No. 230 **16** March ***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

Manufacturing and **Assembly Processes**

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

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the qualification and unit standards. The full qualification and unit standards can be accessed via the SAQA web-site at **www.saqa.org.za**. Copies may also be obtained from the Directorate 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 April 2007.*** All correspondence should be marked Standards Setting – Manufacturing and **Assembly Processes** and addressed to

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SAQA
Attention: Mr. D. Mphuthing
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SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:
National Certificate: Lift Installation and Maintenance

SAQA QUAL ID	*QUALIFICATION TITLE*		
58268	National Certificate: Lift Installation and Maintenance		
SGB		*PROVIDER*	
SGB Manufacturing and Assembly Processes			
ETQA			
QUALIFICATION TYPE	*FIELD*	*SUBFIELD*	
Unknown	6 - Manufacturing, Engineering and Technology	Engineering and Related Design	
ABET BAND	*MINIMUM CREDITS*	*NQF LEVEL*	*QUALCLASS*
Undefined	126	Level 2	Regular-Unit Stds Based
REGISTRATION STATUS	*SAQA DECISION NUMBER*	*REGISTRATION START DATE*	*REGISTRATION END DATE*
Draft - Prep for P Comment			

PURPOSE AND RATIONALE OF THE QUALIFICATION
Purpose:

Learners who achieve this qualification will be able to provide operational support for workplace activities within the lift installation and maintenance industry by:

- Performing routine basic maintenance activities.
- Performing routine basic tasks in support of installation activities.
- Assisting competent persons to perform repairs and maintenance.

Qualifying learners will be able to relate what they see and experience to basic scientific and technological principles and concepts. They will also understand how they should operate within the systems which govern their workplace. The core technical skills and knowledge that are described in this qualification are acquired in relation to lifts.

This qualification also forms the basis for further learning in the lift and escalator field at NQF level 3, where learners will be equipped to assist with the installation, maintenance and repair of lifts and to perform routine maintenance activities on mechanical and electrical components. If the relevant elective is selected, the learner will also be equipped to install escalators.

This qualification will allow employees who previously did not qualify to become apprentices to gain recognition for their skills and knowledge through the recognition of prior learning, thereby contributing to their social upliftment. This qualification will also contribute to broad-based black economic empowerment initiatives, especially by the opportunities it affords for small business initiatives.

Rationale:

This is the first of three related qualifications for the installation and maintenance of lifts and escalators, which together replace a legacy qualification for the trade of lift mechanic and provide a developmental pathway for the full range of lift and escalator installation and maintenance activities.

A person who achieves this qualification will be able to undertake work activities that support lift installation and maintenance activities. This is a recognised position within the industry. Qualifying learners who wish to further their occupational development would be able to continue their learning in the field of lift maintenance and installation at NQF Levels 3 and **4.** Other career alternatives after NQF Level **2** could be found in the field of engineering repair and maintenance.

Typical learners for this qualification would be new entrants to the industry who intend to become fully qualified in lift installation and maintenance and existing employees who wish to formalise their work experience.

This qualification recognises skills, knowledge and values relevant to a workplace and requires workplace experience. It is suitable for learners who:

- Attend courses and then apply the knowledge gained to activities in the workplace (Portfolio to reflect formative assessment). or
- Are already employed and have acquired the skills and knowledge without attending formal courses (RPL can be done through the summative assessment and portfolio of evidence). or
- Participate in skills programmes and have the appropriate work experience. or
- Are part of a learnership programme which integrates structured learning and work experience. or
- Acquire their learning through any combination of the above.

The outcomes of this qualification combine skills and knowledge in the technical, inter-personal and business spheres. This will ensure that learners who achieve this qualification are able to perform the operational aspects of the work, function within a team context and contribute to value-adding processes within the organisation.

This qualification will contribute to the development of skilled employees and thus to ensuring safety and efficiency in lift operation. It also emphasises the learner's role in conserving resources, in behaving responsibly towards the environment in general, and in observing all legal requirements. It will also assist the industry to meet equity targets and will contribute to the' establishment of small and medium sized enterprises.

This qualification will help to achieve the objectives of the National Qualifications Framework as it will contribute to the full development of the learner and provide recognition for skills and knowledge achieved, thereby forming the basis for further advancement in the occupation. It will also provide a basis for further mobility and transportability as it recognises skills and knowledge that are applicable to other sectors of the economy.

RECOGNIZE PREVIOUS LEARNING?

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LEARNING ASSUMED TO BE IN PLACE

It is assumed that learners are already competent in Communication and Mathematical Literacy at NQF Level **4.**

In addition, learners are assumed to have the following skills at NQF Level **4** in the context of CNC production machining:

- Interpret drawings and develop CNC machining process plans, programmes and work instructions for new components.
- Set up and qualify all the processes.
- Identify and rectify manufacturing problems.

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 should be provided to assist the learner in the process of developing a portfolio. The guidelines for integrated assessment should be used to develop the RPL assessment process. **As** with integrated assessment, 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.

Access to the qualification

There is open access to this qualification. A workplace is, however, a prerequisite to obtaining the relevant work experience and evidence required for the assessment of the Exit Level Outcomes.

QUALIFICATION RULES
Level, credits and learning components assigned to the qualification

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

The qualification is made up of Unit Standards that are classified as Fundamental, Core and Elective. A minimum of 126 credits is required to complete the qualification.

In this qualification the credits are allocated as follows:

- Fundamental: 36 credits.
- Core: 78 credits.
- Electives: 12 credits.
- Total: 126 credits.

Motivation for number of credits assigned to Fundamental, Core and Elective

Fundamental Component:

- The fundamental component consists of unit standards to the value of 36 credits. There are twenty (20) credits in Communication and 16 credits in Mathematical Literacy.
- All these standards are compulsory.

Core Component:

- Seventy-eight (78) credits have been allocated to unit standards in the core component of this qualification. The unit standards classified as core describe the use of different engineering tools, drawings and engineering processes, electrical applications, as well as the necessary competences for working within teams. The unit standards encourage application of knowledge and skills in real situations.
- All Unit standards are compulsory.

Elective Component:
- In the elective component there are unit standards totaling twenty-eight (28) credits. Learners are required to select electives that add up to a minimum of twelve **(12)** credits.

EXIT LEVEL OUTCOMES
1. Perform basic engineering operations.
2. Assist competent person to perform maintenance on **lift** equipment and components.
3. Demonstrate knowledge of safety rules and regulations applicable to the industry and perform related practices.

4. Contribute to installation activities.
Range: Activities are performed under supervision of competent person.

ASSOCIATED ASSESSMENT CRITERIA

1.
- Work instructions and work procedures are followed.

Range: Work instructions include engineering drawings and sketches.
- Worn parts are replaced as instructed.
- Portable power tools are used and cared for correctly.
- Basic hand tools are used and cared for correctly.
- Basic measuring equipment is used and cared for correctly.

2.
- Cleaning and lubrication processes are carried out correctly.

Range: This will include the identification of lubricants and their application.
- A variety of worksite preparation and clean up tasks are performed correctly.
- Activities related to taking lift out of service, safeguarding the public and restoring equipment to service are performed as instructed.

3.
- Health and safety requirements are adhered to.
- Knowledge of applicable legislation is demonstrated.

Range: Includes understanding relevant parts of the OHS Act and applicable regulations.

4.
- A variety of worksite preparation tasks are performed correctly.

Range: Preparation includes erecting scaffolding, rigging, barricading and signage.
- Basic tasks related to installation are carried out as instructed.

Range: This includes assisting with installing and aligning of guide rails and wire ways and any such components that need alignment.

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

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

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

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

Assessors and moderators should make use of a range of formative and summative assessment methods. Assessors should assess and give credit for the evidence of learning that

has already been acquired through formal, informal and non-formal learning and work experience.

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

The integrated assessment should be based on a summative assessment guide. The guide will specify how the assessor will assess different aspects of the performance and will include:

- Evaluating evidence in a portfolio of evidence, particularly projects which integrate various aspects of the qualification and which demonstrate the integration of all aspects of learning: fundamental and core; knowledge, skills and values; the development of the critical outcomes.
  - Observing and listening to the learner at work, both in primary activities as well as in other interactions, or in relevant simulations.
  - Asking questions and initiating short discussions to test understanding and to verify other evidence.
- Looking at records and reports.
- Formative and summative assessment of unit standards.

Assessment of competence for this qualification is based on experience acquired by the learner in the workplace, within the particular CNC production machining context. The assessment process should cover the explicit tasks required for the qualification as well as the understanding of the underlying concepts and principles. The assessment process should also establish how the learning process has advanced the Critical Cross-Field Outcomes.

The learner may choose in which language he/she 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 presented if pertinent to any of the Exit Level Outcomes.

Assessors should also evaluate evidence that the learner has been, and is, able to perform consistently over a period of time.

INTERNATIONAL COMPARABILITY

Introductory note:

South Africa has had a long-standing apprenticeship for the lift mechanic occupation, and is one of only a few countries in the world where this occupation is accorded the status of a registered trade. Local experts responsible for the training of apprentices assert that this trade qualification has been regarded by their international counterparts as best practice. South African companies provide training in African countries such as Botswana, Zimbabwe, Namibia and Zambia, in accordance with South African standards. South African companies also provide training in a range of other countries, including the Middle East, India and Australia.

Internationally, the lift and escalator installation, maintenance and repair industry is characterised by large multinational companies which extend their influence across the world. The quality and scope of training is thus determined by international standards for safety and quality in addition to specific product or company issues and localised statutory requirements.

Many countries, for example European countries, do not have national qualifications for lift installation and maintenance. Instead, the industry recruits people who have already qualified in related fields and then provides them with in-house training specifically for lifts and escalators. In many countries where lift and escalator specific training is provided, for example in Canada and

the United States of America, the full range of learning is not necessarily engaged with in order to qualify, as practitioners usually specialize in installation, maintenance, or repair work.

The United Kingdom provides an example of combining the top-up approach with comprehensive lift- or escalator-specific training starting at the entry level. Typically, people with apprentice or technician-level qualifications in the fields of mechanical, electrical, electronic or operations and maintenance engineering undergo on-the-job training leading to a range of work-based awards specifically for the lift and escalator industry. Such training may be company-specific, or it may lead to National Vocational Qualifications such as the Installation and Commissioning NVQ, Level 3, which has pathways for equipment installation, commissioning, traction lift installation, hydraulic lift installation and escalator installation and commissioning. There are also Level 3 National Vocational Qualifications for service and repair of lifts and escalators. Courses and qualifications in this field can also lead to Higher National Certificates and Diplomas and engineering degrees.

Australia has been selected for detailed comparison for two reasons: it has a national system of training and national qualifications for lift installation and maintenance, and conditions in the industry are similar to those in South Africa.

The Australian qualifications (Certificates II, III and IV) correspond to the apprenticeship system, with a further level, the Diploma, which recognises skills equivalent to those of the commissioning engineer.

The qualifications are based on a clustering of unit of competence, covering a combination of compulsory core and elective units to allow flexibility in meeting training needs of enterprises and individuals. Learning may comprise a wide range of learning methods and programmes, provided that an integration of theoretical learning and workplace experience is achieved. Assessment is workplace based and includes the use of portfolios of evidence.

The Certificate II in Lift Systems (Operational Support) is relevant for comparison with NQF Level **2.** People gaining this qualification are able to undertake work activities that support installation and maintenance functions in the lift industry. The learning time is 400 nominal hours.

The following are the Core Units of competence:

- Conduct site cleaning.
- Apply and remove coatings.
- Work site preparation/support.
- Clean/lubricate lift equipment.

The following are the Elective Units of competence:

- Assemble/dismantle amenities.
- Support maintenance activities.
- Inspect ropes

The South African qualification includes these competencies. (except for 'inspecting ropes', which is included at NQF Level 3)

The South African qualification is thus very similar to the Australian qualification in terms of purpose and content.

Conclusion:

The South African qualification follows a system of training for lift maintenance and installation practitioners very similar to that of Australia. The South African qualification is broadly

comparable with the Australian national qualification in content and scope. Both qualifications require an integration of theoretical learning and workplace experience, and they share a common approach to assessment. The Australian version does not specify fundamental learning or organisational competencies.

This series of qualifications has been structured to meet local practices. In South Africa, qualified practitioners in this field are expected to be equipped with a comprehensive range of skills and knowledge required to both install and maintain lifts, **so** the qualifications have been designed to meet this need. This contrasts with the situation in many other countries where people are recruited from related trades and then given industry-specific training. It also contrasts with conditions in countries where union resistance to multi-skilling restricts the breadth of training.

The qualifications being submitted include the contents of the long standing and internationally well regarded trade qualification and have been extended to align with NQF requirements. The well established base of expertise and experience that has been built up in South Africa *to* develop the skills required for lift and escalator maintenance and installation is now being reflected in these qualifications.

References:

Southeast Asia, Korea, China, Japan

- www.kesi.or.kr
- www.hyundaielevator.co.kr
- www.hitachi.co.jp

Europe and United Kingdom

- berufenet.arbeitsagentur.de/bnet2/K/B2710101alternat–t.html
- http://www.learndirect-advice.co.uk
- www.stannah.com/passengerlifts/

Australia and New Zealand

- National Training Information Service www.ntis.gov.au/
- ElectroComms and EnergyUtilities Industry Skills Council www.ee-oz.com.au
- Australian National Training Authority (ANTA) www.anta.gov.au/
- Department of Science, Education and Training (DEST) www.dest.gov.au/
- www.nzqa.govt.nz/

Canada and the USA

- www.itabc.ca/
- www.bls.gov/oco/ocos189.htm
- http://www.naec.org
- www.umsl.edu/services/govdocs
- www.asme.org/education/incomp/courseoptelev.htm

ARTICULATION OPTIONS

This qualification articulates vertically and horizontally with the following qualifications:

The qualification articulates horizontally with:

- National Certificate: Engineering and Related Design: NQF Level 2, ID: 22422.
- National Certificate: Measurement, Control and Instrumentation: **NQF** Level 2, ID: 48695.

The qualification articulates vertically with:

- National Certificate in Lift Installation and Maintenance: NQF Level 3, ID: **58271.**
- National Certificate: Measurement, Control and Instrumentation: NQF Level 3, ID: **48696.**

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.

- 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

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

- A minimum of 2 (two) years' practical, relevant occupational experience in administration.
- To be declared competent in all the outcomes of the National Assessor Unit Standards as stipulated by South African Qualifications Authority. (SAQA)

NOTES

N/A

UNIT STANDARDS

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Core	12477	Identify engineering materials, their characteristics and applications and common metal tests used in engineering	Level 2	4
Core	9882	Read and interpret basic engineering drawings	Level2	8
Core	12219	Select, use and care for engineering power tools	Level2	6
Core	119744	Select, use and care for engineering hand tools	Level2	8
Core	9322	Work in a team	Level2	3
Core	13172	Understand the employer/employee relationship	Level 1	3
Core	243760	Perform simple alignment and positioning of lift components	Level2	4
Core	243761	Identify and replace simple mechanical and electrical lift components	Level 2	8
Core	110300	Clean inspect and lubricate a production machine, and repair minor faults	Level 2	9
Core	10253	Install electric wire ways	Level2	6
Core	9839	Apply and maintain safety in an electrical environment	Level 1	5
Core	14706	Perform basic rigging procedures	Level 2	4
Core	110078	Plan, organise and manage oneself in the organisation	Level 2	2
Core	119074	Erect and dismantle scaffolding	Level2	4
Core	12476	Select, use and care for engineering measuring equipment	Level2	4
Elective	15092	Plan and manage personal finances	Level 1	5

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Elective	12463	Understand and deal with HIV/AIDS	Level 2	3
Elective	114669	Carry out basic electric arc welding in an electrical environment	Level2	8
Elective	1'14616	Carry out basic gas welding, brazing and cutting in an electrical environment	Level2	8
Elective	12483	Perform basic first aid	Level2	4
Fundamental	119454	Maintain and adapt oral/signed communication	Level2	5
Fundamental	119463	Access and use information from texts	Level2	5
Fundamental	119456	Write/present for a defined context	Level2	5
Fundamental	119460	Use language and communication in occupational learning programmes	Level2	5
Fundamental	7480	Demonstrate understanding of rational and irrational numbers and number systems	Level2	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	9009	Apply basic knowledge of statistics and probability to influence the use of data and procedures in order to investigate life related problems	Level2	3
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

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:
National Certificate: Lift Installation and Maintenance

SAQA QUAL ID	*QUALIFICATION TITLE*		
58271	National Certificate: Lift Installation and Maintenance		
SGB		***PROVIDER***	
SGB Manufacturing and Assembly Processes			
ETQA			
QUALIFICATION TYPE	***FIELD***	***SUBFIELD***	
National Certificate	6 - Manufacturing, Engineering and Technology	Engineering and Related Design	
ABET BAND	***MINIMUM CREDITS***	***NQF LEVEL***	***QUAL CLASS***
Undefined	136	Level 3	Regular-Unit Stds Based
STATUS	***NUMBER***	***START DATE***	***END DATE***
Draft - Prep for P			

PURPOSE AND RATIONALE OF THE QUALIFICATION
Purpose:

This qualification will equip learners with the skills, knowledge and values to contribute effectively to workplace activities within the elevator and escalator installation and maintenance industry. Learners who achieve this qualification will be able to:

- Assist competent persons to install, maintain and repair lifts. (if the relevant elective is selected, the learner will also be equipped to install escalators)
- Perform routine maintenance activities on mechanical and electrical components.

Qualifying learners will be able to relate what they see and experience to scientific and technological principles and concepts. They will also understand how they are affected by legislation, regulations, agreements and policies related to their work environment.

The core technical skills and knowledge described in this qualification relate to lifts; **a** learner may also elect to include technical **skills** and knowledge related to the installation of escalators.

This qualification will also serve as a basis for further learning in the lift and escalator field at NQF level **4** where learners will be equipped to install lift systems and ensure that lift components operate correctly. If the relevant elective is chosen, the learner will also be equipped to maintain escalators.

This qualification will contribute to social upliftment and development by allowing employees who previously did not qualify to become apprentices to gain recognition for their skills and knowledge through the recognition of prior learning. This qualification will also contribute to broad-based black economic empowerment initiatives, especially by the opportunities it affords for small business initiatives.

Rationale:

This is the second of three related qualifications for the installation and maintenance of lifts and escalators, which together replace a legacy qualification for the trade of lift mechanic and provide a developmental pathway for the full range of lift and escalator installation and maintenance activities.

Learners who achieve this qualification will be able to perform a range of installation, repair and routine maintenance activities within the lift and escalator industry. They would perform tasks semi-autonomously within the context of an overall team. In most instances this role does not represent a recognised position in the organisation, but is a stage in the learner's occupational development. After achieving this qualification, learners would be able to continue their occupational development in the **field** of lift maintenance and installation by completing the Further Education and Training Certificate in Lift Installation and Maintenance. Other career alternatives after NQF Level 3 could be found in the field of engineering repair and maintenance.

This qualification is designed for learners who engage actively in installation and maintenance activities. It recognises skills, knowledge and values relevant to a workplace and requires workplace experience. Typical learners would have already achieved the National Certificate in Lift Installation and Maintenance: NQF Level 2, or have qualified in another maintenance trade. This qualification is suitable for learners who:

- Attend courses and then apply the knowledge gained to activities in the workplace (Portfolio to reflect formative assessment). or
- Are already employed and have acquired the skills and knowledge without attending formal courses (RPL can be done through the summative assessment and portfolio of evidence). or
- Participate in skills programmes and have the appropriate work experience. or
- Are part of a learnership programme which integrates structured learning and work experience. or
- Acquire their learning through any combination of the above.

The outcomes of this qualification combine skills and knowledge in the technical, inter-personal and business spheres, enabling the learner to perform the operational aspects of the work, function within a team context and contribute to value-adding processes within the organisation.

Together with the other qualifications in the series, this qualification leads to an occupation which benefits society and the economy. It will contribute to the development of skilled employees and thus to ensuring safety and efficiency in the operation *of* lifts and escalators. It also emphasises the learner's role in conserving resources, in behaving responsibly towards the environment in general, and in observing all legal requirements. It will also assist the industry to meet equity targets and will contribute to the establishment of small and medium sized enterprises.

This qualification will help achieve the objectives of the National Qualifications Framework as it will contribute to the full development of the learner and provide recognition for skills and knowledge achieved, thereby forming the basis for further advancement in the occupation. It will also provide a basis for further mobility and transportability as it recognises skills and knowledge that are applicable to other sectors of the economy.

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

The following competencies are assumed for a learner embarking on this qualification:

- Communication and Literacy, NQF Level 2.
- Mathematical Literacy, NQF Level 2.

In addition, learners are assumed to have the following skills and the relevant experience at NQF Level 2 in the context of the lift and escalator installation and maintenance industry:

- Perform basic engineering operations.
- Assist competent person to perform maintenance on lift equipment and components.
- Demonstrate knowledge of safety rules and regulations applicable to the industry and perform related practices.
- Contribute to installation activities.

These skills and the relevant work experience form the basis for determining the credit allocation in this qualification. If a learner does not have such experience, the learning time will be increased. The allocation of credits is also based on the assumption that the learner will be working towards this qualification as part of a learning programme which integrates the unit standards.

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 should be provided to assist the learner in the process of developing a portfolio. The guidelines for integrated assessment should be used to develop the RPL assessment process. As with integrated assessment, 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.

Access to the qualification

There is open access to this qualification. A workplace is, however, a prerequisite to obtaining the relevant work experience and evidence required for the assessment of the Exit Level Outcomes.

QUALIFICATION RULES

Level, credits and learning components assigned to the qualification

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

The qualification is made up of Unit Standards that are classified as Fundamental, Core and Elective. A minimum of 136 credits is required to complete the qualification.

In this qualification the credits are allocated as follows

- Fundamental: 36 credits.
- Core: 88 credits.
- Electives: 12 credits.
- Total: 136 credits.

Motivation for number of credits assigned to Fundamental, Core and Elective

Fundamental Component:

- Unit Standards to the value of (twenty) 20 credits are allocated to Communication at NQF Level 3 and Unit Standards to the value of (sixteen) 16 credits to Mathematical Literacy. These

Unit standards will help the learner to become a literate and numerate worker who is able to function competently in the global community of which South Africa is a part.
o **All** the Unit Standards in this component are compulsory.

Core Component:

o Eighty-eight (88) credits have been allocated to unit standards in the core component of this qualification. The unit standards classified as core describe the use of maintenance routines on lift equipment, installing lift components, maintaining machinery and working with electrical circuits and motor control systems. The unit standards encourage application of knowledge and skills in real situations.
● All Unit standards are compulsory.

Elective Component:
o In the elective component there are unit standards totaling twenty-nine (30) credits. Learners are required to select electives that add up to a minimum of twelve (12) credits.

EXIT LEVEL OUTCOMES
1. Perform inspection and repair of lift equipment and components.
Range: Work is performed under supervision of a competent person. Inspection will include the inspection of mechanical and electrical safety components.
2. Perform routine maintenance and solve problems on lift equipment and components.
3. Communicate with peers, supervisors, customers and the public.
4. Install a range of lift components and associated equipment.
Range: Components will include but are not limited to hoist way, landing doors, counterweight, buffers, sheaves, rams, main motor, gear box, governor, controller equipment.

ASSOCIATED ASSESSMENT CRITERIA
1.
o Worn or damaged components are identified and recorded correctly.
o Faulty components are repaired or replaced according to manufacturer's specifications.

2.
Θ Correct maintenance methodology is applied.
Range: Maintenance methodology includes preventative maintenance.
o Maintenance tasks are performed in accordance with company standards, manufacturer's specifications and statutory requirements.

3.
o Oral and written instructions are followed correctly.
o Relevant information is communicated to and obtained from customers effectively.
● Relevant contribution is made to the team effort.

4.
o All components and equipment are installed according to engineering and layout drawings and to manufacturer's specifications.
● Installation conforms to applicable statutory requirements.

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

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

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

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

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

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

The integrated assessment should be based on a summative assessment guide. The guide will specify how the assessor will assess different aspects of the performance and will include:

- Evaluating evidence in a portfolio of evidence, particularly projects which integrate various aspects of the qualification and which demonstrate the integration of all aspects of learning: fundamental and core; knowledge, skills and values; the development of the critical outcomes.
- Observing and listening to the learner at work, both in primary activities as well as in other interactions, or in relevant simulations.
- Asking questions and initiating short discussions to test understanding and to verify other evidence.
- Looking at records and reports.
- Formative and summative assessment of unit standards.

Assessment of competence for this qualification is based on experience acquired by the learner in the workplace, within the particular CNC production machining context. The assessment process should cover the explicit tasks required for the qualification as well as the understanding of the underlying concepts and principles. The assessment process should also establish how the learning process has advanced the Critical Cross-Field Outcomes.

The learner may choose in which language he/she 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 presented if pertinent to any of the Exit Level Outcomes.

Assessors should also evaluate evidence that the learner has been, and is, able to perform consistently over a period of time.

INTERNATIONAL COMPARABILITY

Introductory note:

South Africa has had a long standing apprenticeship for the lift mechanic occupation, and is one of only a few countries in the world where this occupation is accorded the status of a registered trade. Local experts responsible for the training of apprentices assert that this trade qualification has been regarded by their international counterparts as best practice. South African companies provide training in African countries such as Botswana, Zimbabwe, Namibia and Zambia, in accordance with South African standards. South African companies also provided training in a range of other countries, including the Middle East, India and Australia.

Internationally, the lift and escalator installation, maintenance and repair industry is characterised by large multinational companies which extend their influence across the world. The quality and scope of training is thus determined by international standards for safety and quality in addition to specific product or company issues and localised statutory requirements.

Many countries, for example European countries, do not have national qualifications for lift installation and maintenance. Instead, the industry recruits people who have already qualified in related fields and then provides them with in-house training specifically for lifts and escalators. In many countries where lift and escalator specific training is provided, for example in Canada and the United States of America, the full range of learning is not necessarily engaged with in order to qualify, as practitioners usually specialize in installation, maintenance, or repair work.

The United Kingdom provides an example of combining the top-up approach with comprehensive lift- or escalator-specific training starting at the entry level. Typically, people with apprentice or technician-level qualifications in the fields of mechanical, electrical, electronic or operations and maintenance engineering undergo on-the-job training leading to a range of work-based awards specifically for the lift and escalator industry. Such training may be company-specific, or it may lead to National Vocational Qualifications such as the Installation and Commissioning NVQ, Level 3, which has pathways for equipment installation, commissioning, traction lift installation, hydraulic lift installation and escalator installation and commissioning. There are also Level 3 National Vocational Qualifications for service and repair of lifts and escalators. Courses and qualifications in this field can also lead to Higher National Certificates and Diplomas and engineering degrees.

Australia has been selected for detailed comparison for two reasons: it has a national system of training and national qualifications for lift installation and maintenance, and conditions in the industry are similar to those in South Africa.

The Australian qualifications (Certificates II, III and IV) correspond to the apprenticeship system, with a further level, the Diploma, which recognises skills equivalent to those of the commissioning engineer.

The qualifications are based on a clustering of unit of competence, covering a combination of compulsory core and elective units to allow flexibility in meeting training needs of enterprises and individuals. Learning may comprise a wide range of learning methods and programmes, provided that an integration of theoretical learning and workplace experience is achieved. Assessment is workplace based and includes the use of portfolios of evidence.

The Certificate III in Lift Systems (Electrical) is relevant for comparison with NQF Level 3. People gaining this qualification are able to install, maintain, service and/or repair lifts, escalators and moving walks. The learning time is 1020 nominal hours.

The Core Units of Competence are as follows:

- Install wiring systems.
- Repair electrical circuit faults.

- Replace lift components.
- Release passengers from lifts.
- Participate in the training of others.

The Elective Units of Competence are as fallows:

- Install lift mechanical equipment.
- Maintain escalators/moving walks.

The South African qualification includes these competencies, except for 'releasing passengers from lifts' and 'maintaining escalators/moving walks', which are included at NQF Level 4.

The South African qualifications are thus very similar to the Australian qualifications in terms of purpose and content.

Conclusion:

The South African qualifications follow a system of training for lift maintenance and installation practitioners very similar to that of Australia. The South African qualifications are broadly comparable with the Australian national qualifications in content and scope. Both sets of qualifications require an integration of theoretical learning and workplace experience, and they share a common approach to assessment. The Australian version does not specify fundamental learning or organisational competencies.

This series of qualifications has been structured to meet local practices. In South Africa, qualified practitioners in this field are expected to be equipped with a comprehensive range of skills and knowledge required to both install and maintain lifts, so the qualifications have been designed to meet this need. This contrasts with the situation in many other countries where people are recruited from related trades and then given industry-specific training. It also contrasts with conditions in countries where union resistance to multi-skilling restricts the breadth of training.

The qualifications being submitted include the contents of the long standing and internationally well regarded trade qualification and have been extended to align with NQF requirements. The well established base of expertise and experience that has been built up in South Africa to develop the skills required for lift and escalator maintenance and installation is now being reflected in these qualifications.

References:

Southeast Asia, Korea, China, Japan

- www.kesi.or.kr
- www.hyundaielevator.co.kr
- www.hitachi.co.jp

Europe and United Kingdom

- berufenet.arbeitsagentur.de/bnet2/K/B27 10101alternat–t.html
- http://w.learndirect-advice.co.uk
- www.stannah.com/passengerlifts/

Australia and New Zealand

- National Training Information Service www.ntis.gov.au/

- ElectroComms and Energy Utilities Industry Skills Council www.ee-oz.com.au
- Australian National Training Authority (ANTA) www.anta.gov.au/
- Department of Science, Education and Training (DEST) www.dest.gov.au/
- www.nzqa.govt.nz/

Canada and the USA

- www.itabc.ca/
- www.bls.gov/oco/ocos189.htm
- http://www.naec.org
- www.umsl.edu/services/govdocs
- www.asme.org/education/incomp/courseoptelev.htm

ARTICULATION OPTIONS

This qualification articulates vertically and horizontally with the following qualifications:

The qualification articulates horizontally with:

- National Certificate: Engineering and Related Design: NQF Level 3, ID: **22423.**
- National Certificate: Measurement, Control and Instrumentation: NQF Level 3, ID: **48696.**

The qualification articulates vertically with:

- National Certificate: Engineering and Related Design: NQF Level **4,** ID: **22424.**

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.

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CRITERIA FOR THE REGISTRATION OF ASSESSORS

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

- A minimum of **2 (two)** years' practical, relevant occupational experience in administration.
- To be declared competent in all the outcomes of the National Assessor Unit Standards as stipulated by South African Qualifications Authority. (SAQA)

NOTES

N/A

UNIT STANDARDS

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Core	116652	Fault find and repair an elevator	Level 3	5
Core	243778	Perform routine maintenance on lift equipment	Level 3	18
Core	243768	Install main lift components	Level 3	15
Core	243775	Install or replace lift roping systems	Level 3	7
Core	12456	Explain and use organisational procedures	Level 3	6
Core	116714	Lead a team, plan, allocate and assess their work	Level 3	4
Core	13136	Install, test, maintain and commission basic electrical circuits	Level 2	16
Core	10281	Connect and commission a three-phase direct on line motor control system	Level 3	6
Core	10618	Terminate and connect a low voltage cable to a source of supply	Level 2	3
Core	13283	Maintain bearings in machines and equipment	Level 3	8
Elective	243766	Install escalators	Level 3	8
Elective	9268	Manage basic personal finance	Level 2	6
Elective	10270	Construct Basic Electronic Circuits	Level 3	4
Elective	117877	Perform one-to-one training on the job	Level 3	4
Elective	12455	Perform the role of a safety, health and environmental protection representative	Level 3	4
Elective	10624	Install a lighting system	Level 2	4
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	119465	Write/present/sign texts for a range of communicative contexts	Level 3	5
Fundamental	119467	Use language and communication in occupational learning programmes	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	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

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

further *Education and Training Certificate:* Lift *Installation and Maintenance*

SAQA QUAL ID	***QUALIFICATION TITLE***		
58275	Further Education and Training Certificate: Lift Installation and Maintenance		
SGB		***PROVIDER***	
SGB Manufacturing and Assembly Processes			
ETQA			
QUALIFICATION TYPE	***FIELD***	***SUBFIELD***	
Further Ed and Training Cert	***6*** - Manufacturing, Engineering and Technology	Manufacturing and Assembly	
ABET BAND	***MINIMUM CREDITS***	***NQF LEVEL***	***QUAL CLASS***
Undefined	147	Level 4	Regular-Unit Stds Based
STATUS	***NUMBER***	***STARTDATE***	***END DATE***
Draft - Prep for P			

PURPOSE AND RATIONALE OF THE QUALIFICATION

Purpose:

The purpose of this qualification is to equip learners with the skills, knowledge and values to operate effectively within the lift and escalator installation and maintenance industry. Learners achieving this qualification will be able to:

- Perform activities associated with the installation of lift systems.
- Ensure the correct operation of lift components.
- Communicate information and maintain records and documentation.
- Coordinate the activities of a team.

If the relevant elective is chosen, the learner will also be equipped to maintain escalators.

Qualifying learners will be able to relate what they see and experience to scientific and technological principles and concepts. They will also understand how they should operate within the legislation, regulations, agreements and policies which govern their workplace.

The core technical skills and knowledge described in this qualification relate to lifts; a learner may also elect to include technical skills and knowledge related to the maintenance of escalators.

This qualification also forms the basis for further learning in accordance with the individual's chosen career path. This could include attaining qualifications such as:

- 49061: National Certificate: Master Craftsmanship (Electrical), NQF Level **5.**
- 49511: National Certificate: Lift inspection, NQF Level 5.
- 23656: Further Education and Training Certificate: Management, NQF Level **4.**

This qualification will contribute to social upliftment and development by allowing employees who previously did not qualify to become apprentices to gain recognition for their skills and knowledge through the recognition of prior learning. This qualification will also contribute to broad-based black economic empowerment initiatives, especially by the opportunities it affords for small business initiatives.

Rationale:

This is the last in a series of three related qualifications for the installation and maintenance of lifts and escalators which together replace a legacy qualification for the trade of lift mechanic.

These qualifications provide a developmental pathway for the full range of lift and escalator installation and maintenance activities. In terms of statutory requirements, only a competent person may maintain or install elevators and escalators. Learners who achieve this qualification and who acquire the specified work experience will be able to attain the status of competent person.

Qualifying learners would typically maintain the operating conditions of lifts and escalators, diagnose and respond to faults and safely install new components and equipment. They would perform a range of tasks autonomously in association with a competent person (until attaining this status themselves). This role represents a recognised position in the organisation.

This qualification series begins with the National Certificate in Lift Installation and Maintenance: NQF Level 2. Typical learners would already have achieved the National Certificate in Lift Installation and Maintenance: NQF Level 3.

Further career development alternatives after NQF Level 4 would be based on choices relating to the learner's aspirations. Options include:

- Entrepreneurial activities (starting own business).
- General or technical management.
- Quality management including compliance inspections.
- Advanced lift or escalator technology.

This qualification recognises skills, knowledge and values relevant to a workplace and requires workplace experience. It is designed for learners who engage actively in installation and maintenance activities. It is suitable for learners who:

- Attend courses and then apply the knowledge gained to activities in the workplace (Portfolio to reflect formative assessment), or
- Are already workers and have acquired the skills and knowledge without attending formal courses (RPL can be done through the summative assessment and portfolio of evidence), or
- Participate in skills programmes and have the appropriate work experience, or
- Are part of a learnership programme which integrates structured learning and work experience, or
- Acquire their learning through any combination of the above.

The outcomes of this qualification combine skills and knowledge in the technical, inter-personal and business spheres. Qualifying learners will be able to perform the operational aspects of the work, function within a team context and contribute to value-adding processes within the organisation.

This qualification leads to an occupation which benefits society and the economy. It will contribute to the development of skilled employees and thus to ensuring safety and efficiency in the operation of lifts and escalators. It also emphasises the learner's role in conserving resources, in behaving responsibly towards the environment in general, and in observing all

legal requirements. It will also assist the industry to meet equity targets and will contribute to the establishment of small and medium sized enterprises.

This qualification will help achieve the objectives of the National Qualifications Framework as it will contribute to the full development of the learner and provide recognition for skills and knowledge achieved, thereby forming the basis for further advancement in the occupation. It will also provide a basis for further mobility and transportability across other sectors of the economy as it recognises skills and knowledge that are applicable to various other sectors.

RECOGNIZE PREVIOUS LEARNING?
Y

LEARNING ASSUMED TO BE IN PLACE
The following competencies are assumed for a learner embarking on this qualification:

- Communication and Literacy, NQF Level 3.
- Mathematical Literacy, NQF Level 3.

In addition, learners are assumed to have the following skills and the relevant experience at NQF Level 3 in the context of the lift and escalator installation and maintenance industry:

- Perform inspection and repair of lift equipment and components.
- Perform routine maintenance and solve problems on lift equipment and components.
- Communicate with peers, supervisors, customers and the public.
- Install a range of lift components and associated equipment.

These skills and the relevant work experience form the basis for determining the credit allocation in this qualification. If a learner does not have such experience, the learning time will be increased. The allocation of credits is also based on the assumption that the learner will be working towards this qualification as part of a learning programme which integrates the unit standards.

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 should be provided to assist the learner in the process of developing a portfolio. The guidelines for integrated assessment should be used to develop the RPL assessment process. As with integrated assessment, 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.

Access to the qualification:

There is open access to this qualification. A workplace is, however, a prerequisite to obtaining the relevant work experience and evidence required for the assessment of the Exit Level Outcomes.

QUALIFICATION RULES
Level, credits and learning components assigned to the qualification:

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

The qualification is made up of Unit Standards that are classified as Fundamental, Core and Elective. A minimum of 147 credits is required to complete the qualification.

In this qualification the credits are allocated as follows:

- Fundamental: 56 credits.
- Core: 79 credits.
- Electives: 12 credits.
- Total: 147 credits.

Motivation for number of credits assigned to Fundamental, Core and Elective:

- Fundamental Component:

The Fundamental component consists of Unit Standards to the value of fifty-six (56) credits. Twenty credits are allocated to Communication in a First Language and twenty credits in Communication in a Second Language. The Unit Standards for Communication in the Second South African Language are to be chosen from the following official languages: English. Sepedi, Sesotho, Setswana, siSwati, Tshivenda, Xitsonga, Afrikaans, isiNdebele, isiXhosa, IsiZulu and sign language. The Second Language implies a language other than the language of instruction of, or the language taken as the First Language for this Qualification. The selection of the Second Official Language should be based on the language(s) of the people to whom the Learner is most likely to deliver a service.

Sixteen credits in Mathematical Literacy have been included in the Fundamental Component.

All the Unit Standards in the fundamental section are compulsory.

- Core Component:

Seventy-nine (79) credits have been allocated to unit standards in the Core component of this qualification. The unit standards classified as Core describe the maintain motors, gearboxes, diagnose lift system faults and maintaining and repairing faults on lift systems. The unit standards encourage application of knowledge and skills in real situations.

All Unit standards are compulsory.

- Elective Component:

In the Elective component there are unit standards totalling seventy-three (73) credits. Learners are required to select Electives that add up to a minimum of twelve (12) credits.

EXIT LEVEL OUTCOMES

1. Perform activities associated with the installation of lift systems.

2. Ensure the correct operation of lift components.

3. Communicate information and maintain records and documentation.

4. Coordinate activities of a team.
- Range: Activities will be performed under supervision of a competent person.

ASSOCIATED ASSESSMENT CRITERIA

1:
- Worksite is prepared correctly for installation of new lift.

o Lift shaft and machine room equipment is aligned according to layout drawing.
o Condition and operation of basic equipment commissioned conforms to manufacturer's specifications and statutory requirements.

2:
o Electrical and mechanical faults are diagnosed and rectified in accordance with manufacturer's specifications.
o Control system faults are diagnosed and rectified in accordance with manufacturer's specifications.
o Range: This will include systems such as relay logic, digital and micro process systems.
• Electrical and mechanical equipment is maintained for safe and efficient operation.
• Safety components are tested for functionality according to statutory requirements.
o Range: Governors, ropes, safety gear, car and landing doors, electrical safety circuits, final limits.

3:
• Records and documentation are up to date, meet statutory requirements and are stored correctly.
• Reports are prepared and presented in accordance with company procedures.
• Relevant information is communicated clearly to customers, users and the team.

4:
o Team objectives are achieved as agreed.
o Team performance is reviewed, problems and issues arising are identified and effective corrective actions are taken.
• Effective application of interpersonal skills is demonstrated.

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

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

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

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

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

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

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The qualifications are based on a clustering of unit of competence, covering a combination of compulsory core and elective units to allow flexibility in meeting training needs of enterprises and individuals. Learning may comprise a wide range of learning methods and programmes, provided that an integration of theoretical learning and workplace experience is achieved. Assessment is workplace based and includes the use of portfolios of evidence.

The Certificate IV in Lift Systems (Electrical) and the Diploma of Lift Systems (Technician) are together relevant for comparison with NQF Level **4.** People gaining the Certificate IV in Lift Systems are able to carry out advanced diagnostics on lifts, escalators and moving walks as well as maintaining operating conditions of that equipment. The learning time is 400 nominal hours.

The Core Units of Competence are as follows:

- Repair electronic circuit faults.
- Repair electronic systems faults.

The Elective Units of Competence are as follows:

- Maintain performance parameters.
- Lift equipment compliance testing.

People gaining the Dipioma of Lift Systems are able to commission and vary the operating conditions of lifts, escalators and moving walks. The learning time is 280 nominal hours.

The competencies are as follows:

- Commission lift systems.
- Write operational reports.
- Modify lift circuits.

The South African qualification includes elements of these competencies, where the scope is restricted and commissioning and modification is undertaken in association with a competent person.

The South African qualifications are thus very similar to the Australian qualifications in terms of purpose and content.

Conclusion:

The South African qualifications follow a system of training for lift maintenance and installation practitioners very similar to that of Australia. The South African qualifications are broadly comparable with the Australian national qualifications in content and scope. Both sets of qualifications require an integration of theoretical learning and warkplace experience, and they share a common approach to assessment. The Australian version does not specify fundamental learning or organisational competencies.

This series of qualifications has been structured to meet local practices. In South Africa, qualified practitioners in this field are expected to be equipped with a comprehensive range of skills and knowledge required to both install and maintain lifts, **so** the qualifications have been designed to meet this need. This contrasts with the situation in many other countries where people are recruited from related trades and then given industry-specific,training. It also contrasts with conditions in countries where union resistance to multi-skilling restricts the breadth of training.

The qualifications being submitted include the contents of the long-standing and internationally well-regarded trade qualification and have been extended to align with **NQF** requirements. The well-established base of expertise and experience that has been built up in South Africa to develop the skills required for lift and escalator maintenance and installation is now being reflected in these qualifications.

References:

- Southeast Asia, Korea, China, Japan:
  - www.kesi.or.kr
  - www.hyundaielevator.co.kr
  - www.hitachi.co.jp

- Europe and United Kingdom:
  - berufenet.arbeitsagentur.de/ bnet2/K/B27 10101alternat–t.html
  - **http://www.learndirect-advice.co.uk**
  - www.stannah.com/passengerlifts/

- Australia and New Zealand:
  - National Training Information Service www.ntis.gov.au/
  - ElectroComms and EnergyUtilities Industry Skills Council www.ee-oz.com.au
  - Australian National Training Authority (ANTA) www.anta.gov.au/
  - Department of Science, Education and Training (DEST) www.dest.gov.au/
  - www.nzqa.govt.nz/

- Canada and the USA:
  - www.itabc.ca/
  - www.bls.gov/oco/ocos189.htm
  - http://www.naec.org
  - www.umsl.edu/services/govdocs
  - www.asme.org/education/incomp/courseoptelev.htm

ARTICULATION OPTIONS

This Qualification articulates vertically and horizontally with the following Qualifications:

The qualification articulates horizontally with:

- 22424: National Certificate: Engineering and Related Design: FET Phase, NQF Level 4.

The qualification articulates vertically with:

- 22425: National Certificate: Engineering and Related Design, NQF Level 5.
- 49511: National Certificate: Lift Inspection, NQF Level 5.
- 22435: National Diploma: Engineering and Related Design, NQF Level 5.

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NOTES

N/A

UNIT STANDARDS

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Core	13325	Maintain gearboxes	Level 4	10
Core	243758	Prepare and install templates and plumblines	Level 4	10
Core	243759	Diagnose and respond to lift system faults	Level 4	16
Core	243767	Test and maintain motors and generators within the lift and escalator industry	Level 4	10
Core	243763	Commission lift equipment within scope of competence	Level 4	15
Core	116380	Supervise workers at levels 2 and 3	Level4	6
Core	119257	Produce and maintain work activity reports	Level4	8
Core	13781	Release entrapped passengers from immobile lift	Level4	4
Elective	243778	Perform routine maintenance on lift equipment	Level 3	18
Elective	114589	Manage time productively	Level4	4
Elective	119269	Inspect and test lift well equipment	Level 5	5
Elective	119246	Inspect and test escalator and passenger conveyor	Level 5	12

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
		equipment		
Elective	119270	Inspect and test lift pit equipment	Level 5	3
Elective	13321	Maintain fluid power / pneumatic systems	Level 4	16
Elective	119268	Inspect and test lift machine room equipment	Level 5	15
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	119459	Write/present/sign for a wide range of contexts	Level 4	5
Fundamental	12153	Use the writing process to compose texts required in the business environment	Level 4	5
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	119465	Write/present/sign texts for a range of communicative contexts	Level 3	5
Fundamental	119466	Interpret a variety of literary texts	Level3	5
Fundamental	7468	Use mathematics to investigate and monitor the financial aspects of personal, business, national and international issues	Level 4	6
Fundamental	9015	Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life related problems	Level 4	6
Fundamental	9016	Represent analyse and calculate shape and motion in 2- and 3-dimensional space in different contexts	Level 4	4

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Prepare and install templates and plumblines

SAQA US ID	UNIT STANDARD TITLE		
243758	Prepare and install templates and plumblines		
SGB		PROVIDER	
SGB Manufacturing and Assembly Processes			
FIELD		SUBFIELD	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 4	10
REGISTRATION STATUS	REGISTRATION START DATE	REGISTRATION END DATE	SAQA DECISION NUMBER
Draft - Prep for P Comment			

SPECIFIC OUTCOME 1
Inspect and prepare work area.

SPECIFIC OUTCOME 2
Complete end-of-work activities.

SPECIFIC OUTCOME 3
Position, adjust and secure templates and plumblines.

SPECIFIC OUTCOME 4
Determine requirements from work instructions and layout drawing and prepare for work activities.

SPECIFIC OUTCOME 5
Construct the templates.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Diagnose and respond to lift system faults

SAQA US ID	*UNIT STANDARD TITLE*		
243759	Diagnose and respond to lift system faults		
SGB		*PROVIDER*	
SGB Manufacturing and Assembly Processes			
FIELD		*SUBFIELD*	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 4	16
REGISTRATION STATUS	*REGISTRATION START DATE*	*REGISTRATION END DATE*	*SAQA DECISION NUMBER*
Draft - Prep for P Comment			

SPECIFIC OUTCOME 1
Confirm reported fault with the customer or relevant authority and gather information.

SPECIFIC OUTCOME 2
Plan and prepare work team and work site.

SPECIFIC OUTCOME 3
Identify fault and determine the cause.

SPECIFIC OUTCOME 4
Take corrective action.

SPECIFIC OUTCOME 5
Test and monitor operation of lift and return lift to service.

SPECIFIC OUTCOME 6
Record and report findings and outcomes.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Perform simple alignment and positioning of lift components

SAQA US ID	***UNIT STANDARD TITLE***		
243760	Perform simple alignment and positioning of lift components		
SGB		***PROVIDER***	
SGB Manufacturing and Assembly Processes			
FIELD		***SUBFIELD***	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
ABET BAND	***UNIT STANDARD TYPE***	***NQF LEVEL***	***CREDITS***
Undefined	Regular	Level 2	4
REGISTRATION STATUS	***REGISTRATION START DATE***	***REGISTRATION END DATE***	***SAQA DECISION NUMBER***
Draft - Prep for P Comment			

SPECIFIC OUTCOME 1
Determine what needs to be done and plan work activity.

SPECIFIC OUTCOME 2
Select and use marking out and alignment equipment.

SPECIFIC OUTCOME 3
Mark out all positions and outlines.

SPECIFIC OUTCOME 4
Position, align and secure components.

SPECIFIC OUTCOME 5
Respond to 'what', 'what if and 'why' questions relating to the alignment and positioning of components.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Identify and replace simple mechanical and electrical lift components

SAQA US ID	UNIT STANDARD TITLE		
243761	Identify and replace simple mechanical and electrical lift components		
SGB		PROVIDER	
SGB Manufacturing and Assembly Processes			
FIELD		SUBFIELD	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 2	8
REGISTRATION STATUS	REGISTRATION START DATE	REGISTRATION END DATE	SAQA DECISION NUMBER
Draft - Prep for P Comment			

SPECIFIC OUTCOME 1
Identify components and explain their purpose.

SPECIFIC OUTCOME 2
Interpret work instructions and plan work activity.

SPECIFIC OUTCOME 3
Prepare equipment and worksite for the replacement of components.

SPECIFIC OUTCOME 4
Perform replacement activities.

SPECIFIC OUTCOME 5
Prepare components, equipment and work area for resumption of service.

SPECIFIC OUTCOME 6
Respond to 'what', 'what if and 'why' questions relating to the replacement of omponents.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Commission lift equipment within scope of competence

SAQA US ID	*UNIT STANDARD TITLE*		
243763	Commission lift equipment within scope of competence		
SGB		*PROVIDER*	
SGB Manufacturing and Assembly Processes			
FIELD		*SUBFIELD*	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 4	15
REGISTRATION STATUS	*REGISTRATION START DATE*	*REGISTRATION END DATE*	*SAQA DECISION NUMBER*
Draft - Prep for P Comment			

SPECIFIC OUTCOME 1
Make final adjustments to all equipment and connect electrical cables.

SPECIFIC OUTCOME 2
Check and test the operation of all safety devices.

SPECIFIC OUTCOME 3
Set performance and operating parameters.

SPECIFIC OUTCOME 4
Discuss and explain the requirements of the commissioning documentation and issues related to commissioning.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Install escalators

SAQA US ID	UNITSTANDARD TITLE		
243766	Install escalators		
SGB		PROVIDER	
SGB Manufacturing and Assembly Processes			
FIELD		SUBFIELD	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 3	a
REGISTRATION STATUS	REGISTRATION START DATE	REGISTRATION END DATE	SAQA DECISION NUMBER
Draft - Prep for P			

SPECIFIC OUTCOME 1
Determine work requirements and plan and prepare installation.

SPECIFIC OUTCOME 2
Prepare equipment and worksite for installation.

SPECIFIC OUTCOME 3
Position, align and secure escalator

SPECIFIC OUTCOME 4
Complete installation activities.

SPECIFIC OUTCOME 5
Record information related to installation and report and discuss issues related to the installation process.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Test and maintain motors and generators within the lift and escalator industry

SAQA US ID	*UNIT STANDARD TITLE*		
243767	Test and maintain motors and generators within the lift and escalator industry		
SGB		*PROVIDER*	
SGB Manufacturing and Assembly Processes			
FIELD		*SUBFIELD*	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 4	10
REGISTRATION STATUS	*REGISTRATION START DATE*	*REGISTRATION END DATE*	*SAQA DECISION NUMBER*
Draft - Prep for P Comment			

SPECIFIC OUTCOME 1
Prepare to test and maintain an AC motor and DC motors and generators.

SPECIFIC OUTCOME 2
Check for faults and locate defects.

SPECIFIC OUTCOME 3
Ensure the operation of the motor or generator is in accordance with the design specifications.

SPECIFIC OUTCOME 4
Complete the repair and maintenance tasks.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Install main lift components

SAQA US ID	*UNIT STANDARD TITLE*		
243768	Install main lift components		
SGB		*PROVIDER*	
SGB Manufacturing and Assembly Processes			
FIELD		*SUBFIELD*	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level **3**	**15**
REGISTRATION STATUS	*REGISTRATION START DATE*	*REGISTRATION END DATE*	*SAQA DECISION NUMBER*
Draft - Prep for P Comment			

SPECIFIC OUTCOME 1
Interpret installation instructions and plan and prepare for the activities.

SPECIFIC OUTCOME 2
Prepare equipment and worksite for installation.

SPECIFIC OUTCOME 3
Install lift components.

SPECIFIC OUTCOME 4
Inspect, adjust and secure components.

SPECIFIC OUTCOME 5
Record information related to installation and report and discuss issues related *to* the installation process.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Install or replace lift roping systems

SAQA US ID	*UNIT STANDARD TITLE*		
243775	Install or replace lift roping systems		
SGB		*PROVIDER*	
SGB Manufacturing and Assembly Processes			
FIELD		*SUBFIELD*	
6 - Manufacturing, Engineering and Technology		Engineering and Related Design	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	7
REGISTRATION STATUS	*REGISTRATION START DATE*	*REGISTRATION END DATE*	*SAQA DECISION NUMBER*
Draft - Prep for P Comment			

SPECIFIC OUTCOME 1
Determine requirements from work instructions and drawing.

SPECIFIC OUTCOME 2
Prepare worksite and resources.

SPECIFIC OUTCOME 3
Position components.

SPECIFIC OUTCOME 4
Install or replace roping system.

SPECIFIC OUTCOME 5
Record, report and discuss issues related to installation or lacement **of** roping systems.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Perform routine maintenance on lift equipment

SAQA US ID	*UNIT STANDARD TITLE*		
243778	Perform routine maintenance on lift equipment		
SGB		*PROVIDER*	
SGB Manufacturing and Assembly Processes			
FIELD		*SUBFIELD*	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 3	18
REGISTRATION STATUS	*REGISTRATION START DATE*	*REGISTRATION END DATE*	*SAQA DECISION NUMBER*
Draft - Prep for Comment	P		

SPECIFIC OUTCOME 1
Determine maintenance requirements and plan maintenance activities.

SPECIFIC OUTCOME 2
Prepare site and equipment for maintenance.

SPECIFIC OUTCOME 3
Test safety devices.

SPECIFIC OUTCOME 4
Perform routine maintenance on lift components and machinery.

SPECIFIC OUTCOME 5
Record, report and discuss issues related to routine maintenance.