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REPUBLIEK VAN SUID-AFRIKA

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AIDS HELPLINE: 0800-0123-22 Prevention is the cure

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GOVERNMENT NOTICES

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

No. 1122 **1 October 2004**

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Established in terms of Act 58 of 1995

21 September 2004

The South African Qualifications Authority in terms of the National Standards Body Regulations (Government Gazette No. 18787) published on 28 March 1998, hereby give notice of additional names of the following Standards Generating Body:

NSB 08 : LAW, MILITARY SCIENCE AND SECURITY

Additional Names for the SGB for Sheriffs

NOMINEE	WORKPLACE	NOMINA-TING BODY	EXPERIENCE/ QUALIFICATIONS
Corlette Adams	Technicon of South Africa/ UNISA	UNISA	B Proc LLM (Specialisation in Banking Law) Attorney of the High Court

JOE SAMUELS

DIRECTOR : STANDARDS SETTING AND DEVELOPMENT

No. 1123 **1 October 2004**

Established in terms of Act 58 of 1995

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

Secondary Agriculture

Registered by NSB 01, Agriculture and Nature Conservation, publishes the following unit standard for public comment.

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the unit standard upon which qualifications are based. The full unit standard 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, Hatfield Forum, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the unit standards should reach SAQA at the address ***below and no later than 30 October 2004.*** All correspondence should be marked **Standards Setting – SGB for Secondary Agriculture** and addressed to

The Director: Standards Setting and Development
SAQA
Attention: Mr. D Mphuthing
Postnet Suite 248
Private Bag X06
Waterkloof
0145
or faxed to 012 – 431-5144
dmphuthing@saqa.co.za

JOE SAMUELS
DIRECTOR: STANDARDS SETTING AND DEVELOPMENT

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 1

Clean and sanitize a food processing system

SAQA US ID	*UNIT STANDARD TITLE*
116899	Clean and sanitize a food processing system

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB for Secondary Agriculture: Processing	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Agriculture and Nature Conservation	Secondary Agriculture

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
AGR-SAG-0-SGB SAP	Regular	Level 3	5

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate knowledge of cleaning systems.

SPECIFIC OUTCOME 2

Prepare to clean and sanitise a food processing system.

SPECIFIC OUTCOME 3

Clean and sanitise a food processing system.

SPECIFIC OUTCOME 4

Perform end of cleaning procedures.

No. 1124 **1 October 2004**

Established in terms of Act 58 of 1995

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

Secondary Agriculture

Registered by NSB 01, Agriculture and Nature Conservation, publishes the following unit standard for public comment.

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the unit standard upon which qualifications are based. The full unit standard 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, Hatfield Forum, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the unit standards should reach SAQA at the address ***below and no later than 30 October 2004.*** All correspondence should be marked **Standards Setting – SGB for Secondary Agriculture** and addressed to

The Director: Standards Setting and Development
SAQA
Attention: Mr. D Mphuthing
Postnet Suite 248
Private Bag X06
Waterkloof
0145
or faxed to 012 – 431-5144
dmphuthing@saqa.co.za

JOÉ SAMUELS
DIRECTOR: STANDARDS SETTING AND DEVELOPMENT

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

Further Education and Training Certificate: Primary Tobacco Processing

SAQA QUAL ID	*QUALIFICATION TITLE*
49074	Further Education and Training Certificate: Primary Tobacco Processing
SGB NAME	SGB for Secondary Agriculture: Processing

ABET BAND	*PROVIDER NAME*	
Undefined		
QUALIFICATION CODE	*QUAL TYPE*	*SUBFIELD*
AGR-2-National Certificate	National Certificate	Secondary Agriculture
MINIMUM CREDITS	*NQF LEVEL*	*QUALIFICATION CLASS*
141	Level 2	Regular-Unit Stds Based

SAQA DECISION NUMBER	*REGISTRATION START DATE*	*REGISTRATION END DATE*

PURPOSE OF THE QUALIFICATION

This Qualification is aimed at level 4 on the National Qualification Framework. It provides learners with the opportunity to obtain competence in specialised tobacco processing namely, maintaining the tobacco process and equipment to improve product quality and the opportunity for learners to grow in this specific field.

The fundamental learning, which learners will acquire, will allow them to be able to compile verbal and written communications and perform basic calculations. This Qualification complies with the objectives of the NQF with regard to facilitating access to, mobility and progression within the tobacco processing industry.

The Qualification focuses on the skills, knowledge, values and attitude required to progress further in the industry. The intention is to release the potential of people, in order for them to grow, develop and become more competent workers. This Qualification will furthermore add value to the individuals, their workplace and the economy as a whole.

Rationale for the Qualification

This Qualification provides current learners with the opportunity to advance from the Tobacco Production - NQF Level 3 Qualification or for persons entering the Tobacco Processing environment and others to obtain an integrated practical and theoretical grounding in the maintaining of the tobacco processing and the functions thereof. This will ensure a portable, nationally recognized Qualification that will:

> Improve the quality of safety in the work environment.
> Optimally utilize resources in the production industry.
> Lead to transformation in economic growth and social development.

The typical range of learners is the currently employed, unemployed and other persons, who want to enter a learning programme to obtain a National Certificate in Tobacco Processing at NQF Level 4, to continue building a career path in this industry.

Improved levels of knowledge and skills lead to greater ability to produce at more competitive costs and better quality, which will impact favorably both on the society and the economy of the country.

Fundamental learning:

> Use mathematics to investigate and monitor the financial aspects of personal, business, and national issue.
> Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings of life-related problems.

> Measure, estimate and calculate physical quantities and explore, critique and prove geometrical relations in two and three-dimensional space in the life and workplace of the audit with increasing responsibilities.
> Engage in sustained oral communication and evaluate spoken texts.
> Read, analyse and respond to variety of texts.
> Write for a wide range of contexts.
> Use language and communication in occupational learning programmes.
> Accommodate audience and context needs in oral communication.
> Interpret and use information from texts.
> Write texts from a range of communicative contexts.
> Analyse and respond to a variety of literary texts.

Core learning:

> Analyse processed tobacco quality
> Maintain dosing and weighing belt units
> Maintain a conditioning unit
> Maintain tobacco transport unit
> Maintain a tobacco feeder unit
> Maintain a tobacco silo
> Maintain a tobacco fines extraction unit
> Maintain a tobacco airlock
> Function in a team

Elective learning:

> Maintain a tobacco pre-conditioning unit
> Maintain a tobacco reclaim unit
> Pre-condition unmanufactured tobacco
> Prepare tobacco humectants
> Control conditioning process
> Maintain a conditioning cylinder unit
> Produce cutrag
> Control cutting process
> Maintain a lamina and stem cutter
> Maintain a stem roller

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

Learners:

> Have attained a National Certificate in Tobacco Production NQF 3 on the National Qualifications Framework.
OR
> Have demonstrated competence in a Mechanical background at that level through recognition of prior learning.

Recognition of prior learning (RPL)

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. Where RPL is required the learner will need to prove applied competence in that specific area in order to obtain recognition of that skill and / or knowledge.

Evidence can be presented in a variety of forms, including international or previous local Qualifications, reports, testimonials mentioning functions performed, work records, portfolios, videos of practice and performance records. The assessment methods and tools to be used to assess Prior Learning shall be decided upon jointly by the assessor and the learner.

QUALIFICATION RULES

To obtain this Qualification, all fundamental and core unit standards are compulsory. In addition, a learner must select one of the following combinations from the elective unit standards below:

(1)
> Maintain a tobacco pre-conditioning unit
> Maintain a tobacco reclaim unit
> Pre-condition unmanufactured tobacco
> Prepare tobacco humectants
> Control conditioning process
> Maintain a conditioning cylinder unit

(2)
> Produce cutrag
> Control cutting process
> Maintain a lamina and stem cutter
> Maintain a stem roller

EXIT LEVEL OUTCOMES

1. Identify, explain and execute the functions/duties/responsibilities required in the maintenance of tobacco processing machines in order to sustain optimum production levels and minimize down time and product loss.

2. Describe the functions/duties/responsibilities in the preparation for the conditioning process during product supply, filling of the process lines and blend change-over to ensure required process standards.

3. Describe and perform the functions/duties/responsibilities required to ensure that conditioning procedures are maintained throughout the process.

4. Describe the functions/duties/responsibilities in the preparation for the cutting process during product supply, filling of the process lines and blend change-over to ensure required process standards.

5. Describe and perform the functions/duties/responsibilities required to ensure that cutting procedures are maintained throughout the process.

Critical cross field outcomes:

The following reflect the relevance of the critical cross field outcomes applicable to this Qualification.

Identifying and solving problems in which responses display that responsible decisions using critical and creative thinking have been made.
> Analyse processed tobacco quality
> Maintain dosing and weighing belt units
> Maintain a conditioning unit
> Maintain tobacco transport unit
> Maintain a tobacco feeder unit
> Maintain a tobacco silo
> Maintain a tobacco fines extraction unit
> Maintain a tobacco airlock
> Maintain a tobacco pre-conditioning unit
> Maintain a tobacco reclaim unit
> Pre-condition unmanufactured tobacco
> Prepare tobacco humectants
> Control conditioning process
> Maintain a conditioning cylinder unit
> Produce cutrag
> Control cutting process
> Maintain a lamina and stem cutter
> Maintain a stem roller

Working effectively with others as a member of a team.
> Maintain a conditioning unit
> Maintain tobacco transport unit
> Maintain a tobacco feeder unit
> Maintain a tobacco silo
> Maintain a tobacco fines extraction unit

> Maintain a tobacco airlock
> Function in a team
> Maintain a tobacco pre-conditioning unit
> Maintain a tobacco reclaim unit
> Pre-condition unmanufactured tobacco
> Prepare tobacco humectants
> Control conditioning process
> Maintain a conditioning cylinder unit
> Produce cutrag
> Control cutting process
> Maintain a lamina and stem cutter
> Maintain a stem roller

Organizing and managing oneself and one's activities responsibly and effectively.
> Maintain a conditioning unit
> Maintain tobacco transport unit
> Maintain a tobacco feeder unit
> Maintain a tobacco silo
> Maintain a tobacco fines extraction unit
> Maintain a tobacco airlock
> Function in a team
> Maintain a tobacco pre-conditioning unit
> Maintain a tobacco reclaim unit
> Pre-condition unmanufactured tobacco
> Prepare tobacco humectants
> Control conditioning process
> Maintain a conditioning cylinder unit
> Produce cutrag
> Control cutting process
> Maintain a lamina and stem cutter
> Maintain a stem roller

Communicating effectively using visual, mathematical and/or language skills in the modes of oral and/or written persuasion.
> Maintain a conditioning unit
> Maintain tobacco transport unit
> Maintain a tobacco feeder unit
> Maintain a tobacco silo
> Maintain a tobacco fines extraction unit
> Maintain a tobacco airlock
> Function in a team
> Maintain a tobacco pre-conditioning unit
> Maintain a tobacco reclaim unit
> Pre-condition unmanufactured tobacco
> Prepare tobacco humectants
> Control conditioning process
> Maintain a conditioning cylinder unit
> Produce cutrag
> Control cutting process
> Maintain a lamina and stem cutter
> Maintain a stem roller

Collecting, analysing, organising and critically evaluating information.
> Maintain a conditioning unit
> Maintain tobacco transport unit
> Maintain a tobacco feeder unit
> Maintain a tobacco silo
> Maintain a tobacco fines extraction unit
> Maintain a tobacco airlock
> Maintain a tobacco pre-conditioning unit
> Maintain a tobacco reclaim unit
> Control conditioning process
> Maintain a conditioning cylinder unit
> Control cutting process

> Maintain a lamina and stem cutter
> Maintain a stem roller

Using science and technology effectively and critically, showing responsibility towards the environment and health of others.
> Maintain a conditioning unit
> Maintain tobacco transport unit
> Maintain a tobacco feeder unit
> Maintain a tobacco silo
> Maintain a tobacco fines extraction unit
> Maintain a tobacco airlock
> Maintain a tobacco pre-conditioning unit
> Maintain a tobacco reclaim unit
> Pre-condition unmanufactured tobacco
> Prepare tobacco humectants
> Control conditioning process
> Maintain a conditioning cylinder unit
> Produce cutrag
> Control cutting process
> Maintain a lamina and stem cutter
> Maintain a stem roller

Demonstrating an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.
> Maintain a conditioning unit
> Maintain tobacco transport unit
> Maintain a tobacco feeder unit
> Maintain a tobacco silo
> Maintain a tobacco fines extraction unit
> Maintain a tobacco airlock
> Maintain a tobacco pre-conditioning unit
> Maintain a tobacco reclaim unit
> Pre-condition unmanufactured tobacco
> Prepare tobacco humectants
> Control conditioning process
> Maintain a conditioning cylinder unit
> Produce cutrag
> Control cutting process
> Maintain a lamina and stem cutter
> Maintain a stem roller

Contributing to the personal development of each learner and the social and economic development of the society at large.
> Function in a team

ASSOCIATED ASSESSMENT CRITERIA

1.
> Work site procedures and manufacturer's specifications for a tobacco processing machines are identified and explained.
> Fault finding methods and techniques for a tobacco processing machines are applied in the establishing of functional and quality deviations.
> Minor repairs, adjustments and maintenance for a tobacco processing machines are conducted in accordance with work site procedures and manufacturer's specifications.
> Consequences of not adhering to work site procedures and manufacturer's specifications for a tobacco processing machines are explained.
> Environment, health and safety measures are complied with during the implementation of minor repairs, adjustments and maintenance for tobacco processing machines.

2.
> Work site preparation procedures are identified and explained
> Consequences of not adhering to work site procedures are explained
> The relevant supply, filling and change-over activities are performed in accordance with standard operating procedures
> Procedures for handling equipment and product correctly and according to safety requirements are

explained and implemented.

3.
> Work site conditioning procedures are identified and explained
> Consequences of not adhering to work site supply, filling and change-over procedures are explained
> The relevant activities are performed in accordance with standard processing procedures and quality requirements
> Procedures for handling equipment and product correctly and according to safety requirements are explained and implemented.

4.
> Work site preparation procedures are identified and explained
> Consequences of not adhering to work site procedures are explained
> The relevant supply, filling and change-over activities are performed in accordance with standard operating procedures
> Procedures for handling equipment and product correctly and according to safety requirements are explained and implemented.

5.
> Work site cutting procedures are identified and explained
> Consequences of not adhering to work site supply, filling and change-over procedures are explained
> The relevant activities are performed in accordance with standard processing procedures and quality requirements
> Procedures for handling equipment and product correctly and according to safety requirements are explained and implemented.

Integrated Assessment Criteria

Learners will produce evidence of the following:

> Verbal and written explanations of reasons for adhering to operational and work site procedures as well as statutory requirements, adhering to specific sequence of operations, identifying deviations, taking corrective actions and recording relevant data, and reporting deviations outside the jobholder's responsibility.

> Demonstrations of a range of operational actions relating to the maintenance of tobacco processing machinery and applying general safety in the work place.

> Oral or written questioning regarding the reflexive competencies within the Qualification:

If the identifying and solving of problems, team work, organising one-self, the using of applied science, the implication of actions and reactions in the world as a set of related systems are not clear from the observation a method of oral questioning or a cases study should be applied to determine the whole person development and integration of applied knowledge and skills.

> A portfolio of evidence is required to prove the practical, foundational and reflexive competencies of the learner which may include production and quality statistics.

> Assessors and moderators should develop and conduct their own integrated assessment by making 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.

> Unit standards in the Qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should make use of formative and summative assessment methods and should assess combinations of practical, foundational and reflexive competencies.

INTERNATIONAL COMPARABILITY

Website benchmarking was done with Australia, Canada, New Zealand, Ireland and Scotland but none could be found. Furthermore, the International Tobacco Industry was also investigated for relevant Qualification information, but even within the Industry, nothing could be found to make Industry specific comparisons. Therefore this could be regarded as one of the first formalised Qualifications in Tobacco Processing.

ARTICULATION OPTIONS

N/A

MODERATION OPTIONS

Moderation includes internal and external moderation of assessments. Internal and external moderation systems must ensure that all assessors conduct assessments that are credible, fair, reliable, consistent, adequate and practical.

Internal and external moderation systems must provide learning opportunities that are transparent, affordable and enhancing development in the field and sub-field of the National Qualifications Framework.

The accredited provider with the relevant ETQA must be able to provide internal moderation.

External moderation will be done by the relevant ETQA at its discretion.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

Assessors need experience in the following areas:

> Interpersonal skills, subject matter and assessment.
> The assessor needs to be competent in the planning and conducting assessment of learning outcomes and design and develop assessments as described in the relevant unit standards. The subject matter experience must be well developed within the field of cigarette packaging.
> The subject matter experience of the assessor can be established by recognition of prior learning.
> Assessors need to be registered with the relevant Education and Training Quality Assurance Body.

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	116913 Analyse processed tobacco quality	Level 3	10	Draft - Prep for P Comment
Core	116594 Function in a team	Level 4	4	Draft - Prep for P Comment
Core	116904 Maintain a tobacco fines extraction unit	Level 4	2	Draft - Prep for P Comment
Core	116905 Maintain a tobacco airlock	Level 4	2	Draft - Prep for P Comment
Core	116910 Maintain a tobacco feeder unit	Level 4	4	Draft - Prep for P Comment
Core	116911 Maintain a conditioning unit	Level 4	14	Draft - Prep for P Comment
Core	116912 Maintain dosing and weighing belt units	Level 4	6	Draft - Prep for P Comment
Core	116915 Maintain tobacco transport units	Level 4	4	Draft - Prep for P Comment
Core	116916 Maintain a tobacco silo	Level 4	4	Draft - Prep for P Comment
Elective	114128 Prepare Tobacco Humectants	Level 2	3	Registered
Elective	114124 Pre-condition unmanufactuted tobacco	Level 3	6	Registered
Elective	114125 Produce cutrag	Level 4	12	Registered
Elective	116902 Maintain a stem roller	Level 4	3	Draft - Prep for P Comment
Elective	116903 Control the conditioning process	Level 4	6	Draft - Prep for P Comment
Elective	116906 Maintain a tobacco pre-conditioning unit	Level 4	8	Draft - Prep for P Comment
Elective	116907 Maintain a tobacco reclaim unit	Level 4	6	Draft - Prep for P Comment

Elective	116908 Maintain a lamina and stem cutter	Level 4	14	Draft - Prep for P Comment
Elective	116909 Control the cutting process	Level 4	6	Draft - Prep for P Comment
Elective	116914 Maintain a conditioning cylinder	Level 4	6	Draft - Prep for P Comment
Fundamental	8968 Accommodate audience and context needs in oral communication	Level 3	5	Registered
Fundamental	8969 Interpret and use information from texts	Level 3	5	Registered
Fundamental	8970 Write texts for a range of communicative contexts	Level 3	5	Registered
Fundamental	8972 Interpret a variety of literary texts	Level 3	5	Registered
Fundamental	7468 Use mathematics to investigate and monitor the financial aspects of personal, business, national and international issues	Level 4	2	Registered
Fundamental	8974 Engage in sustained oral communication and evaluate spoken texts	Level 4	5	Registered
Fundamental	8975 Read analyse and respond to a variety of texts	Level 4	5	Registered
Fundamental	8976 Write for a wide range of contexts	Level 4	5	Registered
Fundamental	8979 Use language and communication in occupational learning programmes	Level 4	5	Registered
Fundamental	9015 Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life related problems	Level 4	5	Registered
Fundamental	12417 Measure, estimate & calculate physical quantities & explore, critique & prove geometrical relationships in 2 and 3 dimensional space in the life and workplace of adult with increasing responsibilities	Level 4	4	Reregistered

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 1

Analyse processed tobacco quality

SAQA US ID	*UNIT STANDARD TITLE*
116913	Analyse processed tobacco quality

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB for Secondary Agriculture: Processing	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Agriculture and Nature Conservation	Secondary Agriculture

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
AGR-SAG-0-SGB SAP	Regular	Level 3	10

Specific Outcomes:

SPECIFIC OUTCOME 1

Prepare for quality tests.

SPECIFIC OUTCOME 2

Analyse samples.

SPECIFIC OUTCOME 3

Complete quality tests.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 2

Control the conditioning process

SAQA US ID	*UNIT STANDARD TITLE*
116903	Control the conditioning process

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB for Secondary Agriculture: Processing	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Agriculture and Nature Conservation	Secondary Agriculture

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
AGR-SAG-0-SGB SAP	Regular	Level 4	6

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and prepare for process startup.

SPECIFIC OUTCOME 2

Control process activities.

SPECIFIC OUTCOME 3

Conclude process activities.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 3

Control the cutting process

SAQA US ID	*UNIT STANDARD TITLE*
116909	Control the cutting process

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB for Secondary Agriculture: Processing	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Agriculture and Nature Conservation	Secondary Agriculture

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
AGR-SAG-0-SGB SAP	Regular	Level 4	6

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and prepare for process startup.

SPECIFIC OUTCOME 2

Control process activities.

SPECIFIC OUTCOME 3

Conclude process activities.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 4

Maintain a conditioning cylinder

SAQA US ID	*UNIT STANDARD TITLE*
116914	Maintain a conditioning cylinder

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB for Secondary Agriculture: Processing	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Agriculture and Nature Conservation	Secondary Agriculture

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
AGR-SAG-0-SGB SAP	Regular	Level 4	6

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate an understanding of fault-finding on a conditioning cylinder.

SPECIFIC OUTCOME 2

Plan and prepare for the maintenance of a conditioning cylinder unit.

SPECIFIC OUTCOME 3

Perform maintenance.

SPECIFIC OUTCOME 4

Complete maintenance.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 5

Maintain a conditioning unit

SAQA US ID	*UNIT STANDARD TITLE*
116911	Maintain a conditioning unit

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB for Secondary Agriculture: Processing	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Agriculture and Nature Conservation	Secondary Agriculture

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
AGR-SAG-0-SGB SAP	Regular	Level 4	14

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate an understanding of fault-finding on a conditioning unit.

SPECIFIC OUTCOME 2

Plan and prepare for the maintenance of a conditioning unit.

SPECIFIC OUTCOME 3

Perform maintenance.

SPECIFIC OUTCOME 4

Complete maintenance.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 6

Maintain a lamina and stem cutter

SAQA US ID	*UNIT STANDARD TITLE*
116908	Maintain a lamina and stem cutter

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB for Secondary Agriculture: Processing	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Agriculture and Nature Conservation	Secondary Agriculture

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
AGR-SAG-0-SGB SAP	Regular	Level 4	14

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate an understanding of fault-finding on a lamina and stem cutter.

SPECIFIC OUTCOME 2

Plan and prepare for the maintenance of a lamina and stem cutter.

SPECIFIC OUTCOME 3

Perform maintenance.

SPECIFIC OUTCOME 4

Complete maintenance.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

Established in terms of Act 58 of 1995

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 7

Maintain a stem roller

SAQA US ID	*UNIT STANDARD TITLE*
116902	Maintain a stem roller

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB for Secondary Agriculture: Processing	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Agriculture and Nature Conservation	Secondary Agriculture

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
AGR-SAG-0-SGB SAP	Regular	Level 4	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate an understanding of fault-finding on a stem roller.

SPECIFIC OUTCOME 2

Plan and prepare for the maintenance of a stem roller.

SPECIFIC OUTCOME 3

Perform maintenance.

SPECIFIC OUTCOME 4

Complete maintenance.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 8

Maintain a tobacco airlock

SAQA US ID	*UNIT STANDARD TITLE*
116905	Maintain a tobacco airlock

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB for Secondary Agriculture: Processing	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Agriculture and Nature Conservation	Secondary Agriculture

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
AGR-SAG-0-SGB SAP	Regular	Level 4	2

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate an understanding of fault-finding on a tobacco airlock.

SPECIFIC OUTCOME 2

Plan and prepare for maintenance of the airlock.

SPECIFIC OUTCOME 3

Perform maintenance.

SPECIFIC OUTCOME 4

Complete maintenance.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

Established in terms of Act 58 of 1995

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 9

Maintain a tobacco feeder unit

SAQA US ID	*UNIT STANDARD TITLE*
116910	Maintain a tobacco feeder unit

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB for Secondary Agriculture: Processing	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Agriculture and Nature Conservation	Secondary Agriculture

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
AGR-SAG-0-SGB SAP	Regular	Level 4	4

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate an understanding of fault-finding on a tobacco feeder.

SPECIFIC OUTCOME 2

Plan and prepare for the maintenance of the tobacco feeder.

SPECIFIC OUTCOME 3

Perform maintenance.

SPECIFIC OUTCOME 4

Complete maintenance.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 10

Maintain a tobacco fines extraction unit

SAQA US ID	*UNIT STANDARD TITLE*
116904	Maintain a tobacco fines extraction unit

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB for Secondary Agriculture: Processing	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Agriculture and Nature Conservation	Secondary Agriculture

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
AGR-SAG-0-SGB SAP	Regular	Level 4	2

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate an understanding of fault-finding on a tobacco fines extraction unit.

SPECIFIC OUTCOME 2

Plan and prepare for the maintenance of a tobacco fines extraction.

SPECIFIC OUTCOME 3

Perform maintenance.

SPECIFIC OUTCOME 4

Complete maintenance.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 11

Maintain a tobacco pre-conditioning unit

SAQA US ID	*UNIT STANDARD TITLE*
116906	Maintain a tobacco pre-conditioning unit

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB for Secondary Agriculture: Processing	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Agriculture and Nature Conservation	Secondary Agriculture

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
AGR-SAG-0-SGB SAP	Regular	Level 4	8

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate an understanding of fault-finding on a tobacco pre-conditioning.

SPECIFIC OUTCOME 2

Plan and prepare for the maintenance of the pre-conditioning unit.

SPECIFIC OUTCOME 3

Perform maintenance.

SPECIFIC OUTCOME 4

Complete maintenance.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 12

Maintain a tobacco reclaim unit

SAQA US ID	*UNIT STANDARD TITLE*
116907	Maintain a tobacco reclaim unit

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB for Secondary Agriculture: Processing	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Agriculture and Nature Conservation	Secondary Agriculture

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
AGR-SAG-0-SGB SAP	Regular	Level 4	6

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate an understanding of fault-finding on a tobacoo reclaim unit.

SPECIFIC OUTCOME 2

Plan and prepare for the maintenance of a tobacco reclaim unit.

SPECIFIC OUTCOME 3

Perform maintenance.

SPECIFIC OUTCOME 4

Complete maintenance.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 13

Maintain a tobacco silo

SAQA US ID	*UNIT STANDARD TITLE*
116916	Maintain a tobacco silo

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB for Secondary Agriculture: Processing	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Agriculture and Nature Conservation	Secondary Agriculture

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
AGR-SAG-0-SGB SAP	Regular	Level 4	4

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate an understanding of fault-finding on a tobacco silo.

SPECIFIC OUTCOME 2

Plan and prepare for the maintenance of the tobacco silo.

SPECIFIC OUTCOME 3

Perform maintenance.

SPECIFIC OUTCOME 4

Complete maintenance.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 14

Disseminate spatial data

SAQA US ID	*UNIT STANDARD TITLE*
116823	Disseminate spatial data

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	2

Specific Outcomes:

SPECIFIC OUTCOME 1

Determine nature of input data.

SPECIFIC OUTCOME 2

Determine characteristics and format of output data.

SPECIFIC OUTCOME 3

Assess converted data for correctness.

SPECIFIC OUTCOME 4

Identify most appropriate media for the task required.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 15

Maintain tobacco transport units

SAQA US ID	*UNIT STANDARD TITLE*
116915	Maintain tobacco transport units

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB for Secondary Agriculture: Processing	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Agriculture and Nature Conservation	Secondary Agriculture

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
AGR-SAG-0-SGB SAP	Regular	Level 4	4

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate an understanding of fault-finding on tobacco transport units.

SPECIFIC OUTCOME 2

Plan and prepare for the maintenance of the tobacco transport units.

SPECIFIC OUTCOME 3

Perform maintenance.

SPECIFIC OUTCOME 4

Complete maintenance.

No. 1125 **1 October 2004**

Established in terms of Act 58 of 1995

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

Geographical Information Sciences

Registered by NSB 12, Physical Planning and Construction, publishes the following qualifications 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 upon which qualifications are based. 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, Hatfield Forum West, 1067 Arcadia Street, Hatfield.

Comment on the unit standards should reach SAQA at the address ***below and no later than 30 October 2004.*** All correspondence should be marked **Standards Setting – SGB Geographical Information Sciences** and addressed to

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

JOE SAMUELS
DIRECTOR: STANDARDS SETTING AND DEVELOPMENT

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

National Certificate: Geographical Information Sciences

SAQA QUAL ID	QUALIFICATION TITLE	
49063	National Certificate: Geographical Information Sciences	
SGB NAME	SGB Geographical Information Sciences	
ABET BAND	PROVIDER NAME	
Undefined		
QUALIFICATION CODE	QUAL TYPE	SUBFIELD
PPC-5-National Certificate	National Certificate	Physical Planning, Design and Management
MINIMUM CREDITS	NQF LEVEL	QUALIFICATION CLASS
120	Level 5	Regular-Unit Stds Based
SAQA DECISION NUMBER	REGISTRATION START DATE	REGISTRATION END DATE

PURPOSE OF THE QUALIFICATION

This qualification has been developed for the Geographical Information Science (GISc) occupational area. It aims, through a planned combination of unit standards, to equip learners with skills and knowledge to undertake GISc related tasks and duties in an operational environment, by applying spatial data in different forms for specified outcomes in relation to the generic application of geographical information systems in the fields of map production, spatial awareness and data capturing.

This qualification has been developed to assist with professional advancement across the GISc industry. This will allow learners to register as a systems operator in the Geo-informatics field and lay a foundation for future career advancement in this learning area.

Rationale for the Qualification:

As a result of past legacies many practitioners within the Geographical Information Sciences or Geo-informatics occupational area were denied career advancement and possible registration with a relevant professional body. This was as a direct result of poor educational opportunities at some schools, leading to a lack of entry to higher education institutions. This qualification will address environmental issues that are relevant to the field of geo-informatics by allowing for the socio economic empowerment of learners whilst simultaneously improving the skills base of the country and underpin the country's economic development, planning, infrastructure and sustainable property and agricultural development.

The introduction of a National Certificate in GISc based on unit standards will therefore allow learners to enter the occupational area as Geographical Information Systems (GIS) Operators and to reach full potential of advancement without formal education becoming an impassable barrier and in addition, allow for the recognition of prior learning. It will further explore the Information Technology environment linking spatial data to their attributes stored in a secured computerised system that is underpinned by a proper disaster recovery facility.

The qualifying learner should be able to undertake GISc related tasks and duties in an operational environment by applying spatial data in different forms for specific outcomes and be able to register as a Systems Operator in the geo-informatics field.

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

It is assumed that a learner entering a programme leading to this qualification has achieved a National Certificate at NQF level 4 or equivalent and is proficient in Numeracy including Mathematics and in Communication including writing of technical reports or has two years in GIS related experience.

Recognition of Prior Learning (RPL):

This qualification could be achieved wholly or in part through recognition of prior learning (RPL) which includes formal, informal and non-formal learning and workplace experience in the GIS and related fields. Any learner who has met the requirements of any unit standard in this qualification and wish to be assessed may arrange to do so to the relevant Education and Training Authority (CETA) without having to attend further education or training. The applicant will be assessed against the specific outcomes and with the associated assessment criteria for the relevant unit standard(s). The assessor will decide on the most appropriate assessment procedures after discussion with the learner. Because this is a unit standard based qualification, any learner who demonstrates competence as required by the fundamental, core and relevant elective unit standards to access this qualification.

QUALIFICATION RULES

The Qualification - National Certificate in GISc at level 5 is made up of a number of three learning components and numerous learning areas. All unit standards within the Fundamental and Core have to be completed for the qualification.

The learning components and credit allocations are:
Fundamental: Credits 32 (minimum)
Core: Credits 67
Elective: Credits 21

To be proficient in any one learning area under the Elective of the Qualification, it is recommended that all unit standards within that learning area be completed. A minimum of 20 credits from the Elective must be completed for the qualification. The learning areas listed below and relevant unit standard titles are identified to assist users, and not as a conclusive list:

Basic Workflow:
> Manage a work process; and
> Develop, implement and manage a project/activity plan.

Spatial Analysis:
> Perform spatial analysis under supervision; and
> Perform spatial statistical analysis and communicate findings.

System and software operation:
> Operate a geographical information system and components thereof; and
> Design and produce cartographic products and maps with the use of a Geographical Information System.

Data Transfer:
> Demonstrate an understanding of digital data transfer.

Data Manipulation:
> Identify and select the appropriate map projection and carry out conversions (between map projections) for a specific project;
> Select a map projection and transform data between projections or ellipsoids;
> Demonstrate a basic understanding of vector transformation principles;
> Select a map projection for cartographic design and production; and
> Aggregate and integrate vector geo-information data.

Data Collection & Capture:
> Assess fitness for use of spatial data;
> Demonstrate knowledge of capture methods for primary spatial data; and
> Demonstrate knowledge of sources for spatial data.

Basic Remote sensing:
> Apply basic photogrammetric compilation principles for map production;
> Geo-referencing of image/Remote sensing data according to specifications; and
> Prepare a satellite imagery.

EXIT LEVEL OUTCOMES

The Exit Level Outcomes indicate a planned combination of Specific Outcomes and Critical-Cross Outcomes in terms of competent and applied performance capturing the Core, Fundamental and Elective Unit Standards with Associated Assessment Criteria. These at least indicate explicit exit points should a

learner fail to complete the qualification.

On achieving this qualification a learner will be able to:

1. Undertake work in the field of geo-informatics or geographical graphical information science in any working environment by collecting, presenting and managing spatial data in differing forms.
2. Relevant spatial data are imported into Geographic Information System (GIS).
3. Spatial data is managed under supervision by applying suitable back-up, archiving and storage procedures in a secured environment.
4. Use a wide variety of instruments, techniques, workstations, computer systems and software to collect and process spatial information.
5. Evaluate raw and processed data and confirm acceptance of Geo-informatics results.
6. Display an understanding of spatial awareness required in support of the practical outcomes in the form of geographical spatial information, attribute data and meta data.
7. Capture attribute data to further describe geographical features according to user requirements.
8. Demonstrate an understanding of the different statutes and related policies governing the GIS field as related to professional ethics, values and safety.

Generic exit level outcomes:

Work effectively within a team/group or individually under supervision while continuously monitoring and adapting own performance.

ASSOCIATED ASSESSMENT CRITERIA

Assessment criteria associated with exit level outcomes:

1. Different spatial data sources are identified and collected.
2. Spatial data are manipulated and presented in specified formats in accordance with the task requirements, for example, plans, maps, images, charts, graphs.
3. Spatial analysis is performed to present derived spatial statistical results in specified formats.
4. Basic survey and/or remote sensing techniques are applied for collecting spatial information by using instruments and techniques such as elementary global positioning systems and/or photogrammetary.
5. Computer systems and software are used on the GIS workstations to process spatial information.
6. Raw and processed data are evaluated according to fitness for purpose to comply with intended results.
7.
> The basic concepts and principles in the in GISc are explained and described in terms of data structures and geographical features.
> Task specific meta data is captured in compliance with the national standards.
8. Relevant sections relating to professional ethics, values and safety contained in the GIS statutes and other policies regulating the GIS environment are described and explained.

Generic assessment criteria:

1. Identify GIS related problems and solutions that address own life situations and communicate the results to the GIS community and the world at large using Mathematics and communication skills.
2. GIS related problems are identified and solutions are formulated and knowledge of Geographic Information System is used in such a way as to minimize reoccurrence or inefficiencies in this respect.
3. Problems related to his/her own life situations are identified and solved in which responses show that responsible decisions using critical and creative thinking have been made.
4. Visual Mathematics and language skills in the modes of oral and written presentations are used to communicate effectively with the GISc community and the world at large.
5. An ability to work individually or within a team/group under supervision is demonstrated.
6. An ability to monitor and adapt one's performance is demonstrated.

Integrated Assessment:

Integrated assessment provides learners with an opportunity to display an ability to integrate practical performance, actions, concepts and theory across unit standards to achieve competence in relation to the purpose of this qualification. Learners will therefore be expected to demonstrate competence that integrates the assessment of all specific outcomes before qualifying for this qualification, as well as give evidence that they have attained embedded knowledge and specific skills contained in specific outcomes for each relevant unit standard.

Assessment shall:

> Team work.
> Self-organisation and self-management.
> Communication.
> Use of scienceand technology.

Apply health and safety to a work area:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.

Understand fundamentals of electricity:
> Informationevaluation.
> Team work.
> Self-organisation and self-management.
> Communication.
> Use of scienceand technology.

Demonstrate an understanding of the fundamental elements of railway signalling:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Identify, route, harness and terminate electrical conductors used in railway signalling:
> Informationevaluation.
> Self-organisation and self-management.
> Inter-relatedness of systems.
> Learner and societal development

Assemble an apparatus case:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Assemble an electrical points machine:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Assemble components of a railway signalling interlocking system:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.

the competence described both in individual unit standards as well as the integrated competence described in the qualification.
> Anyone wishing to become an assessor or provider of learning must provide an affordable assessment / learning service.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

For an applicant to register as an assessor, the applicant needs:

> A minimum of 2 (two) years' relevant occupational experience at NQF level 5.
> Declared competent in all the outcomes of the National Assessor Unit Standards as stipulated by SAQA.
> Detailed documentary proof of educational qualification, practical training undergone, experience gained by the applicant must be provided (Portfolio of evidence).

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	11725 Interpret photographic detail from aerial photography for annotation purposes	Level 4	4	Registered
Core	116819 Apply basic Geographic Information System (GIS) vector software functions	Level 4	2	Draft - Prep for P Comment
Core	116825 Design and produce hard copy geo-information output under supervision	Level 4	7	Draft - Prep for P Comment
Core	116835 Aggregate and integrate vector geo-information data	Level 4	7	Draft - Prep for P Comment
Core	116869 Demonstrate an understanding of the basic principles of geographical features	Level 4	3	Draft - Prep for P Comment
Core	116901 Apply basic Geo-Information System (GIS) raster software functions	Level 4	4	Draft - Prep for P Comment
Core	116828 Demonstrate a basic understanding of geographical space and spatial relationships	Level 5	12	Draft - Prep for P Comment
Core	116831 Demonstrate an understanding of the capabilities of Geo-Information Systems	Level 5	7	Draft - Prep for P Comment
Core	116833 Use geo-information output products	Level 5	10	Draft - Prep for P Comment
Core	116874 Demonstrate basic understanding of GIS vector data structures for data acquisition	Level 5	3	Draft - Prep for P Comment
Core	11821 Design a cartographic product according to cartographical specifications and design standards	Level 6	8	Registered
Elective	116826 Comply with the geoscience code of ethics	Level 3	3	Draft - Prep for P Comment
Elective	14926 Describe information systems departments in business organisations	Level 4	3	Registered
Elective	116817 Geo-reference image / remote sense data according to specifications	Level 4	5	Draft - Prep for P Comment
Elective	116824 Demonstrate knowledge of sources for spatial data	Level 4	1	Draft - Prep for P Comment
Elective	116829 Demonstrate knowledge of capturing methods for primary spatial data	Level 4	8	Draft - Prep for P Comment
Elective	10043 Develop, implement and manage a project / activity plan	Level 5	5	Registered
Elective	14274 Apply basic photogrammetric compilation principles for map production	Level 5	6	Registered
Elective	14275 Operate a geographical information system and components thereof	Level 5	6	Registered
Elective	14276 Design and produce cartographic products and maps with use of a geographical information system	Level 5	8	Registered
Elective	14277 Select a map projection for cartographic design and production	Level 5	4	Registered
Elective	116821 Prepare a satellite imagery	Level 5	10	Draft - Prep for P Comment
Elective	116822 Show understanding of vector transformation principles	Level 5	2	Draft - Prep for P Comment
Elective	116823 Disseminate spatial data	Level 5	2	Draft - Prep for P Comment
Elective	116830 Perform spatial statistical analysis	Level 5	2	Draft - Prep for P Comment

Elective	116832	Manage a work process	Level 5	3	Draft - Prep for P Comment
Elective	116834	Perform spatial analysis under supervision	Level 5	4	Draft - Prep for P Comment
Elective	116864	Assess fitness for use of spatial data	Level 5	13	Draft - Prep for P Comment
Elective	11820	Select a map projection and transform data between projections or ellipsoids	Level 6	3	Registered
Elective	116836	Identify and select the appropriate map projection and carry out conversions between map projections for a specific project	Level 6	12	Draft - Prep for P Comment
Fundamental	9533	Use communication skills to handle and resolve conflict in the workplace	Level 3	3	Registered
Fundamental	7465	Collect and use data to establish complex statistical and probability models and solve related problems	Level 4	5	Registered
Fundamental	7468	Use mathematics to investigate and monitor the financial aspects of personal, business, national and international issues	Level 4	2	Registered
Fundamental	8979	Use language and communication in occupational learning programmes	Level 4	5	Registered
Fundamental	12417	Measure, estimate & calculate physical quantities & explore, critique & prove geometrical relationships in 2 and 3 dimensional space in the life and workplace of adult with increasing responsibilities	Level 4	4	Reregistered
Fundamental	14920	Participate in groups and/or teams to recommend solutions to problems	Level 4	3	Registered
Fundamental	14934	Demonstrate an understanding of hardware components for personal computers or handheld computers	Level 4	7	Registered
Fundamental	15233	Harness diversity and build on strengths of a diverse working environment	Level 5	3	Registered

learner fail to complete the qualification.

On achieving this qualification a learner will be able to:

1. Undertake work in the field of geo-informatics or geographical graphical information science in any working environment by collecting, presenting and managing spatial data in differing forms.
2. Relevant spatial data are imported into Geographic Information System (GIS).
3. Spatial data is managed under supervision by applying suitable back-up, archiving and storage procedures in a secured environment.
4. Use a wide variety of instruments, techniques, workstations, computer systems and software to collect and process spatial information.
5. Evaluate raw and processed data and confirm acceptance of Geo-informatics results.
6. Display an understanding of spatial awareness required in support of the practical outcomes in the form of geographical spatial information, attribute data and meta data.
7. Capture attribute data to further describe geographical features according to user requirements.
8. Demonstrate an understanding of the different statutes and related policies governing the GIS field as related to professional ethics, values and safety.

Generic exit level outcomes:

Work effectively within a team/group or individually under supervision while continuously monitoring and adapting own performance.

ASSOCIATED ASSESSMENT CRITERIA

Assessment criteria associated with exit level outcomes:

1. Different spatial data sources are identified and collected.
2. Spatial data are manipulated and presented in specified formats in accordance with the task requirements, for example, plans, maps, images, charts, graphs.
3. Spatial analysis is performed to present derived spatial statistical results in specified formats.
4. Basic survey and/or remote sensing techniques are applied for collecting spatial information by using instruments and techniques such as elementary global positioning systems and/or photogrammetary.
5. Computer systems and software are used on the GIS workstations to process spatial information.
6. Raw and processed data are evaluated according to fitness for purpose to comply with intended results.
7.
> The basic concepts and principles in the in GISc are explained and described in terms of data structures and geographical features.
> Task specific meta data is captured in compliance with the national standards.
8. Relevant sections relating to professional ethics, values and safety contained in the GIS statutes and other policies regulating the GIS environment are described and explained.

Generic assessment criteria:

1. Identify GIS related problems and solutions that address own life situations and communicate the results to the GIS community and the world at large using Mathematics and communication skills.
2. GIS related problems are identified and solutions are formulated and knowledge of Geographic Information System is used in such a way as to minimize reoccurrence or inefficiencies in this respect.
3. Problems related to his/her own life situations are identified and solved in which responses show that responsible decisions using critical and creative thinking have been made.
4. Visual Mathematics and language skills in the modes of oral and written presentations are used to communicate effectively with the GISc community and the world at large.
5. An ability to work individually or within a team/group under supervision is demonstrated.
6. An ability to monitor and adapt one's performance is demonstrated.

Integrated Assessment:

Integrated assessment provides learners with an opportunity to display an ability to integrate practical performance, actions, concepts and theory across unit standards to achieve competence in relation to the purpose of this qualification. Learners will therefore be expected to demonstrate competence that integrates the assessment of all specific outcomes before qualifying for this qualification, as well as give evidence that they have attained embedded knowledge and specific skills contained in specific outcomes for each relevant unit standard.

Assessment shall:

> Measure the quality of the observed practical performance as well as the theory and underpinning knowledge behind it.
> Use methods that are varied to allow the learner to display thinking and decision making in the demonstration of practical performance.
> Maintain a balance between practical performance and theoretical assessment methods to ensure each is measured in accordance with the level of the qualification.
> The relationship between practical and theoretical is not fixed but varies according to the type and level of qualification.

Summative assessment:

Summative assessment is carried out at the end of the learning period to confirm that the learner has demonstrated the required competencies against a particular unit standard. A detailed portfolio of evidence should be provided in this instance to prove the practical, applied and foundational competencies of the learner.

Formative assessment:

The assessment criteria for formative assessment are describes in the various unit standards. This type of assessment will take place during the process of learning and assessors should be fair and consistent in their approach of assessment and therefore use a range of assessment tools that support each other to assess competencies. These include:
> Projects.
> Structured group discussions.
> Experiential learning.
> Working in teams.
> Portfolio of evidence.
> Oral or written report backs.

INTERNATIONAL COMPARABILITY

Within the Geo-informatics field the concept of qualifications based on unit standards is not unique to South Africa. A learner having gained this Qualification will be able to register with the South African Council for Professional and Technical Surveyors (PLATO) in terms of Act 40 of 1984 and through this body's reciprocal agreements with other similar bodies gain international recognition.

In terms of international comparisons, none truly exists as this is a new discipline. Those available are at a higher level, and at this level we have extracted relevant aspects. This qualification has been referenced specifically to the international UNIGIS Certificates (Honours and Masters levels) and URISA (American GIS Society) which is currently still being developed. The New Zealand qualification (NZQA) was also evaluated at the same level and it was found that some aspects were lacking.

ARTICULATION OPTIONS

This qualification has been developed for professional practice across the industry and is intended to provide professional advancement in the industry ensuring the upliftment of the standards in general.

It is applicable to small and large business alike. This qualification builds on other certificates from a range of sub-sectors and will provide articulation both horizontally and vertically in a range of qualifications in both management and service areas of practice such as in the geo-information science field i.e. photogrammetry, cartography, remote sensing, geo-informatics.

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 ETQAs policies and guidelines for assessment and moderation; in terms of agreements reached around assessment and moderation between ETQAs (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

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 1

Comply with the geoscience code of ethics

SAQA US ID	*UNIT STANDARD TITLE*
116826	Comply with the geoscience code of ethics

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 3	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Obtain and describe the geo-science code of conduct.

SPECIFIC OUTCOME 2

Adhere to the code of conduct when dealing with stakeholders within the geoscience discipline.

SPECIFIC OUTCOME 3

Identify and understand the ethical issues of the geoscience discipline.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 2

Aggregate and integrate vector geo-information data

SAQA US ID	*UNIT STANDARD TITLE*
116835	Aggregate and integrate vector geo-information data

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 4	7

Specific Outcomes:

SPECIFIC OUTCOME 1

Combine two or more existing data sets having different characteristics.

SPECIFIC OUTCOME 2

Conflate two or more existing data sets having the same characteristics.

SPECIFIC OUTCOME 3

Aggregate lower level objects into higher level objects.

SPECIFIC OUTCOME 4

Demonstrate a basic understanding of projections, co-ordinate systems, datums and scale.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 3

Apply basic Geo-Information System (GIS) raster software functions

SAQA US ID	*UNIT STANDARD TITLE*
116901	Apply basic Geo-Information System (GIS) raster software functions

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 4	4

Specific Outcomes:

SPECIFIC OUTCOME 1

Launch an application and access raster geo-information.

SPECIFIC OUTCOME 2

Perform basic data manipulation.

SPECIFIC OUTCOME 3

Perform basic queries on raster data.

SPECIFIC OUTCOME 4

Produce basic geo-information outputs.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 4

Apply basic Geographic Information System (GIS) vector software functions

SAQA US ID	*UNIT STANDARD TITLE*
116819	Apply basic Geographic Information System (GIS) vector software functions

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 4	2

Specific Outcomes:

SPECIFIC OUTCOME 1

Launch application and access geo-information.

SPECIFIC OUTCOME 2

Perform basic data manipulation.

SPECIFIC OUTCOME 3

Perform basic queries.

SPECIFIC OUTCOME 4

Produce basic Geo-information output.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 5

Demonstrate an understanding of the basic principles of geographical features

SAQA US ID	*UNIT STANDARD TITLE*
116869	Demonstrate an understanding of the basic principles of geographical features

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 4	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate an understanding of geographical features and layers.

SPECIFIC OUTCOME 2

Demonstrate an understanding of topology.

SPECIFIC OUTCOME 3

Demonstrate an understanding of feature types.

SPECIFIC OUTCOME 4

Demonstrate an understanding of feature attributes.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 6

Demonstrate knowledge of capturing methods for primary spatial data

SAQA US ID	*UNIT STANDARD TITLE*
116829	Demonstrate knowledge of capturing methods for primary spatial data

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 4	8

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate an understanding of the techniques being used in surveying to do primary spatial data ca

SPECIFIC OUTCOME 2

Demonstrate an understanding of the remote sensing techniques used for primary spatial data capture.

SPECIFIC OUTCOME 3

Demonstrate an understanding of the techniques used in census and sampling for primary spatial data

SPECIFIC OUTCOME 4

Demonstrate an understanding of the need for and importance of metadata.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 7

Demonstrate knowledge of sources for spatial data

SAQA US ID	*UNIT STANDARD TITLE*
116824	Demonstrate knowledge of sources for spatial data

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 4	1

Specific Outcomes:

SPECIFIC OUTCOME 1

Identify the different sources for the core data sets as defined by South Africa's Committee for Spa

SPECIFIC OUTCOME 2

Identify the different sources for other vector data sets.

SPECIFIC OUTCOME 3

Identify the different sources for other raster data sets.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 8

Design and produce hard copy geo-information output under supervision

SAQA US ID	*UNIT STANDARD TITLE*
116825	Design and produce hard copy geo-information output under supervision

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 4	7

Specific Outcomes:

SPECIFIC OUTCOME 1

Collate specified input data from various sources and formats.

SPECIFIC OUTCOME 2

Select layer characteristics and sequence as specified.

SPECIFIC OUTCOME 3

Place map furniture as specified.

SPECIFIC OUTCOME 4

Publish hard copy output according to specifications.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 9

Geo-reference image / remote sense data according to specifications

SAQA US ID	*UNIT STANDARD TITLE*
116817	Geo-reference image / remote sense data according to specifications

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-4-SGB GISc	Regular	Level 4	5

Specific Outcomes:

SPECIFIC OUTCOME 1

Prepare data sets for geo-referencing and or ortho-rectification of imagery according to specificati

SPECIFIC OUTCOME 2

Perform geo-referencing and or ortho-rectification of image.

SPECIFIC OUTCOME 3

Evaluate resultant image according to specifications.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 10

Assess fitness for use of spatial data

SAQA US ID	*UNIT STANDARD TITLE*
116864	Assess fitness for use of spatial data

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	13

Specific Outcomes:

SPECIFIC OUTCOME 1

Employ parameters given for doing the assessment.

SPECIFIC OUTCOME 2

Apply quality assurance in assessing the fitness of use of data for a specific project or applicatio

SPECIFIC OUTCOME 3

Demonstrate an ability to check data manually, semi-automatically and fully automatically.

SPECIFIC OUTCOME 4

Log and report on the results, and determine whether or not the data are fit to use.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 11

Demonstrate a basic understanding of geographical space and spatial relationships

SAQA US ID	*UNIT STANDARD TITLE*
116828	Demonstrate a basic understanding of geographical space and spatial relationships

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	12

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate a basic understanding of geography in order to understand the context within which a GIS

SPECIFIC OUTCOME 2

Demonstrate an awareness of geographical location in order to understand the context within which a

SPECIFIC OUTCOME 3

Read maps and aerial photographs in order to understand the context within which a GIS is used.

SPECIFIC OUTCOME 4

Demonstrate an understanding of elementary GIS concepts.

SPECIFIC OUTCOME 5

Demonstrate knowledge of the nature of geographical data.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 12

Demonstrate an understanding of the capabilities of Geo-Information Systems

SAQA US ID	*UNIT STANDARD TITLE*
116831	Demonstrate an understanding of the capabilities of Geo-Information Systems

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	7

Specific Outcomes:

SPECIFIC OUTCOME 1

Describe the potential capabilities of Geo Information Systems.

SPECIFIC OUTCOME 2

Describe the Potential Capabilities of Spatial Analysis.

SPECIFIC OUTCOME 3

Describe the limitations and risks associated with geo- information systems and data.

SPECIFIC OUTCOME 4

Describe the costs associated with the use of geo information spatial analysis and systems.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

Established in terms of Act 58 of 1995

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 13

Demonstrate basic understanding of GIS vector data structures for data acquisition

SAQA US ID	*UNIT STANDARD TITLE*
116874	Demonstrate basic understanding of GIS vector data structures for data acquisition

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Use a prescribed spatial reference framework to set up a data capture environment.

SPECIFIC OUTCOME 2

Use the appropriate feature type for data capture.

SPECIFIC OUTCOME 3

Demonstrate an understanding of the basic theory and principles of Spatial data models used in data

SPECIFIC OUTCOME 4

Demonstrate a basic understanding of data base structures for data capturing.

SPECIFIC OUTCOME 5

Explore geo-data sources.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 14

Disseminate spatial data

SAQA US ID	*UNIT STANDARD TITLE*
116823	Disseminate spatial data

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	2

Specific Outcomes:

SPECIFIC OUTCOME 1

Determine nature of input data.

SPECIFIC OUTCOME 2

Determine characteristics and format of output data.

SPECIFIC OUTCOME 3

Assess converted data for correctness.

SPECIFIC OUTCOME 4

Identify most appropriate media for the task required.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 15

Manage a work process

SAQA US ID	*UNIT STANDARD TITLE*
116832	Manage a work process

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan the workflow process.

SPECIFIC OUTCOME 2

List task-specific milestones and draw up daily work plans.

SPECIFIC OUTCOME 3

Measure and evaluate the workflow progress.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 16

Perform spatial analysis under supervision

SAQA US ID	*UNIT STANDARD TITLE*
116834	Perform spatial analysis under supervision

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	4

Specific Outcomes:

SPECIFIC OUTCOME 1

Perform attribute analysis.

SPECIFIC OUTCOME 2

Perform integrated processing of geometry and attributes.

SPECIFIC OUTCOME 3

Perform connectivity operations.

SPECIFIC OUTCOME 4

Generate digital terrain models.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 17

Perform spatial statistical analysis

SAQA US ID	*UNIT STANDARD TITLE*
116830	Perform spatial statistical analysis

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	2

Specific Outcomes:

SPECIFIC OUTCOME 1

Display a knowledge and understanding of spatial sampling.

SPECIFIC OUTCOME 2

Display a knowledge and understanding of correlation analysis.

SPECIFIC OUTCOME 3

Display a knowledge and understanding of linear spatial analysis techniques.

SPECIFIC OUTCOME 4

Display a knowledge and understanding of non-linear spatial analysis techniques.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 18

Prepare a satellite imagery

SAQA US ID	*UNIT STANDARD TITLE*
116821	Prepare a satellite imagery

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	10

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate knowledge of data structures used for satellite imagery.

SPECIFIC OUTCOME 2

Understand corrections performed on data prior to delivery of the image to the end user.

SPECIFIC OUTCOME 3

Understand characteristics of sensors.

SPECIFIC OUTCOME 4

Understand the differences between sensor types.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 19

Show understanding of vector transformation principles

SAQA US ID	*UNIT STANDARD TITLE*
116822	Show understanding of vector transformation principles

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	2

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate an understanding of basic transformation principles.

SPECIFIC OUTCOME 2

Apply basic transformation principles.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 20

Use geo-information output products

SAQA US ID	*UNIT STANDARD TITLE*
116833	Use geo-information output products

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 5	10

Specific Outcomes:

SPECIFIC OUTCOME 1

Define GIS concepts and terminology.

SPECIFIC OUTCOME 2

Describe the geo-information process from initial capture to final products.

SPECIFIC OUTCOME 3

Describe the capabilities and spatial operations of geo-information systems.

SPECIFIC OUTCOME 4

Use geo-information reports.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 21

Identify and select the appropriate map projection and carry out conversions between map projections for a specific project

SAQA US ID	*UNIT STANDARD TITLE*
116836	Identify and select the appropriate map projection and carry out conversions between map projections for a specific project

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Geographical Information Sciences	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Physical Planning, Design and Management

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-PPD-0-SGB GISc	Regular	Level 6	12

Specific Outcomes:

SPECIFIC OUTCOME 1

Display a knowledge and understanding of map projections.

SPECIFIC OUTCOME 2

Construct a graticule.

No. 1126 **1 October 2004**

Established in terms of Act 58 of 1995

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 NSB 12, Physical Planning and Construction, publishes the following qualifications 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 upon which qualifications are based. 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, Hatfield Forum West, 1067 Arcadia Street, Hatfield.

Comment on the unit standards should reach SAQA at the address ***below and no later than 30 October 2004.*** All correspondence should be marked **Standards Setting – SGB Electrical Engineering and Construction** and addressed to

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

JOE SAMUELS
DIRECTOR: STANDARDS SETTING AND DEVELOPMENT

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

National Certificate: Railway Signalling: Assembly and Wiring of Equipment

SAQA QUAL ID	QUALIFICATION TITLE	
49068	National Certificate: Railway Signalling: Assembly and Wiring of Equipment	
SGB NAME	SGB Electrical Engineering & Construction	
ABET BAND	PROVIDER NAME	
Undefined		
QUALIFICATION CODE	QUAL TYPE	SUBFIELD
PPC-2-National Certificate	National Certificate	Electrical Infrastructure Construction
MINIMUM CREDITS	NQF LEVEL	QUALIFICATION CLASS
169	Level 2	Regular-Unit Stds Based
SAQA DECISION NUMBER	REGISTRATION START DATE	REGISTRATION END DATE

PURPOSE OF THE QUALIFICATION

This qualification will:
> Enable the qualifying learner to safely and effectively assemble and wire railway signalling equipment.
> Prepare the learner to progress through learning in the railway signalling environment to a qualification in the installation and scheduled maintenance of railway signalling equipment at NQF Level 3.

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 would be able to demonstrate occupational skills which 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. Hand skills play a vital role in this qualification.

Qualified learners will also understand:
> The basics of how the business functions and their role in the business, i.e. in railway signalling maintenance and related activities.
> How they are affected by legislation, regulations, agreements and policies related to their particular work environment.

With this understanding, learners will be able to participate in workplace activities.

Rationale for the qualification

This qualification forms the basis for learners who want to follow a career in railway signalling and related fields. Railway signalling 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 signalling equipment be safely and correctly assembled and wired in order to meet standards set in associated railway signal engineering specifications.

The qualification equips the learner with the skills, knowledge and understanding to safely and correctly assemble and wire railway signalling equipment, such as, track circuits, signals and points to the required standards.

Learners credited with this qualification and who apply the acquired knowledge and skills can help address the critical shortage of qualified personnel in the railway signalling industry.

For the new learner, this qualification recognises the applied competence needed by a productive person in a structured workplace and forms the basis for further development.

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

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

This qualification assumes that learners have a General Education and Training Certificate at NQF Level 1 including mathematics, or equivalent.

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 and support and guidance should be provided. 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.

QUALIFICATION RULES

Level, credits and learning components assigned to this qualification

The fundamental, core and elective learning components that make up this qualification are listed below.

Fundamental
> 4 credits at Level 1
> 53 credits at Level 2
> 57credits

Core
> 5 credits at Level 1
> 57 credits at Level 2
> 38 credits at Level 3
> 100 credits

Elective
> 41 credits at Level 2
> 19 credits at level 3
> 60 credits(Select a minimum of 12 credits)

The total credits for this qualification are 217, of which a minimum of 169 credits must be done to achieve this qualification.

Motivation for the number of credits assigned.

> Fundamental Credits.

SAQA stipulates that a minimum of 20 compulsory credits should be allocated to Communication Studies and Languages and 16 credits are allocated to Mathematics and Mathematical Literacy. 57 compulsory credits have been allocated to these fundamental competencies.

> Core.

SAQA stipulates that a minimum of 72 credits should be required at or above the level at which the certificate is awarded.

100 compulsory credits have been allocated to the core unit standards to cover the field of assembly and wiring of railway signalling equipment sufficiently.
> Electives.

A minimum of12 credits should be selected from the 60 listed elective credits. These credits have been grouped to give a learner a meaningful understanding of the section and to allow for progression to the next level of learning on the same railway signalling equipment.

EXIT LEVEL OUTCOMES

1. Demonstrate the knowledge and ability to work effectively at a worksite when performing the assembly and wiring of railway signalling equipment.

2. Demonstrate the knowledge and ability to assemble and wire railway signalling equipment to specifications.

3. Demonstrate the knowledge and ability to apply quality checks on the assembled and wired railway signalling equipment.

4. Demonstrate an understanding of options for further learning in this or a related field of learning, as well as the preparation requirements for such learning.

5. Understand and apply health and safety regulations to a work area.

The table below shows the spread of critical cross-field outcomes across the core unit standards and qualification at level 2.
Critical cross-field outcomes supportedby the unit standards:

Core

Perform basic first aid:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.

Perform basic fire fighting:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.

Select, use and care for electrical measuring instruments:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.

Select, use and care for power tools:
> Problem-solving.
> Self-organisation and self-management.
> Communication.

Identify, inspect, use, maintain and care for engineering hand tools:
> Problem-solving.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.

Apply soldering techniques:
> Problem-solving.
> Team work.
> Communication.

Apply and maintain safety in an electrical environment:
> Problem-solving.

> Team work.
> Self-organisation and self-management.
> Communication.
> Use of scienceand technology.

Apply health and safety to a work area:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.

Understand fundamentals of electricity:
> Informationevaluation.
> Team work.
> Self-organisation and self-management.
> Communication.
> Use of scienceand technology.

Demonstrate an understanding of the fundamental elements of railway signalling:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Identify, route, harness and terminate electrical conductors used in railway signalling:
> Informationevaluation.
> Self-organisation and self-management.
> Inter-relatedness of systems.
> Learner and societal development

Assemble an apparatus case:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Assemble an electrical points machine:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Assemble components of a railway signalling interlocking system:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.

> Use of scienceand technology.
> Learner and societal development

Assemble an electrical railway signal:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Assemble a railway track circuit:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Wire an apparatus case:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Wire an electrical points machine:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Wire components of an electrical railway signalling interlocking system:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Wire an electrical railway signal:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Wire a railway track circuit:

> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Electives

Assemble components of an axle counter:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Assemble components of a flashlight and boom level crossing warning system:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Assemble railway signalling power supply equipment:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Assemble components of a remote control system:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Wire components of an axle counter:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Wire components of a flashlight and boom level crossing warning system:
> Informationevaluation.

> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Wire railway signalling power supply equipment:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Wire components of a remote control system:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.
> Learner and societal development

Carry out basic electric arc welding in an electrical environment:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.

Carry out basic gas welding, brazing and cutting in an electrical environment:
> Informationevaluation.
> Problem-solving.
> Team work.
> Self-organisation and self-management.
> Communication.

Demonstrate an understanding of the uses and safety aspects associated with flammable energy sources:
> Problem-solving.
> Self-organisation and self-management.
> Communication.
> Inter-relatedness of systems.
> Use of scienceand technology.

ASSOCIATED ASSESSMENT CRITERIA

1.
> The planning and procurement of railway signalling equipment is performed according to procurement guidelines.
> The contents of assembly and wiring plans and relevant documents is interpreted in such a manner as to enable the procurement of the correct resources.
> Problems regarding the correctness, quantity and quality of tools, material, parts and components required for the assembly and wiring of railway signalling equipment are solved effectively according to worksite procedures.
> Effective communication skills related to the work are demonstrated by communicating clearly and concisely and by adhering to company-specific communication protocols.
> Learners would organise and manage themselves effectively by executing the task responsibly and safely.
> The work site is safely and correctly restored as per company-specific procedures, policies and instructions and the non-compliance of these policies, procedures and instructions are clearly understood.

2.
> The assembly and wiring of railway signalling equipment is performed according to assembly and wiring specifications.
> Problems regarding the suitability and functionality of equipment and tools are solved within the parameters of the worksite procedures and suitability to the task.
> Learners would organise and manage themselves effectively by having the knowledge to utilise the resources and to execute the task responsibly and safely, by adhering to safety and company-specific policies and procedures.
> Effective communication with relevant role-players related to the assembly and wiring of railway signalling equipment is demonstrated by communicating clearly and concisely, and by knowing how to apply and adhere to company-specific communication protocols.
> Working effectively in teams is understood and demonstrated by displaying participative interaction when assembling and wiring railway signalling equipment.
> Safety in the workplace as well as in the whole environment is understood and demonstrated by applying safe working practices according to safe working procedures while performing the tasks.
> The role of the relevant equipment being assembled and wired is understood and explained in relation to the railway signalling system.
> The role of the individual in the work situation and organisation is demonstrated by:
> Organising and managing themselves and their activities related to assembly and wiring of railway signalling equipment, by understanding and applying organisational procedures and concepts.
> Describing how the organisation functions, by the collection, analysis, organisation and critical evaluation of related information.

3.
> The reasons for performing quality checks on railway signalling equipment are understood, and the quality checks are performed correctly, according to assembly and wiring test procedure.
> Learners would use science and technology by knowing how to use, and demonstrating the use of measuring instruments, test instruments and gauges to comply with specifications.
> Problems with regard to the suitability and functionality of equipment and tools are solved effectively by knowing and applying the methods used to solve problems.
> Learners would organise and manage themselves effectively by having the knowledge to utilise the resources and to execute the task responsibly and safely, by adhering to safety and company-specific policies and procedures.

4.
> Learners would organise and manage themselves and their activities to gather a portfolio of evidence.

> Learners would collect, analyse, organise and critically evaluate information to:
> Analyse qualifications and assess self to determine learning plan requirements.
> Analyse unit standards and assess self to determine readiness for assessment and evidence requirements.

> Clear and concise communication would be demonstrated when presenting a:
> Learning plan
> Portfolio of evidence for assessment

> An understanding of the world as a set of related systems is demonstrated by explaining the relationship between stakeholders within the learning and assessment system.
> The learner can demonstrate an understanding of how the knowledge and skills obtained in this qualification can contribute to the creation of a small business.

5.
> Health and safety regulations are understood and applied by:
> Identifying potential hazards in the work area correctly
> Effectively limiting damage to persons or property in case of an emergency
> Correctly following procedures that apply to illness or injury in the work area

> Communication with relevant role players is clear and concise and is demonstrated effectively in the case of:
> An incident/accident
> A fire
> An injury or sickness

> Learners would organise and manage themselves by understanding and correctly:

> Following procedures that apply to illness or injury in the work area.
> Demonstrating the procedures for reporting and recording of potential hazards.
> Identifying and using protective clothing.

> Problems with regard to the following would be solved effectively by:
> Identifying the potential hazards in the work area.
> Limiting damage to persons or property in case of an emergency.
> Limiting exposure to, and correctly disposing of hazardous substances.

Integrated assessment

Assessors and moderators should develop and conduct their own integrated assessment by using a range of formative and summative assessment methods.

Unit standards in the qualification must be used to assess specific outcomes, critical cross-field outcomes and essential embedded knowledge.

During integrated assessments the assessor should use formative and summative assessment methods and should assess applied competence.

The applied competence (practical, foundational and reflexive competencies) of this qualification will be achieved if a learner is able to achieve all the exit level outcomes of this qualification.

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.

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

INTERNATIONAL COMPARABILITY

This qualification was compared with the Transport and Distribution Qualifications (Rail Infrastructure) on the Australian National Training Information Service.

Units of competencies related to railway signalling as generated in Australia were obtained from the National Training Information Service (Web Site: www.ntis.gov.au), Certificate (levels i - iv) in Transport and Distribution (Rail Infrastructure).

After scrutinising these, it was evident that the format and structure utilised within the Transport and Distribution Industry Specific Units (TDT02) - Equipment Checking and Maintenance, was different to those prescribed by SAQA. The technical content in the units of competencies were not specific and covered a broad spectrum of equipment and tasks. This resulted in broad assessment criteria.

It was also found that although the Australian Qualifications Framework comprises thirteen national qualifications, the first five qualifications in the vocational education and training sector compare favourably with the FET levels within the NQF.

The SGG/SGA could not find any standards within the discipline of Railway Signalling in other African countries where Railway Signalling is utilised
Various Railway companies in Africa have approached Transnet to assist in the training of their signalling maintenance officials. Once this is effected, the unit standards generated in South Africa will be utilised for such training.

The core and elective unit standards that form part of this qualification have been developed to ensure alignment with the engineering practices embraced by the Institution of Railway Signal Engineers (IRSE).

The IRSE is an international professional institution associated with railway signalling and allied professions. The institution aims to advance for public benefit, the science and practice of signalling engineering within the industry and to maintain high standards of knowledge of the profession. The IRSE recognises and encourages Continuing Professional Development (CPD) to keep abreast of new developments in science and technology within the railway signalling and associated disciplines.

Efforts to obtain British National Vocational Qualifications (NVQs) related railway signalling were unsuccessful. The NVQs are not accessible and could not be used for benchmarking.
During the development of the unit standards cognisance was taken of the implementation of a National

Railway Safety Regulator. The National Railway Safety Regulator promotes and controls safe rail operations and recognises that this is fundamental to the safety of all persons and the environment. The unit standards in railway signalling were aligned to these ideals.

ARTICULATION OPTIONS

This is a qualification in a series of railway signalling qualifications from NQF Level 2 to 5. This series of qualifications articulates directly to learning programs and qualifications in railway signalling. It also opens the possibility for further learning in the sub-fields of Electrical Infrastructure Construction, Engineering and Related Design and Manufacturing and Assembly. As one of the focus areas within the Railway Signalling domain is on safety, the embedded safety consciousness within the working environment will be favourable to any employer.

MODERATION OPTIONS

1. An individual wishing to apply for assessment against this qualification, may apply to an assessment agency, assessor or provider institution that has been accredited by the relevant ETQA.

2. Any person assessing a learner or moderating the assessment of a learner against this qualification must be registered as an assessor with the relevant ETQA.

3. Any institution offering learning that will enable achievement of this unit standard must be registered and accredited as a provider with the relevant ETQA as prescribed.

4. Moderation of assessment will be done by the relevant ETQA as prescribed.

5. 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 in Item 6.

6. 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.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

1. Assessors need experience in the following areas:
> Interpersonal skills.
> Subject matter.
> Assessment.

2. The assessor needs to be competent in planning, conducting and providing feedback on assessment of learning outcomes and in the design and development of assessments as described in the Unit Standards. The assessor must also be able to plan, conduct and provide feedback on the assessment of the learning outcomes at NQF Level 2. Subject matter experience must be well developed within the field of railway signalling, quality assurance tests and practices. The assessor must comply with the criteria set by the relevant ETQA.

3. The subject matter experience of the assessor can be established by recognition of prior learning.

4. Assessors need to be registered with the relevant Education and Training Quality Assurance Body.

5. Anyone assessing a learner against a unit standard must be certified as competent against that specific unit standard and registered as an assessor to assess such unit standard.

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	9839 Apply and maintain safety in an electrical environment	Level 1	5	Reregistered
Core	9964 Apply health and safety to a work area	Level 2	3	Reregistered
Core	10237 Select, use and care for electrical measuring instruments	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	12483 Perform basic first aid	Level 2	4	Reregistered
Core	12484 Perform basic fire fighting	Level 2	4	Reregistered
Core	113863 Apply soldering techniques	Level 2	2	Registered
Core	113877 Understand fundamentals of electricity	Level 2	8	Registered
Core	116839 Assemble a railway track circuit	Level 2	2	Draft - Prep for P Comment
Core	116841 Assemble an apparatus case	Level 2	3	Draft - Prep for P Comment
Core	116842 Assemble an electrical railway signal	Level 2	5	Draft - Prep for P Comment
Core	116853 Identify, route, harness and terminate electrical conductors used in railway signalling	Level 2	6	Draft - Prep for P Comment
Core	116844 Assemble an electrical points machine	Level 3	6	Draft - Prep for P Comment
Core	116847 Assemble components of a railway signalling interlocking system	Level 3	6	Draft - Prep for P Comment
Core	116851 Wire an electrical points machine	Level 3	3	Draft - Prep for P Comment
Core	116855 Wire an apparatus case	Level 3	3	Draft - Prep for P Comment
Core	116856 Wire a railway track circuit	Level 3	3	Draft - Prep for P Comment
Core	116858 Demonstrate an understanding of the fundamental elements of railway signalling	Level 3	8	Draft - Prep for P Comment
Core	116860 Wire an electrical railway signal	Level 3	4	Draft - Prep for P Comment
Core	116863 Wire components of an electrical railway signalling interlocking system	Level 3	5	Draft - Prep for P Comment
Elective	7547 Operate a personal computer system	Level 2	6	Reregistered
Elective	7568 Demonstrate knowledge of and produce word processing documents using basic functions	Level 2	3	Reregistered
Elective	7572 Demonstrate knowledge of and produce computer spreadsheets using basic functions	Level 2	3	Reregistered
Elective	113860 Demonstrate an understanding of the uses and safety aspect associated with flammable energy sources	Level 2	3	Registered
Elective	114616 Carry out basic gas welding, brazing and cutting in an electrical environment	Level 2	8	Registered
Elective	114669 Carry out basic electric arc welding in an electrical environment	Level 2	8	Registered
Elective	116891 Assemble components of an axle counter	Level 2	2	Draft - Prep for P Comment
Elective	116894 Assemble components of a remote control system	Level 2	3	Draft - Prep for P Comment
Elective	116897 Wire components of a flashlight and boom level crossing warning system	Level 2	3	Draft - Prep for P Comment
Elective	116898 Assemble components of a flashlight and boom level crossing warning system	Level 2	3	Draft - Prep for P Comment
Elective	116892 Wire railway signalling power supply equipment	Level 3	6	Draft - Prep for P Comment
Elective	116893 Wire components of a remote control system	Level 3	4	Draft - Prep for P Comment
Elective	116895 Assemble railway signalling power supply equipment	Level 3	6	Draft - Prep for P Comment
Elective	116896 Wire components of a remote control system	Level 3	3	Draft - Prep for P Comment
Fundamental	13169 Describe and discuss issues relating to HIV-AIDS, TB and sexually transmitted illnesses and their impact on the workplace	Level 1	4	Registered

Fundamental	7469 Use mathematics to investigate and monitor the financial aspects of personal and community life	Level 2	2	Registered
Fundamental	7480 Demonstrate understanding of rational and irrational numbers and number systems	Level 2	3	Registered
Fundamental	8962 Maintain and adapt oral communication	Level 2	5	Registered
Fundamental	8963 Access and use information from texts	Level 2	5	Registered
Fundamental	8964 Write for a defined context	Level 2	5	Registered
Fundamental	8967 Use language and communication in occupational learning programmes	Level 2	5	Registered
Fundamental	9007 Work with a range of patterns and functions and solve problems	Level 2	2	Registered
Fundamental	9008 Identify, describe, compare, classify, explore shape and motion in 2-and 3-dimensional shapes in different contexts	Level 2	3	Registered
Fundamental	9009 Apply basic knowledge of statistics and probability to influence the use of data and procedures in order to investigate life related problems	Level 2	4	Registered
Fundamental	12444 Measure, estimate and calculate physical quantities and explore, describe and represent geometrical relationships in 2-dimensions in different life or workplace contexts	Level 2	3	Registered
Fundamental	12465 Develop a learning plan and a portfolio for assessment	Level 2	6	Registered
Fundamental	12466 Explain the individual's role within business	Level 2	4	Registered
Fundamental	13217 Collect and use information	Level 2	5	Registered

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

National Certificate: Railway Signalling: Installation and Scheduled Maintenance of Equipment

SAQA QUAL ID	QUALIFICATION TITLE
49066	National Certificate: Railway Signalling: Installation and Scheduled Maintenance of Equipment
SGB NAME	SGB Electrical Engineering & Construction

ABET BAND	PROVIDER NAME	
Undefined		
QUALIFICATION CODE	QUAL TYPE	SUBFIELD
PPC-3-National Certificate	National Certificate	Electrical Infrastructure Construction
MINIMUM CREDITS	NQF LEVEL	QUALIFICATION CLASS
136	Level 3	Regular-Unit Stds Based
SAQA DECISION NUMBER	REGISTRATION START DATE	REGISTRATION END DATE

PURPOSE OF THE QUALIFICATION

This qualification will:
> Enable the qualifying learner to safely and effectively install railway signalling equipment and perform scheduled maintenance tasks
> Prepare the learner to progress through learning in the railway signalling environment to a qualification in the fault-finding and repair of railway signalling equipment at NQF Level 4

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 acquire occupational skills, which will enable them to engage in other technically related activities and the creation of small businesses, through the critical cross-field component of the qualification.

Rationale for the qualification
Railway signalling forms a critical part of the infrastructure of a rail transport system and contributes to the safe and efficient control of rail traffic. In a railway environment, emphasis is placed on safety, reliability and availability of operating systems. It thus follows that for railway signalling systems and equipment to align to these criteria, it is vitally important that signalling equipment be installed safely and correctly to meet standards as depicted in railway signalling engineering specifications. It is equally important that scheduled maintenance be performed timeously as per specifications to enhance and maintain the reliability, availability and safety of train operations.

This qualification equips the learner with the required skills, knowledge and understanding required to effectively perform installation and scheduled maintenance of railway signalling equipment to the required standards.

Learners credited with this qualification and who apply the acquired knowledge and skills can help address the critical shortage of qualified personnel in the railway signalling industry.

For the new learner, this qualification recognises the applied competence needed by a productive person in a structured workplace and forms the basis for further development.

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

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

This qualification assumes that the learner's competencies include but are not limited to the following:
> Knowledge and ability to effectively use engineering hand and power tools.
> Knowledge of electrical wiring techniques and the ability to harness, route and terminate electrical conductors.
> Knowledge and ability to solder electrical conductors and components.
> An understanding of heath and safety in a working environment and the application thereof.
> Knowledge and ability to perform first-aid and fire-fighting
> An understanding of the principles of electricity.
> Knowledge and understanding of railway signalling principles, elements and philosophies.
> Assembly of railway signalling equipment which must include but is not limited to a railway track circuit, an electrical railway signal, an electrical points machine, components of an electrical signalling interlocking system and an apparatus case.
> Electrical wiring of railway signalling equipment which must include but is not limited to a railway track circuit, an electrical railway signal, an electrical points machine, components of an electrical signalling interlocking system and an apparatus case.

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 and support and guidance should be provided. 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.

QUALIFICATION RULES

Level, credits and learning components assigned to this qualification

The fundamental, core and elective learning components that make up this qualification are listed below.

Fundamental
12 credits at Level 2
35 credits at Level 3
Total 47

Core
7 credits at Level 2
34 credits at Level 3
36 credits at Level 4
Total 77

Elective
22 credits at Level 3
3 credits at Level 4
Total 25 (Select a minimum of 12)

The available credits for this qualification are at least 150, of which a minimum of 136 credits must be done to achieve this qualification.

Motivation for the number of credits assigned

Fundamental Credits

SAQA stipulates that a minimum of 20 compulsory credits are allocated to Communication Studies and Languages and 16 credits are allocated to Mathematics and Mathematical Literacy. 47 compulsory credits have been allocated to these fundamental competencies.

Core

SAQA stipulates that a minimum of 72 credits are required at or above the level at which the certificate is awarded. Therefore, 77 compulsory credits have been allocated to the core unit standards to sufficiently cover the field of installation and scheduled maintenance of railway signalling equipment.

Electives

A minimum of 12 credits has to be selected from the 25 listed elective credits. These credits have been meaningfully grouped together to allow for progression to the next level of learning on the same railway signalling equipment and provide an appropriate understanding of the concepts.

EXIT LEVEL OUTCOMES

1. Demonstrate the knowledge and ability to plan and prepare the execution of installation and scheduled maintenance tasks on railway signalling equipment, communicate tasks and responsibilities within the work team and solve potential problems that may arise.

2. Demonstrate the knowledge and ability to safely install railway signalling equipment according to signalling practice and specifications within a team environment, by using effective communication, and the correct application of specific tools, instrumentation and equipment.

3. Demonstrate knowledge and the ability to safely perform scheduled maintenance on railway signalling equipment according to signalling practice and specifications within a team environment, by using effective communication and the correct application and use of specific tools, instrumentation and equipment and adhering to company maintenance policies and safe working procedures.

4. Understand the need for safety and demonstrate the ability to apply safe working before, during and after the execution of the tasks related to the railway signalling equipment being installed or maintained.

5. Understand the need for communication and demonstrate verbal and written communication skills.

Critical cross-field outcomes across the core unit standards and qualification at Level 3.
Critical cross-field outcomes supported by the unit standards

Demonstrate an understanding of the principles of mechanical railway signalling - supports:
> Information evaluation
> Self-organisation and self-management
> Inter-relatedness of systems
> Learner and societal development

Joint electrical railway signalling cables - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Install electrical railway signalling cables - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Apply train working rules as applicable to railway signalling maintenance personnel - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform infrastructure maintenance in the vicinity of or near exposed live high-voltage overhead track equipment - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology

Maintain and repair a bank of batteries as used in railway signalling - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Install components of flashlights and booms - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Install an apparatus case - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Install components of a railway signalling interlocking system - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Install an electrical railway signal - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Install a railway track circuit - supports:
> Information evaluation
> Problem-solving
> Team work

> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Install electrical points - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform routine preventive maintenance on an apparatus case - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform routine preventive maintenance on electrical points - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform routine preventive maintenance on an electrical railway signal - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform routine preventive maintenance on a railway track circuit - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Critical cross-field outcomes across the elective unit standards and qualification at Level 3.
Critical cross-field outcomes supported by the unit standards

Install batteries - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management

> Communication

Install components of an axle counter - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication□
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Install components of a flashlight and boom level crossing warning system - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication□
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Install railway signalling power supply equipment - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication□
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Install components of a remote control system - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication□
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform routine preventive maintenance on an axle counter - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication□
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform routine preventive maintenance on a flashlight and boom level crossing warning system - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication□
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform routine preventive maintenance on power supply equipment - supports:
> Information evaluation

> Problem-solving
> Team work
> Self-organisation and self-management
> Communication□
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

ASSOCIATED ASSESSMENT CRITERIA

1.
> The planning of the task is performed correctly by evaluating and interpreting relevant documentation.
> The correct resources and materials are procured after evaluating and interpreting relevant documentation. This includes but is not limited to required personnel, transport, tools, lifting equipment and lubricating and cleaning materials.
> Problems regarding the correctness, quantity and quality of materials, parts and components as measured against quantities needed and material specifications, to perform the tasks of installation and scheduled maintenance of railway signalling equipment, can be solved effectively.
> Effective communication in the work environment is demonstrated

2.
> The installation of, and quality checks on railway signalling equipment is performed safely and correctly as per railway signalling practices and specifications.
> Problems regarding the suitability and functionality of equipment, instrumentation and tools are solved effectively by demonstrating the knowledge required for identifying sub-standards and by being able to improvise within acceptable signalling practices.
> Learners would organise and manage themselves effectively by utilising the resources and executing the task responsibly and safely.
> Effective communication with relevant role-players related to the installation of railway signalling equipment is demonstrated by communicating clearly and concisely and within the framework of company specific communication protocols.
> The need for working effectively in teams is understood and is demonstrated by displaying participative interaction when installing railway signalling equipment.
> The use and function of the equipment being installed in relation to the railway signalling system is explained correctly in terms of signalling practices and philosophies.

3.
> The scheduled maintenance tasks and quality checks on railway signalling equipment are understood and performed safely and correctly by implementing safe working procedures and adhering to maintenance policies.
> Problems regarding the suitability and functionality of equipment, instrumentation and tools are solved effectively by demonstrating the knowledge required for identifying sub-standards and by being able to improvise within acceptable signalling practices.
> Learners would organise and manage themselves effectively by utilising the resources and executing the task responsibly and safely.
> Effective communication with relevant role-players related to the scheduled maintenance of railway signalling equipment is demonstrated by communicating clearly and concisely and within the framework of company specific communication protocols.
> The need for working effectively in teams is understood and demonstrated by displaying participative interaction whilst performing scheduled maintenance.
> The use and function of the equipment being maintained in relation to the railway signalling system as a whole is explained correctly.
> The ability to identify, prioritise and report the corrective action to take after a defect or substandard has been identified is demonstrated correctly as measured against equipment standards, company maintenance procedures and reporting lines

4.
> Personal and equipment safety are understood and applied while executing the tasks.
> The inter-relatedness of various railway signalling elements and the safety implications of not considering such interrelationships is understood and demonstrated.
> Learners would understand the use of science and technology that is utilised during performance of tasks by using electrical test instruments, measuring instruments and gauges to check compliance with safety specifications.
> Problems with regard to the safety of equipment and tools are understood, identified, and solved effectively by applying judgement of the state of equipment and tools against tool and equipment standards

and implementing company policies related to safety in the workplace.
> Learners would organise and manage themselves by adhering to safety and company-specific policies and procedures.
> Safety in the workplace as well as in the whole environment is understood and demonstrated while performing the tasks.
> The ability to restore the work site and solve any related problems effectively is demonstrated by adherence to company-specific procedures, policies and instructions and the non-compliance of these policies, procedures and instructions are clearly understood.

5.
> Information is clearly presented in a timely manner in the required format and to appropriate parties as stipulated in company specific policies and procedures.
> The relevant communication media and protocol is used correctly while performing tasks.
> Verbal communication is clear and concise.
> Documentation related to the task is fully completed in recognisable writing and as per company specific language policies.

Integrated assessment

Assessors and moderators should develop and conduct their own integrated assessment by using a range of formative and summative assessment methods.

Unit standards in the qualification must be used to assess specific outcomes, critical cross-field outcomes and essential embedded knowledge.

During integrated assessments the assessor should use formative and summative assessment methods and should assess applied competence.

The applied competence (practical, foundational and reflexive competencies) of this qualification will be achieved if a learner is able to achieve all the exit level outcomes of this qualification.

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.

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

INTERNATIONAL COMPARABILITY

This qualification was compared with the Transport and Distribution Qualifications (Rail Infrastructure) on the Australian National Training Information Service.

Units of competencies related to railway signalling as generated in Australia were obtained from the National Training Information Service (Web Site: www.ntis.gov.au), Certificate (levels i - iv) in Transport and Distribution (Rail Infrastructure).

After scrutinising these, it was evident that the format and structure utilised within the Transport and Distribution Industry Specific Units (TDT02) - Equipment Checking and Maintenance, was different to those prescribed by SAQA. The technical content in the units of competencies were not specific and covered a broad spectrum of equipment and tasks. This resulted in broad assessment criteria.

It was also found that although the Australian Qualifications Framework comprises thirteen national qualifications, the first five qualifications in the vocational education and training sector compare favourably with the FET levels within the NQF.

The SGG/SGA could not find any standards within the discipline of Railway Signalling in other African countries where Railway Signalling is utilised.

Various Railway companies in Africa have approached Transnet to assist in the training of their signalling maintenance officials. Once this is effected, the unit standards generated in South Africa will be utilised for such training.

The core and elective unit standards that form part of this qualification have been developed to ensure alignment with the engineering practices embraced by the Institution of Railway Signal Engineers (IRSE).

The IRSE is an international professional institution associated with railway signalling and allied professions. The institution aims to advance for public benefit, the science and practice of signalling engineering within the industry and to maintain high standards of knowledge of the profession. The IRSE recognises and encourages Continuing Professional Development (CPD) to keep abreast of new developments in science and technology within the railway signalling and associated disciplines.

Efforts to obtain British National Vocational Qualifications (NVQs) related railway signalling were unsuccessful. The NVQs are not accessible and could not be used for benchmarking.

During the development of the unit standards cognisance was taken of the implementation of a National Railway Safety Regulator. The National Railway Safety Regulator promotes and controls safe rail operations and recognises that this is fundamental to the safety of all persons and the environment. The unit standards in railway signalling were aligned to these ideals.

ARTICULATION OPTIONS

This is a qualification in a series of qualifications in railway signalling from NQF Level 2 to 5. These qualifications articulate directly to other learning programs and qualifications in railway signalling technology. It also opens the possibility for further learning in the sub-fields of Electrical Infrastructure Construction, Engineering and Related Design and Manufacturing and Assembly. On successful completion of this qualification, the learner will be equipped with skills that will be useful in any electrical construction environment.

MODERATION OPTIONS

1. An individual wishing to apply for assessment against this qualification may apply to an assessment agency, assessor or provider institution that has been accredited by the relevant ETQA.

2. Any person assessing a learner or moderating the assessment of a learner against this qualification must be registered as an assessor with the relevant ETQA.

3. Any institution offering learning that will enable achievement of this unit standard must be registered and accredited as a provider with the relevant ETQA as prescribed.

4. Moderation of assessment will be done by the relevant ETQA as prescribed.

5. 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 ETQAs (including professional bodies); and in terms of the moderation guideline detailed in item 6.

6. 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

CRITERIA FOR THE REGISTRATION OF ASSESSORS

1. Assessors need experience in the following areas:
> Interpersonal skills
> Subject matter
> Assessment

2. The assessor needs to be competent in planning, conducting and providing feedback on assessment of learning outcomes and in the design and development of assessments as described in the Unit Standards. The assessor must also be able to plan, conduct and provide feedback on the assessment of the learning outcomes at NQF Level 3. Subject matter experience must be well developed within the field of railway signalling, quality assurance tests and practices. The assessor must comply with the criteria set by the relevant ETQA.

3. The subject matter experience of the assessor can be established by recognition of prior learning.

4. Assessors need to be registered with the relevant Education and Training Quality Assurance Body.

5. Anyone assessing a learner against a unit standard must be certified as competent against that specific unit standard and registered as an assessor to assess such unit standard

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	116846 Demonstrate an understanding of the principles of mechanical railway signalling	Level 2	6	Draft - Prep for P Comment
Core	116900 Apply electrical high voltage safety instructions when working in the vicinity of or near exposed "live" high-voltage overhead track equipment	Level 2	1	Draft - Prep for P Comment
Core	116843 Perform routine preventive maintenance on a railway track circuit	Level 3	2	Draft - Prep for P Comment
Core	116845 Perform routine preventive maintenance on an electrical railway signal	Level 3	2	Draft - Prep for P Comment
Core	116848 Perform routine preventive maintenance on electrical points	Level 3	3	Draft - Prep for P Comment
Core	116850 Install an electrical railway signal	Level 3	4	Draft - Prep for P Comment
Core	116852 Install an apparatus case	Level 3	3	Draft - Prep for P Comment
Core	116867 Install electrical railway signalling cables	Level 3	5	Draft - Prep for P Comment
Core	116875 Joint electrical railway signalling cables	Level 3	5	Draft - Prep for P Comment
Core	116882 Maintain and repair a bank of batteries as used in railway signalling	Level 3	8	Draft - Prep for P Comment
Core	116887 Perform routine preventive maintenance on an apparatus case	Level 3	2	Draft - Prep for P Comment
Core	116865 Install a railway track circuit	Level 4	6	Draft - Prep for P Comment
Core	116866 Apply train working rules as applicable to railway signalling maintenance personnel	Level 4	13	Draft - Prep for P Comment
Core	116870 Install electrical points	Level 4	11	Draft - Prep for P Comment
Core	116871 Install components of a railway signalling interlocking system	Level 4	6	Draft - Prep for P Comment
Elective	113902 Install batteries	Level 3	4	Registered
Elective	116840 Perform routine preventive maintenance on an axle counter	Level 3	3	Draft - Prep for P Comment
Elective	116849 Perform routine preventive maintenance on railway signalling power supply equipment	Level 3	3	Draft - Prep for P Comment
Elective	116854 Install components of a flashlight and boom level crossing warning system	Level 3	3	Draft - Prep for P Comment
Elective	116857 Install components of a remote control system	Level 3	3	Draft - Prep for P Comment
Elective	116862 Install components of an axle counter	Level 3	3	Draft - Prep for P Comment
Elective	116873 Install railway signalling power supply equipment	Level 3	3	Draft - Prep for P Comment
Elective	116861 Perform routine preventive maintenance on a flashlight and boom level crossing warning system	Level 4	3	Draft - Prep for P Comment
Fundamental	7569 Demonstrate understanding of the basic concepts of databases and the ability to plan and create a simple database	Level 2	3	Reregistered
Fundamental	8420 Operate in a team	Level 2	4	Registered
Fundamental	110001 Communicate effectively in teams	Level 2	5	Registered
Fundamental	7455 Identify and work with simple forms of complex numbers	Level 3	1	Reregistered
Fundamental	8968 Accommodate audience and context needs in oral communication	Level 3	5	Registered
Fundamental	8969 Interpret and use information from texts	Level 3	5	Registered
Fundamental	8970 Write texts for a range of communicative contexts	Level 3	5	Registered
Fundamental	8973 Use language and communication in occupational learning programmes	Level 3	5	Registered

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	Registered
Fundamental	9012 Investigate life and work related problems using data and probabilities	Level 3	5	Registered
Fundamental	9013 Describe, apply, analyse and calculate shape and motion in 2-and 3-dimensional space in different contexts	Level 3	4	Registered
Fundamental	14086 Work with a wide range of patterns and basic functions and solve related problems	Level 3	3	Registered

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

Further Education and Training Certificate: Railway Signalling: Fault-finding and Repair of Equipment.

SAQA QUAL ID	*QUALIFICATION TITLE*	
49067	Further Education and Training Certificate: Railway Signalling: Fault-finding and Repair of Equipment.	
SGB NAME	SGB Electrical Engineering & Construction	
ABET BAND	*PROVIDER NAME*	
Undefined		
QUALIFICATION CODE	*QUAL TYPE*	*SUBFIELD*
PPC-4-National Certificate	National Certificate	Electrical Infrastructure Construction
MINIMUM CREDITS	*NQF LEVEL*	*QUALIFICATION CLASS*
169	Level 4	Regular-Unit Stds Based
SAQA DECISION NUMBER	*REGISTRATION START DATE*	*REGISTRATION END DATE*

PURPOSE OF THE QUALIFICATION

This qualification will prepare the qualifying learner to progress through learning in the railway signalling environment to a qualification in the safe and effective fault-finding and repair of railway signalling equipment at an NQF Level 5.

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 are able to demonstrate occupational skills which 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. Analysis and logical deduction play an important role in this qualification.

Rationale for the qualification

Railway signalling forms a critical part of the infrastructure of a rail transport system and contributes to the safe and efficient control of rail traffic. Due to the density of rail traffic and the emphasis placed on reliability, availability and safety of signalling systems, it is vitally important that malfunctioning signalling equipment be repaired in a timeous and safe manner. To enable safe and timeous repair on railway signalling equipment, maintenance personnel must have a sound knowledge of various railway signalling systems and must follow predetermined fault-finding procedures based on recognised signal engineering practices and specifications.

This qualification equips the learner with the required skills, knowledge and understanding to safely and correctly perform faultfinding on malfunctioning railway signalling systems in order to identify a faulty element and to implement the necessary repair task(s) to re-establish availability of the system and hence safe and reliable rail operations.

Learners credited with this qualification and who apply the acquired knowledge and skills can help address the critical shortage of qualified personnel in the railway signalling industry.

For the new learner, this qualification recognises the applied competence needed by a productive person in a structured workplace and forms the basis for further development.

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

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

This qualification assumes that the learner's competencies include but are not limited to the following:

> Knowledge of mechanical signalling
> Knowledge of company rules and regulations applicable when performing maintenance in the vicinity of or near exposed (live) high voltage overhead track equipment.
> Knowledge of and be able to apply Train Working rules
> Knowledge and ability to perform maintenance and repairs on a bank of batteries
> Knowledge and ability to joint electrical signal cables
> Knowledge and ability to install electrical signal cables
> Knowledge and ability to install an apparatus case
> Knowledge and ability to install an electrical railway signal
> Knowledge and ability to install components of an interlocking system
> Knowledge and ability to install a track circuit
> Knowledge and ability to install electrical points
> Knowledge and ability to perform routine preventive maintenance on electrical points
> Knowledge and ability to perform routine preventive maintenance on and apparatus case
> Knowledge and ability to perform routine preventive maintenance on a colour light signal
> Knowledge and ability to perform routine preventive maintenance on a railway track circuit

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 and support and guidance should be provided. 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.

QUALIFICATION RULES

Level, credits and learning components assigned to this qualification

The fundamental, core and elective learning components that make up this qualification are listed below.

Fundamental - Core - Elective
18 credits at Level 3 - 10 credits at Level 3 - 2 credits at Level 3
56 credits at Level 4 - 73 credits at Level 4 - 38 credits at level 4
□□
74 credits□83 credits□40 credits (Select a minimum of 12)

The available credits for this qualification are at least 197, of which a minimum of 169 credits must be done to achieve this qualification.

Motivation for the number of credits assigned

Fundamental Credits

SAQA stipulates that a minimum of 20 compulsory credits at level 4 and a further 20 compulsory credits at a minimum of level 3 are allocated to Communication Studies and Languages. A further 16 credits at level 4 are allocated to Mathematics and Mathematical Literacy.
74compulsory credits have been allocated to these fundamental competencies.

Core

> SAQA stipulates that a minimum of 72 credits are required at or above the level at which the certificate is awarded.
> 83 compulsory credits have been allocated to the core unit standards to cover the field of assembly and wiring of railway signalling equipment sufficiently.

Electives

A minimum of 12 credits have to be selected from the 40 listed elective credits. These credits have been

grouped to allow for progression to the next level of learning on the same railway signalling equipment.

EXIT LEVEL OUTCOMES

1. Demonstrate the knowledge and ability to plan and prepare the execution of fault-finding and repair tasks on railway signalling equipment, communicate with roleplayers and solve potential problems that may arise.

2. Demonstrate the knowledge and ability to perform fault-finding and repair tasks safely and effectively on railway signalling equipment according to railway signalling engineering practice and specifications

3. Demonstrate the knowledge and ability to apply safety before, during and after the execution of the fault-finding and repair tasks.

4. Understand the need for communications and demonstrate the ability to communicate effectively while working on live equipment under operational conditions.

Critical cross-field outcomes across the core unit standards and qualification at Level 4.

Critical cross - field outcomes supported by the unit standards

Understand basic electrical and mechanical engineering principles - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Understand basic electronic theory and components - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Construct basic electronic circuits - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform corrective preventive maintenance on an apparatus case - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform corrective preventive maintenance on an electrical railway signal - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management

> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform corrective preventive maintenance on a railway track circuit - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform corrective preventive maintenance on electrical points - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform fault-finding and repairs on railway signalling interlocking equipment - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform fault-finding and repairs up to modular level on a remote control system - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform fault-finding and repairs on an electrical railway signal - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform fault-finding and repairs on a railway track circuit - supports:
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform fault-finding and repair on electrical points
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform fault-finding and repairs on an electrical railway signalling cable
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Critical cross-field outcomes across the elective unit standards and qualification at Level 4.
Critical cross-field outcomes supported by the unit standards

Perform corrective preventive maintenance on an axle counter
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform corrective preventive maintenance on a flashlight and boom level crossing warning system
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform corrective preventive maintenance on railway signalling power supply equipment
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform fault-finding and repairs up to modular level on an axle counter
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform fault-finding and repairs on a flashlight and boom level crossing warning system
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

Perform fault-finding and repairs on power supply equipment
> Information evaluation
> Problem-solving
> Team work
> Self-organisation and self-management
> Communication
> Inter-relatedness of systems
> Use of science and technology
> Learner and societal development

ASSOCIATED ASSESSMENT CRITERIA

1.1 The planning of the task is understood and performed correctly by evaluating and interpreting all fault information.
1.2 The correct resources and materials are procured after evaluating and interpreting all fault information. These recourses include but are not limited to personnel, transport, spare equipment, tools and testing instruments
1.3 Problems regarding the resources required for the fault-finding and repair tasks of railway signalling equipment are solved effectively as measured against company policies and procedures. Problems related to the following include but is not limited to personnel, transport, spare equipment, tools and testing instruments
1.4 Effective communication with all roleplayers is demonstrated by communicating clearly and concisely and within the framework of company specific communication protocols..
1.5 The planning for the scheduled repair tasks is performed effectively according to company-specific procedures

2.1 The fault-finding and repairs, quality checks and functional tests on railway signalling equipment are understood and performed safely, correctly and timeously as per associated company policies procedures and instructions.
2.2 The correct tools, instruments and equipment are used safely and correctly as per tools, instruments and equipment handling procedures.
2.3 Problems regarding the suitability and functionality of equipment, instrumentation and tools are identified and solved effectively thus preventing delays in the faultfinding and repair tasks.
2.4 Learners would organise and manage themselves effectively by utilising the resources and executing the tasks responsibly and safely as per company policies and procedures.
2.5 Effective communication with relevant role-players related to the fault-finding and repair of railway signalling equipment is demonstrated by communicating clearly and concisely to the correct role players and within the framework of company specific communication protocols.
2.6 The impact of the fault-finding and repair tasks on the equipment being repaired in relation to the railway signalling system is correctly explained.
2.7 The scheduled repair tasks are executed effectively according to company-specific procedures.
2.8 The fault-finding process is performed logically and timeously by using analytical skills.

3.1. Personal and equipment safety is understood and applied as per company policies while executing faultfinding and repair tasks.
3.2 The inter-relatedness of various railway signalling elements and implications thereof on safety is understood and demonstrated.
3.3. The electrical test and measuring instruments and gauges are checked to ensure that they comply with manufacturers and company safety specifications.
3.4. Problems with regard to the safety of equipment and tools are identified and solved effectively as per company policies and instructions.
3.5. Learners would organise and manage themselves by adhering to safety and company-specific policies and procedures.
3.6. Safety in the workplace, as well as in the whole environment in understood and demonstrated while performing the tasks.

3.7 The knowledge and ability to restore the work site and solve any related problems effectively as per company policies and procedures is demonstrated.

4.1 The relevant communication media, protocols and procedures are used correctly while performing tasks as per company policies, procedures and instructions.
4.2 Verbal communication is done in an assertive, clear and concise manner.
4.3 Written reports are presented clearly in a timely manner in the required format to appropriate parties as per company specific policies.
4.4 Technical and work-related documentation is analysed, interpreted and/or completed correctly to prevent ambiguity and promote operational safety.

Integrated assessment

Assessors and moderators should develop and conduct their own integrated assessment by using a range of formative and summative assessment methods.

Unit standards in the qualification must be used to assess specific outcomes, critical cross-field outcomes and essential embedded knowledge.

During integrated assessments the assessor should use formative and summative assessment methods and should assess applied competence.

The applied competence (practical, foundational and reflexive competencies) of this qualification will be achieved if a learner is able to achieve all the exit level outcomes of this qualification.

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.

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

INTERNATIONAL COMPARABILITY

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The IRSE is an international professional institution associated with railway signalling and allied professions. The institution aims to advance for public benefit, the science and practice of signalling engineering within the industry and to maintain high standards of knowledge of the profession. The IRSE recognises and encourages Continuing Professional Development (CPD) to keep abreast of new developments in science and technology within the railway signalling and associated disciplines.

Efforts to obtain British National Vocational Qualifications (NVQs) related railway signalling were unsuccessful. The registered qualifications on the NVQs were not accessible from the website due to some financial implications and could not be used for benchmarking.

During the development of the unit standards cognisance was taken of the implementation of a National Railway Safety Regulator. The National Railway Safety Regulator promotes and controls safe rail operations and recognises that this is fundamental to the safety of all persons and the environment. The unit standards in railway signalling were aligned to these ideals.

ARTICULATION OPTIONS

This is a qualification in a series of railway signalling qualifications from NQF Level 2 to 5. These qualifications articulate directly to other learning programmes and qualifications in railway signalling technology. It also opens the possibility for further learning in the sub-fields of Electrical Infrastructure Construction, Engineering and Related Design and Manufacturing and Assembly.

Faultfinding and repair of railway signalling equipments, will skill the learner in logical electrical faultfinding procedures, which may be articulated to faultfinding and repair on other commercial type electrical equipment as well as to non-commercial apparatus. The focus on reliability and availability of equipment, and the safety consciousness embedded in learners, will develop learners into delivering work compatible with international best practice.

MODERATION OPTIONS

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3. The subject matter experience of the assessor can be established by recognition of prior learning.

4. Assessors need to be registered with the relevant Education and Training Quality Assurance Body.

5. Anyone assessing a learner against a unit standard must be certified as competent against that specific unit standard and registered as an assessor to assess such unit standard.

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	10270 Construct Basic Electronic Circuits	Level 3	4	Reregistered
Core	114406 Understand basic electronic theory and components	Level 3	4	Registered
Core	116884 Perform corrective preventive maintenance on an apparatus case	Level 3	2	Draft - Prep for P Comment
Core	113873 Understand basic electrical and mechanical engineering principles	Level 4	8	Registered
Core	116868 Perform corrective preventive maintenance on electrical points	Level 4	5	Draft - Prep for P Comment
Core	116877 Perform corrective preventive maintenance on a railway track circuit	Level 4	3	Draft - Prep for P Comment
Core	116878 Perform fault-finding and repair up to modular level on a remote control system	Level 4	10	Draft - Prep for P Comment
Core	116879 Perform fault-finding and repairs on a railway track circuit	Level 4	7	Draft - Prep for P Comment
Core	116881 Perform corrective preventive maintenance on an electrical railway signal	Level 4	5	Draft - Prep for P Comment
Core	116883 Perform fault-finding and repairs on railway signalling interlocking equipment	Level 4	16	Draft - Prep for P Comment
Core	116886 Perform fault-finding and repairs on electrical points	Level 4	8	Draft - Prep for P Comment
Core	116889 Perform fault-finding and repairs on an electrical railway signalling cable	Level 4	4	Draft - Prep for P Comment
Core	116890 Perform fault-finding and repairs on an electrical railway signal	Level 4	7	Draft - Prep for P Comment
Elective	116888 Perform corrective preventive maintenance on an axle counter	Level 3	2	Draft - Prep for P Comment
Elective	11473 Manage individual and team performance	Level 4	8	Registered
Elective	116859 Perform fault-finding and repairs up to modular level on an axle counter	Level 4	5	Draft - Prep for P Comment
Elective	116872 Perform corrective preventive maintenance on railway signalling power supply equipment	Level 4	6	Draft - Prep for P Comment
Elective	116876 Perform corrective preventive maintenance on a flashlight and boom level crossing warning system	Level 4	5	Draft - Prep for P Comment
Elective	116880 Perform fault-finding and repairs on a flashlight and boom level crossing warning system	Level 4	7	Draft - Prep for P Comment
Elective	116885 Perform fault-finding and repairs on railway signalling power supply equipment	Level 4	7	Draft - Prep for P Comment
Fundamental	8969 Interpret and use information from texts	Level 3	5	Registered
Fundamental	8970 Write texts for a range of communicative contexts	Level 3	5	Registered
Fundamental	13915 Demonstrate knowledge and understanding of HIV/AIDS in a workplace, and its effects on a business sub-sector, own organisation and a specific workplace	Level 3	4	Registered
Fundamental	116714 Lead a team, plan, allocate and assess their work	Level 3	4	Public Comment
Fundamental	7457 Work with a wide range of patterns and transformations of functions and solve related problems	Level 4	3	Registered
Fundamental	7483 Solve problems involving sequences and series in real and simulated situations	Level 4	2	Registered
Fundamental	7485 Demonstrate understanding of real and complex number systems	Level 4	3	Registered
Fundamental	8974 Engage in sustained oral communication and evaluate spoken texts	Level 4	5	Registered
Fundamental	8975 Read analyse and respond to a variety of texts	Level 4	5	Registered
Fundamental	8976 Write for a wide range of contexts	Level 4	5	Registered
Fundamental	9016 Represent analyse and calculate shape and motion in 2-and 3-dimensional space in different contexts	Level 4	4	Registered
Fundamental	12153 Use the writing process to compose texts required in the business environment	Level 4	5	Registered
Fundamental	12154 Apply comprehension skills to engage oral texts in a business environment	Level 4	5	Registered

Fundamental	12155 Apply comprehension skills to engage written texts in a business environment	Level 4	5	Registered
Fundamental	12417 Measure, estimate & calculate physical quantities & explore, critique & prove geometrical relationships in 2 and 3 dimensional space in the life and workplace of adult with increasing responsibilities	Level 4	4	Reregistered
Fundamental	116380 Supervise workers at levels 2 and 3	Level 4	6	Public Comment
Fundamental	116389 Write a technical report	Level 4	4	Public Comment

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 1

Apply electrical high voltage safety instructions when working in the vicinity of or near exposed "live" high-voltage overhead track equipment

SAQA US ID	*UNIT STANDARD TITLE*
116900	Apply electrical high voltage safety instructions when working in the vicinity of or near exposed "live" high-voltage overhead track equipment

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 2	1

Specific Outcomes:

SPECIFIC OUTCOME 1

Work safely in the vicinity of or near high-voltage overhead track equipment.

SPECIFIC OUTCOME 2

Identify and react to signs and warning boards related to high-voltage overhead track equipment.

SPECIFIC OUTCOME 3

Identify and verify the correctness of track circuits and bonding.

SPECIFIC OUTCOME 4

Identify OHTE and report related sub standards conditions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 2

Assemble a railway track circuit

SAQA US ID	*UNIT STANDARD TITLE*
116839	Assemble a railway track circuit

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 2	2

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to assemble a railway track circuit safely and correctly.

SPECIFIC OUTCOME 2

Assemble a railway track circuit safely and correctly according to an assembly plan within the alloc

SPECIFIC OUTCOME 3

Perform quality checks on an assembled railway track circuit according to procedures, policies and i

SPECIFIC OUTCOME 4

Restore the site and store or secure an assembled railway track circuit as per company-specific proc

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 3

Assemble an apparatus case

SAQA US ID	*UNIT STANDARD TITLE*
116841	Assemble an apparatus case

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 2	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to safely and correctly perform the assembly of an apparatus

SPECIFIC OUTCOME 2

Assemble an apparatus case safely and correctly according to an assembly plan within the allocated t

SPECIFIC OUTCOME 3

Perform quality checks on an assembled apparatus case according to procedures, policies and instruct

SPECIFIC OUTCOME 4

Restore the site and store or secure an assembled apparatus case as per company-specific procedures,

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 4

Assemble an electrical railway signal

SAQA US ID	*UNIT STANDARD TITLE*
116842	Assemble an electrical railway signal

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 2	5

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to safely and correctly perform the assembly of an electrica

SPECIFIC OUTCOME 2

Assemble an electrical railway signal safely and correctly according to an assembly plan within the

SPECIFIC OUTCOME 3

Perform quality checks on an assembled electrical railway signal according to procedures, policies a

SPECIFIC OUTCOME 4

Restore the site and store or secure an assembled electrical railway signal as per company-specific

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 5

Assemble components of a flashlight and boom level crossing warning system

SAQA US ID	*UNIT STANDARD TITLE*
116898	Assemble components of a flashlight and boom level crossing warning system

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 2	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to safely and correctly perform the assembly of components o

SPECIFIC OUTCOME 2

Assemble components of a flashlight and boom level crossing warning system safely and correctly acco

SPECIFIC OUTCOME 3

Perform quality checks on components of a flashlight and boom level crossing warning system accordin

SPECIFIC OUTCOME 4

Restore the site and store or secure assembled components of a flashlight and boom level crossing wa

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 6

Assemble components of a remote control system

SAQA US ID	*UNIT STANDARD TITLE*
116894	Assemble components of a remote control system

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 2	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to safely and correctly perform the assembly of components f

SPECIFIC OUTCOME 2

Assemble components of a remote control system safely and correctly according to an assembly plan wi

SPECIFIC OUTCOME 3

Perform quality checks on assembled components of a remote control system according to procedures, p

SPECIFIC OUTCOME 4

Restore the site and store or secure (where applicable) the assembled components of a remote control

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 7

Assemble components of an axle counter

SAQA US ID	*UNIT STANDARD TITLE*
116891	Assemble components of an axle counter

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 2	2

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to safely and correctly perform the assembly of components o

SPECIFIC OUTCOME 2

Assemble components of an axle counter safely and correctly according to an assembly plan and specif

SPECIFIC OUTCOME 3

Perform quality checks on assembled components of an axle counter according to procedures, policies

SPECIFIC OUTCOME 4

Restore the site and store or secure (where applicable) components of an assembled axle counter as p

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 8

Demonstrate an understanding of the principles of mechanical railway signalling

SAQA US ID	*UNIT STANDARD TITLE*
116846	Demonstrate an understanding of the principles of mechanical railway signalling

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 2	6

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate an understanding of mechanical points operation.

SPECIFIC OUTCOME 2

Demonstrate an understanding of the mechanical signal operation.

SPECIFIC OUTCOME 3

Demonstrate an understanding of a mechanical interlocking system.

SPECIFIC OUTCOME 4

Demonstrate an understanding of one-way and two-way points indicators.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 9

Identify, route, harness and terminate electrical conductors used in railway signalling

SAQA US ID	*UNIT STANDARD TITLE*
116853	Identify, route, harness and terminate electrical conductors used in railway signalling

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 2	6

Specific Outcomes:

SPECIFIC OUTCOME 1

Identify electrical conductors and insulation according to railway signalling specifications.

SPECIFIC OUTCOME 2

Route and harness electrical conductors according to railway signalling specifications.

SPECIFIC OUTCOME 3

Terminate electrical conductors according to railway signalling specifications.

SPECIFIC OUTCOME 4

Perform quality checks on the terminated electrical conductors according to company procedures, poli

SPECIFIC OUTCOME 5

Restore the site as per company-specific procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 10

Wire components of a flashlight and boom level crossing warning system

SAQA US ID	*UNIT STANDARD TITLE*
116897	Wire components of a flashlight and boom level crossing warning system

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 2	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform the wiring of components of a flashlight and boom

SPECIFIC OUTCOME 2

Wire components of a flashlight and boom level crossing warning system safely and correctly accordin

SPECIFIC OUTCOME 3

Perform quality checks on a wired component of a flashlight and boom level crossing warning system a

SPECIFIC OUTCOME 4

Restore the site and store or secure a wired component of a flashlight and boom level crossing warni

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 11

Assemble an electrical points machine

SAQA US ID	*UNIT STANDARD TITLE*
116844	Assemble an electrical points machine

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	6

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to safely and correctly perform the assembly of an electrica

SPECIFIC OUTCOME 2

Assemble an electrical points machine safely and correctly according to an assembly plan within the

SPECIFIC OUTCOME 3

Perform quality checks on an assembled electrical points machine according to procedures, policies a

SPECIFIC OUTCOME 4

Restore the site and store or secure an assembled electrical points machine as per company-specific

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

Established in terms of Act 58 of 1995

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 12

Assemble components of a railway signalling interlocking system

SAQA US ID	UNIT STANDARD TITLE
116847	Assemble components of a railway signalling interlocking system

SGB NAME	ABET BAND	PROVIDER NAME
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	SUBFIELD DESCRIPTION
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
PPC-EIC-0-SGB ECC	Regular	Level 3	6

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to safely and correctly perform the assembly of components f

SPECIFIC OUTCOME 2

Assemble components of a railway signalling interlocking system safely and correctly according to an

SPECIFIC OUTCOME 3

Perform quality checks on assembled components of a railway signalling interlocking system according

SPECIFIC OUTCOME 4

Restore the site and store or secure (where applicable) the assembled components of a railway signal

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

Established in terms of Act 58 of 1995

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 13

Assemble railway signalling power supply equipment

SAQA US ID	*UNIT STANDARD TITLE*
116895	Assemble railway signalling power supply equipment

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	6

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to safely and correctly perform the assembly of railway sign

SPECIFIC OUTCOME 2

Assemble railway signalling power supply equipment safely and correctly according to an assembly pla

SPECIFIC OUTCOME 3

Perform quality checks on assembled railway signalling power supply equipment according to procedure

SPECIFIC OUTCOME 4

Restore the site and store or secure (where applicable) the assembled railway signalling power suppl

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 14

Demonstrate an understanding of the fundamental elements of railway signalling

SAQA US ID	*UNIT STANDARD TITLE*
116858	Demonstrate an understanding of the fundamental elements of railway signalling

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	8

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate an understanding of the reasons for single, double and uni/bi-directional lines, crossin

SPECIFIC OUTCOME 2

Demonstrate an understanding of the position, purpose, function and methods of operating points in r

SPECIFIC OUTCOME 3

Demonstrate an understanding of the position, purpose, function and methods of operating signals in

SPECIFIC OUTCOME 4

Demonstrate an understanding of the purpose and function of train detection systems in railway signa

SPECIFIC OUTCOME 5

Demonstrate an understanding of the purpose and function of various types of railway signalling inte

SPECIFIC OUTCOME 6

Demonstrate an understanding of the purpose and function of various methods of control systems in ra

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 15

Install an apparatus case

SAQA US ID	*UNIT STANDARD TITLE*
116852	Install an apparatus case

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to install an apparatus case safely and correctly.

SPECIFIC OUTCOME 2

Install an apparatus case safely and correctly according to the installation plans/diagrams within t

SPECIFIC OUTCOME 3

Perform quality checks on the installation of an apparatus case according to procedures, policies an

SPECIFIC OUTCOME 4

Restore the installation site as per company-specific procedures, policies and instructions.

SPECIFIC OUTCOME 5

Hand over the installed apparatus case for commissioning.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 16

Install an electrical railway signal

SAQA US ID	*UNIT STANDARD TITLE*
116850	Install an electrical railway signal

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	4

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to install an electrical railway signal safely and correctly

SPECIFIC OUTCOME 2

Install an electrical railway signal safely and correctly according to the installation plans/diagra

SPECIFIC OUTCOME 3

Perform quality checks on the installation of an electrical railway signal according to procedures,

SPECIFIC OUTCOME 4

Restore the installation site as per company-specific procedures, policies and instructions.

SPECIFIC OUTCOME 5

Hand over the installed electrical railway signal for commissioning.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

Established in terms of Act 58 of 1995

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 17

Install components of a flashlight and boom level crossing warning system

SAQA US ID	*UNIT STANDARD TITLE*
116854	Install components of a flashlight and boom level crossing warning system

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to install components of a flashlight and boom level crossin

SPECIFIC OUTCOME 2

Install components of a flashlight and boom level crossing warning system safely and correctly accor

SPECIFIC OUTCOME 3

Perform quality checks on the installed components of a flashlight and boom level crossing warning s

SPECIFIC OUTCOME 4

Communication is performed according to procedures, policies and instructions.

SPECIFIC OUTCOME 5

Restore the installation site as per company-specific procedures, policies and instructions.

SPECIFIC OUTCOME 6

Hand over the installed components of a flashlight and boom level crossing warning system for commis

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 18

Install components of a remote control system

SAQA US ID	UNIT STANDARD TITLE
116857	Install components of a remote control system

SGB NAME	ABET BAND	PROVIDER NAME
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	SUBFIELD DESCRIPTION
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
PPC-EIC-0-SGB ECC	Regular	Level 3	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to install components of a remote control system safely and

SPECIFIC OUTCOME 2

Install components of a remote control system safely and correctly according to the installation pla

SPECIFIC OUTCOME 3

Perform quality checks on the installation of components of a remote control system according to pro

SPECIFIC OUTCOME 4

Restore the installation site as per company-specific procedures, policies and instructions.

SPECIFIC OUTCOME 5

Hand over the installed components of a remote control system for commissioning.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 19

Install components of an axle counter

SAQA US ID	*UNIT STANDARD TITLE*
116862	Install components of an axle counter

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to install components of an axle counter safely and accordin

SPECIFIC OUTCOME 2

Install components of an axle counter safely and correctly according to the installation plans/diagr

SPECIFIC OUTCOME 3

Perform quality checks on the installation of axle counter components according to procedures, polic

SPECIFIC OUTCOME 4

Restore the installation site as per company-specific procedures, policies and instructions.

SPECIFIC OUTCOME 5

Hand over the installed axle counter components for commissioning.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

Established in terms of Act 58 of 1995

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 20

Install electrical railway signalling cables

SAQA US ID	*UNIT STANDARD TITLE*
116867	Install electrical railway signalling cables

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	5

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to safely install electrical railway signalling cables accor

SPECIFIC OUTCOME 2

Install electrical railway signalling cables safely and correctly according to the installation plan

SPECIFIC OUTCOME 3

Perform quality checks on the installation of electrical railway signalling cables according to proc

SPECIFIC OUTCOME 4

Restore the installation site as per company-specific procedures, policies and instructions.

SPECIFIC OUTCOME 5

Hand over the installed electrical railway signalling cables for termination.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 21

Install railway signalling power supply equipment

SAQA US ID	*UNIT STANDARD TITLE*
116873	Install railway signalling power supply equipment

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to install railway signalling power supply equipment safely

SPECIFIC OUTCOME 2

Install railway signalling power supply equipment safely and correctly according to the installation

SPECIFIC OUTCOME 3

Perform quality checks on the installed railway signalling power supply equipment according to proce

SPECIFIC OUTCOME 4

Restore the installation site as per company-specific procedures, policies and instructions.

SPECIFIC OUTCOME 5

Hand over the installed railway signalling power supply equipment for commissioning.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

Established in terms of Act 58 of 1995

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 22

Joint electrical railway signalling cables

SAQA US ID	*UNIT STANDARD TITLE*
116875	Joint electrical railway signalling cables

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	5

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to safely and correctly joint electrical railway signalling

SPECIFIC OUTCOME 2

Correctly prepare electrical railway signalling cables for jointing according to company-specific po

SPECIFIC OUTCOME 3

Correctly joint electrical railway signalling cables according to specification within the allocated

SPECIFIC OUTCOME 4

Perform quality checks on the jointed electrical railway-signalling cables according to company-spec

SPECIFIC OUTCOME 5

Restore the site as per company procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 23

Maintain and repair a bank of batteries as used in railway signalling

SAQA US ID	*UNIT STANDARD TITLE*
116882	Maintain and repair a bank of batteries as used in railway signalling

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	8

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to safely perform maintenance, fault-finding and repair task

SPECIFIC OUTCOME 2

Perform maintenance on a bank of batteries, battery room and an enclosure.

SPECIFIC OUTCOME 3

Diagnose, locate and repair a fault on a bank of batteries.

SPECIFIC OUTCOME 4

Communicate with control and/or relevant role players before, during and on completion of the mainte

SPECIFIC OUTCOME 5

Restore the site as per company procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 24

Perform corrective preventive maintenance on an apparatus case

SAQA US ID	*UNIT STANDARD TITLE*
116884	Perform corrective preventive maintenance on an apparatus case

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	2

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform corrective preventive maintenance (CPM) tasks on

SPECIFIC OUTCOME 2

Perform corrective preventive maintenance (CPM) tasks on an apparatus case.

SPECIFIC OUTCOME 3

Perform relevant tests to verify the correct operation of the repaired equipment and re-instate the

SPECIFIC OUTCOME 4

Communicate with control and/or relevant role players before, during and on completion of the CPM pr

SPECIFIC OUTCOME 5

Restore the site as per company-specific procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 25

Perform corrective preventive maintenance on an axle counter

SAQA US ID	*UNIT STANDARD TITLE*
116888	Perform corrective preventive maintenance on an axle counter

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	2

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform corrective preventive maintenance (CPM) tasks on

SPECIFIC OUTCOME 2

Perform corrective preventive maintenance (CPM) tasks on an axle counter.

SPECIFIC OUTCOME 3

Perform relevant tests to verify the correct operation of the repaired equipment and re-instate the

SPECIFIC OUTCOME 4

Communicate with control and/or relevant role players before, during and on completion of the CPM pr

SPECIFIC OUTCOME 5

Restore the site as per company procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 26

Perform routine preventive maintenance on a railway track circuit

SAQA US ID	*UNIT STANDARD TITLE*
116843	Perform routine preventive maintenance on a railway track circuit

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	2

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform routine preventive maintenance (RPM) tasks on a r

SPECIFIC OUTCOME 2

Perform routine preventive maintenance (RPM) tasks on a railway track circuit.

SPECIFIC OUTCOME 3

Identify, prioritise and report the corrective action to take after a defect or substandard has been

SPECIFIC OUTCOME 4

Effectively communicate with control and/or relevant role players before, during and on completion o

SPECIFIC OUTCOME 5

Restore the site as per company-specific procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 27

Perform routine preventive maintenance on an apparatus case

SAQA US ID	*UNIT STANDARD TITLE*
116887	Perform routine preventive maintenance on an apparatus case

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	2

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform routine preventive maintenance (RPM) tasks on an

SPECIFIC OUTCOME 2

Perform routine preventive maintenance (RPM) tasks on an apparatus case.

SPECIFIC OUTCOME 3

Identify, prioritise and report the corrective action to take after a defect or substandard has been

SPECIFIC OUTCOME 4

Effectively communicate with control and/or relevant role players before, during and on completion o

SPECIFIC OUTCOME 5

Restore the site as per company-specific procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 28

Perform routine preventive maintenance on an axle counter

SAQA US ID	*UNIT STANDARD TITLE*
116840	Perform routine preventive maintenance on an axle counter

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform routine preventive maintenance (RPM) tasks on an

SPECIFIC OUTCOME 2

Perform routine preventive maintenance (RPM) tasks on an axle counter.

SPECIFIC OUTCOME 3

Identify, prioritise and report the corrective action to take after a defect or substandard has been

SPECIFIC OUTCOME 4

Effectively communicate with control and/or relevant role players before, during and on completion o

SPECIFIC OUTCOME 5

Restore the site as per company-specific procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 29

Perform routine preventive maintenance on an electrical railway signal

SAQA US ID	*UNIT STANDARD TITLE*
116845	Perform routine preventive maintenance on an electrical railway signal

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	2

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform routine preventive maintenance (RPM) tasks on an

SPECIFIC OUTCOME 2

Perform routine preventive maintenance (RPM) tasks on an electrical railway signal according to plan

SPECIFIC OUTCOME 3

Identify, prioritise and report the corrective action to take after a defect or substandard has been

SPECIFIC OUTCOME 4

Effectively communicate with control and/or relevant role players before, during and on completion o

SPECIFIC OUTCOME 5

Restore the site as per company-specific procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 30

Perform routine preventive maintenance on electrical points

SAQA US ID	*UNIT STANDARD TITLE*
116848	Perform routine preventive maintenance on electrical points

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform routine preventive maintenance (RPM) tasks on ele

SPECIFIC OUTCOME 2

Perform routine preventive maintenance (RPM) tasks on electrical points.

SPECIFIC OUTCOME 3

Identify, prioritise and report the corrective action to take after a defect or substandard has been

SPECIFIC OUTCOME 4

Effectively communicate with control and/or relevant role players before, during and on completion o

SPECIFIC OUTCOME 5

Restore the site as per company-specific procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 31

Perform routine preventive maintenance on railway signalling power supply equipment

SAQA US ID	*UNIT STANDARD TITLE*
116849	Perform routine preventive maintenance on railway signalling power supply equipment

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform routine preventive maintenance (RPM) tasks on rai

SPECIFIC OUTCOME 2

Perform routine preventive maintenance (RPM) tasks on railway signalling power supply equipment acco

SPECIFIC OUTCOME 3

Identify, prioritise and report the corrective action to take after a defect or substandard has been

SPECIFIC OUTCOME 4

Effectively communicate with control and/or relevant role players before, during and on completion o

SPECIFIC OUTCOME 5

Restore the site as per company-specific procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 32

Wire a railway track circuit

SAQA US ID	*UNIT STANDARD TITLE*
116856	Wire a railway track circuit

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform the wiring of a railway track circuit safely and

SPECIFIC OUTCOME 2

Wire a railway track circuit safely and correctly according to a wiring plan within the allocated ti

SPECIFIC OUTCOME 3

Perform quality checks on a wired railway track circuit according to procedures, policies and instru

SPECIFIC OUTCOME 4

Restore the site and store or secure a wired railway track circuit as per company-specific procedure

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 33

Wire an apparatus case

SAQA US ID	*UNIT STANDARD TITLE*
116855	Wire an apparatus case

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform the wiring of an apparatus case safely and accord

SPECIFIC OUTCOME 2

Wire an apparatus case safely and correctly according to a wiring diagram within the allocated time

SPECIFIC OUTCOME 3

Perform quality checks on the wiring of an apparatus case according to procedures, policies and inst

SPECIFIC OUTCOME 4

Restore the site and store or secure a wired apparatus case as per company-specific procedures, poli

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 34

Wire an electrical points machine

SAQA US ID	*UNIT STANDARD TITLE*
116851	Wire an electrical points machine

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform the wiring of an electrical points machine safely

SPECIFIC OUTCOME 2

Wire an electrical points machine safely and correctly according to a wiring plan within the allocat

SPECIFIC OUTCOME 3

Perform quality checks on a wired electrical points machine according to procedures, policies and in

SPECIFIC OUTCOME 4

Restore the site and store or secure a wired electrical points machine as per company-specific proce

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 35

Wire an electrical railway signal

SAQA US ID	*UNIT STANDARD TITLE*
116860	Wire an electrical railway signal

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	4

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform the wiring of an electrical railway signal safely

SPECIFIC OUTCOME 2

Wire an electrical railway signal safely and correctly according to a wiring diagram within the allo

SPECIFIC OUTCOME 3

Perform quality checks on the wiring of an electrical railway signal according to procedures, polici

SPECIFIC OUTCOME 4

Restore the site and store or secure a wired electrical railway signal as per company-specific proce

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 36

Wire components of a remote control system

SAQA US ID	*UNIT STANDARD TITLE*
116893	Wire components of a remote control system

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	4

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform the wiring of components of a remote control syst

SPECIFIC OUTCOME 2

Wire components of a remote control system safely and correctly according to a wiring diagram/schedu

SPECIFIC OUTCOME 3

Perform quality checks on a remote control system according to procedures, policies and instructions

SPECIFIC OUTCOME 4

Restore the site and store or secure a wired component of a remote control system as per company-spe

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 37

Wire components of a remote control system

SAQA US ID	*UNIT STANDARD TITLE*
116896	Wire components of a remote control system

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform the wiring of components of a remote control syst

SPECIFIC OUTCOME 2

Wire components of a remote control system safely and correctly according to a wiring diagram/schedu

SPECIFIC OUTCOME 3

Perform quality checks on a remote control system according to procedures, policies and instructions

SPECIFIC OUTCOME 4

Restore the site and store or secure a wired component of a remote control system as per company-spe

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

Established in terms of Act 58 of 1995

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 38

Wire components of an electrical railway signalling interlocking system

SAQA US ID	*UNIT STANDARD TITLE*
116863	Wire components of an electrical railway signalling interlocking system

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	5

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform the wiring of components of an electrical railway

SPECIFIC OUTCOME 2

Wire components of an electrical railway signalling interlocking system safely and correctly accordi

SPECIFIC OUTCOME 3

Perform quality checks on a wired component of an electrical railway signalling interlocking system

SPECIFIC OUTCOME 4

Restore the site and store or secure a wired component of an electrical railway signalling interlock

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 39

Wire railway signalling power supply equipment

SAQA US ID	*UNIT STANDARD TITLE*
116892	Wire railway signalling power supply equipment

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 3	6

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform the wiring of railway signalling power supply equ

SPECIFIC OUTCOME 2

Wire railway signalling power supply equipment safely and correctly according to a wiring diagram/sc

SPECIFIC OUTCOME 3

Perform quality checks on railway signalling power supply equipment according to procedures, policie

SPECIFIC OUTCOME 4

Restore the site and store or secure wired railway signalling power supply equipment as per company-

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 40

Apply train working rules as applicable to railway signalling maintenance personnel

SAQA US ID	*UNIT STANDARD TITLE*
116866	Apply train working rules as applicable to railway signalling maintenance personnel

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 4	13

Specific Outcomes:

SPECIFIC OUTCOME 1

Demonstrate an understanding and knowledge of the definitions, rules and instructions related to Tra

SPECIFIC OUTCOME 2

Apply all Train Working Rules and Instructions applicable to an occupation.

SPECIFIC OUTCOME 3

Apply all Train Working Rules and Instructions related to the maintenance tasks and fault conditions

SPECIFIC OUTCOME 4

Apply all Train Working Rules and Instructions related to incidents.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 41

Install a railway track circuit

SAQA US ID	*UNIT STANDARD TITLE*
116865	Install a railway track circuit

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 4	6

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to install a railway track circuit safely and according to p

SPECIFIC OUTCOME 2

Install a railway track circuit safely and correctly according to the installation plans/diagrams wi

SPECIFIC OUTCOME 3

Perform quality checks on the installation of a railway track circuit according to procedures, polic

SPECIFIC OUTCOME 4

Restore the installation site as per company-specific procedures, policies and instructions.

SPECIFIC OUTCOME 5

Hand over the installed railway track circuit for commissioning.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 42

Install components of a railway signalling interlocking system

SAQA US ID	*UNIT STANDARD TITLE*
116871	Install components of a railway signalling interlocking system

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 4	6

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to install components of an electrical railway signalling in

SPECIFIC OUTCOME 2

Install a component of a railway signalling interlocking system safely and correctly according to th

SPECIFIC OUTCOME 3

Perform quality checks on the installation of railway signalling interlocking system components acco

SPECIFIC OUTCOME 4

Restore the installation site as per company-specific procedures, policies and instructions.

SPECIFIC OUTCOME 5

Hand over the installed railway signalling interlocking system components for commissioning.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 43

Install electrical points

SAQA US ID	*UNIT STANDARD TITLE*
116870	Install electrical points

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 4	11

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to install electrical points safely according to plan and sp

SPECIFIC OUTCOME 2

Install electrical points safely and correctly according to the installation plans/diagrams within t

SPECIFIC OUTCOME 3

Perform quality checks on the installation of electrical points according to procedures, policies an

SPECIFIC OUTCOME 4

Restore the installation site as per company-specific procedures, policies and instructions.

SPECIFIC OUTCOME 5

Hand over the installed electrical points for commissioning.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 44

Perform corrective preventive maintenance on a flashlight and boom level crossing warning system

SAQA US ID	*UNIT STANDARD TITLE*
116876	Perform corrective preventive maintenance on a flashlight and boom level crossing warning system

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 4	5

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform corrective preventive maintenance (CPM) tasks saf

SPECIFIC OUTCOME 2

Perform corrective preventive maintenance (CPM) tasks on the flashlight and boom level crossing warn

SPECIFIC OUTCOME 3

Perform relevant tests to verify the correct operation of the repaired equipment and re-instate the

SPECIFIC OUTCOME 4

Communicate with control and/or relevant role players before, during and on completion of the CPM pr

SPECIFIC OUTCOME 5

Restore the site as per company-specific procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 45

Perform corrective preventive maintenance on a railway track circuit

SAQA US ID	UNIT STANDARD TITLE
116877	Perform corrective preventive maintenance on a railway track circuit

SGB NAME	ABET BAND	PROVIDER NAME
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	SUBFIELD DESCRIPTION
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
PPC-EIC-0-SGB ECC	Regular	Level 4	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform corrective preventive maintenance (CPM) tasks on

SPECIFIC OUTCOME 2

Perform corrective preventive maintenance CPM tasks on a railway track circuit.

SPECIFIC OUTCOME 3

Perform relevant tests to verify the correct operation of the repaired equipment and re-instate the

SPECIFIC OUTCOME 4

Communicate with control and/or relevant role players before, during and on completion of the CPM pr

SPECIFIC OUTCOME 5

Restore the site as per company-specific procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 46

Perform corrective preventive maintenance on an electrical railway signal

SAQA US ID	*UNIT STANDARD TITLE*
116881	Perform corrective preventive maintenance on an electrical railway signal

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 4	5

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform corrective preventive maintenance (CPM) tasks on

SPECIFIC OUTCOME 2

Perform corrective preventive maintenance (CPM) tasks on an electrical railway signal.

SPECIFIC OUTCOME 3

Perform relevant tests to verify the correct operation of the repaired equipment and re-instate the

SPECIFIC OUTCOME 4

Communicate with control and/or relevant role players before, during and on completion of the CPM pr

SPECIFIC OUTCOME 5

Restore the site as per company-specific procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 47

Perform corrective preventive maintenance on electrical points

SAQA US ID	*UNIT STANDARD TITLE*
116868	Perform corrective preventive maintenance on electrical points

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 4	5

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform corrective preventive maintenance (CPM) tasks on

SPECIFIC OUTCOME 2

Perform corrective preventive maintenance (CPM) tasks on the electrical points.

SPECIFIC OUTCOME 3

Perform relevant tests to verify the correct operation of the repaired equipment and re-instate the

SPECIFIC OUTCOME 4

Communicate with control and/or relevant role players before, during and on completion of the CPM pr

SPECIFIC OUTCOME 5

Restore the site as per company-specific procedures, policies and instructions.

Established in terms of Act 58 of 1995

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 48

Perform corrective preventive maintenance on railway signalling power supply equipment

SAQA US ID	UNIT STANDARD TITLE
116872	Perform corrective preventive maintenance on railway signalling power supply equipment

SGB NAME	ABET BAND	PROVIDER NAME
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	SUBFIELD DESCRIPTION
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
PPC-EIC-0-SGB ECC	Regular	Level 4	6

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform corrective preventive maintenance (CPM) tasks saf

SPECIFIC OUTCOME 2

Perform corrective preventive maintenance tasks on railway signalling power supply equipment.

SPECIFIC OUTCOME 3

Perform relevant tests to verify the correct operation of the repaired equipment and re-instate the

SPECIFIC OUTCOME 4

Communicate with control and/or relevant role players before, during and on completion of the CPM ta

SPECIFIC OUTCOME 5

Restore the site as per company-specific procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 49

Perform fault-finding and repair up to modular level on a remote control system

SAQA US ID	*UNIT STANDARD TITLE*
116878	Perform fault-finding and repair up to modular level on a remote control system

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 4	10

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform fault-finding and repair tasks up to modular leve

SPECIFIC OUTCOME 2

Diagnose and locate a fault up to modular level on a remote control system.

SPECIFIC OUTCOME 3

Repair the faulty remote control system up to modular level.

SPECIFIC OUTCOME 4

Perform relevant functional tests to verify the correct operation of the repaired equipment and re-i

SPECIFIC OUTCOME 5

Communicate with control and/or relevant role players before, during and on completion of the fault-

SPECIFIC OUTCOME 6

Restore the site as per company-specific procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 50

Perform fault-finding and repairs on a flashlight and boom level crossing warning system

SAQA US ID	UNIT STANDARD TITLE
116880	Perform fault-finding and repairs on a flashlight and boom level crossing warning system

SGB NAME	ABET BAND	PROVIDER NAME
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	SUBFIELD DESCRIPTION
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
PPC-EIC-0-SGB ECC	Regular	Level 4	7

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform fault-finding and repair tasks on a flashlight an

SPECIFIC OUTCOME 2

Diagnose and locate a fault on a flashlight and boom level crossing warning system.

SPECIFIC OUTCOME 3

Repair the faulty flashlight and boom level crossing warning system.

SPECIFIC OUTCOME 4

Perform relevant functional tests to verify the correct operation of the repaired equipment accordin

SPECIFIC OUTCOME 5

Communicate with control and/or relevant role players before, during and on completion of the fault-

SPECIFIC OUTCOME 6

Restore the site as per company-specific procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 51

Perform fault-finding and repairs on a railway track circuit

SAQA US ID	*UNIT STANDARD TITLE*
116879	Perform fault-finding and repairs on a railway track circuit

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 4	7

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform fault-finding and repair tasks on a railway track

SPECIFIC OUTCOME 2

Diagnose and locate a fault on a railway track circuit.

SPECIFIC OUTCOME 3

Repair the faulty railway track circuit.

SPECIFIC OUTCOME 4

Perform relevant functional tests to verify the correct operation of the repaired equipment and re-i

SPECIFIC OUTCOME 5

Communicate with control and/or relevant role players before, during and on completion of the fault-

SPECIFIC OUTCOME 6

Restore the site as per company-specific procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 52

Perform fault-finding and repairs on an electrical railway signal

SAQA US ID	*UNIT STANDARD TITLE*
116890	Perform fault-finding and repairs on an electrical railway signal

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 4	7

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform fault-finding and repair tasks on an electrical r

SPECIFIC OUTCOME 2

Diagnose and locate a fault on an electrical railway signal.

SPECIFIC OUTCOME 3

Repair the faulty electrical railway signal.

SPECIFIC OUTCOME 4

Perform relevant functional tests to verify the correct operation of the repaired equipment and re-i

SPECIFIC OUTCOME 5

Communicate with control and/or relevant role players before, during and on completion of the fault-

SPECIFIC OUTCOME 6

Restore the site as per company-specific procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

Established in terms of Act 58 of 1995

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 53

Perform fault-finding and repairs on an electrical railway signalling cable

SAQA US ID	*UNIT STANDARD TITLE*
116889	Perform fault-finding and repairs on an electrical railway signalling cable

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 4	4

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform fault-finding and repair tasks on a railway signa

SPECIFIC OUTCOME 2

Diagnose and locate a fault on a railway signalling cable by using a prescribed fault-finding proced

SPECIFIC OUTCOME 3

Repair the faulty railway signalling cable.

SPECIFIC OUTCOME 4

Perform prescribed tests to verify that the cable is correctly repaired and hand over repaired railw

SPECIFIC OUTCOME 5

Communicate with control and/or relevant role players before, during and on completion of the fault-

SPECIFIC OUTCOME 6

Restore the site as per company-specific procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

Established in terms of Act 58 of 1995

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 54

Perform fault-finding and repairs on electrical points

SAQA US ID	*UNIT STANDARD TITLE*
116886	Perform fault-finding and repairs on electrical points

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 4	8

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform fault-finding and repair tasks on an electrical p

SPECIFIC OUTCOME 2

Diagnose and locate a fault on electrical points.

SPECIFIC OUTCOME 3

Repair the faulty electrical points.

SPECIFIC OUTCOME 4

Perform relevant functional tests to verify the correct operation of the repaired equipment and re-i

SPECIFIC OUTCOME 5

Communicate with control and/or relevant role players before, during and on completion of the fault-

SPECIFIC OUTCOME 6

Restore the site as per company procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

Established in terms of Act 58 of 1995

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 55

Perform fault-finding and repairs on railway signalling interlocking equipment

SAQA US ID	*UNIT STANDARD TITLE*
116883	Perform fault-finding and repairs on railway signalling interlocking equipment

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 4	16

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform fault-finding and repair tasks on railway signall

SPECIFIC OUTCOME 2

Diagnose and locate a fault on railway signalling interlocking equipment by using prescribed fault-f

SPECIFIC OUTCOME 3

Repair the faulty railway signalling interlocking equipment.

SPECIFIC OUTCOME 4

Perform prescribed functional tests to verify the correct operation of the repaired equipment and re

SPECIFIC OUTCOME 5

Communicate with control and/or relevant role players before, during and on completion of the fault-

SPECIFIC OUTCOME 6

Restore the site as per company-specific procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 56

Perform fault-finding and repairs on railway signalling power supply equipment

SAQA US ID	*UNIT STANDARD TITLE*
116885	Perform fault-finding and repairs on railway signalling power supply equipment

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 4	7

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform fault-finding and repair tasks on railway signall

SPECIFIC OUTCOME 2

Diagnose and locate a fault on railway signalling power supply equipment.

SPECIFIC OUTCOME 3

Perform relevant functional tests to verify the correct operation of the repaired equipment and re-i

SPECIFIC OUTCOME 4

Communicate with control and/or relevant role players before, during and on completion of the fault-

SPECIFIC OUTCOME 5

Restore the site as per company-specific procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 57

Perform fault-finding and repairs up to modular level on an axle counter

SAQA US ID	*UNIT STANDARD TITLE*
116859	Perform fault-finding and repairs up to modular level on an axle counter

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 4	5

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform fault-finding and repair tasks safely and correct

SPECIFIC OUTCOME 2

Diagnose and locate a fault up to modular level on an axle counter.

SPECIFIC OUTCOME 3

Repair the faulty axle counter up to modular level.

SPECIFIC OUTCOME 4

Perform relevant functional tests to verify the correct operation of the repaired equipment and re-i

SPECIFIC OUTCOME 5

Communicate with control and/or relevant role players before, during and on completion of the fault-

SPECIFIC OUTCOME 6

Restore the site as per company-specific procedures, policies and instructions.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

Established in terms of Act 58 of 1995

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD: 58

Perform routine preventive maintenance on a flashlight and boom level crossing warning system

SAQA US ID	*UNIT STANDARD TITLE*
116861	Perform routine preventive maintenance on a flashlight and boom level crossing warning system

SGB NAME	*ABET BAND*	*PROVIDER NAME*
SGB Electrical Engineering & Construction	Undefined	

FIELD DESCRIPTION	*SUBFIELD DESCRIPTION*
Physical Planning and Construction	Electrical Infrastructure Construction

UNIT STANDARD CODE	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
PPC-EIC-0-SGB ECC	Regular	Level 4	3

Specific Outcomes:

SPECIFIC OUTCOME 1

Plan and procure the resources required to perform routine preventive maintenance (RPM) tasks safely

SPECIFIC OUTCOME 2

Perform routine preventive maintenance (RPM) tasks on a flashlight and boom level crossing warning s

SPECIFIC OUTCOME 3

Identify, prioritise and report the corrective action to take after a defect or substandard has been

SPECIFIC OUTCOME 4

Effectively communicate with control and/or relevant role players before, during and on completion o

SPECIFIC OUTCOME 5

Restore the site as per company-specific procedures, policies and instructions.

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