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**SOUTH AFRICAN QUALIFICATIONS AUTHORITY (SAQA)**

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

Physical Planning and Construction

publishes the following 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 qualification and unit standards can be accessed via the SAQA web site at www.saga.org.za. Copies may also be obtained from the Directorate of Standards Setting and Development at the SAQA offices, Hatfield Forum West, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the qualification and unit standards should reach SAQA at the address *below and no later than 15 August 2005*. All correspondence should be marked **Standards Setting – SGB Electrical Engineering and Construction** and addressed to

The Director: Standards Setting and Development
SAQA
Attention: Mr. Eddie Brown
Postnet Suite 248
Private Bag X06
Waterkloof
0145
or faxed to 012 – 431-5144
e-mail: ebrown@saqa.co.za


DUGMORE MPHUTHING
ACTING DIRECTOR: STANDARDS SETTING AND DEVELOPMENT



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

General Education and Training Certificate: General Technical Practice

SAQA QUAL ID	QUALIFICATION TITLE		
49753	General Education and Training Certificate: General Technical Practice		
SGB NAME	NSB 12	PROVIDER NAME	
SGB Electrical Engineering & Construction	Physical Planning and Construction		
QUAL TYPE	FIELD	SUBFIELD	
National Certificate	Physical Planning and Construction	Electrical Infrastructure Construction	
ABET BAND	MINIMUM CREDITS	NQF LEVEL	QUALIFICATION CLASS
Undefined	130	Level 1	Regular-Unit Stds Based

PURPOSE AND RATIONALE OF THE QUALIFICATION

Purpose

This entry-level qualification reflects the workplace-based needs of the Energy sector, expressed by employers and employees, for now and in the future. This qualification improves the employability of learners within the energy industries and provides flexibility to pursue different careers within the sector.

The qualification specifies the key skills, knowledge and values required to participate in learning processes within a formal work environment. While acquiring a strong core background to the world of work in a technical environment, the level of flexibility within the range of electives will allow the individual to pursue a career within any chosen field in the energy industry.

Rationale

The energy sector requires workers at a wide range of levels and this qualification will meet the needs of learners at entry levels as well as provide them with the knowledge and skills required for further learning. All of the NQF Level 2 technical and occupational qualifications in the energy sector assume some learning at NQF Level 1. This qualification formalises those assumptions. In doing so, it provides a range of qualifying learners with access to further learning at NQF Levels 2 and beyond in the fields or sub-disciplines of Energy Generation, Transmission and Distribution, Renewable energy, Electrical Construction and Engineering.

For those who have acquired experience in the workplace, the qualification represents part of the RPL process to acknowledge workplace skills acquired without the benefit of formal education or training. For the unemployed or first time workers it provides an introduction to the world of work and an opportunity to acquire vocational skills and values which will enhance the employability of the learner within the energy sector.

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

It is assumed that learners are competent in the following:

- > Mathematical Literacy at ABET Level 3
- > Communication at ABET Level 3

Recognition of prior learning:

This qualification may be achieved in part or completely through the recognition of prior learning, which

includes formal, informal and non-formal learning and work experience. The learner should be thoroughly briefed on the mechanisms to be used and provided with sufficient support and guidance to prepare for the assessment process.

Care should be taken that the mechanism used for RPL provides the learner with the opportunity to demonstrate competence and is not so onerous as to prevent learners from taking up the RPL option to gain this qualification. This qualification will also allow for the design of top-up courses, or additional experience based on gaps identified during an initial assessment process.

ACCESS TO THE QUALIFICATION

The ability to distinguish colour is crucial for a person entering an electrical sub-field. Entry is open to any learner bearing in mind the above-mentioned physical requirement and the learning assumed to be in place.

QUALIFICATION RULES

The rules of combination for this Qualification:

The Fundamental, Core and Elective learning components are broken down as follows:

Fundamental Unit Standards:

The "Communication" category contains 23 Credits. The "Mathematics Literacy" category contains 20 credits and "Science and Technology" and "world of Work" categories together contain 11 Credits. This amounts to 54 Credits for the Fundamental component of the Qualification. All the fundamental Unit Standards are compulsory.

Core Unit Standards:

This amounts to 46 credits. All the Core Unit Standards are compulsory.

Elective Unit Standards:

A minimum of 30 Credits must be done from one of the following fields:

- > Energy
- > Generation/Transmission
- > Distribution
- > Renewable energy
- > Electrical Construction and Engineering

A minimum of 130 Credits must be done to achieve a Certificate.

EXIT LEVEL OUTCOMES

1. Understand and adhere to safe working practices, select and use appropriate tools and equipment, follow instructions and use diagrammatic guides under supervision.
2. Work to acceptable standards, evaluate quality of own work and utilise efficient time management, study and self-management skills.
3. Describe and explain general business principles and practices at a basic level, understand common workplace processes and apply basic problem solving techniques within a defined context.
4. Describe and explain, the procedures, legislation and policies that govern a specific working environment and explain understanding of technologies applied in the energy environment, alternative forms of energy, energy efficiency and terminology.

ASSOCIATED ASSESSMENT CRITERIA

1.

(Note: Assessment must be carried out in situ)

- > The applicable knowledge and practical skills are described in terms of a range of key elements or processes in the fields or sub-disciplines of Energy Generation, Transmission and Distribution, Renewable Energy, Electrical Construction and Engineering and include; tools and equipment, materials, technical information, communication structures and/or the service provided or the final product.
- > Understanding of the applicable key elements or processes in his/her field is demonstrated by providing explanations on site.
- > Appropriate verbal and written communication skills, including sketches, drawings and diagrams, are selected and used to explain concepts and processes.

2.

- > The learner is able to apply Quality control principles are applied to work, own life and study.
- > The learner's goals and learning targets are identified.
- > Concept of self- management and planning is applied in work and in personal life.

3.

- > The roles and interdependence of markets, suppliers, customers, employers and shareholders are described with examples.
- > Generic business concepts are described and explained with examples.
- > Links between inappropriate behaviour in the workplace and its effect on productivity is drawn using practical examples.

4.

- > The procedures and policies that impact on the learner's tasks in the workplace are identified and explained using examples from own world experiences.
- > The purpose and the need for such policies and procedures is illustrated with examples.
- > Clear links are drawn between the process/task and the scientific and technological concepts underpinning it, drawing on insights gained by the learner during his/her work experience.

Integrated assessment

Integrated assessment at the level of this qualification will evaluate the learner's capacity to integrate concepts, actions and ideas across a range of activities and knowledge domains.

The integrated assessment must specifically evaluate the learner's ability to:

- > Implement and apply procedures with special reference to the relevant Codes of Practice and applicable regulations pertaining to specific tasks.
- > Understand, use and care for basic tools, machinery and equipment.
- > Explain and discuss issues, aspects and principles and relate them to the specific workplace context.

This will require assessment methodologies which will include demonstration and oral and written responses, both summative and formative, and evidence of these in the form of portfolios or projects.

Since this is a foundational qualification, the learner must show sufficient evidence to apply the fundamental learning skills both in the workplace and in other contexts.

This assessment should also ensure that learners are assessed for the critical outcomes.

INTERNATIONAL COMPARABILITY

The unit standards of this qualification were compared to international standards and Qualifications at a similar level in New Zealand, Wales and Ireland. A comparable outcomes-based occupational qualification could not be found. This qualification compares well in terms of addressing minimum levels of literacy and numeracy whilst promoting lifelong learning. It is also unique in that it combines an introduction to the world of work with occupational skills standards.

ARTICULATION OPTIONS

This qualification has been designed as a broad - based foundation for a wide range of occupational and workplace based qualifications. The learner will acquire general technical skills that will enable the individual to pursue different careers in the energy sector and also facilitate articulation within the engineering industries.

Horizontal articulation is possible with:

- > GETC: Basic Technical Practice: Energy at NQF Level 1

Vertical articulation is possible with:

- > NC: Electrical Engineering at NQF Level 2

MODERATION OPTIONS

> Anyone assessing a learner or moderating the assessment of a learner against this Qualification must be registered as an assessor with the relevant ETQA.

> Any institution offering learning that will enable the achievement of this Qualification must be accredited as a provider with the relevant ETQA.

> Assessment and moderation of assessment will be overseen by the relevant ETQA according to the ETQA's policies and guidelines for assessment and moderation; in terms of agreements reached around assessment and moderation between ETQA's including professional bodies; and in terms of the moderation guideline detailed immediately below.

> Moderation must include both internal and external moderation of assessments at exit points of the qualification, unless ETQA policies specify otherwise. Moderation should also encompass achievement of the competence described both in individual Unit Standards, exit level outcomes as well as the integrated competence described in the qualification.

Anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

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

Assessors must have a technical knowledge of an engineering or electrical occupation context. They should also have sufficient expertise to assess communication, numeracy, technology and business processes.

NOTES

N/A

UNIT STANDARDS

(Note: A blank space after this line means that the qualification is not based on Unit Standards.)

	UNIT STANDARD ID AND TITLE	LEVEL	CREDITS	STATUS
Core	7461 Use maps to access and communicate information concerning routes, location and direction	Level 1	1	Reregistered
Core	12512 Practice environmental awareness	Level 1	4	Registered
Core	13165 Describe the properties of materials found in the workplace and describe their impact on the environment	Level 1	6	Registered
Core	13172 Understand the employer/employee relationship	Level 1	3	Registered
Core	13174 Identify and discuss inappropriate behaviours in the workplace	Level 1	2	Registered
Core	13995 Demonstrate an understanding of contracts and their sources	Level 1	2	Reregistered
Core	14569 Demonstrate an understanding of how to participate effectively in the workplace	Level 1	3	Registered
Core	110075 Apply basic fire fighting techniques	Level 1	3	Registered
Core	116511 Carry out basic first aid treatment in the workplace	Level 1	1	Registered
Core	119831 Mark off and cut out shapes using a template	Level 1	3	Draft - Prep for P Comment
Core	8420 Operate in a team	Level 2	4	Reregistered
Core	10252 Identify, inspect, use, maintain and care for engineering hand tools	Level 2	6	Reregistered
Core	10255 Select, use and care for power tools	Level 2	5	Reregistered
Core	113860 Demonstrate an understanding of the uses and safety aspect associated with flammable energy sources	Level 2	3	Registered
Elective	9839 Apply and maintain safety in an electrical environment	Level 1	5	Reregistered
Elective	13617 Select, use and maintain specialised tools for reticulation network construction	Level 1	2	Registered
Elective	14014 Read and interpret construction drawings and specifications	Level 1	3	Registered
Elective	14111 Demonstrate an understanding of how scientific skills and knowledge could contribute to sustainable use of resources	Level 1	2	Reregistered
Elective	119832 Construct and wire basic electrical circuits	Level 1	4	Draft - Prep for P Comment
Elective	119833 Install cables	Level 1	7	Draft - Prep for P Comment
Elective	119834 Install under-surface wireways and draw in conductors	Level 1	8	Draft - Prep for P Comment
Elective	119835 Install and maintain poles	Level 1	4	Draft - Prep for P Comment

Elective	10254	Maintain electrical distribution boards, panels and enclosures	Level 2	6	Reregistered
Elective	113861	Maintain servitudes, wayleaves and clearances	Level 2	5	Registered
Elective	113877	Understand fundamentals of electricity	Level 2	8	Registered
Fundamental	7447	Working with numbers in various contexts	Level 1	6	Reregistered
Fundamental	7448	Work with patterns in various contexts	Level 1	4	Reregistered
Fundamental	7450	Work with measurement in a variety of contexts	Level 1	2	Reregistered
Fundamental	7453	Use algebraic notation, conventions and terminology to solve problems	Level 1	3	Reregistered
Fundamental	7509	Apply basic concepts and principles in the natural sciences	Level 1	5	Reregistered
Fundamental	12462	Engage in a range of speaking and listening interactions for a variety of purposes	Level 1	6	Registered
Fundamental	12469	Read and respond to a range of text types	Level 1	6	Registered
Fundamental	12470	Write for a variety of different purposes	Level 1	6	Registered
Fundamental	12471	Explore and use a variety of strategies to learn (revised)	Level 1	5	Registered
Fundamental	12535	Understand the world of work	Level 1	5	Registered
Fundamental	14084	Demonstrate an understanding of and use the numbering system	Level 1	1	Registered
Fundamental	14098	Understand and use energy in technological product and systems	Level 1	1	Reregistered
Fundamental	110083	Process, analyse and communicate numerical data	Level 1	4	Registered



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

1

Mark off and cut out shapes using a template

SAQA US ID	UNIT STANDARD TITLE		
119831	Mark off and cut out shapes using a template		
SGB NAME	NSB 12	PROVIDER NAME	
SGB Electrical Engineering & Construction	Physical Planning and Construction		
UNIT STANDARD TYPE	FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Physical Planning and Construction	Electrical Infrastructure Construction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	3	Level 1	Regular

SPECIFIC OUTCOME 1

Plan and prepare materials and equipment for marking off.

SPECIFIC OUTCOME 2

Mark off surface using template.

SPECIFIC OUTCOME 3

Cut out and finish off shape.

SPECIFIC OUTCOME 4

Apply quality checks on completed work and store tools, equipment and templates.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

2

Construct and wire basic electrical circuits

SAQA US ID	UNIT STANDARD TITLE		
119832	Construct and wire basic electrical circuits		
SGB NAME	NSB 12	PROVIDER NAME	
SGB Electrical Engineering & Construction	Physical Planning and Construction		
UNIT STANDARD TYPE	FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Physical Planning and Construction	Electrical Infrastructure Construction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	4	Level 1	Regular

SPECIFIC OUTCOME 1

Plan and sketch a basic circuit diagram.

SPECIFIC OUTCOME 2

Understand and describe the functioning of the circuit.

SPECIFIC OUTCOME 3

Understand and operate a power supply.

SPECIFIC OUTCOME 4

Prepare to construct a basic electrical circuit.

SPECIFIC OUTCOME 5

Construct basic electrical circuits.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

3

Install cables

SAQA US ID	UNIT STANDARD TITLE		
119833	Install cables		
SGB NAME		NSB 12	PROVIDER NAME
SGB Electrical Engineering & Construction		Physical Planning and Construction	
UNIT STANDARD TYPE		FIELD DESCRIPTION	SUBFIELD DESCRIPTION
Regular		Physical Planning and Construction	Electrical Infrastructure Construction
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	7	Level 1	Regular

SPECIFIC OUTCOME 1

Plan work task.

SPECIFIC OUTCOME 2

Install surface mounted cables.

SPECIFIC OUTCOME 3

Install under-surface cables.

SPECIFIC OUTCOME 4

Install cables in trenches.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

4

Install under-surface wireways and draw in conductors

SAQA US ID	UNIT STANDARD TITLE		
119834	Install under-surface wireways and draw in conductors		
SGB NAME	NSB 12	PROVIDER NAME	
SGB Electrical Engineering & Construction	Physical Planning and Construction		
UNIT STANDARD TYPE	FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Physical Planning and Construction	Electrical Infrastructure Construction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	8	Level 1	Regular

SPECIFIC OUTCOME 1

Plan work task.

SPECIFIC OUTCOME 2

Install under-surface wireways.

SPECIFIC OUTCOME 3

Complete task.

SPECIFIC OUTCOME 4

Draw in conductors in wireways.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

5

Install and maintain poles

SAQA US ID	UNIT STANDARD TITLE		
119835	Install and maintain poles		
SGB NAME	NSB 12	PROVIDER NAME	
SGB Electrical Engineering & Construction	Physical Planning and Construction		
UNIT STANDARD TYPE	FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Physical Planning and Construction	Electrical Infrastructure Construction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	4	Level 1	Regular

SPECIFIC OUTCOME 1

Excavate hole for erection of pole.

SPECIFIC OUTCOME 2

Handle and erect poles.

SPECIFIC OUTCOME 3

Backfill the excavation.

SPECIFIC OUTCOME 4

Assess condition of and maintain or remove damaged poles.