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SOUTHAFRICAN QUALIFICATIONS AUTHORITY (SAQA)

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


Civil Engineering Construction

publishes the following unit standards for public comment.

This notice contains the titles, fields, subfields, NQF levels, credits, and purpose of the qualification and unit standards. The qualification and unit standards can be accessed via the SAQA web-site at www.saga.org.za. Copies may also be obtained from the Directorate of Standards Setting and Development at the SAQA offices, Hatfield Forum West, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the qualification and unit standards should reach **SAQA** at the address below and no later **than 11 July 2005**. All correspondence should be marked Standards Setting - SGB Civil Engineering Construction and addressed to

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ACTING DIRECTOR: STANDARDS SETTING AND DEVELOPMENT



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

National Certificate: Construction: Geotechnical

SAQA QUAL ID		QUALIFICATION TITLE	
49602		National Certificate: Construction: Geotechnical	
SGB NAME		NSB 12	PROVIDER NAME
SGB Civil Engineering Construction		Physical Planning and Construction	
QUAL TYPE		FIELD	SUBFIELD
National Certificate		Physical Planning and Construction	Civil Engineering Construction
ABET BAND	MINIMUM CREDITS	NQF LEVEL	QUALIFICATION CLASS
Undefined	145	Level 3	Regular-Unit Stds Based

PURPOSE AND RATIONALE OF THE QUALIFICATION

Purpose

This qualification is aimed at people who work or intend to work within a construction context on a site, and who seek recognition for essential skills in construction operations in the geotechnical field.

Recipients of this qualification will have the knowledge and skills to conduct the essential operations associated with efficient and safe work in the geotechnical field.

The qualification is designed to be flexible and accessible so that people are able to demonstrate the competencies required to work safely in construction generally and more specifically in the geotechnical field.

People credited with this qualification are able to:

- > Communicate in a variety of ways
 - > Use mathematics in real life situations
 - > Work safely on a geotechnical construction site
 - > Conduct site administration
 - > Supervise work groups
 - > Demonstrate knowledge of construction materials
 - > Conduct basic setting out
- And one of
- > Install geotechnical foundations
 - > Apply trenchless technology procedures
 - > Apply small diameter boring systems

Rationale

The introduction of a unit standard based National Certificate in **Construction: Geotechnical** at NQF level 3, will allow learners to develop skills required for geotechnical work conditions. The generic competence contained in the Fundamental and Core learning, enhances portability - enabling learners to transfer this competence to other areas of specialisation within the Construction Industry.

The majority of the candidates learning towards this qualification are likely to be working in the construction sector. The qualification will give them the opportunity to balance their practical skills with the essential knowledge needed to earn a formal qualification in construction without formal education becoming an impassable barrier.

There is also a critical need in the industry to identify people who are able to conduct the essential operations associated with efficient and safe construction work in the geotechnical field.

RECOGNIZE PREVIOUS LEARNING?

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LEARNING ASSUMED TO BE IN PLACE

It is assumed that candidates embarking on learning towards this qualification are already competent in the following areas:

- > Communication NQF level 2.
- > Mathematical literacy NQF level 2
- > Basic knowledge of **construction** works
- > Safe work practices on a construction site
- > Working **effectively** as part of a team

Recognition of prior learning

This qualification can be achieved wholly or in part **through** recognition of prior learning .

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.

All such evidence should be judged according to the general principles of assessment described in the note to **assessors**.

QUALIFICATION RULES

Fundamental

- > 20 Communications credits from the list **specified**
- > 16 Mathematical Literacy credits from the list **specified**

Core

- > All 94 credits from the list **of** standards generic to construction

Elective

- > Learners are to choose all the unit standards totalling 15 credits in one of the specialist areas.

Summary of credit composition

Fundamental

Level 3 - 36

Total: 36

Core

Level 2 - 18

Level 3 - 58

Level 4 - 18

Total: 94

Elective

Level 3 - 15

Total: 15

Total: 145

EXIT LEVEL OUTCOMES

1. Communicate in a variety of ways.
2. Use mathematics in real life situations.
3. Work safely on a geotechnical construction site.
4. Conduct site administration.
5. Supervise work groups.
6. Demonstrate knowledge of construction materials.
7. Conduct basic setting out.
8. Install geotechnical foundations.
9. Apply trenchless technology procedures.
10. Apply small diameter boring systems.

ASSOCIATED ASSESSMENT CRITERIA

1.
 - > A critical awareness of language usage is shown
 - > Information is analysed and presented
 - > Communication is appropriate to the purpose and situation
2.
 - > Mathematical methods are interpreted for different contexts
 - > Algebraic notation and terminology is used appropriately
 - > Maps are used to enhance communication methods
 - > Cultural products are analysed in terms of shape, space and Ume
3.
 - > Work is conducted in accordance with workplace safety requirements
 - > Loads are lifted and moved in accordance with workplace safety requirements
 - > Open holes are made safe prior to workers entering and working therein
 - > Deep excavations are made safe in accordance with workplace safety requirements
4.
 - > Plant and equipment production is recorded in accordance with workplace requirements
 - > Construction drawings are interpreted in terms of original meanings
 - > Reinforcing materials documentation is interpreted in terms of steelfixing requirements
 - > Construction contracts are conducted in accordance with agreed quality standards
5.
 - > Construction plant and equipment is controlled in accordance with workplace requirements
 - > Construction plant and equipment is ensured to be available as and when required on a specific site
 - > Work instructions are communicated to team members
 - > Work is allocated to team members according to their specific skills
 - > Team members are supervised in accordance with workplace requirements
6.
 - > Types of concrete are identified in terms of the common uses
 - > Reasons for using specialised concrete are in accordance with specific work requirements
 - > Different soil types are identified in terms of ease of removal and stability
 - > Ground conditions are identified in terms of workplace safety
7.
 - > Position markers are placed in accordance with workplace requirements
 - > Original survey points are identified and protected in accordance with good survey practices
- a.
 - > Knowledge of various foundation applications is demonstrated
 - > Work is prepared in accordance with project requirements
 - > Work is conducted in accordance with project requirements
 - > Work is completed in accordance with project requirements
9.
 - > Knowledge of various trenchless technology applications is demonstrated
 - > Work is prepared in accordance with project requirements
 - > Work is conducted in accordance with project requirements
 - > Work is completed in accordance with project requirements
10.
 - > Knowledge of various small diameter boring systems is demonstrated
 - > Work is prepared in accordance with project requirements
 - > Work is conducted in accordance with project requirements
 - > Work is completed in accordance with project requirement

This qualification addresses the following Critical Cross-Field Outcomes. The way in which the Critical Cross-Field Outcomes are addressed is presented in detail in the unit standards for this qualification.

- > Identifying and solving problems in which responses display that responsible decisions using critical and creative thinking have been made
- > Working effectively with others as a member of a team, group, organisation, or community

- > Organizing and managing oneself and one's activities responsibly and effectively
- > Collecting, analysing, organizing and critically evaluating information
- > Communicating effectively using visual, mathematical and/or language skills in the modes of oral and/or written persuasion
- > Using science and technology effectively and critically, showing responsibility towards the environment and health of others
- > Demonstrating an understanding of the world as a set of related systems by recognizing that problem-solving contexts do not exist in isolation.

Learning programmes directed towards this qualification will also contribute to the full personal development of each learner and the social and economic development of the society at large, by making individuals aware of the importance of:

- > Reflecting on and exploring a variety of strategies to learn more effectively
- > Participating as responsible citizens in the life of local, national and global communities
- > Being culturally and aesthetically sensitive across a range of social contexts
- > Exploring education and career opportunities; and developing entrepreneurial opportunities.

Integrated Assessment

Integrated assessment provides a requirement for learners 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. To be awarded the qualification, learners must demonstrate competence in all the unit standards in the Fundamental, Core and the chosen Elective components as well as in the Exit Level Outcomes of the qualification.

Evidence is further required that the candidate is able to achieve the purpose of the qualification as a whole at the time of the award of the qualification. Evidence of this may be gathered through various assessment activities.

Notes for assessors:

Assessors should keep the following general principles in mind when designing and conducting assessments:

- > Focus the initial assessment activities on gathering evidence in terms of the main outcomes expressed in the titles of the unit standards to ensure assessment is integrated rather than fragmented. The aim is to declare the person competent in terms of the qualification purpose. Where assessment across titles or at title level is unmanageable, then focus assessment around each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.
- > Make sure evidence is gathered across the entire range, wherever it applies. Assessment activities should be as close to the real performance as possible, and where simulations or role-plays are used, there should be supporting evidence to show the candidate is able to perform in the real situation.
- > All assessments should be conducted in line with the following well documented principles of assessment as defined below:
Principles of assessment:
 - > Appropriate: The method of assessment is suited to the performance being assessed.
 - > Fair: The method of assessment does not present any barriers to achievements, which are not related to the evidence. In particular, the method of assessment is sensitive to language diversity.
 - > Manageable: The methods used make for easily arranged, cost-effective assessments that do not unduly interfere with learning.
 - > Integrated into work or learning: Evidence collection is integrated into the work or learning process where this is appropriate and feasible.
 - > Valid: The assessment focuses on the requirements laid down in the Standard; i.e. the assessment is fit for purpose.
 - > Direct: The activities in the assessment mirror the conditions of actual performance as closely as possible
 - > Authentic: The assessor is satisfied that the work being assessed is attributable to the person being assessed.
 - > Sufficient: The evidence collected establishes that all criteria have been met and that performance to the required Standard can be repeated consistently.
 - > Systematic: Planning and recording is sufficiently rigorous to ensure that assessment is fair.

- > Open: Learners can contribute to the planning and accumulation of evidence. Assessment candidates understand the assessment process and the criteria that apply.
- > Consistent: The same assessor would make the same judgement again in similar circumstances. The judgement made is similar to the judgement that would be made by other assessors.

INTERNATIONAL COMPARABILITY

This qualification and the component unit standards have been compared with similar qualifications from Australia, Europe and the United Kingdom.

The closest match to this qualification is found in the Australian Certificate in Drilling at level 3. The main differences in these qualifications is that the Australian qualification focuses attention on a smaller component, i.e. drilling, and the South African qualification is broader in terms of its scope of coverage.

South Africa is the leader in geotechnical technology on the African continent and this qualification will be useful to construction companies in all of the SADC countries.

ARTICULATION OPTIONS

This qualification has been developed as a progression in specialised or skilled work within the Construction Industry and is intended to facilitate progression to other qualifications in construction, construction related sub-fields and construction supervision. Horizontally it articulates with: Construction Material Manufacturing in particular, this qualification builds on the National Certificate in Construction NQF Level 2 and leads to the Further Education and Training Certificate in the supervision of construction processes.

MODERATION OPTIONS

- > Providers offering learning towards achievement of any of the unit standards that make up this qualification must be accredited through the relevant ETQA.
- > Internal moderation of assessment must take place at the point of assessment with external moderation provided by the relevant ETQA according to the moderation guidelines and the ETQA procedures.
- > Assessors registered with the relevant ETQA must carry out the assessment of candidates for any of the unit standards that make up this qualification.
- > Anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

Assessors wishing to assess candidates against this qualification must have:

- > Registered as an assessor with the relevant ETQA.
- > A relevant qualification in Construction or related industry at NQF level 4 or higher.

NOTES

Range statements

The unit standards provide the details of the ranges within which candidates are required to perform.

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	9964 Apply health and safety to a work area	Level 2	3	Reregistered
core	9986 Apply quality principles on a construction site	Level 2	12	Registered
Core	116578 Read and interpret reinforcing materials documentation	Level 2	3	Registered
core	11694 Undertake tape and offset surveying	Level 3	5	Reregistered
Core	14580 Read and interpret construction drawings and specifications	Level 3	10	Registered
core	119524 identify different soil types and ground conditions	Level 3	6	Draft-Prep for P Comment
core	119526 Implement safety procedures for open hole or deep excavations	Level 3	4	Draft - Prep for P Comment

core	119527 Lift and move a load on a construction site	Level3	15	Draft - Prep for P Comment
core	119531 Maintain production records for plant and equipment on a construction site	Level3	9	Draft - Prep for P Comment
Core	119533 Supervise and control the use of construction plant and equipment	Level3	9	Draft * Prep for P Comment
Core	14417 Lead and supervise construction teams	Level4	8	Registered
Core	15183 Demonstrate knowledge of concrete construction technology	Level4	10	Registered
Elective	116931 Use a Graphical User Interface (GUI)-based web-browser to search the Internet	Level2	4	Registered
Elective	9968 Procure materials, tools and equipment	Level3	6	Registered
Elective	116930 Use a Graphical User Interface (GUI)-based presentation application to enhance presentation appearance	Level3	5	Registered
Elective	116936 Use a Graphical User Interface (GUI)-based database application to work with simple databases	Level3	3	Registered
Elective	119534 Supervise the application of trenchless technology procedures	Level3	15	Draft - Prep for P Comment
Elective	119535 Supervise the installation of foundation applications	Level3	15	Draft - Prep for P Comment
Elective	119536 Supervise the process of small bore drilling	Level 3	15	Draft - Prep for P Comment
Elective	119520 Conduct acceptance criteria testing for completed geotechnical work	Level4	8	Draft - Prep for P Comment
Fundamental	7456 Use mathematics to investigate and monitor the financial aspects of personal, business and national issues	Level3	5	Reregistered
Fundamental	8968 Accommodate audience and context needs in oral communication	Level3	5	Reregistered
Fundamental	8969 Interpret and use information from texts	Level3	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	Level3	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	Level3	2	Reregistered
Fundamental	9012 Investigate life and work related problems using data and probabilities	Level3	5	Reregistered
Fundamental	9013 Describe, apply, analyse and calculate shape and motion in 2- and 3-dimensional space in different contexts	Level3	4	Reregistered



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Identify different soil types and ground conditions

SAQA US ID	UNIT STANDARD TITLE		
119524	Identify different soil types and ground conditions		
SGB NAME	NSB 12	PROVIDER NAME	
SGB Civil Engineering Construction	Physical Planning and Construction		
UNIT STANDARD TYPE	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

Differentiate between types of soils.

SPECIFIC OUTCOME 2

Identify cohesiveness and stability of soil types.

SPECIFIC OUTCOME 3

Identify soft and hard rock masses.

SPECIFIC OUTCOME 4

Identify the presence of ground water.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Implement safety procedures for open hole or deep excavations

SAQA US ID	UNIT STANDARD TITLE		
119526	Implement safety procedures for open hole or deep excavations		
SGB NAME	NSB 12	PROVIDER NAME	
SGB Civil Engineering Construction	Physical Planning and Construction		
UNIT STANDARD TYPE	FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Physical Planning and Construction	Civil Engineering Construction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	4	Level 3	Regular

SPECIFIC OUTCOME 1

Explain the legal responsibilities for Health & Safety when working in or alongside excavations.

SPECIFIC OUTCOME 2

Identify unsafe working conditions relating to excavations.

SPECIFIC OUTCOME 3

Determine methods of achieving health & safety when working in or alongside excavations.

SPECIFIC OUTCOME 4

Undertake responsibility for safety of self and others.

SPECIFIC OUTCOME 5

Conduct safe work practices.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:**Lift and move a load on a construction site**

SAQA US ID	UNIT STANDARD TITLE		
119527	Lift and move a load on a construction site		
SGB NAME	NSB 12	PROVIDER NAME	
SGB Civil Engineering Construction	Physical Planning and Construction		
UNIT STANDARD TYPE	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

Explain the factors **critical** to lifting and moving loads.

SPECIFIC OUTCOME 2

~~Prepare to lift and move a load.~~

SPECIFIC OUTCOME 3

Lift and move a load.

SPECIFIC OUTCOME 4

Make the load available for production purposes.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

SAQA US ID	UNIT STANDARD TITLE		
119531	Maintain production records for plant and equipment on a construction site		
SGB NAME	NSB 12	PROVIDER NAME	
SGB Civil Engineering Construction	Physical Planning and Construction		
UNIT STANDARD TYPE	FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Physical Planning and Construction	Civil Engineering Construction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	9	Level 3	Regular

SPECIFIC OUTCOME 1

Confirm recording requirements on site.

SPECIFIC OUTCOME 2

Complete time, log and production sheets.

SPECIFIC OUTCOME 3

Monitor performance levels.

SPECIFIC OUTCOME 4

Store and communicate records.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

SAQA US ID	UNIT STANDARD TITLE		
119533	Supervise and control the use of construction plant and equipment		
SGB NAME	NSB 12	PROVIDER NAME	
SGB Civil Engineering Construction	Physical Planning and Construction		
UNIT STANDARD TYPE	FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Physical Planning and Construction	Civil Engineering Construction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	9	Level 3	Regular

SPECIFIC OUTCOME 1

Demonstrate knowledge of construction plant and equipment.

SPECIFIC OUTCOME 2

Prepare for construction activities.

SPECIFIC OUTCOME 3

Monitor production.

SPECIFIC OUTCOME 4

Monitor lubrication and maintenance programmes.

SPECIFIC OUTCOME 5

Complete work activities.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

SAQA US ID	UNIT STANDARD TITLE		
119534	Supervise the application of trenchless technology procedures		
SGB NAME	NSB 12	PROVIDER NAME	
SGB Civil Engineering Construction	Physical Planning and Construction		
UNIT STANDARD TYPE	FIELD	DESCRIPTION	
3	Physical Planning and Construction	Civil Engineering Constructor	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	15	Level 3	Regular

SPECIFIC OUTCOME 1

Demonstrate knowledge of various trenchless technology applications.

SPECIFIC OUTCOME 2

Prepare to conduct trenchless technology procedures.

SPECIFIC OUTCOME 3

Supervise the conducting of trenchless technology procedures.

SPECIFIC OUTCOME 4

Complete trenchless technology procedures.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

SAQA US ID	UNIT STANDARD TITLE		
SGB NAME	NSB 12	PROVIDER NAME	
SGB Civil Engineering Construction	Physical Planning and Construction		
UNIT STANDARD TYPE	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

Demonstrate knowledge of various foundation types.

SPECIFIC OUTCOME 2

Prepare to install foundation applications.

SPECIFIC OUTCOME 3

Supervise the installation of foundation applications.

SPECIFIC OUTCOME 4

Complete foundation applications.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

SAQA US ID	UNIT STANDARD TITLE		
119536	Supervise the process of small bore drilling		
SGB NAME	NSB 12	PROVIDER NAME	
SGB Civil Engineering Construction	Physical Planning and Construction		
UNIT 11	TYPE	FIELD DESCRIPTION	SUBFIELD DESCRIPTION
Regular		Physical Planning and	Civil Engineering Con
ABET BAND	CREDITS	NQF LEVEL	UNIT 11 TYPE
Undefined	15	Level 3	

SPECIFIC OUTCOME 1

Demonstrate knowledge of small bore drilling.

SPECIFIC OUTCOME 2

Prepare to conduct a drilling application.

SPECIFIC OUTCOME 3

Supervise the drilling process.

SPECIFIC OUTCOME 4

Complete drilling applications.

SPECIFIC OUTCOME 5

Explain health and safety measures required on construction sites.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

SAQA US ID	UNIT STANDARD TITLE		
119520	Conduct acceptance criteria testing for completed geotechnical work		
SGB NAME	NSB 12	PROVIDER NAME	
SGB Civil Engineering Construction	Physical Planning and Construction		
UNIT STANDARD TYPE	FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Physical Planning and Construction	Civil Engineering Construction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	8	Level 4	Regular

SPECIFIC OUTCOME 1

Plan to conduct tests.

SPECIFIC OUTCOME 2

Prepare to conduct tests.

SPECIFIC OUTCOME 3

Conduct tests.

SPECIFIC OUTCOME 4

Complete tests.

SPECIFIC OUTCOME 5

Explain health and safety measures required on construction sites.