



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 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 for 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 18 May 2006*. All correspondence should be marked **Standards Setting - SGB for Electrical Engineering and Construction** and addressed to

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S BHIKHA
DIRECTOR: STANDARDS SETTING AND DEVELOPMENT



SAQA QUAL ID		QUALIFICATION TITLE	
50020		National Certificate. Construction and Maintenance of Overhead Track Equipment	
SGB NAME		ORGANISING FIELD ID	PROVIDER NAME
SGB Electrical Engineering & Construction		12	
QUAL TYPE		ORGANISING FIELD DESCRIPTION	SUBFIELD
National Certificate		Physical Planning and Construction	Electrical Infrastructure Construction
ABET BAND	MINIMUM CREDITS	NQF LEVEL	QUALIFICATION CLASS
Undefined	146	Level 3	Regular-Unit Stds Based

PURPOSE AND RATIONALE OF THE QUALIFICATION

Purpose

The primary purpose of this qualification is to develop the required competencies in a learner for a career in Overhead Track construction, maintenance and repair.

Qualified learners will whilst under supervision be able to:

- > Perform construction and maintenance of overhead track equipment under isolated and earthed conditions.
- > Communicate effectively verbally and in written form with relevant role-players (e.g. peers, managers, etc.)
- > Calculate quantities and distances correctly.

The core and elective Unit Standards provide credits that allow the learner access to both vertically and horizontally articulated qualifications in the electrical engineering and construction field. The social status, productivity and employability of the qualifying learner within the electrical engineering and construction field will be enhanced, thereby contributing to the quality and skills required in this field. Learners will be able to demonstrate occupational skills, which will enable them to engage in life skills activities, creation of small businesses and health and environmental issues, through the critical cross-field component of the qualification.

Rationale for the Qualification

This qualification is for learners who want to follow a career in installation, maintenance and repair of Overhead Track Equipment (OHE) and related fields. Overhead Track Equipment forms a critical part of the infrastructure of a rail transport system and contributes to reliable, available, safe and efficient train operations. It is therefore vitally important that Overhead Track Equipment be safely and correctly maintained on 3 kV DC and 25/50 kV AC under isolated and earthed conditions (dead conditions) in order to meet standards set in associated Overhead Track Equipment engineering specifications.

The qualification equips the learner with the skills, knowledge and understanding to safely and correctly remove, assemble, replace, install and maintain Overhead Track Equipment to the required standards and specifications under supervision.

Learners credited with this qualification and who apply the acquired knowledge and skills can help address the critical shortage of qualified personnel in the industry. For the new learner, this qualification is needed to enable him/her to be a productive person in a structured workplace.

These skills and knowledge are essential in and to the following domains:

- > Enabling the rendering of electrical continuity to the rail transport service.
- > Enabling the rendering of a rail transport service.

Overhead track equipment (OHTE) forms a critical part of the infrastructure of a rail transport system and contributes to the safe and efficient running of rail traffic. Due to the density of rail traffic and the emphasis placed on reliability, availability and safety of overhead track equipment, it is vitally important that the equipment be repaired in a timeous, efficient and safe manner with a minimal disruption of the continuity of the power supply system. To enable safe and timeous repair on overhead track equipment, maintenance personnel must have a sound knowledge of various overhead track systems and must follow predetermined **faultfinding** and repair procedures based on overhead track engineering practices and specifications.

The qualification equips the learner with the skills, knowledge and understanding to safely and independently do fault finding, inspections, repair and maintenance on overhead track equipment under "Live" conditions while under tension (mechanical) to the required standards and specifications.

This qualification also equips the learner with the skills, knowledge and understanding to work safely and independently under isolated and earth conditions and to clearance from exposed "live" high-voltage electrical equipment (3-kV DC, 25-kV and 50-kV AC overhead traction equipment [OHTE] and all transmission lines and associated equipment) with a mechanised vehicle/on track machine.

Learners credited with this qualification and who apply the acquired knowledge and skills can help address the critical shortage of qualified personnel in the industry. For the new learner, this qualification and its competence standards, which are instrumental to the development and recognition of the foundational, practical and reflective competence (applied competence), is needed to be a productive person in a structured workplace and forms part of the development.

These services are essential in and to the following domains:

- > Enabling the rendering of electrical continuity to the rail network service.
- > Enabling the rendering of a efficient productive rail network service.
- > Contributing to economic growth.

For learners who have acquired experience in the workplace, this qualification may be obtained in part or in whole through Recognition of Prior Learning, by formally acknowledging workplace skills acquired without the benefit of formal education or training.

RECOGNIZE PREVIOUS LEARNING?

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LEARNING ASSUMED TO BE IN PLACE

This qualification assumes that learners are already competent in the following:

- > Communication at NQF Level 3.
- > Mathematical Literacy at NQF Level 3.

Recognition of Prior Learning:

This qualification may be obtained in part or in whole through RPL. The learner should be thoroughly briefed on the mechanism to be used. Support and guidance should be provided to the learner. Care should be taken that the mechanism used provides the learner with an opportunity to demonstrate competence and is not so onerous as to prevent learners from taking up the RPL option towards gaining a qualification.

Access to the Qualification

Due to the safety requirements in the overhead track environment, learners must:

- > Not be colour blind.
- > Not be claustrophobic.
- > Be able to gauge distance.
- > Not suffer from acrophobia.

It is preferable that learners first complete the National Certificate: Construction and Maintenance of OHTE under isolated and earthed conditions NQF Level 3 before accessing this qualification.

QUALIFICATION RULES

Fundamental:

- > 20 credits at NQF Level 3.
- > 36 credits at NQF Level 4.
- > Total credits 56.

Core:

- > 23 credits at NQF Level 3.
- > 60 credits at NQF Level 4.
- > Total credits 83.

Elective:

- > 5 credits at NQF Level 3.
- > 15 credits at NQF level 4.
- > Total credits 20.

Motivation for the number of credits assigned

Fundamental Credits:

- > A minimum of 20 credits at level 4 in a first South African language and a further 20 compulsory credits at a minimum of level 3 in a second South African language are allocated to Communication. 16 credits are allocated to Mathematical Literacy.
- > This results in 56 credits in the Fundamental component.

Core Credits:

- > 83 credits have been allocated to the Core Unit Standards and are compulsory.

Elective Credits:

- > 20 credits have been allocated to the elective component of the qualification. 15 credits must be selected from this category.

In order to obtain the qualification, the learner needs to complete at least a total of 154 credits as stipulated above.

EXIT LEVEL OUTCOMES

The learner must achieve the following exit level outcomes under live conditions.

Note: Live: A conductor is said to be "live" when it is at a potential different from that of the earth or any other conductor of the system of which it forms a part.

1. Plan and prepare for the inspection, faultfinding, repair and corrective maintenance on overhead track equipment under "live" and/or isolated and earthed conditions.
2. Perform corrective maintenance on overhead track equipment according to company-specific instructions and manufacturer's specifications under "live" conditions.
3. Finalise the corrective maintenance and quality checks on overhead track equipment according to company-specific instructions under "live" conditions whilst working independently.
4. Communicate with internal and external clients.
5. Know and understand electrical systems and related concepts.

ASSOCIATED ASSESSMENT CRITERIA

1.
 - > Relevant documentation is evaluated and interpreted.
 - > The correct resources and material is procured after evaluating and interpreting relevant documentation.
 - > Range: This includes but is not limited to required personnel, transport, tools and lifting equipment.
 - > Problems regarding the procurement of materials, parts and components are solved using processes and procedures applicable in the OHTE environment.
 - > Work permit is obtained, if required, within the framework of company-specific communication protocol.
 - > The mechanised maintenance vehicle or on-track machine is prepared for work to be done.
2.
 - > Inspection, faultfinding, repair and adjustment are performed safely as per company-specific instructions and manufacturer's specifications under "live" conditions. Range: Work is performed safely while working "live" on 3-kV DC overhead track equipment while conductors is under tension (mechanical). Work to

clearance with a mechanised maintenance vehicle/on-track machine from "live" overhead track equipment whilst performing inspection, faultfinding, repair and adjustment under isolated and earthed conditions.

- > Problems regarding the suitability and functionality of equipment and tools are solved by being able to improvise within acceptable overhead track practices.
- > The resources are utilised and the tasks are executed safely and responsibly.
- > The use and function of the equipment being installed in relation to the overhead track system are explained in terms of overhead track practices and philosophies.

3.

- > Quality checks are performed safely and correctly as per company-specific instructions and manufacturer's specifications under "live" conditions.
- > Problems regarding the quality checks performed on OHTE under "live" conditions are solved by being able to improvise within acceptable company practices and philosophies.
- > The resources are utilised correctly and the task executed safely and responsibly.
- > Tools, equipment and material are removed safely and correctly according to company-specific instructions.
- > Tools, equipment and material are cleaned and stored according to company specific house keeping rules.
- > Work permit is cancelled if used within the framework of company-specific communication protocol.
- > Mechanised maintenance vehicle/on-track machine is shut down and secured if used.

4.

- > Information is presented timeously in the required format to the appropriate role players as stipulated in company specific policies and procedures.
- > Relevant communication media and protocol is used correctly while performing tasks.
- > Verbal communication is clear and concise in accordance with company specific communication protocol.
- > Documentation relating to the task is completed and distributed as per company-specific instructions
- > Procedures for reporting and recording of potential hazards are followed correctly as per company-specific instructions.

5.

- > Procedures and instructions and the application of safe working methods to work live on 3-kV DC systems are explained in accordance with electrical systems principles.
- > The reticulation system of OHTE is explained in the context of overhead track maintenance.
- > The interrelatedness of systems within the rail sector and the importance of applying the electrical safety instructions in an electrical environment is explained with examples.
- > Substandard conditions relating to high-voltage overhead track equipment are identified and explained in accordance with company-specific instructions.

Integrated Assessment

Because assessment practices must be open, transparent, fair, valid, and reliable and ensure that no learner is disadvantaged in any way whatsoever, an integrated assessment approach is incorporated into the Qualification.

Learning, teaching and assessment are inextricably linked. Whenever possible, the assessment of knowledge, skills, attitudes and values shown in the Unit Standards should be integrated.

Assessment of the communication, language, literacy and numeracy should be conducted in conjunction with other aspects and should use authentic overhead track equipment contexts wherever possible.

A variety of methods must be used in assessment and tools and activities must be appropriate to the context in which the learner is working. Where it is not possible to assess the learner in the workplace or on-the-job, simulations, case studies, role-plays and other similar techniques should be used to provide a context appropriate to the assessment.

The term 'Integrated Assessment' implies that theoretical and practical components should be assessed together. During integrated assessments the assessor should make use of formative and summative assessment methods and assess combinations of practical, applied, foundational and reflective competencies.

Assessors and moderators should make use of a range of formative and summative assessment methods. Assessors should assess and give credit for the evidence of learning that has already been acquired through formal, informal and non-formal learning and work experience.

Assessment should ensure that all specific outcomes, embedded knowledge and critical cross-field outcomes are evaluated. The assessment of the critical cross-field outcomes should be integrated with the

assessment of specific outcomes and embedded knowledge.

INTERNATIONAL COMPARABILITY

International comparability was done with qualifications offered in countries that have extensive electrical rail systems using similar voltages to South Africa.

United Kingdom:

The National Certificate in Overhead Track Equipment has been benchmarked against the corresponding Qualifications on the Qualification Framework in the United Kingdom. The following emanated from the benchmarking process:

Title of corresponding Qualifications:

> NVQ in Rail Transport Engineering Maintenance, Levels 4.

Differences with South African Qualification:

The UK Qualification incorporates the different railway engineering disciplines into one Qualification, i.e. a generic core with different streams representing the various disciplines, such as Signal Maintenance, Signal Faulting, Communications, Permanent way, Electrification, Traction & Rolling stock and Plant. In the South African model, each of the railway engineering disciplines are reflected in separate, specialised Qualifications. e.g. cable joining, repairing lengths of cable and connecting them to overhead lines. Repair overhead equipment under "live" and/or isolated and earthed conditions whilst working independently.

Similarities with South African Qualification:

There are a lot of similarities with regard to the individual units or competencies included in this Qualification.

These include competencies relating to:

- > Establishing and maintaining protection.
- > Health & Safety.
- > Implement safe systems for work under "live" and/or isolated and earthed conditions.
- > Coordinating activities with others.
- > Contributing to improving the organisation's working practices.
- > Plan requirements for safe access to work on or near electrification and plant assets.
- > Planning activities and preparing resources.
- > Reinstating the work area upon completion of activities.

New Zealand:

The National Certificate in Overhead Track Equipment has been benchmarked against the corresponding Qualification and individual Unit Standards registered by the New Zealand Qualifications Authority. The following emanated from the benchmarking process:

Title of corresponding Qualification/s:

> National Certificate in Electrical Engineering level 4

Differences with South African Qualification:

The aim of the New Zealand Qualification is to provide recognition for a learner wishing to pursue employment and further training in the electrical and related industries. The South Africa qualification in Overhead Track Equipment, Level 4 focuses more or less on the same topics, with the exception of work under "live" and/or isolated and earthed conditions.

Similarities with South African Qualification:

There are a lot of similarities with regard to the individual unit standards or Competencies included in this Qualification.

- > Fundamental competencies, i.e. Communication & Mathematics.
- > Health & Safety.
- > An understanding of the rail transport industry.
- > Principles of electricity.
- > Demonstrate the knowledge of safe working in an electrical environment.
- > Demonstrate knowledge of electricity.
- > The use and care of a range of tools.

Scotland:

The National Certificate in Overhead Track Equipment has been benchmarked against the corresponding Qualifications on the Qualification Framework in Scotland. The following emanated from the benchmarking process:

Title of corresponding Qualification/s:

- > City & Guilds, Level 4, NQF in Railway Engineering (Unity/102/6887: Unit 220)

Differences with South African Qualification:

The Scottish Qualification incorporates the different railway engineering disciplines into one Qualification, i.e. a generic core with different streams representing the various disciplines, such as Signal Maintenance, Signal Faulting, Communications, Permanent way, Electrification, Traction & Rolling stock and Plant. In the South African model, each of the railway engineering disciplines is reflected in separate, specialized Qualifications.

Similarities with South African Qualification:

There are a lot of similarities with regard to the individual unit standards or competencies included in this Qualification.

Individual Unit Standards registered, which correlate with some of the South African Unit Standards, include:

- > Work within approved procedures and specifications.
- > Support health and safety practices in the workplace.
- > Prepare work sites and materials for electrification.
- > Coordinating activities with others.
- > Contributing to improving the organisation's working practices.
- > Identify and deal with hazards in the railway environment.
- > The complexity of the preparations.
- > Planning activities and preparing resources.
- > Maintain the condition of the work site, materials and equipment.

Australia:

The National Certificate in Overhead Track Equipment has been benchmarked against the corresponding Qualification and individual Unit Standards registered by the Australian Qualifications Authority. The following emanated from the benchmarking process:

Title of corresponding Qualification/s:

- > Electrical Engineering - Electrical Installations, e.g. testing; inspection, repairing, maintaining, etc.

Differences with South African Qualification:

The Australian Qualification incorporates the different railway engineering disciplines into one Qualification, i.e. a generic core with different streams representing the various disciplines, such as, High-voltage testing, Installations which includes sets and testing. The Australian Qualification provides recognition for a broader range of competencies related to the maintenance of electrical equipment.

Similarities with South African Qualification:

There are a lot of similarities with regard to the individual unit standards and competencies included in these Qualifications when work is done under "live" and/or isolated and earthed conditions.

These include competencies relating to:

- > Plan and prepare work.
- > Jointing of electrical cables.
- > Testing of cables.
- > Installation of circuit breakers.
- > High-voltage switchgear above 1000 kV.
- > Clean up.

In conclusion, it can be stated that this South African qualification compares well with those qualifications mentioned above.

Despite the differences, the essential competencies relating to the work that will be done by the learners are contained in the South African.

ARTICULATION OPTIONS

This is a qualification in a series in overhead track equipment qualifications varying from NQF Level 2 to 4. As one of the focus areas within the overhead track equipment is on safety, the embedded safety consciousness within the working environment will be favourable to any employer. This series of qualifications articulates directly to learning programmes and qualifications in overhead track equipment. It also opens the possibility for further learning in the sub-fields of Electrical Infrastructure Construction, Engineering and Related Design and Manufacturing and Assembly.

Horizontal articulation is possible with:

- > 49067: "Further Education and Training Certificate: Railway Signalling: Fault-finding and Repair of Equipment" at NQF Level 4
- > 48474: "National Certificate: Electrical Engineering" at NQF Level 4

Vertical articulation is possible with:

- > 49745: "National Certificate: Value Engineering" at NQF Level 5

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 or with an ETQA that has a Memorandum of Understanding 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 or with an ETQA that has a Memorandum of Understanding with the relevant ETQA.

> Assessment and moderation of assessment will be overseen by the relevant ETQA or by an ETQA that has a Memorandum of Understanding with the relevant ETQA, according to the ETQA policies and guidelines for assessment and moderation.

> 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 as well as the integrated competence described in the Qualification.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

Assessors and moderators wishing to assess candidates against this qualification must:

- > Be registered as assessors with the relevant ETQA or with an ETQA that has a Memorandum of Understanding with the relevant ETQA body.
- > Be in possession of a relevant qualification in OHTE or Electrical Engineering at least at NQF Level 5 or above.
- > Have practical work experience in the OHTE environment.

NOTES

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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	120216 Obtain, issue and cancel a work permit	Level 3	6	Draft - Prep for P Comment
Core	120217 Inspect, manufacture, remove, install or replace and adjust and or position droppers on overhead track equipment (OHTE)	Level 3	4	Draft - Prep for P Comment
Core	120232 Fault find and install splices on Overhead Track Equipment (OHTE) conductors under "live" and/or isolated and earthed conditions	Level 3	13	Draft - Prep for P Comment
core	14057 Demonstrate knowledge and understanding of electrical systems and related concepts	Level 4	6	Registered
Core	113873 Understand basic electrical and mechanical engineering principles	Level 4	8	Registered
core	119884 Work live on all transmission lines and associated equipment from a mechanised maintenance vehicle	Level 4	9	Draft - Prep for P Comment

Core	119887	Inspect, fault find, remove, install/replace and adjust a steady arm and/or side strain insulator on overhead traction equipment (OHTE) under "live" and/or isolated and earthed conditions	Level 4	11	Draft - Prep for P Comment
Core	119891	Inspect, assemble, remove, replace/install and adjust section insulator runners on 3-kV DC overhead track equipment under "live" conditions	Level 4	14	Draft - Prep for P Comment
Core	119892	Measure and set the stagger and height of the contact wire on overhead traction equipment OHTE under "live" conditions	Level 4	12	Draft - Prep for P Comment
Elective	14623	Afford on-track protection	Level 3	5	Registered
Elective	119888	Work live on 3kV DC OHTE, or to clearance from exposed "live" high-voltage electrical equipment (3kV DC, 25 kV and 50kV AC OHTE and all transmission lines and associated equipment)	Level 4	15	Draft - Prep for P Comment
Fundamental	8970	Write texts for a range of communicative contexts	Level 3	5	Reregistered
Fundamental	119457	Interpret and use information from texts	Level 3	5	Registered
Fundamental	119467	Use language and communication in occupational learning programmes	Level 3	5	Registered
Fundamental	119472	Accommodate audience and context needs in oral/signed communication	Level 3	5	Registered
Fundamental	7468	Use mathematics to investigate and monitor the financial aspects of personal, business, national and international issues	Level 4	6	Reregistered
Fundamental	9015	Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life related problems	Level 4	6	Reregistered
Fundamental	9016	Represent, analyse and calculate shape and motion in 2- and 3-dimensional space in different contexts	Level 4	4	Reregistered
Fundamental	12154	Apply comprehension skills to engage oral texts in a business environment	Level 4	5	Reregistered
Fundamental	119459	Write/present/sign for a wide range of contexts	Level 4	5	Registered
Fundamental	119462	Engage in sustained oral/signed communication and evaluate spoken/signed texts	Level 4	5	Registered
Fundamental	119469	Read/view, analyse and respond to a variety of texts	Level 4	5	Registered



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

1

Prepare and install a booster return conductor on 25/50 kV AC overhead traction equipment (OHTE) under isolated and earthed conditions

SAQA US ID	UNIT STANDARD TITLE		
119881	Prepare and install a booster return conductor on 25/50 kV AC overhead traction equipment (OHTE) under isolated and earthed conditions		
SGB NAME	ORGANISING FIELD ID	PROVIDER NAME	
SGB Electrical Engineering & Construction	12		
UNIT STANDARD TYPE	ORGANISING FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Physical Planning and Construction	Civil Engineering Construction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	9	Level 4	Regular

SPECIFIC OUTCOME 1

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

SPECIFIC OUTCOME 2

Prepare and install booster return conductors.

SPECIFIC OUTCOME 3

Prepare and install booster return conductors according to company specific instructions and manufacturer's specifications.

SPECIFIC OUTCOME 4

Finalise the installation process of booster return conductors.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

2

SAQA US ID	UNIT STANDARD TITLE		
119883	Remove, replace/install and adjust section insulator/phase break/runners on 25/50Kv AC overhead traction equipment (OHTE) under isolated and earthed conditions		
SGB NAME	ORGANISING FIELD ID	PROVIDER NAME	
SGB Electrical Engineering & Construction	12		
UNIT STANDARD TYPE	ORGANISING FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Physical Planning and Construction	Civil Engineering Construction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	8	Level 4	Regular

SPECIFIC OUTCOME 1

Communicate with relevant role players and complete relevant documentation.

SPECIFIC OUTCOME 2

Prepare to remove, replace/install and adjust section insulator/phase break/runners on 25/50Kv AC on OHTE under isolated and earthed conditions.

SPECIFIC OUTCOME 3

Remove, replace/install and adjust section insulator/phase break/runners on 25/50Kv AC on OHTE under isolated and earthed conditions according to company-specific instructions and manufacturer's specifications.

SPECIFIC OUTCOME 4

Finalise the removal, replacement/installation and adjustment of section insulator/phase break/runners on 25/50Kv AC on OHTE under isolated and earthed conditions.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

3

Work live on all transmission lines and associated equipment from a mechanised maintenance vehicle

SAQA US ID	UNIT STANDARD TITLE		
119884	Work live on all transmission lines and associated equipment from a mechanised maintenance vehicle		
SGB NAME	ORGANISING FIELD ID	PROVIDER NAME	
SGB Electrical Engineering & Construction	12		
UNIT STANDARD TYPE	ORGANISING FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Physical Planning and Construction	Electrical Infrastructure Construction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	9	Level 4	Regular

SPECIFIC OUTCOME 1

Prepare the mechanised maintenance vehicle.

SPECIFIC OUTCOME 2

Operate the mechanised maintenance vehicle.

SPECIFIC OUTCOME 3

Communicate clearly and concisely without misunderstanding to relevant role players and complete relevant documentation.

SPECIFIC OUTCOME 4

Work safely with due care to self, fellow workers, machines, equipment, materials and environment.

SPECIFIC OUTCOME 5

Shut down and secure the mechanised maintenance vehicle.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

4

inspect, fault find, remove, install/replace and adjust a steady arm and/or side strain insulator on overhead traction equipment (OHTE) under "live" and/or isolated and earthed conditions

SAQA US ID	UNIT STANDARD TITLE		
119887	inspect, fault find, remove, install/replace and adjust a steady arm and/or side strain insulator		
SGB NAME	ORGANISING FIELD ID	PROVIDER NAME	
SGB Electrical Engineering & Construction	12		
UNIT STANDARD TYPE	ORGANISING FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Physical Planning and Construction	Civil Engineering Construction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	11	Level 4	Regular

SPECIFIC OUTCOME 1

Communicate with relevant role players and complete relevant documentation.

SPECIFIC OUTCOME 2

Prepare to inspect, fault find, remove install/replace and adjust a steady arm and/or side strain isolator under "live" and/or isolated and earthed conditions.

SPECIFIC OUTCOME 3

Inspect, fault find, remove, install/replace and adjust steady arm and/or side strain insulator under "live" and/or isolated and earthed conditions according to company specific instructions and manufacturer's specifications.

SPECIFIC OUTCOME 4

Finalise the inspection, faultfinding, removal, installation/replacement and adjustment of steady arm and/or side strain insulator under "live" and/or isolated and earthed conditions.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

5

Work live on 3kV DC OHTE, or to clearance from exposed "live" high-voltage electrical equipment (3kV DC, 25 kV and 50kV AC OHTE and all transmission lines and associated equipment)

SAQA US ID		UNIT STANDARD TITLE	
119888		Work live on 3kV DC OHTE, or to clearance from exposed "live" high-voltage electrical equipment (3kV DC, 25 kV and 50kV AC OHTE and all transmission lines and associated equipment)	
SGB NAME		ORGANISING FIELD ID	PROVIDER NAME
SGB Electrical Engineering & Construction		12	
UNIT STANDARD TYPE		ORGANISING FIELD DESCRIPTION	SUBFIELD DESCRIPTION
Regular		Physical Planning and Construction	Civil Engineering Construction
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	15	Level 4	Regular

SPECIFIC OUTCOME 1

Work live on 3kV DC OHTE,

SPECIFIC OUTCOME 2

Work to clearance from exposed "live" high-voltage electrical equipment (3kV DC, 25 kV and 50kV AC OHTE and all transmission lines and associated equipment).

SPECIFIC OUTCOME 3

Perform switching, testing, and earthing on high-voltage overhead track equipment and all transmission lines and associated equipment.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

6

Sag and tension overhead conductors on OHTE under isolated and earthed conditions

SAQA US ID	UNIT STANDARD TITLE		
119890	Sag and tension overhead conductors on OHTE under isolated and earthed conditions		
SGB NAME	ORGANISING FIELD ID	PROVIDER NAME	
SGB Electrical Engineering & Construction	12		
UNIT STANDARD TYPE	ORGANISING FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Physical Planning and Construction	Civil Engineering Construction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD N P E
Undefined	12	Level 4	Regular

SPECIFIC OUTCOME 1

Communicate with relevant role players and complete relevant documentation.

SPECIFIC OUTCOME 2

Prepare to sag and tension overhead conductors on OHTE.

SPECIFIC OUTCOME 3

Sag and tension overhead conductors on OHTE in accordance with company specific procedures and instructions.

SPECIFIC OUTCOME 4

Finalise the sagging and tensioning of overhead conductors on OHTE.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

7

SAQA US ID	UNIT STANDARD TITLE		
119891	Inspect, assemble, remove, replace/install and adjust section insulator runners on 3-kV DC overhead track equipment under "live" conditions		
SGB NAME		ORGANISING FIELD ID	PROVIDER NAME
SGB Electrical Engineering & Construction		12	
UNIT STANDARD TYPE		ORGANISING FIELD DESCRIPTION	SUBFIELD DESCRIPTION
Regular		Physical Planning and Construction	Civil Engineering Construction
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	14	Level 4	Regular

SPECIFIC OUTCOME 1

Communicate with relevant role players and complete relevant documentation.

SPECIFIC OUTCOME 2

Prepare to inspect, assemble, remove and replace section insulator runners.

SPECIFIC OUTCOME 3

Inspect, assemble, remove and replace section insulator runners.

SPECIFIC OUTCOME 4

Finalise the assembling, removal, replacement, installation and adjustment of section insulator and/or runners.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

8

SAQA US ID	UNIT STANDARD TITLE		
119892	Measure and set the stagger and height of the contact wire on overhead traction equipment OHTE under "live" conditions		
SGB NAME	ORGANISING FIELD ID	PROVIDER NAME	
SGB Electrical Engineering & Construction	12		
UNIT STANDARD TYPE	ORGANISING FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Physical Planning and Construction	Civil Engineering Construction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	12	Level 4	Regular

SPECIFIC OUTCOME 1

Communicate with relevant role players and complete relevant documentation.

SPECIFIC OUTCOME 2

Prepare to measure and set the stagger and height of the contact wire on OHTE.

SPECIFIC OUTCOME 3

Measure and set the stagger and height of the contact wire on OHTE in accordance with company specific procedures and instructions.

SPECIFIC OUTCOME 4

Finalise the measuring and setting of the stagger and the height of the contact wire on OHTE.