No. 540 **9 June *2006***

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**

Manufacturing and Assembly Processes

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

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

Comment on the qualification and unit standards should reach **SAQA** at the address ***below and no later than* 6 *July 2006.*** All correspondence should be marked **Standards Setting - SGB for Manufacturing and Assembly Processes** and addressed **to**

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DIRECTOR STANDARDS SETTING AND DEVELOPMENT

SAQA

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

National Certificate: Small Craft Construction

SAQA QUAL ID	*QUALIFICATION TITLE*		
50543	National Certificate: Small Craft Construction		
SGB NAME		*ORGANISING FIELD 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	122	Level 3	Regular-Unit Stds Based

Range: Small craft construction is limited to boats with fibreglass hulls not exceeding five meters Construction excludes the manufacturing of the hull and major components such as the power system and communication systems but does include the fitting of such systems.

Rationale:

Since smalt craft construction discipline has *not* previously had formal qualifications, people who have worked in this field require validation by being given access to formal qualifications and standards.

The qualification will therefore be able to affirm the experiences of boat builders through the recognition of prior learning, credit accumulation and achievement of competencies specifically in communicating with peers and members of supervisory/management levels; using information which has been gathered to produce simple written reports; apply elementary manufacturing processes, effective organisational relations and practices to achieve small craft building business objectives; engaging (with guidance) in self-directed activity in the small craft construction processes and to interpret designs and processes and recognise marine systems in order to maintain and support quality 'elementary installation processes in building small

Craft.

This qualification is for learners who are pursuing a career specifically within the small craft construction sector and is one of several in a learning pathway that has been created. It also provides learners with opportunities for professional development and career advancement within the broader manufacturing environment

This qualification reflects the need and demand within the small craft construction of boats with fibreglass hulls not exceeding five meters and excludes the manufacturing of the hull and major components such as the power system and communication systems but does include the fitting of such systems in a sector for skilled employees, people looking for a career in small craft construction or new entrants to the employment market that will be able to perform predominantly in a production environment that produces national and international quatity small craft for leisure activity. Through the availability of this qualification employees within the boating environment will be able to provide world class service, improve professionalism and enhance the quality of service delivery thereby contributing to the creation of investor confidence and global competitiveness in the South African small craft construction sector.

This qualification opens up access for historically disadvantaged incumbents as well as other learners in the boating environment for further development through vertical mobility to higher-level qualifications and horizontally to qualifications on the same level but in a different discipline in the manufacturing field.

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

It is assumed that learners are already competent in:

> Communication and Mathematical Literacy at NQF Levet 2.

The unit standards:

> "Demonstrate understanding of small craft designs and terminology" at NQF Level 2.
> "Identify and explain the various small craft construction techniques, materials and their applications" at NQF Level 2.
> "Identify and describe the systems required for different on-board applications" at NQF Levet 2.
> "Identify and use applicable methods and materials in finishing a small craft" at NQF level 2.
> "Demonstrate seamanship for the safe crewing of a small craft' at NQF level 2.

Recognition of prior learning:

The structure of this unit standards-based qualification makes the Recognition of Prior Learning possible. This qualification may therefore be achieved in part or completely through the recognition of prior learning, which includes formal, informal and non-formal learning and work experience, The ieamer should be thoroughly briefed on the mechanism to be used and support and guidance should be provided. Care should be taken that the mechanism used provides the learner with an opportunity to demonstrate competence and is not so onerous as to prevent learners from taking up the RPL option towards gaining a qualification.

If the learner is able to demonstrate competence in the knowledge, skills, values and attitudes implicit in this qualification the appropriate credits should be assigned to the learner. Recognition of Prior Learning will be done by means of Integrated Assessment as mentioned above.

This Recognition of Prior Learning may allow:

> Accelerated access to further learning at this or higher levels on the NQF.
> Gaining of credits towards a unit standard.
> Obtaining of this Qualification in pert or in whole,

Access to the Qualification:

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

QUALIFICATION RULES

The Qualification is made up of a planned combination of learning outcomes that have a defined purpose and will provide qualifying learners with applied competence and a basis for further training. The

Quatification is made up of unit standards that are classified as Fundamental, Core and Elective in achieving its purpose. A minimum of 130 credits is required to complete the Qualification.

In this Qualification the credits are allocated as follows:

> Fundamental: 36 credits.
> Core: 66 credits.
> Electives (minimum): 20 credits.
> **TOTAL: 122** credits.

Note that fifty four percent of the credits relate directly to small craft construction practices, The elective component allows the learner to select unit standards that are:

> Related to the work done by the learner in an organisation.
> Related to specialist areas in small craft construction specifically or other specialist areas that the learner might be interested in.

This is to ensure that while there is a strong small craft construction focus, there is scope for learners to select additional unit standards that are relevant to their own situations and cement articulation and portability opportunities for the learner.

Motivation for number of credits assigned to fundamental, core and ebctive

Allocation of Fundamental credits:

Unit standards to the value of 36 credits in Language and Communication, Mathematical Literacy have been selected for the Fundamental Component These unit standards will add value to learners both organisationally and functionally in terms of their ability to operate as a proficient person in a global economy. All the Fundamental unit standards are compulsory.

Allocation of *Core credits:*

66 credits have been allocated to unit standards in the Core component of this qualification. This is to ensure that the qualification has a strong small craft construction focus. The unit standards classified as Core reflect the compulsory aspects in small craft construction that the learner needs to be fully competent in. The Core component covers competencies related to small craft construction practices, marine systems and processes, quality assurance and management and life skills. The unit standards provide the knowledge, values and skills that all learners require in order to engage in small craft construction practices. AU Core. unit standards are compulsory.

Allocation of Elective credits:

There are unit standards totalling 105 credits in this component Learners are required to select electives Walling a minimum of 20 credits. It is intended that the selected electives should allow learners to develop alternative career paths; or gain additional skills and knowledge that relate directly to the work of the learner and which will enhance the learner's work performance or introduce a learner to areas *of* specialisation in small craft construction.

EXIT LEVEL OUTCOMES

1. Communicate with peers and members of supervisory/management levels and to use information which has been gathered and summarised from a range of sources to produce simple written reports.
2. Apply elementary manufacturing processes, effective organisational relations and practices to achieve small craft building business objectives.
3. Engage (with guidance) in self-directed activity in the small craft building processes.
4. Interpret designs and processes and recognise marine systems in order to maintain and support quality elementary installation processes in building small craft.

ASSOCIATED ASSESSMENT CRITERIA

1.
> Information and data is interpreted to ensure simple reports are produced for record keeping purposes.
> Communication processes are engaged in to inform peers and supervisors of production processes and challenges.
> Manufacturing materials tools are listed and stored for the purpose of production to standard specifications.
> Relationships with peers, supervisory and management levels are established and functioning to promote

communication within the workplace.
> Issues related to own role and purpose in the organisation are discussed to reflect an understanding of individual contribution to the manufacturing process.
> Problems are identified in a timely manner, reported and discussed and the agreed corrective action is implemented.

2.
> Demonstrate the ability to produce components and assemblies of some complexity, including the manufacture of simple moulds, the commissioning and repairing of tooling using a variety of fabrication methods and operations, resins, reinforcements, core materiat and impregnation techniques.
> Knowledge and comprehension of occupational health, safety and environmental legislation are applied as relevant to the small craft manufacturing industry according to standard operating procedures.
> Knowledge and comprehension of safety practices and procedures are applied in smalt craft manufacturing according to standard operating procedures.
> Small craft manufacturing quality assurance practices are monitored and controlled according to standard operating procedures.
> Small craft manufacturing equipment, tools and surfaces are cleaned according to standard operating procedures.

3.
> The fundamentals of composite, wood and metal small craft construction methods are applied according to company operating procedures.
> Curved laminated timber and board components are produced during self-directed activity in the building of a small craft.
> Polymer composite products are fabricated in accordance with design specifications.
> Sheet, plate, pipe and structural section are formed and shaped using power machinery required in the manufacturing process.

4.
> Quality issues are identified and resolved speedily and effectively.
> Appropriate data is collected and checked for non-conformances.
> Appropriate conclusions are drawn from the data.
> Appropriate consultations and discussions are held to communicate conclusions.,
> Marine systems are installed under close supervision.
> The fundamentah of design are applied in the smalt craft construction process.

Integrated Assessment

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

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

> Assessment of Communication and Mathematical Literacy should be integrated as far as possible with other aspects and should use practical administration 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 or will work. Where it is not possible to assess the learner in the workplace or on-thejob, 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 a range of formative and summative assessment tools methods and assess combinations of practical, applied, foundational and reflective competencies.

> 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.

> Assessment should ensure that all specific outcomes, embedded knowledge and critical cross-field outcomes are evaluated in an integrated manner.

INTERNATIONAL COMPARABILITY

This qualification was compared with training offered in countries that are acknowledged leaders in the

small boat-building industry; countries whose industry supplies small craft to others.

These countries are:

> Malaysia.
> China.
> Turkey.
> Australia.
> New Zealand.
> UK.
> USA.

United States of America:

Several providers of courses in boat building were identified in the USA, however no evidence was found of a national qualification in boat building. Standards for vocational training in boat building have been approved by the US Department of Education. Most courses are short learning programmes on a specific type of boat. The level at which these programmes are presented seems to be very elementary and the contents are well defined. It is deduced that the proposed South African qualifications at level 2 and 3 compares well with most of the learning programmes presented in the USA. It is evident that the South African approach will provide for a much more informed learner whilst the opportunity to follow a skills programme based on selected unit standards will allow learners to develop a very specific focused skill as is the USA.

Malaysia:

Malaysia is an emerging boat building country. To date they have not developed a formal national qualification. They have however identified future training objectives and are in the process of developing learning programmes for fibreglass boats.

China:

China has a well-established boat building industry but no evidence was found of any formal qualifications in boat building.

Turkey:

The boating industry is in Turkey is well developed. A technical high school, Kurucasile, on the Black Sea Coast of Turkey, is devoted to boat building only. This school, in addition to modern techniques, teaches its students, elements and principles of traditional craftsmanship. All the schools and academic institutions, issue diplomas to students who have attended the necessary courses and fulfilled all conditions, including tests and exams. In addition, people attending and successfully finishing the training courses held at various places, such as large yards, and other institutions, are given certificates declaring that the holder has completed a certain programAll these diplomas and certificates are valid nationwide. Diplomas issued by large universities (such as the naval architect diplomas issued by most technical universities) are internationally recognized.

Australia:

Australia has a well-established boat-building industry supported by well-defined units of study to be applied by training providers. Their learning programmes in boat building do not seem to follow levels of complexity but rather that of completeness. It is very difficult to compare the South African individual boat building qualifications with those in Australia. However, it seems that once South African learners had completed the FETC in Boat Building, they will be adequately equipped to compete,with their Australian counterparts.

New Zealand:

The New Zealand authorities compiled a range of national certificates that can be applied in the boat building industry. Most of these certificates are at level 4 with the exception of one that is registered at level 3. In general the contents of the South African boat building qualifications compares well with the New Zealand boat building qualifications.

United Kingdom:

The United Kingdom is renowned for their boat building expertise and similarly displays a well-thought-out capability to train towards that expertise. The UK has several national registered qualifications, however, it

does seem as though many training providers still present their own traditional learning programmes based on years of experience and specific community needs. It is thought that the South African boat building qualifications are much more comprehensive.

Africa in General:

Although many countries in Africa have displayed across the continent the capability to build boats of many shapes and sizes it still lacks the capability to build modern boats. No evidence was found of any boat building training being presented in sub-Saharan Africa. The South African qualifications could help to fill that gap on the continent by making these qualifications available to all those countries that might show an interest in these qualifications.

ARTICULATION OPTIONS

Articulation possibilities:

This Qualification articulates with the following proposed and registered Qualifications:

Horizontal articulation:

> National Certificate in Polymer Composite Fabrication NQF Level 3, ID 36155.
> National Certificate in Airconditioning, Refrigeration and Ventilation: NQF Level 3, ID 48963.
> National Certificate in Welding Application and Practice: NQF Level 3, ID 24213.

Vertical articulation:

> FETC: Small craft construction, ID 50542.
> FETC: Polymer Composite Fabrication, ID 36153.
> FETC: Airconditioning, Refrigeration and Ventilation, ID 48966.
> FETC: Welding Application and Practice, ID 24216.
> FETC: Furniture Making: Wood, ID 49092.

MODERATION OPTIONS

> Anyone assessing a learner or moderating the assessment of a learner against this Qualification must be registered as an assessor with an appropriate 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 ETQA or with an ETQA that has a Memorandum of Understanding with the relevant ETQA.

> Moderation of assessment will be overseen by the relevant ETQA 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 in the exit level outcomes described in the Qualification.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

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

> To be registered as an assessor with the relevant ETQA.
> To have a similar qualification at one level higher than *the* level of the qualification and a minimum of 12 months working experience.

NOTES

The elective unit standard category is open ended to allow the learner to choose the 20 credits associated to the elective unit standards from any discipline that would add value to the purpose of the qualification or the learners own development on a learning pathway within the manufacturing environment

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	110281 Fabricate a polymer composite product	Level 2	9	Registered
Core	9530 Manage work time effectively	Level 3	3	Reregistere
Core	9532 Demonstrate basic knowledge of computers	Level 3	6	Reregistered
Core	12244 Form and shape sheet, plate, pipe and structural section using power machinery	Level 3	15	Reregistered
Core	12488 Complete feasibility and commissioning reports	Level 3	3	Registered
Core	13254 Apply quality procedures	Level 3	6	Registered
Core	123599 Apply the fundamental methods of composite, wood and metal small craft construction	Level 3	10	Draft - Prep for P Comment
Core	123601 Demonstrate an understanding of basic machine systems installation and operation under close supervision	Level 3	10	Draft - Prep for P Comment
Core	123604 Apply design fundamentals in small craft construction processes	Level 3	10	Draft - Prep for P Comment
Elective	9533 Use communication skills to handle and resolve conflict in the workplace	Level 3	3	Reregistered
Elective	10783 Join of aluminium by means of arc welding	Level 3	5	Registered
Elective	12246 Assemble and mechanically join sheet, plate, tube, pipe and steel sections	Level 3	4	Reregistered
Elective	12255 weld workpieces with the gas metal arc welding process in all positions	Level 3	15	Registered
Elective	12455 Perform the role of a safety, health and environmental protection representative	Level	4	Registered
Elective	12456 Explain and use organisational procedures	Level 3	6	Registere
Elective	14735 Manufacture products from wood	Level 3	32	Registered
Elective	110280 Produce complex polymer composite product	Level 3	28	Registered
Elective	116720 Show understanding of diversity in the workplace	Level 3	3	Registered
Elective	116940 Use a Graphical User Interface (GUI)-based spreadsheet applicatio.. to solve a given problem	Level 3	6	Registered
Fundamental	7456 Use mathematics to investigate and monitor the financial aspects of personal, business and national affairs	Level 3	5	Reregistered
Fundamental	9010 Demonstrate an understanding of the use of different number bases and measurement units and an awareness of error in the context of relevant calculations	Level 3	2	Reregistered
Fundamental	9012 Investigate life and work related problems using data and probabilities	Level 3	5	Reregistered
Fundamental	9013 Describe, apply, analyse and calculate shape and motion in 2-and 3-dimensional space in different contexts	Level 3	4	Reregistered
Fundamental	119457 Interpret and use information from texts	Level 3	5	Registered
Fundamental	119466 Interpret a variety of literary texts	Level 3	5	Registered
Fundamental	119467 Use language and communication in occupational learning programmes	Level 3	5	Registered
Fundamental	119472 Accommodate audience and context needs in oral/signed communication	Level 3	5	Registered

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UNIT STANDARD: 1

Apply the fundamental methods of composite, wood and metal small craft construction

SAQA US ID	*UNIT STANDARD TITLE*		
123599	Apply the fundamental methods of composite, wood and metal small craft construction		
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	Manufacturing and Assembly
ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	10	Level 3	Regular

SPECIFIC OUTCOME 1

Interpret design factors relevant for small craft construction.

SPECIFIC OUTCOME 2

Prepare work area and gather materials and equipment.

SPECIFIC OUTCOME 3

Apply design factors for the construction of a small craft.

SPECIFIC OUTCOME 4

Finish and evaluate small craft final product

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UNIT STANDARD: ***2***

SAQA US ID	*UNIT STANDARD TITLE*		
123601	Demonstrate an understanding of basic marine systems installation and operation under close supervision		
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	Manufacturing and Assembly
ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
.Undefined	10	Level 3	Regular

SPECIFIC OUTCOME 1

Demonstrate an understanding and apply basic plumbing principles to marine systems.

SPECIFIC OUTCOME 2

Demonstrate an understanding and apply basic mechanical principles to marine propulsion and steering systems.

SPECIFIC OUTCOME 3

Demonstrate an understanding and apply basic direct current (DC) and alternating current (AC) electrical principles to marine systems.

SPECIFIC OUTCOME 4

Demonstrate a basic understanding of airconditioning, refrigeration and ventilation systems as relevant to their use on small craft.

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UNIT STANDARD: I 3

Apply **design fundamentals in small craft construction processes**

SAQA US ID	*UNIT STANDARD TITLE*		
123604	Apply design fundamentals in small craft construction processes		
SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB Manufacturing and Assembly Processes		**6**	
UNIT S NDARD YPE		*DESCRIPTION*	*SUBFIEL PT*
Regular		Manufacturing, Engine r : Technology	Manufac ind Ass mbly
ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	10	Level **3**	Regular

SPECIFIC OUTCOME 1

Describe and interpret the basic principles of design of small craft

SPECIFIC OUTCOME 2

Interpret and apply drawings.

SPECIFIC OUTCOME 3

Produce a technical drawing.

SPECIFIC OUTCOME 4

Use, store and retrieve design process documentation.