No. 980 ***7* October *2005***

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

Civil Engineering and Construction

Registered by Organising Field **12,** Physical Planning and Construction, publishes the following qualification and unit standards for public comment.

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the qualification and unit standards 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 7 November 2005.*** All correspondence should be marked **Standards Setting – SGB Civil Engineering and Construction** and addressed to

The Director: Standards Setting and Development
SAQA
*Attention: Mr. E. **Brown***
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DUGMORE MPHUTHING
ACTJNG DIRECTOR: STANDARDS SETTING AND DEVELOPMENT

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

National Certificate: Overhead Track Equipment

SAQA QUAL ID	*QUALIFICATION TITLE*		
50020	National Certificate: Overhead Track Equipment		
SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Civil Engineering Construction		12	
QUALIFICATION TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD*
National Certificate		Physical Planning and Construction	Electrical Infrastructure Construction
ABET BAND	*MINIMUM CREDITS*	*NQF LEVEL*	*QUALIFICATION CLASS*
Undefined	*158*	Level *3*	Regular-Unit Stds Based

PURPOSE AND RATIONALE OF THE QUALIFICATION

Purpose:

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

Qualified learners will be able to:

> Remove, assemble, replace/install and maintain overhead track equipment.
> Obtain, issue and cancel a work permit.
> Communicate effectively with relevant role-players (e.g. peers, managers, etc.) by expressing opinions in spoken and written form.
> Calculate quantities and distances correctly.

The core and elective Unit Standards provide credits that allow the learner access to both vertically and horizontally articulated qualifications in the electrical engineering and construction field. The social status, productivity and employability of the qualifying learner within the electrical engineering and construction field will be enhanced, thereby contributing to the quality and skills required in this field. Learners 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.

Rationale for the qualification:

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

There are 3 qualifications in the Overhead Track Equipment at level 2, 3 and 4. This is the third qualification in the learning pathway. The qualification equips the learner with the skills, knowledge and understanding to safely and correctly remove, assemble, replace/install and maintain Overhead Track Equipment to the required standards and specifications.

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

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

> Enabling the rendering of electrical continuity to the rail transport service.
> Enabling the rendering of a rail transport service.
> Contributing to economic growth.

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

This qualification assumes that learners are competent in:

> Communication at NQF Level 2
> Mathematical Literacy at NQF Level 2

Recognition of prior learning:

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

Access to the qualification:

Learners need to be physically fit and robust.

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

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

Access to the qualification is open to all learners complying with the above-mentioned criteria It would be preferable for learners to first complete the National Certificate in Overhead Track Equipment Level 2 before accessing this 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:
> **36** credits at NQF Level **3**
> **36** credits

Core:
> 6 credits at NQF Level 2
> **56** credits at NQF Level **3**
> **30** credits at NQF Level 4
> Total: 92 credits

Elective:
> **31** credits at NQF Level **3**
> Total: **31** credits

The total credits for this qualification are **159.**

Motivation for the number of credits assigned:

Fundamental credits:

> Twenty credits are allocated to Communication and **16** credits to Mathematical Literacy. All the Fundamental unit standards are compulsory.

Core credits:

> 92 credits have been allocated to the Core Unit Standards to sufficiently cover the field of removal, assembling, installation and maintenance of overhead track equipment. All the Core unit standards are compulsory.

Elective credits:

> **31** credits have been allocated to the Elective Component of the qualification. 20 credits must be selected from this category.

In order to obtain the qualification, the learner needs to complete at least a total of **147** credits as stipulated above.

EXIT LEVEL OUTCOMES

1. Plan and prepare the removal, assembly, replacement/installation and maintenance work on overhead track equipment under isolated and earthed conditions.

2. Remove, assemble, replace/install and maintain overhead track equipment according to overhead track equipment specifications, company-specific instructions and manufacturer's specifications under isolated and earthed conditions.

3. Finalise removal, assembly, replacement/installation and maintenance work on overhead track equipment according to company-specific instructions under isolated and earthed conditions.

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

5. Demonstrate an understanding of the electrical environment in the rail sector.

ASSOCIATED ASSESSMENT CRITERIA

1.

> Relevant documentation is evaluated and interpreted correctly.
> Correct resources and material are procured after evaluating and interpreting relevant documentation.

Range: (This includes but is not limited to required personnel, transport, tools and lifting equipment)

> Problems regarding the correctness, quantity and quality of materials, parts and components as measured against quantities needed and material specifications are solved to perform the tasks of removal, assembly, replacement/installation and maintenance work on overhead track equipment, effectively under isolated and earthed conditions.

2.

> Overhead track equipment is removed, assembled, replaced/installed and maintained under isolated and earthed conditions safely and correctly as per overhead track equipment specifications, company-specific instructions and manufacturer's specifications.

> Clearance is worked "live" on overhead track equipment while performing the removal, replacement/installation and maintenance work on "live" high-voltage overhead track equipment.

> Problems regarding the suitability and functionality of equipment and tools are solved effectively by demonstrating the knowledge required for identifying sub-standards and by being able to improvise within acceptable overhead track practices. Resources are utilised and the task executed safely and responsibly.

> The use and function of the equipment being installed are explained in relation to the overhead track system correctly in terms of overhead track practices and philosophies.

3.

> Tools, equipment and material are removed safely and correctly according to company-specific instructions.

> Problems regarding finalisation of the removal, assembly, replacement/installation and maintenance work are solved under isolated and earthed conditions by demonstrating the knowledge required for identifying sub-standards and by being able to improvise within acceptable overhead track practices.

> Resources are utilised correctly and the task executed safely and responsibly.

> Work permit is obtained and cancelled within the framework of company-specific communication protocol.

4.

> Information is presented in a timely manner in the required format and to appropriate parties as stipulated in company specific policies and procedures.

> Relevant communication media and protocol are used correctly while performing tasks.

> Verbal communication is clear and concise.

> Complete documentation relating to the task in recognisable writing and as per company-specific instructions.

> Procedures for reporting and recording of potential hazards is followed according to organisational procedure.

5.

> Safe work procedures and instructions are explained and applied to work safely in the vicinity of or near high-voltage electrical systems.

> An understanding of the rail and OHTE environment is demonstrated as per company specifications.

> Information from visual high-voltage indicators is evaluated and reacted to critically.

> The inter-relatedness of systems within the rail sector and the importance of applying the electrical safety instructions are understood in an electrical environment.

> Sub-standard conditions relating to high-voltage overhead track equipment are identified and reported in accordance with company-specific instructions.

Integrated assessment:

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

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

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

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

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

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

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

INTERNATIONAL COMPARABILITY

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

Units of competencies related to overhead track equipment as generated in Australia were obtained from the National Training Information Service (Web Site: www.ntis.gov.au), Certificate (Levels 1 - 4) 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 overhead track equipment in other African countries where overhead track equipment is utilised.

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

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 overhead track equipment were aligned to these ideals.

ARTICULATION OPTIONS

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

Vertical articulation is possible with:

> FETC: NC: Overhead Track Equipment at NQF Level 4
> FETC: NC: Railway Signalling: Faultfinding and Repair of Equipment at NQF Level 4
> NC: Electrical Engineering at NQF Level 4

Horizontal articulation is possible with:

> NC: Railway Signalling and Scheduled Maintenance of Equipment at NQF Level 3
> NC: Electrical Engineering at NQF Level 3

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

> Any institution offering learning that will enable the achievement of this Qualification must be accredited as a provider with the relevant (ETQA) Body, or with an ETQA that has a Memorandum of Understanding with the relevant ETQA.

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

> Moderation must include both internal and external moderation of assessments at exit points of the Qualification, unless ETQA policies specify otherwise. Moderation should also encompass achievement of

the competence described both in individual Unit Standards as well as the integrated competence described in the Qualification.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

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

> Be registered as assessors with the relevant ETQA or with an ETQA that has a Memorandum of Understanding with the relevant ETQA body.

> Be in possession of a relevant qualification in OHTE or Electrical Engineering at least at NQF Level 4 or above.

> Have practical work experience in the OHTE environment.

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	120215 Install a height gauge	Level 2	2	Draft - Prep for P Comment
core	120217 Manufacture, remove, install or replace and adjust and/or position droppers on overhead traction equipment (OHTE)	Level 2	4	Draft - Prep for P Comment
COre	10894 Interpret electrical circuits	Level 3	2	Registered
Core	116438 Operate earthing devices on electrical networks	Level 3	5	Registered
Core	120218 Assemble and fit small steelwork to overhead traction equipment (OHTE) steel structures under isolated and earthed conditions	Level 3	12	Draft - Prep for P Comment
core	120219 Erect, assemble and fit Overhead Track Equipment steelwork under isolated and earthed conditions	Level 3	15	Draft - Prep for P Comment
core	120222 Install and secure overhead traction equipment (OHTE) switches under isolated and earthed conditions	Level 3	11	Draft - Prep for P Comment
Core	120232 Prepare and Install OHTE conductors under isolated and earthed conditions	Level 3	11	Draft - Prep for P Comment
Core	119881 Prepare a booster return conductor on 25/50 kV AC OHTE under isolated and earthed conditions	Level 4	9	Recommended
cOre	119883 Remove, replace/install and adjust section insulator/phase break/runners on 25/50Kv AC OHTE under isolated and earthed conditions	Level 4	9	Recommended
cOre	119890 Sag and tension overhead conductors on OHTE under isolated and earthed conditions	Level 4	12	Recommended
Elective	116253 Operate a truck mounted loader crane	Level 2	20	Registered
Elective	14623 Afford on-track protection	Level 3	5	Registered
Elective	120216 Obtain, issue and cancel a work permit	Level 3	6	Draft - Prep for P Comment
Fundamental	7456 Use mathematics to investigate and monitor the financial aspects of personal, business and national issues	Level 3	5	Reregistered
Fundamental	8968 Accommodate audience and context needs in oral communication	Level 3	5	Reregistered
Fundamental	8969 Interpret and use information from texts	Level 3	5	Reregistered
Fundamental	8970 Write texts for a range of communicative contexts	Level 3	5	Reregistered
Fundamental	8973 Use language and communication in occupational learning programmes	Level 3	5	Reregistered
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	Reregistered

Fundamental	9012 Investigate life and work related problems using data and probabilities	Level 3	5	Reregistered
Fundamental	9013 Describe, apply, analyse and calculate shape and motion in 2-and 3-dimensional space in different contexts	Level 3	4	Reregistered

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UNIT STANDARD: **1**

Install a height gauge

SAQA US ID	*UNIT STANDARD TITLE*		
120215	Install a height gauge		
SGB Civil Engineering (Construction	**12**		
UNIT STANDARD TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular		Physical Planning and Construction	Civil Engineering Construction
ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	2	Level 2	Regular

SPECIFIC OUTCOME 1

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

SPECIFIC OUTCOME 2

Prepare to install a height gauge.

SPECIFIC OUTCOME 3

Install a height gauge to company specific instructions and procedures.

SPECIFIC OUTCOME 4

Finalise the installation of a height gauge.

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UNIT STANDARD: **2**

Manufacture, remove, install or replace and adjust and/or position droppers on overhead traction equipment (OHTE)

SAQA US ID	*UNIT STANDARD TITLE*
120217	Manufacture, remove, install or replace and adjust and/or position droppers on overhead traction equipment (OHTE)

SGB NAME	*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Civil Engineering Construction	12	
UNIT STANDARD TYPE	***ORGANISING FIELD DESCRIPTION***	***SUBFIELD DESCRIPTION***
Regular	Physical Planning and Construction	Civil Engineering Construction

ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	4	Level 2	Regular

SPECIFIC OUTCOME 1

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

SPECIFIC OUTCOME 2

Prepare to manufacture, remove, install/replace and adjust/position overhead droppers.

SPECIFIC OUTCOME 3

Manufacture droppers in accordance with dropper manufacturing procedures and specifications.

SPECIFIC OUTCOME 4

Remove, install/replace and position/adjust droppers in accordance with dropper installation and replacement procedures.

SPECIFIC OUTCOME 5

Finalise the manufacturing, removal, installation/replacement and adjust/position of droppers.

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UNIT STANDARD: **3**

SAQA US ID	*UNIT STANDARD TITLE*
120218	Assemble and fit small steelwork to overhead traction equipment (OHTE) steel structures under isolated and earthed conditions

SGB NAME	*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Civil Engineering Construction	**12**	
UNIT STANDARD TYPE	***ORGANISING FIELD DESCRIPTION***	***SUBFIELD DESCRIPTION***
Regular	Physical Planning and Construction	Civil Engineering Construction

ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	**12**	Level **3**	Regular

SPECIFIC OUTCOME **1**

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

SPECIFIC OUTCOME 2

Prepare to assemble and fit small steelwork to OHTE steel structures.

SPECIFIC OUTCOME 3

Assemble and fit small steelwork on OHTE steel structures according to company specific instructions and manufacturer's specifications.

SPECIFIC OUTCOME 4

Finalise the assembling and fitting of small steelwork on OHTE steel structures,

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UNIT STANDARD: **4**

SAQA US ID	***UNIT STANDARD TITLE***		
120219	Erect, assemble and fit Overhead Track Equipment steelwork under isolated and earthed conditions		
SGB NAME		***ORGANISING FIELD ID***	***PROVIDER NAME***
SGB Civil Engineering Construction		**12**	
UNIT STANDARD TYPE		***ORGANISING FIELD DESCRIPTION***	***SUBFIELD DESCRIPTION***
Regular		Physical Planning and Construction	Civil Engineering Construction
ABET BAND	***CREDITS***	***NQF LEVEL***	***UNIT STANDARD TYPE***
Undefined	15	Level **3**	Regular

SPECIFIC OUTCOME 1

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

SPECIFIC OUTCOME 2

Prepare to erect, assemble and fit Overhead Track Equipment steelwork.

SPECIFIC OUTCOME 3

Erect, assemble and fit OHTE steelwork according to company specific-instructions and manufacturer's specifications.

SPECIFIC OUTCOME 4

Finalise the erection, assembly and fitting of OHTE steelwork.

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UNIT STANDARD: ***5***

Install and secure overhead traction equipment (OHTE) switches under isolated and earthed **conditions**

SAQA US ID	*UNIT STANDARD TITLE*		
120222	Install and secure overhead traction equipment (OHTE) switches under isolated and earthed conditions		
SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Civil Engineering Construction		12	
UNIT STANDARD TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular		Physical Planning and Construction	Civil Engineering Construction
ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	11	Level 3	Regular

SPECIFIC OUTCOME 1

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

SPECIFIC OUTCOME 2

Prepare to install, secure and adjust OHTE switches.

SPECIFIC OUTCOME 3

Install, secure and adjust OHTE switches in according to company-specific instructions and manufacturer's specifications.

SPECIFIC OUTCOME 4

Finalise the installation, secure and adjustment of OHTE switches.

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UNIT STANDARD: 6

Prepare and install OHTE conductors under isolated and earthed conditions

SAQA US ID	*UNIT STANDARD TITLE*
120232	Prepare and install OHTE conductors under isolated and earthed conditions

SGB NAME	*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Civil Engineering Construction	12	

UNIT STANDARD TYPE	*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular	Physical Planning and Construction	Civil Engineering Construction

ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	11	Level 3	Regular

SPECIFIC OUTCOME 1

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

SPECIFIC OUTCOME 2

Prepare and install OHTE conductors.

SPECIFIC OUTCOME 3

Prepare and install OHTE conductors in according to company-specific instructions and manufacturer's specifications.

SPECIFIC OUTCOME 4

Finalise the installation of OHTE conductors.

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UNIT STANDARD: ***7***

SAQA US ID	*UNIT STANDARD TITLE*
120216	Obtain, issue and cancel a work permit

SGB NAME	*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Civil Engineering Construction	12	
UNIT STANDARD TYPE	*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular	Physical Planning and Construction	Civil Engineering Construction

ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	*6*	Level *3*	Regular

SPECIFIC OUTCOME 1

Obtain work permit.

SPECIFIC OUTCOME 2

Cancel work permit.