of internal and external industrial lighting systems including termination Selecting and obtaining appropriate tools, lighting and accessories Sequencing the installation effectively with other affected by the work Routing, installing and securing internal and external industrial lighting systems in compliance with requirements Placing and securing accessories accurately and maintaining fire integrity Rectifying any defects revealed through on-going inspection. Correct documenting of internal and external industrial lighting systems and accessories Dealing with unplanned events Cleaning worksite Notifying completion of work using established procedures 					

Work