GOVERNMENT NOTICES

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

No. 1094 **9 November 2005**

Established in terms of Act 58 of 1995

SOUTH AFRICAN QUALIFICATIONS AUTHORITY (SAQA)

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

Draughting

Registered by Organising Field 06, Manufacturing, Engineering and Technology, publishes the following unit standard for public comment.

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

Comment on the unit standards should reach SAQA at the address **below *and no* later than *74* November 2005.** All correspondence should be marked **Standards Setting – SGB for Manufacturing and Assembly Processes** and addressed to

The Director: Standards Setting and Development
SAQA
Attention: Mr. E. Brown
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ACTING DIRECTOR: STANDARDS SETTING AND DEVELOPMENT

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

National Certificate: General Draughting

SAQA QUAL ID	*QUALIFICATION TITLE*		
50022	National Certificate: General Draughting		
SGB NAME		*ORGANISING FIEL ID*	*PROVIDER NAME*
SGB Manufacturing and Assembly Processes		**6**	
QUAL TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD*
National Certificate		Manufacturing, Engineering and Technology	Manufacturing and Assembly
ABET BAND	*MINIMUM CREDITS*	*NQF LEVEL*	*QUALIFICATION CLASS*
Undefined	121	Level ***3***	Regular-Unit Stds Based

Any learners, who are *or* wish to be involved in draughting, will have access to this qualification. This qualification is intended to serve as access to the architectural, engineering and construction industries by providing skilled draughtpersons who can produce drawings. Portability across other National Qualifications in engineering and draughting is therefore ensured.

The specific purpose of this qualification represents the skills, knowledge and understanding required by competent practitioners to:

> Use measuring instruments and conventional drawing equipment to produce a drawing.
> Produce a drawing for the appropriate engineering area of draughting.
> Understand the workflow and administration procedures for the drawing office.
> Operate a personal computer system.
> Communicate with clients and work colleagues to enhance the quality of work and service.
> Create a freehand drawing.

Rationale:

The National Certificate in General Draughting Level 3 is designed to meet the needs of those learners who enter the field of draughting.

The General Draughting at NQF Level 3 will provide a broad base *of* knowledge and skills needed in the industry and will help those learners progressing along a career path who:

> Were previously disadvantaged or who were unable to complete their schooling and were therefore denied access to Further Education and Training.
> Have worked in drawing offices as draughtspersons for many years, but have no formal qualificafion in draughting.
> Wish to extend their range of skills and knowledge of the industry so that they can become knowledgeable workers in draughting.
> Have completed their schooling up to and including grade 12 who wish to follow a career in draughting.

The National Certificate in General Draughting Level 3 allows the learner to work towards a nationally recognised qualification. The qualification will allow both those in formal education and those already employed in architectural, engineering and construction organisations access, due to its flexibility. It aims to develop learners who are informed and skilled in Draughting.

The qualification focuses on the skills, knowledge, values and attitudes required to progress further in this field of learning. The intention is:

> To provide the development of knowledge and skills that are required in all sub-sectors of Draughting.
> To realise the potential of people in draughting.
> To provide opportunities for people *to* move up career paths by being more valuable to their organisation, the economy and themselves.

The National Certificate in General Draughting Level 3 should produce knowledgeable, skilled draughtspersons who are able *to* contribute *to* improved productivity and efficiency within the draughting industry. It should provide the means for current learners in the draughting field to receive recognition for prior learning and *to* upgrade their skills and knowledge base. The qualification is structured in such a way that it will expose learners to a set of core competencies to give a broad understanding of draughting. The electives will allow for specific competence in selected areas of drawing specialisation. It will also promote the notion of life-long learning.

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

It is assumed that learners are already competent in Mathematical Literacy and Communication at NQF Level 2.

Recognition of prior learning

The structure of this Unit Standard based Qualification makes the Recognition of Prior Learning possible, if the learner is able *to* demonstrate competence in the knowledge, skills, values and attitudes implicit in this draughting qualification. Recognition of Prior Learning will be done by means of an Integrated Assessment as mentioned in the previous paragraph.

This Recognition of Prior Learning may allow:

> For accelerated access *to* further learning.
> Gaining of credits towards a unit standard.

All recognition of Prior Learning is subject to quality assurance by the relevant accredited Education, Training, Quality, Assurance Body and *is* conducted by a registered workplace assessor.

Access *to* the Qualification:

Access *to* this qualification is open, bearing in mind learning assumed to be in place.

QUALIFICATION RULES

The qualification provides a learning pathway in a variety of specializations.

Each of the learning pathways will include the compulsory Fundamentals of 36 Credits as well as compulsory Core of 51 Credits with a minimum of **34** Credits chosen from the Electives as follows:

Learners must choose the following unit standards:

Mechanical draughtsperson:

> 12238: "Draw and interpret simple engineering drawings" Level 2, 10 Credits
> 9885: "Read and interpret engineering drawings" Level 3, 12 Credits
> 13298: "Produce detailed engineering drawings" Level 3, 6 Credits
> **9526:** "Manage basic business finance" Level 3, 6 Credits
> Total: 34 Credits

Building and Civil Construction draughtsperson:

> 9882: "Read and interpret basic engineering drawings" Level 2, 8 Credits
> 14580: "Read and interpret construction drawings and specifications" Level 3, 10 Credits

> 120213: "Read, interpret and produce working civil construction drawings" Level 4, 8 Credits
> 9526: "Manage basic business finance" Level 3, 6 Credits
> 14430: "Supervise the procurement, use and storage of construction materials" Level 4, 10 Credits
> Total: 42 Credits

Electrical and Air conditioning, ventilation duct and plant draughtsperson:

> 9882: "Read and interpret basic engineering drawings" Level 2, 8 Credits
> 9885. "Read and interpret engineering drawings" Level 3, 12 Credits
> 10894: "Interpret electrical circuits" Level 3, 2 Credits
> 115242: "Draw and interpret electrical diagrams" Level 3, 3 Credits
> 9526: "Manage basic business finance" Level 3, 6 Credits
> 13395: "Draw fee hand diagrams of typical electrical control and power circuits used in air-conditioning, refrigeration and ventilation systems and explain their operating sequence" Level 4, 10 Credits
> Total: 41 Credits

EXIT LEVEL OUTCOMES

1. Use and operate a computer system.
2. Communicate with both clients and work colleagues to enhance the quality of work and service produced.
3. Produce drawings for an appropriate area of draughting
4. Use a wide variety of measuring instruments and conventional drawing equipment to produce a quality drawing.
5. Collect data for the desired design requirements.
6. Demonstrate an understanding of the workflow and administration procedures pertaining to a drawing office.
7. Produce a free hand drawing in preparation for a instrument scale drawing.

ASSOCIATED ASSESSMENT CRITERIA

1.

> Basic computer hardware components are connected to a computer system.
> Keyboard and mouse are used to access a computer.
> Computer, software and peripherals are used to process information.

2.

> Oral and written communication is successfully engaged in a draughting environment.
> Problems are understood and solved to enhance work and delivery of service.
> Information required to plan and produce a drawing is communicated with clients.

3.

> The brief is interpreted correctly.
> A layout for a drawing is prepared.
> Drawings are produced according to the customer's needs.
> Drawing produced conforms to applicable code of practice.

4.

> Measuring instruments and conventional drawing equipment are used to produce quality drawings.
> Drawing equipment is used to produce a drawing according to layout requirements.

5.

> A data sheet for the design requirements is produced.

6.

> A plan for the workflow is prepared.
> Documentation is administered in a drawing office.
> Drawings are indexed and filed.
> Drawings are kept safely in a storage.

> Drawing office protocol is followed.

7.

> Prepare a layout for a drawing.
> The brief is interpreted correctly.
> A free hand drawing is produced.

Intergrated Assessment:

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

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

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

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

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

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

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

INTERNATIONAL COMPARABILITY

The draughting and design Industry is a discipline with globally recognised best practices, standards and qualifications. This qualification and set of unit standards utilises international and locally recognised best practice and standards in draughting.

Benchmarking was done by comparison ***to*** Unit Standards/Outcomes of learning against:

> The New Zealand qualifications - National Certificate in Design (Draughting) (Level 2) total credit value 70.
> New Zealand Unit Standards in Design:
  > Produce orthographic, scale working drawings.
  > Produce scale production drawings.
  > Produce scale production drawings.
  > Demonstrate knowledge of numerical data used in the draughting industry.
> Technical And Further Education Authority **(TAFEA)** New South Wales was also used as a resource for international benchmarking.

A direct comparison with each unit standard was undertaken and the best practice points were highlighted and incorporated into each unit standard. However the points incorporated were written in a South African context.

Because of the difference in levels across the different countries, difficulty was found in making actual direct comparisons, level to level. It was found that the South African unit standards seem to contain more detail and therefore are slightly more complex and the qualification ***is*** longer in duration as they only have 70 credits.

The work groups also referred to other facets of national and international benchmarking, which occurred

continuously throughout the qualifications and unit standard writing process

These facets were:

> The methods and techniques for writing standards.
> The contents of the unit standards.
> The levels in other countries compared to South Africa.

ARTICULATION OPTIONS

This qualification allows for both horizontal and vertical articulation.

Horizontal articulation:

> National Certificate in Mechanical Engineering: NQF Level 3.
> National Certification in Polymer Composites Fabrication NQF Level 3.
> National Certificate in Electrical Engineering NQF Level 3.
> National Certificate in Automotive Components Manufacturing and Assembling NQF Level 3.
> National Certificate in Air Conditioning, Refrigeration and Ventilation NQF Level 3.
> National Certificate in Road Works Construction NQF Level 3.
> National Certificate in Welding: NQF Level 3.

Vertical articulation:

> FETC: Computer Aided Drawing Office Practice.

MODERATION OPTIONS

Assessment of learner achievements takes place at providers accredited by relevant ETQA or any ETQA which has signed a Memorandum of Understanding (MoU) with the relevant ETQA in accordance with ETQA Regulations (RSA, 1998b).

> Anyone assessing a learner or moderating the assessment of a learner against this 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 at exit points of the Qualification, unless ETQA policies specify otherwise. Moderation should also encompass achievement of the competence described both in individual Unit Standards as well as the integrated competence described in the Qualification.

> 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

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

> Registered as an assessor with the relevant ETQA.
> A similar qualification at one level above the level of the qualification and a minimum of three years experience in the relevant field.

NOTES

Career pathways

A learner could follow a career in:

> Aeronautical Engineering
> Surveying
> Electronic Engineering
> Mining Engineering
> Electrical Engineering
> Automotive Engineering
> Structural steel detailing.
> Piping and plant design.
>Building and Civil Construction
> Engineering and design draughting
> Air-conditioning and ventilation design
> Architecture
> Town and regional planning
> Road construction

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	Level2	3	Reregistered
core	13217 Collect and use information	Level2	5	Registered
core	116937 Use a Graphical User Interface (GUI)-based spreadsheet application to create and edit soreadsheek	Level2	4	Registered
core	9532 Demonstrate basic knowledge of computers	Level3	6	Reregistered
core	114978 Use a word processing package to produce business documents	Level3	3	Registered
core	120224 Interpret and produce free hand drawings	Level3	6	Draft - Prep for P Comment
core	120226 Understand the basic principles of design	Level3	2	Draft - Prep for P Comment
core	120227 Plan and determine drawing requirements to produce a drawing	Level3	6	Draft - Prep for P Comment
core	120228 Understand and apply the process of design	Level3	3	Draft - Prep for P Comment
core	120229 Demonstrate an understanding of drawing office procedures	Level3	3	Draft - Prep for P Comment
core	120230 Apply the code of practice for draughting	Level3	4	Draft - Prep for P Comment
core	14474 Plan and schedule workflow	Level4	3	Registered
Core	14486 Demonstrate an understanding of measuring instruments and produce free-hand drawings	Level4	3	Registered
Elective	9882 Read and interpret basic engineering drawings	Level2	8	Reregistered
Elective	9526 Manage basic business finance	Level3	6	Reregistered
Elective	10894 Interpret electrical circuits	Level3	2	Registered
Elective	14580 Read and interpret construction drawings and specifications	Level3	10	Registered
Elective	115242 Draw and interpret electrical diagram	Level3	3	Registered
Elective	120231 Demonstrate the basic understanding of the workflow	Level3	3	Draft - Prep for P Comment
Eiective	13395 Draw free hand diagrams of typical electrical control and power circuits used in air-conditioning. refrigeration and ventilation systems and explain their operating sequence	Level4	10	Registered
Elective	14430 Supervise the procurement, use and storage of construction materials	Level4	10	Registered
Elective	120213 Read, interpret and produce working civil construction drawings	Level4	8	Public 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	Level3	5	Reregistered
Fundamental	8971 Analyse and respond to a variety of literary texts	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	Level 3	5	Reregistered
Fundamental	9013 Describe. apply, analyse and calculate shape and motion in 2-and 3-dimensional space in different contexts	Level 3	4	Reregistered

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UNIT STANDARD:

SAQA US ID	*UNIT STANDARD TITLE*		
120224	Interpret and produce free hand drawings		
SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Manufacturing and Assembly Processes		6	
UNIT STANDARD TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular		Manufacturing, Engineering and Technology	Engineering and Related Design
ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	*6*	Level 3	Regular

SPECIFIC OUTCOME 2

Interpret free hand drawings.

SPECIFIC OUTCOME 3

Produce a free hand drawing.

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UNIT STANDARD:

SAQA US ID	*UNIT STANDARD TITLE*		
120226	Understand the basic principles of design		
SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Manufacturing and Assembly Processes		6	
UNIT STANDARD TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular		Manufacturing, Engineering and Technology	Engineering and Related Design
ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	2	Level 3	Regular

SPECIFIC OUTCOME 1

Understand the effects of design.

SPECIFIC OUTCOME 2

Understand the application of anthropology to design.

SPECIFIC OUTCOME 3

Understand the basic principles of design.

SPECIFIC OUTCOME 4

Interpret the design process documentation.

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UNIT STANDARD:

Plan and determine drawing requirements to produce a drawing

SAQA US ID	*UNIT STANDARD TITLE*
120227	Plan and determine drawing requirements to produce a drawing

SGB NAME	*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Manufacturing and Assembly Processes	**6**	
UNIT STANDARD TYPE	***ORGANISING FIELD DESCRIPTION***	***SUBFIELD DESCRIPTION***
Regular	Manufacturing, Engineering and Technology	Engineering and Related Design

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

***SPECIFIC OUTCOME* 1**

Comply with work instructions.

SPECIFIC OUTCOME 2

Determine drawing requirements.

SPECIFIC OUTCOME 3

Prepare to produce drawing.

***SPECIFIC OUTCOME* 4**

Record and store drawings according to a filing system.

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UNIT STANDARD:

Understand and apply the process of design

SAQA US ID	*UNIT STANDARD TITLE*
120228	Understand and apply the process of design

SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Manufacturing and Assembly Processes		**6**	
UNIT STANDARD TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular		Manufacturing, Engineering and Technology	Engineering and Related Design
ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	*3*	Level *3*	Regular

SPECIFIC OUTCOME 2

Understand and use design tools.

SPECIFIC OUTCOME 3

Apply the levels of graphic communication.

SPECIFIC OUTCOME 4

Apply the design cycle.

SPECIFIC OUTCOME 5

Process the design projects.

SPECIFIC OUTCOME 6

Work safely with due care for self, fellow workers, and equipment.

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UNIT STANDARD:

Demonstrate an understanding **of** drawing **office** procedures

SAQA US ID	*UNIT STANDARD TITLE*		
120229	Demonstrate an understanding of drawing office procedures		
SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Manufacturing and Assembly Processes		**6**	
UNIT STANDARD TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular		Manufacturing, Engineering and Technology	Engineering and Related Design
ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	*3*	Level *3*	Regular

***SPECIFIC OUTCOME* 1**

Obtain and evaluate data to facilitate drawing workflow.

***SPECIFIC OUTCOME* 2**

Demonstrate an understanding of the planning and scheduling of workflow processes.

***SPECIFIC OUTCOME* 3**

Plan and schedule workflow according to organisational requirements.

***SPECIFIC OUTCOME* 4**

Monitor the achievement of the workflow plan.

***SPECIFIC OUTCOME* 5**

Work safely with due care for self, fellow workers, and equipment.

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UNIT STANDARD:

SAQA US ID	*UNIT STANDARD TITLE*		
120230	Apply the code of practice for draughting		
SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Manufacturing and Assembly Processes		6	
UNIT STANDARD TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular		Manufacturing, Engineering and Technology	Engineering and Related Design
ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	4	Level 3	Regular

SPECIFIC OUTCOME 1

Identify and describe the different types of engineering drawings.

SPECIFIC OUTCOME 2.

Identify and describe the standard welding and machining symbols as per relevant code of practice.

SPECIFIC OUTCOME 3

Apply the draughting standards to an engineering drawing.

SPECIFIC OUTCOME 4

Work safely with due care for self, fellow workers, and equipment.

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UNIT STANDARD:

SAQA US ID	*UNIT STANDARD TITLE*		
120231	Demonstrate the basic understanding of the workflow		
SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Manufacturing and Assembly Processes		6	
UNIT STANDARD TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular		Manufacturing, and Technology	Engineering and Related Design
ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	*3*	Level *3*	Regular

SPECIFIC OUTCOME 1

Understand planning and scheduling of the workflow processes.

SPECIFIC OUTCOME 2

Plan and schedule workflow according to organisational requirements.

SPECIFIC OUTCOME 3

Monitor the achievement of the workflow plan.

SPECIFIC OUTCOME 4

Work safely with due care for self, fellow workers and equipment.