GOVERNMENT NOTICES

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

No. 984 **19 September 2008**

SOUTH AFRICAN QUALIFICATIONS AUTHORITY (SAQA)

In accordance with Regulation 24(c) of the National Standards Bodies Regulations of 28 March 1998, the Standards Generating Body (SGB) for

Electrical Engineering and Construction

registered by Organising Field 12, Physical Planning and Construction, publishes the following Qualification and Unit Standards for public comment.

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the Qualification and Unit Standards. The full Qualification and Unit Standards can be accessed via the SAQA web-site at **www.saqa.org.za**. Copies may also be obtained from the Directorate of Standards Setting and Development at the SAQA offices, SAQA House, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the Qualification and Unit Standards should reach SAQA at the address below and ***no later 20 October 2008.*** All correspondence should be marked **Standards Setting – Electrical Engineering and Construction** addressed to

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SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:
National Certificate: Electrical Engineering

SAQA QUAL ID	*QUALIFICATION TITLE*		
63790	National Certificate: Electrical Engineering		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
QUALIFICATION TYPE	*FIELD*	*SUBFIELD*	
National Certificate	12 - Physical Planning and Construction	Electrical Infrastructure Construction	
ABET BAND	*MINIMUM CREDITS*	*NQF LEVEL*	*QUAL CLASS*
Undefined	133	Level 3	Regular-Unit Stds Based

This qualification replaces:

Qual ID	Qualification Title	NQF Level	Min Credits	Replacement Status
48475	National Certificate: Electrical Engineering	Level 3	127	Will occur as soon as 63790 is registered

PURPOSE AND RATIONALE OF THE QUALIFICATION
Purpose:

The purpose of this qualification is to provide learners, education and training providers and employers with the standards and the range of learning required to work effectively within various industries, making use of electrical engineering knowledge and skills to meet the challenges of such an environment.

Qualifying learners will also be able to relate their learning to scientific and technological principles and concepts. They will also be able to maintain and support the various policies and procedures related to the safety, health, environment and quality systems that govern their workplace. This qualification will enable the learner to find employment as a skilled worker or become self employed as a single phase worker in the electrical field.

Qualifying learners at NQF Level 3 will be able to:

> Understand electrical equipment and protection technology and interpret integrated circuit schematics.
> Install and commission electrical equipment on integrated electrical circuits.
> Maintain and repair electrical equipment on integrated electrical circuits.
> Evaluate and solve familiar problems pertaining to electrical equipment, integrated electrical circuits and related processes.
> Accept responsibility for utilising and maintaining equipment without working under direct supervision.

The status and relevance of this qualification will attract and retain quality learners and employees, and is the second step along a recognised and meaningful career path. Qualifying learners will be able to relate the tasks and processes to scientific and technological principles and concepts. They will also be able to maintain and support the various policies and procedures integral to safety, health and the environment. Learner achievements in this

qualification will also serve as a basis for further learning to engage in more complex installation, maintenance and repair activities and processes.

Rationale:

This is the second of a three-level qualification series that reflect the workplace-based needs of the electrical field that is expressed by employers and employees, both now and for the future. This electrical engineering qualification provides the intermediate competencies required to work on integrated electrical circuits and installations. This qualification provides the learner with accessibility to be employed within the electrical engineering field and provides the flexibility to pursue different careers across various industry sectors and articulate within industries such as:

> Manufacturing and Engineering.
> Energy Sector.
> Mining.
> Chemical.
> Transport.
> Other related engineering industry sectors.

This qualification will enhance the status and productivity of the learner as well as contribute to improved quality, production rate and growth within the engineering sector. The range of typical learners at this level could include individuals preparing to qualify in occupations or trades such as:

> Electrician.
> Domestic Appliance Repair.

This intermediate set of skills acquired at NQF Level 3 enables the learner to work on integrated circuits and installations. Further learning at NQF Level 4 will enable the learner to work on integrated systems and installations and operate as a skilled worker performing Artisan duties in the electrical field.

This qualification could assist with the achievement of national government and industrial development policies and strategies to grow a pool of scarce and other related skills in support of sustainable economic growth. People working in the electrical engineering fields require specialized technical skills and knowledge in order to meet the requirements of continually changing environment of the various industries. Through its design, this qualification will meet the needs of learners within the electrical engineering sectors who require technical expertise and essential knowledge needed to earn formal qualifications. This qualification facilitates access for previously disadvantaged groups and other learners to acquire the technical knowledge and skills that are required as well as provide access and mobility into higher-level more specialised occupations. This will allow the learner greater employability and support the development of small and medium enterprises (SME).

RECOGNIZE PREVIOUS LEARNING?
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LEARNING ASSUMED IN PLACE
This qualification assumes learners obtained a National Certificate in Electrical Engineering NQF Level 2 or an equivalent qualification. If the learner does not already have such a qualification, learning in preparation for this qualification would also have to include:

> Language and Maths at NQF Level 2.
> Introductory concepts of Science and Technology related to electrical engineering, materials and tools used in installation processes.
> An ability to install designated electrical equipment and circuits.

> Occupational health, safety and environmental practices within the electrical environment.
> An understanding of procedures related to workplace relationships, roles and responsibilities.

Recognition of Prior Learning:

This qualification can be obtained wholly or in part through the recognition of prior learning (RPL). The learner should be thoroughly briefed on the process. Support and guidance should be provided. The process should not be so onerous as to prevent learners from taking up the RPL option in obtaining the qualification.

Access to the Qualification:

Access to this qualification is open and the learner must be physically able to perform the outcomes as specified in the unit standards and be able to differentiate between various colours applicable to the industry. The learner must also have skills related to and knowledge of designated electrical circuits and equipment at NQF Level 2 or equivalent.

QUALIFICATION RULES
Fundamental Component:

The fundamental component consists of 20 credits in the field of Communication and 16 credits in the field of Mathematical Literacy. All unit Standards in the fundamental component are compulsory.

Core Component:

The compulsory unit standards in the Core Component of this qualification reflect the generic competencies required in the field of Electrical Engineering for all industrial environments. The learner must demonstrate competence in the Core Component for the total of 77 credits.

Elective Component:

This component consists of several specialisations each with its own set of unit standards. Learners are to choose a specialisation area and complete a minimum of 20 credits from the unit standards listed under that specialisation area so as to attain a minimum of 133 credits required for certification purposes.

Specialisation Area 1:

Mining:

Unit Standard Title; Level; Credits:

> Design and Install Electrical Wire Ways; NQF Level 3; 8 Credits.
> Fault Find, Test and Repair Domestic Appliances; NQF Level 3; 6 Credit.
> Inspect, operate and maintain high mast lighting structures; NQF Level 3; 7 Credits.
> Install/replace mini substations and ring-main units/switches; NQF Level 3; 6 credits.
> Install batteries; NQF Level 3; 4 Credits.
> Install or replace Medium Voltage transformers; NQF Level 3; 6 Credits.
> Perform work on energised low voltage networks; NQF Level 3; 8 Credits.
> Operate on MV radial networks; NQF Level 3; 20 Credits.
> Construct, maintain and dismantle MV overhead lines; NQF Level 3; 14 Credits.
> Maintain electrical mini substations; NQF Level 3; 3 Credits.
> Carry out a detailed inspection and repair defects on explosion prevention apparatus; NQF Level 3; 6 Credits.
> Use and care for MV electrical test instruments; NQF Level 3; 3 Credits.

> Test, diagnose and locate a fault on a MV/HV electrical cable; NQF Level 3; 9 Credits.
> Isolate a 3 phase transformer and carry out tap changes; NQF Level 3; 2 Credits.
> Maintain the electrical system of a surface mining production machine; NQF Level 3; 5 Credits.
> Maintain the electrical system of winder installations; NQF Level 3; 5 Credits.
> Maintain the electrical system of conveyor installations; NQF Level 3; 5 Credits.
> Install and maintain an electrical supply unit in a production section; NQF Level 3; 5 Credits.

Specialisation Area 2:

Electrical Construction:

Unit Standard Title; Level; Credits:

> Design and Install Electrical Wire Ways; NQF Level 3; 8 Credits.
> Perform work on energised low voltage networks; NQF Level 3; 8 Credits.
> Install and maintain a solar hot water system; NQF Level 3; 5 Credits.
> Demonstrate an understanding of energy efficiency; NQF Level 3; 4 Credits.
> Lower, inspect, service and maintain a stand - alone battery charging wind turbine; NQF Level 3; 5 Credits.
> Fault find and repair a stand - alone battery charging wind turbine; NQF Level 3; 5 Credits.
> Operate on MV radial networks; NQF Level 3; 20 Credits.
> Use a Graphical User Interface (GUI)-based spreadsheet application to create and edit spreadsheets; NQF Level 2; 4 Credits.
> Complete certificate of compliance for a single phase domestic installation; NQF Level 4; 5 Credits.
> Produce business plans for a new venture; NQF Level 4; 8 Credits.
> Manage finances of a new venture; NQF Level 4; 5 Credits.
> Tender to secure business for a new venture; NQF Level 4; 5 Credits.
> Apply the principles of costing and pricing to a business venture; NQF Level 4; 6 Credits.
> Demonstrate an understanding of an entrepreneurial profile; NQF Level 4; 5 Credits.
> Interpret basic financial statements; NQF Level 4; 3 Credits.

Specialisation Area 3:

Chemical:

Unit Standard Title; Level; Credits:

> Design and Install Electrical Wire Ways; NQF Level 3; 8 Credits.
> Perform work on energised low voltage networks; NQF Level 3; 8 Credits.
> Carry out a detailed inspection and repair defects on explosion prevention apparatus; NQF Level 3; 6 Credits.

Specialisation Area 4:

Electrical Distribution:

Unit Standard Title; Level; Credits:

> Maintain and repair a high voltage security fence system; NQF Level 3; 4 Credits.
> Fault Find, Test and Repair Domestic Appliances; NQF Level 3; 6 Credit.
> Construct, maintain and dismantle MV overhead lines; NQF Level 3; 14 Credits.
> Install/replace mini substations and ring-main units/switches; NQF Level 3; 6 Credits.
> Install or replace Medium Voltage transformers; NQF Level 3; 6 Credits.

> Perform work on energised low voltage networks; NQF Level 3; 8 Credits.
> Maintain electrical mini substations; NQF Level 3; 3 Credits.
> Use and care for MV electrical test instruments; NQF Level 3; 3 Credits.
> Test, diagnose and locate a fault on a MV/HV electrical cable; NQF Level 3; 9 Credits.
> Isolate a 3 phase transformer and carry out tap changes; NQF Level 3; 2 Credits.
> Demonstrate an understanding of energy efficiency; NQF Level 3; 4 Credits.
> Operate on MV radial networks; NQF Level 3; 20 Credits.

Specialisation Area 5:

Electrical Generation:

Unit Standard Title; Level; Credits:

> Maintain and repair a high voltage security fence system; NQF Level 3; 4 Credits.
> Fault Find, Test and Repair Domestic Appliances; NQF Level 3; 6 Credits.
> Install batteries; NQF Level 3; 4 Credits.
> Install or replace Medium Voltage transformers; NQF Level 3; 6 Credits.
> Maintain electrical mini substations; NQF Level 3; 3 Credits.
> Test, diagnose and locate a fault on a MV/HV electrical cable; NQF Level 3; 9 Credits.
> Isolate a 3 phase transformer and carry out tap changes; NQF Level 3; 2 Credits.
> Maintain the electrical system of conveyor installations; NQF Level 3; 5 Credits.
> Demonstrate an understanding of energy efficiency; NQF Level 3; 4 Credits.

Specialisation Area 6:

Transport:

Unit Standard Title; Level; Credits:

> Design and Install Electrical Wire Ways; NQF Level 3; 8 Credits.
> Fault find a photovoltaic supplied system; NQF Level 3; 8 Credits.
> Fault Find, Test and Repair Domestic Appliances; NQF Level 3; 6 Credits.
> Inspect, operate and maintain high mast lighting structures; NQF Level 3; 7 Credits.
> Construct, maintain and dismantle MV overhead lines; NQF Level 3; 14 Credits.
> Install/replace mini substations and ring-main units/switches; NQF Level 3; 6 Credits.
> Install batteries; NQF Level 3; 4 Credits.

Specialisation Area 7:

Renewable Energy:

Unit Standard Title; Level; Credits:

> Fault find a photovoltaic supplied system; NQF Level 3; 8 Credits.
> Install and maintain a solar hot water system; NQF Level 3; 5 Credits.
> Demonstrate an understanding of energy efficiency; NQF Level 3; 4 Credits.
> Lower, inspect, service and maintain a stand - alone battery charging wind turbine; NQF Level 3; 5 Credits.
> Fault find and repair a stand - alone battery charging wind turbine; NQF Level 3; 5 Credits.

EXIT LEVEL OUTCOMES

1. Install and commission electrical equipment in integrated circuits.

2. Demonstrate the ability to test, fault find, maintain and repair electrical equipment and installations in integrated circuits.

3. Demonstrate operational knowledge of mathematical, technological and theoretical concepts during the execution of tasks with an ability to read, interpret technical drawings, sketch electrical/electronic wiring diagrams and construct basic electronic circuits.

4. Apply safety procedures as embedded in each unit standard.

5. Demonstrate the ability to gather and interpret information from a range of sources and apply solutions to familiar problems related to working in the electrical engineering field with some scope for personal decision-making and responsibility.

Critical Cross-Field Outcomes:

These are embedded in the unit standards, which make up the qualification and are thus also reflected in the Exit Level Outcomes of the qualification.

The Critical Cross-Field Outcomes are supported by the Exit Level Outcomes as follows:

Identifying and solving problems in which responses display that responsible decisions using critical thinking have been made:

> Solving problems related to the installation and maintenance of electrical machinery, components and circuits.

Working effectively with others as a member of a team, group, organization and community:

> All tasks and work-related experience are performed within a team environment.
> Taking into account, the safety of others.
> Communicating with production, quality control and supervisory personnel and/or clients.

Organising and managing oneself and one's activities responsibly and effectively:

> Related to planning and preparation for installation and maintenance activities.
> Developing best practice behaviour in work performance and adhering to standard operating procedures.
> Focussing on housekeeping, safe practices and care and storage of tools and equipment.

Collecting, analyzing, organizing and critically evaluating information:

> Completion of technical reports related to the job activity.
> Interpret findings to solve familiar problems during the execution of electrical tasks.

Communicating effectively using visual, mathematical and/or language skills:

> Execution of commands and completion of technical reports related to the job activity.
> Communicating as a part of a team.

Using science and technology effectively and critically, showing responsibility toward the environment and health of others:

> Application of science and technology during the installation and maintenance of electrical machinery, components and circuits.
> Relating to the safety of others and paying attention to environmental issues.

> Solving problems and applying science and technology to the job activity.

Demonstrate an understanding of the world as a set of related systems by recognizing that problem contexts do not exist in isolation:

> Integrating the task with the functionality of electrical installations.
> Solving problems through the integration of various sources of information.
> Demonstrating and understanding of related systems through the use of general and specific channels of communication when dealing with peers, production, quality control and supervisory personnel and/or clients.

ASSOCIATED ASSESSMENT CRITERIA

Associated Assessment Criteria for Exit Level Outcome 1:

1.1 Components and equipment relating to the installation of integrated electrical circuits are identified and installed according to specifications.
1.2 Components and equipment in integrated electrical circuits are connected according to diagrams.
1.3 Relevant control/protection devices are selected and applied according to safe operating parameters.
1.4 Integrated circuit installations are commissioned according to statutory requirements.

Associated Assessment Criteria for Exit Level Outcome 2:

2.1 Integrated electrical circuits to be worked on are isolated and secured according to work procedures.
2.2 Integrated electrical circuits and components are inspected for non-conformance.
2.3 Correct operation of equipment in integrated electrical circuits is tested and verified according to requirements.
2.4 Faults are identified and faulty equipment in integrated electrical circuits is repaired or replaced according to work procedures.
2.5 Electrical equipment and installations are maintained and repaired according to work procedures.
2.6 Conditions in integrated electrical circuits are monitored and recorded according to work procedures.

Associated Assessment Criteria for Exit Level Outcome 3:

3.1 Principles of electrical engineering are applied in the interpretation and problem solving of integrated circuit electrical drawings and diagrams.
3.2 The principles and operation of protection in integrated electrical circuits are demonstrated in accordance with circuit and equipment specifications.
3.3 Basic electronic circuits are interpreted and constructed according to circuit diagrams and components provided.

Associated Assessment Criteria for Exit Level Outcome 4:

4.1 Oral and written instructions are interpreted and carried out as required by relevant electrical and safety procedures.
4.2 Communication with superiors, peers and clients is conducted effectively according to industry procedures.
4.3 Knowledge of statutory requirements pertaining to integrated installations and equipment is applied in accordance with relevant codes.
4.5 Relevant on-site health and safety requirements are demonstrated as required.

Associated Assessment Criteria for Exit Level Outcome 5:

5.1 Known solutions to familiar and simple unfamiliar problems within the electrical construction and maintenance environment are identified and applied according to standard practices.
5.2 Energy efficiency and related environmental issues that enable the learner to resolve problems in the work environment are identified and discussed.
5.3 Written reports on basic problems and hazards are drafted according to work procedures.

Integrated Assessment:

Integrated assessment during the implementation of this qualification provides an opportunity for learners to show that they are able to integrate knowledge, skills and values integral to a range of unit standards and practical contexts. Some assessment aspects will demand practical demonstration.

Assessors will be required to collect evidence of the learner's competence by:

> Observing the learner at work (both in primary activities, as well as other interactions) or by relevant simulations.
> Asking questions and initiating formative discussions to assess understanding.
> Evaluating records and reports.

A detailed portfolio of evidence is required to prove the practical, applied and foundational competencies of the learner.

INTERNATIONAL COMPARABILITY
This qualification forms part of a progression across the three levels of the Further Education and Training band. The international comparability section for the field of Electrical Engineering applies to Levels 2, 3 and 4 of the qualification series.

The qualification series was compared to similar outcomes-based qualifications in New Zealand, Australia, United Kingdom, and to some African countries in the Southern African Development Community (SADC); Mozambique, Namibia, Botswana, Zimbabwe, as well as countries in the East African Community (EAC); Kenya, Tanzania and Uganda.

SADC:

Mozambique, Zimbabwe and Zambia:

Amongst the Southern African Development Community (SADC) there are countries which align with the United Kingdom's model of Vocational Education and Training (VET), through the London City and Guilds qualification framework and the National Vocational Qualification system (NVQ). Despite the fact that SADC countries are not as industrialised as the United Kingdom, it could be concluded that countries using the British qualifications compare favourably to similar South African qualifications as discussed under the U.K. section. In all SADC countries researched, none currently have an active training infrastructure in electrical engineering.

Botswana:

The Botswana Training Authority website provides information on the development and co-ordination of an integrated and standards-based vocational training system. At this present time, focus on the development of standards-based qualifications through a Botswana Vocation Education and Training System (BVET) has focused on the Wholesale and Retail and Tourism sectors.

Currently, electricians in Botswana are trained through the apprenticeship system. The length and duration of the practical and theoretical components differ slightly to the South African

apprenticeship system, but the learning competencies are similar, with a focus on the predominant diamond mining and small local manufacturing and engineering industries.

Namibia:

There are currently no qualifications or unit standards for electrical training registered on the Namibian Training Framework.

EAC:

In Kenya, Tanzania, and Uganda, the three member states of the East African Community (EAC), no comparable qualification systems and related infrastructure could be identified.

Through enquiry and research in the Mining and Chemical sectors, it has been established that training, in the field of electrical engineering, of foreign nationals from Mozambique, Nigeria, Tanzania as well as, Zambia and Zimbabwe employed in International companies, takes place in South Africa. These candidates are trained in-house and achieve company certificates for Unit Standards completed.

New Zealand:

The South African 'National Certificate: Electrical Engineering Level 2 has elements of both Levels 2 and 3 of the New Zealand 'National Certificate in Electrical Engineering'. Although NZ qualifications are also unit standard based, the focus of the NZ unit standards at Level 2 [NQF Ref: 0174] and 3 [NQF Ref: 0223] is largely on knowledge acquisition whereas the practical competencies are assessed only at Level 4.

In New Zealand, a learner could register for the Level 4 qualification over a 3-4 year period and be awarded the Level 2 and 3 certificates as well because the Level 4 NZ qualification shares credit/unit standards with both Levels 2 and 3 qualifications. Holders of the NZ NC in Electrical Engineering (Electrician for Registration) (Level 4) [NQF Ref: 1195] can apply to the Electrical Workers Registration Board (EWRB) for electrical registration and practising license. The SA Electrical Engineering qualifications in comparison require competencies achieved at Levels 2 and 3 or through RPL processes to gain entry to Level 4 and a further trade test before full licensing is achieved. The NZ Level 5 qualification [NQF Ref: 0951] focuses mainly on management skills and business skills in the elective component but the core electrical unit standards are similar to the level of those in the SA Level 4 qualification.

United Kingdom:

To qualify as an electrician in the U.K. the learner must have the Electrotechnical Services NVQ at Level 3, which is awarded by City & Guilds (2356) and EMTA Awards Limited. As another option in England, Wales and Northern Ireland, an apprentice between the ages of 16-19 may sign up with an electrical contractor or building company. An alternative for those not eligible for apprenticeship or direct access into the NVQ is the City & Guilds (2330) Technical Certificate in Electrotechnical Technology Levels 2 and 3 at a college. Graduates would then need to gain employment in the industry to complete the NVQ. These technical certificates would compare with the SA National certificates: Electrical Engineering Levels 2 & 3. The NVQ (Level 3) compares with the SA Level 4 qualification.

Australia:

The following information was obtained on the website: http://www.ntis.au (National Information Training System) with regards to qualifications in electrical engineering training streams in Australia.

"Australian Apprenticeships" is the new name for the scheme formerly known as `New Apprenticeships`.

Australian Apprenticeships encompass all apprenticeships and traineeships. They combine time at work with training and can be full-time, part-time or school-based. The change of name and appearance is the first step in a range of improvements to be introduced in Australian Apprenticeships. The qualifications for electricians cover:

> ASCO4311-11 General Electrician.
> ANZSCO341111 Electrician (General).

Comments:

> Apprenticeships and VET programmes: In all the examples found, learning is vocational-based. In some countries (England, Scotland, New Zealand and Australia) these are called "modern apprenticeships". These take the form of two categories, namely a programme-led apprenticeship where learners are able to follow a vocational programme at a college and then seek employment as trainees/apprentice/interns in order to qualify as artisans; and an employer-led apprenticeship, in which learners are engaged in a formal contract of learning and most learning is workplace-based. In most cases learners "earn while they learn".

> International qualifications researched, do not lead to three different qualifications, but in most cases culminate in one qualification over a four-year period. It is only in the vocational context, that we find the tendency to "break up" the traditional trades into levels of learning. This practice is endemic of those countries which have a close association with outcomes-based methodology and standards-based qualifications development.

References:

> New Zealand: (www.nzqa.go.nz).
> Australia: (www.ntis.gov.au; www.aqf.edu.au).
> U.K.: (www.aset.ac.uk; www.learndirect-advise.co.uk).
> Botswana: (www.bota.org.bw; www.unesco.org).
> Namibia: (www.nta.com).

ARTICULATION OPTIONS

The qualification was designed to enable qualifying learners to move from one engineering context to another and still get recognition for successful learning achievements in the previous context. This means that credit accumulation towards certification could be obtained across industries.

Vertical Articulation:

> ID 48474: National Certificate: Electrical Engineering NQF Level 4.

Horizontal Articulation:

> ID 49056: National Certificate: Domestic Appliance Repair NQF Level 3.

> Fundamental learning at this level applies to equivalent credit accrual for engineering-related qualifications at NQF Level 3.

MODERATION OPTIONS

> Anyone assessing a learner against this qualification must be registered as an assessor with a relevant ETQA.

> Any institution or learning provider offering learning towards the achievement of this qualification should be accredited as a provider with a relevant ETQA.

> Moderation of assessment should be overseen by a relevant ETQA according to the moderation guidelines provided for in this qualification, as well as the agreed ETQA guidelines.

CRITERIA FOR THE REGISTRATION OF ASSESSORS
The following criteria should be applied by a relevant ETQA as a minimum requirement:

1. Assessors should be in possession of an appropriate qualification, namely:

> Electrical Engineering at NQF Level 4 and a minimum of 2 years related experience.
> An artisan qualification in Electrical Engineering (Trade test certificate or completed contract of apprenticeship) with a minimum of 2 years related experience.
OR
> Subject matter experience, which may be established through recognition of prior learning (RPL).

2. Evidence of competency in a unit standard related to assessment theory, processes and practices.

3. Good inter-personal skills and the ability to:

> Maintain national and local industry standards.
> Act in the interest of the learner.
> Understand the need for transformation to redress the legacies of the past.
> Respect the cultural background and language of the learner.

4. Registration as an assessor with a relevant ETQA.

NOTES
This unit standard replaces unit standard 48475, "National Certificate: Electrical Engineering", Level 3, 127 credits.

This qualification is the result of the combined review process which considered the following qualifications and replaces the following:

> ID 48475: National Certificate: Electrical Engineering NQF Level 3.
> ID 13640: Chemical Electrical NQF Level 3.

A generic qualification was developed to give meaning to NQF objectives to provide articulation possibilities, enable learners to get recognition for learning achievements across economic sub-sectors and to support the notion of life long learning.

UNIT STANDARDS

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Fundamental	119472	Accommodate audience and context needs in oral/signed communication	Level 3	5
Fundamental	9010	Demonstrate an understanding of the use of different number bases and measurement units and an awareness of error in the context of relevant calculations	Level 3	2
Fundamental	9013	Describe, apply, analyse and calculate shape and motion in 2-and 3-dimensional space in different contexts	Level 3	4
Fundamental	119457	Interpret and use information from texts	Level 3	5
Fundamental	9012	Investigate life and work related problems using data and probabilities	Level 3	5

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Fundamental	119467	Use language and communication in occupational learning programmes	Level 3	5
Fundamental	7456	Use mathematics to investigate and monitor the financial aspects of personal, business and national issues	Level 3	5
Fundamental	119465	Write/present/sign texts for a range of communicative contexts	Level 3	5
Core	259078	Install and commission electrical metering units, measuring instruments and control devices	Level 2	8
Core	10270	Construct Basic Electronic Circuits	Level 3	4
Core	258966	Inspect and test a single phase domestic installation	Level 3	10
Core	259077	Install and commission direct-on-line AC rotating machines and control gear	Level 3	10
Core	259038	Maintain and repair direct-on-line AC rotating machines and control gear	Level 3	8
Core	258965	Maintain lighting systems	Level 3	4
Core	9530	Manage work time effectively	Level 3	3
Core	258959	Operate on Low Voltage networks	Level 3	12
Core	258961	Repair and maintain electric power tools	Level 3	6
Core	258977	Understand basic electronic theory and components	Level 3	4
Core	258968	Wire and commission domestic or commercial electrical circuits	Level 3	8
Elective	10244	Maintain and repair a high voltage security fence system	Level 2	4
Elective	258918	Select, use and care for electrical measuring and testing instruments	Level 2	4
Elective	116937	Use a Graphical User Interface (GUI)-based spreadsheet application to create and edit spreadsheets	Level 2	4
Elective	259097	Carry out a detailed inspection and repair defects on explosion prevention apparatus	Level 3	6
Elective	258969	Construct, maintain and dismantle Medium Voltage overhead networks	Level 3	14
Elective	116674	Demonstrate an understanding of energy efficiency	Level 3	4
Elective	259037	Design and install electrical wire ways	Level 3	8
Elective	258924	Fault Find, Test and Repair Domestic Appliances	Level 3	6
Elective	113869	Fault find a photovoltaic supplied system	Level 3	8
Elective	113875	Inspect, operate and maintain high mast lighting structures	Level 3	7
Elective	258964	Inspect, test and maintain earthing and negative return systems on 3-kV DC traction substations	Level 3	7
Elective	114660	Install Medium Voltage transformers	Level 3	6
Elective	116678	Install and maintain a solar hot water system	Level 3	5
Elective	258963	Install and maintain an electrical supply unit in a production section	Level 3	5
Elective	258997	Install batteries	Level 3	4
Elective	258958	Install or replace mini substations and ring-main units/switches	Level 3	6
Elective	258930	Isolate a three-phase transformer and carry out tap changes	Level 3	2
Elective	259057	Maintain the electrical system of a surface mining production machine	Level 3	5
Elective	259018	Maintain the electrical system of conveyor installations	Level 3	5
Elective	258940	Maintain the electrical system of winder installations	Level 3	5
Elective	259058	Perform work on energised Low Voltage networks	Level 3	8
Elective	259117	Test and maintain electrical mini substations	Level 3	3
Elective	258933	Test, diagnose and locate a fault on a high voltage electrical cable	Level 3	9
Elective	114594	Apply the principles of costing and pricing to a business venture	Level 4	6
Elective	113898	Complete certificate of compliance for a single phase domestic installation	Level 4	5
Elective	114598	Demonstrate an understanding of an entrepreneurial profile	Level 4	5
Elective	113884	Fault find and repair a stand-alone battery charging wind turbine	Level 4	5
Elective	117156	Interpret basic financial statements	Level 4	4
Elective	113885	Lower, inspect service and maintain a stand-alone battery charging wind turbine	Level 4	5
Elective	114586	Manage finances of a new venture	Level 4	5

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Elective	113900	Operate on Medium Voltage radial networks	Level 4	20
Elective	114592	Produce business plans for a new venture	Level 4	8
Elective	114593	Tender to secure business for a new venture	Level 4	5

LEARNING PROGRAMMES RECORDED AGAINST THIS QUALIFICATION
None

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Fault Find, Test and Repair Domestic Appliances

SAQA US ID	*UNIT STANDARD TITLE*		
258924	Fault Find, Test and Repair Domestic Appliances		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	6

This unit standard replaces:

US ID	Unit Standard Title	NQF Level	Credits	Replacement Status
10268	Fault Find, Test and Repair Domestic Appliances	Level 3	6	Will occur as soon as 258924 is registered

SPECIFIC OUTCOME 1
Plan to do fault finding and repair to domestic appliances.

SPECIFIC OUTCOME 2
Conduct fault finding and testing of domestic appliances.

SPECIFIC OUTCOME 3
Repair domestic appliances.

SPECIFIC OUTCOME 4
Conclude appliance repair.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Isolate a three-phase transformer and carry out tap changes

SAQA US ID	*UNIT STANDARD TITLE*		
258930	Isolate a three-phase transformer and carry out tap changes		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	2

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Explain the requirements pertaining to tap changing.

SPECIFIC OUTCOME 2
Prepare to change tap settings.

SPECIFIC OUTCOME 3
Change tap settings.

SPECIFIC OUTCOME 4
Restore power, and perform reporting and housekeeping duties.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Test, diagnose and locate a fault on a high voltage electrical cable

SAQA US ID	*UNIT STANDARD TITLE*		
258933	Test, diagnose and locate a fault on a high voltage electrical cable		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	9

This unit standard replaces:

US ID	Unit Standard Title	NQF Level	Credits	Replacement Status
11775	Test, diagnose and locate a fault on a high voltage electrical cable	Level 3	9	Will occur as soon as 258933 is registered

SPECIFIC OUTCOME 1
Explain the requirements pertaining to testing and fault location on high voltage cables.

SPECIFIC OUTCOME 2
Prepare to test.

SPECIFIC OUTCOME 3
Test and locate fault.

SPECIFIC OUTCOME 4
Perform reporting and housekeeping practices.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Maintain the electrical system of winder installations

SAQA US ID	*UNIT STANDARD TITLE*		
258940	Maintain the electrical system of winder installations		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	5

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Explain the factors critical to maintaining the electrical system of winder installations.

SPECIFIC OUTCOME 2
Prepare to maintain the electrical system of winder installations.

SPECIFIC OUTCOME 3
Maintain the electrical system of winder installations.

SPECIFIC OUTCOME 4
Test the electrical system of winder operations and prepare for operation.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Install or replace mini substations and ring-main units/switches

SAQA US ID	*UNIT STANDARD TITLE*		
258958	Install or replace mini substations and ring-main units/switches		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	6

This unit standard replaces:

US ID	Unit Standard Title	NQF Level	Credits	Replacement Status
113891	Install / replace mini substations and ring-main units / switches	Level 3	6	Will occur as soon as 258958 is registered

SPECIFIC OUTCOME 1
Plan to install mini substation, ring-main unit or switch.

SPECIFIC OUTCOME 2
Prepare to install mini substation, ring-main unit or switch.

SPECIFIC OUTCOME 3
Remove the mini substation, ring-main unit or switch.

SPECIFIC OUTCOME 4
Install mini substation, ring-main unit or switch.

SPECIFIC OUTCOME 5
Complete work task.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Operate on Low Voltage networks

SAQA US ID	*UNIT STANDARD TITLE*		
258959	Operate on Low Voltage networks		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	12

This unit standard replaces:

US ID	Unit Standard Title	NQF Level	Credits	Replacement Status
113865	Operate on low voltage networks	Level 3	12	Will occur as soon as 258959 is registered

SPECIFIC OUTCOME 1
Plan and prepare to operate on Low Voltage networks.

SPECIFIC OUTCOME 2
Switch apparatus on Low Voltage networks.

SPECIFIC OUTCOME 3
Isolate apparatus on Low Voltage networks.

SPECIFIC OUTCOME 4
Safety test and earth apparatus on Low Voltage networks.

SPECIFIC OUTCOME 5
Restore supply to Low Voltage networks.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Repair and maintain electric power tools

SAQA US ID	*UNIT STANDARD TITLE*		
258961	Repair and maintain electric power tools		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	6

This unit standard replaces:

US ID	Unit Standard Title	NQF Level	Credits	Replacement Status
14135	Repair and maintain electric power tools	Level 3	3	Will occur as soon as 258961 is registered

SPECIFIC OUTCOME 1
Plan to repair and maintain electrical power tools.

SPECIFIC OUTCOME 2
Prepare to repair and maintain electrical power tools.

SPECIFIC OUTCOME 3
Testing and fault finding on electrical power tools.

SPECIFIC OUTCOME 4
Repair and maintain electrical power tools.

SPECIFIC OUTCOME 5
Complete repairs and maintenance to electrical power tools.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Install and maintain an electrical supply unit in a production section

SAQA US ID	*UNIT STANDARD TITLE*		
258963	Install and maintain an electrical supply unit in a production section		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	5

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Explain the factors critical to install and maintain an electrical supply unit in a production section.

SPECIFIC OUTCOME 2
Prepare to install and maintain an electrical supply unit in a production section.

SPECIFIC OUTCOME 3
Install and maintain an electrical supply unit in a production section.

SPECIFIC OUTCOME 4
Test the electrical supply unit and prepare for operation.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Inspect, test and maintain earthing and negative return systems on 3-kV DC traction substations

SAQA US ID	*UNIT STANDARD TITLE*		
258964	Inspect, test and maintain earthing and negative return systems on 3-kV DC traction substations		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	7

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Communicate clearly and concisely without misunderstanding with relevant role players and complete relevant documentation.

SPECIFIC OUTCOME 2
Plan to maintain earthing and negative return systems on 3-kV DC traction substations.

SPECIFIC OUTCOME 3
Prepare to maintain earthing and negative return systems on 3-kV DC traction substations.

SPECIFIC OUTCOME 4
Inspect and maintain earthing and negative return systems on 3-kV DC traction substations.

SPECIFIC OUTCOME 5
Complete the work task.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Maintain lighting systems

SAQA US ID	*UNIT STANDARD TITLE*		
258965	Maintain lighting systems		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	4

This unit standard replaces:

US ID	Unit Standard Title	NQF Level	Credits	Replacement Status
10269	Maintain lighting System	Level 3	4	Will occur as soon as 258965 is registered

SPECIFIC OUTCOME 1
Explain the requirements pertaining to maintaining lighting systems.

SPECIFIC OUTCOME 2
Prepare to maintain a lighting system.

SPECIFIC OUTCOME 3
Maintain lighting systems.

SPECIFIC OUTCOME 4
Prepare and test the maintained lighting systems for operation.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Inspect and test a single phase domestic installation

SAQA US ID	*UNIT STANDARD TITLE*		
258966	Inspect and test a single phase domestic installation		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	10

This unit standard replaces:

US ID	Unit Standard Title	NQF Level	Credits	Replacement Status
113893	Test and inspect a single phase domestic installation	Level 3	10	Will occur as soon as 258966 is registered

SPECIFIC OUTCOME 1
Plan the electrical installation tests to be done.

SPECIFIC OUTCOME 2
Inspect the electrical installation.

SPECIFIC OUTCOME 3
Test the electrical installation.

SPECIFIC OUTCOME 4
Complete the required test and inspection documentation.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Wire and commission domestic or commercial electrical circuits

SAQA US ID	*UNIT STANDARD TITLE*		
258968	Wire and commission domestic or commercial electrical circuits		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	8

This unit standard replaces:

US ID	Unit Standard Title	NQF Level	Credits	Replacement Status
10265	Wire and commission domestic electrical circuits	Level 3	8	Will occur as soon as 258968 is registered

SPECIFIC OUTCOME 1
Plan to wire and commission domestic or commercial circuits.

SPECIFIC OUTCOME 2
Prepare to wire and commission domestic or commercial circuits.

SPECIFIC OUTCOME 3
Wire domestic or commercial circuits.

SPECIFIC OUTCOME 4
Commission domestic or commercial circuits.

SPECIFIC OUTCOME 5
Complete the wiring and commissioning of domestic or commercial circuits.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Construct, maintain and dismantle Medium Voltage overhead networks

SAQA US ID	*UNIT STANDARD TITLE*		
258969	Construct, maintain and dismantle Medium Voltage overhead networks		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	14

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Plan and prepare to construct, maintain and dismantle Medium Voltage networks.

SPECIFIC OUTCOME 2
Construct Medium Voltage networks.

SPECIFIC OUTCOME 3
Inspect, maintain and repair Medium Voltage networks.

SPECIFIC OUTCOME 4
Dismantle Medium Voltage networks.

SPECIFIC OUTCOME 5
Complete the work task.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Understand basic electronic theory and components

SAQA US ID	*UNIT STANDARD TITLE*		
258977	Understand basic electronic theory and components		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	4

This unit standard replaces:

US ID	Unit Standard Title	NQF Level	Credits	Replacement Status
114406	Understand basic electronic theory and components	Level 3	4	Will occur as soon as 258977 is registered

SPECIFIC OUTCOME 1
Understand and explain electron theory in terms of current flow.

SPECIFIC OUTCOME 2
Understand and explain the operation of basic electronic components.

SPECIFIC OUTCOME 3
Understand the operation of a P-N junction diode.

SPECIFIC OUTCOME 4
Understand the operation and function of power supplies.

SPECIFIC OUTCOME 5
Understand the operation and application of a transistor.

SPECIFIC OUTCOME 6
Understand the principles of opto-electronics and its applications.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Install batteries

SAQA US ID	*UNIT STANDARD TITLE*		
258997	Install batteries		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	4

This unit standard replaces:

US ID	Unit Standard Title	NQF Level	Credits	Replacement Status
113902	Install batteries	Level 3	4	Will occur as soon as 258997 is registered

SPECIFIC OUTCOME 1
Plan work task.

SPECIFIC OUTCOME 2
Prepare work area.

SPECIFIC OUTCOME 3
Installation of batteries.

SPECIFIC OUTCOME 4
Complete work task.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Maintain the electrical system of conveyor installations

SAQA US ID	*UNIT STANDARD TITLE*		
259018	Maintain the electrical system of conveyor installations		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	5

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Explain the factors critical to maintain electrical system of conveyor installations.

SPECIFIC OUTCOME 2
Prepare to maintain electrical system of conveyor installations.

SPECIFIC OUTCOME 3
Maintain electrical system of conveyor installations.

SPECIFIC OUTCOME 4
Test the maintained electrical system of conveyor installations.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Design and install electrical wire ways

SAQA US ID	*UNIT STANDARD TITLE*		
259037	Design and install electrical wire ways		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	8

This unit standard replaces:

US ID	Unit Standard Title	NQF Level	Credits	Replacement Status
10258	Design and Install Electrical Wire Ways	Level 3	8	Will occur as soon as 259037 is registered

SPECIFIC OUTCOME 1
Plan to install electrical wire ways.

SPECIFIC OUTCOME 2
Prepare to install electrical wire ways.

SPECIFIC OUTCOME 3
Install electrical wire ways.

SPECIFIC OUTCOME 4
Complete the installation of wire ways.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Maintain and repair direct-on-line AC rotating machines and control gear

SAQA US ID	*UNIT STANDARD TITLE*		
259038	Maintain and repair direct-on-line AC rotating machines and control gear		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	8

This unit standard replaces:

US ID	Unit Standard Title	NQF Level	Credits	Replacement Status
14134	Maintain and repair single phase AC machines and control gear	Level 3	6	Will occur as soon as 259038 is registered

SPECIFIC OUTCOME 1
Explain the requirements pertaining to maintaining and repairing direct-on-line AC rotating machines and control gear.

SPECIFIC OUTCOME 2
Prepare to maintain and repair direct-on-line AC rotating machines and control gear.

SPECIFIC OUTCOME 3
Maintain and repair direct-on-line AC rotating machines and control gear.

SPECIFIC OUTCOME 4
Test the direct-on-line AC rotating machines and control gear for operation.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Maintain the electrical system of a surface mining production machine

SAQA US ID	*UNIT STANDARD TITLE*		
259057	Maintain the electrical system of a surface mining production machine		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	5

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Explain the factors critical to maintaining the electrical system of a surface mining machine.

SPECIFIC OUTCOME 2
Prepare to maintain the electrical system of a surface mining production machine.

SPECIFIC OUTCOME 3
Maintain the electrical system of a surface mining production machine.

SPECIFIC OUTCOME 4
Test the electrical system of a surface mining production machine and prepare for operation.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Perform work on energised Low Voltage networks

SAQA US ID	*UNIT STANDARD TITLE*		
259058	Perform work on energised Low Voltage networks		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	8

This unit standard replaces:

US ID	Unit Standard Title	NQF Level	Credits	Replacement Status
113889	Perform work on energised low voltage networks	Level 3	8	Will occur as soon as 259058 is registered

SPECIFIC OUTCOME 1
Prepare to do work on energised Low Voltage networks.

SPECIFIC OUTCOME 2
Perform work on energised Low Voltage networks.

SPECIFIC OUTCOME 3
Complete the work task.

SPECIFIC OUTCOME 4
Carry out routine inspections of equipment used for work on energised Low Voltage networks.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Install and commission direct-on-line AC rotating machines and control gear

SAQA US ID	*UNIT STANDARD TITLE*		
259077	Install and commission direct-on-line AC rotating machines and control gear		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	10

This unit standard replaces:

US ID	Unit Standard Title	NQF Level	Credits	Replacement Status
10261	Install and Commission Single Phase AC Machines and Control Gear	Level 3	8	Will occur as soon as 259077 is registered

SPECIFIC OUTCOME 1
Plan and prepare for the work task.

SPECIFIC OUTCOME 2
Install direct-on-line AC rotating machines and control gear.

SPECIFIC OUTCOME 3
Connect direct-on-line AC rotating machines and control gear.

SPECIFIC OUTCOME 4
Commission direct-on-line AC rotating machines and control gear.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Install and commission electrical metering units, measuring instruments and control devices

SAQA US ID	*UNIT STANDARD TITLE*		
259078	Install and commission electrical metering units, measuring instruments and control devices		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 2	8

This unit standard replaces:

US ID	Unit Standard Title	NQF Level	Credits	Replacement Status
10260	Install and commission electrical measuring instruments and control devices	Level 3	5	Will occur as soon as 259078 is registered

SPECIFIC OUTCOME 1
Explain the procedure and requirements to install electrical metering units or measuring instruments and control devices.

SPECIFIC OUTCOME 2
Plan to install and connect electrical metering units or measuring instruments with their relative control devices.

SPECIFIC OUTCOME 3
Prepare, install and connect electrical metering units or measuring instruments and control devices.

SPECIFIC OUTCOME 4
Commission electrical metering units or measuring instruments.

SPECIFIC OUTCOME 5
Complete work activity.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Carry out a detailed inspection and repair defects on explosion prevention apparatus

SAQA US ID	*UNIT STANDARD TITLE*		
259097	Carry out a detailed inspection and repair defects on explosion prevention apparatus		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	6

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Explain the requirements pertaining to a detailed inspection on explosion prevention apparatus.

SPECIFIC OUTCOME 2
Prepare to inspect the apparatus.

SPECIFIC OUTCOME 3
Inspect and repair the apparatus.

SPECIFIC OUTCOME 4
Restore the apparatus to operational status.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	63790	National Certificate: Electrical Engineering	Level 3

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Test and maintain electrical mini substations

SAQA US ID	*UNIT STANDARD TITLE*		
259117	Test and maintain electrical mini substations		
ORIGINATOR		*PROVIDER*	
SGB Electrical Engineering & Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Electrical Infrastructure Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	3

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Explain the factors critical to carry out a detailed electrical inspection on a mini substation.

SPECIFIC OUTCOME 2
Prepare to inspect a mini substation.

SPECIFIC OUTCOME 3
Inspect the mini substation.

SPECIFIC OUTCOME 4
Test the mini substation and prepare for operation.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	63790	National Certificate: Electrical Engineering	Level 3