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## CONTENTS -INHOUD

<i>No.</i>	<i>Page No.</i>	<i>Gazette No.</i>
<b>GOVERNMENT NOTICES</b>		
<b>South African Qualifications Authority</b>		
<i>Government Notices</i>		
585 National Standards Body Regulations: Standards Generating Body: SGB Forensic Science Organising Field 08: Law, Military Science and Security ..	3	30065
586 oo.: do.: SGB Legal Education and Training Organising Field 08: Law, Military Science and Security ..	4	30065
587 do.: Standards Generating Body: SGB Resolving of Crime Organising Field 08: Law, Military Science and Security	5	30065
588 Public Notice by Organising Field 08, Law, Military Science and Security of the re-registration of the Standards Generating Body (SGB) for Corrections .	6	30065
589 Public Notice by Organising Field 06, Manufacturing, Technology and Engineering of the re-registration of the Standards Generating Body (SGB) for Weapons Maintenance .	10	30065
590 National Standards Bodies Regulations : Standards Generating Body (SGB) for Safety in Society registered by Organising Field 08, Law Military Science and Security ..	12	30065
591 do.: do .	39	30065
592 do.: Standards Generating Body (SGB) for Administration registered by Organising Field 03 – Business, Commerce and Management ..	56	30065
593 do.: Standards Generating Body (SGB) for Manufacturing & Assembly Processes registered by Organising Field 06 - Manufactuirng, Engineering and Technology ..	75	30065
594 do.: do .	84	30065
595 do.: Standards Generating Body (SGB) for Generic Manufacturing, Engineering and Technology registered by Organising Field 06 - Manufacturing, Engineering and Technology .	93	30065
596 do.: Standards Generating Body (SGB) for Generic Manufacturing, Engineering and Technology registered by Organising Field 06 - Manufacturing, Engineering and Technology ..	131	30065
597 do.: do .	150	30065

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**GOVERNMENT NOTICES**


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**SOUTH AFRICAN QUALIFICATIONS AUTHORITY**

No. 585

13 July 2007

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5 July 2007

The South African Qualifications Authority in terms of the National Standards Body Regulations (Government Gazette No. 18787) published on 28 March 1998, hereby gives notice of additional names for the following Standards Generating Body:

**SGB Forensic Science**  
**Organising Field 08: Law, Military Science and Security**

NOMINEE	WORKPLACE	NOMINATING BODY	EXPERIENCE / QUALIFICATIONS
M Rehder	South African Police Service	South African Police Service	<ul style="list-style-type: none"> <li>Advanced Certificate: Forensic Document examination</li> <li>18 years experience as Questioned Document examiner in SAPS</li> <li>Training Manager of SAPS Questioned Document Unit since 2000</li> </ul>

**S BHIKHA**  
**DIRECTOR: STANDARDS SETTING AND DEVELOPMENT**

**SAQA'S MISSION**

*..To ensure the development and implementation of a National Qualifications Framework which contributes to the full development of each learner and to the social and economic development of the nation at large"*

No. 586

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1 June 2007

The South African Qualifications Authority in terms of the National Standards Body Regulations (Government Gazette No. 18787) published on 28 March 1998, hereby gives notice of additional names for the following Standards Generating Body:

SGB Legal Education and Training  
 Organising Field 08: Law, Military Science and Security

NOMINEE	WORKPLACE	NOMINATING BODY	EXPERIENCE / QUALIFICATIONS
NJ Botha	University of South Africa	University of South Africa	<ul style="list-style-type: none"> <li>• BJuris</li> <li>• LLB</li> <li>• LLD</li> <li>• Professor of Public International Law</li> <li>• HoD: Constitutional, International and Indigenous Law</li> </ul>
EC Schlemmer	University of South Africa	University of South Africa	<ul style="list-style-type: none"> <li>• BA</li> <li>• LLB</li> <li>• LLM</li> <li>• LLD</li> <li>• Professor of Law, UNISA (2001- to date)</li> <li>• Professor of Law, RAU (1999)</li> <li>• Associate Professor, UNISA (1997)</li> </ul>
M Petersen-Waughtal	University of South Africa	University of South Africa	<ul style="list-style-type: none"> <li>• MA (Psychology)</li> <li>• BA Honours (Industrial Psychology)</li> <li>• BsocSc Honours (Psychology)</li> <li>• BsocSci</li> <li>• Registered Assessor and Moderator</li> <li>• Lecturer (1996-2002)</li> <li>• Educational Consultant dealing with curriculum design at Unisa (2002 - to date)</li> </ul>

**S BHIKHA**

DIRECTOR: STANDARDS SETTING AND DEVELOPMENT

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1 June 2007

The South African Qualifications Authority in terms of the National Standards Body Regulations (Government Gazette No. 18787) published on 28 March 1998, hereby gives notice of additional names for the following Standards Generating Body:

SGB Resolving of Crime  
 Organising Field 08: Law, Military Science and Security

NOMINEE	WORKPLACE	NOMINATING BODY	EXPERIENCE / QUALIFICATIONS
G Barnes	Liberty Life	The Association of Certified Fraud Examiners	<ul style="list-style-type: none"> <li>National Diploma: Police Management (TSA)</li> <li>Diploma: Crime Justice and Auditing (RAU)</li> <li>Certified Fraud Examiner (CFE)</li> </ul>
A White	Xavier Desktop Publishing and Corporate Services	The Association of Certified Fraud Examiners	<ul style="list-style-type: none"> <li>BA(HDE)</li> <li>Honours Linguistics</li> <li>Masters Applied Linguistics</li> <li>Skills Development Assessor</li> <li>Facilitator</li> <li>Human Resource Manager Training and Development Officer</li> </ul>
SM Olley	South African National Defence Force	Department of Defence	<ul style="list-style-type: none"> <li>Practical Pistol Shooter Instructor</li> <li>Security Officer Firearms Training</li> <li>Word and Excel Practical Training</li> <li>27 Years experience in the SANDF</li> </ul>

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 DIRECTOR: STANDARDS SETTING AND DEVELOPMENT

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PUBLIC NOTICE BY ORGANISING FIELD 08, LAW, MILITARY SCIENCE AND SECURITY OF THE RE-REGISTRATION OF THE STANDARDS GENERATING BODY (SGB) FOR CORRECTIONS.

BRIEF OF THE SGB

The Directorate for Standards Setting and Development hereby re-registers the SGB for Corrections in the sub-field of Safety in Society, in order to:

1. Identify transformation, development, access and equity issues relevant to legal education and training and develop mechanisms to include these issues within the standards and qualifications as envisaged in (3) below [*Regulation 24(1)(e)*].
2. Develop learning and career pathways for potential standards and qualifications in legal education and training from NQF level 1 through to level 8 [*Regulation 24(1)(e)*]
3. Generate qualifications and unit standards in accordance with SAQA requirements [*Regulation 24(1)(a)*]
4. Recommend the qualifications and standards generated in paragraph 3, above, to Organising Field 08 [*Regulation 24(1)(c)*].
5. Recommend criteria for the registration of assessors and moderators or moderating bodies [*Regulation 24(1)(d)*].
6. Review these qualifications and unit standards and effect the necessary changes [*Regulation 24(1)(b)*].
7. Perform such other functions as may from time to time be delegated by Organising Field 08 (Law, Military Science and Security) [*Regulation 24(1)(e)*].

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**Composition of SGB: Corrections**

<b>Nominee</b>	<b>Workplace</b>	<b>Nominating Body</b>	<b>Experience/Qualifications</b>
MR Sekotlong	Department of Correctional Services	Department of Correctional Services	<ul style="list-style-type: none"> <li>• B of Education</li> <li>• BA: Pedagogics</li> <li>• Educator, Gauteng Department of Education (1987-1990)</li> <li>• Lecturer, Promat Training College (1991-1995)</li> </ul>
J Monyante	GSL Solutions	GSL Solutions	<ul style="list-style-type: none"> <li>• National Diploma: Correctional Services Management</li> <li>• Custodial Duties, Department of Correction Services (DoCS)</li> <li>• Unit Manager, Mangaung Correctional Centre (MCC)</li> </ul>
P Maluleka	GSL Solutions	GSL Solutions	<ul style="list-style-type: none"> <li>• Diploma: Education, Training and Development</li> <li>• Diploma: Corporate Forensic Investigation</li> <li>• Senior Training Officer, DoCS</li> <li>• Training and Development Manager, Training Consultancy: PTMS</li> </ul>
F Booyesen	GSL Solutions	GSL Solutions	<ul style="list-style-type: none"> <li>• National Diploma: Human Resource Management</li> <li>• Inmate Information Services Supervisor, MCC</li> <li>• Employee Development Supervisor, MCC</li> </ul>
S James	GSL Solutions	GSL Solutions	<ul style="list-style-type: none"> <li>• BAdmin</li> <li>• B Tech: Correctional Services Management</li> <li>• Case Management, MCC</li> <li>• Unit Supervisor, MCC</li> </ul>

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I Swart	GSL Solutions	GSL Solutions	<ul style="list-style-type: none"> <li>• BA: Social Work</li> <li>• BA Honours: Human Resource Development</li> <li>• Social Worker, DoCS</li> <li>• Compiling job profiles for MCC</li> <li>• Development of Induction Training Programme, MCC</li> </ul>
TR Mabuza	Department of Correctional Services	Department of Correctional Services	<ul style="list-style-type: none"> <li>• Programme in Project Management</li> <li>• Masters: Public Policy and Administration</li> <li>• Bachelor: Education</li> <li>• BA</li> <li>• Director: Training Standards, DoCS</li> <li>• Deputy Director: Kroonstad and Zonderwater College, Pretoria</li> </ul>
SB Joseph	Department of Correctional Services	Department of Correctional Services	<ul style="list-style-type: none"> <li>• BTech: Correctional Services</li> <li>• BTech: Human Resource Development</li> <li>• MTech: Human Resource Development</li> <li>• Vocational Skills Development</li> <li>• ABET and Formal Education</li> </ul>
PS Motaung	Department of Correctional Services	Department of Correctional Services	<ul style="list-style-type: none"> <li>• MA</li> <li>• Further Diploma: Education</li> <li>• Director: Core Curriculum</li> <li>• Management and Support of DoCS Training Colleges</li> </ul>

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B Madhlaba	Department Correctional Services	of	Department of Correctional Services	<ul style="list-style-type: none"><li>• SA</li><li>• SA Honours: Psychology</li><li>• Educator, DoE</li><li>• Head: Training and Development, DoCS</li></ul>
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**DRS BHIKHA**  
**DIRECTOR: STANDARDS SETTING AND DEVELOPMENT**

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PUBLIC NOTICE BY ORGANISING FIELD 06, MANUFACTURING, TECHNOLOGY AND ENGINEERING OF THE RE-REGISTRATION OF THE STANDARDS GENERATING BODY (SGB) FOR WEAPONS MAINTENANCE.

BRIEF OF THE SGB

The Organising Field 06 hereby registers the SGB for Weapons Maintenance in the sub-field of Manufacturing and Assembly, in order to:

1. Identify transformation, development, access and equity issues relevant to legal education and training and develop mechanism to include these issues within the standards and qualifications as envisaged in (3) below [*Regulation 24(1)(e)J*].
2. Develop learning and career pathways for potential standards and qualifications in legal education and training from NQF level 1 through to level 8 [*Regulation 24(1)(e)*]
3. Generate qualifications and unit standards in accordance with SAQA requirements [*Regulation 24(1)(a)*]
4. Recommend the qualifications and standards generated in paragraph 3, above, to Organising Field 08 [*Regulation 24(1)(c)J*].
5. Recommend criteria for the registration of assessors and moderators or moderating bodies [*Regulation 24(1)(d)J*].
6. Review these qualifications and unit standards and effect the necessary changes [*Regulation 24(1)(b)*].
7. Perform such other functions as may from time to time be delegated by Organising Field 08 (Law, Military Science and Security) [*Regulation 24(1)(e)J*].

## Additional Names: Weapons Maintenance

Nominee	Workplace	Nominating Body	Experience/Qualifications
MF Mondo	South African Police Service	South African Police Service	27 years as logistical head
CJ Gerber	South African Police Service	South African Police Service	32 years as logistical head
KS Monchusi	South African Police Service	South African Police Service	<ul style="list-style-type: none"> <li>• Diploma: Human Resource Management</li> <li>• 10 years Supply Chain Management Commander</li> <li>• 5 years as an armourer</li> <li>• 2 years in firearm Special Projects</li> </ul>
A Pretorius	ITA Firearms	ITA Firearms	<ul style="list-style-type: none"> <li>• Qualified moderator</li> <li>• Appointed verifier</li> <li>• Certified National Rifle Association Training</li> <li>• Counsellor</li> <li>• Firearms Instructor</li> <li>• Law-Enforcement Officer</li> <li>• SWAT Instructor and Training Counsellor</li> </ul>



DRS BHIKHA  
DIRECTOR: STANDARDS SETTING AND DEVELOPMENT



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

Safety in Society

registered by Organising Field 08, Law Military Science and Security, 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 full Qualification and Unit Standards can be accessed via the SAQA web-site at [www.saga.org.za](http://www.saga.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 Qualification and Unit Standards should reach SAQA at the address below *and no later 13 August 2007*. All correspondence should be marked Standards Setting - Safety in Society and addressed to

The Director: Standards Setting and Development  
SAQA

*Attention: Mr. D. Mphuthing*

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DR. S. BHIKHA

DIRECTOR: STANDARDS SETTING AND DEVELOPMENT



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**QUAL/FICATION:**  
**Further Education and Training Certificate: Electronic Security Installation Practices**

<b>SAQA QUAL ID</b>		<b>QUAL/FICATION TITLE</b>	
58697		Further Education and Training Certificate: Electronic Security Installation Practices	
<b>ORIGINATOR</b>		<b>PROVIDER</b>	
SGB Security			
<b>QUAL/FICATION TYPE</b>	<b>FIELD</b>	<b>SUBFIELD</b>	
Further Ed and Training Cert	8 - Law, Military Science and Security	Safety in Society	
<b>ABET BAND</b>	<b>MINIMUM CREDITS</b>	<b>NQFLEVEL</b>	<b>QUAL CLASS</b>
Undefined	128	Level 4	Regular-Unit Stds Based

**PURPOSE OF THE QUAL/FICATION**

This qualification will allow a learner in the electronic security industry to obtain a nationally recognized qualification. This qualification will contribute towards a safer society, as it will set standards of professionalism needed by the industry. Learners will be able to plan effectively, install and configure electronic security systems and utilise equipment while applying safety and health principles. This qualification provides learners with knowledge and skills to effectively install, configure, test and hand-over electronic security systems to meet the customer's needs and satisfaction. The elective component of this qualification will allow a qualifying learner to demonstrate knowledge and understanding of specialised electronic security systems.

This qualification is designed to develop skills and knowledge required for learners to specialise in the planning, installing and configuring of electronic security systems such as closed circuit television (CCTV) systems, access controls systems, access automation systems, alarm systems as well as electric fence systems and intercom systems. These competencies will be applicable in wide range of contexts such as residential, commercial and industrial contexts and will significantly broaden the learner's employability.

A learner who has achieved this qualification will be capable of combining a range of self-organisation and life long skills with a working knowledge of South African electronic security issues, and integrating these within context to produce a professional practice which adheres to the high quality standards as expected by the security industry.

Competent learners will be able to:

- Install electronic security systems.
- Communicate with clients.
- Apply elementary physical science related concepts.

Rationale:

Electronic security is one of the major contributors to producing a safer society and environment. It creates a sense of security that is needed to support various political, social, economic and business agendas. The reduction of crime is currently a national prerogative on various levels as it leads and contributes towards a stable environment.

It has become clear that relying on human resources only for crime reduction and prevention purposes will not have the effect on crime levels currently desired. Hence, an initiative to find other ways and methods of dealing with crime prevention and reduction are embraced by both the government and the private sector. The use and importance of electronic security equipment has thus been highlighted in recent years.

Electronic security systems promote proactive prevention and reduction of crime, protection of persons and property and securing and provision of information as evidence, where necessary, to protect the broader society against crime. This qualification will provide electronic security standards aimed at supporting industry sectors, public or private companies, large and small, by identifying security risks and minimizing security breaches in any given environment.

This qualification reflects the workplace-based needs of the electronic security industry that are expressed by employers and employees. This qualification provides learners with accessibility to be employed within the electronic security industry and provides the flexibility to pursue an electronic security career with a wide variety of specialization options within this industry.

### **RECOGNIZE PREVIOUS LEARNING?**

Y

### **LEARNING ASSUMED IN PLACE**

- Communication at NQF Level 2.
- Mathematical Literacy at NQF Level 3.
- Use of hand tools at NQF Level 2.
- Use of power tools at NQF Level 2.

Recognition of Prior Learning:

The structure of this qualification makes the Recognition of Prior Learning possible through the assessment of individual Unit Standards. 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 learner 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.

This Recognition of Prior Learning may allow:

- Accelerated access to further learning at this or higher levels on the NQF.
- Gaining of credits for unit standards in the qualification.
- Obtaining of this Qualification in part or in whole.

Access to the Qualification:

Open access.

### **QUALIFICATION RULES**

- Learners must complete all the fundamental unit standards to the value of 56 credits.
- Learners must complete all the core unit standards to the value of 57 credits.
- Learners must complete unit standards to the value of at least 15 credits in the elective credits.

- The elective unit standards are clustered to provide areas of specialisation within the electronic security domain. Learners choosing an area of specialisation must complete all unit standards listed within that area of specialisation.

The specialisations are:

CCTV Specialisation:

- Demonstrate an understanding of CCTV.
- Install Close Circuit TV.

Access Control Systems Specialisation:

- Demonstrate an understanding of electronic access control.
- Install electronic access control systems.

Gate Automation System Specialisation:

- Demonstrate an understanding of gate automation.
- Install a gate automation system.

Electric Fencing Specialisation:

- Demonstrate an understanding of electric fencing.
- Install electric fencing.

Alarm System Specialisation:

- Demonstrate an understanding of intruder alarm systems.
- Install a basic radio transmitter and antenna system.

The elective component of this qualification is left open ended in order to allow the learner to choose unit standards that will add to this qualification.

### ***EXIT LEVEL OUTCOMES***

1. Install electronic security systems.
2. Communicate with clients.
3. Apply elementary physical science related concepts.

Critical Cross-Field Outcomes:

This qualification addresses the following Critical Cross-Field Outcomes, as detailed and expressed in the associated unit standards:

1. Identifying and solving electronic security problems where responses indicate that responsible decisions using critical and creative thinking have been made when doing installations and trying to meet clients needs and demands.
2. Working effectively with others as a member of a team, group, organisation, or community by participating effectively in carrying joint work with other people and helping to improve the work of his/her immediate team to meet organizational goals and objectives.

3. Organizing and managing oneself and one's activities responsibly and effectively through prioritizing personal tasks and maintaining as well as implementing a task list.
4. Collecting, analysing, organizing and critically evaluate information to determine and implement course of action.
5. Communicating effectively, using visual, mathematical and/or language skills in the modes of oral and/or written communication and persuasion when dealing with clients and designing systems and installations.
6. Using science and technology effectively and critically, showing responsibility towards the environment and the well being of others by using technology solutions for electronic security.
7. Demonstrating an understanding of the world as a set of related systems by recognizing that problem-solving contexts do not exist in isolation and engage with complex interrelated aspects of society and challenges and demands of electronic security from the legal, ethical, economical and political perspectives.
8. Participating as responsible citizens in the life of local, national and global communities as the knowledge and skills acquired will contribute towards effective and efficient electronic security practice.

#### **ASSOCIATED ASSESSMENT CRITERIA**

Assessment Criteria for Exit Level Outcome 1:

- 1.1 Cabling techniques are demonstrated when performing installations.
- 2.2 Equipment is used according to their specifications and applications.  
Range: Equipment refers to but is not limited to testing equipment, electronic equipment and installation equipment.
- 3.3 Operational requirements are determined for an installation according to given specifications.
- 4.4 An installation is configured according to given specifications.
- 5.5 An installation is assessed to determine faults and whether it complies with given specifications.
- 6.6 An installation is conducted according to given manufacturers specifications and legal prescripts.

Assessment Criteria for Exit Level Outcome 2:

- 2.1 Clients are interviewed to establish specifications and requirements of an installation.
- 2.2 Client service principles are applied when dealing with clients.
- 2.3 The importance of ethical behaviour is emphasised within the electronic security industry.

Assessment Criteria for Exit Level Outcome 3:

- 3.1 Principles of elementary electronics are applied when installing electronic security systems.
- 3.2 Principles of elementary mathematics are applied when installing electronic security systems.
- 3.3 Principles of elementary statistics are applied when installing electronic security systems.

Integrated Assessment:

Integrated assessments at the level of qualification provides an opportunity for learners to show that they are able to integrate concepts, ideas and actions across unit standards to achieve competence that is grounded and coherent in relation to the purpose of the qualification.

The applied competence (practical, foundational and reflective competencies) of this qualification will be achieved if a person is able to plan, design, install and program a wide range of electronic security systems and equipment. This planning, installation and programming of a system/equipment must be safe for society, quality assured and comply with minimum legislation.

The identifying and solving of problems, team work, organising one-self, the using of applied science, the implications of actions and reactions in the world as a set of related systems must be assessed during any combination of practical, foundational and reflexive competency assessment methods and tools to determine the whole person development and integration of applied knowledge and skills.

Applicable assessment tools to establish the foundational, reflective and embedded knowledge to problem solving and application of the world as a set of related systems within the electronic security environment.

A broad range of task orientated and theoretical assessment tools may be used.

A detailed portfolio of evidence may be required to prove the practical, applied and foundational competencies of the learner.

Assessors and moderators should develop and conduct their own integrated assessment by making 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 experience.

#### **INTERNATIONAL COMPARABILITY**

International searches were conducted to ensure that the qualification and its associated unit standards meet international standards. The comparison focused on the specific practices within the electronics security practices environment in terms of the qualification level, scope and competencies covered. The search provided a list of qualifications and the relevant awarding bodies accredited to provide a wide range of academic and vocational qualifications in this field. The world leader in the field of electronic security is the United Kingdom and hence a comparison was done with the qualifications in the UK. New Zealand was also used to conduct a comparison against, as their usage of electronic security systems are very similar to South Africa.

United Kingdom:

ETITO is an institution accredited with the United Kingdom Qualifications Authority that supports apprentices and employers within apprenticeship programmes including the Electronic Security industry. It is an institution that is recognised by government and the Electro-Technology industry as the national standards setting body involved in developing national qualifications, secure training and assessment, and manage quality of training. Some of the units standards contained in the qualification offered by ETITO compare favourably with the FETC: Electronic Security:

- "Regulations and standards applicable to electronic security" is covered in the embedded knowledge components of unit standards found in the FETC: Electronic Security where legal prescripts are dealt with.
- "Electronic security sub-systems and terminology" is covered in specific outcomes of unit standards found in the FETC: Electronic Security where terminology is dealt with.
- "Electronic security installation requirements and procedures" covers similar competencies as found in the unit standard: "Determine Installation Requirements" found in the FETC: Electronic Security.



- "Connection, Testing and programming of intruder alarm systems" covers similar competencies as found in the unit standard: "Configure an installation" found in the FETC: Electronic Security.
- "Cable support systems and cables" covers similar competencies as found in the unit standard: "Apply cabling methods" found in the FETC: Electronic Security.
- "Practical installation of intruder alarm systems" covers similar competencies as found in the elective component of the FETC: Electronic Security.
- The fundamental component and Exit Level Outcomes of the FETC Electronic Security deal with two unit standards dealing with "Report Writing" and "Customer Service" in the UK based qualification.
- "Design electronic security intercom systems" and "Design electronic security CCTV systems" covers similar competencies as found in the elective component of the FETC: Electronic Security.

A City and Guilds qualification at level 3 on the UK NVQ entitled: "Security, emergency and alarm systems" is similar to the FETC. The following standards in this qualification compare well with the unit standards found in the FETC: Electronic Security:

- "Communicate effectively in the workplace" covers similar competencies as found in the unit standard named "Accommodate audience and context needs in oral/signed communication" found in the FETC: Electronic Security.
- "Plan the installation of security, emergency or alarm systems and services" covers similar competencies as found in the unit standard "Determine Installation Requirements" found in the FETC: Electronic Security.
- "Diagnose and rectify faults on security, emergency or alarm systems" covers similar competencies as found in the unit standard "Determine and rectify faults in an installation" found in the FETC: Electronic Security.
- "Install cabling for security, emergency or alarm systems" covers similar competencies as found in the unit standard "Apply cabling methods" found in the FETC: Electronic Security.
- "Install security, emergency or alarm equipment" covers similar competencies as found in the unit standard "Install electronic equipment" found in the FETC: Electronic Security.
- "Commission and hand-over security, emergency or alarm system" covers similar competencies as found in the unit standard "Conduct a briefing on installed systems" found in the FETC: Electronic Security.
- "Demonstrate the use of and hand over security, emergency or alarm systems" to customers covers similar competencies as found in the unit standard "Conduct a briefing on installed systems" found in the FETC: Electronic Security.

#### New Zealand:

The New Zealand qualifications framework has a qualification at an equivalent level to the FETC: Electronic Security. The New Zealand qualification is pitched at New Zealand NQF Level 4 and is worth 92 credits, whereas the FETC: Electronic Security consists of 128 credits. There is thus a difference in notional hours of training. The unit standards of the New Zealand qualification compare well with the FETC: Electronic Security.

#### National Certificate in Electronic Security (Level 4) (New Zealand).

The following unit standards form part of the New Zealand qualification and covers the same competencies outlined in certain unit standards of the FETC: Electronic Security:

- "Demonstrate knowledge of electronic security systems and equipment functions" covers similar competencies as found in the unit standard: "Determine Installation Requirements", found in the FETC: Electronic Security.

- "Design electronic security access control system" covers similar competencies as found in the elective component of the FETC: Electronic Security.
- "Design electronic security intruder alarm system" covers similar competencies as found in the elective component of the FETC: Electronic Security.
- "Commission and hand-over integrated electronic security system" covers similar competencies as found in the unit standard: "Conduct a briefing on installed systems", found in the FETC: Electronic Security.
- "Manage and/or supervise workplace operations" are covered by the Critical Cross Field Outcomes outlined in the FETC: Electronic Security.
- "Design electronic security intercom systems" covers similar competencies as found in the elective component of the FETC: Electronic Security.
- "Design electronic security CCTV systems" covers similar competencies as found in the elective component of the FETC: Electronic Security.

### **ARTICULATION OPTIONS**

This qualification articulates horizontally with the following qualification:

- ID 57713: FETe: Specialist Security Practices NQF Level 4.

This qualification articulates vertically with the following qualification:

- ID 50122: National Certificate: Policing NQF Level 5.

### **MODERATION OPTIONS**

- Anyone assessing a learner or moderating the assessment of a learner against this qualification must be registered as an assessor with the relevant ETQA and any other body with whom a MOU was entered into.
- Any institution offering learning that will enable achievement of this qualification must be accredited as a provider through the relevant ETQA and any other body with whom a MOU was entered into by SAQA.
- The relevant ETQA and any other body with whom a MOU was entered into will oversee assessment and moderation of assessment according to the moderation guidelines in the relevant competency and the relevant ETQA and any other body with whom a MOU was entered into procedures.
- Moderation must include both internal and external moderation of assessment at exit points of the qualification, unless ETQA policies specify otherwise. Moderation should encompass achievement of the competence described both in individual unit standards, exit level outcomes as well as the integrated competence described in the qualification.
- Anyone wishing to be assessed against this competency may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA and any other body with whom a MOU was entered into.

### **CRITERIA FOR THE REGISTRATION OF ASSESSORS**

- The assessor must be a registered assessor with the relevant ETQA.
- The assessor must be a subject matter expert within the field of electronic security systems and equipment.
- The assessor must be competent in the outcomes of this qualification.
- The assessor must have at least 12 months experience within the field of electronic security systems and equipment.

### **NOTES**

N/A

**UNIT STANDARDS**

	<b>ID</b>	<b>UNIT STANDARD TITLE</b>	<b>LEVEL</b>	<b>CREDITS</b>
Core	244328	Apply cabling methods	Level 3	8
Core	244321	Use elementary electronics as applied to electronic systems	Level 3	4
Core	244336	Configure an installation	Level 4	7 ~
Core	244323	Determine installation requirements	Level 4	4
Core	244326	Explain the use of installed systems	Level 4	3
Core	244333	Install electronic equipment	Level 4	12
Core	244315	Assess threat for security installation purposes	Level 5	7
Core	244331	Determine and rectify faults in an installation	Level 5	12
Elective	244337	Demonstrate an understanding of CCTV	Level 4	6
Elective	244332	Demonstrate an understanding of electric fencing	Level 4	4
Elective	244325	Demonstrate an understanding of electronic access control	Level 4	6
Elective	244322	Demonstrate an understanding of gate automation	Level 4	6
Elective	244316	Demonstrate an understanding of intruder alarm systems	Level 4	11
Elective	244320	Install Closed Circuit Television (CCTV)	Level 4	10
Elective	244318	Install a basic radio transmitter and antenna system	Level 4	4
Elective	244324	Install a gate automation system	Level 4	15
Elective	244329	Install electric fencing	Level 4	11
Elective	244314	Install electronic access control systems	Level 4	10
Fundamental	119472	Accommodate audience and context needs in oral/signed communication	Level 3	5
Fundamental	119457	Interpret and use information from texts	Level 3	5
Fundamental	119467	Use language and communication in occupational learning programmes	Level 3	5
Fundamental	119465	Write/present/sign texts for a range of communicative contexts	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	119462	Engage in sustained oral/signed communication and evaluate spoken/signed texts	Level 4	5
Fundamental	12417	Measure, estimate & calculate physical quantities & explore, critique & prove geometrical relationships in 2 and 3 dimensional space in the life and workplace of adult with increasing responsibilities	Level 4	4
Fundamental	119469	Read/view, analyse and respond to a variety of texts	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	12153	Use the writing process to compose texts required in the business environment	Level 4	5
Fundamental	119459	Write/present/sign for a wide range of contexts	Level 4	5



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:*****Install electronic access control systems***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244314	Install electronic access control systems		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
SGB Security			
<b>FIELD</b>	<b>SUBFIELD</b>		
8 - Law, Military Science and Security	Safety in Society		
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	I Regular	Level 4	10

**SPECIFIC OUTCOME 1**

Plan an access control system.

**SPECIFIC OUTCOME 2**

Acquire configuration information.

**SPECIFIC OUTCOME 3**

Installing an access control system.

**SPECIFIC OUTCOME 4**

Configure the system.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### UNIT STANDARD:

#### *Assess threat for security installation purposes*

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244315	Assess threat for security installation purposes		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
SGB Security			
<b>FIELD</b>	<b>SUBFIELD</b>		
8 - Law, Military Science and Security	Safety in Society		
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQFLEVEL</b>	<b>CREDITS</b>
Undefined	1Regular	Level5	17

#### **SPECIFIC OUTCOME 1**

Demonstrate an understanding of electronic security principles.

#### **SPECIFIC OUTCOME 2**

Describe factors influencing electronic security protection.

#### **SPECIFIC OUTCOME 3**

Design electronic security protection installations.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:*****Demonstrate an understanding of intruder alarm systems***

<b>SAQA USID</b>	<b>UNIT STANDARD TITLE</b>		
244316	Demonstrate an understanding of intruder alarm systems		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
SGB Security			
<b>FIELD</b>	<b>SUBFIELD</b>		
8 - Law, Military Science and Security	Safety in Society		
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Reoular	Level 4	11

**SPECIFIC OUTCOME 1**

Explain theory of intruder alarm systems.

**SPECIFIC OUTCOME 2**

Explain the theory associated with intruder detectors.

**SPECIFIC OUTCOME 3**

Determine intruder alarm systems requirements.



**SOUTH AFRICAN QUALIFICATIONS AUTHORITY**

**UNIT STANDARD:**

***Install a basic radio transmitter and antenna system***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244318	I Install a basic radio transmitter and antenna system		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
SGB Security			
<b>FIELD</b>	<b>SUBFIELD</b>		
8 - Law, Military Science and Security	Safety in Society		
<b>ABETBAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQFLEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 4	14

**SPECIFIC OUTCOME 1**

Describe basic radio propagation theory.

**SPECIFIC OUTCOME 2**

Describe the fundamental components of a radio transmission system.

**SPECIFIC OUTCOME 3**

Mount, wire, configure and test a basic radio transmission system.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

## UNIT STANDARD:

*Install Closed Circuit Television (CCTV)*

SAQA USID	UNIT STANDARD TITLE		
244320	Install Closed Circuit Television	CCTV)	
ORIGINATOR	PROVIDER		
SGB Security			
FIELD	SUBFIELD		
8 - Law, Military Science and Security	Safety in Society		
ABET BAND	UNIT STANDARD TYPE	NQFLEVEL	CREDITS
Undefined	Regular	Level 4	10

## SPECIFIC OUTCOME 1

Verify components suitability for the application.

## SPECIFIC OUTCOME 2

Mount and install CCTV components.

## SPECIFIC OUTCOME 3

Use CCTV test equipment.





## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:***Use elementary electronics as applied to electronic systems*

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244321	Use elementary electronics as applied to electronic systems		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
SGB Security			
<b>FIELD</b>	<b>SUBFIELD</b>		
8 - Law, Military Science and Security	Safety in Society		
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 3	/4

**SPECIFIC OUTCOME 1**

Apply elementary electrical fundamentals.

**SPECIFIC OUTCOME 2**

Demonstrate the application of electronic components used in electronic installations.

**SPECIFIC OUTCOME 3**

Use multimeters to perform measurements in electronic circuits.

**SPECIFIC OUTCOME 4**

Apply soldering techniques.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:*****Demonstrate an understanding of gate automation***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244322	1 Demonstrate an understanding of gate automation		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
SGB Security			
<b>FIELD</b>	<b>SUBFIELD</b>		
8 - Law, Military Science and Security	Safety in Society		
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	1 Regular	Level 4	16

**SPECIFIC OUTCOME 1**

Identify general requirements for gate automation.

**SPECIFIC OUTCOME 2**

Describe basic mechanical principles used in gate automation.

**SPECIFIC OUTCOME 3**

Explain gate automation functions.



**SOUTH AFRICAN QUALIFICATIONS AUTHORITY**

**UNIT STANDARD:**

***Determine installation requirements***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244323	Determine installation requirements		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
SGB Security			
<b>FIELD</b>	<b>SUBFIELD</b>		
8 - Law, Military Science and Security	Safety in Society		
<b>ABETBAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQFLEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 4	14

**SPECIFIC OUTCOME 1**

Determine site requirements for an installation.

**SPECIFIC OUTCOME 2**

Determine equipment required for installation.

**SPECIFIC OUTCOME 3**

Determine resources for installation.

**SPECIFIC OUTCOME 4**

Confirm power requirements of the system.



**SOUTH AFRICAN QUALIFICATIONS AUTHORITY**

**UNIT STANDARD:**

***Install a gate automation system***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244324	Install a gate automation system		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
SGB Security			
<b>FIELD</b>	<b>SUBFIELD</b>		
8 - Law, Military Science and Security	Safety in Society		
<b>ABETBAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQFLEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 4	15

**SPECIFIC OUTCOME 1**

Prepare a site for gate automation.

**SPECIFIC OUTCOME 2**

Install gate automation.

**SPECIFIC OUTCOME 3**

Test Gate Automation.



**SOUTH AFRICAN QUALIFICATIONS AUTHORITY**

**UNIT STANDARD:**

***Demonstrate an understanding of electronic access control***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244325	Demonstrate an understanding of electronic access control		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
SGB Security			
<b>FIELD</b>	<b>SUBFIELD</b>		
8 - Law, Military Science and Security	Safety in Society		
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQFLEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 4	16

**SPECIFIC OUTCOME 1**

Demonstrate an understanding of electronic access control systems.

**SPECIFIC OUTCOME 2**

Determine electronic access control requirements.

**SPECIFIC OUTCOME 3**

Describe the legislation that governs the electronic access control environment.

**SPECIFIC OUTCOME 4**

Demonstrate an understanding of locking systems in an electronic access control environment.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### UNIT STANDARD:

#### *Explain the use of installed systems*

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244326	Explain the use of installed systems		
<b>ORIGINATOR</b>			<b>PROVIDER</b>
SGB Security			
<b>FIELD</b>			<b>SUBFIELD</b>
8 - Law, Military Science and Security			Safety in Society
<b>ABETBAND</b>	<b>1</b>	<b>UNIT STANDARD TYPE</b>	<b>NQFLEVEL</b> <b>1 CREDITS</b>
Undefined	1	Regular	Level 4      13

#### **SPECIFIC OUTCOME 1**

Assess system functionality.

#### **SPECIFIC OUTCOME 2**

Prepare and conduct a customer briefing.



**SOUTH AFRICAN QUALIFICATIONS AUTHORITY**

**UNIT STANDARD:**

***Apply cabling methods***

<b>SAQA USID</b>	<b>UNIT STANDARD TITLE</b>		
244328	Apply cabling methods		
<b>ORIGINATOR</b>		<b>PROVIDER</b>	
SGB Security			
<b>FIELD</b>		<b>SUBFIELD</b>	
8 - Law, Military Science and Security		Safety in Society	
<b>ABETBAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQFLEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 3	/8

**SPECIFIC OUTCOME 1**

Describe cable types.

**SPECIFIC OUTCOME 2**

Apply cable termination methods.

**SPECIFIC OUTCOME 3**

Secure cabling from point of origin to termination point.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:*****Install electric fencing***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244329	Install electric fencing		
<b>ORIGINATOR</b>		<b>PROVIDER</b>	
SGB Security			
<b>FIELD</b>		<b>SUBFIELD</b>	
8 - Law, Military Science and Security		Safety in Society	
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 4	11

**SPECIFIC OUTCOME 1**

Plan an electric fence installation.

**SPECIFIC OUTCOME 2**

Install electric fence components.

**SPECIFIC OUTCOME 3**

Install energiser.

**SPECIFIC OUTCOME 4**

Test for operation, safety and handover installation.





**SOUTH AFRICAN QUALIFICATIONS AUTHORITY**

**UNIT STANDARD:**

***Determine and rectify faults in an installation***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244331	Determine and rectify faults in an installation		
<b>ORIGINATOR</b>		<b>PROVIDER</b>	
SGB Security			
<b>FIELD</b>		<b>SUBFIELD</b>	
8 - Law, Military Science and Security		Safety in Society	
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 5	12

**SPECIFIC OUTCOME 1**

Determine the nature of the condition.

**SPECIFIC OUTCOME 2**

Determine causes of the condition .

**SPECIFIC OUTCOME 3**

Conduct checks and tests.

**SPECIFIC OUTCOME 4**

Rectify a faulty installation.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:*****Demonstrate an understanding of electric fencing***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244332	Demonstrate an understanding of electric fencing		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
SGB Security			
<b>FIELD</b>	<b>SUBFIELD</b>		
8 - Law, Military Science and Security	Safety in Society		
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 4	14

**SPECIFIC OUTCOME 1**

Describe electric fencing insulators.

**SPECIFIC OUTCOME 2**

Describe electric fencing brackets.

**SPECIFIC OUTCOME 3**

Describe types of wire used in electric fencing.

**SPECIFIC OUTCOME 4**

Demonstrate knowledge of terminology used in electric fencing.

**SPECIFIC OUTCOME 5**

Differentiate between types of energisers.

**SPECIFIC OUTCOME 6**

Demonstrate knowledge of the current standard and safety regulation regarding electric fencing.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:*****Install electronic equipment***

<b>SAQA US ID</b>		<b>UNIT STANDARD TITLE</b>	
244333		Install electronic equipment	
<b>ORIGINATOR</b>		<b>PROVIDER</b>	
SGB Security			
<b>FIELD</b>		<b>SUBFIELD</b>	
8 - Law, Military Science and Security		Safety in Society	
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 4	12

**SPECIFIC OUTCOME 1**

Prepare for electronic installation.

**SPECIFIC OUTCOME 2**

Verify the suitability of equipment.

**SPECIFIC OUTCOME 3**

Install components.

**SPECIFIC OUTCOME 4**

Perform an installation test.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:****Configure an instal/ation**

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244336	Configure an installation		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
SGB Security			
<b>FIELD</b>	<b>SUBFIELD</b>		
8 - Law, Military Science and Security	Safety in Society		
<b>ABETBAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQFLEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 4	17

**SPECIFIC OUTCOME 1**

Prepare for system configuration.

**SPECIFIC OUTCOME 2**

Perform system configuration.

**SPECIFIC OUTCOME 3**

Perform system configuration testing.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:*****Demonstrate an understanding of CCTV***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244337	Demonstrate an understanding of CCTV		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
SGB Security			
<b>FIELD</b>	<b>SUBFIELD</b>		
8 - Law, Military Science and Security	Safety in Society		
<b>ABETBAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQFLEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 4	16

**SPECIFIC OUTCOME 1**

Demonstrate an understanding of the basic theory of CCTV.

**SPECIFIC OUTCOME 2**

Explain the functionality of the components of a CCTV system.

**SPECIFIC OUTCOME 3**

Explain the ethics and legal aspects pertaining to CCTV installations.

No. 591

13 July 2007



## 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

## Safety in Society

registered by Organising Field 08, Law Military Science and Security, 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 full Qualification and Unit Standards can be accessed via the SAQA web-site at [www.saga.org.za](http://www.saga.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 Qualification and Unit Standards should reach SAQA at the address below *and no later 13 August 2007*. All correspondence should be marked Standards Setting - Safety in Society and addressed to

The Director: Standards Setting and Development  
SAQA  
*Attention: Mr. D. Mphuthing*  
Postnet Suite 248  
Private Bag X06  
Waterkloof  
0145  
or faxed to 012 - 431-5144  
e-mail: [dmphuthing@saqa.org.za](mailto:dmphuthing@saqa.org.za)

DR. S. BHIKHA  
DIRECTOR: STANDARDS SETTING AND DEVELOPMENT



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### QUAL/FICATION:

#### *National Certificate: Close Protection*

<b>SAQA QUAL ID</b>	<b>QUAL/FICATION TITLE</b>		
58696	National Certificate: Close Protection		
<b>ORIGINATOR</b>		<b>PROVIDER</b>	
SGB Security			
<b>QUAL/FICATION TYPE</b>	<b>FIELD</b>	<b>SUBFIELD</b>	
National Certificate	8 - Law, Military Science and Security	Safety in Society	
<b>ABETBAND</b>	<b>MINIMUM CREDITS</b>	<b>NQFLEVEL</b>	<b>QUAL CLASS</b>
Undefined	131	Level5	Regular-Unit Stds Based

### **PURPOSE OF THE QUAL/FICATION**

Purpose:

This qualification is intended for individuals interested in the close protection field be they new entrants, security personnel or government officials within the arena of safety in society and other persons involved in close protection functions. Learners who achieve this qualification will be able to demonstrate knowledge and skills including attitudes and values pertinent to the close protection sector. The close protection learner will not only gain the protection competencies needed by this sector, but will also gain valuable skills in terms of conflict management, protocol, etiquette, diplomacy and threat and risk analysis.

Close protection officers are often required not only to react appropriately to any threat or situation confronting or impeding his/her principal, but also to plan activities of the principals whom they are protecting (taking into account risks and hazards) and to interact with diplomatic, public and other figures. This qualification is designed to produce a well-rounded individual who is able to manage difficult and sensitive situations. Physical protection is normally the last action which such an individual must take as the planning and conflict resolution skills should always be utilised first in all risk related matters.

This qualification intends to provide learners with competencies that will enable them to provide professional close protection services by way of creating and maintaining a safe and secure environment within which a principal(s) can conduct his/her activities relative free of threat, harassment, embarrassment and undue interference. This qualification is designed to provide learners who wish to join the close protection service sector with competencies to respond and deal effectively with, situations that may detrimentally affect their principal(s).

Competent learners will be capable of:

- Researching protective risk related information.
- Formulating a risk profile.
- Planning and preparing for a close protection operation.
- Implementing close protective measures.
- Communicating with role-players within the context of protective operation.

Rationale:

The security sector plays an integral part in South Africa as it assists the law enforcement sector with a sustained environment in which crime is prevented and deterred. It is therefore, vital to

ensure that persons within the ambit of private and public close protection are adequately trained and educated in terms of their competencies, skills and values. The security domain is divided into different sectors of which close protection is one.

Close protection is a vital domain of security as it provides protection services to public and private figures such as high-ranking governmental officials and dignitaries. The creation of a safe and secure environment for these public and private figures is important as it creates a stable platform for them to fulfil their mandates and roles. Without their safety they would be unable to contribute to the country on various levels including, political, business, scientific, Non Governmental Organisations (NGOs) and entertainment levels. While the general security of the society in the country plays an important role to ensure that all citizens are secured and protected, it is of national interest that individuals such as business leaders, diplomats, dignitaries, celebrities and the general public are protected. Therefore this qualification plays a pivotal role in fulfilling the need for a safe and protected environment. This qualification will enable learners to gain knowledge and skills to assist principal(s) live their lives in a safe and secure environment. The importance and impact of Close Protection in South Africa is significant, especially with the current development initiatives by government to improve the economy of the country, for example, protection of dignitaries from other countries visiting the South African government, international sporting events and concerts where protection is needed for both individuals and spectators.

Most learners endeavouring to complete this qualification may come from the law enforcement, defence and private security sector. Many of them would have completed a qualification in basic security aspects and will then move on to complete this qualification as it forms an area of specialisation within the security sector. However, this qualification has also been designed to allow learners who have no previous experience to access the sector. Learners entering this qualification will be able to progress vertically from generic security and law enforcement services qualifications to more specialized close protection services as well as articulate horizontally to security management practices, bomb disposal, policing, special combat capabilities and certain emergency medical care qualifications.

Currently there are a limited number of trained individuals who were either trained overseas or within the government sector to perform exclusive close protection services and as a result there is a serious shortage of trained people in this field. The number of current close protection officers in the country is limited hence the need for this qualification is eminent in order to develop a pool of close protection officers. The qualification facilitates access to education, training and a career path within the close protection services thus developing a pool of qualified, professional close protection personnel. This qualification aims to formalize close protection as a credible profession in South Africa as there was previously no complete formal qualification recognized by authorities or registered on the South African National Qualifications Framework (NQF).

### **RECOGNIZE PREVIOUS LEARNING?**

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### **LEARNING ASSUMED IN PLACE**

- Communication at NQF Level 4.
- Mathematical Literacy at NQF Level 4.

It is assumed that learners are competent in the following unit standards:

- "Operate a rigid light vehicle", ID 123257.
- "Demonstrate knowledge of Firearms Control Act ", ID 117705.
- "Handle and use a handgun", ID 119649.
- "Provide risk based primary emergency care/first aid as an advanced first responder in the workplace", ID120336.



**Recognition of Prior Learning:**

This qualification can be achieved wholly or in part through Recognition of Prior Learning. The learner and assessor will jointly decide on methods to determine prior learning and competence implicit in the qualification and the associated unit standards. Recognition of prior learning should be done by means of integrated assessment. Due to the fact that there are persons who are already working in this sector, the RPL process may allow for:

- Accelerated access to further learning.
- Gaining of credits contained in the unit standards of this qualification.

**Access to the Qualification:**

Senior certificate or equivalent, learners without an equivalent NQF Level 4 qualification can gain access through the application of Recognition of Prior Learning. Learners with certain physical disabilities may find it difficult to successfully complete this qualification.

**QUALIFICATION RULES****Fundamental:**

All the unit standards to the value of 20 credits in the fundamental component are compulsory.

**Core:**

All the unit standards to the value of 92 credits in the core component are compulsory.

**Electives:**

Learners must complete unit standards to the value of at least 19 credits in the elective credits. The elective unit standards are clustered to provide areas of specialisation within the close protection domain. Learners choosing an area of specialisation must complete all unit standards listed within that area of specialisation. Learners choosing not to specialise are limited to choosing unit standard from the generic cluster listed below to the value of 19 credits. Should an area of specialisation not contain the prescribed minimum elective credits needed to complete the qualification, learners may choose additional credits from the generic elective component. The specialisations are:

**Counter Assault Operations Specialization:**

- Handle and use a shotgun for business purposes.
- Demonstrate tactical proficiency with a shotgun.
- Handle and use a self loading rifle or carbine for business.
- Demonstrate tactical proficiency with a self loading rifle or carbine.
- Handle and use a manual operated rifle or carbine for business purposes.
- Demonstrate tactical and street survival techniques.

**Events Security Specialization:**

- Apply technical knowledge and skill in an emergency situation.
- Conduct security at an event.

**Protective Information Practices Specialization:**

- Apply principles of risk management.
- Conduct a security threat assessment in a defined operational area.

- Develop an incident management plan.

Generic Electives:

- Write and present for a wide range of purposes audiences and contexts.
- Implement policies regarding HIV/AIDS in the workplace.
- Interpret the principles contained in basic South African law as entrenched in the constitution and the Bill of Rights.
- Demonstrate an understanding of stress in order to apply strategies to achieve optimal stress levels in personal and work situations.
- Apply leadership concepts in a work context.
- Identify and explain explosives.
- Negotiate and manage conflict in the workplace.
- Demonstrate tactical and street survival techniques.
- Supervise shooting exercises.

The elective component of this qualification is left open ended in order to allow the learner to choose unit standards that will add to this qualification. Further elective clusters such as remote emergency assistance, control room operations and surveillance may be added in future.

**EXIT LEVEL OUTCOMES**

1. Research protective risk related information.
  - Range: Risk related information refers to information directly relevant to a protection operation.
2. Formulate a risk profile.
3. Plan and prepare for a close protection operation.
4. Implement close protective measures.
  - Range: Close protective measures include but are not limited to proactive and reactive, static and transit measures.
5. Communicate with role-players within the context of close protection operations.

Critical Cross-Field Outcomes:

This qualification addresses the following Critical Cross-Field Outcomes, as detailed and expressed in the associated unit standards:

1. Problem-solving.
  - Range: Identifying and solving problems in which responses indicate that responsible decisions using critical and creative thinking have been made when acting on decisions to solve close protection industry related problems efficiently and effectively.
2. Working effectively with others as a member of a team, group, organisation or community.
  - Range: Working effectively with others as a member of a team, group, organisation, or community by participating effectively in carrying joint work with other people and helping to improve the work of his/her immediate team to meet organizational goals and objectives.
3. Organising and managing oneself and one's activities responsibly and effectively.
  - Range: Organizing and managing oneself and one's activities responsibly and effectively through prioritizing personal tasks and maintaining as well as implementing a task list.
4. Collecting, analysing and organising information.

- Range: Collecting, analysing, organizing and critically evaluate information when determining and implementing a course of action.

#### 5. Communicating effectively.

- Range: Communicating effectively, using visual, mathematical and/or language skills in the modes of oral and/or written communication and persuasion.

#### 6. Using science.

- Range: Using science and technology effectively and critically, showing responsibility towards the environment and the well being of others by using technology to gather and interpret information relating to security risks.

#### 7. Understanding the world as a set of related systems.

- Range: Demonstrating an understanding of the world as a set of related systems by recognizing that problem-solving contexts do not exist in isolation when engaging with complex interrelated aspects of society and challenges and demands of close protection from the legal, ethical, economical and political perspectives.

#### 8. Understanding the learner and society.

- Range: Participating as responsible citizens in the life of local, national and global communities as the knowledge and skills acquired will contribute towards effective and efficient close protection practice.

### **ASSOCIATED ASSESSMENT CRITERIA**

#### Assessment Criteria for Exit Level Outcome 1:

##### 1.1 Sources of information are identified to conduct risk analysis.

- Range: Information refers to but is not limited to the information about the principal, routes, venue, closed and open sources and government agencies.

##### 1.2 Information gathering methods are used to access information in order to compile a risk profile.

- Range: Information may refer to but is not limited to interviews, fieldwork and questionnaires.

##### 1.3 Gathered information is assessed and interpreted to determine its validity, relevance and priority.

##### 1.4 Information is reviewed in order to inform future decision-making.

#### Assessment Criteria for Exit Level Outcome 2:

##### 2.1 A risk profile is reviewed in order to inform future protective actions and decision-making.

##### 2.2 Terminology and concepts used in risk profiling are described to establish standardisation.

##### 2.3 Information is analysed for risk analysis purposes.

- Range: Analysis must include specific and generic risk identification.

##### 2.4 Potential risk is quantified in order to compile a risk profile.

- Range: Quantification refers to but is not limited to level of risk, possible implications and possible limitations. Potential risk may include health and safety hazards, medical, traffic, environmental, location and cultural threats.

##### 2.5 A risk forecast is determined and communicated to role-players.

- Range: Risk forecast must contain forecasts pertaining to protocol, logistics, financial constraints and human resources needs.

##### 2.6 A risk profile is collated for operational use.

#### Assessment Criteria for Exit Level Outcome 3:

##### 3.1 Key role-players are identified in line with the given risk profile.

##### 3.2 Operational requirements are determined for planning purposes.

- Range: Operational requirements refer to administration resources, logistical resources, financial resources, accommodation and human resources.
- 3.3 Personal strengths and weaknesses of self, employees and principals are assessed in order to match them with operational requirements.
- 3.4 Operational plan is formulated in line with operational requirements.
- Range: Operational plan refers but is not limited to a venue plan, route plan and pedestrian escort plan (including emergencies, contingency plans).
- 3.5 The operational plan is reviewed to inform future operational decisions.
- 3.6 Factors influencing the operation are assessed to determine their impact.
- Range: Factors include but are not limited to psychological, cultural, resource and protocol factors.

#### Assessment Criteria for Exit Level Outcome 4:

- 4.1 The importance of reviewing protective measures is explained to inform future decision-making.
- 4.2 Protective measures are selected in terms of their advantages and disadvantages in given situations.
- Range: Given situations refer but are not limited to case studies, structured scenarios, role-plays and simulations.
- 4.3 Protective measures are applied in line with the operational plan.

#### Assessment Criteria for Exit Level Outcome 5:

- 5.1 Communication techniques are identified for use in close protection operation.
- Range: Communication techniques refer but are not limited to verbal and non-verbal and emergency indicators such as hand signals.
- 5.2 Protocol and etiquette is adhered to when communicating with the principal and other role-players.
- Range: Protocol and etiquette refer but are not limited to accepted, prescribed official and unofficial protocol, etiquette, religious and cultural norms.
- 5.3 Reports are collated for record-keeping purposes.
- Range: Reports refer but are not limited to written (such as occurrence book, operational diary entries), electronic and verbal reports.

#### Integrated Assessment:

The assessment criteria embedded in the unit standards contained in this qualification are performance-based, assessing applied competence (practical, foundational and reflective) competencies regarding security management related knowledge and skills. The learner assessed against this qualification should be able to integrate the various unit standards outcomes to be able to practice as a close protection officer. Both formative and summative assessments are required so that learners are given feedback on their progress in achievement of specific learning outcomes. The qualification should be assessed on the basis of evidence of demonstrated performance in the workplace or in simulated work situations designed to draw upon similar performance to that required at the workplace.

The summative assessment should be concerned with the judgment of the learning in relation to the exit level outcomes, which evaluates the learner's ability to integrate knowledge and skills as well as the attitude or behaviour required to provide security management services and deal effectively with difficult and sensitive situations. Assessment of communication and mathematical literacy should be integrated as far as possible within the context of specific learning.

All exit level outcomes, critical cross-field outcomes, and essential embedded knowledge required by the component unit standards are to be assessed. Evidence of the achievement of

the critical cross-field outcomes should be found both in performance and in explaining and applying the essential embedded knowledge.

### **INTERNATIONAL COMPARABILITY**

It must be highlighted that the security industry especially within the close protection sector is a highly regulated industry whose information is regarded as sensitive and protected and may not be easily accessible.

Background and rationale for the choice of countries for comparison.

Close Protection training is a highly regulated and sophisticated practice. When selecting countries for comparison, a well-documented and comprehensive report on research conducted in the sector with special reference to training was sought, with a view seeking those countries where close protection or security management practices are regarded to be of high quality. The United Kingdom, Israel and Australia were chosen as they embody current best practice in terms of Close Protection. The United States of America was not chosen as there is no universal standard set for the entire country (Standards are determined on a state by state basis). However, research indicated that there were training institutions in the USA providing training services on close protection. It was found that countries in Africa either had limited regulatory structures and/or no established close protection training standards, hence conducting a comparison with them was very difficult. Most African and developing countries use military and law enforcement agencies to conduct close protection of their political and public figures and were loath to exchange information in this regard.

When determining international comparability it is important to note that South Africa has been a leader in Security regulation and monitored training for many years. An example of this is the fact that our security regulatory authority PSIRA (the former Security Officers Board) has been in existence since 1986, whereas, the Security Industry Authority (SIA) of the United Kingdom has only been operational for the last two years.

It is quite clear that in terms of South African training standards and competencies of local close protection officers, the unique operational requirements of the South African environment need to be prioritized. This qualification not only matches the competency outcomes of similar type international qualifications but takes them a step further.

The United Kingdom:

Currently the UK is governed by the Security Industry Authority (SIA) a subdivision of the Home Office which has in place a set standard for Close Protection training. The UK standard includes almost no hard skills (firearms and non-lethal weapons training) and would not be transferable in the South African environment for obvious reasons. However, the converse would be true in terms of the soft skills competencies of their qualification which would have a direct relationship with the National Certificate: Close Protection which also emphasise the soft skills needed such as diplomatic protocol, verbal conflict management and operating within current legal frameworks.

In the UK the security industry training standards are set by the Security Industry Authority (SIA) which is responsible for licensing and regulation via awarding bodies (similar to the South African qualification generation bodies (such as SGBs) and the quality control mechanisms (such as ETQA's). SIA fulfils similar functions to PSIRA in South Africa.

There are also qualifications level ratings based on the National Vocational Qualifications (NVQ) system which correspond to South Africa's National Qualifications Framework (NQF). The primary difference being that the NQF takes all qualifications into account while the NVQ concentrates on vocational qualifications and not on tertiary level qualifications such as university degrees. The National Certificate: Close Protection is deemed to fit NQF level 5

according to the level descriptor document while the VQ qualification of the UK is deemed to fit level descriptors pertaining to their level 3.

Israel:

At a superficial level it appears as if the close protection industry in Israel is unregulated. However, on closer examination close protection officers candidates in Israel must still meet minimum firearms' competencies which are covered by the National Certificate: Close Protection in terms of learning assumed to be in place as well as in the elective component. The fact that military service is compulsory in Israel seems to have created a surplus of persons in the close protection environment.

The infrastructure of private security regulation in Israel is quite capable of creating a separate database and regulatory body for Close Protection Officers (in terms of established regulatory bodies, potential inspectors and penalty systems for non-compliance). However, it seems that it has been the Israeli authorities' choice to regulate Close Protection as part of the whole private security industry. Moreover, Israel has a strict implementation of regulating the private security industry (i.e. sight inspections and penalties or prosecution for utilising non-registered operatives).

Overall, the key information extracted from interviews conducted seems to indicate that the infrastructure for regulation seems to be in place but it is the lack of suitable standards, specifically for close protection, that fails to separate qualified persons in close protection from the rest of the private security industry operatives in Israel.

Australia:

Again, like the case of the USA, it was difficult to utilise Australia as a base for comparison since each state (seven) in Australia has different laws, standards and regulation procedures. However, the findings of research indicated that close protection industry in Australia is highly regulated and very closely monitored. On the whole the demand for private sector close protection officers in Australia appears quite low compared to South Africa. In Australia the vast majority of close protection tasks are performed by the relevant authorities, police or other government agencies such as the Federal Protection Service on either a federal or state level.

The majority of information gathered was focused on New South Wales (NSW). The regulations in place in NSW seem to be more or less consistent with the other states in Australia that seemed to have relatively minor differences (Le. registration fees, renewal procedures, scope of duties that private security officers can apply, etc.) in terms of this research.

The key consideration is that there is a unit standard equivalent titled: Perform Close Personal Protection Duties (PUAPPP001A), which is in place and listed on the Australian National Training Information Service. It is, however, not available for civilian perusal. The fact that a standard exists clearly indicates that there are set minimum standards for operational competency of Close Protection Operatives in place for Australia as a whole.

In NSW, a regulation and licensing procedure for close protection officers is in place with an expiry period (the duration of a licence varies from one to five years) applicable to such licences. The overseeing body is the Security Industry Registry which is administered by the NSW police service (<http://www.police.nsw.gov.au>). Each state in Australia also recognises licenses from one another. However, in order to operate in different states a close protection officer must register with the relevant authority in each state (i.e. the Security Industry Registry in Victoria) before being able to work in that state.

The Australian close protection industry seems to conform to all aspects covered by the National certificate: Close Protection, however, interesting questions seemed to have been raised in the Australian context on aspects such as:

1. Is over-regulation making it too difficult for potential close protection officers to enter the market? In the National Certificate: Close Protection it is emphasised that access is of an inclusive nature rather than exclusionary in line with the objectives of the NQF.
2. Is the highest level of training actually being offered since there is not really a comparative environment? Comparison in this regard is quite difficult in Australia as the private sector has not yet gained momentum, however, in South Africa the public and the private sector are both currently engaged within the close protection environment. In South Africa the minimum standards as outlined but the National Certificate: Close Protection is set high as this qualification caters for both the private and government sectors such as the South African Police Service, the South African Air Force and the National Key Points.
3. With the majority of training in Australia being provided by state agencies and very little private sector training taking place (as compared to South Africa where formalised private close protection training has been offered since 1995), the scope of career development for close protection officers is very limited e.g. the highest tertiary qualification is a Diploma in Security Management with no further security related qualifications being available. The National Certificate: Close Protection ensures proper articulation into the further Higher Education band by articulating to qualifications such as the Bachelor: Policing Practices currently registered on the NQF.

SADC region:

- Botswana:

Further searches were conducted in the SADC region including Botswana, and no formalised training standards were found for comparison purposes. Close protection officers from Africa are mostly trained either in South Africa or overseas.

### **ARTICULATION OPTIONS**

This qualification articulates horizontally with the following registered qualifications:

- ID 49124: National Diploma: Bomb Disposal, NQF Level 5.
- ID 48879: National Diploma: South African Special Forces Operations, NQF Level 5.
- ID 50122: National Certificate: Policing, NQF Level 5.

This qualification articulates vertically with the following registered qualifications:

- ID 50194: BA. Policing Practices, NQF Level 6.
- National Diploma: Policing at NQF Level 6.
- B Tech Security Risk Management.

### **MODERATION OPTIONS**

N/A

### **CRITERIA FOR THE REGISTRATION OF ASSESSORS**

- Must be competent and have practical experience in the outcomes of this qualification.
- Have subject matter expertise in the field of close protection.
- Be registered as an assessor with the relevant ETQA.
- Must have two years practical operational experience within the field of close protection.

### **NOTES**

Learners who do not have a formal licence issued by an authorized licensing body will not be able to prove certain competencies related to driving of light vehicles, as they are not allowed access to public roads according to legal prescripts.

The learner should exhibit the physical attributes necessary to conduct close protection activities.

### UNIT STANDARDS

	10	UNIT STANDARD TITLE	LEVEL	CREDITS
Core	123510	Apply tactical knowledge in the use of firearms	Level 4	5
Core	123513	Demonstrate tactical proficiency with a handgun	Level 4	5
Core	123515	Handle and use a handgun for business purposes	Level 4	3
Core	7854	Provide First Aid	Level 4	4
Core	115311	Apply advanced driving skills / techniques in defensive and offensive situations	Level 5	9
Core	244330	Compile a threat and risk assessment for a close protection operation	Level 5	5
Core	120486	Demonstrate physical defensive restraining techniques	Level 5	6
Core	244319	Provide close protection to designated persons whilst in transit	Level 5	15
Core	244327	Provide pedestrian escort to designated persons within a close protection environment	Level 5	15
Core	244334	Provide protection to designated persons whilst embussing or debussing	Level 5	10
Core	244317	Provide static protection to designated persons.	Level 5	15
Elective	242824	Apply leadership concepts in a work context	Level 4	12
Elective	242679	Apply technical knowledge and skill in emergency planning	Level 4	3
Elective	242830	Conduct a security threat assessment in a defined operational area	Level 4	6
Elective	244335	Conduct security at an event	Level 4	5
Elective	123518	Demonstrate tactical proficiency with a self-loading rifle or carbine	Level 4	5
Elective	123512	Demonstrate tactical proficiency with a shotgun	Level 4	5
Elective	123519	Handle and use a manually operated rifle or carbine for business purposes	Level 4	3
Elective	123511	Handle and use a self loading rifle or carbine for business	Level 4	3
Elective	123514	Handle and use a shotgun for business purposes	Level 4	3
Elective	11513	Operate effectively within a specified control room environment	Level 4	15
Elective	115313	Prepare officials and individuals to survive a hostage incident	Level 4	2
Elective	123516	Supervise shooting exercises	Level 4	3
Elective	120303	Apply principles of risk management	Level 5	8
Elective	9407	Communicate with clients and discuss work	Level 5	5
Elective	15096	Demonstrate an understanding of stress in order to apply strategies to achieve optimal stress levels in personal and work situations	Level 5	5
Elective	120477	Demonstrate tactical and street survival techniques	Level 5	10
Elective	119034	Develop an incident management plan	Level 5	6
Elective	117469	Identify and explain explosives	Level 5	9
Elective	9224	Implement policies regarding HIV/AIDS in the workplace	Level 5	4
Elective	114226	Interpret and manage conflicts within the workplace	Level 5	8
Elective	113810	Interpret the principles contained in basic South African law as entrenched in the constitution and the Bill of Rights	Level 5	6
Elective	115790	Write and present for a wide range of purposes, audiences and contexts	Level 5	5
Fundamental	120476	Adhere to professional conduct and organisational ethics	Level 5	4
Fundamental	117449	Apply the general principles of criminal law to the investigation of crime	Level 5	8
Fundamental	114871	Know and apply diplomatic protocols and etiquette	Level 5	8





## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### UNIT STANDARD:

*Provide static protection to designated persons.*

SAQA US ID	UNIT STANDARD TITLE		
244317	Provide static protection to designated persons.		
<b>ORIGINATOR</b>		<b>PROVIDER</b>	
SGB Security			
<b>FIELD</b>		<b>SUBFIELD</b>	
8 - Law, Military Science and Security		Safety in Society	
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 5	15

#### **SPECIFIC OUTCOME 1**

Identify and assess potential risks at a venue.

#### **SPECIFIC OUTCOME 2**

Implement measures to protect the principal whilst at the venue.

#### **SPECIFIC OUTCOME 3**

Establish and coordinate a venue operations centre.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:*****Provide close protection to designated persons whilst in transit***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244319	Provide close protection to desi	nated persons whilst in transit	
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
SGB Security			
<b>FIELD</b>	<b>SUBFIELD</b>		
8 - Law, Military Science and Security	Safety in Society		
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 5	15

**SPECIFIC OUTCOME 1**

Plan and reconnoitre routes according to a transit risk profile.

**SPECIFIC OUTCOME 2**

Set-up a convoy according to a transit risk profile.

**SPECIFIC OUTCOME 3**

Manage tactical convoy movements.



**SOUTH AFRICAN QUALIFICATIONS AUTHORITY**

**UNIT STANDARD:**

***Provide pedestrian escort to designated persons within a close protection environment***

<b>SAQA USID</b>	<b>UNIT STANDARD TITLE</b>		
244327	Provide pedestrian escort to designated persons within a close protection environment		
<b>ORIGINATOR</b>		<b>PROVIDER</b>	
SGB Security			
<b>FIELD</b>		<b>SUBFIELD</b>	
8 - Law, Military Science and Security		Safety in Society	
<b>ABETBAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQFLEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 5	15

**SPECIFIC OUTCOME 1**

Plan a pedestrian escort.

**SPECIFIC OUTCOME 2**

Provide body cover to a principal whilst implementing pedestrian foot formations.

**SPECIFIC OUTCOME 3**

Manage threats and or attacks on the principal whilst on foot.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:*****Compile a threat and risk assessment for a close protection operation***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244330	Compile a threat and risk assessment for a close protection operation		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
SGB Security			
<b>FIELD</b>	<b>SUBFIELD</b>		
8 - Law, Military Science and Security	Safety in Society		
<b>ABETBAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQFLEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 5	15

**SPECIFIC OUTCOME 1**

Collate information regarding threats and risks to a principal.

**SPECIFIC OUTCOME 2**

Evaluate and estimate threat probability and impact of threats.

**SPECIFIC OUTCOME 3**

Categorize risk levels.

**SPECIFIC OUTCOME 4**

Provide recommendations on the protective measures needed to ensure the safety of a principal.



**SOUTH AFRICAN QUALIFICATIONS AUTHORITY**

**UNIT STANDARD:**

***Provide protection to designated persons whilst embussing or debussing***

<b>SAQA USID</b>	<b>UNIT STANDARD TITLE</b>		
244334	Provide protection to designated persons whilst embussing or debussing		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
SGB Security			
<b>FIELD</b>	<b>SUBFIELD</b>		
8 - Law, Military Science and Security	Safety in Society		
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQFLEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 5	10

**SPECIFIC OUTCOME 1**

Plan and secure a transition area earmarked for the arrival and/or departure of the principal.

**SPECIFIC OUTCOME 2**

Manage the principal's risk while in transition.

**SPECIFIC OUTCOME 3**

Conclude transition duties.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:****Conduct security at an event**

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244335	I Conduct security at an event		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
SGB Security			
<b>FIELD</b>	<b>SUBFIELD</b>		
8 - Law, Military Science and Security	Safety in Society		
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQFLEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 4	15

**SPECIFIC OUTCOME 1**

Perform event security.

**SPECIFIC OUTCOME 2**

React to incidents and breaches of security in a given situation.

**SPECIFIC OUTCOME 3**

Direct crowds at special events.



## 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

## Administration

registered by Organising Field 03 - Business, Commerce and Management, 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 full Qualification and Unit Standards can be accessed via the SAQA web-site at [www.saga.org.za](http://www.saga.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 Qualification and Unit Standards should reach SAQA at the address below and *no later than 13 August 2007*. All correspondence should be marked Standards Setting-Administration and addressed to

The Director: Standards Setting and Development  
SAQA

*Attention: Mr. D. Mphuthing*  
Postnet Suite 248  
Private Bag X06  
Waterkloof  
0145  
or faxed to 012 - 431-5144  
e-mail: [dmphuthing@saqa.org.za](mailto:dmphuthing@saqa.org.za)

DR. S. BHIKHA  
DIRECTOR: STANDARDS SETTING AND DEVELOPMENT



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

## QUALIFICATION:

National Certificate: Local Government Support Services

SAQA QUALID	QUALIFICATION TITLE		
58644	National Certificate: Local Government Support Services		
ORIGINATOR		PROVIDER	
SGB Administration			
QUALIFICATION TYPE	FIELD	SUBFIELD	
National Certificate	3 - Business, Commerce and Management Studies	Public Administration	
ABET BAND	MINIMUM CREDITS	NQFLEVEL	QUAL CLASS
Undefined	127	Level 3	Regular-Unit Stds Based

**PURPOSE OF THE QUALIFICATION**

Purpose of the Qualification:

The purpose of the qualification is to enable qualifying learners to gain an insight into the business of Local Government, especially with reference to the key municipal processes and programme initiatives undertaken. It will enable learners to:

- Enter rotational job programmes *in* a support service capacity in the different technical sectors of Local Government having gained an introductory knowledge and insight into how each sector works.
- Understand the overall functions of government departments and how they fit into the overall service delivery objectives.
- Provide the necessary support and administrative services in the Local Government environment.

The learning outcomes contained in this qualification are based on the competencies required to contribute to Local Government support services from an administrative and/or financial support perspective. These competences relate to:

- Demonstrating an understanding of municipal financial management and budgeting.
- Providing support and administrative services in a Local Government environment.
- Demonstrating an understanding of the areas of technical service delivery within Local Government.
- Utilising problem-solving and decision-making techniques in own Local Government context.
- Demonstrating an understanding of the municipal working environment.

Rationale:

In response to the need for critical skills in Local Government this qualification provides a broad introductory overview to learners either wishing to enter Local Government and be exposed to new job opportunities, or for learners already in Local Government positions wishing to have opportunities for job growth. This qualification is designed to provide the learners with an overview of the specific Local Government work environment, how it functions and how it interlinks with other government departments and what constitutes its broad programme and key service objectives.



Skills needs at Level 3 of the NQF are critical to the overall success and the efficient functioning of Local Government. Many learners already in related jobs or wishing to enter the job market at this level play a critical role in the support units of the Local Government. This qualification provides a strong foundation for future learning. Equally this qualification may serve as a basis for the development of employee induction programmes at any level entering Local Government for the first time.

### **RECOGNIZE PREVIOUS LEARNING?**

Y

### **LEARNING ASSUMED IN PLACE**

It is assumed that the learners accessing this qualification are competent in:

- Communication at NQF Level 2.
- Mathematical Literacy at NQF Level 2.

Recognition of Prior Learning:

The structure of this Unit Standards-based Qualification makes the Recognition of Prior Learning possible. Learner and Assessor will jointly decide on the methods to be used to determine prior learning and competencies implicit in the Qualification and the associated Unit Standards. Recognition of Prior Learning will be done by means of an Integrated Assessment.

This Recognition of Prior Learning may allow for:

- Accelerated access to further learning at this or higher levels on the NQF.
- Gaining of credits towards an Unit Standard in this Qualification.
- Obtaining this Qualification in whole or in part.

All recognition of Prior Learning is subject to quality assurance by the relevant ETQA or an ETQA that has a Memorandum of Understanding with the relevant ETQA.

Access to the Qualification:

Access to this Qualification is open, bearing in mind the Learning Assumed to be in Place.

### **QUALIFICATION RULES**

The Certificate is made up of Unit Standards that are classified as Fundamental, Core and Elective. A minimum of 127 credits is required to complete the qualification.

Fundamental Component:

Unit standards totalling thirty six (36) credits are allocated to the Fundamental component: twenty (20) credits in Communication and sixteen (16) credits in Mathematical Literacy.

All these standards are compulsory.

Core Component:

Unit standards totalling eighty eight (80) credits have been allocated to the Core Component of this Qualification to ensure strong Local Government support and awareness focus. The unit standards classified as Core describe the integral functions and activities required to work in Local Government support services and provide opportunities to develop knowledge of the municipal working environment, integrating support services into own Local Government context.

All these standards are compulsory.

Elective Component:

There are unit standards totalling forty seven (42) credits in this Component. These unit standards continue from the core component in focusing on learning areas pertinent to Local Government support services and will enable learners to gain specialist knowledge and skills. Learners are required to select Electives that add up to at least eleven (11) credits. The learner may also select other unit standards at the level of the qualification, not listed here, which are of particular interest to the learner, with the approval of the relevant ETQA (Education, Training and Quality Assurance Body).

### **EXIT LEVEL OUTCOMES**

1. Demonstrate an understanding of how Local Government operates.
2. Apply support and administrative services in Local Government context.
3. Demonstrate an understanding of municipal financial management and budgeting.

### **ASSOCIATED ASSESSMENT CRITERIA**

1.
  - The policy and legal framework guiding Local Government is explained with reference to own work context.
  - The municipal working environment is explained with specific reference to how it links into own support services role.
  - The areas of technical service delivery within Local Government are demonstrated so that job rotation can be undertaken in each area in support services capacity.
  - The planning functions of Local Government are explained with examples.
  - National programmes are identified and explained in relation to their impact on Local Government.
  - The employment relationship in Local Government is explained with reference to own employment context.
2.
  - Accountability is ensured in own work context by applying appropriate problem solving and decision making skills according to Local Government policies and procedures.
  - The various administrative systems and resources that are available to support service delivery are identified and integrated into own work context.
  - Support services are provided to specific projects.
  - Project principles and processes are applied in own work context.
  - Storage and retrieval systems are set up in line with local government policies and procedures.
  - The principles of Batho Pele are applied to own work context.
3.
  - The way in which effective financial management is ensured within Local Government is outlined with examples.
  - A budget is discussed within the context of Local Government.
  - The sources of revenue in Local Government are identified with examples.
  - The budget process is described in reference to Local Government.

Integrated Assessment:

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

Learning, teaching and assessment are inextricably linked. 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 strategic analysis and planning competencies should be conducted in conjunction with other aspects and should use authentic municipal development 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-ed, 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**

Introduction:

Training in African countries and the Western World where Local Government structures are well established was looked at to assess the suitability and the level of learning in the qualification.

SADC:

Angola:

Local Government in Angola is under-resourced and lacks capacity to deliver services effectively. While decentralisation has taken place this was mainly decentralization of roles and responsibilities. No training initiatives are available. Angola is in need of programmes similar to those that have been developed in South Africa.

Tanzania:

The Association of Local Authorities of Tanzania (ALAT) engagement in this area is entirely through the Municipal Development Partnership for Eastern and Southern Africa (MDPESA).

Mali:

Mali is in the process of decentralising power to municipal level and developing programmes for strengthening skills at this level. The Association of Municipalities of Mali (AMM) through the Municipal Development Partnership for Eastern and Southern Africa (MDPESA), is *also* engaged in the process.

Mozambique:

There are examples of sporadic training conducted in Mozambique, but there is no continuous process leading to a recognised qualification. The National Association of Municipalities of Mozambique (ANAM) is also engaged in the process through the Municipal Development Partnership for Eastern and Southern Africa (MDPESA).

Kenya:

The Association of Local Government Authorities of Kenya (ALGAK) (<http://www.algak.net/cms/index.php>) has introduced programmes for training of councillors and local authority officers. In an effort to enhance management skills in Local Government ALGAK has produced the Kenya Councillors Handbook (1998) with an update in 2002, and has taken initial measures to revive professionalism in the Local Government sector. Training of the kind envisaged by this qualification is absent at present in Kenya.

The Municipal Development Partnership for Eastern and Southern Africa (MDPESA). ([http://www.mdpafrica.org.zw/africaJocal\\_governance\\_programme.htm](http://www.mdpafrica.org.zw/africaJocal_governance_programme.htm)):

This regional organisation with participation from the United Nations, Canada and other capacity building NGOs is concerned with building capacity in Local Government mainly by strengthening counsellors' skills and the community including providing assistance to decentralisation initiatives. South Africa is a member of this organisation and is clearly a leader in initiatives of the kind proposed by this qualification. If any comparable initiatives exist in the nations reviewed, these initiatives are too low key to register in the media or in discussions on available websites of development organisations. It should be concluded that South Africa is a pioneer in the field of Local Government capacity building in Africa.

United Kingdom:

This qualification can be compared to the Public Services National Diploma, Level 3 in the UK. This nationally validated course is recognised by the public service and the universities in Britain. It aims to prepare students for a wide variety of careers including the police; fire service; ambulance service; HM customs; the armed forces and the rescue services. Students may take additional qualifications alongside their public services course such as *AS/A* Levels, and GCSE results. The qualification covers 18 units over 2 years, of which 2 are externally assessed. These units allow students to investigate the nature of the work within specific public service department or sector including their role within the community and society, as well as focusing on general issues relevant to all sectors of the public service.

A second qualification of interest is the Certificate in Administration, offered by the North Devon College. It is a two year full time course which has been designed primarily to prepare students with the skills and knowledge needed to meet the entry requirements of a number of public service organisations. The course comprises 18 units:

- Understanding the Public Sector.
- Law & the Legal System.
- Leadership.
- Citizenship & Contemporary Issues.
- Diversity & the Public Services.
- International Perspectives.
- Data Interpretation.
- The Uniformed Services.
- Expedition Skills.
- Human Behaviour.
- Dealing with Accidents.
- Teamwork.

- Health & Fitness.
- Outdoor Activities.
- Criminology.
- Custodial Care.
- Major Incidents.
- Customs & Excise.
- Signals and Communication.
- Nautical Studies.

The course fits the needs of the so called uniformed public services.

Recently the British Government has established a Sector Skills Council for Central Government Standards and Qualifications to upgrade the skills of its civil servants.

The future plans and objectives of this newly formed organisation include:

- Developing an interim Standards and Qualifications Strategy based on Professional Skills for Government by December 2006.
- Developing a Standards and Qualifications strategy by December 2007.
- Developing Standards and Qualifications to meet the needs of PSG by December 2008.
- Influencing the development of Standards and Qualifications by other SSCs and sector bodies.
- Developing a Standards and Qualifications framework for central government.

Considering the developments in South Africa in this regard we are ahead of Britain, especially in providing entry level training in government processes and programmes.

Canada:

Athabasca University provides a Certificate in Public Administration that educates students on administration at the municipal, provincial, and federal levels of government.

Athabasca University is Canada's 'Open University'. More details can be found at <http://www.athabascau.ca/>.

The programme's curriculum includes:

- Public Finance.
- Budgeting.
- Economics.
- Public policy.
- Legal Studies.
- Industrial Relations.

The Public Administration Certificate enables students to enter or re-enter the job market, for a promotion in the public sector or career migration.

The certificate requires 30 credits from the following selection (credit values in brackets):

- Administrative Principles (3).
- Microeconomics (3).
- Macroeconomics (3).
- Public Policy and Administrative Governance (3).
- Public Policy in a Global Era (3).
- Public Budgeting and Financial Management in a Globalised World (3).

- Industrial Relations: A Critical Introduction (3).
- Administrative Law (3).
- Commercial Law (3).
- Introduction to Political Science I: Concepts, Structures, and Institutions (3).
- Canadian Government and Politics (3).

This is an undergraduate course certificate, equivalent to a first year degree course and is at a much higher level than this level 3 qualification. It emphasises an academic rather than a practical approach if compared to this level 3 qualification which is tailored to our practical South African developmental needs, particularly for unemployed learners.

Australia:

In Australia apprentices and trainees gain qualifications under the Australian Qualifications Framework (AQF) predominantly between AQF levels 1 to 3 (AQF has 6 Levels). The majority of traineeships are currently conducted under a Training Agreement of 12 months duration and provide an AQF Level 2 qualification. The majority of apprenticeships are currently conducted in 3 to 4 years Training Agreement and provide a minimum qualification at AQF level 3. Both trainees and apprentices can enter subsequent Training Agreements to gain higher level qualifications.

In the case of an Administrative Services Trainee (General), who obtains a Certificate II in Government the employee will work as a general administrative assistant performing a range of tasks under close supervision.

His summary of training includes the following units:

- Work in a public sector environment.
- Communicate in the workplace.
- Use technology in the workplace.
- Follow defined occupational health and safety policies and procedures.
- Deliver service to clients.
- Access and use resources.
- Handle workplace information.

Considering the title, specific outcomes, assessment criteria, exit level outcomes and embedded knowledge of this certificate we can conclude that it compares best with our qualification at Level 3 but still places limited emphasis on the Local Government environment.

Conclusion:

From the information available on developmental initiatives, undertaken in other countries it can be concluded that within the SADC region, various projects are underway to build capacity, focusing mainly on the councillor and related functions that facilitate democratic processes and citizen involvement. Limited evidence exists in relation to capacity building from within Local Government, particularly at entry Level. Based on the information and analysis of the training initiatives and programmes in other countries it is clear that South Africa is a pioneer in the training field for Local Government support services practitioners in a variety of positions.

### **ARTICULATION OPTIONS**

This Qualification articulates horizontally with the following qualifications:

- 1057804: National Certificate: Public Administration, NQF Level 3.
- 10 58578: National Certificate: Local Government Councillor Practices, NQF Level 3.

This Qualification articulates vertically with the following qualifications:

- 1050372: Further Education and Training Certificate: Municipal Finance and Administration, NQF Level 4.
- 10 50081: Further Education and Training Certificate: Leadership, NQF Level 4.
- 10 36436: Further Education and Training Certificate: Local Economic Development, NQF Level 4.
- 1049129: Further Education and Training Certificate: Management and Administration, NQF Level 4.

### **MODERATION OPTIONS**

- Anyone assessing a learner or moderating the assessment of a learner against this Qualification must be registered as an assessor with the relevant 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 primary 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 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**

N/A

### **NOTES**

N/A

### **UNIT STANDARDS**

	<b>10</b>	<b>UNIT STANDARD TITLE</b>	<b>LEVEL</b>	<b>CREDITS</b>
Core	114941	Apply knowledge of HIV/AIDS to a specific business sector and a workplace	Level 3	4
Core	117111	Apply knowledge of basic accounting principles to financial services	Level 3	4
Core	242860	Apply the Batho Pele principles to own work role and context	Level 3	4
Core	244295	Demonstrate an understanding of municipal financial management and budgeting	Level 3	6
Core	244294	Demonstrate an understanding of national programmes and their impact on Local Government	Level 3	6
Core	244300	Demonstrate an understanding of public participation in Local Government	Level 3	6
Core	244299	Demonstrate an understanding of the areas of technical service delivery within Local Government	Level 3	10
Core	244297	Demonstrate an understanding of the employment relationship in Local Government	Level 3	6
Core	244296	Demonstrate an understanding of the municipal working environment	Level 3	6
Core	244302	Demonstrate an understanding of the planning functions	Level 3	8

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
		of Local Government		
Core	244175	Demonstrate an understanding of the policy and legal framework guiding Local Government	Level 3	10
Core	244301	Ensure personal accountability in own Local Government context	Level 3	6
Core	244298	Provide support and administrative services in Local Government	Level 3	4
Elective	123458	Administer accounting and budgeting for input into municipal financial resource management	Level 4	15
Elective	120385	Apply a range of project management tools and techniques	Level 4	7
Elective	120391	Apply leadership skills to relationship management	Level 4	8
Elective	11473	Manage individual and team performance	Level 4	8
Elective	110479	Outline the environment of local economic development in South Africa	Level 4	4
Fundamental	119472	Accommodate audience and context needs in oral/signed communication	Level 3	5
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
Fundamental	9013	Describe, apply, analyse and calculate shape and motion in 2-and 3-dimensional space in different contexts	Level 3	4
Fundamental	119457	Interpret and use information from texts	Level 3	5
Fundamental	9012	Investigate life and work related problems using data and probabilities	Level 3	5
Fundamental	119467	Use language and communication in occupational learning programmes	Level 3	5
Fundamental	7456	Use mathematics to investigate and monitor the financial aspects of personal, business and national issues	Level 3	5
Fundamental	119465	Write/present/sign texts for a range of communicative contexts	Level 3	5





**SOUTH AFRICAN QUALIFICATIONS AUTHORITY**

**UNIT STANDARD:**

***Demonstrate an understanding of national programmes and their impact on Local Government***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244294	Demonstrate an understanding of national programmes and their impact on Local Government		
<b>SGB</b>		<b>PROVIDER</b>	
SGB Administration			
<b>FIELD</b>		<b>SUBFIELD</b>	
3 - Business, Commerce and Manaoernent Studies		Public Administration	
<b>ABETBAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQFLEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 3	16

**SPECIFIC OUTCOME 1**

Identify and discuss the government's broad economic growth strategy and impact on Local Government.

**SPECIFIC OUTCOME 2**

Explain the various national programmes currently underway.

**SPECIFIC OUTCOME 3**

Discuss how the various national programmes impact on local government.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:*****Demonstrate an understanding of municipal financial management and budgeting***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244295	Demonstrate an understanding of municipal financial management and budgeting		
<b>SGB</b>		<b>PROVIDER</b>	
SGB Administration			
<b>FIELD</b>		<b>SUBFIELD</b>	
3 - Business, Commerce and Management Studies		Public Administration	
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 3	16

**SPECIFIC OUTCOME 1**

Outline the way in which financial management is ensured in Local Government.

**SPECIFIC OUTCOME 2**

Explain why a budget is important in Local Government.

**SPECIFIC OUTCOME 3**

Explain the sources of revenue in Local Government.

**SPECIFIC OUTCOME 4**

Describe the budget process in Local Government.



**SOUTH AFRICAN QUALIFICATIONS AUTHORITY**

**UNIT STANDARD:**

***Demonstrate an understanding of the municipal working environment***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244296	Demonstrate an understanding of the municipal working environment		
<b>SGB</b>			<b>PROVIDER</b>
SGB Administration			
<b>FIELD</b>			<b>SUBFIELD</b>
3 - Business, Commerce and Management Studies			Public Administration
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQFLEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 3	16

**SPECIFIC OUTCOME 1**

Explain the nature of the public sector and its importance.

**SPECIFIC OUTCOME 2**

Identify and explain the three spheres of government.

**SPECIFIC OUTCOME 3**

Explain the strategic framework that guides government.

**SPECIFIC OUTCOME 4**

Explain the role of employer and employee organisations in Local Government.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:**

**Demonstrate an understanding of the employment relationship in Local Government**

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244297	Demonstrate an understanding of the employment relationship in Local Government		
<b>SGB</b>	<b>PROVIDER</b>		
SGB Administration			
<b>FIELD</b>	<b>SUBFIELD</b>		
3 - Business, Commerce and Management Studies	Public Administration		
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 3	16

**SPECIFIC OUTCOME 1**

Identify what it means to be an employee in local government.

**SPECIFIC OUTCOME 2**

Identify and discuss the employment practices, policies and conditions of service in local government.

**SPECIFIC OUTCOME 3**

Discuss employee rights and opportunities in relation to own work context.

**SPECIFIC OUTCOME 4**

Outline own development plan in line with local government objectives.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### UNIT STANDARD:

*Provide support and administrative services in Local Government*

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244298	Provide support and administrative services in Local Government		
<b>SGB</b>	<b>PROVIDER</b>		
SGB Administration			
<b>FIELD</b>	<b>SUBFIELD</b>		
3 - Business, Commerce and Management Studies	Public Administration		
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 3	14

#### **SPECIFIC OUTCOME 1**

Identify the administrative systems and resources available to support service delivery in Local Government.

#### **SPECIFIC OUTCOME 2**

Identify and use a data capturing system.

#### **SPECIFIC OUTCOME 3**

Utilise resources to enhance service delivery in own work context.

#### **SPECIFIC OUTCOME 4**

Apply organisational skills to fulfil instructions.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### UNIT STANDARD:

*Demonstrate an understanding of the areas of technical service delivery within Local Government*

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244299	Demonstrate an understanding of the areas of technical service delivery within Local Government		
<b>SGB</b>		<b>PROVIDER</b>	
SGB Administration			
<b>FIELD</b>		<b>SUBFIELD</b>	
3 - Business, Commerce and Management Studies		Public Administration	
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 3	10

#### **SPECIFIC OUTCOME 1**

Explain how sustainable human settlement fits into service delivery objectives.

#### **SPECIFIC OUTCOME 2**

Explain how housing fits into service delivery objectives.

#### **SPECIFIC OUTCOME 3**

Identify how water and sanitation fit into service delivery objectives.

#### **SPECIFIC OUTCOME 4**

Explain how waste management fits into service delivery objectives.

#### **SPECIFIC OUTCOME 5**

Explain how transport and road services fit into service delivery objectives.



**SOUTH AFRICAN QUALIFICATIONS AUTHORITY**

**UNIT STANDARD:**

***Demonstrate an understanding of public participation in Local Government***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244300	Demonstrate an understanding of public participation in Local Government		
<b>SGB</b>	<b>PROVIDER</b>		
SGB Administration			
<b>FIELD</b>	<b>SUBFIELD</b>		
3 - Business, Commerce and Management Studies	Public Administration		
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 3	16

**SPECIFIC OUTCOME 1**

Identify what is meant by public participation in Local Government.

**SPECIFIC OUTCOME 2**

Discuss the history of local government and its transition to public participation.

**SPECIFIC OUTCOME 3**

Identify and explain the mechanisms that exist to support public participation.

**SPECIFIC OUTCOME 4**

Explain the functions of ward committees, municipal councillors, mayors and other related stakeholders as forums for public participation.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

## UNIT STANDARD:

*Ensure personal accountability in own Local Government context*

<i>SAQA US ID</i>	<i>UNIT STANDARD TITLE</i>		
244301	Ensure personal accountability in own Local Government context		
<i>SGB</i>	<i>PROVIDER</i>		
SGB Administration			
<i>FIELD</i>	<i>SUBFIELD</i>		
3 - Business, Commerce and Management Studies	Public Administration		
<i>ABET BAND</i>	<i>UNIT STANDARD TYPE</i>	<i>NQF LEVEL</i>	<i>CREDITS</i>
Undefined	Regular	Level 3	16

## SPECIFIC OUTCOME 1

Identify and discuss the values and attributes related to accountability in the Local Government environment.

## SPECIFIC OUTCOME 2

Identify problem-solving techniques that add accountability in own work context.

## SPECIFIC OUTCOME 3

Identify the levels of authority that govern decision-making within Local Government.

## SPECIFIC OUTCOME 4

Apply basic decision-making techniques to own work context.





**SOUTH AFRICAN QUALIFICATIONS AUTHORITY**

**UNIT STANDARD:**

**Demonstrate an understanding of the planning functions of Local Government**

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244302	Demonstrate an understanding of the planning functions of Local Government		
<b>SGB</b>	<b>PROVIDER</b>		
SGB Administration			
<b>FIELD</b>	<b>SUBFIELD</b>		
3 - Business, Commerce and Management Studies	Public Administration		
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQFLEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 3	18

**SPECIFIC OUTCOME 1**

Explain the core municipal planning processes.

**SPECIFIC OUTCOME 2**

Explain the broad guidelines for Integrated Development Planning (IDP).

**SPECIFIC OUTCOME 3**

Explain the importance of Local Economic Development(LED).

**SPECIFIC OUTCOME 4**

Discuss LED in the context of IDP.



### 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 & Assembly Processes

registered by Organising Field 06 - Manufacturing, Engineering and Technology, publishes the following Qualification and Unit Standard for public comment.

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the Qualification and Unit Standard. The full Qualification and Unit Standard can be accessed via the SAQA web-site at [www.saga.org.za](http://www.saga.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 Qualification and Unit Standard should reach SAQA at the address below and *no later than 13 August 2007*. All correspondence should be marked Standards Setting- Manufacturing & Assembly Processes and addressed to

The Director: Standards Setting and Development  
SAQA

*Attention: Mr. D. Mphuthing*

Postnet Suite 248

Private Bag X06

Waterkloof

0145

or faxed to 012 - 431-5144

e-mail: [dmphuthing@saqa.org.za](mailto:dmphuthing@saqa.org.za)

DR. S. BHIKHA

DIRECTOR: STANDARDS SETTING AND DEVELOPMENT



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### QUAL/FICATION:

#### National Certificate: Metals Processing

SAQA QUALID	QUAL/FICATION TITLE		
58718	National Certificate: Metals Processing		
ORIGINATOR	PROVIDER		
SGB Manufacturing and Assembly Processes			
QUAL/FICATION TYPE	FIELD	SUBFIELD	
National Certificate	6 - Manufacturing, Engineering and Technology	Manufacturing and Assembly	
ABETBAND	MINIMUM CREDITS	NQFLEVEL	QUAL CLASS
Undefined	120	Level 2	Regular-Unit Stds Based

### PURPOSE OF THE QUAL/FICATION

Purpose:

This qualification is designed to empower learners to operate efficiently in a Metals Processing environment supplying quality product to a highly competitive global market.

This qualification recognises the skills, knowledge and values acquired by learners involved in the continuous and repetitive processing of a range of products, with little variation.

The chief skills learnt in this qualification are recognising and responding to observable changes that happen during Metals Processing. This capability requires a fundamental understanding of quality requirements and of metals processing. Hand skills play a large role in this qualification as evident through operating a production process and selecting, using and caring for engineering measuring equipment.

On completion, the learner will receive recognition for the ability to:

- Prepare material, equipment and/or process in line with product and scheduling requirements.
- Operate simple manually operated production machines.
- Inspect and report equipment operation.
- Monitor and adjust equipment operation and process.
- Solve known associated routine problems.
- Process a limited range of products/metals.
- Check the processed metals/product against quality standards.
- Function in workplaces that use such processes.

Qualified learners will also understand:

- The basics of how a business functions.
- Their role in the business, i.e. in production and related activities.
- How they are affected by legislation, regulations, agreements and policies related to their particular working environment.
- How they should function within the legislative, safety, health, environmental, quality and risk management systems that govern their workplace.
- How to apply the various policies and procedures related to these systems.

Qualifying in the exit level outcomes will enable learners to effectively perform a range of workplace activities. What learners achieve in this qualification will also serve as a basis for further learning within Metals Processing. Learners will also have foundational competence in mathematics, science, reading, writing and speaking. relevant to the Metals Processing industry.

Rationale:

The Metals Processing industry is a complex and specialised industry supplying a vast range of products, currently manufactured by semi-skilled labour, primarily operating simple manually operated production machines or equipment, according to international, customer and relevant ISO standards. The processing of metals typically includes but is not limited to the treatment, conversion and finishing of ferrous and non-ferrous metal products through:

- Electroplating.
- Hot dip galvanizing.
- Powder coating.
- Enamelling.
- Anodising.
- Wire manufacturing.

This is the first in a series of qualifications in metals processing starting at NQF Level 2 and progressing to NQF Level 3. At NQF Level 4, learners engage with the National Certificate: Management (ID 23656), appropriate to first line supervisors and junior managers.

This series of qualifications will enable learners to:

- Develop their existing skills level and progress vertically in a selected career path in metals processing.
- Receive recognition for learning achieved.
- Obtain skills and knowledge portable within similar processing industries.
- Gain access to higher levels of learning and learning provision.
- Access opportunities to progress in their personal life and career, and add value to the operations in which they function.
- Contribute to the growth of the South African economy and the development of society.

### **RECOGNIZE PREVIOUS LEARNING?**

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### **LEARNING ASSUMED IN PLACE**

This qualification assumes learners have a National Certificate (GETC) in Manufacturing, Engineering and Related Activities: NQF Level 1 or equivalent.

If the learner does not already have such a qualification, learning in preparation for this qualification would also have to include NQF Level 1 learning in:

- Literacy and numeracy.
- Basic concepts of science and technology.

Recognition of Prior Learning:

This qualification may be obtained through a process of RPL. The learner should be thoroughly briefed prior to the assessment and support provided and guidance should be provided to assist in the process of developing a portfolio. While this is primarily a workplace-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the exit-level outcomes.

Care should be taken that the process used provides the learner with an opportunity to demonstrate competence and is not too demanding as to prevent learners from taking up the RPL option towards gaining a qualification.

Access to the Qualification:

This qualification is designed for learners who:

- Are new-entry workers to Metals Processing.
- Have attended courses and applied the knowledge gained in the workplace.
- Are already workers and have acquired the skills and knowledge without attending formal courses.
- Are part of a learnership programme, which integrates structured learning, and work experience.

Access for learners with physical disabilities is dependent:

- On the type and severity of disability.
- On the nature of Metals Processing and the requirements of equipment operation.

### **QUALIFICATION RULES**

In order to be awarded this qualification, learners have to be declared competent in:

- All listed unit standards in the Fundamental category of the qualification totalling 45 credits.
- All listed unit standards in the Core category of the qualification totalling 42 credits.
- A choice of unit standards from the Elective category of the qualification totalling a minimum of 33 credits.

### **EXIT LEVEL OUTCOMES**

1. Understand the production process and the quality requirements and recognise and respond to changes in the production process that will result in reduced levels of safety, health, quality or efficiency.
2. Demonstrate an ability to prepare and process/surface finish ferrous and/or non-ferrous materials and/or products.
3. Apply appropriate procedures to solve familiar problems and emergencies within Metals Processing and operate within clearly defined contexts, with limited scope for personal decision-making and responsibility.
4. Communicate and work effectively with peers and members of supervisory/management levels.
  - o Range: This includes understanding the purpose of the organization, own role in organization and explains options for further learning.

### **ASSOCIATED ASSESSMENT CRITERIA**

Associated Assessment Criteria for Exit Level Outcome 1:

- Production of scrap or faulty product is minimised in accordance with quality requirements.
- Changes and responses are accurately and clearly (orally or in writing) reported in accordance with organizational requirements.
- A clean and safe work area is maintained in relation to procedures.
- Questions are responded to and issues related to production and relevant to the outcomes are discussed with examples.
- Applicable policies and procedures are applied and adhered to at all times.

Associated Assessment Criteria for Exit Level Outcome 2:

- Production equipment and/or process is prepared, started up and shut down.
- Materials and/or product is prepared and processed in accordance with specifications.
- Simple adjustments or changes are made to equipment and process.
- Product quality is monitored throughout the process.
- Applicable policies and procedures are applied and adhered to at all times.
- Problems, changes and/or malfunctions are recognised and reported in accordance with organizational requirements.
- Questions are responded to and issues related to preparing and processing/surface finishing ferrous and/or non-ferrous materials and/or products are discussed with examples.

Associated Assessment Criteria for Exit Level Outcome 3:

- Procedures to solve problems and deal with emergencies are applied in accordance with requirements.
- Problems are accurately reported to appropriate personnel.
- Questions are responded to and issues related to familiar problems are discussed within metals processing context.

Associated Assessment Criteria for Exit Level Outcome 4:

- Regular and ongoing communication is conducted.
- Daily work schedules and production issues are discussed on a regular basis with other team members.
- Information relevant to own work context and production process are gathered, recorded and reported when required and in an appropriate manner.
- Options for further learning in this or a related field of learning are identified and preparation requirements for such learning are explained with examples.

Integrated Assessment:

Integrated assessment at the level of the qualification provides an opportunity for learners to show they are able to integrate concepts, actions and ideas achieved across a range of unit standards and contexts.

Integrated assessment must evaluate the quality of observable performance as well as the thinking behind the performance, and must be based on a summative assessment guide. The guide will spell out how the assessor will assess different aspects of the performance and will include:

- Observing the learner at work (both in the primary activity as well as other interactions).
- Asking questions and initiating short discussions to test understanding.
- Looking at records and reports in the portfolio and reviewing previous assessments.

In some cases, inference will be necessary to determine competence depending on the nature and context within which performance takes place.

Since this is a foundational qualification, it is necessary to ensure that the fundamental part of the qualification is also targeted to ensure that while the competence may have been achieved in a particular context, learners are able to apply it in a range of other contexts and for further learning. The assessment should also ensure that all the critical cross-field outcomes have been achieved.

The learner may choose in which language s/he wants to be assessed. This should be established as part of a process of preparing the learner for assessment and familiarising the learner with the approach being taken.

While this is primarily a workplace-based qualification, evidence from other areas of *endeavour* may be introduced if pertinent to any of the exit-level outcomes. The assessment process should *cover* both the explicit tasks required for the qualification as well as the understanding of the concepts and principles that underpin the activities associated with Metals Processing.

### **INTERNATIONAL COMPARABILITY**

Extensive use was made of the links to other international qualification authorities *provided* on SAQA's website. Further to this, Internet searches using a range of search engines were conducted for any reference to standards, unit standards, competency standards, qualifications and skills programmes. *Relatively* little sources of outcomes-based, standards-based and/or learning material could be found during Internet searches.

The only information found was on the New Zealand Qualifications Authority website, through a link on the website of EXITO Training Organisation situated in Christchurch, New Zealand. At the time of finalising this qualification, EXITO had not yet responded to our request for information on the curriculum of their learning programmes towards the National Certificate in Hot Dip Galvanizing: NQF *Levels* 2, 3 and 4.

The comparison was made difficult because neither the fundamental learning elements nor some of the generic core elements are specified. A further complication is brought about by the fact that the learning required crosses *several levels*. Further to this, the New Zealand qualification does not specify the *level* of complexity that has to be achieved. The applied competence in the South African qualification focuses on achieving a specific *level* of competence required by a person working in a real-world metals processing context in which a degree of specialisation, experience and problem-solving ability is required.

Further comparison elements are highlighted below.

Comparison Element; New Zealand Metals Finishing qualifications; This Metals Finishing qualifications suite:

Scope; Nominal competence in a wide range of processing methods; Mastery of specific fabrication methods in context.

Approach; Task based; Skills development-based.

Level(s); NQF Level 2, 3 and 4; NQF Level 2, 3 and 4.

Context; Partly contextualised; Contextual.

Assessment; Institution or work-based; Work-based and portfolio-based.

Essential embedded knowledge; Not clear; Specified.

Credits; 49,82 and 144 respectively; 120, 120 and 139 respectively.

Fundamental learning; Not formally specified; Specified.

Business relations; Not formally specified; Specified.

Working with and developing others; Not formally specified; Specified.

Life skills; Not formally specified; Specified.

There are considerable similarities in the competencies required but the approach of the South African qualification looks at whole-person development in not only technological, but also in team- and business-related skills and makes explicit assumptions related to *level* of schooling and life skills.

Additional to this, subject matter experts in this field contacted their international counterparts to establish what learning processes they *have* available. There is evidence of training material, although not aligned to any formal qualification framework. This material is however, available at

a cost. Comparison between this qualification and any other international model was therefore not possible. Due to their uniqueness, Metals Processing operations situated in other African countries could utilise and benefit from these qualifications.

It was evident that the technical content of this qualification for Metals Processing is of similar quality and value to learners and the provision of learning according to NQF principles.

### **ARTICULATION OPTIONS**

The qualification has been designed and structured so that qualifying learners can move both horizontally from one area of specialisation to another, and vertically, further specialising in a particular skills area.

This qualification articulates horizontally with the following qualifications:

- 1021011: National Certificate: Power and Telecommunication Cable Manufacturing: NQF Level 2.

This qualification articulates vertically with the following qualifications:

- 1058719: National Certificate: Metals Processing at NQF Level 3.
- 1021012: National Certificate: Power and Telecommunication Cable Manufacturing at NQF Level 3.

The qualification should also, in terms of the fundamental, non-manufacturing unit standards and other portable skills, articulate with any other qualification at NQF Level 2 in the fields of:

- Engineering.
- Machine-based production processes such as Product Coating and Metal Production.

The qualification has been designed so that the learner can meaningfully articulate into the Higher Education and Training band once s/he has obtained a NQF Level 3 qualification in Metals Processing, supported by further learning at NQF Level 4 in the National Certificate: Management (ID 23656).

Employers, learners and/or institutions should be able to evaluate the outcomes of these qualifications against the needs of a production context and structure top-up learning appropriately. Equally, holders of other qualifications may be evaluated against this qualification for the purpose of RPL.

### **MODERATION OPTIONS**

Moderators for this qualification should be qualified and accredited with an appropriate ETQA. To assure the quality of the assessment process, the moderation should cover one or more of the following:

- Assessor credentials.
- The assessment instrument(s).
- The assessment process (including preparation and post-assessment feedback).

### **CRITERIA FOR THE REGISTRATION OF ASSESSORS**

The following criteria should be applied by the relevant ETQA:

- 1 At least the NQF Level 3 Metals Processing qualification with relevant workplace experience of at least 12 months in the field of Metals Processing. The subject matter experience of the assessor can be established by recognition of prior learning.
- 2 Appropriate experience and understanding of assessment theory, processes and practices.
- 3 Good interpersonal skills and the ability to balance the conflicting requirements of:



- o Maintaining national standards.
  - a The interests of the organisation.
  - o The interests of the learner.
  - o The need for transformation and redressing the legacies of the past.
  - a The cultural background and language of the learner.
- 4 Registration as an assessor with the relevant ETQA.
- 5 Any other criteria required by the relevant ETQA.

**NOTES**

N/A

**UNIT STANDARDS**

	<b>10</b>	<b>UNIT STANDARD TITLE</b>	<b>LEVEL</b>	<b>CREDITS</b>
Core	13222	Deal with safety, health and environmental emergencies in the workplace	Level 2	4
Core	120402	Demonstrate an understanding of introductory principles of chemistry and physics	Level 2	5
Core	12466	Explain the individual's role within business	Level 2	4
Core	244338	Operate a production process	Level 2	15
Core	13258	Participate in work group activities	Level 2	4
Core	12476	Select, use and care for engineering measuring equipment	Level 2	4
Core	12456	Explain and use organisational procedures	Level 3	6
Elective	117867	Managing files in a Graphical User Interface (GUI) environment	Level 1	3
Elective	116932	Operate a personal computer system	Level 1	3
Elective	117902	Use generic functions in a Graphical User Interface (GUI)-environment	Level 1	4
Elective	9909	Identify and process waste	Level 2	4
Elective	9268	Manage basic personal finance	Level 2	6
Elective	242976	Operate overhead/cranes	Level 2	5
Elective	12484	Perform basic fire fighting	Level 2	4
Elective	12483	Perform basic first aid	Level 2	4
Elective	9919	Prepare metal surfaces	Level 2	6
Elective	12481	Slinaloads	Level 2	4
Elective	12463	Understand and deal with HIV/AIDS	Level 2	3
Elective	13223	Apply safety, health and environmental protection procedures	Level 3	6
Elective	115093	Control workplace hazardous substances	Level 3	4
Elective	117171	Manage time effectively to enhance productivity and enable a balanced lifestyle	Level 3	2
Elective	242974	Operate counter-balanced lift truck	Level 3	7
Fundamental	119463	Access and use information from texts	Level 2	5
Fundamental	9009	Apply basic knowledge of statistics and probability to influence the use of data and procedures in order to investigate life related problems	Level 2	3
Fundamental	12461	Communicate at work	Level 2	5
Fundamental	7480	Demonstrate understanding of rational and irrational numbers and number systems	Level 2	3
Fundamental	12465	Develop a learning plan and a portfolio for assessment	Level 2	6
Fundamental	9008	Identify, describe, compare, classify, explore shape and motion in 2-and 3-dimensional shapes in different contexts	Level 2	3
Fundamental	119454	Maintain and adapt oral/signaled communication	Level 2	5
Fundamental	12444	Measure, estimate and calculate physical quantities and explore, describe and represent geometrical relationships in 2-dimensions in different life or workplace contexts	Level 2	3
Fundamental	119460	Use language and communication in occupational learning programmes	Level 2	5
Fundamental	7469	Use mathematics to investigate and monitor the financial aspects of personal and community life	Level 2	2
Fundamental	9007	Work with a range of patterns and functions and solve problems	Level 2	5



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:****Operate a production process**

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244338	Operate a production process		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
5GB Manufacturing and Assembly Processes			
<b>FIELD</b>	<b>SUBFIELD</b>		
6 - Manufacturing, Engineering and Technology	Manufacturing and Assembly		
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	I Regular	Level 2	15

**SPECIFIC OUTCOME 1**

Prepare for start up.

**SPECIFIC OUTCOME 2**

Start equipment and/or process.

**SPECIFIC OUTCOME 3**

Operate manufacturing equipment and/or process.

**SPECIFIC OUTCOME 4**

Shut down manufacturing equipment and/or process.

**SPECIFIC OUTCOME 5**

Conduct post-operating processes.



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 & Assembly Processes

registered by Organising Field 06 - Manufacturing, Engineering and Technology, publishes the following Qualification for public comment.

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the Qualification. The full Qualification can be accessed via the SAQA web-site at [www.saga.org.za](http://www.saga.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 Qualification should reach SAQA at the address below and *no later than 13 August 2007*. All correspondence should be marked Standards Setting - Manufacturing & Assembly Processes and addressed to

The Director: Standards Setting and Development  
SAQA

*Attention: Mr. D. Mphuthing*

Postnet Suite 248

Private Bag X06

Waterkloof

0145

or faxed to 012 - 431-5144

e-mail: [dmphuthing@saqa.org.za](mailto:dmphuthing@saqa.org.za)

DR. S. BHIKHA

DIRECTOR: STANDARDS SETTING AND DEVELOPMENT



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

## QUAL/FICATION:

*Ntifa/ Certificete: Metals Processing*

<i>SAQA QUALID</i>	<i>QUAL/FICATION TITLE</i>		
58719	National Certificate: Metals Processing		
<i>ORIGINATOR</i>			<i>PROVIDER</i>
SGB Manufacturing and Assembly Processes			
<i>QUAL/FICATION TYPE</i>	<i>FIELD</i>	<i>SUBFIELD</i>	
National Certificate	6 - Manufacturing, Engineering and Technology	Engineering and Related Design	
<i>ABET BAND</i>	<i>MINIMUM CREDITS</i>	<i>NQFLEVEL</i>	<i>QUAL CLASS</i>
Undefined	120	Level 3	Regular-Unit Stds Based

*PURPOSE OF THE QUAL/FICATION*

Purpose:

This qualification is designed to enhance the skills of the workforce to efficiently process a range of customer input materials and/or products, to compete in a dynamic and competitive global market.

This qualification recognises the skills, knowledge and values acquired by learners involved in setting up a metals processing operation to continuously produce a range of products using a range of often technologically advanced production equipment and/or machines, to specified customer specification. Learning to oversee the metals processing operation is dealt with in the NQF Level 4 qualification.

The chief skill learnt in this qualification is the ability to bring the production line back into specification by responding to equipment indicators when deviations occur. This capability requires a more advanced understanding of quality requirements and the metals processing/production process.

On completion, the learner will receive recognition for the ability to:

- Process a range of ferrous and non-ferrous metals products for both domestic and international markets.
- Inspect, prepare and load material.
- Inspect, monitor and adjust the operation of a metals processing/production process and report equipment operation.
- Monitor and adjust product processing.
- Solve known associated/routine problems.
- Check the processed product against quality standards.
- Function in workplaces that use such processes.

Qualified learners will also understand:

- Their role in the business, i.e. in production and related activities and how their actions affect the business.
- How they are affected by legislation, regulations, agreements and policies related to their particular working environment.

- How they should function and participate within the legislative, safety, health, environmental, quality and risk management systems that govern their workplace.
- How to apply the various organisational policies and procedures.

Qualifying in the exit level outcomes will enable learners to effectively perform a range of workplace activities. What learners achieve in this qualification will also serve as a basis for further learning within the supervisory and/or management of such Metals Processing environments. Learners will also further develop their foundational competence in mathematics, science, reading, writing and speaking relevant to the Metals Processing industry.

Rationale:

The Metals Processing industry is a complex and specialised industry supplying a vast range of products, currently manufactured by semi-skilled labour, primarily operating simple manually operated production machines or equipment, according to international, customer and relevant ISO standards. The processing of metals typically includes but is not limited to the treatment, conversion and finishing of ferrous and non-ferrous metal products through:

- Electroplating.
- Hot dip galvanizing.
- Powder coating.
- Enamelling.
- Anodising.
- Wire manufacturing.

This qualification follows on the NQF Level 2 qualification and further develops the skills and knowledge required in Metals Processing. At NQF Level 4 learners engage with the National Certificate: Management (ID # 23656), appropriate to first line supervisors and junior managers.

This series of qualifications will enable learners to:

- Develop their existing skills level and progress vertically in a selected career path in Metals Processing/production processes.
- Receive recognition for learning achieved.
- Obtain skills and knowledge portable within similar processing industries.
- Gain access to higher levels of learning and learning provision.
- Access opportunities to progress in their personal life and career, and add value to the operations in which they function.
- Contribute to the growth of the South African economy and the development of society.

### **RECOGNIZE PREVIOUS LEARNING?**

Y

### **LEARNING ASSUMED IN PLACE**

This qualification assumes learners have obtained a National Certificate in Metals Processing: NQF Level 2 or equivalent.

If the learner does not already have such a qualification, learning in preparation for this qualification would also have to include learning in:

- Literacy and numeracy at NQF Level 2.
- Basic concepts of science and technology related to material, machinery and equipment in use in production processes at NQF Level 2.
- Basic concepts regarding organising factors in labour, business and the economy.
- Purpose of procedures related to the workplace, governing:
  - o Relationships.

- o Roles.
- o Responsibilities.

#### Recognition of Prior Learning:

This qualification may be obtained through a process of RPL. The learner should be thoroughly briefed prior to the assessment and support provided and guidance should be provided to assist in the process of developing a portfolio. While this is primarily a workplace-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the exit-level outcomes.

Care should be taken that the process used provides the learner with an opportunity to demonstrate competence and is not too demanding as to prevent learners from taking up the RPL option towards gaining a qualification.

#### Access to the Qualification:

This qualification is designed for learners who:

- Are new-entry workers to a machine-based metals processing/production process.
- Preferably completed the National Certificate: Metals Processing NQF level 2.
- Have attended courses and applied the knowledge gained in the workplace.
- Are already workers and have acquired the skills and knowledge without attending formal courses.
- Are part of a learnership programme, which integrates structured learning, and work experience.

Access for learners with physical disabilities is dependant:

- On the type and severity of disability.
- On the nature of Metals Processing and the requirements of equipment operation.

#### **QUALIFICATION RULES**

In order to be awarded this qualification, learners have to be declared competent in:

- All listed unit standards in the Fundamental category of the qualification totalling 40 credits.
- All listed unit standards in the Core category of the qualification totalling 74 credits.
- A choice of unit standards from the Elective category of the qualification totalling a minimum of 6 credits.

#### **EXIT LEVEL OUTCOMES**

1. Demonstrate an ability to prepare and set up the process for metals processing, working safely and with due care for fellow workers and the environment.
2. Demonstrate the ability to monitor and control a ferrous and/or non-ferrous metal processing operation.
3. Select appropriate procedures to solve familiar problems within Metals Processing operations and operate within clearly defined contexts, with some scope for personal decision-making and responsibility.
4. Communicate with team members, internal customers and members of supervisory/management levels by demonstrating the ability to gather and summarise relevant information from a range of sources and report this information.
5. Handle and resolve interpersonal conflict in the workplace.

**ASSOCIATED ASSESSMENT CRITERIA**

Associated Assessment Criteria for Exit Level Outcome 1:

- Appropriate materials/consumables tools and instruments are used to make adjustments or changes to process equipment set up.
- Equipment specifications and manufacturing requirements are complied throughout the process.
- Process equipment availability and readiness for manufacturing processes is maintained in accordance with specifications.
- A clean and safe work area is maintained in accordance with requirements.
- Applicable policies and procedures are applied and adhered to at all times.
- Questions are responded to and issues related to process equipment set up activities relevant to the outcomes are discussed in relation to metals processing.

Associated Assessment Criteria for Exit Level Outcome 2:

- The production line is brought back into specification by responding to equipment indicators when deviations occur.
  - Includes monitoring and controlling of the operation.
- Quality, safety, health, environmental and risk management specifications are adhered to throughout the metal processing operation.
- Production processes are selected and used in accordance with specifications.

Associated Assessment Criteria for Exit Level Outcome 3:

- Appropriate procedures are selected to solve problems in an efficient and effective manner.
- Unfamiliar problems are accurately reported to appropriate personnel.
- Questions and issues related to familiar problems in the setting up, monitoring and control of process equipment for metals processing are discussed with examples.

Associated Assessment Criteria for Exit Level Outcome 4:

- Relevant information is gathered from a range of sources and accurately summarised and reported in an appropriate and timely manner to relevant parties.
- Production issues in work area discussed and resolved on a regular basis with other team members, internal customers and supervisors/management.

Associated Assessment Criteria for Exit Level Outcome 5:

- Information is collected from a range of role-players, considering feelings and the actual problem.
- A range of conflict resolution methods and behaviour of different people in a conflict situation is considered, choosing that most appropriate to the situation.
- The conflict situation is resolved in accordance with organizational standards.

Integrated Assessment:

Integrated assessment at the level of the qualification provides an opportunity for learners to show they are able to integrate concepts, actions and ideas achieved across a range of unit standards and contexts.

Integrated assessment must evaluate the quality of observable performance as well as the thinking behind the performance, and must be based on a summative assessment guide. The guide will spell out how the assessor will assess different aspects of the performance and will include:

- Observing the learner at work (both in the primary activity as well as other interactions).
- Asking questions and initiating short discussions to test understanding.
- Looking at records and reports in the portfolio and reviewing previous assessments.

In some cases inference will be necessary to determine competence depending on the nature and context within which performance takes place.

It is necessary to ensure that the fundamental part of the qualification is also targeted to ensure that while the competence may have been achieved in a particular context, learners are able to apply it in a range of other contexts and for further learning. The assessment should also ensure that all the critical cross-field outcomes have been achieved.

The learner may choose in which language s/he wants to be assessed. This should be established as part of a process of preparing the learner for assessment and familiarising the learner with the approach being taken.

While this is primarily a workplace-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the exit-level outcomes. The assessment process should cover both the explicit tasks required for the qualification as well as the understanding of the concepts and principles that underpin the activities associated with Metals Processing.

#### **INTERNATIONAL COMPARABILITY**

Extensive use was made of the links to other international qualification authorities provided on SAQA's website. Further to this, Internet searches using a range of search engines were conducted for any reference to standards, unit standards, competency standards, qualifications and skills programmes. Relatively little sources of outcomes-based, standards-based and/or learning material could be found during Internet searches.

The only information found was on the New Zealand Qualifications Authority website, through a link on the website of EXITO Training Organisation situated in Christchurch, New Zealand. At the time of finalising this qualification EXITO had not yet responded to our request for information on the curriculum of their learning programmes towards the National Certificate in Hot Dip Galvanizing: NQF Levels 2,3 and 4.

The comparison was made difficult because neither the fundamental learning elements nor some of the generic core elements are specified. A further complication is brought about by the fact that the learning required crosses several levels. Further to this, the New Zealand qualification does not specify the level of complexity that has to be achieved. The applied competence in the South African qualification focuses on achieving a specific level of competence required by a person working in a real-world metals processing context in which a degree of specialisation, experience and problem-solving ability is required.

Further comparison elements are highlighted below.

Comparison Element; New Zealand Metals Finishing qualifications; This Metals Finishing qualifications suite:

- Scope; Nominal competence in a wide range of processing methods; Mastery of specific fabrication methods in context.
- Approach; Task based; Skills development-based.
- Level(s); Level 2, 3 and 4; Level 2, 3 and 4.
- Context; Partly contextualised; Contextual.
- Assessment; Institution or work-based; Work-based and portfolio-based.
- Essential embedded knowledge; Not clear; Specified.
- Credits; 49, 82 and 144 respectively; 120, 120 and 139 respectively.
- Fundamental learning; Not formally specified; Specified.



- Business relations; Not formally specified; Specified.
- Working with and developing others; Not formally specified; Specified.
- Life skills; Not formally specified; Specified.

There are considerable similarities in the competencies required but the approach of the South African qualification looks at whole-person development in not only technological, but also in team- and business-related skills and makes explicit assumptions related to level of schooling and life skills.

Additional to this, subject matter experts in this field contacted their international counterparts to establish what learning processes they have available. There is evidence of training material, although not aligned to any formal qualification framework. This material is however, available at a cost. Comparison between this qualification and any other international model was therefore not possible. Due to their uniqueness, Metals Processing operations situated in other African countries could utilise and benefit from these qualifications.

It was evident that the technical content of this qualification for Metals Processing is of similar quality and value to learners and the provision of learning according to NQF principles.

### **ARTICULATION OPTIONS**

The qualification has been designed and structured so that qualifying learners can move both horizontally from one area of specialisation to another, and vertically, further specialising in a particular skills area.

This qualification articulates horizontally with the following qualifications:

- 10 21012: National Certificate: Power and Telecommunication Cable Manufacturing, NQF Level 3.

This qualification articulates vertically with the following qualifications:

- 10 23656: Further Education and Training Certificate: Management, NQF Level 4.
- 1021013: National Certificate: Power and Telecommunication Cable Manufacturing, NQF Level 4.

The qualification should also, in terms of the fundamental, non-manufacturing unit standards and other portable skills, articulate with any other qualification at level 3 in the fields of:

- Engineering.
- Machine-based production processes such as Product Coating and Metal Production.

This qualification has been designed so that the learner can meaningfully articulate into the Higher Education and Training band once s/he has obtained the NQF Level 4 qualification, Further Education and Training Certificate: Management (10 23656).

Employers, learners and/or institutions should be able to evaluate the outcomes of these qualifications against the needs of a production context and structure top-up learning appropriately.

Equally, holders of other qualifications may be evaluated against this qualification for the purpose of RPL.

### **MODERATION OPTIONS**

Moderators for the qualification should be qualified and accredited with an appropriate ETQA. To assure the quality of the assessment process, the moderation should cover one or more of the following:

- Assessor credentials.
- The assessment instrument(s).
- The assessment process (including preparation and post-assessment feedback).

### **CRITERIA FOR THE REGISTRATION OF ASSESSORS**

The following criteria should be applied by the relevant ETQA:

1. At least the NQF Level 3 Metals Processing qualification, supplemented by the NQF Level 4 Management qualification 1023656, with relevant workplace experience of at least 12 months in the field of Metals Processing. The subject matter experience of the assessor can be established by recognition of prior learning.
2. Appropriate experience and understanding of assessment theory, processes and practices.
3. Good interpersonal skills and the ability to balance the conflicting requirements of:
  - a Maintaining national standards.
  - a The interests of the organisation.
  - a The interests of the learner.
  - a The need for transformation and redressing the legacies of the past.
  - a The cultural background and language of the learner.
4. Registration as an assessor with the relevant ETQA.
5. Any other criteria required by the relevant ETQA.

### **NOTES**

N/A

### **UNIT STANDARDS**

	<b>ID</b>	<b>UNIT STANDARD TITLE</b>	<b>LEVEL</b>	<b>CREDITS</b>
Core	9883	Adjust and maintain production machinery	Level 3	30
Core	13234	Apply Quality procedures	Level 3	8
Core	9914	Handle and care for materials	Level 3	12
Core	13918	Manage time and the work process in a business environment	Level 3	4
Core	9913	Perform first line maintenance	Level 3	14
Core	116720	Show understanding of diversity in the workplace	Level 3	3
Core	9533	Use communication skills to handle and resolve conflict in the workplace	Level 3	3
Elective	116024	Operate an effluent treatment plant	Level 2	12
Elective	13912	Apply knowledge of self and team in order to develop a plan to enhance team performance	Level 3	5
Elective	13223	Apply safety, health and environmental protection procedures	Level 3	6
Elective	9887	Coat material and components	Level 3	4
Elective	12429	Develop a personal financial plan	Level 3	2
Elective	12457	Develop learning strategies and techniques	Level 3	3
Elective	242820	Maintain records for a team	Level 3	4
Elective	13260	Perform non-destructive tests on metal parts and components	Level 3	6
Elective	12455	Perform the role of a safety, health and environmental protection representative	Level 3	4
Elective	242816	Conduct a structured meeting	Level 4	5
Elective	242821	Identify responsibilities of a team leader in ensuring that organisational standards are met	Level 4	6
Fundamental	119472	Accommodate audience and context needs in oral/signed communication	Level 3	5
Fundamental	9010	Demonstrate an understanding of the use of different number bases and measurement units and an awareness	Level 3	2

	<b>ID</b>	<b>UNIT STANDARD TITLE</b>	<b>LEVEL</b>	<b>CREDITS</b>
		of error in the context of relevant calculations		
Fundamental	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
Fundamental	9013	Describe, apply, analyse and calculate shape and motion in 2-and 3-dimensional space in different contexts	Level 3	4
Fundamental	119457	Interpret and use information from texts	Level 3	5
Fundamental	9012	Investigate life and work related problems using data and probabilities	Level 3	5
Fundamental	119467	Use language and communication in occupational learning programmes	Level 3	5
Fundamental	7456	Use mathematics to investigate and monitor the financial aspects of personal, business and national issues	Level 3	5
Fundamental	119465	Write/present/sign texts for a range of communicative contexts	Level 3	5



## 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

## Generic Manufacturing, Engineering and Technology

registered by Organising Field 06 - Manufacturing, Engineering and Technology, publishes the following Qualification and Unit Standard for public comment.

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the Qualification and Unit Standard. The full Qualification and Unit Standard can be accessed via the SAQA web-site at [www.saga.org.za](http://www.saga.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 Qualification and Unit Standard should reach SAQA at the address below and *no later than 13 August 2007*. All correspondence should be marked Standards Setting - Generic Manufacturing, Engineering and Technology and addressed to

The Director: Standards Setting and Development  
SAQA

*Attention: Mr. D. Mphuthing*

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DR. S. BHIKHA

DIRECTOR: STANDARDS SETTING AND DEVELOPMENT



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### QUALIFICATION: *Further Education and Training Certificate: Engineering Fabrication*

SAQA QUALID	QUALIFICATION TITLE		
58721	Further Education and Training Certificate: Engineering Fabrication		
ORIGINATOR			PROVIDER
8GB Generic Manufacturing, Engineering & Technoloc			
QUALIFICATION TYPE	FIELD	SUBFIELD	
Further Ed and Training Cert	6 - Manufacturing, Engineering and Technology	Fabrication and Extraction	
ABET BAND	MINIMUM CREDITS	NQF LEVEL	QUAL CLASS
Undefined	141	Level 4	Regular-Unit 8tds Based

#### PURPOSE OF THE QUALIFICATION

Purpose:

This qualification is designed to meet the needs of the Learner in a variety of engineering related sectors. Engineering Fabrication is a generic engineering and trade related qualification that builds on the competencies of fabrication. This qualification will provide learners, education and training providers and employers with the standards and the range of learning required to work effectively in various industries making use of complex engineering fabrication processes and methods.

The main skill that is recognised in this qualification is the ability to produce complex components of using a variety of fabrication methods. This capability requires an understanding of, and the ability to, layout and mark off complex shapes; set up and use powered machinery; develop and fabricate from complex drawings and sketches and cut and join components using welding and other mechanical methods.

The metal components that the qualified person fabricates will be vital for the construction, maintenance and reliable operation of equipment and machinery in a variety of industries.

The qualification adds value to the qualifying learner in terms of enrichment of the person, recognition, and contributes towards the achievement of competencies that allows the qualifying learner to display the ability to lead, and communicate with, people to ensure the relevant work is performed in an acceptable manner. This will include basic concepts of coaching, assessment and functional business concepts.

The qualification is structured in such a way that it exposes learners to generic and specific competencies, of a specialist nature, as required in Engineering Fabrication industries. This qualification makes provision for engineering fabrication to be applied within the following sectors:

- Mining and Minerals sector.
- Chemical sector.
- Transport sector.
- Manufacturing sector.
- Other engineering related sectors.

Qualifying learners will be able to:

- Demonstrate an understanding of a variety of complex engineering fabrication methods.
- Demonstrate the ability to use equipment to cut, drill and punch, assemble and mechanically join structural metal work.
- Maintain and support procedures to solve a variety of problems, both familiar and unfamiliar, within an engineering fabrication context, and operate within familiar and new situations, taking responsibility and making decisions.
- Demonstrate leadership through effective interaction and communication with peers and members of supervisory and management levels by co-ordinating a working team, promoting the maintenance of a safe and efficient workplace, and developing the skills and performance of workgroup members, whilst meeting output requirements and working safely with due care for fellow workers and the environment.

Qualifying learners will also understand:

- The basics of how a business functions, and the role of the qualified learner in the business, i.e. fabrication and related activities.
- How the learning achieved whilst obtaining this qualification relates to the learning required in other similar qualifications.
- The importance of communication in achieving goals.
- How they are affected by legislation, regulations, agreements and policies related to their particular work environment.

With this understanding, learners will be able to participate effectively in workplace activities.

Rationale:

Engineering Fabrication, in the context of this qualification is the designing and fabrication of complex metal components. These components are usually required for initial or replacement purposes, as opposed to merely for maintenance reasons, as required within various industry sectors. The main focus is on interpreting complex drawings, the layout and development of complex metal components, and manipulation of metal (sheet metal, plate and pipe) to produce usable components, as per design requirements.

This qualification is for learners who wish to further their learning and to possibly specialise in fabrication, within the context of boiler making, plating, welding, sheet metal working or auto vehicle body building. This qualification also lends itself to the development of the learner to progress to levels of supervision and is suitable for application in various industries, such as the Mining and Minerals Industry; Chemical; Petro-chemical; Metal, Engineering and related industries.

It enables learners who have gained relevant experience in the workplace to gain credits through the RPL process. The qualification also forms the basis for further learning in the field of engineering fabrication where the learner will be able to specialise in one of the Fabrication or Welding skills areas at NQF Level 5.

Most industries rely on the design and fabrication of complex metal components. Examples of this may be the chemical industry where a wide variety of pipes of various shapes and sizes are utilised. Invariably these pipes are exclusive to a particular plant and need to be specifically fabricated to be fit for purpose. The mining and minerals industry typically has a need for designing and fabrication of components that require special welding and fabrication processes to cater for moving of men and materials. It is evident that each peculiar industry will have specific specialist requirements.

The design of this qualification stems from the collaborative approach to achieve generic type qualifications that allows progression and access, within and between sectors. Certain components of learning within this qualification may have pertinence within other engineering learning fields. This will predominantly be in the area of interpreting complex drawings, welding and the layout and development of complex metal components.

The qualifying learner will be more employable within a broad industry context, and will thus be a contributing factor to the economy of the relevant organisation and the country. The learner will benefit from obtaining this qualification due to the fact that industry has a need for persons with the ability to design, develop and fabricate complex industry related equipment.

This qualification focuses on developing skills and knowledge necessary to perform at the level of competence required. This qualification replaces the (currently de-registered) Further Education Certificate: Fabrication Level 4 and the interim registered National Certificate: Plater Welder and Plater Boilermaker NQF Level 3.

As this qualification forms the basis for further learning in the field of engineering fabrication, where the learner will be able to specialise in one of the Fabrication or Welding skills areas, it is accepted that the learner may exit (and be employed at this level (NQF Level 4)), or continue further learning toward obtaining the next level qualification.

The learner may also choose to learn towards achievement in other fields, as the learning in the fundamental and core component of this qualification lends itself to lateral as well as vertical exploitation. This qualification enables learners who have gained relevant experience in the workplace to gain credits through the RPL process.

#### **RECOGNIZE PREVIOUS LEARNING?**

Y

#### **LEARNING ASSUMED IN PLACE**

In order that the learner may progress at a desired rate whilst learning towards this qualification, it is assumed that learners are already competent in Communication and Mathematics at NQF Level 3.

Recognition of Prior Learning:

This qualification can be achieved wholly or in part through recognition of prior learning in terms of the criteria laid out above.

Evidence can be presented in a variety of forms, including international or previous local qualifications, reports, testimonials mentioning functions performed, work records, portfolios, videos of practice and performance records.

Access to the Qualification:

Access to this qualification is open. However, it is preferable that learners have completed a relevant industry related National Certificate at NQF Level 3. An example of this may be the National Certificate: Engineering Fabrication NQF Level 3.

#### **QUALIFICATION RULES**

To achieve this qualification the learner must achieve a minimum of 141 Credits.

The learner must achieve the Fundamental, Core and Elective learning components of this qualification as follows:

Fundamental Unit Standards:

- Learners wishing to achieve this qualification must successfully complete all the listed fundamental unit standards with a total credit value of 56 credits.

Core Unit Standards:

- Learners wishing to achieve this qualification must successfully complete all the listed core unit standards with a total credit value of 70 credits.

Elective Unit Standards:

- Learners wishing to achieve this qualification must successfully obtain a minimum of 15 credits from the list of elective unit standards.

**EXIT LEVEL OUTCOMES**

1. Demonstrate the ability to produce complex components using a variety of fabrication methods and operations.
2. Maintain and support procedures to solve a variety of problems, both familiar and unfamiliar, within an engineering fabrication context, and operate within familiar and new situations, taking responsibility and making decisions.
3. Demonstrate the ability to use equipment to cut, drill and punch, assemble and mechanically join structural metal work.
  - Range: Equipment includes power tools; hand tools and fixed machinery.
4. Demonstrate leadership through effective interaction and communication with peers and members of supervisory and management levels by co-ordinating a working team, promoting the maintenance of a safe and efficient workplace, and developing the skills and performance of workgroup members, whilst meeting output requirements and working safely with due care for fellow workers and the environment.

Critical Cross-Field Outcomes:

In accordance with SAQA guidelines, all unit standards include the assessment of relevant critical cross-field outcomes. Consequently, Exit Level Outcomes are consistent with critical cross-field outcome requirements.

The following CCFO's have been addressed in this qualification as per the unit standards outlined in the Annexures.

Identifying and solving problems in which responses display that responsible decisions using critical thinking have been made.

- Evident in Exit Level Outcome/s 1, 2, 3, 4.

Working effectively with others as a member of a team, group, organisation and community.

- Evident in Exit Level Outcome/s 2, 4.

Organising and managing oneself and one's activities responsibly and effectively.

- Evident in Exit Level Outcome/s 1, 2, 3, 4.

Collecting, analysing, organising and critically evaluating information.

- Evident in Exit Level Outcome/s 1, 2, 3, 4.

Communicating effectively using visual, mathematical and/or language skills.

- Evident in Exit Level Outcome/s 1, 2, 3, 4.



Using science and technology effectively and critically, showing responsibility toward the environment and health of others.

- Evident in Exit Level Outcome/s 1, 2, 3.

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

- Evident in Exit Level Outcomes 1, 3, 4.

Contributing to the full personal development of each learner and the social and economic development of society at large, by making it an underlying intention of the programme of learning to make an individual aware of:

- Reflecting on and exploring a variety of strategies to learn more effectively.
  - Participating as responsible citizens in the life of local, national and global communities.
  - Being culturally and aesthetically sensitive across a range of contexts.
  - Exploring education and career opportunities.
  - Developing entrepreneurial opportunities.
- (Evident in all Exit Level Outcomes).

### **ASSOCIATED ASSESSMENT CRITERIA**

Associated Assessment Criteria for Exit Level Outcome 1:

- The interpretation of complex instructions/drawings to producing complex plating and structural metal drawings is demonstrated and applied in accordance with performance standards.
- Measuring and marking off of detailed plating and structural metal for complex component manufacture is demonstrated according to specified requirements.
- Complex components are produced according to specified requirements.
- Occupational health, safety and environmental legislation is understood in order to apply specific safety practices and procedures relevant to the engineering fabrication industry.

Associated Assessment Criteria for Exit Level Outcome 2:

- Appropriate problem solving techniques are applied to ensure familiar and new problems are addressed within the workplace.
- Decisions are made in accordance with work and organisational requirements.
- The ability to successfully produce complex components within a variety of situations is demonstrated in accordance with performance standards.

Associated Assessment Criteria for Exit Level Outcome 3:

- Appropriate machinery is used to form structural metal work in accordance with specified drawing requirements.
- Appropriate equipment is utilised in a manner that facilitates cutting, drilling and punching of structural metal work according to drawing specifications.
- Structural metal work is assembled using appropriate techniques; powered tools and equipment according to drawing specifications.

Associated Assessment Criteria for Exit Level Outcome 4:

- The work team is coordinated in a manner that promotes team work and avoids conflict. The team also displays an ability to work in a safe and efficient way accordance with site specific practices and policies.

- Current skills and performance of the work team is monitored and the necessary interventions (coaching/leading) are implemented when required.
- Work team output is monitored and maintained in order to identify problems and determine trends.
- Correct technical information is communicated using written reports.

Integrated Assessment:

Integrated assessment at the level of the qualification provides an opportunity for learners to show they are able to integrate concepts, actions and ideas achieved across a range of unit standards and contexts.

Integrated assessment must evaluate the quality of observable performance as well as the thinking behind the performance, and must be based on a summative assessment guide. The guide will spell out how the assessor will assess different aspects of the performance and will include:

- Observing the learner at work (both in the primary activity as well as other interactions).
- Asking questions and initiating short discussions to test understanding.
- Looking at records and reports in the portfolio and reviewing previous assessments.

In some cases inference will be necessary to determine competence depending on the nature and context within which performance takes place.

It is necessary to ensure that the fundamental part of the qualification is also targeted to ensure that while the competence may have been achieved in a particular context, learners are able to apply it in a range of other contexts and for further learning. The assessment should also ensure that all the critical cross-field outcomes have been achieved.

The learner may choose in which language s/he wants to be assessed. This should be established as part of a process of preparing the learner for assessment and familiarising the learner with the approach being taken.

While this is primarily a workplace-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the exit-level outcomes. The assessment process should cover both the explicit tasks required for the qualification as well as the understanding of the concepts and principles that underpin the activities associated with the engineering fabrication process.

### **INTERNATIONAL COMPARABILITY**

It must be stated from the outset of this statement that reference to international benchmarking for this qualification series, applies only to the education and training content at specific levels between NQF Level 3 and NQF Level 4 and its measure of "appropriateness" when compared with fabrication training programs internationally. It was not possible to assimilate operational applicability as contexts are too various and wide.

South Africa (SAQA) has embarked on a rationalisation of engineering qualification on the National Qualifications Framework. The traditional qualifications (from the Apprenticeship route) such as Plater Welder, Plater Boilermaker, Boilermaker, etc. were mostly similar in content and intent. In order to arrive at a meaningful and acceptable nomenclature for the qualification, it was decided to use "Fabrication" as a description of the type of activity for this qualification.

This presented a problem when attempting to do a comparison of qualifications, nationally and internationally. The problem is that the understanding of the term "Fabrication" is very broad. Many qualifications and outcomes are available but not many in the context of what we (South African Industry) require. The plastic forming industries, as well as the wood and furniture type

industries also use "fabrication" as their activity description. This made the International Comparability research more complex. An attempt to concentrate on contextually relevant qualifications during the research process was thought to be prudent.

African countries with manufacturing and engineering infrastructure (including SADC countries) were scanned for applicable qualifications or training programs, but no relevant (equivalence) qualifications are offered in any of these countries.

Despite exhaustive information searches for information regarding fabrication qualification in Germany and Korea. It was apparent that a similar problem of specialisation as opposed to generalisation existed.

International comparability, including similar qualification structures and progressions from NQF Level 3 to NQF Level 4 were found in the following countries:

United Kingdom:

It appears that the United Kingdom has a qualification process in place that caters for "post qualification" progress. It is also evident that the qualification is comparable to SAQA's whole qualification design process. No unit standards were available for direct comparison to the SAQA Level 4 Fabrication Qualification.

However, some similarity of the qualifications is evident in the fact that the qualifying learner will gain supervisory competence and values in the field of engineering fabrication. The Qualification Supervisory Management in the Fabrication and Welding Industry is made up of Units of Learning with well described supporting "assessment criteria". It is interesting to note that competence a UNIT is the smallest component that will allow the learner to be recognised by issuing a certificate of achievement.

All National Vocational Qualifications in the United Kingdom are achieved through training and assessment. Assessment is normally through on-the-job observation and questioning. Candidates produce evidence to prove they have the competence to meet the NVQ standards. Assessors 'sign-off' units when the candidates are ready - the assessor tests candidates' underpinning knowledge, understanding and work-based performance to make sure they can demonstrate competence in the workplace. This process is fully compatible and comparable with the South African process.

Many of the units of learning are not applicable as they are largely outside the peculiar specialisation areas as required in South Africa. It is not evident what the credit value for this qualification is, as the value of 360 hours as calculated does not equate to a full diploma or qualification in South African terms.

The relevant qualification is shown below:

Diploma for Supervisory Management in Fabrication and Welding Studies NQF Level 4.

Unit Design:

Each unit contains:

- Learning Outcomes: defines what the candidate needs to do.
- Knowledge Requirements: defines what the candidate needs to know. The minimum requirements are outlined.

On completion of this qualification the candidate will be able to demonstrate an understanding of:

- The application of both metallic and non-metallic materials within the fabrication engineering industry.
- Effective supervisory management skills in relation to team working and delegation.
- Fabrication processes and associated site and workshop procedures.
- Operating principles and applications for welding processes.
- Quality management systems.
- The production of working sketches, templates and patterns (both the use of micro computers and by hand) for use in the structural and fabrication industry.
- Applying skills and knowledge gained within industry-relevant context.
- Current industry practice at the supervisory management level.
- Progression routes within the industry.

#### Qualification Structure:

For successful completion of the ABC Level 4 Diploma for Supervisory Management in Fabrication and Welding, candidates must complete 4 units, one Mandatory and three units from the Option Units listed below:

#### Mandatory:

- Unit 1 Supervisory Management in the Fabrication and Welding Industry (0/103/5302)\*.

#### Optional:

- Unit 2 Applied Fabrication and Welding Science (H/103/5303)\*.
- Unit 3 Advanced Fabrication Processes (1</103/5304)\*.
- Unit 4 Principles and Applications of Advanced Welding Process.
- Technologies (M/103/5305)\*.
- Unit 5 Managing Quality Assurance in the Fabrication and Welding Industry (T103/5306)\*.
- Unit 6 Advanced Pattern Development of Plate Work and Metal Structures (A/103/5307)\*.

\*Numbers in brackets indicate QCA Unit Numbers.

All units have equal weighting.

#### Qualification Content:

##### Unit 1:

- Supervisory management in the fabrication and welding industry.
- (60 Guided Learning Hours).

#### Unit Summary:

This is a Mandatory Unit. The candidate is required to develop an understanding of methods used by management personnel to communicate information between themselves and their workforce.

This will include for example:

- An introduction to the management styles as outlined by McGregor's Theory XIY and Ouchie's Theory Z.
- An understanding of Maslow's Hierarchy of Needs relative to the fabrication industry and how these may affect human relations.
- An understanding of the types of authority and how this may be delegated.
- The candidate is also required to develop an understanding of Work Study and how this may be applied within the fabrication workshop.

### Learning Outcomes:

#### 1.1 Responsibilities and duties of a supervisor.

Candidates will be expected to be able to:

1. Explain the duties and responsibilities of a supervisor.
2. Compare and contrast an authoritarian style of management and a participative one.

#### 1.2 Human Relations.

Candidates will be expected to be able to:

1. Explain and justify the importance of encouraging good human relations within the primary working group.
2. Identify 2 benefits and 2 disadvantages of formal/informal working groups.
3. Evaluate the consequences of permitting unofficial groups and leaders to influence working morale.
4. Produce a management tree structure for at least 3 levels and describe different ways in which each will interact with the other levels.
5. Analyse how motivational theories may influence relationships within a working group.

#### 1.3 Delegating Authority.

Candidates will be expected to be able to:

1. Explain the term 'Formal Authority' and discuss the benefits of authority having been gained by respect.
2. Explain the meaning of the term delegation and discuss the benefits gained from its effective implementation within a company or organisation.
3. Explain and justify two circumstances where the delegation of authority cannot be given.

#### 1.4 Planning of Work.

Candidates will be expected to be able to:

1. Demonstrate an understanding of process planning by discussing the types of planning methods used for named production methods (See Knowledge Requirements) and justifying how each acts to aid the manufacturing process.
2. State and compare the production methods used in the named production methods.

#### 1.5 Work Study.

Candidates will be expected to be able to:

1. Define Work Study, Method Study, and Work Measurement.
2. Explain how work study techniques can be used in the workplace.
3. Describe the different stages required for Method Study and Work Measurement.
4. Use a variety of process charts with appropriate symbols, explaining the sequence of events within them.

### Knowledge Requirements:

#### 1.1 Responsibilities and duties of a supervisor.

Candidates should understand:

- The role of a supervisor and their different responsibilities.
  - o Operational (how methods and personnel are chosen for a particular function).
  - o Technical (The supervisors influence on technical aspects of the production methods).
  - o Personnel (How the supervisor's management style affects relationships with the workforce).

- What is meant by an authoritarian style and participative style of management.

#### 1.2 Human Relations.

Candidates should understand:

- The importance of good human relations within the primary working group.
- The difference between formal and informal working groups.
- The difference between official and unofficial group leaders.
- Management tree structures.
- Motivational theories e.g. McGregor's Theory of X!Y and/or Maslow's Hierarchy of Needs.

#### 1.3 Delegating Authority.

Candidates should understand:

- The terms 'formal authority' and delegation and their benefits.
- Circumstances where delegation cannot be given.

#### 1.4 Planning Work.

Candidates should understand:

- Planning methods used for production of:
  - One off job.
  - Batch production.
  - Flow system.
  - Mass production and the production methods used in each.
- The principles of process planning and how it acts as an aid to the manufacturing process.

#### 1.5 Work Study.

Candidates should understand:

- The terms work study, method study and work measurement.
- The different stages required for method study e.g. Selection of tasks to study, recording facts, examining facts, developing a new method, installing/implementing/maintaining it.
- The different stages required for work measurement e.g. selecting the task to study, recording the facts, analysing them, calculating the basic and standard times for the task, agreeing the method and its related time.
- Operation process charts, flow process charts (single and multiple column), multiple activity charts (man and machine), workplaces charts (left and right hand), simultaneous motion cycle charts (SIMO charts) and the types of symbols used in conjunction with these.

Unit 2:

Applied fabrication and welding science.

- (60 Guided Learning Hours).

Unit Summary:

In this Option Unit, the candidate is required to develop an understanding of both metallic and nonmetallic materials and their applications within the fabrication engineering industry: this includes looking at problems such as corrosion, erosion and degradation of plastics. The use of rectification and inverter technology, along with mathematical calculations and applications provide the candidate with the appropriate knowledge to solve problems in the workshop.

Learning Outcomes:

### 2.1 Materials (Metallic).

Candidates will be expected to be able to:

1. Compare the chemical, physical and mechanical properties of carbon manganese metal, stainless/heat resisting metals, aluminium/aluminium rich alloys, copper/copper rich alloys, titanium, clad materials and hard surfacing alloys.
2. Explain the use of the Schaeffler Diagram.
3. Give typical applications for the materials stated above.

### 2.2 Materials (Non-Metallic).

Candidates will be expected to be able to:

- Ceramics and glass:

1. Give examples and state the typical properties of engineering ceramics which are based on oxides, nitrides, carbides, borides or silicides and their applications.
2. Simply describe the reaction Bonding, Sintering and Hot pressing methods used to produce ceramic.

- Thermoplastics:

3. Explain the basic structure of polymers and state the typical properties of Thermoplastics.
4. Explain addition polymerisation and the importance of the Dipole Effect.
5. Describe van der Waals forces and explain how they react when heated.

- Thermosetting Plastics:

6. Simply explain how condensation polymerisation is used to produce thermosetting plastic.
7. State the typical properties of thermosetting plastic materials.

- Rubbers (Natural and Synthetic):

8. Describe the properties of natural rubber and explain how sulphur is used to change them.
9. State the typical applications of natural rubber.
10. Explain why synthetic rubbers are used in preference to natural rubber, give examples of synthetic rubbers and state their applications.

### 2.3 Chemistry.

Candidates will be expected to be able to:

- Corrosion:

1. Define the coherent and non-coherent types of surface corrosion and describe how surface corrosion of metal occurs.
2. Describe the principles of Electrochemical Corrosion. Explain how zinc provides sacrificial protection against corrosion on metal products.
3. Explain how surface corrosion on aluminium may be detrimental to a welded product if it is not removed either prior or during welding.

- Fluxes:

4. Explain the basic compositions and functions of fluxes used in a variety of welding processes (See Knowledge Requirements).

- Changes of State:

5. Describe how the changes of state in a material affect how the material is formed and welded and state the types of defects that this may cause during welding and forming.

### 2.4 Electricity.

Half and full wave rectification.

Candidates will be expected to be able to:

1. State the reasons why solid state diodes are used in rectifiers.
2. Explain the principle of a half wave rectification for a single phase power supply.
3. Produce 2 simple circuit diagrams, one to illustrate how the half wave rectifier works and one to illustrate how the full wave rectifier works.
4. List the advantages of a rectifier.

• Inverter Technology:

5. Explain the principles of an inverter welding power source.
6. Identify the main components of an inverter and state their function.
7. List the advantages of using an inverter power source.

2.5 Calculations.

Candidates will be expected to be able to:

1. Calculate the bending allowances required when determining the developed lengths of the circumference of a cylinder and angled bends using mean/neutral line for calculations (bending allowances).
2. Determine the thickness allowance to be used when forming.
3. Using practical examples, use simple transposition of formula to solve problems.
4. Calculate the volume of weld metal required for butts of different joint preparations, fillet and outside corner welds including an allowance to ensure the weld is not less than the required size.
5. Calculate the weights of sheet and plate materials in terms of kilograms per square metre.
6. Using realistic prices, determine economical use of plate/sheet for given components.
7. Use trigonometry to determine the length of a line, value of an angle and chord lengths.

Knowledge Requirements:

2.1 Materials (Metallic).

Candidates should understand:

Carbon Manganese metal:

- The typical compositions, applications and weldability of carbon-manganese metals.
- The main problems associated with the welding of carbon-manganese metals and how to avoid such problems.

Stainless/heat resisting metals:

- The typical compositions and weldability of the following: Ferritic, Martensitic, Austenitic and Duplex.
- The use of the Schaeffler Diagram.
- The main differences between stainless and heat resisting metals.

Aluminium and Aluminium Rich Alloys:

- How to categorise these as cast/wrought and heat-treatable/non-heat treatable.
- The effects of adding the alloy elements Silicon, Magnesium, Manganese and Copper to Aluminium (AlSi, AlMg, AlMn and AlCu).

Copper and Copper Rich Alloys:

- The types of copper available to the engineering industry and their weldability.



- The different types of Copper/Zinc (Brass) alloys and show how each type may be determined using the Copper/Zinc Thermal Equilibrium Diagram.
- The different types of Copper/Tin (Bronze) alloys and show how each type may be determined using the Copper/Tin Thermal Equilibrium Diagram.

Titanium:

- Describe properties of the metal.
- Identify typical applications for the use of the metal.

Clad Materials:

- The types and purpose of clad materials in terms of corrosion resistance, mechanical properties and economics.
- How dilution is kept to a minimum during welding.
- How dilution may affect the properties of clad materials.
- The extent of weld metal dilution.

Hard surfacing Alloys:

- The purpose of hard surfacing.
- The types of hard surfacing materials available and why different types are necessary.

## 2.2 Materials (Non-Metallic).

Candidates should understand:

Ceramics and Glass:

- The term ceramics.
- The typical properties of engineering ceramics based on oxides, nitrides, carbides, borides or silicides and their applications.
- Reaction Bonding, Sintering and Hot Pressing methods used to produce ceramics.

Thermoplastics:

- The basic structure of polymers.
- Addition polymerisation and the importance of the Dipole Effect.
- Van der Waals forces and how they react when heated.

Thermosetting Plastics:

- How condensation polymerisation is used to produce Thermosetting plastic and how the long chain of molecules are bonded by cross linking.
- The properties of thermosetting plastics.

Rubbers (Natural and Synthetic):

- The properties and typical applications of natural rubber and how sulphur is used to change these properties.
- Why synthetic rubbers are used in preference to natural rubbers giving examples and their typical properties.

## 2.3 Chemistry.

Candidates should understand:

Corrosion:

- Coherent and non-coherent types of corrosion.
- How surface corrosion occurs.
- The principles of Electro-chemical corrosion.
- How zinc provides sacrificial protection against corrosion on metal products.

- The detrimental effect of surface corrosion on aluminium to a welded product.

#### Erosion:

- The use of hard surfacing to minimise erosion.

#### Degradation of Plastics:

- The use of additives to ensure temperature stability and prevent colour degradation in plastics.

#### Fluxes:

- The compositions and functions of fluxes used in oxy-acetylene welding and brazing, manual metal arc welding and submerged arc welding.

#### Changes of State:

- How changes of state in a material affect how the material is formed and welded.
- The defects the changes of state in materials may cause during forming and welding.

### 2.4 Electricity.

#### Half wave and Full Wave Rectification:

- The use of solid state diodes in rectifiers.
- The principle of a half wave rectification for single-phase power supply.
- How the half wave and the full wave rectifier works.
- The advantages of rectifiers.

#### Inverter Technology:

- The principles of an inverter welding power source.
- The main components of an inverter and their functions.
- The advantages of using an inverter power source.

### 2.5 Calculations.

- How to calculate bending allowances.
- How to determine thickness allowance when forming.
- Symbolic expression.
- How to use simple transposition of formula to solve problems, using practical examples.
- How to calculate the volume of weld metal required.
- How to calculate weights of sheet and plate materials.
- How to determine economical use of plate/sheet for components.
- The trigonometrical ratios of sine, cosine and tangent relative to the right-angled triangle and how to use them to determine the length of a line, value of an angle and chord lengths.

#### Unit 3:

#### Advanced fabrication processes.

- (60 Guided Learning Hours).

#### Unit Summary:

The candidate is required to provide evidence of competence and an understanding of advanced fabrication processes. The candidate will/earn about site and workshop procedures that need to be followed whilst planning, cutting, forming and assembling a range of fabricated components using advanced processes.

#### Learning Outcomes:

### 3.1 Layout and Plan Work.

Candidates will be expected to:

1. Explain the suitability of the listed production methods used to produce sheet/plate fabrications and structures (See Knowledge Requirements).
2. Compare marking out methods and state the advantages of using Direct Marking, Templates and Calculations.
3. Describe handling methods and equipment used when handling Sheet, Plate, Non-Ferrous, Plastics and section.
4. Describe the planned disposition of joints on sheet/plate, stating processes and equipment used.

### 3.2 Procedures for Working on Site.

Candidates will be expected to:

1. State the relevant sections of the Health and Safety at Work etc. Act 1974 and relevant codes of practice.
2. Describe factors to be considered when assembling fabrications on site.
3. Describe the use of Erection Equipment, and Cranes on site.

### 3.3 Methods of Cutting Sheet, Plate, Non-ferrous, Sections, Plastics and Clad Materials.

Candidates will be expected to:

1. Describe the working principles of non-thermal cutting processes used to cut the stated materials and compare advantages and limitations of the processes.
2. Describe the working principles of thermal cutting processes and compare advantages and limitations of the processes.
3. Compare the relative merits of oxy-fuel gas, plasma, laser and abrasive water jet cutting methods.
4. Describe the application of CNC guillotines for cutting materials.

### 3.4 Methods of forming Sheet, Plate, Non-ferrous, Sections, Plastics and Clad materials.

Candidates will be expected to:

1. Describe the working principles of different forming machines used to form materials.
2. Compare the use of hand and machine forming capacities taking into account materials' tensile strength, thickness and length of the material, accuracy achieved, speed of operation, Quality required, Limitations and suitability of process.
3. Compare the merits of machine selection for single or batch production of components.
4. Explain the effect of changing the die width on the load required for press brake forming and the required quality of the fabrication.
5. Describe the process of forming, folding, flanging and pressing to inside and outside dimensions, and the necessary allowances required on the developed length.
6. Compare rolling with folding, flanging and pressing of materials and state the need for presetting prior to rolling. State the methods used to pre-set materials and the variation in spring back allowances necessary when forming different materials.

### 3.5 Methods of assembling Sheet, Plate, Non-ferrous, Sections, Plastics and Clad materials.

Candidates will be expected to:

1. Describe the sequence of assembly required and methods used to control distortion and achieve alignment with dimensional accuracy of fabricated components.
2. Describe the use of jigs, positioner's assembly and erection equipment.

Knowledge Requirements:

### 3.1 Layout and Plan Work.

Candidates should understand:

- Production methods and scale to include:
  - a Batch - Flow - Job - Mass.
- The following marking methods:
  - a Direct - Templates - Calculations.
- Handling methods and equipment used for sheet/plate/non-ferrous/plastics and section, to include: manual methods, protection of surfaces, clamps, Crosby clips, suction pad.
- The following processes and equipment related to the planned disposition of joints on Sheet/Plate:
  - a Economy of Material.
  - a Labour.
  - a Simplicity of Fabrication.
  - a Joint Location.
  - a Distortion Control.
  - a Use and Disposition of Templates.
  - a Folding/Cutting Allowances.

### 3.2 Procedures for Working On Site.

Candidates should understand:

- The relevant sections of the Health and Safety at Work etc. Act 1974 and relevant codes of practice to include:
  - a Risk Assessments, COSHH, PUWER, Work Permits, site related health and safety regulations, legislation and safe working practices.
- Issues relating to assembly fabrication on site to include:
  - a Type and size of fabrication.
  - a Size of lifting equipment.
  - a Maximum lift - Ground conditions.
  - a Site restrictions.
  - a Juxtaposition of general public and site.
- The use of erection equipment and cranes:
  - a Derricks.
  - a Mobile.
  - a Tower and Goliath cranes.
  - a Use of equipment for specific site conditions.

### 3.3 Methods of cutting sheet, plate, non-ferrous, sections, plastics and clad materials.

Candidates should understand:

- The working principles of Non-Thermal Cutting Processes to include:
  - a Hand and power shears, gUillotines, nibblers, turret and power punches, edge cutters, universal plate worker, croppers, punches, power saws, planing, milling, radial arm drills, water jet cutting.
- The working principles of Thermal Cutting Processes to include:
  - a Oxy-fuel Gas.
  - a Plasma.
  - a Laser.
- The relative merits of Oxy-fuel Gas, Plasma, Laser and Abrasive Water Jet Cutting methods in terms of:
  - a Equipment Costs.
  - a Operating costs.
  - a Cutting speed.
  - a Kerf width.

- o Skill requirements.
- o Material type and thickness.
- o Process versatility.
- o Cut quality.
- The application of CNC guillotines for cutting materials considering:
  - o Health and safety requirements.
  - o Blade design.
  - o Programming operations for blade clearance.
  - o Back gauge and blade rake angle.
  - o Ancillaries to aid production.
  - o Stroke counter.
  - o Magnetic/non magnetic sheet supports.
  - o Holding down equipment for soft and polished materials.
  - o Scrap.
  - o Dividers and stacker units.

### 3.4 Describe methods of forming Sheet, Plate, Non-ferrous, Sections, Plastics and Clad Materials.

Candidates should understand:

- The working principles of the following machines forming machines:
  - o Hand and powered folders.
  - o CNC Press brake.
  - o Vertical stroke press.
  - o Manual and powered rolls.
  - o Wheeling machine.
  - o Spinning machine.
  - o Edging/Flanging machine.
  - o Rubber pad.
  - o Hydrostatic.
  - o Matched die.
  - o hot wire methods to form plastics.
- Hand and machine forming capacities taking into account:
  - o Materials Tensile Strength.
  - o Thickness and length of the material.
  - o Accuracy achieved.
  - o Speed of operation.
  - o Quality required.
  - o Limitations and suitability of process.
- The benefits of machine selection for single/batch production of components.
- Characteristics of the die width on the load required for press brake forming and the required quality of the fabrication.
- The process of forming, folding, flanging and pressing to inside and outside dimensions, and the necessary allowances required on the developed length.
- Rolling, folding, flanging and pressing of materials and state the need for pre-setting prior to rolling. The methods used to pre-set materials and the variation in spring back allowances necessary when forming different materials.

### 3.5 Methods of assembling Sheet, Plate, Non-ferrous, Sections, Plastics and Clad materials.

Candidates should understand:

- The sequence of assembly.
- Methods to control distortion and achieve accurate alignment with dimensional accuracy of fabricated components.
- The use of jigs, positioner's assembly and erection equipment in terms of:

- o Positioning of components.
- o Use of datum's.
- o Joint alignment.
- o Maintaining shape.
- o Sub-assemblies.
- o Trial erections.
- o Choice of lifting equipment.
- o Mass production/repetitive work.
- o Manipulation of components.
- o Surface protection.
- o Economy of operation.

#### Unit 4:

Principles and applications of advanced welding process technologies.

- (60 Guided Learning Hours).

#### Unit Summary:

The candidate is required to develop an understanding of the operating principles and applications for advanced welding processes. The advantages and disadvantages of each process are evaluated and this assists in providing the candidate with the necessary skills to select the appropriate process for particular applications. The candidate will also be able to explain the consumable types, fluxes (if any) and flux cored/metal cored wires (where applicable) for successfully welding a variety of materials for these processes.

#### Learning Outcomes:

##### 4.1 Health and Safety Issues.

Candidates will be expected to:

1. Explain general Health and Safety issues relating to a range of welding processes.

##### 4.2 Inspection Requirements.

Candidates will be expected to:

1. Describe in detail a minimum of 3 inspection requirements relating to a range of welding processes.

##### 4.3 Operating Principles and Applications.

Candidates will be expected to:

1. Describe in detail a range of operating principles and applications on a variety of materials (where appropriate).
2. Identify 2 advantages and 2 disadvantages for each of the processes.

##### 4.4 Different Edge Preparations for Different Materials|Thickness and Processes.

Candidates will be expected to:

1. Describe in detail the required edge preparations for different material types and thickness for the processes listed in knowledge requirements 4.3 and 4.1.

#### Knowledge Requirements:

##### 4.1 Health and Safety Issues.

Candidates should understand:

- Health and Safety issues specific to the following processes on a variety of materials identified in Knowledge Requirement 4.3.
- Submerged-Arc, Resistance, to include Spot, Seam, Projection Resistance, Butt and Flash Butt welding, MAGS, TAGS, SAW, Plasma, Electron-Beam, Orbital, Robotics, Plastics, Rubbers, Ceramics.
- Pressure-welding to include Cold pressure and Ultra-sonic welding, Pulsed, Carbon-arc, Atomic - hydrogen.
- StUd-welding to include "arc" Capacitor discharge, Laser, Friction, Friction Stir and Explosive.

#### 4.2 Inspection Requirements.

Candidates should understand:

- Inspection requirements for the above processes on a variety of materials identified in Knowledge requirement 4.3.

#### 4.3 Operating Principles and Applications.

Candidates should understand:

- Operating principles and applications of the above processes on a variety of materials listed below for the processes listed in 4.1 .
- Materials to include: Carbon and Carbon Manganese Metals, Aluminium, Aluminium Alloys, Ferritic, Martensitic, Austenitic and Duplex Stainless and Heat Resisting. Metals, Copper and Copper Alloys, Magnesium and Magnesium Alloys, Clad Materials, Dissimilar Metals, Hard Surfacing Alloys, Titanium and Titanium Alloys, Plastics, Rubbers, Ceramics.
- Advantages and disadvantages of the processes listed in 4.1.

Unit 5:

Managing quality assurance in the fabrication and welding industry.

- (60 Guided Learning Hours).

Unit Summary:

The Quality Assurance unit is designed to develop the candidate's understanding of Quality Management systems and the specific recommendations set out in European Standards for welding of metallic materials necessary in the fabrication industry.

This unit develops a candidate's understanding of how quality management systems provide the means for an organisation to demonstrate its ability to consistently provide a product that meets customer and applicable regulatory requirements. In addition it also addresses how European standards provide the relevant guidelines for satisfactory production and control of welded fabrications, including some of the possible detrimental phenomena that may occur, with advice on methods by which they may be avoided.

Learning Outcomes:

#### 5.1 Quality Management System.

Candidates will be expected to:

1. Describe the Process-Based Model and the methodology of the PDCA Approach.
2. Identify the general requirements of the Quality Management System.
3. Explain the responsibility of management.
4. Identify how Quality Management Systems influence the product.
5. Explain the importance of measurement, analysis and improvement.

## 5.2 Quality Requirements for Welding-Fusion Welding of Metallic Materials.

Candidates will be expected to:

1. Outline the manufacturer's contractual requirements and responsibilities regarding Contract Review, Design Review, SUB-contracting.
2. Recognise the manufacturer's need to have at his disposal competent personnel to carry out planning, performing, supervising and examining welding production.
3. Recognise the manufacturer's need to identify and provide the relevant facilities and equipment necessary to produce a quality related to fabrication and welding related activities.
4. Describe welding activities in terms of: Production Plans - Weld procedure approval, Welder approvals, and specifications, Work Instructions and documentation.
5. State the manufacturer's responsibilities regarding:
  - Storage of parent materials.
  - Batch testing, storage and handling electrodes.
  - Post weld heat treatment.
6. Explain the manufacturer's responsibilities for inspection and testing before, during and after welding.
7. Describe the measures which should be implemented to deal with non-conformity and corrective actions, calibration, identification and traceability, quality records.

Knowledge Requirements:

### 5.1 Quality Management System.

Candidates should understand:

- That a Quality Management System can be used by internal and external parties, including certificating bodies, to assess the organisation's ability to meet customer, regulatory and the organisation's own requirements.
- Quality Assurance models to include the Process-Based model and the PDCA Approach (Plan, Do, Check, Act).
- The general requirements of the Quality Management System in terms of:
  - Quality policy.
  - Quality manuals.
  - Control of documents.
  - Control of records.
- Management responsibility in terms of:
  - Management commitment.
  - Customer focus.
  - Quality policy.
  - Planning.
  - Responsibility, authority and communications.
  - Management review.
- The necessity for management to provide:
  - Provision of Resources.
  - Relevant Human Resources.
  - Relevant Infrastructure.
  - Working Environment.
- How Quality Management Systems influence the product via:
  - Planning of product realisation.
  - Customer-related processes.
  - Design and development.
  - Purchasing.
  - Production and service provision.
  - Control of monitoring and measuring devices.



- o Case histories of welding and fabrication disasters.
- The importance of measurement, analysis and improvement related to:
  - o Customer satisfaction.
  - o Control of nonconforming product.
  - o Analysis of data.
  - o Improvement.

## 5.2 Quality Requirements for Welding-Fusion Welding of Metallic Materials.

Candidates should understand:

- How the application of comprehensive quality requirements provide manufacturers with the capability to produce welded constructions fulfilling specified quality.
- A manufacturer's contractual requirements and responsibilities regarding contract review, design review and subcontracting.
- The need to have competent staff to plan, perform, supervise and examine welding production in terms of:
  - o Welders.
  - o Welding Co-coordinators (with reference to the National Welding Training Standard).
  - o Non destructive testing personnel.
- The need to provide relevant facilities and equipment necessary to produce quality fabrication and welding activities in terms of:
  - o Description and suitability of equipment.
  - o Production and testing equipment.
  - o Maintenance of equipment.
- Welding activities in terms of:
  - o Production Plans.
  - o Welding procedure approval.
  - o Specifications.
  - o Work instructions.
  - o Documentation.
- Manufacturers responsibilities regarding Storage of parent materials, Batch testing, storage and handling of electrodes, Post weld heat treatment.
- Manufacturers responsibilities for inspection and testing before, during and after welding.
- Measures which should be implemented to deal with:
  - o Non-conformity and corrective actions.
  - o Calibration.
  - o Identification and traceability.
  - o Quality records.

Unit 6:

Advanced pattern development of plate work and metal structures.

- (60 Guided Learning Hours).

Unit Summary:

The candidate is required to provide evidence of competence in the ability to interpret and construct workshop drawings, to produce working sketches, to develop templates and patterns as would be used in the structural and fabrication industry.

Learning Outcomes.

The candidate will be expected to:

1. Interpret drawings and use methods of construction to develop complex shape and structural details.

2. Determine lines of intersection to enable the development of complex shapes.
3. Determine complex pattern shapes by the parallel line technique.
4. Determine complex pattern shapes by the radial line technique.
5. Determine complex pattern shapes by the triangulation technique.
6. Draw helical chutes, worm feed blades and spiral stairways.
7. Determine by calculation, sketch and dimension complex pattern shapes with the aid of micro computers.

#### Knowledge Requirements:

The candidate should understand:

- How to construct auxiliary views in double projection to simplify development of right cylindrical off-set branches and rectangular ducts.
- How to determine true lengths and shapes of structural sections for inclined beams, hip rakers, ties, struts, bevel, cleats and dihedral angle.
- How to use the principle of a common central sphere applied to multiple junction pieces involving 'right' cones and cylinders.
- How to use cutting planes applied to:
  - o Right cylindrical branches on transformer pieces.
  - o Oblique cone to oblique cone.
  - o Inclined right cylindrical branches on right cones on and off-centre.
  - o Various branch cross-sections on square/rectangular hoppers.
- How to use the parallel line technique to develop pattern shapes for:
  - o Swan-necked transition pieces.
  - o Rectangle to rectangle in angular plane.
  - o Cylindrical branches on to right segmental bends.
  - o Modified set-outs to accommodate material thickness.
- How to use the radial line technique to develop pattern shapes for:
  - o Right cones in multiple connections of right cones and right cylinders.
  - o Breeches and multi-way pieces involving oblique cones.
- How to use the triangulation technique to:
  - o Re-position triangles to aid surface contour and avoid kinks in the construction of transformer pieces.
  - o Develop patterns of 'kink' sided hoppers.
  - o Develop patterns of quadrilateral to round transformers between parallel planes.
  - o Develop patterns of square and rectangle to round transformers with openings at right angles and different levels.
- How to construct the elevations pattern shapes of:
  - o Worm feed screw blades showing inner and outer spirals.
  - o Spiral stairways and stringers.
  - o Helical chutes.
- How to use micro computers to determine, sketch and dimension:
  - o Square and rectangular kink sided hoppers.
  - o Square to round transformers between parallel planes.
  - o Helical chutes and blades.
  - o Spiral stairway stringers.
  - o Frusta of right cones, including major and minor radii, pattern angle and chordal check length.

#### New Zealand:

The Level 4 Qualification National Certificate in Engineering - Fabrication (Level 4) with Sectoral strands in Heavy Fabrication, Light Fabrication, and Welding was used as comparison. There is some similarity in the content of the qualifications with the New Zealand qualification being more specific in terms of unit standard titles. (It should be noted that the same qualification was used as comparison within the Level 3 Qualification comparison process).

National Certificates in New Zealand are achieved through training and assessment. Assessment is normally through on-the-job observation and other evidence gathering techniques. Candidates provide evidence to prove they have the competence to meet the NZQA standards. Assessors test candidates' underpinning knowledge, understanding and work-based performance to make sure they can demonstrate competence in the workplace.

This process is fully compatible and comparable with the South African process with the exception that New Zealand has some unit standards with the requirement of being performed "under supervision". This is contrary to outcomes based learning and development principles.

The qualification compares well with the one in New Zealand and also appears to satisfy the comparison in terms of a combined (non-specialist) qualification attainment. This is due to the availability of a choice of strands being available to the industry and the learner.

The minimum credit value for this qualification is listed as 269 credits which indicates that it would compare well with the apprenticeship type qualifications.

The competencies listed in this qualification are as below:

<http://www.nzqa.govt.nz/lnqfdocs/quals/doc/O122.doc>

ID; Title; Level; Credits:

- 101; Develop and use keyboarding skills to enter text; Level 1; 3 Credits.
- 2353; Pre-treat work for subsequent metal surface finishing operations; Level 1 ; 5 Credits.
- 2363; Polish ferrous and non-ferrous metal parts to produce a decorative finish; Level 3; 10 Credits.
- 2387; Assemble mechanical components under supervision; Level 2; 2 Credits.
- 2395; Select, use, and care for engineering hand tools; Level 1; 4 Credits.
- 2396; Select, use, and maintain portable hand held engineering power tools; Level 2; 4 Credits.
- 2414; Layout and mark off regular fabrication shapes under supervision; Level 2; 15 Credits.
- 2415; Form and shape fabrication materials under supervision; Level 2; 10 Credits.
- 2416; Assemble and mechanically join plate and sheet under supervision; Level 2; 10 Credits.
- 2417; Mechanically cut fabrication materials under supervision; Level 2; 8 Credits.
- 2418; Layout and mark off irregular fabrication shapes under supervision; Level 3; 15 Credits.
- 2419; Form and shape, sheet, plate, pipe and structural sections using power machines under supervision; Level 3; 15 Credits.
- 2420; Assemble and mechanically join tube, pipe and sections under supervision; Level 3; 15 Credits.
- 2421; Mechanically cut fabrication materials using powered machinery under supervision; Level 3; 10 Credits.
- 2422; Layout and mark off complex fabrication shapes; Level 4; 15 Credits.
- 2423; Form and shape fabrication materials; Level 4; 15 Credits.
- 2424; Assemble and mechanically join sheet, plate, tube, pipe and structural sections; Level 4; 20 Credits.
- 2425; Mechanically cut sheet, plate, tube, pipe and structural sections; Level 4; 10 Credits.
- 2430; Draw and interpret engineering sketches under supervision; Level 2; 4 Credits.
- 2431; Draw and interpret engineering drawings under supervision; Level 2; 8 Credits.
- 2432; Construct engineering plane geometric shapes; Level 2; 3 Credits.
- 2433; Create two dimensional engineering drawings using computer aided design system; Level 2; 6 Credits.
- 2434; Produce detailed engineering drawings under supervision; Level 3; 15 Credits.
- 2438; Produce fabrication drawings; Level 4; 20 Credits.
- 2670; Avoid welding hazards with safe work practices; Level 2; 1 Credit.

- 2671; Weld metal structures with the manual metal arc welding process in down hand positions; Level 3; 6 Credits.
- 2672; Weld metal to a general purpose industry standard with the gas metal arc welding process; Level 3; 6 Credits.
- 2673; Weld metal structures with the gas metal arc welding process in down hand positions; Level 3; 6 Credits.
- 2674; Weld stainless metal plate with the gas metal arc welding processes in the down hand positions; Level 3; 6 Credits.
- 2675; Weld aluminium with the gas metal arc welding process in the down hand positions; Level 3; 6 Credits.
- 2676; Weld stainless metal sheet with the gas tungsten arc welding process; Level 3; 6 Credits.
- 2677; Weld aluminium with the gas tungsten arc welding process in the down hand positions; Level 3; 6 Credits.
- 2678; Join metals with the oxyacetylene welding process; Level 3; 6 Credits.
- 2679; Join metals using torch brazing and soldering; Level 3; 6 Credits.
- 2680; Join metals with the resistance welding process; Level 3; 4 Credits.
- 2681; Weld metal structures with the submerged arc welding process; Level 3; 4 Credits.
- 2682; Weld metal to a general purpose industry standard with the manual metal arc welding process; Level 3; 6 Credits.
- 2683; Cut metals using manual thermal processes; Level 3; 4 Credits.
- 2684; Weld metal structures with the gas metal arc welding processes in all positions; Level 4; 10 Credits.
- 2685; Weld metal structures with the manual metal arc welding process in all positions; Level 4; 10 Credits.
- 2686; Weld aluminium with the gas metal arc welding process in all positions; Level 4; 10 Credits.
- 2687; Weld stainless metal sheet and plate with the gas metal arc welding processes in all positions; Level 4; 10 Credits.
- 2688; Weld stainless metal tube with the gas tungsten arc welding process; Level 4; 10 Credits.
- 2689; Weld aluminium with the gas tungsten arc welding process in all positions; Level 4; 10 Credits.
- 2690; Weld metal pipe with the oxyacetylene process; Level 4; 10 Credits.
- 2691; Cut metals using mechanised thermal processes; Level 4; 4 Credits.
- 2692; Repair non-ferrous metal components by welding; Level 4; 10 Credits.
- 2693; Repair ferrous metal components by welding; Level 4; 10 Credits.
- 2694; Weld metal pipe with the manual metal arc welding process using cellulosic electrodes; Level 4; 20 Credits.
- 2695; Weld metal pipe with the manual metal arc welding process using hydrogen controlled electrodes; Level 4; 20 Credits.
- 2696; Weld pipe in all positions with the gas tungsten arc welding process; Level 4; 12 Credits.
- 2697; Weld aluminium pipe in all positions with the gas tungsten arc welding process; Level 4; 10 Credits.
- 2824; Follow safe working practices on an engineering worksite; Level 2; 3 Credits.
- 3234; Install metal pipe work according to plans and specifications under supervision; Level 3; 12 Credits.
- 3236; Install stainless metal pipe work according to plans and specification under supervision; Level 3; 12 Credits.
- 3238; Manufacture duct work to plans and specifications; Level 3; 20 Credits.
- 4432; Identify and convert basic units of measure used in engineering; Level 1; 1 Credit.
- 4433; Measure with non-complex devices used in engineering; Level 1; 2 Credits.
- 4436; Select, use and care for engineering marking-out equipment; Level 2; 4 Credits.
- 4795; Distinguish the characteristics of engineering materials; Level 1; 2 Credits.
- 4796; Distinguish the characteristics of engineering metals; Level 2; 3 Credits.

- 9184; Erect non-notifiable prefabricated scaffolding; Level 3; 3 Credits.
- 12299; Shift loads in the performance of machinery and equipment installation and maintenance; Level 2; 3 Credits.
- 16954; Calculate lengths, areas and mass of engineering fabrication materials; Level 2; 4 Credits.
- 16955; Calculate sizes, mass, volumes, and quantities for engineering fabrication; Level 3; 4 Credits.
- 16956; Demonstrate knowledge of force and stress in engineering fabrications; Level 4; 4 Credits.
- 18106; Gouge metals using manual thermal processes; Level 3; 2 Credits.
- 18107; Layout and mark off complex heavy fabrication shapes; Level 4; 15 Credits.

Australia:

Following the Australian Prime Minister's announcement, the responsibilities and functions of the Australian National Training Authority (ANTA) have been transferred to the Department of Education, Science and Training (DEST).

Certificates in Australia are achieved through training and assessment. Assessment is through training provider and on-the-job observation and other evidence gathering techniques. Candidates provide evidence to prove they have the competence to meet the DEST standards. Assessors test candidates' underpinning knowledge, understanding and work-based performance confirm they can demonstrate competence in the workplace. This process is fully compatible and comparable with the South African process.

The trade of Boiler-making is utilised in Australia. However, the process of achieving the qualification is from various options. These options have various specialisations with a set of core components. The list of unit standards shown below are those that make up the entire qualification requirements.

The main areas of learning within this qualification are:

- Heavy Fabrication.
- Light Fabrication.
- Welding.

Other (for comparison purposes) specialisation areas are listed as:

- Refrigeration and Air-conditioning.
- Casting and Moulding.
- CNC programming.
- Fluid Power.
- Instrumentation.
- Jewellery.
- Lock smith.
- Maintenance.
- Marine Electronics.
- Mechatronics.
- Patternmaking.
- Robotics.
- Surface Finishing.
- Tool making.
- Watch making.

This comparison indicates that there are synergies between this SAQA qualification and the qualification listed in Australia (MEM40150).

The competencies listed in the qualification are as follows:

## Compulsory Units:

Unit code; Unit title:

- MEM12.23A; Perform engineering measurements.
- MEM12.24A; Perform computations.
- MEM13.14A; Apply principles of occupational health and safety in the work environment.
- MEM14.4A; Plan to undertake a routine task.
- MEM14.5A; Plan a complete activity.
- MEM15.24A; Apply quality procedures.
- MEM15.2A; Apply quality systems.
- MEM16.6A; Organise and communicate information.
- MEM16.7A; Work with others in a manufacturing, engineering or related environment.
- MEM16.8A; Interact with computing technology.
- MEM17.3A; Assist in the provision of on the job training.

## Optional (Elective) Units:

Unit code; Unit title; Points:

- MEM5.24B; Perform welding supervision; 12.
- MEM5.25C; Perform welding/fabrication inspection ; 12.
- MEM5.26B; Apply welding principles; 4.
- MEM5.42B; Perform welds to code standards using flux core arc welding process; 6.
- MEM5.43B; Perform welds to code standards using gas metal arc welding process; 6.
- MEM5.44B; Perform welds to code standards using gas tungsten arc welding process; 6.
- MEM5.45B; Perform pipe welds to code standards using manual metal arc welding process; 6.
- MEM5.46B; Perform welds to code standards using manual metal arc welding process; 6.
- MEM5.53A; Set and edit computer controlled thermal cutting machines; 4.
- MEM5.54A; Write basic NC/CNC programs for thermal cutting machines; 4.
- MEM7.16C; Set and edit computer controlled machines/processes; 4.
- MEM7.18C; Write basic NC/CNC programs; 4.
- MEM7.19C; Program NC/CNC machining centre; 2.
- MEM7.20C; Program multiple spindle and/or multiple axis NC/CNC machining centre; 2.
- MEM7.22C; Program CNC wire cut machines; 2.
- MEM7.23C; Program and set up CNC manufacturing cell; 6.
- MEM7.39A; Write programs for industrial robots; 4.
- MEM9.4B; Perform electrical/electronic detail drafting; 8.
- MEM9.6B; Perform advanced engineering detail drafting; 4.
- MEM9.7B; Perform advanced mechanical detail drafting; 4.
- MEM9.8B; Perform advanced structural detail drafting; 4.
- MEM9.9C; Create 2D drawings using computer aided design system; 8.
- MEM9.10C; Create 3D models using computer aided design system; 4.
- MEM9.23A; Create 3D code files using computer aided manufacturing system; 6.
- MEM10.7C; Modify control systems; 6.
- MEM10.8B; Undertake commissioning procedures for plant and/or equipment; 4.
- MEM12.3B; Perform precision mechanical measurement; 2.
- MEM12.4B; Perform precision electrical/electronic measurement; 4.
- MEM12.5B; Calibrate measuring equipment; 6.
- MEM12.25A; Use graphical techniques and perform simple statistical computations; 2.
- MEM14.1 B; Schedule material deliveries; 8.
- MEM14.2B; Undertake basic process planning; 8.
- MEM14.3B; Undertake basic production scheduling; 8.
- MEM15.7B; Conduct product and/or process capability studies; 6.

- MEM15.8B; Perform advanced statistical quality control; 2.
- MEM15.10B; Perform laboratory procedures; 8.
- MEM15.11 B; Exercise external quality assurance; 6.
- MEM15.12B; Maintain/supervise application of quality procedures; 4.
- MEM15.15B; Examine trading practices; 5.
- MEM15.16B; Inspect pre-packed articles; 8.
- MEM15.17B; Use and maintain reference standards; 3.
- MEM15.18B; Investigate consumer complaints; 6.
- MEM15.19B; Conduct a field inspection; 12.
- MEM15.20C; Perform verification/certification or in-service inspection; 12.
- MEM15.21C; Conduct audits of servicing licensees and public weighbridge licensees; 4.
- MEM15.22B; Verify reference standards; 8.
- MEM16.1 B; Give formal presentations and take part in meetings; 2.
- MEM16.3B; Provide advanced customer service; 2.
- MEM16.9A; Research and analyse engineering information; 2.
- MEM16.10A; Write reports; 2.
- MEM16.11A; Communicate with individuals and small groups; 2.
- MEM16.12A; Interpret technical specifications and manuals; 4.
- MEM16.13A; Operate in a self-directed team; 2.
- MEM16.14A; Report technical information; 2.
- MEM17.1 B; Assist in development and deliver training in the workplace; 2.
- MEM17.2B; Conduct workplace assessment; 2.
- MEM18.10C; Perform equipment condition monitoring and recording; 4.
- MEM18.11 C; Shut down and isolate machines/equipment; 2.
- MEM18.16B; Analyse plant and equipment condition monitoring results; 4.
- MEM18.17C; Modify mechanical systems and equipment; 8.
- MEM18.19B; Maintain pneumatic systems; 4.
- MEM18.21 B; Maintain hydraulic systems; 4.
- MEM18.22B; Maintain fluid power controls; 8.
- MEM18.23B; Modify fluid power system operation; 8.
- MEM18.49B; Disconnect/reconnect fixed wired equipment up to 1000 volts *a.c.*/1500 volts d.c.; 3.
- MEM18.50B; Disconnect/reconnect fixed wired equipment over 1000 volts *a.c.*// 500 volts d.c.; 3.
- MEM18.51B; Fault find and repair/rectify complex electrical circuits; 6.
- MEM18.53B; Modify fluid power control systems; 6.
- MEM18.54B; Fault find, test and calibrate instrumentation systems and equipment; 8.
- MEM18.56B; Diagnose and repair analog equipment and components; 10.
- MEM18.58C; Modify electronic equipment; 4.
- MEM18.59B; Modify electronic systems; 4.
- MEM18.60B; Maintain, repair control instrumentation - single and multiple loop control systems; 8.
- MEM18.61 B; Maintain/calibrate complex control systems; 8.
- MEM18.62B; Install, maintain and calibrate instrumentation sensors, transmitters and final control elements; 8.
- MEM18.65B; Diagnose and repair digital equipment and components; 10.
- MEM18.66B; Diagnose and repair microprocessor-based equipment; 6.
- MEM18.67B; Tune control loops - multi controller or multi element systems; 6.
- MEM18.69B; Maintain, repair instrumentation process control analysers; 6.
- MEM18.70C; Modify complex electrical circuits and systems; 6.
- MEM18.73A; Perform advanced equipment testing and diagnostics on mobile plant and equipment; 8.
- MEM18.91 B; Maintain and repair multi stage, cascade and/or ultra-cold industrial refrigeration systems; 4.

- MEM18.92B; Maintain and repair commercial and/or industrial refrigeration and/or air conditioning controls; 6.
- MEM18.93B; Maintain and repair integrated industrial refrigeration and/or large air handling system controls; 8.
- MEM19.8B; Prepare jewellery designs; 6.
- MEM19.13B; Produce jewellery metal masters; 4.
- MEM19.18B; Repair jewellery items; 6.
- MEM19.22B; Perform precision micro-mechanism diagnosis and servicing; 6.
- MEM20.8A; Develop and implement a master key system; 4.
- MEM20.11A; Service and repair fire and security containers; 6.
- MEM20.12A; Service and repair mechanical automotive locking systems; 6.
- MEM20.13A; Service automotive transponder systems; 2.
- MEM24.2B; Perform penetrant testing; 4.
- MEM24.4B; Perform magnetic particle testing; 4.
- MEM24.6B; Perform eddy current testing; 6.
- MEM24.8B; Perform ultrasonic testing; 6.
- MEM24.10B; Perform radiographic testing; 6.
- MEM24.11B; Establish non-destructive tests; 12.
- MEM24.12B; Apply metallurgy principles; 4.
- MEM25.8B; Repair marine vessel surfaces and structures; 4.
- MEM25.13B; Produce three-dimensional plugs/moulds; 12.
- MEM30.12A; Use mathematical techniques and perform simple statistical computations; 4.
- MEM3.1B; Perform manual production assembly; 4.
- MEM3.2B; Perform precision assembly; 4.
- MEM3.3B; Perform sheet and plate assembly; 4.
- MEM3.4B; Perform electronic/electrical assembly (production); 8.
- MEM3.5B; Rework and repair (electrical/electronic production); 8.
- MEM3.6B; Set assembly stations; 2.
- MEM4.1B; Operate melting furnaces; 4.
- MEM4.2B; Perform gravity die casting; 2.
- MEM4.3B; Operate pressure die casting machine; 4.
- MEM4.4B; Prepare and mix sand for metal moulding; 4.
- MEM4.5B; Produce moulds and cores by hand (jobbing); 16.
- MEM4.6B; Operate sand moulding and core making machines; 8.
- MEM4.7B; Pour molten metal; 4.
- MEM4.8B; Fettle and trim metal castings/forgings; 4.
- MEM4.10B; Develop and manufacture wood patterns; 20.
- MEM4.11B; Produce polymer patterns; 8.
- MEM4.12B; Assemble plated patterns; 8.
- MEM4.13B; Develop and manufacture polystyrene patterns; 2.
- MEM4.14B; Develop and manufacture production patterns; 8.
- MEM4.15B; Develop and manufacture vacuum forming moulds and associated equipment; 6.
- MEM4.16C; Develop and manufacture precision models; 6.
- MEM4.17B; Develop and manufacture gear, conveyor screw and propeller patterns; 4.
- MEM4.18B; Perform general wood working machine operations; 4.
- MEM4.19B; Perform refractory installation and repair; 4.
- MEMS. 1B; Perform manual soldering/de-soldering - electrical/electronic components; 4.
- MEM5.2B; Perform high reliability soldering and de-soldering; 4.
- MEM5.3B; Perform soft soldering; 2.
- MEM5.4C; Perform routine Oxy-acetylene welding; 2.
- MEM5.5B; Carry out mechanical cutting; 2.
- MEM5.6B; Perform brazing and/or silver soldering; 2.
- MEM5.7C; Perform manual heating and thermal cutting; 2.
- MEM5.8C; Perform advanced manual thermal cutting, gouging and shaping; 2.
- MEM5.9C; Perform automated thermal cutting; 2.



- MEM5.10B; Apply fabrication, forming and shaping techniques; 8.
- MEM5.11C; Assemble fabricated components; 8.
- MEM5.12C; Perform routine manual metal arc welding; 2.
- MEM5.13C; Perform manual production welding; 2.
- MEM5.14C; Monitor quality of production welding/fabrications; 2.
- MEM5.15C; Weld using manual metal arc welding process; 4.
- MEM5.16C; Perform advanced welding using manual metal arc welding process; 4.
- MEM5.17C; Weld using gas metal arc welding process; 4.
- MEM5.18C; Perform advanced welding using gas metal arc welding process; 4.
- MEM5.19C; Weld using gas tungsten arc welding process; 4.
- MEM5.20C; Perform advanced welding using gas tungsten arc welding process; 4.
- MEM5.22C; Perform advanced welding using oxyacetylene welding process; 6.
- MEM5.23C; Weld using submerged arc welding process; 4.
- MEM5.36C; Repair/replace/modify fabrications; 4.
- MEM5.37B; Perform geometric development; 6.
- MEM5.38B; Perform advanced geometric development - cylindrical/rectangular; 2.
- MEM5.39B; Perform advanced geometric development - conical; 2.
- MEM5.40B; Perform advanced geometric development - transitions; 4.
- MEM5.41B; Weld using powder flame spraying; 4.
- MEM5.47B; Weld using flux core arc welding process; 4.
- MEM5.48B; Perform advanced welding using flux core arc welding process; 4.
- MEM5.49B; Perform routine gas tungsten arc welding; 2.
- MEM5.50B; Perform routine gas metal arc welding; 2.
- MEM5.51A; Select welding processes; 2.
- MEM5.52A; Apply safe welding practices; 4.
- MEM6.1B; Perform hand forging; 4.
- MEM6.2B; Perform hammer forging; 4.
- MEM6.3C; Carry out heat treatment; 6.
- MEM6.4B; Select heat treatment processes and test finished product; 6.
- MEM6.5B; Perform drop and upset forging; 4.
- MEM6.6C; Repair springs; 4.
- MEM6.7B; Perform basic incidental heat/quenching, tempering and annealing; 2.
- MEM6.8A; Hammer forge complex shapes; 4.
- MEM6.9A; Hand forge complex shapes; 4.
- MEM7.1B; Perform operational maintenance of machines/equipment; 2.
- MEM7.2C; Perform precision shaping/planning/slotting operations; 4.
- MEM7.3B; Perform machine setting (routine); 4.
- MEM7.4B; Perform machine setting (complex); 8.
- MEM7.5B; Perform general machining; 8.
- MEM7.6B; Perform lathe operations; 4.
- MEM7.7B; Perform milling operations; 4.
- MEM7.8C; Perform grinding operations; 4.
- MEM7.9B; Perform precision jig boring operations; 4.
- MEM7.10B; Perform tool and cutter grinding operations; 4.
- MEM7.11B; Perform complex milling operations; 4.
- MEM7.12B; Perform complex grinding operations; 4.
- MEM7.13B; Perform machining operations using horizontal and/or vertical boring machine; 4.
- MEM7.14B; Perform electro-discharge (EDM) machining operations; 4.
- MEM7.15B; Set computer controlled machines/processes; 2.
- MEM7.21B; Perform complex lathe operations; 4.
- MEM7.24B; Operate and monitor machine/process; 4.
- MEM7.25B; Perform advanced machine/process operation; 6.
- MEM7.26B; Perform advanced plastic processing; 6.
- MEM7.27B; Perform advanced press operations; 6.
- MEM7.28B; Operate computer controlled machines/processes; 2.

- MEM7.29B; Perform routine sharpening/maintenance of production tools and cutters; 4.
- MEM7.30C; Perform metal spinning lathe operations (basic); 8.
- MEM7.31 C; Perform metal spinning lathe operations (complex); 4.
- MEM7.32B; Use workshop machines for basic operations; 2.
- MEM7.33B; Operate and monitor basic boiler; 6.
- MEM7.34A; Operate and monitor intermediate class boiler; 4.
- MEM7AOA; Set multistage integrated processes; 6.
- MEM8.1 B; Perform wire, jig and barrel load/unload work; 4.
- MEM8.2C; Pre-treat work for subsequent surface coating; 4.
- MEM8.3C; Perform electroplating operations; 6.
- MEM8AB; Finish work using wet, dry and vapour deposition methods; 4.
- MEM8.5B; Prepare and produce specialised coatings; 4.
- MEM8.6B; Produce clear and/or coloured and/or sealed anodised films on aluminium; 2.
- MEM8.7B; Control surface finish production and finished product quality; 4.
- MEM8.8B; Operate and control surface finishing waste treatment process; 3.
- MEM8.9C; Make up solutions; 2.
- MEMS.1 OB; Manually finish/polish materials; 6.
- MEM8.11 B; Prepare surfaces using solvents and/or mechanical means; 2.
- MEM8.12B; Prepare surfaces by abrasive blasting (basic); 4.
- MEM8.13B; Prepare surfaces by abrasive blasting (advanced); 4.
- MEM8.14B; Apply protective coatings (basic); 4.
- MEM8.15B; Apply protective coatings (advanced); 4.
- MEM8.16B; Control blast coating by-products, materials and emissions; 1.
- MEM8.18; Electroplate engineering coatings; 6.
- MEM8.19B; Electroplate protective finishes; 6.
- MEM8.20B; Electroplate decorative finishes; 6.
- MEM9.2B; Interpret technical drawing; 4.
- MEM9.3B; Prepare basic engineering drawing; 8.
- MEM9.5B; Perform basic engineering detail drafting; 8.
- MEM9.11 B; Apply basic engineering design concepts; 6.
- MEM9.21 B; Interpret and produce curved 3-dimensional shapes; 4.
- MEM9.22A; Create 2D code files using computer aided manufacturing system; 4.
- MEM10.1C; Erect structures; 4.
- MEM10.2B; Terminate and connect electrical wiring; 3.
- MEM10.3B; Install and test electrical wiring and circuits up to 1000 volts a.c. and 1500 volts d.c.; 12.
- MEM10AB; Enter and change programmable controller operational parameters; 2.
- MEM10.5B; Commission programmable controller programs; 4.
- MEM10.6B; Install machine/plant; 4.
- MEM10.9B; Install refrigeration and air conditioning plant and equipment; 4.
- MEM10.10B; Install pipe work and pipe work assemblies; 4.
- MEM10.11 B; Terminate and connect specialist cables; 3.
- MEM10.12A; Install split air conditioning system; 4.
- MEM11.1 C; Erect/dismantle scaffolding and equipment; 4.
- MEM11.2C; Erect/dismantle complex scaffolding and equipment; 4.
- MEM11.3B; Coordinate erection/dismantling of complex scaffolding/equipment; 4.
- MEM11AB; Undertake dogging; 4.
- MEM11.5B; Pick and process orders; 4.
- MEM11.6B; Perform production packaging; 2.
- MEM11.7B; Administer inventory procedures; 4.
- MEM11.8B; Package materials (stores and warehouse); 2.
- MEM11.9B; Handle/move bulk fluids/gases; 4.
- MEM11.1 OB; Operate mobile load shifting equipment; 4.
- MEM11.11 B; Undertake manual handling; 2.
- MEM11.12B; Purchase materials; 6.

- MEM11.13B; Undertake warehouse receivable process; 4.
- MEM11.14B; Undertake warehouse dispatch process; 4.
- MEM11.15B; Manage warehouse inventory system; 6.
- MEM11.16B; Order materials; 2.
- MEM11.17B; Organise and lead stock takes; 4.
- MEM11.18B; Organise and maintain warehouse stock receivable and/or dispatch system; 6.
- MEM11.19B; Undertake tool store procedures; 4.
- MEM11.20B; Perform advanced warehouse computer operations; 4.
- MEM11.21B; Perform advanced operation of load shifting equipment; 2.
- MEM11.22B; Operate fixed/moveable load shifting equipment; 4.
- MEM12.1B; Use comparison and basic measuring devices; 2.
- MEM12.2B; Perform electrical/electronic measurement; 2.
- MEM12.6B; Mark off/out (general engineering); 4.
- MEM12.7C; Mark off/out structural fabrications and shapes; 8.
- MEM12.19B; Measure components using coordinate measuring machine; 4.
- MEM12.20B; Set and operate coordinate measuring machine; 2.
- MEM12.21B; Program coordinate measuring machine; 4.
- MEM12.22B; Program coordinate measuring machine (advanced); 2.
- MEM13.1B; Perform emergency first aid; 2.
- MEM13.2B; Undertake occupational health and safety activities in the workplace; 3.
- MEM13.3B; Work safely with industrial chemicals and materials; 2.
- MEM13.4B; Work safely with molten metals/glass; 2.
- MEM13.6B; Collect and evaluate occupational health and safety data for an enterprise or section of an enterprise; 4.
- MEM13.7B; Maintain water treatment systems for cooling towers; 2.
- MEM13.10A; Supervise occupational health and safety in an industrial work environment; 4.
- MEM13.13B; Work safely with ionizing radiation; 4.
- MEM15.1B; Perform basic statistical quality control; 2.
- MEM15.3B; Use improvement processes in team activities; 4.
- MEM15.4B; Perform inspection; 2.
- MEM15.5B; Select and control inspection processes and procedures; 4.
- MEM16.2C; Conduct formal interviews and negotiations; 4.
- MEM16.4B; Perform internal/external customer service; 2.
- MEM16.5A; Operate as a team member to conduct manufacturing, engineering or related activities; 2.
- MEM18.1C; Use hand tools; 2.
- MEM18.2B; Use power tools/hand held operations; 2.
- MEM18.3C; Use tools for precision work; 4.
- MEM18.4B; Maintain and overhaul mechanical equipment; 4.
- MEM18.5B; Perform fault diagnosis, installation and removal of bearings; 4.
- MEM18.6B; Repair and fit engineering components; 6.
- MEM18.7B; Maintain and repair mechanical drives and mechanical transmission assemblies; 4.
- MEM18.8B; Balance equipment; 2.
- MEM18.9B; Perform leveling and alignment of machines and engineering components; 4.
- MEM18.12B; Perform installation and removal of mechanical seals; 2.
- MEM18.13B; Perform gland packing; 2.
- MEM18.14B; Manufacture press tools and gauges; 8.
- MEM18.15B; Maintain tools and dies; 4.
- MEM18.18C; Maintain pneumatic system components; 4.
- MEM18.20B; Maintain hydraulic system components; 4.
- MEM18.24B; Maintain engine cooling systems; 2.
- MEM18.25B; Service combustion engines; 2.
- MEM18.26C; Test compression ignition fuel systems; 4.
- MEM18.27C; Overhaul engine fuel system components; 8.

- MEM18.28B; Maintain engine lubrication systems; 2.
- MEM18.29B; Tune diesel engine; 4.
- MEM18.30B; Diagnose and rectify low voltage electrical systems; 8.
- MEM18.31 B; Diagnose and rectify low voltage starting systems; 2.
- MEM18.32B; Maintain induction/exhaust systems; 4.
- MEM18.33B; Perform engine bottom-end overhaul; 4.
- MEM18.34B; Perform engine top-end overhaul; 8.
- MEM18.35B; Diagnose and rectify braking systems; 6.
- MEM18.37B; Diagnose and rectify low voltage charging systems; 2.
- MEM18.38B; Maintain wheels and tyres; 2.
- MEM18.39B; Diagnose and rectify track type undercarriage; 4.
- MEM18.40B; Maintain suspension systems; 4.
- MEM18.41B; Maintain steering systems; 4.
- MEM18.42C; Diagnose and rectify manual transmissions; 4.
- MEM18.43C; Diagnose and rectify automatic transmissions; 8.
- MEM18.44C; Diagnose and rectify drive line and final drives; 4.
- MEM18.45B; Fault find/repair electrical equipment/components up to 250 volts single phase supply; 4.
- MEM18.46B; Fault find/repair electrical equipment/components up to 1000 volts a.c./1500 volts d.c.; 10.
- MEM18.47B; Diagnose and maintain electronic controlling systems on mobile plant; 4.
- MEM18.48B; Fault find and repair/rectify basic electrical circuits; 12.
- MEM18.52B; Maintain fluid power systems for mobile plant; 4.
- MEM18.55B; Dismantle, replace and assemble engineering component; 3.
- MEM18.57B; Maintain/service analog/digital electronic equipment; 6.
- MEM18.63B; Terminate signal and data cables; 4.
- MEM18.64B; Maintain instrumentation system components; 6.
- MEM18.71B; Connect/disconnect fluid conveying system components; 2.
- MEM18.72B; Manufacture fluid conveying conductor assemblies; 4.
- MEM18.86B; Test, recover, evacuate and charge refrigeration systems; 4.
- MEM18.87B; Service and repair domestic and light commercial refrigeration and air conditioning equipment; 6.
- MEM18.88B; Maintain and repair commercial air conditioning systems and components; 4.
- MEM18.89B; Maintain and repair central air handling systems; 6.
- MEM18.90B; Maintain and repair industrial refrigeration systems and components; 6.
- MEM18.94B; Service and repair commercial refrigeration; 6.
- MEM18.95A; Maintain and repair cooling towers/evaporative condensers and associated equipment; 4.
- MEM18.96A; Maintain, repair/replace and adjust refrigerant flow controls and associated equipment; 6.
- MEM18.97A; Manufacture cavity dies; 8.
- MEM19.1B; Perform jewellery metal casting; 6.
- MEM19.2B; Prepare jewellery illustrations; 4.
- MEM19.3B; Handle gem materials; 2.
- MEM19.4B; Handle and examine gemstone materials; 6.
- MEM19.5B; Produce three-dimensional precision items; 8.
- MEM19.6B; Replace watch batteries; 1.
- MEM19.7B; Perform gemstone setting; 6.
- MEM19.9B; Perform investment procedures for lost wax casting process; 1.
- MEM19.10B; Produce rubber moulds for lost wax casting process; 2.
- MEM19.11 B; Perform wax injection of moulds for lost wax casting process; 2.
- MEM19.12B; Produce jewellery wax model; 4.
- MEM19.14B; Perform hand engraving; 4.
- MEM19.15B; Perform jewellery enamelling; 4.
- MEM19.16B; Construct jewellery components; 4.

- MEM19.17B; Fabricate jewellery items; 6.
- MEM19.20B; Fault-find and maintain micro-mechanisms; 4.
- MEM19.21 B; Diagnose and service micro-mechanisms; 6.
- MEM20.1A; Produce keys; 4.
- MEM20.2A; Assemble and test lock mechanisms; 6.
- MEM20.3A; Install and upgrade locks and hardware; 4.
- MEM20AA; Gain entry; 4.
- MEM20.5A; Install and maintain door control devices/systems; 2.
- MEM20.6A; Maintain and service mechanical locking devices; 6.
- MEM20.7A; Plan and prepare a master key system; 6.
- MEM20.9A; Gain entry and reinstate fire and security containers; 4.
- MEM20.10A; Gain entry and reinstate automotive locking systems; 4.
- MEM20.14A; Perform a site security survey; 2.
- MEM24.1B; Perform basic penetrant testing; 2.
- MEM24.3B; Perform basic magnetic particle testing; 2.
- MEM24.5B; Perform basic eddy current testing; 2.
- MEM24.7B; Perform ultrasonic thickness testing; 7.
- MEM24.9B; Perform basic radiographic testing; 2.
- MEM25.1B; Apply fibre-reinforced materials; 2.
- MEM25.2B; Form and integrate fibre-reinforced structures; 4.
- MEM25.3B; Set up marine vessel structures; 4.
- MEM25AB; Fair and shape surfaces; 2.
- MEM25.5B; Construct and assemble marine vessel timber components; 8.
- MEM25.6B; Undertake marine sheathing operations; 2.
- MEM25.7B; Maintain marine vessel surfaces; 4.
- MEM25.9B; Form timber shapes using hot processes; 2.
- MEM25.10B; Perform fit-out procedures; 4.
- MEM25.11 B; Install marine systems; 8.
- MEM25.12B; Install and test operations of marine auxiliary systems; 6.
- MEM25.14B; Perform marine slipping operations; 2.
- MEM25.15A; Assemble and install equipment and accessories/ancillaries; 2.
- MEM50.2B; Work safely on marine craft; 1.
- MEM50.3B; Follow work procedures to maintain the marine environment; 1.
- MEM50AB; Maintain quality of environment by following marina codes; 1.
- MEM50.9B; Safely operate a mechanically powered recreational boat; 2.
- AUR2801A; Garry out minor panel repairs; 4.
- BSBOHS502;A; Participate in the management of the OHS information and data systems; 2.
- BSBOHS602A; Develop OHS information and data analysis and reporting and recording processes; 2.
- BSBOHS601A; Develop a systematic approach to managing OHS; 4.
- BSBOHS603A; Analyse and evaluate OHS risk; 4.
- ICTTC136B; Install, maintain and modify customer premises communications cabling: ACA Restricted Rule; 6.
- ICTTC137B; Install, maintain and modify customer premises communications cabling: ACA Open Rule; 6.
- MEA405A; Repair/modify aircraft composite material structure/components; 4.
- PMBPROD291A; Operate resin infusion moulding equipment; 2.
- PMBPROD294; Operate resin transfer moulding equipment; 2.
- PMBPROD298A; Operate equipment using pre-pregs material; 2.
- PMBPROD391A; Produce composites using resin infusion; 4.
- PMBPROD394A; Produce composites using resin transfer moulding; 4.
- PMBPROD398A; Produce composites using pre-pregs; 4.
- PRSTS202A; Install security equipment/system; 4.
- PRSTS302A; Program security equipment/system; 2.
- PRSTS303A; Test installed security equipment/system; 2.

- PRSTS304A; Commission/decommission security equipment system; 2.
  - PRSTS305A; Identify and diagnose electronic security equipment system fault; 2.
  - PRSTS307A; Maintain and service security equipment system; 4.
  - PRSTS317A; Provide estimate and quote; 4.
  - PRSTS319A; Modify and repair security equipment system; 4.
- A direct comparison with these international qualifications indicates that the education and training focus of all the qualifications is basically the same. However, the basic construct differs in that the nomenclature is dissimilar to that used in South Africa.
- This SAQA Qualification compares well with the international qualifications and training programs offered. The specific operational content (elective component) incorporated in the qualification will serve to enable qualifying learners to make better informed decisions within an expansive context that compares well with international learners. The South African Qualification is very explicit in the way elective competencies play a role in contextual competence.

It is not evident what the credit value for this qualification.

### **ARTICULATION OPTIONS**

The Qualification has been designed and structured so that qualifying learners may move from one engineering context to certain other engineering contexts (within same industry sector or to new industry sectors). This can be achieved by the selection of appropriate credits in the elective category. Equally, holders of other similar qualifications may be evaluated against this qualification for the purpose of RPL.

Horizontal articulation:

Other contextually relevant engineering qualifications may be:

- ID 57877: Further Education and Training Certificate: Welding Application and Practice at NQF Level 4.
- ID 23275: Further Education and Training Certificate: Mechanical Engineering: Fitting at NQF Level 4.

Vertical articulation:

- Possible further specialisation in the welding and fabrication environments.

### **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**

Assessors should be in possession of:

- An appropriate qualification at or above the level of the qualification and preferably relevant workplace practical experience.
- Registration as an assessor with the relevant ETQA.

### **NOTES**

N/A

### **UNIT STANDARDS**

	<b>10</b>	<b>UNIT STANDARD TITLE</b>	<b>LEVEL</b>	<b>CREDITS</b>
Core	116714	Lead a team, plan, allocate and assess their work	Level 3	4
Core	244341	Perform heat manipulation processes on plate, pipe and structural materials	Level 3	4
Core	13254	Contribute to the implementation and maintenance of business processes	Level 4	10
Core	12253	Cut, drill and punch, assemble and mechanically join structural steel work	Level 4	24
Core	12252	Develop and fabricate from complex drawings	Level 4	28
Elective	243056	Weld carbon steel workpieces using the shielded metal arc welding process in all positions	Level 2	16
Elective	243064	Weld carbon steel workpieces, using the gas metal arc welding process in all positions	Level 2	15
Elective	13275	Perform heat treatment processes on engineering metals	Level 3	8
Elective	13260	Perform non-destructive tests on metal parts and components	Level 3	6
Elective	12814	Remove metals using air-carbon arc gouging processes	Level 3	4
Elective	243052	Weld carbon steel workpieces using the cored-wire welding process in all positions	Level 3	8
Elective	243058	Weld carbon steel workpieces using the gas tungsten arc welding process in all positions	Level 3	25
Elective	243068	Weld carbon steel workpieces using the gas tungsten arc welding process in the down hand position	Level 3	15
Elective	114194	Demonstrate understanding of regulations codes and drawing office practices for structural steel detailing	Level 4	7
Elective	14473	Develop and produce computer aided drawings	Level 4	4
Elective	14492	Identify, interpret and produce working drawings	Level 4	6
Elective	243054	Weld carbon steel pipe, using the gas tungsten arc welding process in all positions	Level 4	20
Fundamental	119472	Accommodate audience and context needs in oral/signed communication	Level 3	5
Fundamental	119457	Interpret and use information from texts	Level 3	5
Fundamental	119467	Use language and communication in occupational learning programmes	Level 3	5
Fundamental	119465	Write/present/sign texts for a range of communicative contexts	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	119462	Engage in sustained oral/signed communication and evaluate spoken/signed 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

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	<b>10</b>	<b>UNIT STANDARD TITLE</b>	<b>LEVEL</b>	<b>CREDITS</b>
Fundamental	119459	Write/present/sign for a wide range of contexts	Level 4	5





## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### UNIT STANDARD:

#### *Perform heat manipulation processes on plate, pipe and structural materials*

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244341	Perform heat manipulation processes on plate, pipe and structural materials		
<b>ORIGINATOR</b>		<b>PROVIDER</b>	
8GB Generic Manufacturing, Engineering & Technoloq			
<b>FIELD</b>	<b>SUBFIELD</b>		
6 - Manufacturing, Engineering and Technology	Engineering and Related Design		
<b>ABETBAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQFLEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 3	14

#### **SPECIFIC OUTCOME 1**

Discuss and explain the effects of heat on plate, pipe and structural steelwork.

#### **SPECIFIC OUTCOME 2**

Determine heat manipulation requirements.

#### **SPECIFIC OUTCOME 3**

Prepare materials and equipment for heat manipulation process.

#### **SPECIFIC OUTCOME 4**

Perform heat manipulation of plate, pipe and structural steelwork.

#### **SPECIFIC OUTCOME 5**

Care for and store consumables and equipment.

No. 596

13 July 2007



## 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

## Generic Manufacturing, Engineering and Technology

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 full Qualification and Unit Standards can be accessed via the SAQA web-site at [www.saga.org.za](http://www.saga.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 Qualification and Unit Standards should reach SAQA at the address below and *no later than 13 August 2007*. All correspondence should be marked Standards Setting - Generic Manufacturing, Engineering and Technology and addressed to

The Director: Standards Setting and Development  
SAQA  
*Attention: Mr. D. Mphuthing*  
Postnet Suite 248  
Private Bag X06  
Waterkloof  
0145  
or faxed to 012 - 431-5144  
e-mail: [dmphuthing@saqa.org.za](mailto:dmphuthing@saqa.org.za)

DR. S. BHIKHA  
DIRECTOR: STANDARDS SETTING AND DEVELOPMENT



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

### QUALIFICATION:

*Natlonsl Certificet«: Erunneertna Fabrication*

SAQA QUALID	QUALIFICATION TITLE		
58722	National Certificate: Engineering Fabrication		
ORIGINATOR		PROVIDER	
SGB Generic Manufacturing, Engineering & Technology			
QUAL/FICATION TYPE	FIELD	SUBFIELD	
National Certificate	6 - Manufacturing, Engineering and Technology	Engineering and Related Design	
ABET BAND	MINIMUM CREDITS	NQFLEVEL	QUAL CLASS
Undefined	148	Level 2	Regular-Unit Stds Based

### PURPOSE OF THE QUALIFICATION

Purpose:

Engineering Fabrication is a generic engineering and trade related qualification that builds the foundational knowledge and skills required by learners involved in Engineering Fabrication. This qualification is designed to meet the needs of the Learner in a variety of engineering related sectors.

The NC: Engineering Fabrication shall develop learners to produce simple (uncomplicated) metal components using a variety of fabrication methods. This capability requires an understanding of basic fabrication theory; machinery functioning, operation and maintenance; engineering materials and tools; concepts of measurement; basic engineering drawing and development of components and simple (uncomplicated) methods of cutting and joining metals. The metal components that the qualified person fabricates will be vital for the maintenance and reliable operation of equipment and machinery in a variety of industries.

The qualification adds value to the qualifying learner in terms of enrichment of the person, recognition, and contributes towards the achievement of "artisan" status or other accepted progression route.

The qualification is structured in such a way that it exposes learners to generic and specific competencies required in the Engineering Fabrication industries. This qualification makes provision for engineering fabrication to be applied within the following sectors:

- Mining and Minerals sector.
- Chemical sector.
- Transport sector.
- Manufacturing sector.
- Other engineering related sectors.

Qualifying learners will be able to do the following:

- Demonstrate an understanding of a variety of engineering fabrication methods.
- Produce simple metal components.
- Use and maintain engineering hand and power tools.
- Adhere to Occupational Health, Safety and Environmental requirements.

- Communicate effectively in order to achieve personal, business and organisational objectives.

Qualifying learners will also understand:

- The basics of how a business functions, and the role of the qualified learner in the business, i.e. fabrication and related activities.
- How the learning achieved whilst obtaining this qualification relates to the learning required in other similar qualifications.
- The importance of communication in achieving goals.
- How they are affected by legislation, regulations, agreements and policies related to their particular work environment.

With this understanding, learners will be able to participate effectively in workplace activities.

Rationale:

Engineering Fabrication, in the context of this qualification is the designing and making of metal components that are required within various industry sectors. The main focus is on the laying out and manipulation of low carbon metal (sheet metal, plate, sections and pipe) to produce usable components.

Most industries are dependant on the fabrication of metal components. Examples of this may be the ship building industry (plates and welding), the chemical industry (pipes and welding) and/or the mining and minerals industry (plate and pipes and welding). It is evident that each peculiar industry may use different nomenclature.

Due to the nature of the collaborative approach to designing this qualification, access, progression, transferability of competence and mobility of the learner within and between sectors is more feasible. Certain components of learning within this qualification may have pertinence within other learning fields such as fitting, electro-mechanical, automotive etc. This will predominantly be in the area of welding and fuel cutting and welding equipment.

This qualification is intended for persons that wish to enter a career in the fabrication industry. The learner achieving this qualification will be more employable within a broad industry context, and will thus be a contributing factor to the economy of the relevant organisation and the country. The learner will benefit from obtaining this qualification due to the fact that industry has a need for persons with fabrication competencies. Competent persons will be responsible for fabricating and maintaining industry related equipment and machinery.

This qualification focuses on developing skills and knowledge necessary to ensure optimal productivity in the Mining and Minerals Industry; Chemical; Petro-chemical; Metal, Engineering and other related industries. This qualification is intended to replace the (currently de-registered) National Certificate: Fabrication Level 2.

As this qualification forms the basis for further learning in the field of engineering fabrication, where the learner will be able to specialise in one of the Fabrication or Welding skills areas, it is accepted that the learner may exit (and be employed at this level (Level 2)), or continue further learning toward obtaining the next level qualification.

The learner may also choose to learn towards achievement in other fields as the learning in the fundamental and core component of this qualification lends itself to lateral as well as vertical exploitation. This qualification enables learners who have gained relevant experience in the workplace to gain credits through the RPL process.

### **RECOGNIZE PREVIOUS LEARNING?**

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**LEARNING ASSUMED IN PLACE**

In order that the learner may progress at a desired rate whilst learning towards this qualification, It is assumed that learners are already competent in or have an equivalent of:

- Communication and Mathematical Literacy at NQF Level 1.

Recognition of Prior Learning:

This qualification can be achieved wholly or in part through recognition of prior learning in terms of the criteria laid out above.

Evidence can be presented in a variety of forms, including international or previous local qualifications, reports, testimonials mentioning functions performed, work records, portfolios, videos of practice and performance records.

Access to the qualification:

Access to this qualification is open. However, it is preferable that learners have completed a relevant industry related General Education and Training intervention at NQF Level 1.

**QUALIFICATION RULES**

To achieve this qualification the learner must achieve a minimum of 158 Credits.

The learner must achieve the Fundamental, Core and Elective learning components of this qualification as follows:

Fundamental:

- Learners wishing to achieve this qualification must successfully complete all the listed fundamental unit standards with a total credit value of 36 credits.

Core:

- Learners wishing to achieve this qualification must successfully complete all the listed core unit standards with a total credit value of 100 credits.

Elective:

- Learners wishing to achieve this qualification must successfully obtain a minimum of 12 credits from the list of elective unit standards, and preferably from those that reflect their specific industry needs.

**EXIT LEVEL OUTCOMES**

1. Demonstrate an understanding of a range of relevant engineering fabrication methods.
2. Produce simple components that meet quality and output requirements.
3. Adhere to Occupational Health, Safety and Environmental requirements.
4. Communicate effectively in order to achieve personal, business and organisational objectives.

Critical Cross-Field Outcomes.

In accordance with SAQA guidelines, all unit standards include the assessment of relevant critical cross-field outcomes. Consequently, Exit Level Outcomes are consistent with critical cross-field outcome requirements.

The following CCFO's have been addressed in this qualification as per the unit standards outlined in the Annexures:

Identifying and solving problems in which responses display that responsible decisions using critical thinking have been made

- Evident in Exit Level Outcomes 1, 2, 3, 4.

Working effectively with others as a member of a team, group, organisation and community

- Evident in Exit Level Outcomes 2, 3, 4.

Organising and managing oneself and one's activities responsibly and effectively

- Evident in Exit Level Outcomes 1, 2, 3, 4.

Collecting, analysing, organising and critically evaluating information

- Evident in Exit Level Outcomes 1, 2, 3, 4.

Communicating effectively using visual, mathematical and/or language skills

- Evident in Exit Level Outcomes 1, 2, 3, 4.

Using science and technology effectively and critically, showing responsibility toward the environment and health of others

- Evident in Exit Level Outcomes 1, 2.

Demonstrating an understanding of the world as a set of related systems by recognising that problem contexts do not exist in isolation

- Evident in Exit Level Outcomes 3, 4.

Contributing to the full personal development of each learner and the social and economic development of society at large, by making it an underlying intention of the programme of learning to make an individual aware of:

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

(Evident in Exit Level Outcomes 1, 2, 3, 4.)

### **ASSOCIATED ASSESSMENT CRITERIA**

Associated Assessment Criteria for Exit Level Outcome 1:

- Engineering principles are explained relative to engineering fabrication.
- Fabrication methods that are appropriate are identified and applied when fabricating simple metal components.
- Mathematical principles and techniques are applied to determine calculations and measurement values used in an engineering fabrication process.

Associated Assessment Criteria for Exit Level Outcome 2:

- Basic Engineering drawings are read in accordance with work instructions.

- Relevant measuring equipment, and engineering tools are selected and used to perform marking off procedures, shape and form sheet metal components and to cut drill and punch steel components according to specified requirements.
- o Range: Engineering tools include hand and power tools.
- Oxy-fuel gas cutting equipment is operated to fabricate and assemble steel components.
- Work-pieces are joined and assembled using appropriate shielded metal arc Welding equipment and processes.
- Record keeping is explained and applied in accordance with specified quality requirements.

Associated Assessment Criteria for Exit Level Outcome 3:

- Occupational health, safety and environmental legislation is understood in order to apply specific safety practices and procedures relevant to the engineering fabrication industry.
- Output and quality requirements are described/explained and met in accordance with occupational health, safety and environmental standards (including job specifications).
- Consequences of non compliance are explained.

Associated Assessment Criteria for Exit Level Outcome 4:

- The purpose of the organisation is described in terms of achieving specific objectives.
- Communication techniques within the engineering fabrication workplace are explained and demonstrated in accordance with specified requirements.
- o Range: Communication Techniques include verbal and written instructions.
- Relationships with peers are maintained to promote effective communication within the workplace.
- Engineering Fabrication related information is interpreted and conveyed in accordance with organisational work requirements.

Integrated Assessment.

Integrated assessment at the level of the qualification provides an opportunity for learners to show they are able to integrate concepts, actions and ideas achieved across a range of unit standards and contexts.

Integrated assessment must evaluate the quality of observable performance as well as the thinking behind the performance, and must be based on a summative assessment guide. The guide will spell out how the assessor will assess different aspects of the performance and will include:

- Observing the learner at work (both in the primary activity as well as other interactions).
- Asking questions and initiating short discussions to test understanding.
- Looking at records and reports in the portfolio and reviewing previous assessments.

In some cases inference will be necessary to determine competence depending on the nature and context within which performance takes place.

It is necessary to ensure that the fundamental part of the qualification is also targeted to ensure that while the competence may have been achieved in a particular context, learners are able to apply it in a range of other contexts and for further learning. The assessment should also ensure that all the critical cross-field outcomes have been achieved.

The learner may choose in which language s/he wants to be assessed. This should be established as part of a process of preparing the learner for assessment and familiarising the learner with the approach being taken.

While this is primarily a workplace-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the exit-level outcomes. The assessment process should cover both the explicit tasks required for the qualification as well as the understanding of the concepts and principles that underpin the activities associated with the engineering fabrication process.

### **INTERNATIONAL COMPARABILITY**

This qualification arises from the need within South Africa to rationalise the Qualifications Framework. The traditional qualifications such as Plater Welder, Plater Boilermaker, Boilermaker, etc were mostly similar in content and intent. In order to arrive at a meaningful and acceptable nomenclature for the qualification series, it was decided to use "Fabrication" as a description of the type of activity for this qualification.

This in itself presented a problem when attempting to do a comparison of qualifications, nationally and internationally. The problem is that the colloquial understanding of the term "Fabrication" is very broad. Many qualifications and outcomes are available as comparison, but none precisely in the context of what we (South African Industry) need.

The plastic forming industries, as well as the wood and furniture type industries use "fabrication" as their activity description. Also, certain industries have fabrication as a very limited and specialist activity viz. air-conditioning ducting. This made the International Comparability research more difficult and complex.

It must be stated from the outset of this statement that reference to international benchmarking for this qualification, applies only to the education and training content at specific levels between NQF Level 2, NQF Level 3 and NQF Level 4 and its measure of "appropriateness" when compared with fabrication training programs internationally. It was not possible to assimilate operational applicability as contexts are too various and wide.

African countries with manufacturing and engineering infrastructure (including SADC countries) were scanned for applicable qualifications or training programs, but no relevant information regarding the delivery of qualifications in any of these countries was available.

Despite exhaustive information searches for information regarding fabrication qualification in Germany and Korea. It was apparent that a similar problem of specialisation as opposed to generalisation existed. Some interesting information is contained in a document by Derek King of Liverpool Community College. This can be viewed at the following website:  
<http://www2.trainingvillage.gr/download/journal/bull-22/22-en.html>.

Further research in International comparability, including similar qualification structures and progressions from NQF Level 2 to NQF Level 3 resulted in the following:

United Kingdom:

The United Kingdom has a longstanding international reputation in the metal manufacturing and fabrication industry. It is due to this reputation that it is deemed prudent to use the United Kingdom as a benchmark for South African Fabrication Qualifications.

Fabrication and Welding Engineering NQF Level 2 (NVQ: 100/3611/8-SVQ: G7E022):  
[http://www.tsw.co.uk/tsw/uploaded\\_files/Fabrication%20&%20Welding%20Engineering%20level%202.pdf](http://www.tsw.co.uk/tsw/uploaded_files/Fabrication%20&%20Welding%20Engineering%20level%202.pdf).

The competencies listed in this qualification are as below:

Assess Route; Unit Title:



- FWE2/001; Complying with Statutory Regulations and Organisational Safety Requirements.
- FWE2/002; Using and Interpreting Engineering Data and Documentation.
- FWE2/003; Working Efficiently and Effectively in Engineering.
- FWE2/004; Joining Materials by the Manual Metal Arc Welding Process.
- FWE2/005; Joining Materials by Manual MIG/MAG and other Continuous Wire.
- FWE2/006; Joining materials by Manual TIG and Plasma-arc Welding Processes.
- FWE2/007; Joining Materials by the Manual Gas Welding Process.
- FWE2/008; Producing Fillet Welded Joints using a Manual Welding Process.
- FWE2/009; Welding Materials with Mechanised Arc Welding Equipment.
- FWE2/010; Welding Materials using Resistance Spot, Seam and Projection Welding Machines.
- FWE2/011; Welding Materials using Laser Welding Machines.
- FWE2/012; Welding Materials using Electron Beam Welding Machines.
- FWE2/013; Welding Materials using Friction Welding Machines.
- FWE2/014; Joining Rails using the Aluminothermy Welding Process.
- FWE2/015; Restore Rails to Operational Condition using an Arc Welding Process.
- FWE2/016; Welding Rails using Flash Welding Equipment.
- FWE2/017; Joining Materials by Manual Torch Brazing and Soldering.
- FWE2/018; Joining Materials by Manual Torch Brazing Machines.
- FWE2/021; Marking Out Components for Fabrication.
- FWE2/022; Cutting Sheet Metal to Shape using Hand and Machine Tools.
- FWE2/023; Forming Sheet Metal using Hand and Machine tools.
- FWE2/024; Producing Sheet Metal Assemblies.
- FWE2/025; Heat Treating Materials for Fabrication Activities.
- FWE2/026; Cutting and Shaping Materials using NC/CNC Laser Profiling Machines.
- FWE2/027; Cutting and Shaping using NC/CNC Plasma or Gas Cutting Machines.
- FWE2/028; Assembling Components using Mechanical Fasteners.
- FWE2/029; Bonding Engineering Materials using Adhesives.
- FWE2/030; Joining Materials by Resistance Spot Welding.
- FWE2/031; Slings, Lifting and Moving Materials and Components.
- FWE2/032; Cutting Plate and Sections using Shearing Machines.
- FWE2/033; Cutting Materials using Hand Operated Thermal Cutting Equipment.
- FWE2/034; Cutting and Shaping Materials using Gas Cutting Machines.
- FWE2/035; Cutting Materials using Saws and Abrasive Discs.
- FWE2/036; Bending and Forming Plate using Power Operated Machines.
- FWE2/037; Forming Plate work using Power Rolling Machines.
- FWE2/038; Producing Plate work Assemblies.
- FWE2/039; Producing Holes using Drilling Machines.
- FWE2/040; Forming of Structural Sections using Machines.
- FWE2/041; Producing Structural Metal Ancillary Components.
- FWE2/042; Assembling Structural Metalwork.
- FWE2/043; Forming Pipe work by Machine Bending.
- FWE2/044; Producing Socket and Flange Fillet Welded Joints in Pipe using a Manual Welding Process.
- FWE2/045; Producing Composite Mouldings using Wet Lay-up Techniques.
- FWE2/046; Producing Composite Mouldings using Pre-Preg Laminating Techniques.
- FWE2/047; Producing Components by Acrylic Moulding.
- FWE2/048; Vacuum Forming Composite Materials.
- FWE2/049; Trimming Composite Mouldings using Hand Tools.
- FWE2/050; Identifying Defects in Composite Mouldings.
- FWE2/051; Applying Surface Finishes to Composite Mouldings.
- FWE2/052; Bonding Composite Mouldings.
- FWE2/053; Producing Composite Assemblies.

National Vocational Qualifications are achieved through training and assessment. Assessment is normally through on-the-job observation and questioning. Candidates produce evidence to prove they have the competence to meet the NVQ standards. Assessors 'sign-off units when the candidates are ready the assessor tests candidates' underpinning knowledge, understanding and work-based performance to make sure they can demonstrate competence in the workplace. This process is fully compatible and comparable with the South African process.

The elective component is largely outside the peculiar specialisation areas as required in South Africa. It is not evident what the credit value for this qualification is.

New Zealand:

Two separate qualifications were found. There is some similarity in the content of both but the reason why they were separately developed is not evident.

National Certificates in New Zealand are achieved through training and assessment. Assessment is normally through on-the-job observation and other evidence gathering techniques. Candidates provide evidence to prove they have the competence to meet the NZQA standards. Assessors test candidates' underpinning knowledge, understanding and work-based performance to make sure they can demonstrate competence in the workplace.

This process is fully compatible and comparable with the South African process with the exception that New Zealand has some unit standards with the requirement of being performed "under supervision". This is contrary to outcomes based learning and development principles. It is also difficult to think it feasible that level 2 will be a legitimate exit level qualification.

National Certificate in Mechanical Engineering (NQF Level 2) Reference 1220:  
<http://www.nzqa.govt.nz/lnqfdocs/quals/doc/1220.doc>.

The credit value for the qualification National Certificate in Mechanical Engineering (NQF Level 2) is 60.

The competencies listed in this qualification are as below:

Unit Number; Unit Standard Title; Level; Credit:

- 20799; Demonstrate basic knowledge of engineering metals; Level 2; 4 Credits.
- 20917; Demonstrate basic knowledge of engineering materials; Level 2; 2 Credit.
- 4433; Select, use, and care for simple measuring devices used in engineering; Level 1; 2 Credits.
- 4435; Select, use, and care for engineering dimensional measuring equipment; Level 2; 3 Credits.
- 4436; Select, use, and care for engineering marking-out equipment; Level 2; 4 Credits.
- 2395; Select, use and care for, engineering hand tools; Level 2; 4 Credits.
- 2396; Select, use and maintain portable hand held engineering power tools; Level 2; 4 Credits.
- 21905; Demonstrate knowledge of trade calculations and units for mechanical engineering trades; Level 2; 4 Credits.
- 21906; Perform basic mechanical engineering machining operations under supervision; Level 2; 12 Credits.
- 21908; Demonstrate knowledge of basic mechanics for mechanical engineering trades; Level 2; 2 Credits.
- 21909; Demonstrate knowledge of fasteners used in mechanical engineering; Level 2; 1 Credits.
- 21911; Demonstrate knowledge of safety on engineering worksites; Level 2; 1 Credits.

- 21913; Shift loads in engineering installation, maintenance, and fabrication work; Level 2; 2 Credits.
- 2430; Draw and interpret engineering sketches under supervision; Level 2; 4 Credits.
- 2432; Construct engineering plane geometric shapes under supervision; Level 2; 3 Credits.
- 2387; Assemble mechanical components under supervision; Level 2; 2 Credits.
- 21907; Demonstrate and apply knowledge of safe welding procedures under supervision; Level 2; 3 Credits.
- 6401; Provide first aid; Level 2; 1 Credits.
- 6402; Provide resuscitation Level 2; 1; 1 Credits.
- 497; Protect health and safety in the workplace; Level 1; 1 Credits.

National Certificate in Engineering (General Engineering-Mechanical) (NQF Level 2) Reference: 0903: <http://www.nzqa.govt.nz/nqfdocs/quals/doc/0903.doc>.

The credit value for the qualification National Certificate in Engineering (General Engineering-Mechanical) (NQF Level 2) is 77.

The competencies listed in this qualification are as below:

Unit Number; Unit Standard Title; Level; Credit:

- 4795; Distinguish the characteristics of engineering materials; Level 1; 2 Credits.
- 4796; Distinguish the characteristics of engineering metals; Level 2; 3 Credits.
- 4432; Identify and convert basic units of measure used in engineering; Level 1; 1 Credits.
- 4433; Measure with non-complex devices used in engineering; Level 1; 2 Credits.
- 4435; Select, use and care for engineering dimensional measuring equipment; Level 2; 3 Credits.
- 4795; Distinguish the characteristics of engineering materials; Level 1; 2 Credits.
- 4796; Distinguish the characteristics of engineering metals; Level 2; 3 Credits.
- 4432; Identify and convert basic units of measure used in engineering; Level 1; 1 Credits.
- 4433; Measure with non-complex devices used in engineering; Level 1; 2 Credits.
- 4435; Select, use and care for engineering dimensional measuring equipment; Level 2; 3 Credits.
- 4436; Select, use and care for engineering marking-out equipment; Level 2; 4 Credits.
- 2395; Select, use, and care for engineering hand tools; Level 1; 4 Credits.
- 2396; Select, use, and maintain portable hand held engineering power tools; Level 2; 4 Credits.
- 2824; Follow safe working practices on an engineering worksite; Level 2; 3 Credits.
- 2430; Draw and interpret engineering sketches under supervision; Level 2; 4 Credits.
- 2431; Draw and interpret engineering drawings under supervision; Level 2; 8 Credits.
- 2432; Construct engineering plane geometric shapes; Level 2; 3 Credits.
- 2414; Layout and mark off regular fabrication shapes under supervision; Level 2; 15 Credits.
- 2415; Form and shape fabrication materials under supervision; Level 2; 10 Credits.
- 2416; Assemble and mechanically join plate and sheet under supervision; Level 2; 10 Credits.
- 2417; Mechanically cut fabrication materials under supervision; Level 2; 8 Credits.
- 16954; Calculate lengths, areas and mass of engineering fabrication materials; Level 2; 4 Credits.
- 16955; Calculate sizes, mass, volumes, and quantities for engineering fabrication; Level 3; 4 Credits.
- 2701; Produce components by performing reciprocating cutting operations; Level 2; 10 Credits.
- 11661; Produce components by performing general engineering drilling operations; Level 2; 5 Credits.
- 11662; Produce components by performing general engineering turning operations; Level 2; 12 Credits.

- 11663; Produce components by performing general engineering milling operations; Level 2; 12 Credits.
- 11664; Produce components by performing general engineering surface grinding operations; Level 2; 3 Credits.
- 2722; Maintain a fluid power system; Level 2; 5 Credits.
- 2723; Make a fluid power system safe; Level 2; 8 Credits.
- 2724; Clean a fluid power system for service; Level 2; 4 Credits.
- 17344; Draw a diagram, and explain the operating principles, of a simple pneumatic power system; Level 2; 3 Credits.
- 17345; Draw a diagram, and explain the operating principles, of a simple hydraulic power system; Level 2; 3 Credits.
- 2397; Service machines and equipment; Level 2; 4 Credits.
- 2398; Monitor, under supervision, the condition of machinery and equipment; Level 3; 4 Credits.
- 2401; Shut down and isolate machines and equipment; Level 3; 3 Credits.
- 2670; Avoid welding hazards with safe work practices; Level 2; 1 Credits.
- 2672; Weld metal to a general purpose industry standard with the gas metal arc welding process; Level 3; 6 Credits.
- 2676; Weld stainless metal sheet with the gas tungsten arc welding process; Level 3; 6 Credits.
- 2678; Join metals with the oxyacetylene welding process; Level 3; 6 Credits.
- 2682; Weld metal to a general purpose industry standard with the manual metal arc welding process; Level 3; 6 Credits.
- 2683; Cut metals using manual thermal processes; Level 3; 4 Credits.

Australia:

Two separate qualifications were noted and included in the research. The NQF Level 1 Qualification complements the NQF Level two Qualification and it is prudent to recognise both together.

Following the Australian Prime Minister's announcement, the responsibilities and functions of the Australian National Training Authority (ANTA) have been transferred to the Department of Education, Science and Training (DEST).

Certificates in Australia are achieved through training and assessment. Assessment is through training provider and on-the-job observation and other evidence gathering techniques. Candidates provide evidence to prove they have the competence to meet the DEST standards. Assessors test candidates' underpinning knowledge, understanding and work-based performance confirm they can demonstrate competence in the workplace. This process is fully compatible and comparable with the South African process.

Certificate I in Engineering (NQF Level 1) (MEM10105).  
<http://www.qsa.qld.edu.au/memos/06/071-06.pdf>.

Unit Code; Unit title; Points:

- MEM13.14A; Apply principles of occupational health and safety in the work environment.
- MEM14.4A; Plan to undertake a routine task.
- MEM15.24A; Apply quality procedures.
- MEM16.7A; Work with others in a manufacturing, engineering or related environment.
- MEM5.4C; Perform routine oxyacetylene welding; 2.
- MEM5.5B; Carry out mechanical cutting; 2.
- MEM5.6B; Perform brazing and/or silver soldering; 2.
- MEM5.7C; Perform manual heating and thermal cutting; 2.
- MEM5.12C; Perform routine manual metal arc welding; 2.

- MEM7.32B; Use workshop machines for basic operations; 2.
- MEM11.11 B; Undertake manual handling; 2.
- MEM12.23A; Perform engineering measurements; 5.
- MEM12.24A; Perform computations; 3.
- MEM16.8A; Interact with computing technology; 2.
- MEM18.1 C; Use hand tools; 2.
- MEM 18.2B; Use power tools/hand held operations; 2.

Certificate II in Engineering: Production Engineering (NQF Level 2) (MEM20205) does not compare well with the requirements or context of this comparison.

It appears that this comparison indicates that there are no commensurate qualifications that compare well with the generic nature of the SAQA National Certificate Fabrication (NQF Level 2). However, the Certificate III in Engineering - Fabrication Trade (Apprenticeship) will appear to satisfy the comparison in terms of a combined qualification attainment. This means that the SAQA NQF Level 2 and NQF Level 3 (combined) may be seen to be fair comparison. As an illustration of this, the Australian "NQF Level 3" qualification is indicated below.

It is also apparent that different measuring mechanisms are used. One qualification uses the point process and another uses the hour/credits process. Unlike the consistent SAQA process of measurement, this may lead to confusion.

Certificate III in Engineering: Fabrication Trade (Apprenticeship):

[http://www.nmit.vic.edu.au/courses/manufacturing/fab\\_cer3\\_app\\_a.html#top](http://www.nmit.vic.edu.au/courses/manufacturing/fab_cer3_app_a.html#top).

Unit Code; Unit title; Hours:

- MEM12.23A; Perform engineering measurements; 50 hrs.
- MEM12.24A; Perform computations; 30 hrs.
- MEM13.14A; Apply principles of occupational health and safety in the work environment.
- MEM14.4A; Plan to undertake a routine task.
- MEM14.5A; Plan a complete activity; 40 hrs.
- MEM15.2A; Apply quality systems; 20 hrs.
- MEM15.24A; Apply quality procedures.
- MEM16.6A; Organise and communicate information; 20 hrs.
- MEM16.7A; Work with others in a manufacturing, engineering or related environment.
- MEM16.8A; Interact with computing technology; 20 hrs.
- MEM17.3A; Assist in the provision of on the job training; 20 hrs.
- MEM5.4C; Perform routine oxyacetylene welding; 20 hrs.
- MEM5.5B; Carry out mechanical cutting; 20 hrs.
- MEM5.7C; Perform manual heating and thermal cutting; 20 hrs.
- MEM5.10B; Apply fabrication, forming and shaping techniques; 80 hrs.
- MEM5.11 C; Assemble fabricated components; 80 hrs.
- MEM5.12C; Perform routine manual metal arc welding; 20 hrs.
- MEM5.15C; Weld using manual metal arc welding process; 40 hrs.
- MEM5.17C; Weld using gas metal arc welding process; 40 hrs.
- MEM5.19C; Weld using gas tungsten arc welding process; 40 hrs.
- MEM5.36C; Repair/replace/modify fabrications; 40 hrs.
- MEM5.37B; Perform geometric development; 60 hrs.
- MEM5.38B; Perform advanced geometric development-cylindrical/rectangular; 20 hrs.
- MEM5.39B; Perform advanced geometric development-conical; 20 hrs.
- MEM5.40B; Perform advanced geometric development-transitions; 40 hrs.
- MEM5.49B; Perform routine gas tungsten arc welding; 20 hrs.
- MEM5.50B; Perform routine gas metal arc welding; 20 hrs.
- MEM5.51A; Select welding processes; 20 hrs.

- MEM5.52A; Apply safe welding practices; 40 hrs.
- MEM8.1OB; Manually finish/polish materials; 60 hrs.
- MEM9.2B; Interpret technical drawing; 40 hrs.
- MEM12.7C; Mark off/out structural fabrications and shapes; 40 hrs.
- MEM18.1 C; Use hand tools; 20 hrs.
- MEM18.2B; Use power tools/hand held operations; 20 hrs.
- MEM7.32B; Use workshop machines for basic operations; 20 hrs.
- MEM11.11 B; Undertake manual handling; 20 hrs.
- MEM30.12A; Apply mathematical techniques in a manufacturing, engineering or related environment; 40 hrs.

A direct comparison with these international qualifications indicates that the education and training focus of all the qualifications is basically the same. However, the basic construct differs in that the nomenclature is dissimilar to that used in South Africa. One has to draw the conclusion of comparison as follows:

- In Australia the Mandatory Units of Learning may be what we see as Fundamental. This is due to the fact that no technical related units of learning appear in this section. There is a distinct lack of core and elective components in the Australian model as the only other section of the qualification is termed Specialisation Units. In South Africa we may call this the Elective component.

- This Qualification compares well with the international qualifications and training programs offered. The specific operational content (elective component) incorporated in the qualification will serve to enable qualifying learners to make better informed decisions within a more expansive context than international learners. This is mainly due to the fact that the South African Qualification is very explicit in the way Fundamental, Core and Elective competencies play a role in contextual competence.

It is not evident what the credit value for this qualification is as Australia seems to use a points system. Also, the Mandatory unit do not have a points value allocation.

### **ARTICULATION OPTIONS**

The Qualification has been designed and structured so that qualifying learners may move from one engineering context to certain other engineering contexts (within same industry sector or to new industry sectors). This can be achieved by the selection of appropriate credits in the elective category. Equally, holders of other similar qualifications may be evaluated against this qualification for the purpose of RPL.

Vertical articulation:

- 1058720: National Certificate: Engineering Fabrication, NQF Level 3.

Horizontal articulation:

- 1057881: National Certificate: Welding Application and Practice, Level 2.
- 1023273: National Certificate: Mechanical Engineering Fitting, NQF Level 2.

Fundamental learning at this level applies to equivalent credit accrual for most engineering qualifications, NQF Level 2.

Core learning at this level may lead to credit accrual for some unit standards in the following qualifications, NQF Level 2:

- National Certificates in Mechanical Engineering (Welding), (Fitting), (Machining).
- Vehicle Servicing.

- Automotive Component Manufacturing.

### **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**

Assessors should be in possession of:

- An appropriate qualification at or above the level of the qualification and preferably relevant workplace practical experience.
- Registration as an assessor with the relevant ETQA.

### **NOTES**

This qualification replaces qualification 22869, "National Certificate: Engineering Fabrication", NQF Level 2, 159 credits.

### **UNIT STANDARDS**

	<b>ID</b>	<b>UNIT STANDARD TITLE</b>	<b>LEVEL</b>	<b>CREDITS</b>
Core	243067	Cut materials using the oxy-fuel gas cutting process (manual cutting)	Level 2	6
Core	243075	Draw and interpret simple plate, pipe and structural steel plate, pipe and structural steel drawings	Level 2	6
Core	12240	Form and shape sheetmetal using hand or power operated machines	Level 2	8
Core	244345	Identify fabrication materials, their characteristics and applications used in engineering	Level 2	4
Core	244342	Measure and mark off steel profiles	Level 2	2
Core	12239	Mechanically cut, drill and punch fabrication materials.	Level 2	10
Core	13214	Operate and monitor a drilling machine to produce simple components	Level 2	6
Core	119744	Select, use and care for engineering hand tools	Level 2	8
Core	12476	Select, use and care for engineering measuring equipment	Level 2	4
Core	12219	Select, use and care for engineering power tools	Level 2	6
Core	12481	Sling loads	Level 2	4
Core	243063	Weld carbon steel work-pieces using the shielded metal arc welding process in the down-hand position.	Level 2	15
Core	243072	Weld workpieces using the oxy-acetylene gas welding process in the downhand position	Level 2	10

	<b>10</b>	<b>UNIT STANDARD TITLE</b>	<b>LEVEL</b>	<b>CREDITS</b>
Core	9443	Work safely and use safety equipment	Level 2	7
Core	12246	Assemble and mechanically join sheet, plate, tube, pipe and steel sections	Level 3	4
Elective	117867	Managing files in a Graphical User Interface (GUI) environment	Level 1	3
Elective	116932	Operate a personal computer system	Level 1	3
Elective	117902	Use generic functions in a Graphical User Interface (GUI)-environment	Level 1	4
Elective	115101	Address workplace hazards and risks	Level 2	4
Elective	116520	Apply safety, health and environmental principles and procedures in a workplace	Level 2	2
Elective	14683	Apply work site practices	Level 2	5
Elective	10824	Bend a pipe by means of a hydraulic pipe bender	Level 2	2
Elective	116533	Demonstrate basic knowledge and understanding of emergency preparedness and response	Level 2	2
Elective	110205	Demonstrate knowledge of the Mine Health and Safety Act, regulations and definitions	Level 2	5
Elective	12465	Develop a learning plan and a portfolio for assessment	Level 2	6
Elective	12466	Explain the individual's role within business	Level 2	4
Elective	244340	Fasten components by means of swage lock bolts (Huck bolt)	Level 2	1
Elective	9678	Follow basic health and safety practices underground	Level 2	5
Elective	12482	Join metals using the resistance welding process	Level 2	4
Elective	9268	Manage basic personal finance	Level 2	6
Elective	116235	Operate a pendant controlled overhead crane	Level 2	5
Elective	12484	Perform basic fire fighting	Level 2	4
Elective	12483	Perform basic first aid	Level 2	4
Elective	115547	Replace conveyor belt steel structures (stringers, cradles)	Level 2	3
Elective	12463	Understand and deal with HIV/AIDS	Level 2	3
Elective	14713	Use welding definitions and symbols	Level 2	5
Elective	115093	Control workplace hazardous substances	Level 3	4
Elective	244339	Mark off and fabricate sections using the contour marker method	Level 3	9
Elective	243053	Weld carbon steel workpieces using the oxy-acetylene gas welding process in all positions	Level 3	10
Fundamental	119463	Access and use information from texts	Level 2	5
Fundamental	9009	Apply basic knowledge of statistics and probability to influence the use of data and procedures in order to investigate life related problems	Level 2	3
Fundamental	12461	Communicate at work	Level 2	5
Fundamental	7480	Demonstrate understanding of rational and irrational numbers and number systems	Level 2	3
Fundamental	119454	Maintain and adapt oral/signed communication	Level 2	5
Fundamental	12444	Measure, estimate and calculate physical quantities and explore, describe and represent geometrical relationships in 2-dimensions in different life or workplace contexts	Level 2	3
Fundamental	7469	Use mathematics to investigate and monitor the financial aspects of personal and community life	Level 2	2
Fundamental	9007	Work with a range of patterns and functions and solve problems	Level 2	5
Fundamental	119456	Write/present for a defined context	Level 2	5





## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

## UNIT STANDARD:

*Mark off and fabricate sections using the contour marker method*

SAQA US ID	UNIT STANDARD TITLE		
244339	Mark off and fabricate sections using the contour marker method		
ORIGINATOR		PROVIDER	
5GB Generic Manufacturing, Engineering & Technolog			
FIELD		SUBFIELD	
6 - Manufacturing, Engineering and Technology		Fabrication and Extraction	
ABETBAND	UNIT STANDARD TYPE	NQFLEVEL	CREDITS
Undefined	Regular	Level 3	19

## SPECIFIC OUTCOME 1

Explain the factors critical to fabricating sections.

## SPECIFIC OUTCOME 2

Prepare to mark off and fabricate a section.

## SPECIFIC OUTCOME 3

Mark off and fabricate the section.

## SPECIFIC OUTCOME 4

Complete the marking off and fabricating process.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:*****Fasten components by means of swage lock bolts (Huck bolt)***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244340	Fasten components by means of swage lock bolts (Huck bolt)		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
8GB Generic Manufacturing, Engineering & Technolog			
<b>FIELD</b>	<b>SUBFIELD</b>		
6 - Manufacturing, Engineering and Technology	Fabrication and Extraction		
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 2	1

**SPECIFIC OUTCOME 1**

Explain the factors critical to fastening components by means of swage lock bolts (Huck bolt).

**SPECIFIC OUTCOME 2**

Prepare to fasten components by means of huckbolts.

**SPECIFIC OUTCOME 3**

Fasten components by means of swage lock bolts (Huck bolt).

**SPECIFIC OUTCOME 4**

Complete the process and prepare for operation and/or production.



**SOUTH AFRICAN QUALIFICATIONS AUTHORITY**

**UNIT STANDARD:**

**Measure and mark off steel profiles**

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244342	1 Measure and mark off steel profiles		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
8GB Generic Manufacturing, Engineering & Technolog			
<b>FIELD</b>	<b>SUBFIELD</b>		
6 - Manufacturing, Engineerinc and Technologv	Fabrication and Extraction		
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Reoular	Level 2	12

**SPECIFIC OUTCOME 1**

Explain the factors critical to measuring and marking off steel profiles.

**SPECIFIC OUTCOME 2**

Prepare to measure and mark off the steel profiles.

**SPECIFIC OUTCOME 3**

Measure and mark off the steel profiles.

**SPECIFIC OUTCOME 4**

Complete the measuring and marking off process.



**SOUTH AFRICAN QUALIFICATIONS AUTHORITY**

**UNIT STANDARD:**

***Identify fabrication materials, their characteristics and applications used in engineering***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244345	Identify fabrication materials, their characteristics and applications used in engineering		
<b>ORIGINATOR</b>		<b>PROVIDER</b>	
8GB Generic Manufacturing, Engineering & Technolog			
<b>FIELD</b>		<b>SUBFIELD</b>	
6 - Manufacturing, Engineering and Technology		Engineering and Related Design	
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQFLEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 2	14

**SPECIFIC OUTCOME 1**

Identify common engineering fabrication materials.

**SPECIFIC OUTCOME 2**

Determine the physical properties and perform and perform material testing on engineering fabrication materials.

**SPECIFIC OUTCOME 3**

Determine information and characteristics of steel sections and profiles.

No. 597

13 July 2007



## 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

## Generic Manufacturing, Engineering and Technology

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 full Qualification and Unit Standards can be accessed via the SAQA web-site at [www.saga.org.za](http://www.saga.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 Qualification and Unit Standards should reach SAQA at the address below and *no later than 13 August 2007*. All correspondence should be marked Standards Setting - Generic Manufacturing, Engineering and Technology and addressed to

The Director: Standards Setting and Development  
SAQA  
*Attention: Mr. D. Mphuthing*  
Postnet Suite 248  
Private Bag X06  
Waterkloof  
0145  
or faxed to 012 - 431-5144  
e-mail: [dmphuthing@saga.org.za](mailto:dmphuthing@saga.org.za)

DR. S. BHIKHA  
DIRECTOR: STANDARDS SETTING AND DEVELOPMENT



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

## QUAL/FICATION:

*National Certificate: Engineering Fabrication*

SAQA QUALID	QUAL/FICATION TITLE		
58720	National Certificate: Engineering Fabrication		
ORIGINATOR	PROVIDER		
8GB Generic Manufacturing, Engineering & Technology			
QUAL/FICATION TYPE	FIELD	SUBFIELD	
National Certificate	6 - Manufacturing, Engineering and Technology	Engineering and Related Design	
ABET BAND	MINIMUM CREDITS	NQF LEVEL	QUAL CLASS
Undefined	138	Level 3	Regular-Unit 8tds Based

*PURPOSE OF THE QUAL/FICATION*

## Purpose:

This qualification is designed to meet the needs of the Learner in a variety of engineering related sectors. Engineering Fabrication is a generic engineering and trade related qualification that builds on the fundamentals of fabrication. This qualification will provide learners, education and training providers and employers with the standards and the range of learning required to work effectively in various industries making use of engineering fabrication.

The main skill that is recognised in this qualification is the ability to produce components of some complexity using a variety of fabrication methods. This capability requires an understanding of, and the ability to, layout and mark off shapes; set up and use powered machinery; develop and fabricate from drawings and sketches and cut and join components using welding and other mechanical methods.

The metal components that the qualified person fabricates will be vital for the construction, maintenance and reliable operation of equipment and machinery in a variety of industries.

The qualification adds value to the qualifying learner in terms of enrichment of the person, recognition, and contributes towards the achievement of "artisan" status or other accepted progression route.

The qualification is structured in such a way that it exposes learners to generic and specific competencies required in the Engineering Fabrication industries. This qualification makes provision for engineering fabrication to be applied within the following sectors:

- Mining and Minerals sector.
- Chemical sector.
- Transport sector.
- Manufacturing sector.
- Other engineering related sectors.

Qualifying learners will be able to do the following:

- Demonstrate an understanding of a variety of engineering fabrication methods.
- Interpret structural and engineering drawings.

- Develop and layout metal work pieces for fabrication.
- Produce metal components of some complexity.
- Use and maintain engineering hand and power tools.
- Adhere to Occupational Health, Safety and Environmental requirements.
- Communicate with peers and members of supervisory levels.

Qualifying learners will also understand:

- The basics of how a business functions, and the role of the qualified learner in the business, i.e. fabrication and related activities.
- How the learning achieved whilst obtaining this qualification relates to the learning required in other similar qualifications.
- The importance of communication in achieving goals.
- How they are affected by legislation, regulations, agreements and policies related to their particular work environment.

With this understanding, learners will be able to participate effectively in workplace activities.

Rationale:

Engineering Fabrication, in the context of this qualification is the designing and fabrication of metal components with certain complexity. These components are usually required for initial or replacement structural purposes, as opposed to merely for maintenance reasons, as required within various industry sectors. The main focus is on interpreting drawings, the layout and development of metal components, and manipulation of metal (sheet metal, plate and pipe) to produce usable components, as per design requirements.

This qualification is intended for learners who want to follow or further a career in the field of engineering fabrication in any of various industries, such as the Mining and Minerals Industry; Chemical; Petro-chemical; Metal, Engineering and related industries. This qualification is for learners who wish to further their learning and to possibly specialise in fabrication, within the context of boiler making, plating, welding, sheet metal working or auto vehicle body building.

It enables learners who have gained relevant experience in the workplace to gain credits through the RPL process. The qualification also forms the basis for further learning in the field of engineering fabrication where the learner will be able to specialise in one of the Fabrication or Welding skills areas at NQF Level 4.

Most industries rely on the design and fabrication of metal components, of some complexity. Examples of this may be the chemical industry where a wide variety of pipes are utilised. Invariably these pipes are exclusive to a particular plant and need to be specifically fabricated to be fit for purpose. The mining and minerals industry typically has a need for designing and fabrication of components that require special welding processes to cater for high pressure pumping systems. It is evident that each peculiar industry will have a specific requirement.

The design of this qualification stems from the collaborative approach to achieve generic type qualifications, that allows (promotes) access, progression, transferability of competence and mobility of the learner within and between sectors. Certain components of learning within this qualification may have pertinence within other learning fields such as fitting, electro-mechanical, automotive etc. This will predominantly be in the area of welding and oxy-fuel equipment cutting and welding.

The qualifying learner will be more employable within a broad industry context, and will thus be a contributing factor to the economy of the relevant organisation and the country. The learner will benefit from obtaining this qualification due to the fact that industry has a need for persons

with design, development and fabrication competencies. Competent persons will be responsible for designing, developing and fabricating industry related equipment.

This qualification focuses on developing skills and knowledge necessary to perform at the level of competence required. This qualification replaces the (currently de-registered) National Certificate: Fabrication NQF Level 3 and the interim registered National Certificate: Plater Welder and Plater Boilermaker NQF Level 3.

As this qualification forms the basis for further learning in the field of engineering fabrication, where the learner will be able to specialise in one of the Fabrication or Welding skills areas, it is accepted that the learner may exit (and be employed at this level (Level 3)), or continue further learning toward obtaining the next level qualification.

The learner may also choose to learn towards achievement in other fields, as the learning in the fundamental and core component of this qualification lends itself to lateral as well as vertical exploitation. This qualification enables learners who have gained relevant experience in the workplace to gain credits through the RPL process.

This qualification is the result of various Standards Generating Bodies collaborating in a common or generic approach to develop Fabrication Qualifications. All the participating 8GB bodies recognize the fact that a generic approach, with opportunity for peculiar specialisations, is a solution to avoiding duplication of registering qualifications on the NQF.

#### **RECOGNIZE PREVIOUS LEARNING?**

Y

#### **LEARNING ASSUMED IN PLACE**

In order that the learner may progress at a desired rate whilst learning towards this qualification, it is assumed that learners are already competent in Communication and Mathematical Literacy at NQF Level 2.

Recognition of Prior Learning:

If the learner does not have an equivalent qualification or combination of competencies and assessment of prior learning in relation to the relevant learning guidelines at NQF Level 2 and NQF Level 3 may be undertaken.

The learner 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.

Access to the qualification:

Access to this qualification is open. However, it is preferable that learners have completed a relevant industry related National Certificate at NQF Level 2. An example of this may be the National Certificate: Engineering Fabrication NQF Level 2.

#### **QUALIFICATION RULES**

To achieve this qualification the learner must achieve a minimum of 138 Credits.

The learner must achieve the Fundamental, Core and Elective learning components of this qualification as follows:

Fundamental Unit Standards:



- Learners wishing to achieve this qualification must successfully complete all the listed fundamental unit standards with a total credit value of 37 credits.

Core Unit Standards:

- Learners wishing to achieve this qualification must successfully complete all the listed core unit standards with a total credit value of 76 credits.

Elective Unit Standards:

- The elective unit standards from all sectors/industries are listed. However certain unit standards are fit for purpose to a peculiar specialisation area. These peculiar specialisation areas may be the Mining and Minerals Industry, The Chemical Industry, Transport industry, etc.

Learners wishing to achieve this qualification must successfully obtain a minimum of 25 credits from the list of elective unit standards, and preferably from those that reflect their specific industry needs.

**EXIT LEVEL OUTCOMES**

1. Demonstrate the ability to produce components of some complexity using a variety of fabrication methods and operations.
2. Demonstrate the ability to select and apply appropriate methods to determine component compliance with specifications and select appropriate procedures to solve familiar problems within a fabrication environment.
3. Contribute to workgroup efforts and support the maintenance of a safe, effective and efficient workplace through effective communication.
4. Maintain organisational relationships through effective communication with peers and members of supervisory/management levels.

Critical Cross-Field Outcomes:

In accordance with SAQA guidelines, all unit standards include the assessment of relevant critical cross-field outcomes. Consequently, Exit Level Outcomes are consistent with critical cross-field outcome requirements.

The following CCFO's have been addressed in this qualification as per the unit standards outlined in the Annexures.

Identifying and solving problems in which responses display that responsible decisions using critical thinking have been made.

- Evident in Exit Level Outcome/s 1, 2, 3, 4.

Working effectively with others as a member of a team, group, organisation and community.

- Evident in Exit Level Outcome/s 2, 3, 4.

Organising and managing oneself and one's activities responsibly and effectively.

- Evident in Exit Level Outcome/s 1, 2, 3, 4.

Collecting, analysing, organising and critically evaluating information.

- Evident in Exit Level Outcome/s 1, 2, 3, 4.

Communicating effectively using visual, mathematical and/or language skills.

- Evident in Exit Level Outcome/s 1, 2, 3, 4.

Using science and technology effectively and critically, showing responsibility toward the environment and health of others.

- Evident in Exit Level Outcome/s 1, 2.

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

- Evident in Exit Level Outcome/s 3, 4.

Contributing to the full personal development of each learner and the social and economic development of society at large, by making it an underlying intention of the programme of learning to make an individual aware of:

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

(Evident in Exit Level Outcome/s 1, 2, 3, 4).

### **ASSOCIATED ASSESSMENT CRITERIA**

Associated Assessment Criteria for Exit Level Outcome 1:

- Plating and structural metal drawings of some complexity are read and interpreted.
- Detailed plating and structural metal drawings are produced according to specified requirements.
- Component fabrication methods are explained in context to complexity of fabrication.
- Materials that are appropriate are identified for the fabrication of components of some complexity.
- Equipment is selected and utilized in a safe working manner.
- Components with some complexity are produced to the required specifications.

Associated Assessment Criteria for Exit Level Outcome 2:

- Components' specification compliance is determined in accordance with accepted best practice.
- Components are fabricated whilst displaying the ability to function within clearly defined contexts, with some scope for personal decision-making and responsibility.
- Appropriate problem solving techniques are applied and/or communicated in a timely manner.

Associated Assessment Criteria for Exit Level Outcome 3:

- The purpose and importance of communication in the workplace is explained in terms of achieving specific objectives.
- Occupational health, safety and environmental legislation is understood in order to apply specific safety practices and procedures relevant to the engineering fabrication industry.
- The correct channels of effective, regular and on-going communication are explained and demonstrated.
- Correct information is gathered and communicated through written reports.
- Problems are identified in a timely manner, reported and discussed and the agreed corrective action is implemented.

Associated Assessment Criteria for Exit Level Outcome 4:

- Communication techniques within the engineering fabrication discipline are explained and demonstrated in accordance with specified requirements.

- o Range: Communication Techniques include verbal and written instructions and reports.
- Relationships with peers, supervisory and management levels are established and maintained to promote effective communication within the workplace.
- Engineering Fabrication related information is interpreted and communicated to peers and management in accordance with organisational work requirements.

#### Integrated Assessment:

Integrated assessment at the level of the qualification provides an opportunity for learners to show they are able to integrate concepts, actions and ideas achieved across a range of unit standards and contexts.

Integrated assessment must evaluate the quality of observable performance as well as the thinking behind the performance, and must be based on a summative assessment guide. The guide will spell out how the assessor will assess different aspects of the performance and will include:

- Observing the learner at work (both in the primary activity as well as other interactions).
- Asking questions and initiating short discussions to test understanding.
- Looking at records and reports in the portfolio and reviewing previous assessments.

In some cases inference will be necessary to determine competence depending on the nature and context within which performance takes place.

It is necessary to ensure that the fundamental part of the qualification is also targeted to ensure that while the competence may have been achieved in a particular context, learners are able to apply it in a range of other contexts and for further learning. The assessment should also ensure that all the critical cross-field outcomes have been achieved.

The learner may choose in which language s/he wants to be assessed. This should be established as part of a process of preparing the learner for assessment and familiarising the learner with the approach being taken.

While this is primarily a workplace-based qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the exit-level outcomes. The assessment process should cover both the explicit tasks required for the qualification as well as the understanding of the concepts and principles that underpin the activities associated with the engineering fabrication process.

#### **INTERNATIONAL COMPARABILITY**

It must be stated from the outset of this statement that reference to international benchmarking for this qualification series, applies only to the education and training content at specific levels between NQF Levels 2, 3 and 4 and its measure of "appropriateness" when compared with fabrication training programs internationally. It was not possible to assimilate operational applicability as contexts are too various and wide.

South Africa (SAQA) has embarked on a rationalisation of engineering qualification on the National Qualifications Framework. The traditional qualifications (from the Apprenticeship route) such as Plater Welder, Plater Boilermaker, Boilermaker, etc. were mostly similar in content and intent. In order to arrive at a meaningful and acceptable nomenclature for the qualification, it was decided to use "Fabrication" as a description of the type of activity for this qualification.

This presented a problem when attempting to do a comparison of qualifications, nationally and internationally. The problem is that the understanding of the term "Fabrication" is very broad. Many qualifications and outcomes are available but not many in the context of what we (South African Industry) require. The plastic forming industries, as well as the wood and furniture type

industries also use "fabrication" as their activity description. This made the International Comparability research more complex. An attempt to concentrate on contextually relevant qualifications during the research process was thought to be prudent.

African countries with manufacturing and engineering infrastructure (including SADC countries) were scanned for applicable qualifications or training programs, but no relevant (equivalence) qualifications is offered in any of these countries.

Despite exhaustive information searches for information regarding fabrication qualification in Germany and Korea. It was apparent that a similar problem of specialisation as opposed to generalisation existed.

International comparability, including similar qualification structures and progressions from Level 2 to Level 3 were found in the following countries:

United Kingdom:

Fabrication & Welding Engineering Level 3 (NVQ 100/2949/7 SVQ G75023).

[http://www.tsw.co.uk/tsw/uploaded\\_files/Fabrication%20&%20Welding%20Engineering%20Level%203.pdf](http://www.tsw.co.uk/tsw/uploaded_files/Fabrication%20&%20Welding%20Engineering%20Level%203.pdf)

The competencies listed in this qualification are as below:

Assess Route; Unit Title:

- FWE3/001; Complying with Statutory Regulations and Organisational Safety Requirements.
- FWE3/002; Using and Interpreting Engineering Drawings and Documents.
- FWE3/003; Working Efficiently and Effectively in Engineering.
- FWE3/004; Welding Materials by the Manual Metal-Arc Process.
- FWE3/005; Welding Materials by the Manual MIG/MAG and the other Continuous Wire Processes.
- FWE3/006; Welding Materials by the Manual TIG and Plasma-Arc Welding Process.
- FWE3/007; Welding Materials by the Manual Gas Welding Process.
- FWE3/008; Welding Pipe/Tube Using Multiple Manual Arc Welding Processes.
- FWE3/009; Welding Plate Using Multiple Manual Arc Welding Processes.
- FWE3/010; Preparing Mechanised Arc Welding Equipment for Production.
- FWE3/011; Preparing Resistance Spot, Seam and Projection Welding Machines for Production.
- FWE3/012; Preparing Laser Welding Machines for Production.
- FWE3/013; Preparing Electron Beam Welding Machines for Production.
- FWE3/014; Preparing Friction Welding Machines for Production.
- FWE3/015; Preparing Brazing Machines for Production.
- FWE3/016; Welding Materials with Mechanised Arc Welding Equipment.
- FWE3/017; Welding Materials Using Resistance Spot, Seam and Projection Welding Machines.
- FWE3/018; Welding Materials using Laser Welding Machines.
- FWE3/019; Welding Materials Using Electron Beam Machines.
- FWE3/020; Welding Materials Using Friction Welding Machines.
- FWE3/021; Joining Materials Using Brazing Machines.
- FWE3/022; Marking Out Components for Metalwork.
- FWE3/023; Cutting Sheet metal to Shape Using Hand and Machine Tools.
- FWE3/024; Forming Sheet metal Using Hand and Machine Tools.
- FWE3/025; Producing Sheet metal Assemblies.
- FWE3/026; Heat Treating Materials for Fabrication Activities.

- FWE3/027; Developing and Marking Out Templates for Metalwork.
- FWE3/028; Joining Fabricated Components Using Mechanical Fasteners.
- FWE3/029; Bonding Engineering Materials Using Adhesives.
- FWE3/030; Joining Materials by Resistance Spot Welding.
- FWE3/031; Producing Fillet Welded Joints Using a Manual Welding Process.
- FWE3/032; Cutting Plate and Sections Using Shearing Machines.
- FWE3/033; Cutting and Shaping Materials Using Portable Thermal Cutting Equipment.
- FWE3/034; Cutting Materials Using Saws and Abrasive Discs.
- FWE3/035; Bending and Forming Plate Using Press Brakes or Bending Machines.
- FWE3/036; Forming Plate Work Using Power Rolling Machines.
- FWE3/037; Producing and Finishing Holes Using Drilling Machines.
- FWE3/038; Producing Plate Work Assemblies.
- FWE3/039; Slings, Lifting and Moving Materials and Components.
- FWE3/040; Forming Structural Sections Using Machines.
- FWE3/041; Producing Structural Metal Ancillary Components.
- FWE3/042; Producing Major Structural Components/Sub- assemblies.
- FWE3/043; Erecting Structural Metalwork.
- FWE3/044; Forming Pipe work by Machine Bending.
- FWE3/045; Producing Pipe Fabrications.
- FWE3/046; Producing Socket and Flange Fillet Welded Joints in Pipe Using a Manual Welding Process.
- FWE3/047; Producing Components by Fibre Reinforced Plastic (FRP) Moulding.
- FWE3/048; Producing Components by Acrylic Moulding.
- FWE3/049; Producing Components from Carbon Fibre.
- FWE3/050; Producing Components from Glass Fibre.
- FWE3/051; Producing Composite Assemblies.
- FWE3/052; Producing Components by Vacuum Forming.
- FWE3/053; Trimming Composite Mouldings Using Hand Tools.
- FWE3/054; Joining Plastics Using Manual Welding Processes.
- FWE3/055; Bonding Composite Mouldings.
- FWE3/056; Welding Rails Using the Aluminothermy Welding Process.
- FWE3/057; Restore Rails to Operational Condition Using on Arc Welding Process.
- FWE3/058; Preparing Flash Welding Machines for Operation.
- FWE3/059; Joining Rails Using Flash Welding Equipment.

All National Vocational Qualifications in the United Kingdom are achieved through training and assessment. Assessment is normally through on-the-job observation and questioning. Candidates produce evidence to prove they have the competence to meet the NVQ standards. Assessors 'sign-off units when the candidates are ready - the assessor tests candidates' underpinning knowledge, understanding and work-based performance to make sure they can demonstrate competence in the workplace. This process is fully compatible and comparable with the South African process.

Many of the units of learning are not applicable as they are largely outside the peculiar specialisation areas as required in South Africa. It is not evident what the credit value for this qualification is.

New Zealand:

No relevant qualifications at Level 3 were found. However the Level 4 Qualification National Certificate in Engineering - Fabrication (Level 4) with Sectoral strands in Heavy Fabrication, Light Fabrication, and Welding was used as comparison. There is some similarity in the content of the qualifications with the New Zealand qualification being more specific in terms of unit standard titles.

National Certificates in New Zealand are achieved through training and assessment. Assessment is normally through on-the-job observation and other evidence gathering techniques. Candidates provide evidence to prove they have the competence to meet the NZQA standards. Assessors test candidates' underpinning knowledge, understanding and work-based performance to make sure they can demonstrate competence in the workplace.

This process is fully compatible and comparable with the South African process with the exception that New Zealand has some unit standards with the requirement of being performed "under supervision". This is contrary to outcomes based learning and development principles.

The qualification compares well with the one in New Zealand and also appears to satisfy the comparison in terms of a combined (non-specialist) qualification attainment. This is due to the availability of a choice of strands being available to the industry and the learner.

The minimum credit value for this qualification is listed as 269 credits which indicates that it would compare well with the apprenticeship type qualifications.

The competencies listed in this qualification are as below:

<http://www.nzqa.govt.nz/lnqfdocs/quals/doc/0122.doc>

10; Title; Level; Credit:

- 101; Develop and use keyboarding skills to enter text; Level 1; 3 credits.
- 2353; Pre-treat work for subsequent metal surface finishing operations; Level 3; 5 credits.
- 2363; Polish ferrous and non-ferrous metal parts to produce a decorative finish; Level 3; 10 credits.
- 2387; Assemble mechanical components under supervision; Level 2; 2 credits.
- 2395; Select, use, and care for engineering hand tools; Level 1; 4 credits.
- 2396; Select, use, and maintain portable hand held engineering power tools; Level 2; 4 credits.
- 2414; Layout and mark off regular fabrication shapes under supervision; Level 2; 15 credits.
- 2415; Form and shape fabrication materials under supervision; Level 2; 10 credits.
- 2416; Assemble and mechanically join plate and sheet under supervision; Level 2; 10 credits.
- 2417; Mechanically cut fabrication materials under supervision; Level 2; 8 credits.
- 2418; Layout and mark off irregular fabrication shapes under supervision; Level 3; 15 credits.
- 2419; Form and shape, sheet, plate, pipe and structural sections using power machines under supervision; Level 3; 15 credits.
- 2420; Assemble and mechanically join tube, pipe and sections under supervision; Level 3; 15 credits.
- 2421; Mechanically cut fabrication materials using powered machinery under supervision; Level 3; 10 credits.
- 2422; Layout and mark off complex fabrication shapes; Level 4; 15 credits.
- 2423; Form and shape fabrication materials; Level 4; 15 credits.
- 2424; Assemble and mechanically join sheet, plate, tube, pipe and structural sections; Level 4; 20 credits.
- 2425; Mechanically cut sheet, plate, tube, pipe and structural sections; Level 4; 10 credits.
- 2430; Draw and interpret engineering sketches under supervision; Level 2; 4 credits.
- 2431; Draw and interpret engineering drawings under supervision; Level 2; 8 credits.
- 2432; Construct engineering plane geometric shapes; Level 2; 3 credits.
- 2433; Create two dimensional engineering drawings using computer aided design system; Level 2; 6 credits.
- 2434; Produce detailed engineering drawings under supervision; Level 3; 15 credits.
- 2438; Produce fabrication drawings; Level 4; 20 credits.
- 2670; Avoid welding hazards with safe work practices; Level 2; 1 credit.

- 2671; Weld metal structures with the manual metal arc welding process in down hand positions; Level 3; 6 credits.
- 2672; Weld metal to a general purpose industry standard with the gas metal arc welding process; Level 3; 6 credits.
- 2673; Weld metal structures with the gas metal arc welding process in down hand positions; Level 3; 6 credits.
- 2674; Weld stainless metal plate with the gas metal arc welding processes in the down hand positions; Level 3; 6 credits.
- 2675; Weld aluminium with the gas metal arc welding process in the down hand positions; Level 3; 6 credits.
- 2676; Weld stainless metal sheet with the gas tungsten arc welding process; Level 3; 6 credits.
- 2677; Weld aluminium with the gas tungsten arc welding process in the down hand positions; Level 3; 6 credits.
- 2678; Join metals with the oxyacetylene welding process; Level 3; 6 credits.
- 2679; Join metals using torch brazing and soldering; Level 3; 6 credits.
- 2680; Join metals with the resistance welding process; Level 3; 4 credits.
- 2681; Weld metal structures with the submerged arc welding process; Level 3; 4 credits.
- 2682; Weld metal to a general purpose industry standard with the manual metal arc welding process; Level 3; 6 credits.
- 2683; Cut metals using manual thermal processes; Level 3; 4 credits.
- 2684; Weld metal structures with the gas metal arc welding processes in all positions; Level 4; 10 credits.
- 2685; Weld metal structures with the manual metal arc welding process in all positions; Level 4; 10 credits.
- 2686; Weld aluminium with the gas metal arc welding process in all positions; Level 4; 10 credits.
- 2687; Weld stainless metal sheet and plate with the gas metal arc welding processes in all positions; Level 4; 10 credits.
- 2688; Weld stainless metal tube with the gas tungsten arc welding process; Level 4; 10 credits.
- 2689; Weld aluminium with the gas tungsten arc welding process in all positions; Level 4; 10 credits.
- 2690; Weld metal pipe with the oxyacetylene process; Level 4; 10 credits.
- 2691; Cut metals using mechanised thermal processes; Level 4; 4 credits.
- 2692; Repair non-ferrous metal components by welding; Level 4; 10 credits.
- 2693; Repair ferrous metal components by welding; Level 4; 10 credits.
- 2694; Weld metal pipe with the manual metal arc welding process using cellulosic electrodes; Level 4; 20 credits.
- 2695; Weld metal pipe with the manual metal arc welding process using hydrogen controlled electrodes; Level 4; 20 credits.
- 2696; Weld pipe in all positions with the gas tungsten arc welding process; Level 4; 12 credits.
- 2697; Weld aluminium pipe in all positions with the gas tungsten arc welding process; Level 4; 10 credits.
- 2824; Follow safe working practices on an engineering worksite; Level 2; 3 credits.
- 3234; Install metal pipe work according to plans and specifications under supervision; Level 3; 12 credits.
- 3236; Install stainless metal pipe work according to plans and specification under supervision; Level 3; 12 credits.
- 3238; Manufacture duct work to plans and specifications; Level 3; 20 credits.
- 4432; Identify and convert basic units of measure used in engineering; Level 1; 1 credit.
- 4433; Measure with non-complex devices used in engineering; Level 1; 2 credits.
- 4436; Select, use and care for engineering marking-out equipment; Level 2; 4 credits.
- 4795; Distinguish the characteristics of engineering materials; Level 1; 2 credits.
- 4796; Distinguish the characteristics of engineering metals; Level 2; 3 credits.
- 9184; Erect non-notifiable prefabricated scaffolding; Level 3; 3 credits.

- 12299; Shift loads in the performance of machinery and equipment installation and maintenance; Level 2; 3 credits.
- 16954; Calculate lengths, areas and mass of engineering fabrication materials; Level 2; 4 credits.
- 16955; Calculate sizes, mass, volumes, and quantities for engineering fabrication; Level 3; 4 credits.
- 16956; Demonstrate knowledge of force and stress in engineering fabrications; Level 4; 4 credits.
- 18106; Gouge metals using manual thermal processes; Level 3; 2 credits.
- 18107; Layout and mark off complex heavy fabrication shapes; Level 4; 15 credits.

Australia:

Following the Australian Prime Minister's announcement, the responsibilities and functions of the Australian National Training Authority (ANTA) have been transferred to the Department of Education, Science and Training (DEST).

Certificates in Australia are achieved through training and assessment. Assessment is through training provider and on-the-job observation and other evidence gathering techniques. Candidates provide evidence to prove they have the competence to meet the DEST standards. Assessors test candidates' underpinning knowledge, understanding and work-based performance confirm they can demonstrate competence in the workplace. This process is fully compatible and comparable with the South African process.

The trade of Boiler-making is utilised in Australia. However, the process of achieving the qualification is from various options. These options have various specialisations with a set of core components. The lists of unit standards shown below are those that make up the entire qualification requirements.

The relevant (for comparison purposes) specialisation areas are listed as:

- General Heavy Fabrication.
- Sheet metal.
- Welding.

The qualification Certificate III in Engineering - Fabrication Trade replaces the following qualifications:

- Boiler-making.
- Boiler making and/or Structural Metal work.
- Boiler-making|Welding.
- Welding.
- Sheet metal.
- Working.
- Blacksmithing.
- Tin-smithing.

This comparison indicates that there are synergies between this SAQA qualification and the qualification listed in Australia (MEM30398). The Certificate III in Engineering - Fabrication Trade (Apprenticeship) also appears to satisfy the comparison in terms of a combined (non-specialist) qualification attainment.

Certificate III in Engineering -Fabrication Trade MEM30398.

<http://apprenticeship.det.nsw.edu.au/htmltrades/fabrication.htm>



Unit code; Unit title:

- MEM1.1FA; Undertake interactive workplace communication.
- MEM1.2FA; Apply principles of Occupational Health and Safety (O H & S) in work environment.
- MEM1.3FA; Apply quality procedures.
- MEM1.4FA; Plan to undertake a routine task.
- MEM2.1C12A; Apply quality systems.
- MEM2.2C11A; Organise and analyse information.
- MEM2.3C11 B; Operate in a work based team environment.
- MEM2.4C11A; Assist in the provision of on-the-job training.
- MEM2.5C11A; Measure with graduated devices.
- MEM2.6C10A; Plan a complete activity.
- MEM2.7C10A; Perform computations - basic.
- MEM2.8C10A; Perform computations.
- MEM2.9C1 0A; Performs computer operations.
- MEM5.5AA; Carry out mechanical cutting.
- MEM5.7AB; Manual heating and thermal cutting.
- MEM5.8AA; Advanced manual heating, thermal cutting, gouging and shaping.
- MEM5.9AB; Automated thermal cutting.
- MEM5.1OAA; Undertake fabrication, forming, bending and shaping.
- MEM5.11AB; Assemble fabricated components.
- MEM5.12AB; Perform routine manual metal arc welding.
- MEM5.15AB; Weld using manual metal arc welding process.
- MEM5.16AB; Perform advanced welding using manual metal arc welding process.
- MEM5.17AB; Weld using gas metal arc welding process.
- MEM5.19AB; Weld using gas tungsten arc welding process.
- MEM5.36AB; Repair/replace/modify fabrications.
- MEM5.37AA; Geometric Development.
- MEM5.47AA; Weld using flux core arc welding process.
- MEM5.49AA; Perform routine gas tungsten welding.
- MEM5.50AA; Perform routine gas metal arc welding.
- MEM9.1AA; Draw and interpret sketch.
- MEM9.2AA; Interpret technical drawing.
- MEM11.11AA; Manual handling.
- MEM12.7AA; Mark off/out structural fabrications and shapes.
- MEM18.1AB; Use hand tools.
- MEM18.2AA; Use power tools/hand held operations.
- MEM2.13C5A; Perform mathematical computations.
- MEM5.20AB; Perform advanced welding using gas tungsten arc welding process.
- MEM5.38AA; Advanced Geometric Development - Cylindrical/Rectangular.
- MEM5.39AA; Advanced Geometric Development - Conical.
- MEM5.40AA; Advanced Geometric Development /R- Transitions.
- MEM5.49AA; Perform routine gas tungsten arc welding.
- MEM7.15AA; Set NC/CNC machines/processes (basic).
- MEM7.16AA; Set and edit NC/CNC machine/process.
- MEM5.18AB; Perform advanced welding using gas metal arc welding process.
- MEM5.20AB; Perform advanced welding using gas tungsten arc welding process.
- MEM5.48AA; Perform advanced welding using flux core arc welding process.

It is also apparent that different outcomes are utilised for various qualification titles. The comparison of the Level 2 qualifications indicated that there is a different qualification (MEM30305) that may also be utilised when wishing to embark on further learning in this field.

- A direct comparison with these international qualifications indicates that the education and training focus of all the qualifications is basically the same. However, the basic construct differs in that the nomenclature is dissimilar to that used in South Africa.
- This SAQA Qualification compares well with the international qualifications and training programs offered. The specific operational content (elective component) incorporated in the qualification will serve to enable qualifying learners to make better informed decisions within an expansive context that compares well with international learners. One difference is the fact that the SAQA qualification caters for a broader category of industries. This is mainly due to the fact that the South African Qualification is very explicit in the way elective competencies play a role in contextual competence.

It is not evident what the credit value for this qualification. The discussion documents do however make mention of periods in the region of 36 months duration.

### **ARTICULATION OPTIONS**

The qualification has been designed and structured so that qualifying learners may move from one engineering context to certain other engineering contexts (within same industry sector Orto new industry sectors). This can be achieved by the selection of appropriate credits in the elective category. Equally, holders of other similar qualifications may be evaluated against this qualification for the purpose of RPL.

Vertical articulation:

- 1058721: Further Education and Training Certificate: Engineering Fabrication, NQF Level 4.

Horizontal articulation:

Other contextually relevant engineering qualifications may be:

- 1057886: National Certificate: Welding Application and Practice, NQF Level 3.
- 1023274: National Certificate: Mechanical Engineering: Fitting, NQF Level 3.

Fundamental learning at this level applies to equivalent credit accrual for most engineering qualifications at NQF Level 3.

Core learning at this level may lead to credit accrual for some unit standards in the following qualifications at NQF Level 3:

- National Certificates in Mechanical Engineering (Welding), (Fitting), (Machining).
- Vehicle Servicing.
- Automotive Component Manufacturing.

### **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**

Assessors should be in possession of:

- An appropriate qualification at or above the level of the qualification and preferably relevant workplace practical experience.
- Registration as an assessor with the relevant ETQA.

### **NOTES**

N/A

### **UNIT STANDARDS**

	<b>10</b>	<b>UNIT STANDARD TITLE</b>	<b>LEVEL</b>	<b>CREDITS</b>
Core	116520	Apply safety, health and environmental principles and procedures in a workplace	Level 2	2
Core	243075	Draw and interpret simple plate, pipe and structural steel plate, pipe and structural steel drawings	Level 2	6
Core	14713	Use welding definitions and symbols	Level 2	5
Core	13234	Apply quality procedures	Level 3	8
Core	243077	Cut material using the oxy-fuel pipe cutting device	Level 3	3
Core	243080	Cut material using the oxy-fuel profile cutting machine	Level 3	5
Core	243081	Cut material using the oxy-fuel straight-line cutting machine	Level 3	3
Core	115568	Fabricate components by means of the parallel line method	Level 3	4
Core	115571	Fabricate components by means of the radial line method	Level 3	4
Core	115565	Fabricate components by means of the triangulation method	Level 3	4
Core	12244	Form and shape sheet, plate, pipe and structural section using power machinery	Level 3	15
Core	244339	Mark off and fabricate sections using the contour marker method	Level 3	9
Core	12245	Mechanically cut, drill, punch and assemble fabrication materials using powered machinery	Level 3	8
Elective	243061	Assemble work pieces in jigs (minor amendments include the use of manipulators)	Level 2	3
Elective	243069	Braze metals using the oxy-fuel brazing process	Level 2	6
Elective	10780	Cut mild steel by means of an Oxy-acetylene profile cutter	Level 2	4
Elective	10842	Join cast iron by means of arc welding	Level 2	3
Elective	12482	Join metals using the resistance welding process	Level 2	4
Elective	12481	Sling loads	Level 2	4
Elective	243076	Weld carbon steel workpieces using the cored-wire welding process in the down hand position	Level 2	8
Elective	243066	Weld carbon steel workpieces using the gas metal arc welding process in the down-hand position	Level 2	8
Elective	243056	Weld carbon steel workpieces using the shielded metal arc welding process in all positions	Level 2	16
Elective	244343	Align a steel structure using a dumpy level	Level 3	2
Elective	12246	Assemble and mechanically join sheet, plate, tube, pipe and steel sections	Level 3	4
Elective	12457	Develop learning strategies and techniques	Level 3	3
Elective	12456	Explain and use organisational procedures	Level 3	6
Elective	115740	Fabricate a launder	Level 3	5

	10	UNIT STANDARD TITLE	LEVEL	CREDITS
Elective	115744	Fabricate a spiral by means of trianoulation	Level 3	5
Elective	115699	Fabricate rolled sections	Level 3	6
Elective	14700	Layout and mark off regular and irregular shapes for thermoplastic fabrication	Level 3	25
Elective	244346	Layout and fabricate a metal structure	Level 3	5
Elective	9526	Manage basic business finance	Level 3	6
Elective	9530	Manaoe work time effectively	Level 3	3
Elective	8039	Operating cranes	Level 3	10
Elective	8038	Operating lift trucks	Level 3	6
Elective	14695	Remove material with the shields metal arc gouging process	Level 3	8
Elective	10790	Silver solder metals by means of Oxy-acetylene equipment	Level 3	3
Elective	243068	Weld carbon steel workpieces using the gas tungsten arc welding process in the downhand position	Level 3	15
Elective	10789	Weld mild steel by means of Oxy-acetvlene equipment	Level 3	4
Elective	14698	Cut materials using plasma cutting	Level 4	4
Elective	243065	Weld carbon steel pipe using the gas metal arc welding process in all positions	Level 4	20
Elective	243062	Weld carbon steel pipe, using the shielded metal arc welding process in all positions	Level 4	20
Fundamental	119472	Accommodate audience and context needs in oral/signed communication	Level 3	5
Fundamental	9528	Communicate with clients	Level 3	3
Fundamental	12488	Complete feasibility and commissioning reports	Level 3	3
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
Fundamental	9013	Describe, apply, analyse and calculate shape and motion in 2-and 3-dimensional space in different contexts	Level 3	4
Fundamental	119457	Interpret and use information from texts	Level 3	5
Fundamental	9012	Investigate life and work related problems using data and probabilities	Level 3	5
Fundamental	7456	Use mathematics to investigate and monitor the financial aspects of personal, business and national issues	Level 3	5
Fundamental	119465	Write/present/sign texts for a range of communicative contexts	Level 3	5



**SOUTH AFRICAN QUALIFICATIONS AUTHORITY**

**UNIT STANDARD:**

***Align a steel structure using a dumpy level***

<b>SAQA USID</b>	<b>1 UNIT STANDARD TITLE</b>		
244343	Align a steel structure using a dumpy level		
<b>ORIGINATOR</b>		<b>PROVIDER</b>	
SGB Generic Manufacturing, Engineering & Technoloq			
<b>FIELD</b>		<b>SUBFIELD</b>	
6 - Manufacturing, Engineering and Technology		Fabrication and Extraction	
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQFLEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 3	12

**SPECIFIC OUTCOME 1**

Explain the factors critical to aligning a steel structure using a dumpy level.

**SPECIFIC OUTCOME 2**

Prepare to align the steel structure using a dumpy level.

**SPECIFIC OUTCOME 3**

Align the steel structure using a dumpy level.

**SPECIFIC OUTCOME 4**

Complete the aligning process.



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:*****Layout and fabricate a metal structure***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
244346	Layout and fabricate a metal structure		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
SGB Generic Manufacturing, Engineering & Technolog			
<b>FIELD</b>	<b>SUBFIELD</b>		
6 - Manufacturing, Engineering and Technology	Fabrication and Extraction		
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 3	15

**SPECIFIC OUTCOME 1**

Explain the factors critical to layout and fabricate a metal structure.

**SPECIFIC OUTCOME 2**

Prepare to layout and fabricate the metal structure.

**SPECIFIC OUTCOME 3**

Layout and fabricate the metal structure.

**SPECIFIC OUTCOME 4**

Complete the layout and fabrication process.