GOVERNMENT NOTICES

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

No. 327 **27 March 2009**

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

Forestry

registered by Organising Field 01 – Agriculture and Nature Conservation, 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 Qualifications and Unit Standards. The full Qualifications 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, SAQA House, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the Qualifications and Unit Standards should reach SAQA at the address below and ***no later than 27 April 2009.*** All correspondence should be marked **Standards Setting – SGB for Forestry** and addressed to

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SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:
Further Education and Training Certificate: Roof Truss Technology

SAQA QUAL ID	***QUALIFICATION TITLE***		
66370	Further Education and Training Certificate: Roof Truss Technology		
ORIGINATOR		***PROVIDER***	
SGB Forestry			
QUALIFICATION TYPE	***FIELD***	***SUBFIELD***	
Further Ed and Training Cert	1 - Agriculture and Nature Conservation	Forestry and Wood Technology	
ABET BAND	***MINIMUM CREDITS***	***NQF LEVEL***	***QUAL CLASS***
Undefined	131	Level 4	Regular-Unit Stds Based

This qualification does not replace any other qualification and is not replaced by another qualification.

PURPOSE AND RATIONALE OF THE QUALIFICATION
Purpose:

The purpose of this qualification is to provide entry level and foundational competencies in the area of roof truss technology. The qualification enables the qualifying person with integrated competencies, in various contexts, workplace, learning and education to:

> Interpret a roof plan in order to estimate quantities for roof design in compliance with client expectations and legislative requirements.
> Demonstrate knowledge of roof truss technology, concepts and required solutions to interpret roof design for estimation.
> Interface with the client to determine and confirm client needs.

The qualification seeks to address an existing gap in the wood processing sector for reasons of consistency and standardization within the occupational context. It addresses the need for persons wanting to acquire the roof truss estimation qualification.

Qualifying learners will be able to:

> Establish client requirements and gather and apply required design information.
> Use a GUI-based word processor to enhance a document through the use of tables and columns.
> Develop and maintain effective working relationship with clients.
> Process roof layout documents in a compliant manner.
> Apply knowledge of roof terminology and concepts.
> Identify structural material required for a roof design.
> Explain the dynamic interaction of the various elements to a functional roof structure.
> Recommend material best suited for roof design within context.
> Calculate pitch, height and span using trigonometric equations.
> Demonstrate knowledge of industry legislation, the various stakeholders, their responsibilities, and compliance requirements.
> Interpret roof design for a roof solution.
> Estimate the quantity of material required for roof design.
> Apply problem solving strategies.

Rationale:

Roof estimation for roof design purposes is a specialised occupation within the forestry and wood processing subfield. There is currently a high demand for competent persons at this level (NQF Level 4) to address the need for roof estimation personnel for the various sectors that make use of this competence. This includes building construction persons, roof designers and manufacturers and wood processing agents and public clients in need of the various roof solutions.

This qualification serves as a foundational base and an entry point for the next level: roof design. Roof design is at NQF Level 5.

The roof estimation competence is designed for persons who have achieved grade 11 and or an equivalent qualification, (NCV) with maths and science. This includes persons at the workplace with the equivalent workplace and life experience.

This qualification enables qualifying persons to acquire all the foundational competencies in, mainly, the various knowledge areas of legislation, the various roof estimation practices, sector and or specific roof estimation norms and standards and key mathematical concepts and applications (calculations).

It is foundational in nature as it introduces the learner, worker or RPL person to the basic concepts that will enable the learner to practice as a roof estimator.

The key requirement is a reasonable level of Mathematical Literacy and related concepts that will enable the qualifying person to deal with challenges of scale, height, angles, span and estimation.

This qualification allows for access to previously disadvantaged persons to the profession through RPL by means of matching the relevant work and life experience with the requirements of the relevant unit standard. The NQF principles (portability, progression) will be realized through the articulation path suggested for the qualification.

It is through this qualification that the needs of the various stakeholders, mentioned above, will be met.

RECOGNIZE PREVIOUS LEARNING?
Y

LEARNING ASSUMED IN PLACE
This qualification assumes that learners are already competent in:

> Communication and Mathematical Literacy at NQF Level 3.

Recognition of Prior Learning:

This qualification can be achieved wholly or in part through Recognition of Prior Learning.

Whether a learner attends formal courses or acquires the required skills through informal means, the same standards apply as per the matrix of unit standards and Exit Level Outcomes. The qualification and the standards have been written in such a way that the learning has to be assessed in an integrated way. Assessors will assess evidence to establish what the learners know, understand and can do. Such evidence may be gathered through course related activities and/or through work related activities. In cases where candidates do not attend formal courses, assessors should seek work related evidence as far as possible.

Assessors should ensure that learners submitting themselves to RPL are thoroughly briefed prior to assessment. Learners will be required to submit a Portfolio of Evidence in the prescribed format to be assessed for formal recognition.

Where courses are provided for learners, institutions can use the unit standards and this qualification to assess learning achievements. For learners who are not able to achieve the outcomes, providers can then use the standards and qualifications to determine a specific learning program to suit the learning needs of the candidates.

Access to Qualification:

> Access to this qualification is open however bearing in mind learning assumed to be in place.

QUALIFICATION RULES
The qualification consists of:

Fundamental, Core and Elective unit standards. A minimum of 131 credits is required to achieve this qualification. The credits are allocated as follows:

> 56 credits from the Fundamental component are compulsory for all the learners.

The fundamental component consists of the following learning:

> Unit standards at NQF Level 4, totalling 16 credits in Mathematical literacy.
> Unit standards at NQF Level 4, totalling 20 credits in Communication in a First South African Language.
> Unit standards at NQF Level 3, totalling 20 credits in Communication in a Second South African Language.

It is therefore compulsory for learners to do Communication in two different South African languages, one at NQF Level 4 and the other at NQF Level 3.

69 credits from the Core component are compulsory for all learners.

For the elective component, the qualifying learner must choose a minimum of 5 credits in order to meet the qualification requirements.

EXIT LEVEL OUTCOMES
1. Communicate and solve problems by applying practical mathematical applications in a variety of ways.

2. Interpret a roof plan in order to estimate quantities for roof design in compliance with client expectations and legislative requirements.

3. Demonstrate knowledge of roof truss technology, concepts and required solutions to interpret roof design for estimation.

4. Interface with the client to determine and confirm client needs.

Critical Cross Field Outcomes:

Critical cross field outcomes have been addressed by exit level outcomes as follows:

Trigonometric equations - in relation to roof processes and within the context of an awareness of geometric considerations - are undertaken. This is relative to the following critical cross-field outcomes:

> Make decisions and solve problems.
> Technology and science.
> Work effectively with others.
> Information.
> Related systems.

Skills in verbal and written communication in relation to client roofing requirements and the need to maintain effective working relationships are demonstrated, and their need is explained, relative to the following critical cross-field outcomes:

> Make decisions solve problems.
> Organisation Teamwork.
> Communication.
> Information.
> Work effectively with others.

Procedures, logical sequences and requirements for roof estimation for design are identified and discussed, relative to the following critical cross-field outcomes:

> Make decisions solve problems.
> Communication.
> Technology and science.
> Related systems.
> Information.

Consequences of defective material in relation to key estimation and design requirements are explained in terms of legislative and contractual considerations, relative to the following critical cross-field outcomes:

> Make decisions solve problems.
> Communication.
> Technology and science.
> Related systems.
> Information.
> Work effectively with others.

ASSOCIATED ASSESSMENT CRITERIA
Associated Assessment Criteria for Exit Level Outcome 1:

1.1 Client requirements are gathered and communicated.
1.2 Oral communication is maintained and adapted as required to promote effective interaction in a work context.
1.3 Written communication is conducted at an appropriate level for designated target audiences.
1.4 Oral and written communication is conducted at an appropriate level in a second language.
1.5 Mathematical principles and techniques are applied while performing the tasks in the operational context.
1.6 Solutions are recorded and presented at an appropriate level.

Associated Assessment Criteria for Exit Level Outcome 2:

2.1 Quantity of material required for roof design is estimated.

2.2 Roof layout documents are processed as outlined in the specifications.
2.3 Roof design is interpreted for a roof solution according to client's requirements.
2.4 Trigonometric equations are used to calculate pitch, height and span.
2.5 A GUI-based word processor is used to enhance a document through the use of tables and columns.

Associated Assessment Criteria for Exit Level Outcome 3:

3.1 Knowledge of roof terminology and concepts is applied.
3.2 Knowledge of industry legislation, the various stakeholders, their responsibilities, and compliance requirements is demonstrated.
3.3 The dynamic interaction of the various elements to a functional roof structure is explained.
3.4 Structural material required for a roof design is identified.
3.5 Material best suited for roof design within context is recommended.

Associated Assessment Criteria for Exit Level Outcome 4:

4.1 Problem solving strategies are applied.
4.2 Effective working relationship with clients is developed and maintained.
4.3 Client requirements are established and required design information is gathered and applied.

Integrated Assessment:

Integrated assessment evaluates the learner's ability to combine actions and ideas across a range of activities and knowledge areas. The integrated must specifically assess the learner's ability to:

> Demonstrate competence by means of the practical application of the embedded knowledge in a manner that meets the required performance standards required.
> Illustrate a clear understanding of the concepts, theory and principles that underpin the practical action taken.

The assessment will require assessment methods, which measure and evaluate evidence generated during learning and on-the-job activities. Because assessment practices must be open and transparent, fair, valid and reliable; ensuring that no leaner is disadvantaged in any way whatsoever, an integrated assessment approach is incorporated into the qualification.

A variety of methods must be used in assessment tools and activities must be appropriate to the context in which the learner is working or will work. Where it id not possible to assess the learner at the workplace, 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. Whenever possible, the assessment of knowledge, skills, attitudes and values shown in the unit standards should be integrated and, during integrated assessment, the assessor should make use of a range of formative and summative assessment tools and methods. Combinations of practical, applied, foundational and reflective competencies should be assessed. Assessment should further ensure that all specific outcomes, embedded knowledge and critical cross field outcomes are evaluated in an integrated way.

Assessors must assess and give credit for the evidence of learning that has already been acquired through formal, informal and non-formal learning and work experience as the assessment process is capable of being applied to RPL, subject to the rules and criteria of the relevant ETQA.

INTERNATIONAL COMPARABILITY

The qualification was benchmarked against qualifications from New Zealand, United States of America and Australia.

New Zealand:

There are easily comparable similarities between the South African and New Zealand qualifications. Generally, both countries adopt the same approach in their requirement for learners to acquire what are considered "foundational" competencies in roofing/building concepts, i.e.:

> Terminology.
> Knowledge of the broader industry.
> Its norms and the legal requirements.
> Material used.
> Structures used.
> The ability to do related calculations.
> And the interaction between the roof plan, the desired material, wall and roof structure and the intended roof design.

The qualifying learner is able to: Perform building calculations, demonstrate knowledge of preliminary work needed for construction, demonstrate knowledge of compliance with building legislation, demonstrate knowledge of timber used in construction, demonstrate knowledge of working drawings, specifications and quantity lists, describe timber wall framing and components, demonstrate knowledge of equal pitch gable, and hip roof construction, demonstrate knowledge of construction of alternative roof structures.

The majority of the unit standards that express the competencies referred to above, is located in both South Africa and New Zealand, at NQF Level 4.

In New Zealand, these individual unit standards straddle the fields: Planning and Construction and the sub field: Carpentry. The singular South African Roof Truss Technology qualification, which is located within the Forestry and nature conservation field and the forestry and wood processing sub-field, is different from the loose unit standards that make up the competencies referred to above. The different credit weightings of the unit standards may be a function of their location, function and rationale, in their context.

United States of America (USA):

The Texas State Technical College offers a course in Conventional Roof Systems: (CRPT 1411) Construction Management System (120 hrs) at introductory level. Overall, the course is aimed at addressing design and construction skills needed to construct a conventional roof system. This qualification is, at its core, similar to the South African Roof Truss Technology, in many ways. It introduces roof components, types, layout, theory and roof design solutions, together with the attendant calculations.

Equivalents of fundamental and critical cross-field outcomes are included as part of the qualification design. These include the use of critical thinking, reading and writing skills, the need to exhibit professional skills in personal conduct.

The difference is that the Conventional Roof Systems course has a roof and ceiling design component that is not part of the South African Roof Truss Technology qualification.

The Green River Community College in Washington provides a variety of courses, under the title Carpentry Technology, which has similar learning areas with the South African Roof Truss Technology qualification in the following areas:

> Carp 144: Residential Blueprint Reading: This entails how to read and interpret architectural blueprints for residential and light commercial market. The South African Roof Truss Technology qualification is limited to roof map reading skills.

> Carp 145: Star design and Construction, topics covered include Star design factor, Building code requirements. The South African Roof Truss Technology qualification focuses on industry legislation, which comprises the various role players, their responsibilities and the various building codes.

> Carp 148: Material Estimating: Introduction to estimating materials, services and other related costs needed to construct a residential home using general pick- off methods. The focus in the South African Roof Truss Technology qualification is on roof estimation.

> Carp 151: International Residential Code. This includes specific requirements of building codes, energy codes, zoning laws, environmental protection requirements. This is covered under legislation as mentioned above.

Australia:

This South African qualification compares, somewhat in its outlook, with the Australian qualification W263-Certificate IV in Building and Construction (Estimating). The qualification is a nationally recognised building construction (BCG40306) qualification.

It is a level 4 qualification which is aimed at enabling the qualifying learner to read and interpret plans and specifications, develop labour and material schedules, estimate costs for a building project and prepare tender documentation. Qualifying learners learn about building codes and standards and structural principles related to low rise residential and commercial buildings.

Compared to the South African Roof Truss Technology qualification, the Australian qualification is a generic building construction qualification that focuses on the domestic and commercial market. It also has the advantage of having the reading and interpreting of generic construction plans and specifications. In addition, the qualification includes the application of risk management technique, produce labour and material schedules for ordering, which are not part of the roof design qualification.

Canada:

Construction Learning Skills (CLS) is a learning organisation in Ontario, central Canada, which provides a course in construction estimator. The course is in three levels: The learner is introduced, at level 1, to the role and responsibilities of a Construction Estimator. The course also covers the necessary company practices and the critical function of the construction estimator in a construction team. The preparation and procedure for setting up a tender document for a construction project are fully covered in the course. Level 2 introduces the learner to quantity surveying and estimating in order to aid the student in determining material quantities and unit cost for a complete project. Level 3 enables the qualifying learner to work in teams to review specifications, take off quantities, and prepare bid forms for large construction projects.

This is, essentially a construction estimation course that can only be compared to the, South African Roof Truss Technology qualification, from an estimation angle.

SADC:

A number of universities in Africa, including South African universities, offer typical undergraduate and graduate programs in quantity surveying, civil engineering and quantity surveying that comprise all or part of a full qualification.

For example, in its Structural Engineering undergraduate course, the University of Alexandria (Egypt) offers, at undergraduate level, courses, such as Theory of Structures-1(CE 161), which includes the following elements of the Roof Truss Technology qualification:
Types of structures and supports, types of loads, differential relations between loads and internal forces, internal forces in simple, compound, and subdivided trusses and trussed beams.

Other undergraduate courses include Properties of materials 1 (CE 162). However, in relation to the courses offered by the Universities, we were unable to determine the exact nature of the value of the credits in the undergraduate courses, as well as how these would directly articulate with the NQF Level 4 qualification: Roof Truss Technology in South Africa.

Conclusion:

Based on the above, the survey indicates that the Roof Truss Technology qualification is introductory in nature.

The American and New Zealand courses are located in the carpentry sub-field of physical planning and construction.

In contrast, the South African Roof Truss Technology qualification resides in the field Forestry and Nature Conservations, and in the sub filed: forestry and wood processing. The remainder of the components is elements of classical structural engineering.
Accordingly, the core elements of material theory and structure, codes, calculations, map reading and interpretation are consistent across the board.

Despite the above, the South African qualification will always stand out in its insistence on the need to demonstrate the fundamental literacy/communication and numeracy skill in order to address inequalities of the past, and in line with National Qualifications Framework (NQF) principles.

Summary:

In summary, the Roof Truss Technology qualification is a hybrid of physical planning, structural engineering and estimation.

On the one side the are the practical applications of construction's carpentry and on the other side, the elements of quantity surveying, for example, construction cost estimates, schedules of materials controlling the cost of labour, plant and materials.

ARTICULATION OPTIONS
Upon completion of this qualification, the learner will articulate horizontally to:

> ID 49053: National Certificate: Supervision of Construction Processes, NQF Level 4.
> ID 50018: Further Education and Training Certificate: Computer Aided Drawing Office Practice, NQF Level 4.
> ID 50441: National Certificate: (Vocational) Level 4, NQF Level 4.

Vertically to:

> ID 49419: National Diploma: Business Consulting Practice, NQF Level 5.

MODERATION OPTIONS

> Anyone assessing a learner or moderating the assessment of a learner against the qualification must be registered as an assessor with the relevant Education, Training, Quality, Assurance (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 Education, Training, Quality, Assurance (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 Education, Training, Quality, Assurance (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, unless ETQA policies specify otherwise. Moderation should also encompass achievement of the competence described in the associated unit standards.

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

CRITERIA FOR THE REGISTRATION OF ASSESSORS

> Anyone assessing a learner against this qualification with the relevant ETQA as an assessor.

> Any institution offering learning that will enable the achievement this qualification must be accredited as a provider with the relevant ETQA. Assessment will be overseen by the relevant ETQA according to the policies and guidelines for assessment of that ETQA, in terms of agreements reached around assessment and between various ETQA's (including professional bodies).

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

> The options as listed above provide the opportunity to ensure that assessment and moderation can be transparent, affordable, valid reliable and non-discriminatory.

> For an applicant to register as an assessor or moderator of this qualification, the applicant needs:
> To be registered as an assessor with the relevant ETQA.
> To be in possession of the relevant qualification.
> To have sufficient relevant experience.
> To have the appropriate qualification to assess communication and mathematical literacy.

NOTES

N/A

UNIT STANDARDS

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Fundamental	119458	Analyse and respond to a variety of literary texts	Level 3	5
Fundamental	119466	Interpret a variety of literary texts	Level 3	5
Fundamental	119457	Interpret and use information from texts	Level 3	5
Fundamental	119465	Write/present/sign texts for a range of communicative contexts	Level 3	5
Fundamental	12154	Apply comprehension skills to engage oral texts in a business environment	Level 4	5
Fundamental	12155	Apply comprehension skills to engage written texts in a business environment	Level 4	5

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Fundamental	7484	Describe, represent, analyse and explain changes in shape and motion in 2- and 3-dimensional space with justification	Level 4	4
Fundamental	7481	Find the derivatives and integrals of a range of functions including the trigonometric functions and apply these to problems	Level 4	4
Fundamental	7483	Solve problems involving sequences and series in real and simulated situations	Level 4	2
Fundamental	12153	Use the writing process to compose texts required in the business environment	Level 4	5
Fundamental	7470	Work with a wide range of patterns and inverses of functions and solve related problems	Level 4	6
Fundamental	119459	Write/present/sign for a wide range of contexts	Level 4	5
Core	119078	Use a GUI-based word processor to enhance a document through the use of tables and columns	Level 3	5
Core	263794	Apply knowledge and understanding of roof erection document requirements	Level 4	3
Core	263777	Apply knowledge and understanding of roof terminology and concepts	Level 4	4
Core	263795	Apply knowledge and understanding of structural material in the roofing industry	Level 4	6
Core	263762	Apply knowledge and understanding of truss manufacturing in recommendations made for roof design	Level 4	5
Core	14927	Apply problem solving strategies	Level 4	4
Core	263758	Apply trigonometry equations to calculate pitch, height and span	Level 4	4
Core	263776	Demonstrate knowledge of industry legislation, the various stakeholders, their responsibilities, and compliance requirements	Level 4	10
Core	14467	Establish client requirements and gather and apply required design information	Level 4	6
Core	263764	Estimate the quantity of material required for a roof design	Level 4	5
Core	263814	Explain the dynamic interaction of the various elements to a functional roof structure	Level 4	4
Core	263818	Recommend material best suited for roof design	Level 4	5
Core	119173	Develop and maintain effective working relationship with clients	Level 5	8
Elective	263775	Demonstrate an understanding of the impact of wind on roof engineering design	Level 4	10
Elective	14471	Plan drawing layout	Level 4	6
Elective	263842	Demonstrate an understanding of a roofing business environment	Level 5	10
Elective	263841	Identify the structural material specification for a roof design	Level 5	4

LEARNING PROGRAMMES RECORDED AGAINST THIS QUALIFICATION
None

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply trigonometry equations to calculate pitch, height and span

SAQA US ID	*UNIT STANDARD TITLE*		
263758	Apply trigonometry equations to calculate pitch, height and span		
ORIGINATOR		*PROVIDER*	
SGB Forestry			
FIELD		*SUBFIELD*	
1 - Agriculture and Nature Conservation		Forestry and Wood Technology	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 4	4

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
List and discuss the trigonometry equations.

SPECIFIC OUTCOME 2
Apply the relevant trigonometric equation to calculate the height of a truss.

SPECIFIC OUTCOME 3
Apply the relevant trigonometric equation to calculate the span and pitch of a truss.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	66370	Further Education and Training Certificate: Roof Truss Technology	Level 4

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply knowledge and understanding of truss manufacturing in recommendations made for roof design

SAQA US ID	*UNIT STANDARD TITLE*		
263762	Apply knowledge and understanding of truss manufacturing in recommendations made for roof design		
ORIGINATOR		*PROVIDER*	
SGB Forestry			
FIELD		*SUBFIELD*	
1 - Agriculture and Nature Conservation		Forestry and Wood Technology	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 4	5

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Apply an understanding of material selection.

SPECIFIC OUTCOME 2
Apply an understanding of material preparation and accuracy.

SPECIFIC OUTCOME 3
Apply an understanding of manufacturing tolerances.

SPECIFIC OUTCOME 4
Describe the quality control procedure.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	66370	Further Education and Training Certificate: Roof Truss Technology	Level 4

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Estimate the quantity of material required for a roof design

SAQA US ID	*UNIT STANDARD TITLE*		
263764	Estimate the quantity of material required for a roof design		
ORIGINATOR		*PROVIDER*	
SGB Forestry			
FIELD		*SUBFIELD*	
1 - Agriculture and Nature Conservation		Forestry and Wood Technology	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 4	5

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Identify types of materials required.

SPECIFIC OUTCOME 2
Calculate quantities of materials required.

SPECIFIC OUTCOME 3
Complete and submit an estimate.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	66370	Further Education and Training Certificate: Roof Truss Technology	Level 4

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Demonstrate an understanding of the impact of wind on roof engineering design

SAQA US ID	*UNIT STANDARD TITLE*		
263775	Demonstrate an understanding of the impact of wind on roof engineering design		
ORIGINATOR		*PROVIDER*	
SGB Forestry			
FIELD		*SUBFIELD*	
1 - Agriculture and Nature Conservation		Forestry and Wood Technology	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 4	10

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Explain the effect of wind on the roof of a structure.

SPECIFIC OUTCOME 2
Explain the effect of Terrain Category and Class of Buildings on wind force.

SPECIFIC OUTCOME 3
Calculate external and internal pressures on buildings with different shapes and heights.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	66370	Further Education and Training Certificate: Roof Truss Technology	Level 4

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply knowledge and understanding of structural material in the roofing industry

SAQA US ID	*UNIT STANDARD TITLE*		
263795	Apply knowledge and understanding of structural material in the roofing industry		
ORIGINATOR		*PROVIDER*	
SGB Forestry			
FIELD		*SUBFIELD*	
1 - Agriculture and Nature Conservation		Forestry and Wood Technology	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 4	6

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Describe the different materials used in roofing.

SPECIFIC OUTCOME 2
Identify the structural properties and non-compliance of timber and steel.

SPECIFIC OUTCOME 3
Identify the structural connectors and their application.

SPECIFIC OUTCOME 4
Differentiate between the advantages and disadvantages of the different structural materials.

SPECIFIC OUTCOME 5
Identify the specification criteria.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	66370	Further Education and Training Certificate: Roof Truss Technology	Level 4

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply knowledge and understanding of roof terminology and concepts

SAQA US ID	***UNIT STANDARD TITLE***		
263777	Apply knowledge and understanding of roof terminology and concepts		
ORIGINATOR		***PROVIDER***	
SGB Forestry			
FIELD		***SUBFIELD***	
1 - Agriculture and Nature Conservation		Forestry and Wood Technology	
ABET BAND	***UNIT STANDARD TYPE***	***NQF LEVEL***	***CREDITS***
Undefined	Regular	Level 4	4

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Demonstrate an understanding of roofing terminology.

SPECIFIC OUTCOME 2
Demonstrate an understanding of truss terminology and types.

SPECIFIC OUTCOME 3
Demonstrate an understanding of roofing dimensions.

SPECIFIC OUTCOME 4
Identify and describe roofing sundry terms.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	66370	Further Education and Training Certificate: Roof Truss Technology	Level 4

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply knowledge and understanding of roof erection document requirements

SAQA US ID	***UNIT STANDARD TITLE***		
263794	Apply knowledge and understanding of roof erection document requirements		
ORIGINATOR		***PROVIDER***	
SGB Forestry			
FIELD		***SUBFIELD***	
1 - Agriculture and Nature Conservation		Forestry and Wood Technology	
ABET BAND	***UNIT STANDARD TYPE***	***NQF LEVEL***	***CREDITS***
Undefined	Regular	Level 4	3

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Generate the site documents required for roof erection.

SPECIFIC OUTCOME 2
Demonstrate an understanding of the legal impact of confirmation of receipt of site document.

SPECIFIC OUTCOME 3
Demonstrate an understanding of the legal implications of complete/incomplete site details.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	66370	Further Education and Training Certificate: Roof Truss Technology	Level 4

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Demonstrate knowledge of industry legislation, the various stakeholders, their responsibilities, and compliance requirements

SAQA US ID	*UNIT STANDARD TITLE*		
263776	Demonstrate knowledge of industry legislation, the various stakeholders, their responsibilities, and compliance requirements		
ORIGINATOR		*PROVIDER*	
SGB Forestry			
FIELD		*SUBFIELD*	
1 - Agriculture and Nature Conservation		Forestry and Wood Technology	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 4	10

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
List and describe the legislative framework applicable to roofing as per industry standards

SPECIFIC OUTCOME 2
Describe the governance structures, the inspection authorities and the relevant criteria that are applicable to the roofing industry.

SPECIFIC OUTCOME 3
Demonstrate an understanding of the various industry players and their responsibilities in line with the relevant legislation.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	66370	Further Education and Training Certificate: Roof Truss Technology	Level 4

G09-071820—C

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Explain the dynamic interaction of the various elements to a functional roof structure

SAQA US ID	*UNIT STANDARD TITLE*		
263814	Explain the dynamic interaction of the various elements to a functional roof structure		
ORIGINATOR		*PROVIDER*	
SGB Forestry			
FIELD		*SUBFIELD*	
1 - Agriculture and Nature Conservation		Forestry and Wood Technology	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 4	4

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Discuss triangulation and the transfer of the load to the foundations with respect to roof structure.

SPECIFIC OUTCOME 2
Differentiate between load definitions, application and specification with respect to roof structure.

SPECIFIC OUTCOME 3
Identify the difference between, and impact of the different types of structural forces.

SPECIFIC OUTCOME 4
Identify the strength and impact of materials on a structure.

SPECIFIC OUTCOME 5
Describe the methods of connections used in the design and manufacture of trusses.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	66370	Further Education and Training Certificate: Roof Truss Technology	Level 4

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Recommend material best suited for roof design

SAQA US ID	*UNIT STANDARD TITLE*		
263818	Recommend material best suited for roof design		
ORIGINATOR		*PROVIDER*	
SGB Forestry			
FIELD		*SUBFIELD*	
1 - Agriculture and Nature Conservation		Forestry and Wood Technology	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 4	5

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Recommend material options for roof design as per roof design drawing.

SPECIFIC OUTCOME 2
Prepare material by demonstrating an understanding of organisational and sector requirements.

SPECIFIC OUTCOME 3
Demonstrate understanding of manufacturing tolerances with respect to roof structure.

SPECIFIC OUTCOME 4
Describe manufacturing limitations in terms of roof structure.

SPECIFIC OUTCOME 5
Conduct quality control in respect of roof design estimation.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	66370	Further Education and Training Certificate: Roof Truss Technology	Level 4

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Identify the structural material specification for a roof design

SAQA US ID	*UNIT STANDARD TITLE*		
263841	Identify the structural material specification for a roof design		
ORIGINATOR		*PROVIDER*	
SGB Forestry			
FIELD		*SUBFIELD*	
1 - Agriculture and Nature Conservation		Forestry and Wood Technology	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 5	4

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Identify structural materials as per design specification.

SPECIFIC OUTCOME 2
Identify materials that can optimise the design.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	66370	Further Education and Training Certificate: Roof Truss Technology	Level 4

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Demonstrate an understanding of a roofing business environment

SAQA US ID	*UNIT STANDARD TITLE*		
263842	Demonstrate an understanding of a roofing business environment		
ORIGINATOR		*PROVIDER*	
SGB Forestry			
FIELD		*SUBFIELD*	
1 - Agriculture and Nature Conservation		Forestry and Wood Technology	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 5	10

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Demonstrate an understanding of the internal responsibilities within the organisation.

SPECIFIC OUTCOME 2
Apply knowledge and understanding of the impact of estimating correctly.

SPECIFIC OUTCOME 3
Apply knowledge and understanding of contractual requirements.

SPECIFIC OUTCOME 4
Demonstrate an understanding of the impact of design and manufacturing inefficiencies.

SPECIFIC OUTCOME 5
Demonstrate understanding of the handling of trusses.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	66370	Further Education and Training Certificate: Roof Truss Technology	Level 4

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:
Further Education and Training Certificate: General Forestry

SAQA QUAL ID	***QUALIFICATION TITLE***		
66349	Further Education and Training Certificate: General Forestry		
ORIGINATOR		***PROVIDER***	
SGB Forestry			
QUALIFICATION TYPE	***FIELD***	***SUBFIELD***	
Further Ed and Training Cert	1 - Agriculture and Nature Conservation	Forestry and Wood Technology	
ABET BAND	***MINIMUM CREDITS***	***NQF LEVEL***	***QUAL CLASS***
Undefined	120	Level 4	Regular-Unit Stds Based

This qualification does not replace any other qualification and is not replaced by another qualification.

PURPOSE AND RATIONALE OF THE QUALIFICATION
Purpose:

The general management and maintenance of forests is an important part of ensuring the sustainability of the industry and the environment. A number of established methods are available to achieve these goals.

There is a need for technical and general operational management to achieve established forestry goals and priorities. Generic management skills and technical operational forestry skills jointly enable the reaching of identified forestry priorities and objectives.

The need to achieve greater balance is often a product of the interplay between the various stakeholders under the guidance of forestry professionals. This may necessitate the participation of the local community in forestry initiatives undertaken in their area or within the community's immediate environment.

This Qualification provides the qualifying learner with the skills required to:

> Use numeric skills in forestry operations.
> Advise and inform role players about the regulatory requirements impacting on forestry operations for compliance.
> Manage technical forestry operations in own area of specialisation.
> Apply operational management skills to forestry operation(s).
> Design and execute community development initiatives.

Range: Small scale contractor/small business owner, the Forest Foreman, the Assistant Forester and Community engagement officer.

This qualification will allow the learner to acquire and develop the following competencies:

> Describe and apply the core functions in the forestry environment.
> Apply the budget function in a business unit.
> Explain Human Resource policies and procedures.
> Apply safety, health and environment protection procedures.

> Conduct basic map reading.
> Demonstrate understanding of the principles of Silviculture and Fire Protection.
> Demonstrate understanding of the principles of Forest Engineering practices.

Rationale:

Role players within the Forest Industry Stakeholders/organisation:

Department of Water Affairs and Forestry (DWAF), Forestry Structure Council (FSC), Forestry South Africa (FSA), House of traditional leadership, South African Forestry Contractors Association (SAFCA), World Wildlife Foundation (WWF), Forest Industries Training Providers Association.

There is currently a need for a Qualification in the area of forestry at the lower levels, from and between the level of Ground Worker and the First Line Manager or Supervisor. This range also includes the small scale forestry operator who runs a small business. The need that necessitates the construction of this Qualification is generally that of managing a small scale forestry operation through operational management skills and the application of related technical forestry skills.

Those standing to benefit from the Qualification are operators of forestry SMME's and previously disadvantaged persons who are currently in the field, as employees. The list of beneficiaries also includes Previously Disadvantaged Individual) PDI 's, and other persons with the requisite job experience who may want to exercise the option of Recognition of Prior Learning (RPL).

Accordingly, the objectives of increased access to learning opportunities are reached and the capacity to deal with forestry and related environment challenges is increased.

Transformational areas and beneficiaries:

This qualification will benefit Department of Water Affairs and Forestry, (DWAF), WAF, FSC, FSA, House traditional leadership, South African Forestry Contractors Association (SAFCA), World Wildlife Foundation, Forest Industries Training Providers Association.

Target Learners:

Learners who are currently working in the industry and new entrants who aspire to pursue a career in Forestry.

Other groups of people to benefit from this qualification will include rural communities which are located adjacent to forestry operations.
Emerging contractors also stand a chance to benefit from this qualification as it will professionalize their entrepreneurial initiatives.

NQF Principles:

In keeping with NQF principles, this qualification seeks to create increased learning opportunities for persons and communities in outlying areas in and around forestry plantations. In the same way, it enables the formalization of prior learning in forestry learning areas. This ensures that principles of access and redress are actualized. The other principles of portability and so on, are actualised through the articulation of this qualification.

RECOGNIZE PREVIOUS LEARNING?
Y

LEARNING ASSUMED IN PLACE

This qualification assumes that the candidate has already achieved the following:

> ID 50266: National Certificate: Forestry: Silviculture at NQF Level 3.
> ID 48988: National Certificate: Timber Harvesting at NQF Level 3.
> An equivalent set of experience at entry.

Access to the Qualification:

> Access to this Qualification is open.

Recognition of Prior Learning (RPL):

This Qualification can be achieved wholly or in part through Recognition of Prior Learning. Whether a learner attends formal courses or acquires the required skills through informal means, the same standards apply as per the matrix of unit standards and Exit Level Outcomes.

The Qualification and the Unit Standards have been written in such a way that the learning has to be assessed in an integrated way. Assessors will assess evidence to establish what the learners know, understand and can do. Such evidence may be gathered through course related activities and/or through work related activities. In cases where candidates do not attend formal learning programs, assessors should seek work related evidence as far as possible.

Assessors should ensure that learners submitting themselves to RPL are thoroughly briefed prior to assessment. Learners will be required to submit a Portfolio of Evidence in the prescribed format to be assessed for formal recognition.

Where courses are provided for learners, institutions can use the Unit Standards and this Qualification to assess learning achievements. For learners who are not able to achieve the outcomes, providers can then use the Unit Standards and Qualification to determine a specific learning program to suit the learning needs of the candidate.

QUALIFICATION RULES
Fundamental Component:

All fundamental unit standards are compulsory (56 credits).

The fundamental Component consists of the following, which is compulsory for all learners:

> Unit standards at NQF Level 4, totalling 16 credits in Mathematical Literacy.
> Unit standards at NQF Level 4, totalling 20 credits in Communication in a First South African Language.
> Unit standards at NQF Level 3, totalling 20 credits in Communication in a Second South African Language.

It is therefore compulsory for learners to do Communication in two different South African Languages, one at NQF Level 4 and the other at NQF Level 3.

Core Component:

All core unit standards are compulsory (34 credits).

Elective Component:

There are five elective pathways, Forest Engineering Management, Silviculture Management, Small Business Management, Community engagement Officer and Safety, Health and Environment Officer.

Specialisation path 1: Forest Engineering Management with unit standards titles below with 19 credits:

> Apply knowledge of manual and mechanized harvesting and transport systems.
> Supervise aerial extraction systems.
> Supervise maintenance of forest roads.
> Cost harvesting and transport operations.
> Prepare an operational harvest plan.

Specialisation path 2: Silviculture Management with unit standards titles below with 27 credits:

> Demonstrate knowledge of Silviculture in commercial forestry.
> Cost Silviculture operations.
> Prepare an operational Silviculture plan.
> Specialisation path 3: Social and Community Forestry with unit standards titles below with 23 credits:

> Conduct basic community needs.
> Develop networks for development practice.
> Identify and facilitate the implementation of a community forest project.

Specialisation path 4: Business and Human Resources Management with unit standards titles below with 23 credits:

> Finance a new venture.
> Manage finances of a new venture.
> Produce business plans for a new venture.
> Tender to secure business for a new venture.

Specialisation path 5: Environment, Health and Safety with unit standards titles below with 27 credits:

> Explain and apply environmental legal principles, rights, duties and responsibilities to a specific work context.
> Apply safety, health and environment protection procedures.
> Perform administrative functions during wildfire suppression.
> Manage a crew during wildfire suppression.
> Lead a strike attack force to contain or extinguish a wildfire.

General Electives with unit standards titles below with 30 credits:

> Demonstrate knowledge and understanding of HIV/AIDS in a workplace and its effect on a business sub-sector, own organisation and a specific workplace.
> Participate in a group to recommend solutions to problems.
> Negotiate an agreement in an authentic work solution.
> Supervise work unit to achieve objectives (individuals and teams).
> Apply routine maintenance and servicing plans and procedures.
> Demonstrate knowledge of nursery practices including seedling quality.

Note: Each of the specialization areas has a different number of credits. The minimum number of elective credits is 30. Therefore the balance of credits required to achieve this qualification must be selected from any of the other elective pathways.

EXIT LEVEL OUTCOMES

1. Use numeric skills in forestry operations.

2. Advise and inform relevant parties and or subordinates about the regulatory codes governing and or impacting on forestry operations for compliance.
>Range: Colleagues, subordinates, the local community.

3. Manage technical forestry operations in own area of specialisation.
> Range: The qualifying learner should be able to know, understand and apply the theory and practical applications of own area of specialisation and its impact on role players and their area of operation.

4. Apply operational management skills to forestry operation(s).

5. Conduct community development and liaison in relation to forestry.
> Range: The qualifying learner should be able to know, understand and apply the theory and practical requirements of the impact of forestry on the local community, in terms of socio-economic and ecological development and sustainability.

Critical Cross-Field Outcomes:

Critical Cross-field outcomes have been addressed by the Exit Level Outcomes, as follows:

Identify and solve problems:

This will be achieved when qualifying learners:

> Identify and classify forests.
> Conduct risk assessment.
> Community development needs.

Work effectively with others as a member of a team or organisation.

This will be achieved when qualifying learners:

> Contribute to team and operational goals.
> Adhere to operational procedures.
> Support team members in adhering to procedures and work roles to be carried out.
> Adhere to team and organisational protocols.

Organise and manage oneself and one's activities responsibly and effectively.

This will be achieved when qualifying learners:

> Respond appropriately to risk and hazards.
> Apply work procedures appropriately to meet work requirement.

Collect, analyse, organise and critically evaluate information.

This will be achieved when qualifying learners:

> Conduct risk assessment.
> Respond appropriately to risks identified.
> Apply legal and environmental standards.
> Choice and use of equipment (chain saw and protective clothing).

Communicate effectively by using mathematical and language skills in the modes of oral and written presentations.

This will be achieved when qualifying learners:

> Report injures.
> Brief ground crew.
> Communicate with role players.

Use science and technology effectively and critically, showing responsibility towards the environment and health of others.

This will be achieved when qualifying learners:

> Apply occupational health, safety and environmental requirements in the workplace.
> Adhere to sector standards.
> Use and care for equipment properly.

Demonstrate an understanding of the world as a set of related systems by recognizing that problem solving contexts do not exist in isolation.

This will be achieved when qualifying learners:

> Provide appropriate solutions to forestry needs identified.
> Conduct risk assessment.
> Apply occupational health, safety and environmental requirements in the workplace.
> Assist team members.

ASSOCIATED ASSESSMENT CRITERIA
Associated Assessment Criteria for Exit Level Outcome 1.

Financial projections, budgets, business ratio analyses and numeric applications specific to forestry business operations are:

1.1 Explained in relation to forestry operations.
1.2 Undertaken correctly in relation to forestry operations.

Associated Assessment Criteria for Exit Level Outcome 2.

2.1 Relevant parties are advised and informed about the regulatory requirements governing and or impacting on forestry operations for compliance
Range:
> Occupational Health and Safety Act.
> Relevant forestry legislation.
> Relevant forestry legislation.

Associated Assessment Criteria for Exit Level Outcome 3.

The following technical standards are explained or demonstrated in relation to forestry operations:

3.1 Technical operational objectives.
3.2 Technical operational procedures.
3.3 Technical applications.
3.4 Sector norms and standards.

3.5 Operational requirements.

Associated Assessment Criteria for Exit Level Outcome 4.

4.1 Operational plans for forestry operations are developed and executed.
4.2 Human Resource for forestry operations are developed and executed.
4.3 Monitoring and review plans for forestry operations are developed and executed.
4.4 Operational documentation for forestry operations is developed and executed.

Associated Assessment Criteria for Exit Level Outcome 5.

Design and execution of community development initiatives, are in line with:

5.1 Forestry project objectives.
5.2 Organisational standards.
5.3 Sector specific guidelines.

Integrated Assessment:

Integrated assessment evaluates the learner's ability to combine actions and ideas across a range of activities and knowledge areas. The integrated assessment must specifically assess the learner's ability to:

> Demonstrate competence by means of the practical application of the embedded knowledge in a manner that meets the required performance standards required.
> Illustrate a clear understanding of the concepts, theory and principles that underpin the practical action taken.

The assessment will require assessment methods which measure and evaluate evidence generated during learning and on-the-job activities. Because assessment practices must be open and transparent, fair, valid and reliable; ensuring that no leaner is disadvantaged in any way whatsoever, an integrated assessment approach is incorporated into the Qualification.

A variety of methods must be used in assessment tools and activities must be appropriate to the context in which the learner is working or will work. Where it is not possible to assess the learner at the workplace, 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. Whenever possible, the assessment of knowledge, skills, attitudes and values shown in the Unit Standards should be integrated and, during integrated assessment, the assessor should make use of a range of formative and summative assessment tools and methods. Combinations of practical, applied, foundational and reflective competencies should be assessed. Assessment should further ensure that all specific outcomes, embedded knowledge and critical cross field outcomes are evaluated in an integrated way.

Assessors must assess and give credit for the evidence of learning that has already been acquired through formal, informal and non-formal learning and work experience as the assessment process is capable of being applied to RPL, subject to the rules and criteria of the relevant ETQA.

INTERNATIONAL COMPARABILITY
United Kingdom:

In conducting the international comparability for this qualification, three countries, namely New Zealand, the United Kingdom and Canada were selected. The two countries were selected for

the ease with which their qualifications could be compared to their South African equivalents, on a like-on-like basis. Canada, with its expansive forests, as well as its expertise in the field was also selected.

National Qualifications:

Forestry Level 2

In the UK, all vocational qualifications fall under the qualifications, National Vocational Qualifications (NVQs) and Scottish Vocational Qualifications (SVQs). The qualification under review in South Africa, is comparable to the following:

Forestry NVQ/SVQ Level 2 with two streams: Forestry: planning new forest plantation and Harvesting: planning, felling, delimbing, extraction, log making, fleeting, loading and finally transportation to log yards for further processing).

Arboriculture Level 2, and Tree Work Level 3:

> Arboriculture NVQ/SVQ Level 2.
> Tree work NVQ/SVQ Level 3.

Mandatory units:

> Maintain activities to meet requirements (Management Standards).
> Unit B1 Support the efficient use of resources (Management Standards).
> Unit C5 Develop productive working relationships (Management Standards).
> Unit CU3 Promote, monitor and maintain health, safety and security.

The following learning unit could be compared to the South African forestry costing equivalent:

Unit CU96 Develop, negotiate and agree proposals to offer.

New Zealand

This country probably has the widest range of qualifications in forestry in the Level 2-4 Band that can be directly compared to the same South African range. The forestry Training Guide is a useful tool that comprises the following wide range of qualifications:

National Certificate Programmes:

> National Certificate in Forestry (Foundation Skills) 6, Level 2, Credits 60.
> National Certificate in Forestry (Establishment and Silviculture) 9, Level 3, Credits 90.
> National Certificate in Forestry (Forest Establishment) 13, Level 4, Credits 90.
> National Certificate in Forestry (Mechanical Land Preparation) 17, Level 4, Credits 90.
> National Certificate in Forestry (Silvicultural Pruning) 20, Level 4, Credits 90.
> National Certificate in Forestry (Silvicultural Thinning) 23, Level 4, Credits 90.
> National Certificate in Forestry (Harvesting) 26, Level 3, Credits 90.
> National Certificate in Forestry (Tree Felling) 28, Level 4, Credits 90.
> National Certificate in Forestry (Ground Based Harvesting - Extraction) 31, Level 4, Credits 120.
> National Certificate in Forestry (Mechanised Harvesting) 34, Level 4, Credits 120.
> National Certificate in Forestry (Cable Harvesting - Extraction) 37, Level 4, Credits 120.
> National Certificate in Forestry (Log Making) 40, Level 4, Credits 90.
> National Certificate in Forestry (Log Scaling) 43, Level 4, Credits 60.
> National Certificate in Forestry (Log Loading) 46, Level 4, Credits 90.

Contents:

> National Certificate in Forestry (Mensuration) 49, Level 4, Credits 60.
> National Certificate in Forestry (Operations Management) 52, Level 4, Credits 90.

General Code of practice for forestry players:

The Code of Practice is a tool for people involved in forest management. It has been developed by the New Zealand Forestry Association and endorsed by other major industry organizations. The aim to help forest managers, contractors and their staff take into account the many factors which influence forest management and operations. The Code is based around 18 Best Environmental Management Practices (BEPs) which are structured as practical decision-making and audit tools.

Code of practice for health and safety in the field of forestry:

A statement of statutory requirements, rules and provisions, based on preferred work practices and arrangements, for the purpose of ensuring the health and safety of persons to which this code applies and persons who may be affected by the code. The code is supported by guidelines containing safety, health, training and operational information and outlining preferred work practices or arrangements on the major components related to each part. This will be practical information for those carrying out or directly associated with the work.

Canada

There is only one post secondary school in Canada that specialises in General Forestry. Most of the training and educational course work in Canada that could be said to compare with the South African equivalent is at University undergraduate level. There are also a number of post High School Courses that have the status of Continuing Education or professional short courses at the various Universities.

The following is a sample of comparable undergraduate programs at the University of Brunswick:

Core Course:

Introduction to Forestry FOR 10014 ch (3C 3L):

This course provides students with an overview of field forestry skills through collection and analysis of basic stand-level inventory data. Emphasis is on developing basic mensuration and computation skills through a series of laboratory exercises and practical problems. Students learn how to quantify stand structure and to use basic quantitative information to make forestry decisions.

Forest Dynamics and Management 4 ch (3C 3L):

For 2006: Focuses on modelling forests and examining the nature of their change with and without intervention. Introduces a decision-making process to manage change in forests.

For 2014 Structure and Development of Woody Plants 3 ch (2C 3L):

Development of woody-plant structure from embryo to maturity. Topics include morphogenesis and basic anatomy, development of crown architecture, interrelationships between crown and stem development, wood and elements of wood quality, mechanisms of asexual and sexual

reproduction. For each topic, differences among major genera will be considered. Prerequisite: FOR 2425.

FOR 2425 Autecology of Forest Vegetation 4 ch (3C 3L) Recognition and identification of species, environmental requirements, and persistence mechanisms of various life-forms of forest vegetation; interpretation of silvical characteristics of tree species; analysis of stands of trees in relation to general site conditions and relative stage of development; and evaluation of interrelationships among components of forest vegetation over time, including likely responses to perturbation or to interventions of various kinds.Prerequisite: A basic university course in Biology or Botany, Co-requisite: FOR 2435.

FOR 2432 Forest Inventory and Growth 4 ch (3C 3L):

This course focuses on the design and analysis of forest-level inventories. Concepts of stratification and multistage sampling are presented. Approaches to modelling and predicting stand growth and inventory updates are explored.

FOR 2505 Soils for Plant Growth 3 ch (2C 3L):

Students examine relationships between soils and plants, and related roles of water and nutrients. Factors that restrict root growth, and processes that influence soil development are revealed through field exercises and laboratory work. Effects of natural and anthropogenic disturbances on forest soils and subsequent plant responses are emphasized.

FOR 3005 Silviculture and Stand Intervention Design 5 ch (3C 6L) Takes a design-based approach to Silviculture. Students develop stand intervention plans for the main stages of stand development integrating the biology of growing trees, engineering of conducting operations, and economics of costing operations.

FOR 3006 Forest Management 4 ch (3C 6L) Continuation of FOR 3005. Introduction to linear programming in forest management. Introduction to elements of resource modelling and productivity assessment (e.g. water flow) at the stand level. Analysis of the impact of alternative interventions at the operational level and their integration with strategic and tactical plans, including: financial and socioeconomic evaluation of forest management and resulting value flows; and risk management for insect or pathogenic attacks and wildfire. Post-implementation assessment of activities as a critical part of the management process. Prerequisite: FOR 2006, FOR 3005, or permission of instructor.

FOR 3445 Forest Ecology: Populations and Communities 4 ch (3C 3L) To understand and link processes acting on individuals, populations, and communities in space and time. To predict the response of individuals, populations, and communities to disturbance and to understand the implications of such responses for management of populations, communities, and ecosystems. Prerequisite: FOR 2420, 2505.

FOR 3456 Forest Watershed and Forest Fire Management 3 ch (2C 3L) Emphasizes the principles of management of watersheds and fire at the stand and landscape level. Influences of climate, topography/terrain, and stand and fuel types are covered. Concepts of watershed conservation are introduced as well as principles and models dealing with water retention and flow, and carbon and nutrient cycling in primary forest watersheds. Fire management concepts deal with the Fire Weather Index system, the Fire Behaviour Prediction system, fire ecology, and fire management strategies, tactics and operations. Prerequisites: FOR3445 or permission of instructor.

FOR 4020 Management Practicum 8 ch (1C 3L):

Practical exercise in forest landscape management, designed to provide an opportunity to integrate skills and knowledge gained throughout the program. Forest Ecosystem Management and Forest Engineering students will work on the same project to design landscape management plans at the strategic, tactical and operational levels. The practicum will be based on real forests. Through consultation with clients and/or members of the public, goals will be developed. Plans will be derived to integrate these goals. Teams will be responsible for project management, including planning, budgeting and report preparation.

FOR 4096 Forest Landscape Design and Management 5 ch (3C 3L Integrates value-flow planning with landscape planning by: 1) introducing students to the concepts and techniques used in dealing with the spatial dimensions in forest management planning; 2) introducing students to the difficulties involved with management for a complex set of demands, where resources demanded have production functions that include complex spatial and temporal relationships of inputs, many of which are unknown, and 3) exposing students to techniques available to forecast landscape patterns resulting from flow driven management planning, and to design landscape patterns based on analysis of natural dynamics. Prerequisite: FOR 3006, or permission of instructor.

FOR 4625 Integrated Management of Insects and Fungi 4 ch (3C 3L).

FOR 4992 Individual Project I 3ch.

Elective Courses:

FOR 2265 Computer Programming for Forestry 3 ch.
FOR 2286 GIS IN FORESTRY II 3 ch (3L).
FOR 2933 Bioethics in Forestry 2 ch 3 ch (3C).
FOR 2946 Bioethics, Emotional Intelligence, and the Nature of Spirituality 3 ch (3C).
FOR 3853 Problem-Solving and Interpersonal Communication 3 ch (3C/S) Designed to help develop skills in solving problems and communicating with others. Models will be presented and used. Emphasizes student participation and leadership.

FOR 4013 Basic Woodlot Management 3 ch (3C).

Introduction to basic woodlot management, covering such topics as planning, harvesting, Silviculture, Christmas trees, maple products, wildlife and recreation, economics, owner characteristics and organization, government programs and policies and industry relations as they relate to small woodlots. Prerequisite: Open to 4th- and 5th-year Faculty of Forestry and Environmental Management students, or permission of instructor.

Conclusion

This brief comparative survey stretches from the certificate study level of forestry to undergraduate levels, at university. The reason is that there appears, in many countries, to be a limited number of learning programs in "pure" forestry outside the universities and Higher Education.

Despite this, as explained, the forestry learning infrastructure in New Zealand is wide, all-encompassing and very instructional as an example to be followed.

Similarities: Broadly speaking the topics are similar on key or core components of study, as demonstrated by the topics and the learning areas and or subjects covered. There are subjects in the countries under review that resemble South Africa's Critical Cross Field Outcomes (CCFO's). Examples are problems solving, as well as other subjects in the filed of life skills like Emotional Intelligence (IQ).

Differences:

In many countries, the subject of forestry is studied at Higher Education Level. In addition, the advanced nature of countries in the developed world is shown by the inclusion for study of subjects like Geographic Information Systems (GIS) for easy spatial location in the forest. The subject of Bio-ethics is included to strengthen the case for an integrated view of the universe.

ARTICULATION OPTIONS
This Qualification articulates both horizontally and vertically.

Horizontal articulation:

> Further Education and training Certificate: New Venture Creation (SMME), NQF Level 4.

Vertical articulation:

> ID 17499: National Certificate: Forestry, NQF Level 5.
> ID 17496: National Diploma: Forestry, NQF Level 5.
> ID 19248: National Certificate in Forestry, NQF Level 5.
> 2069: National Higher Certificate: Forestry, NQF Level 5.

MODERATION OPTIONS
> Anyone assessing a learner or moderating the assessment of a learner against the qualification must be registered as an assessor with the relevant Education, Training, Quality, Assurance (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 Education, Training, Quality, Assurance (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 Education, Training, Quality, Assurance (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, unless ETQA policies specify otherwise. Moderation should also encompass achievement of the competence described in the associated unit standards.

> 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
Criteria for registration of assessors:

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

Any institution offering learning that will enable the achievement this qualification must be accredited as a provider with the relevant ETQA. Assessment will be overseen by the relevant ETQA according to the policies and guidelines for assessment of that ETQA, in terms of agreements reached around assessment and between various ETQA's (including professional bodies).

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

The options as listed above provide the opportunity to ensure that assessment and moderation can be transparent, affordable, valid reliable and non-discriminatory.

For an applicant to register as an assessor or moderator of this qualification, the applicant needs:

> To be registered as an assessor with the relevant ETQA.
> To be in possession of the relevant qualification.
> To have sufficient relevant experience.
> To have the appropriate qualification to assess Communication and Mathematical Literacy.

UNIT STANDARDS

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Fundamental	119472	Accommodate audience and context needs in oral/signed communication	Level 3	5
Fundamental	119458	Analyse and respond to a variety of literary texts	Level 3	5
Fundamental	119466	Interpret a variety of literary texts	Level 3	5
Fundamental	119457	Interpret and use information from texts	Level 3	5
Fundamental	9015	Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life related problems	Level 4	6
Fundamental	119470	Evaluate literary texts	Level 4	5
Fundamental	119469	Read/view, analyse and respond to a variety of texts	Level 4	5
Fundamental	9016	Represent analyse and calculate shape and motion in 2- and 3-dimensional space in different contexts	Level 4	4
Fundamental	119471	Use language and communication in occupational learning programmes	Level 4	5
Fundamental	7468	Use mathematics to investigate and monitor the financial aspects of personal, business, national and international issues	Level 4	6
Fundamental	119459	Write/present/sign for a wide range of contexts	Level 4	5
Core	13223	Apply safety, health and environmental protection procedures	Level 3	6
Core	117085	Conduct basic forestry map reading	Level 3	2
Core	263815	Demonstrate understanding of the principles of Forest Engineering practices	Level 4	5
Core	263760	Demonstrate understanding of the principles of Silviculture and fire protection	Level 4	5
Core	14667	Describe and apply the management functions of an organization	Level 4	10
Core	242810	Manage Expenditure against a budget	Level 4	6
Elective	116275	Apply routine maintenance and servicing plans and procedures	Level 3	3
Elective	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
Elective	119515	Develop networks for development practice	Level 3	6
Elective	263819	Apply knowledge of manual and mechanized harvesting and transport systems	Level 4	5
Elective	110053	Conduct a basic community needs assessment	Level 4	12
Elective	263817	Cost Silviculture operations	Level 4	4
Elective	263816	Cost harvesting and transport operations	Level 4	4
Elective	263840	Demonstrate knowledge of nursery practices including seedling	Level 4	3
Elective	123240	Demonstrate knowledge of silviculture in commercial forestry	Level 4	20
Elective	115591	Explain and apply environmental legal principles, rights, duties and responsibilities to a specific work context	Level 4	6
Elective	114584	Finance a new venture	Level 4	5
Elective	263836	Identify possible community initiatives	Level 4	5

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Elective	123232	Lead a strike attack force to contain or extinguish a wildfire	Level 4	4
Elective	123231	Manage a crew during wildfire suppression	Level 4	7
Elective	114586	Manage finances of a new venture	Level 4	5
Elective	13948	Negotiate an agreement or deal in an authentic work situation	Level 4	5
Elective	14920	Participate in groups and/or teams to recommend solutions to problems	Level 4	3
Elective	123230	Perform administrative functions during wildfire suppression	Level 4	4
Elective	263838	Prepare an operational Silviculture plan	Level 4	3
Elective	117070	Prepare an operational harvest plan	Level 4	4
Elective	114592	Produce business plans for a new venture	Level 4	8
Elective	263834	Supervise aerial extraction systems and fire protection	Level 4	3
Elective	263835	Supervise maintenance of forest roads	Level 4	3
Elective	10981	Supervise work unit to achieve work unit objectives (individuals and teams)	Level 4	12
Elective	114593	Tender to secure business for a new venture	Level 4	5

LEARNING PROGRAMMES RECORDED AGAINST THIS QUALIFICATION
None

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Demonstrate understanding of the principles of Silviculture and fire protection

SAQA US ID	*UNIT STANDARD TITLE*		
263760	Demonstrate understanding of the principles of Silviculture and fire protection		
ORIGINATOR		*PROVIDER*	
SGB Forestry			
FIELD		*SUBFIELD*	
1 - Agriculture and Nature Conservation		Forestry and Wood Technology	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 4	5

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Describe the establishment and re-establishment of plantations.

SPECIFIC OUTCOME 2
List and briefly describe the different aspects of plantation maintenance.

SPECIFIC OUTCOME 3
List and briefly describe the pruning and thinning process.

SPECIFIC OUTCOME 4
Briefly describe fire protection measures practiced in the Forestry Industry.

SPECIFIC OUTCOME 5
Briefly describe the elements of Silviculture planning.

SPECIFIC OUTCOME 6
Demonstrate an understanding of the Safety, Health, Environmental and Quality standards framework within which Silvicultural and Fire Protection practices are applied.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	66349	Further Education and Training Certificate: General Forestry	Level 4

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Demonstrate understanding of the principles of Forest Engineering practices

SAQA US ID	*UNIT STANDARD TITLE*		
263815	Demonstrate understanding of the principles of Forest Engineering practices		
ORIGINATOR		*PROVIDER*	
SGB Forestry			
FIELD		*SUBFIELD*	
1 - Agriculture and Nature Conservation		Forestry and Wood Technology	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 4	5

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
List and briefly describe the components of the Harvesting Process.

SPECIFIC OUTCOME 2
Demonstrate an understanding of the Safety, Health, Environmental and Quality standards framework within which Forest Engineering practices are applied.

SPECIFIC OUTCOME 3
List and briefly discuss relevant timber transport systems.

SPECIFIC OUTCOME 4
Briefly describe the different elements involved in the management of roads within plantations.

SPECIFIC OUTCOME 5
Describe the application of fundamental ergonomics in Forestry Engineering.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	66349	Further Education and Training Certificate: General Forestry	Level 4

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Cost harvesting and transport operations

SAQA US ID	*UNIT STANDARD TITLE*		
263816	Cost harvesting and transport operations		
ORIGINATOR		*PROVIDER*	
SGB Forestry			
FIELD		*SUBFIELD*	
1 - Agriculture and Nature Conservation		Forestry and Wood Technology	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 4	4

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
List and explain the key requirements for a harvesting or transport operation for costing tasks.

SPECIFIC OUTCOME 2
Identify resources required for each task identified.

SPECIFIC OUTCOME 3
Determine rates for the individual tasks according to operative company procedure e.g. R/ton.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	66349	Further Education and Training Certificate: General Forestry	Level 4

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Cost Silviculture operations

SAQA US ID	*UNIT STANDARD TITLE*		
263817	Cost Silviculture operations		
ORIGINATOR		*PROVIDER*	
SGB Forestry			
FIELD		*SUBFIELD*	
1 - Agriculture and Nature Conservation		Forestry and Wood Technology	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 4	4

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
List the tasks required, production standards and quantities involved in a particular Silviculture operation.

SPECIFIC OUTCOME 2
Identify resources required for each task identified.

SPECIFIC OUTCOME 3
Determine rates for the individual tasks according to a standardized measure e.g. R/hectare.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	66349	Further Education and Training Certificate: General Forestry	Level 4

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply knowledge of manual and mechanized harvesting and transport systems

SAQA US ID	*UNIT STANDARD TITLE*		
263819	Apply knowledge of manual and mechanized harvesting and transport systems		
ORIGINATOR		*PROVIDER*	
SGB Forestry			
FIELD		*SUBFIELD*	
1 - Agriculture and Nature Conservation		Forestry and Wood Technology	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 4	5

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Explain the appropriate process to follow when assigned a particular area of trees to be harvest.

SPECIFIC OUTCOME 2
Explain relevant safety, health, environmental and quality considerations to be applied in terms of industry norms and statutory requirements.

SPECIFIC OUTCOME 3
Describe the appropriate production, Safety Health Environment and Quality (SHEQ) control measures to be applied in order to achieve the given task.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	66349	Further Education and Training Certificate: General Forestry	Level 4

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Supervise aerial extraction systems and fire protection

SAQA US ID	***UNIT STANDARD TITLE***		
263834	Supervise aerial extraction systems and fire protection		
ORIGINATOR		***PROVIDER***	
SGB Forestry			
FIELD		***SUBFIELD***	
1 - Agriculture and Nature Conservation		Forestry and Wood Technology	
ABET BAND	***UNIT STANDARD TYPE***	***NQF LEVEL***	***CREDITS***
Undefined	Regular	Level 4	3

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Implement the approved felling plan in accordance with company operating procedures.

SPECIFIC OUTCOME 2
Set up the extraction system in terms of extraction plan.

SPECIFIC OUTCOME 3
Supervise extraction process in relation to extraction plan.

SPECIFIC OUTCOME 4
Maintain machines and equipment in accordance with maintenance schedule.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	66349	Further Education and Training Certificate: General Forestry	Level 4

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Supervise maintenance of forest roads

SAQA US ID	*UNIT STANDARD TITLE*		
263835	Supervise maintenance of forest roads		
ORIGINATOR		*PROVIDER*	
SGB Forestry			
FIELD		*SUBFIELD*	
1 - Agriculture and Nature Conservation		Forestry and Wood Technology	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 4	3

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Identify road maintenance priorities and formulate maintenance plan.

SPECIFIC OUTCOME 2
Implement the maintenance plan in accordance with the maintenance program.

SPECIFIC OUTCOME 3
Adhere to relevant Standard Operating Procedures (SOP) and regulatory requirements.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	66349	Further Education and Training Certificate: General Forestry	Level 4

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Identify possible community initiatives

SAQA US ID	*UNIT STANDARD TITLE*		
263836	Identify possible community initiatives		
ORIGINATOR		*PROVIDER*	
SGB Forestry			
FIELD		*SUBFIELD*	
1 - Agriculture and Nature Conservation		Forestry and Wood Technology	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 4	5

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Set up community structures for liaison.

SPECIFIC OUTCOME 2
Identify potential problems and strategies to avoid them.

SPECIFIC OUTCOME 3
Facilitate community meeting.

SPECIFIC OUTCOME 4
Explain where and how funds can be acquired.

SPECIFIC OUTCOME 5
Demonstrate knowledge of the relevant legislation.

SPECIFIC OUTCOME 6
Identify commercial opportunities for communities within the forestry.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	66349	Further Education and Training Certificate: General Forestry	Level 4

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Prepare an operational Silviculture plan

SAQA US ID	*UNIT STANDARD TITLE*		
263838	Prepare an operational Silviculture plan		
ORIGINATOR		*PROVIDER*	
SGB Forestry			
FIELD		*SUBFIELD*	
1 - Agriculture and Nature Conservation		Forestry and Wood Technology	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 4	3

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Explain the purpose of a Silviculture plan.

SPECIFIC OUTCOME 2
Describe the individual processes and time frame of a typical Silvicultural Process planning.

SPECIFIC OUTCOME 3
Collect data for the preparation of an operational Silviculture plan.

SPECIFIC OUTCOME 4
Describe and list typical resource requirements for a Silvicultural Operational Plan.

QUALIFICATIONS UTILISING THIS UNIT STANDARD
None

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Demonstrate knowledge of nursery practices including seedling

SAQA US ID	***UNIT STANDARD TITLE***		
263840	Demonstrate knowledge of nursery practices including seedling		
ORIGINATOR		***PROVIDER***	
SGB Forestry			
FIELD		***SUBFIELD***	
1 - Agriculture and Nature Conservation		Forestry and Wood Technology	
ABET BAND	***UNIT STANDARD TYPE***	***NQF LEVEL***	***CREDITS***
Undefined	Regular	Level 4	3

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Supervise nursery processes.

SPECIFIC OUTCOME 2
Monitor seed or cut material for planting in a nursery.

SPECIFIC OUTCOME 3
Supervise germination in a nursery.

SPECIFIC OUTCOME 4
Make decisions on germinating seed and cut material for healthy development in line with species.

SPECIFIC OUTCOME 5
Monitor handling of product for dispatch.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	66349	Further Education and Training Certificate: General Forestry	Level 4