No. 218 **2 March 2009**

SOUTH AFRICAN QUALIFICATIONS AUTHORITY (SAQA)

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

Building Construction

registered by Organising Field 12 – Physical Planning and Construction, publishes the following Qualifications and Unit Standards for public comment.

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

Comment on the Qualifications and Unit Standards should reach SAQA at the address below and ***no later than 2 April 2009.*** All correspondence should be marked **Standards Setting – SGB for Building Construction** and addressed to

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SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:
National Certificate: Glazing

SAQA QUAL ID	***QUALIFICATION TITLE***		
65769	National Certificate: Glazing		
ORIGINATOR		***PROVIDER***	
SGB Building Construction			
QUALIFICATION TYPE	***FIELD***	***SUBFIELD***	
National Certificate	12 - Physical Planning and Construction	Building Construction	
ABET BAND	***MINIMUM CREDITS***	***NQF LEVEL***	***QUAL CLASS***
Undefined	138	Level 2	Regular-Unit Stds Based

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

PURPOSE AND RATIONALE OF THE QUALIFICATION
Purpose:

This Qualification is for any individual who is, or wishes to be, involved as a glazier in the glazing sector. The Qualification contains all the competencies, skills and values required by a learner who may wish to work towards becoming a fully qualified and recognised glazier. In addition, the learner will need to comply with South African National Standards (SANS) and industry regulations.

The core component of the National Certificate: Glazing at NQF Level 2 contains competencies that help the learner install a range of glazing systems which could be broadly categorised as follows:

> Casements.
> Folding doors.
> Shop fronts.
> Sliding folding systems.
> Shower doors.
> Sliding doors and windows.
> Steel and wood systems.

The core component consists of competencies in:

> Installing and testing of the glazing systems described above.
> Handling, cutting and processing glass.
> Basic First Aid.
> Health and Safety.
> HIV/Aids.
> The use of scaffolding and harnesses.
> Ethics.
> Customer service.
> Establishing a small business.
> Reading and interpreting installation drawings and specifications.

> Using and maintaining hand and power tools and equipment.

The Elective component allows for the acquisition of entrepreneurial competencies so that the glaziers could set-up a business of their own or deepen understanding of aspects in construction.

Learners working towards this Qualification will find that the acquisition of competencies in the Unit Standards, which make up the Qualification, add value to their conceptual understanding of the field and their work performance. This Qualification is intended to enhance the provision of service within the glazing sector.

The Qualification will facilitate access to, and mobility and progression within, education and training for learners who:

> Were previously disadvantaged.
> Have worked in this field for many years, but have no formal Qualification and would like to achieve this Qualification through the process of Recognition of Prior Learning (RPL) and/or formal study.
> Wish to extend their range of skills and knowledge and hence their competencies in glazing environment.

The intention of this Qualification is to:

> Promote the development of knowledge, skills and values that are required for service excellence within the glazing field.
> Release the potential of people.
> Provide opportunities for people to explore different activities within the glazing sector.

Rationale:

There is a significant demand for highly qualified glaziers mainly in the construction field as the state and the private sector embark on or roll out huge projects like the expanded public works programme, for example. There is currently a significant amount of construction going on like the football stadiums for 2010. All these projects generate work and create opportunities for glaziers. There is also a large demand at the residential level. In fact, most glaziers, running a small business, will probably be occupied doing glazing work in residential areas. Hence, glaziers make a significant contribution to the economy and the need to have fully qualified glaziers becomes increasingly important. This emphasises the need for this qualification.

This qualification is directed at an individual who will focus solely on the planning and installation of the glazing systems, at times under the supervision of a supervisor.

It will be in the interest of the country as a whole to ultimately have quality glaziers who are trained according to this Qualification in order to improve productivity, efficiency and effectiveness.

Currently there are no national Qualifications for these learners at this level. Learners tend to enter the field by acquiring work experience with a glazing company.

The National Certificate: Glazing, NQF Level 2 is the first Qualification in the suite of qualifications for this sector. In terms of a learning pathway the learner will be able to pursue the National Certificate: Glass Forming, NQF Level 3 on completion of this qualification.

The National Certificate: Glazing, NQF Level 2 supports the objectives of the NQF in that it gives the learner access to a registered Qualification. It will ensure that the quality of education and training in the glazing sector is enhanced and of a world-class standard. The Qualification will

allow learners not only to develop their knowledge and skills in the glazing field but will also enable them to benchmark their competence against international standards.

RECOGNIZE PREVIOUS LEARNING?
Y

LEARNING ASSUMED IN PLACE
Learners wishing to study towards this Qualification are assumed to have:

> Mathematical Literacy at NQF Level 1.
> Communication at NQF Level 1.

Recognition of Prior Learning:

The structure of this Unit Standard-based Qualification makes the recognition of prior learning (RPL) possible, if the learner is able to demonstrate competence in the knowledge, skills, values and attitudes implicit in this Qualification.

Learners who already work in the glazing sector and who believe that they possess the competencies to enable them to meet all of the outcomes listed in the Unit Standards will be able to present themselves for assessment against the Unit Standards of their choice. A range of assessment tools and techniques should be used which have been jointly decided upon by the learner and the assessor. Such procedures, and the assessment of individual cases, are subject to moderation by independent assessors. The same principles that apply to assessment of this Qualification also apply to recognition of prior learning.

Once found competent, these learners will be certified as competent and credited accordingly. Recognition of Prior Learning can also be conducted for these learners at Qualification level, by means of Integrated Assessment.

RPL will allow for accelerated access to further learning and gaining of credits towards the Qualification. All RPL ought to be carried out by the provider in agreement with the relevant ETQA or another ETQA that has a Memorandum of Understanding in place with the relevant ETQA.

RPL is particularly important, as there are people in the profession with a variety of Qualifications of differing quality and scope. It is important that an RPL process be available to assist in making sense of existing Qualifications, and helping to standardise Qualifications towards a common standard.

Access to the Qualification:

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

QUALIFICATION RULES
A minimum of credits is required to complete the Qualification which is made up of the following components:

> Fundamental: 36 credits.
> Core: 94 credits.
> Electives: 8 credits.

Total: 138 credits.

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

Fundamental Component:

There are 36 credits allocated to this component at the level of the Qualification. These constitute Communication and Mathematical Literacy skills. All the Unit Standards designated as Fundamental are compulsory.

Core Component:

94 credits have been allocated to Unit Standards designated as Core for the purpose of this Qualification. These Unit Standards provide the generic knowledge and skills related to Glazing in general, issues that have been highlighted in the Purpose Statement.

All the Unit Standards indicated as Core are compulsory.

Elective Component:

Learners are to choose Elective unit standards that give a minimum of 8 credits.

These Elective Unit Standards provide opportunities for the holistic development of the learner and allow for maximum flexibility and multi-skilling to enable the learners to achieve a Qualification that is relevant to the context in which they work.

EXIT LEVEL OUTCOMES

1. Explain and apply knowledge of health and safety as it pertains to installation of glazing systems.

2. Apply knowledge of scaffolding and fall arrest in installation of installation of glazing systems.

3. Explain the importance of developing an ethical framework and providing good customer service within the glazing sector.

4. Install a glazing system.

Critical Cross-Field Outcomes:

Identify and solve problems in which responses display that responsible decisions using critical and creative thinking have been made when:

> Selecting and using appropriate tools and equipment to glaze and install systems.
> Identifying potential hazards and dealing with them.
> Erecting and dismantling a system scaffold with ladder access taking into consideration physical conditions.
> Handling and storing glass.
> Cutting and processing glass.
> Solving problems related to glazing and installation.
> Use and performance of basic rescues for fall arrest systems.
> Dealing with ethical dilemmas.
> Resolving customer queries.

Work effectively with others as a member of a team, group, organisation, community to:

> Install the glazing system through correct application of glazing principles.

> Ensure the safety of all personnel during installation and follow procedures that apply to illness or injury in the work area.
> Communicate and receive advice from client.
> Erect and dismantle a system scaffold with ladder access.
> Implement fall protection plans.
> Cut and process glass according to job/customer requirements.
> Package and transport glass.

Organise and manage oneself and one's activities responsively and effectively when:

> Reading and interpreting building drawings.
> Identifying, selecting, using appropriate tools and equipment to glaze and install the system.
> Ensuring the safety of all personnel during glazing and installation in accordance with building industry regulations.
> Measuring, cutting glass sizes in preparation for the installation of glazing systems.
> Packaging and transporting glass.
> Handling and storing glass.
> Follow procedures that apply to illness or injury in the work area.
> Installing and using fall arrest systems.
> Endure that all activities take place within an ethical framework.
> Attending to customer queries.

Collect, analyse, organise and critically evaluate information to:

> Prepare for assembly and glazing of identified system.
> Interpret information contained in drawings.
> Resolve problems pertaining to glazing and installation.
> Resolve customer queries.

Communicate effectively using visual, mathematical and/or language skills in the modes of oral and/or written presentation to:

> Issue clear verbal instructions to team members.
> Limit damage to persons or property in the case of an emergency.
> Assemble and check scaffolding and fall arrest equipment and systems.
> Finalise customer preferences and resolve customer queries.

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

> Using the appropriate tools and equipment according to manufacturer's instructions.

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

> Basic first aid techniques are applied to alleviate pain and assistance is requested to treat serious cases.
> Potential hazards in the work area are identified and attended to.
> Damage to persons or property in the case of an emergency is limited through identification of the type of emergencies and responding appropriately.
> Procedures that apply to illness or injury in the work area are applied and a report is prepared to the relevant authority.
> Appropriate safety procedures are followed before, during and after job processes.

Associated Assessment Criteria for Exit Level Outcome 2:

> A system scaffold with ladder access is erected and dismantled according to standard procedure.
> A trestle scaffold is erected and dismantled according to procedure and specifications.
> An extension ladder is erected and dismantled and a step ladder is used according to procedure.
> Basic knowledge of the limitations of a limited range of fall arrest equipment and regulations is demonstrated.
> Fall arrest equipment is inspected, assembled, used according to procedure and stored.
> Pre-installed vertical and horizontal life-lines are used and explained to reduce risks during rescue.

Associated Assessment Criteria for Exit Level Outcome 3:

> Own values and belief systems are reflected in terms of how they influence own behaviour.
> The manner in which an individual can behave ethically in a business context is explained to show how ethical behaviour can impact within and outside of the business.
> Techniques for dealing with situations where own values and ethics conflict with work practice are discussed using case studies.
> The importance of customer service is explained in terms of customer attraction and retention.
> The use of communication skills during interaction with the customer is demonstrated to resolve queries and attend to requests.

Associated Assessment Criteria for Exit Level Outcome 4:

> National Building Regulations and safety legislation are explained and adhered to in order to ensure compliance and safety during the installation.
> The safe handling and use of hand and power tools are applied in accordance with installation requirements.
> Different systems are described to show the variety of systems in each category.
> Glass is measured, handled, cut and processed as per requirements.
> Systems are assembled, glazed, transported, and installed in terms of manufacturer's requirements.
> Work is undertaken with safety, using personal protective clothing, scaffolding and/or harnesses if necessary.
> Building plans are read and interpreted to calculate measurements for glazing.

Integrated Assessment:

The importance of integrated assessment is to confirm that the learner is able to demonstrate applied competence (practical, foundational and reflexive) and ensure that the purpose of this Qualification is achieved. Both formative and summative assessment methods and strategies are used to ensure that the Exit Level Outcomes and the purpose of the Qualification are achieved through the achievement of the Unit Standards. Learning, teaching and assessment are inextricably linked.

Learning and assessment should be integrated and assessment practices must be fair, transparent, valid and reliable. A variety of assessment strategies and approaches must be used. This could include tests, assignments, projects, demonstrations and/or any applicable method. The learner must demonstrate evidence of analytical thinking, problem solving, and integration of theory and practice as deemed appropriate at this level.

Formative assessment is an on-going process which is used to assess the efficacy of the teaching and learning process. It is used to plan appropriate learning experiences to meet the learner's needs. Formative assessments can include a mix of simulated and actual (real) clinical practice or authentic settings. Feedback from assessment informs both teaching and learning. If

the learner has met the assessment criteria of the Unit Standards then s/he has achieved the Exit Level Outcomes of the Qualification.

Summative assessment is concerned with the judgement of the learning in relation to the Unit Standards and consequently of the Exit Level Outcomes of the Qualification. Such judgement must include integrated assessment(s) which test the learners' ability to integrate the larger body of knowledge, skills and attitudes, which are represented by the Unit Standards and the Exit Level Outcomes. Summative assessment can take the form of oral, written and practical examinations as agreed to by the relevant ETQA.

Integrated assessment must be designed to achieve the following:

> An integration of the achievement of the Exit Level Outcomes in a way that reflects a comprehensive approach to learning and shows that the purpose of the Qualification has been achieved.

> Judgement of learner performance to provide evidence of applied competence or capability.

INTERNATIONAL COMPARABILITY
The following countries were chosen:

> Australia.
> United States.
> United Kingdom.
> New Zealand.
> Canada.
> India.
> Japan.
> France.
> Italy.
> Malaysia.
> Botswana.
> Namibia.
> Nigeria.

Australia:

Holmsglen institute offers Technical and Further Education (TAFE) courses. TAFE provides students with practical skills that are transferable to the workplace. Most TAFE courses are based on national competency standards that are set around industry training packages. These packages are designed to produce a nationally consistent curriculum and levels of training so that students receive the same standard of training no matter which TAFE they attend. The following courses in glazing, closely resemble this Qualification.

Certificate III in Glass and Glazing:

> Description: This course provides comprehensive training for Glass and Glazing apprentices in all practical and theoretical aspects of the glass and glazing industry.
> Qualification and Recognition: Upon successful completion of their Apprenticeship, students are eligible to receive the Certificate III in Glass and Glazing.
> Job Prospects: Career opportunities for graduates of this course are excellent and include work as domestic or commercial glaziers, cutters or bevellers. There are opportunities for self-employment or for employment with a range of leading organisations.
> Who Can Apply: Individuals who have a current training agreement with a registered employer from the industry, and who need to commence their Apprenticeship training.

> Course Length: Glass and Glazing Apprentices attend classes for 7 x 1 week blocks in their first two years, and 6 x 1 week blocks in their third year, a total of 800 hours training.
> Course Structure: This program is delivered in Holmesglen's specially designed facilities, where an emphasis is placed on providing hands-on, practical training wherever possible. To successfully achieve the Certificate III in Glass and Glazing, students must complete all modules. The course is designed to meet the requirements of the Glass and Glazing Industry.
> Assessment: Assessment is based on competency, that is the ability to demonstrate specific skills, and is undertaken through a combination of observation, discussion, written assignments, tests, and/or practical application and work related projects.

Certificate II in Glass and Glazing:

> Description: The Certificate II in Glass & Glazing allows students already employed in the industry to further their skills and gain qualifications in a broad range of skills required by the industry.
> Qualification and Recognition: Upon successful completion, students are eligible to receive the Certificate II in Glass and Glazing.
> Job Prospects: Glass and Glazing is a nationally recognised trade, and offers students a range of exciting career opportunities for young people across the commercial and domestic glazing.
> Flat Glass workers carry out various interesting tasks with flat or sheet glass, across a wide range of industries such as construction, automotive and furnishing. Achieving certification can further the career of someone already employed by the industry.
> Who Can Apply: Individuals seeking to develop the skills required in the industry, or to achieve the certification of skills they have already gained through employment.
> Course Length: The total hours of training required for the Certificate II is 391 hours. Training attendance requirements may vary.
> Course Structure: This program is delivered in Holmesglen's specially designed facilities, where an emphasis is placed on providing hands-on, practical training wherever possible. The course is designed to meet the requirements of the Glass & Glazing Industry.

Modules:

> Follow Safe Working Policies and Practices, 40 hours.
> Communicate In The Workplace, 20 hours.
> Carry Out Measurements and Calculations, 20 hours.
> Work Effectively with Others, 15 hours.

> Use Glass and Glazing Sector Hand and Power Tools, 56 hours.
> Apply First Aid, 8 hours.
> Operate Glass Freefall Rack and Table, 8 hours.
> Process Thin Glass by Hand, 64 hours.
> Move Glass Sheets by Hand, 8 hours.
> Move Single Glass Sheets by Mechanical Means, 16 hours.
> Process Glass by Basic Machines, 48 hours.
> Glaze/Reglaze Residential Windows and Doors, 72 hours.
> Move Block/Bulk Glass Sheets by Mechanical Means.

The Canberra institute of Technology offers the following:

Glass and Glazing: Certificate II and III:

> Program Summary: These programs involve glass installation and/or window manufacture and glazing of windows and doors. Some work may cross into the shop and office fit out sector. Areas of study include safe storage and handling of glass, use of machinery, glazing, lead lighting and the fabrication and assembly of metal frames and the installation of mirrors.

Qualifications:

> Certificate III in Glass and Glazing (LMF30602).
> Certificate II in Glass and Glazing (LMF20402).
> Delivery Mode: Certificate III: 4 semesters part-time (approx. 6 hours per week).
> Certificate II: 2 semesters part-time (approx. 6 hours per week).

Job Opportunities: Flat glass worker, glazier.

Subjects: To gain the Certificate III in Glass and Glazing you must successfully complete the following:

Subject; Course No; Title.

Core (complete all):

> Occupational health and safety (1).
> Occupational health and safety (2).
> Materials handling.
> Communications.
> Calculations.
> Workplace environment.
> Working with others.
> Use glass and glazing sector hand and power tools.
> Operate glass freefall rack and table.
> Process thin glass by hand.
> Move glass sheets by hand.
> Process glass by basic machines.
> Glaze/reglaze residential windows and doors.
> Plan reading and specifications 1.
> Plan reading and specifications II.
> Process thick glass by hand.
> Move single glass sheets by mechanical means.
> Fabricate and assemble metal frames.
> Store and handle glass.
> Process glass by semi-automatic and automatic machines.
> Apply patterns and designs to glass.
> Construct and repair leadlight panels.
> Prepare and install mirrors.
> Fabricate and install commercial glazing.
> Conduct commercial and structural glazing.
> Erect and dismantle restricted height scaffolding.

Subjects: To gain the Certificate II in Glass and Glazing you must successfully complete the following.

Core (complete all):

> Occupational health and safety (1).
> Occupational health and safety (2).
> Materials handling.
> Communications.
> Calculations.
> Workplace environment.

> Working with others.
> Use glass and glazing sector hand and power tools.
> Operate glass freefall rack and table.
> Process thin glass by hand.
> Move glass sheets by hand.
> Process glass by basic machines.
> Glaze/reglaze residential windows and doors.

Electives (complete 2):

> Move single glass sheets by mechanical means.
> Fabricate and assemble metal frames.
> Process thick glass by hand.
> Store and handle glass.
> Process glass by semi-automatic and automatic machines.
> Apply patterns and designs to glass.
> Construct and repair leadlight panels.
> Prepare and install mirrors.
> Fabricate and install commercial glazing.
> Conduct commercial and structural glazing.

United States:

According to the Bureau of Labor Statistics of the US Department of Labor most glaziers learn their trade by helping experienced workers, sometimes with supplemental classroom training. A few formal apprenticeship programs are available.

Education and training: Glaziers learn their trade through formal and informal training programs. Usually 3 years of classroom and on-the-job training are required to become a skilled glazier. There are a number of different avenues that one can take to obtain the necessary training. Most glaziers start by obtaining a job with a contractor who then provides on-the-job training. Entry-level workers generally start as helpers, assisting more experienced workers. During this time, employers may send the employee to a trade or vocational school or community college to receive further classroom training.

Some employers offer formal apprenticeships. These programs combine paid on-the-job training with related classroom instruction. Apprenticeship applicants usually must be at least 18 years old and meet local requirements. The length of the program is usually 3 years, but varies with the apprentice's skill. Because the number of apprenticeship programs is limited, however, only a small proportion of glaziers learn their trade through these programs.

On the job, apprentices or helpers often start by carrying glass and cleaning up debris in glass shops. They often practice cutting on discarded glass. Later, they are given an opportunity to cut glass for a job and assist experienced workers on simple installation jobs. By working with experienced glaziers, they eventually acquire the skills of a fully qualified glazier. On the job, they learn to use the tools and equipment of the trade, handle, measure, cut, and install glass and metal framing, cut and fit moldings, and install and balance glass doors. In the classroom, they are taught about glass and installation techniques as well as basic mathematics, blueprint reading and sketching, general construction techniques, safety practices, and first aid.

Licensure: Only the State of Connecticut currently requires glaziers to have a license. In addition to passing a test, workers need education, experience, and an apprenticeship to be licensed. There is a voluntary license in Florida. Other States may require licenses in the future.

Other qualifications: Skills needed to become a glazier include manual dexterity, eye-hand coordination, physical fitness, and a good sense of balance. The ability to solve arithmetic

problems quickly and accurately also is required. In addition, a good work history or military service is viewed favorably by employers.

Certification and advancement. Glaziers who learn the trade through a formal registered apprenticeship program become certified journeyworkers. Some associations offer other certifications.

Advancement for glaziers generally consists of increases in pay, some advance to glazier supervisors, general construction supervisors, independent contractors, or cost estimators.

The National Glass Association, for example, offers a series of written examinations that certify an individual's competency to perform glazier work at three progressively difficult levels of proficiency: Level I Glazier, Level II Commercial Interior or Residential Glazier, or Storefront or Curtainwall Glazier, and Level III Master Glazier.

Description of the courses:

> Glass Installer: Level 1: Many of these competencies overlap with this Qualification. Just the relevant ones have been selected.

First Aid and Workplace Safety:

> Description: What a Hazardous Communication Program is and how it is used, how to administer first aid, avoiding unsafe conditions and acts, and how to safely deal with and use fire and electricity.

Glass Installer Techniques: Part 1 (VIDEO):

> Description: Part 1 discusses parts and assembly of a door frame, door sizes, tempered, laminated and safety glass, and violent weather and glass.

Glass Installer Techniques: Part 2 (VIDEO):

> Description: Part 2 discusses installation of glass in a door, including proper measuring and how to make adjustments.

Glass Installer Techniques: Part 3 (VIDEO):

> Description: Part 3 discusses door openings, door closers, door sweeps, sealants and finishes.

Glass Installer Techniques: Part 4 (VIDEO):

> Description: Part 4 discusses flush glazing systems, including door parts, safety, measuring, materials, installing glass and using suction cups.

Glass Installer Techniques: Part 5 (VIDEO):

> Description: Part 5 discusses cutting glass, including types of cutters, cutting safety, measuring, scoring and breaking glass, and discarding extra glass.

Putty and Adhesives in Glass Installations:

> Description: How to use putty when installing glazing material, the proper way to clean and prepare various surfaces, how to apply primers and how to estimate the required amount of sealant.

Techniques for Sealant Installation:

> Description: Installation requirements and techniques for sealants, why seals fail, proper joint design, glazing with sealants and applying sealants.

Mirrors:

> Description: The proper and safe way to install mirrors, custom mirrors and how to install them, mirror mastic and precautions to take when using it.

Glass Handling Safety (VIDEO):

> This course covers glass handling safety, a concern of everyone that works with or handles glass.

History and Types of Glass:

> Description: Learn about the history of glass, modern glass, types of glass and how they are made, heat-treated glass and glass used for energy codes.
> Glass Installer: Level 2: Residential: Some of these competencies overlap with this Qualification.

Bath Enclosures and Residential Operable Glass:

> Description: The proper way to install glass bath enclosures and residential operable glass windows and doors.

Frameless Shower Doors, Advanced Measuring Techniques: Part 1 (VIDEO):

> Description: Most frameless showers are custom units made to fit the size and configuration of the opening, so it's essential that measurements are precise and conveyed accurately to the fabricator. Part 1 discusses tools - both required and optional, site assessment, laying out the unit and measuring techniques.

Frameless Shower Doors, Advanced Measuring Techniques: Part 2 (VIDEO):

> Description: Frameless shower doors involve angles which must be measured precisely for the glass to fit. Part 2 discusses why angles are so important and how to measure them using a protractor.

Hardware for Glass Doors:

> Description: The name, purpose and installation for various types of hardware used in the glazing industry.

Techniques for Working with Glass:

> Description: Glass cutting including techniques for field scoring and breaking of glass, techniques for drilling glass, notching glass and mirrors and edgework for glass and mirrors.

Hurricane Impact Codes and Testing:

> Description: Discussion of hurricanes, their effects and the new codes and requirements pertaining to glass in at-risk areas.

Glass Installer: Level 2 - Commercial:

Techniques for Working with Glass:

> Description: Glass cutting including techniques for field scoring and breaking of glass, techniques for drilling glass, notching glass and mirrors and edgework for glass and mirrors.

Blueprints:

> Description: The basics of blueprint reading and shop drawings.

Trade Mathematics: Geometry:

> Description: Angles, geometric shapes and area measure, triangles, circles, rise and run, the Pythagorean Theorem and calculating the weight of glass panels.

Glass Handling Equipment:

> Description: How to properly and safely use glass handling equipment such as cutting tables, dollies, sling systems, vacuum cup devices and cranes.

Glass Handling Techniques:

> Description: Proper glass handling techniques for one or two people, what to do if glass is broken or breaks when handling, and how to calculate the weight of glass.

Installation of Basic Glass Systems:

> Description: The do's and don'ts of glass safety, the proper and safe way to do standard installations, flush set installations and enclosed frame installations, and proven techniques for measuring glass.

Storefront vs. Curtain Wall:

> Description: Discussion of the differences, benefits and disadvantages between storefront and curtain walls.

Basic Framing Requirements:

> Description: The proper application and selection of storefront framing systems and appropriate components.

Basics of Entrances:

> Description: Discusses applications, terms, consideration and construction related to aluminum entrances, including various types of hardware and their uses.

Basics of Entrance Hardware:

> Description: Discussion of the three categories of entrance hardware operating hardware, security hardware and accessory hardware.

Hurricane Impact Codes and Testing:

> Description: Discussion of hurricanes, their effects and the new codes and requirements pertaining to glass in at-risk areas.

Commercial Operable Windows and Doors:

> Description: Types of commercial operable windows and glass doors.

Proven Anchors for Metal Framing:

> Description: The types of anchors used for metal fabrication and how to use them properly and safely.

Safety When Working Above Ground Level:

> Description: How to use ladders, scaffolding and man lifts safely.

Rigging and Lifting Safety:

> Description: How to use rigging and hoisting safely, how to correctly tie knots and how to use chain.

Metal Working Equipment:

> Description: The tools used for metal fabrication and how to use them properly and safely.

The Wisconsin Department of Workplace Development provides training for glaziers. They describe the glaziers as being responsible for selecting, cutting, installing, replacing and removing all types of glass. Residential glazing work involves replacing glass in home windows, installing glass mirrors, shower doors and bathtub enclosures, and fitting glass for table tops and display cases. On commercial interior projects, glaziers install items such as heavy, often etched, decorative room dividers or security windows. Glaziers assemble and install metal-framed glass enclosures for showers. They install, cut and remove all window glass, plate and all other types of glass including structural glass, mirror glass, tempered and laminated glass, safety or protection glass, all types of insulating glass units, all plastics or other similar materials when used in place of glass when set or glazed with putty, molding rubber, cement, and all other types of mastic or materials used in place of same. Glazing projects also may involve replacement of storefront windows. Glaziers build metal framework from extrusions and install glass panels or curtain walls in large commercial buildings. They drill, tap, and attach metal hinges, handles, locks and other hardware to commercial aluminum doors.

Tasks:

> Architectural Metal: Fabricate and install frames and framing for store front entrances, curtain wall, sky lights, metal fabrication, closers and operators, hardware application, entrance installation, sash and extrusion installation, facing materials.
> Glazing: Cut, fabricate and install plate glass, insulating units, security glass using tape, putty, vinyl and neoprene, gasket.
> Supporting tasks, including: Mirrors, shower doors, tub enclosures, plastic, application of sealant, residential replacements.
> Installation of: Repair sash and screening, architectural, decorative panel, flashing and ornamental work art, curtain walls, and use of newer modular glazing systems.
> Cut and remove broken glass prior to installing replacement glass.

How the training is structured:

> 4 year training program.

> 6,240 hours on-the-job training.
> 400 hours paid related instruction.
> Apprentices shall take and satisfactorily complete an approved standard first aid course and CPR course during the first 2,000 hours of work and have a current card in order to complete the apprenticeship.
> The apprentice in his/her final year must complete the Transition-To-Trainer Course.

What are the Application Requirements:

> Applicants must be 17 years of age.
> High school diploma or equivalent.
> Meet required norms on aptitude test (if required).
> Physically able to perform trade.
> Valid driver's license or reliable transportation.

United Kingdom:

There is a Level 2 National Vocational Qualification in Glazing. This is very similar to the South African Qualification.

Qualification summary:

This Qualification is aimed at those who work as glaziers, installing glass into frames (eg windows, doors), or those who work to maintain glazing installations (usually opening mechanisms such as for windows and doors). The standards cover the most important aspects of the job. This qualification is at Level 2, and should be taken by those who are fully trained to deal with routine assignments. Candidates should require minimum supervision in undertaking the job.

Qualification details:

Progression:

A Level 3 Technical Certificate is already available from which candidates/achievers can progress.
The new Glazing standards are more reflective of the requirements for NVQ/SVQ qualifications. New entrants or those already employed but not qualified will normally commence at Level 2 and when appropriate move to Level 3. If prior experience is claimed and supporting evidence is acceptable (or a systematic training programme is planned) individuals can register direct onto the Level 3. The glass sector has introduced a Foundation Degree course (that has a route for Glaziers). Some Glaziers can move on to supervisory and/or management positions.

Qualification structure summary:

Candidates must complete all units from either the Glazing (Installation) route or the Glazing (Maintenance) route.

Qualification structure:

> Glazing (Installation).

Mandatory Units for the Glazing (Installation) endorsement. This group represents a pathway.

> Maintain health and safety within the glazing environment.
> Contribute to the work of the glazing team.
> Confirm glazing requirements.

> Transport and handle glazing materials.
> Prepare for glazing work.
> Make safe damaged glass on site.
> Install glass into glazing systems.
> Cut glass for glazing.

> Glazing (Maintenance).

Mandatory units for the Glazing (Maintenance) endorsement. This group represents a pathway.

> Maintain health and safety within the glazing environment.
> Contribute to the work of the glazing team.
> Confirm glazing requirements.
> Transport and handle glazing materials.
> Prepare for glazing work.
> Make safe damaged glass on site.
> Install glass into glazing systems.
> Maintain glazing systems.

An organisation called Glass Training Limited in the UK is the industry training organisation for the glass and related sector. Regarding skills and training, they say that this part of the industry offers opportunities for people who are good at working with their hands, but who can also solve problems and work well as part of a bigger team, often in situations where deadlines may be tight.

The skills involved are those of a very practical nature and learning on the job with experienced workers is a vital part of the training. Glaziers may find it useful to achieve NVQs in Glazing at Levels 2 (described above) and 3.

Glass cutters are usually trained as part of the job, but one may need to be over 21 before one can work with the overhead cranes used for larger glass cutting. Working with smaller companies may not require higher skill levels.

Glass Training Ltd also offers short courses in:

Handling Glass Safely, which consists of:

> Management of health and safety.
> Storage and movement of glass.
> Manual Handling.
> Personal Protective Equipment (PPE).
> Provision and use of work equipment.
> Conducting risk assessments.

Proper Manual Handling, which consists of:

> Reducing risk of injury.
> Duties of employers.
> Duties of employees.
> Risk assessments.
> Lifting techniques.
> Kinaesthetic handling.

Short courses on specific glazing aspects are offered by various companies. For example, Johnsons Windows (UK) Ltd offers a 3 Day Flat Glass Installation Course. There are many others offered by different institutions, too numerous to mention here.

New Zealand:

National Certificate in Glass and Glazing (Introduction) (Level 2) carrying 45 credits. This qualification overlaps in some aspects with the South African qualification.

This qualification is intended for people entering the glazing industry.

The qualification covers the knowledge and skills related to health and safety, customer service, history of glass making, glass industry terminology, primary glass manufacture, glass processes, glass types, glazing materials, glass properties, legislations and standards, glass ordering, pricing materials, documentation, and plastics used in glazing.

As all of the skills and knowledge covered in this qualification are required by people entering the industry, all of the unit standards are compulsory.

This qualification leads to other glass and glazing qualifications, the National Certificate in Glass Processing with an optional strand in Extended Glass Processing Skills [Ref:1103], and the National Certificate in Glazing (Level 4) [Ref:1104].

The following standards are required.

Title; Level; Credit.

> Demonstrate knowledge of workplace health and safety requirements; Level 1; 3 Credits.

Title; Level; Credit.

> Provide customer service in the glass, joinery or joinery related industries; Level 2; 4 Credits.
> Demonstrate knowledge of the history of the glass industry; Level 2; 2 Credits.
> Demonstrate knowledge of glass industry terminology; Level 2; 3 Credits.
> Demonstrate knowledge of primary glass manufacture; Level 2; 2 Credits.
> Demonstrate knowledge of glass processes; Level 2; 3 Credits.
> Demonstrate knowledge of glass types and their application; Level 2; 3 Credits.
> Demonstrate knowledge of glazing materials; Level 2; 2 Credits.
> Demonstrate knowledge of glass properties; Level 3; 4 Credits.
> Demonstrate knowledge of glass ordering requirements; Level 2; 3 Credits.
> Price materials for simple glazing work; Level 2; 4 Credits.
> Demonstrate knowledge of documentation for glazing work; Level 2; 2 Credits.
> Demonstrate knowledge of plastics used in glazing; Level 2; 2 Credits.
> Demonstrate knowledge of the implications of legislation and standards applicable to the glass industry; Level 2; 8 Credits.

The other qualification is the National Certificate in Glass Processing with an optional strand in Extended Glass Processing Skills at Level 3 with 102 credits.

This is a specialist qualification that recognises the skills and knowledge required by those who process glass and glass products in preparation for installation in buildings and related structures. This qualification reflects the technological developments in this industry and the change in focus from flat glass to a diverse range of glass and glass applications.

The electives recognise that not every glass processing workplace uses the entire skill set identified in this qualification. The purpose of the elective group is to enable trainees to gain the

required number of credits by selecting standards which best reflect the work done in their workplace.

This qualification builds on the National Certificate in Glass and Glazing (Introduction) (Level 2) [Ref: 0997]. This qualification shares a number of standards with the National Certificate in Glazing (Level 4) [Ref: 1104].

All the standards listed below are required.

Title; Level; Credit.

> Manage first aid in emergency situations; Level 3; 2 Credits.
> Provide first aid; Level 2; 1 Credit.
> Provide resuscitation Level 2; Level 1; 1 Credit.

Title; Level; Credit.

> Load and unload vehicles used to carry glass, Insulating Glass Units and glazing materials; Level 3; 3 Credits.
> Work safely in the glass and glazing industry; Level 2; 3 Credits.
> Use safe work practices to handle, store and move glass manually; Level 2; 6 Credits.
> Manage glass and glazing materials in a glass and glazing workplace; Level 3; 7 Credits.
> Unload transport containers of glass and glazing materials; Level 3; 2 Credits.
> Pack and unpack stock glass and processed glass; Level 3; 2 Credits.
> Cut 12 mm-25 mm glass to regular shapes manually; Level 3; 4 Credits.
> Cut glass to irregular shapes manually; Level 3; 4 Credits.
> Drill, countersink and notch glass; Level 4; 5 Credits.
> Cut special glasses; Level 3; 5 Credits.
> Cut 2 mm - 10 mm glass to regular shapes manually; Level 3; 3 Credits.
> Edgework glass with edgeworking machines; Level 4; 5 Credits.
> Edgework glass manually; Level 3; 4 Credits.

Elective:

A minimum of 45 credits is required from the following standards.

Title; Level; Credit.

> Process etched glass; Level 4; 5 Credits.
> Process sand blasted glass; Level 4; 5 Credits.
> Process silvered glass; Level 4; 5 Credits.
> Optimise cutting of glass using a computerised optimiser; Level 2; 4 Credits.
> Process clad glass; Level 4; 6 Credits.
> Process laminate glass; Level 4; 7 Credits.
> Process Insulating Glass Units (IGUs); Level 4; 6 Credits.
> Process bent glass; Level 4; 6 Credits.
> Process toughened and heat strengthened glass; Level 4; 8 Credits.
> Use safe work practices to handle glass with overhead mechanical handling systems; Level 3; 4 Credits.
> Load transport containers of glass and glazing materials; Level 3; 2 Credits.
> Cut glass with an automated or semi-automated machine; Level 3; 4 Credits.
> Drill glass with an automated or semi-automated machine; Level 3; 4 Credits.
> Edgework glass with Computer Numerically Controlled (CNC) edgeworking machines; Level 5; 6 Credits.

There is also a Unit Standard on the NZ framework entitled 'Install frameless shower doors and screens at Level 4 and carrying 6 credits.

Canada:

Saskatchewan Apprenticeship & Trade Certification Commission offers the following courses, many of whose competencies are included in this Qualification.

Glassworker: On-the-Job Training Guide:

Glassworkers cut, prepare, fabricate and install glass in residential, commercial and industrial structures, in furniture and in motor vehicles. Training Requirements: 7200 hours (4 years) including: four 6-week training sessions at SAIT in Calgary, Alberta. Apprenticeship training is mutually beneficial to both employer and apprentice. The employer's investment in training apprentices results in skilled and certified workers. The pamphlet summarizes the tasks to be covered by the apprentice during the on-the-job portion of apprenticeship training. An apprentice spends approximately 85% of the apprenticeship term training on-the-job. It is the employer's or journeyperson's training responsibility to supervise an apprentice's practical skills development until a satisfactory level of proficiency has been reached.

Employer Training Responsibility:

> Expose the apprentice to all appropriate tools and materials, and to approved safety practices.
> Provide guided, hands-on training in the techniques and knowledge of the trade o provide training in company policies, procedures and technology.
> Employers should make every effort to expose their apprentices to work experience in as many areas of the trade as possible.

Level One: Theory:

> Glass.
> Glass cutting and shaping.
> Glazing and repair.
> Occupational Health and Safety Regulations.
> Sash and frames.
> Auto glass.
> Customer relations.

The employer can assist the apprentice to achieve these objectives by:

> Providing WHMIS and OH and S training.
> Providing company specific safety training.
> Training in customer relations.
> Ensuring access to printed informational material.
> Introducing National Auto Glass Specifications (NAGS).

Trade Mathematics:

Calculations related to trade practices.

The employer can assist the apprentice to achieve this objective by:

> Training the apprentice in the basic on-the-job calculations.
> Giving the apprentice an opportunity to use mathematical calculations to complete a task.

Blueprint Reading:

> Introduction of drawing instruments.
> Drawing interpretation.

The employer can assist the apprentice to achieve these objectives by:

> Providing shop drawings and assisting with their interpretation.

Practical:

> Glass.
> Explosive actuated tools course.
> Glass cutting and shaping.
> Sash and frames.
> Auto glass.

The employer can assist the apprentice to achieve these objectives by:

> Providing hands-on training in safe glass handling, i.e. suction cups, straps, tie downs, etc.
> Allowing apprentice to assist journeyperson.
> Training in the duties involved with glass cutting and handling in the shop.
> Providing hands-on experience in auto glass installation with supervision.

Level Two: Theory:

> Glass.
> Glazing.
> Glazing compound and sealants.
> Metal work.
> Auto glass.

The employer can assist the apprentice to achieve these objectives by:

> Explaining the proper use of specific types of glass, i.e. tempered, laminate, semi-tempered, wired glass, coated glass.
> Providing metal installation manuals.
> Introducing the proper use of sealants.

Trade Mathematics:

> Calculations.

The employer can assist the apprentice to achieve this objective by:

> Demonstrating the use of mathematical equations specific to job requirements.

Blueprint Reading:

> Blueprints and shop drawings.

The employer can assist the apprentice to achieve this objective by:

> Using shop drawings to interpret window and door locations, door hardware schedules, etc.

Practical:

> Glass.
> Glazing.
> Glazing compounds and sealants.
> Metal work.
> Auto glass.

The employer can assist the apprentice to achieve these objectives by:

> Allowing hands-on opportunities to assist in fabrication and installation of frames and glass.
> Providing hands-on experience in auto glass installation with supervision.

Level Three: Theory:

> Metal work.
> Frames.
> Glass and glazing.

The employer can assist the apprentice to achieve these objectives by:

> Explaining the uses of different extrusions and hardware on job sites.
> Exposure to available glass and metal manufacturing facilities, where available.

Trade Mathematics:

> Calculations.

The employer can assist the apprentice to achieve this objective by:

> Continuing exposure to shop drawing calculations.

Blueprint Reading:

> Blueprint reading and drawings.

The employer can assist the apprentice to achieve this objective by:

> Assisting in training with blueprints on the job.

Practical:

> Frames.
> Glass and glazing.

The employer can assist the apprentice to achieve these objectives by:

> Allowing apprentice to fabricate and install door and window frames, storefronts, hardware, etc with limited supervision.
> Allowing apprentice to install glass and glazing and perform service work.

Level Four: Theory:

> Frames and doors.
> Curtain walls.

> Glass and glazing.
> Skylights and slope glazing.

The employer can assist the apprentice to achieve these objectives by:

> Providing access to job specifications, installation manuals, specification books and wind load charts, and the use of all of the above.
> Training in written communications on the job.

Mathematics:

> Calculations.

The employer can assist the apprentice to achieve this objective by:

> Exposing apprentice to material take off and optimizing training.

Blueprint Reading/Shop Drawing:

> Shop drawing.

The employer can assist the apprentice to achieve this objective by:

Ensuring that the apprentice has a good understanding of blueprints and shop drawings.

Practical:

> Frames and doors.
> Curtain walls.
>Skylights and slope glazing.

The employer can assist the apprentice to achieve these objectives by:

> Allowing a complete range of responsibility for fabrication and installation tasks, i.e. store fronts, curtain walls, skylights and slope glazing, etc.

A search for qualifications/training programmes/courses in India, Japan, France, Italy, Malaysia, Botswana, Namibia and Nigeria yielded very little information.

Conclusion:

This Qualification compares very well with the qualifications from New Zealand, the United Kingdom and the training described in the United States. As far as glazing specific skills are concerned, this Qualification focusses on the installation of various glazing systems while the Level 2 New Zealand qualification focusses mainly on understanding the various aspects pertaining to glass. It also compares very favourably with the Australian Level 2 qualification. ON the whole this Qualification is more comprehensive than all the qualifications and learning programmes/short courses covered in this comparability exercise.

ARTICULATION OPTIONS
Horizontal Articulation:

> ID: 57162: National Certificate: Aluminium Fabrication and Installation, NQF Level 2.
> ID: 49410: National Certificate: Construction, NQF Level 2.
> ID: 24198: National Certificate: Construction Material Manufacturing, NQF Level 2.

Vertical Articulation:

> ID: 57828: National Certificate:Glass Forming, NQF Level 3.
> ID: 63349: National Certificate: Molten Glass Production, NQF Level 3.

MODERATION OPTIONS

> This Qualification and its Unit Standards will be internally assessed and externally moderated by a moderator registered by the relevant accredited ETQA or an ETQA that has a Memorandum of Understanding with the relevant accredited ETQA. Providers should establish or refine existing moderation procedures and systems at their institutions with a view to aligning them with the requirements of the relevant ETQA.

> The learner's performance/results should be moderated by one or more external moderators. Moderators should report not only on the standard of achievement but also on the validity and reliability of the assessment strategies, design and criteria in relation to the Unit Standards and the purpose and Exit Level Outcomes of the Qualification.

> Moderators must be competent at the level of the Qualification and registered with the relevant accredited ETQA to ensure that the standard is consistent. Moderators must also be registered as assessors with the relevant ETQA. A relevant accredited ETQA will monitor and quality assure moderation and assessment according to the guidelines in the Qualification.

> Providers must be accredited to provide this Qualification with the relevant ETQA or ETQA that has a Memorandum of understanding in place with the relevant ETQA.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

> Assessors must be registered as assessors with a relevant accredited ETQA. Providers must also be accredited as providers with a relevant accredited ETQA. Providers will primarily use their own qualified staff as assessors but may, if they wish make use of tutors and/or outside accredited assessors or assessment agencies provided that the provider monitors the process.

> Internal and external assessors must have an appropriate Qualification at least one level above the level of the Qualification and appropriate experience in glazing.

NOTES

N/A

UNIT STANDARDS

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
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	7480	Demonstrate understanding of rational and irrational numbers and number systems	Level 2	3
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/signed communication	Level 2	5
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
Fundamental	119456	Write/present for a defined context	Level 2	5
Core	13159	Care for, select and use hand and measuring tools	Level 1	4

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Core	229998	Explain and perform fall arrest techniques when working at height	Level 1	2
Core	113924	Apply basic business ethics in a work environment	Level 2	2
Core	9964	Apply health and safety to a work area	Level 2	3
Core	114974	Apply the basic skills of customer service	Level 2	2
Core	262669	Assemble and install a casement system	Level 2	10
Core	262688	Assemble and install a shop front system	Level 2	12
Core	262705	Assemble and install a sliding door/window system	Level 2	10
Core	262704	Assemble and install a sliding folding system	Level 2	11
Core	262686	Glaze steel and wood	Level 2	10
Core	262684	Handle, cut and process glass	Level 2	14
Core	9965	Render basic first aid	Level 2	3
Core	10255	Select, use and care for power tools	Level 2	5
Core	9967	Erect, use and dismantle access equipment	Level 3	6
Elective	10007	Identify, analyse and select business opportunities	Level 1	3
Elective	9976	Apply basic business concepts	Level 2	8
Elective	9982	Comply with legal requirements for a construction contract	Level 2	8
Elective	262707	Install a frameless shower door	Level 2	10
Elective	119674	Manage finances for a new venture	Level 2	10
Elective	119670	Produce a business plan for a new venture	Level 2	8
Elective	12463	Understand and deal with HIV/AIDS	Level 2	3

LEARNING PROGRAMMES RECORDED AGAINST THIS QUALIFICATION
None

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Assemble and install a casement system

SAQA US ID	*UNIT STANDARD TITLE*		
262669	Assemble and install a casement system		
ORIGINATOR		*PROVIDER*	
SGB Building Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Building Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 2	10

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

SPECIFIC OUTCOME 1
Prepare for installation of a casement system.

SPECIFIC OUTCOME 2
Assemble the outer frame of the casement system.

SPECIFIC OUTCOME 3
Glaze the casement system.

SPECIFIC OUTCOME 4
Install the casement system.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	65769	National Certificate: Glazing	Level 2

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Handle, cut and process glass

SAQA US ID	*UNIT STANDARD TITLE*		
262684	Handle, cut and process glass		
ORIGINATOR		*PROVIDER*	
SGB Building Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Building Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 2	14

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

SPECIFIC OUTCOME 1
Explain the safety aspects of glass handling.

SPECIFIC OUTCOME 2
Demonstrate knowledge of glass.

SPECIFIC OUTCOME 3
Cut and process glass.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	65769	National Certificate: Glazing	Level 2

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Glaze steel and wood

SAQA US ID	*UNIT STANDARD TITLE*		
262686	Glaze steel and wood		
ORIGINATOR		*PROVIDER*	
SGB Building Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Building Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 2	10

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

SPECIFIC OUTCOME 1
Confirm job/customer requirements for glazing of wood/steel.

SPECIFIC OUTCOME 2
Prepare to replace and glaze steel/wood.

SPECIFIC OUTCOME 3
Glaze steel/wood.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	65769	National Certificate: Glazing	Level 2

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Assemble and install a shop front system

SAQA US ID	*UNIT STANDARD TITLE*		
262688	Assemble and install a shop front system		
ORIGINATOR		*PROVIDER*	
SGB Building Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Building Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 2	12

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

SPECIFIC OUTCOME 1
Prepare for installation of a shop front system.

SPECIFIC OUTCOME 2
Assemble the outer frame of the shop front system.

SPECIFIC OUTCOME 3
Glaze the shop front system.

SPECIFIC OUTCOME 4
Install the shop front system.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	65769	National Certificate: Glazing	Level 2

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Assemble and install a sliding folding system

SAQA US ID	*UNIT STANDARD TITLE*		
262704	Assemble and install a sliding folding system		
ORIGINATOR		*PROVIDER*	
SGB Building Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Building Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 2	11

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

SPECIFIC OUTCOME 1
Prepare for installation of a sliding folding system.

SPECIFIC OUTCOME 2
Assemble the outer frame of the sliding folding system.

SPECIFIC OUTCOME 3
Glaze the sliding folding system.

SPECIFIC OUTCOME 4
Install the sliding folding system.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	65769	National Certificate: Glazing	Level 2

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Assemble and install a sliding door/window system

SAQA US ID	*UNIT STANDARD TITLE*		
262705	Assemble and install a sliding door/window system		
ORIGINATOR		*PROVIDER*	
SGB Building Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Building Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 2	10

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

SPECIFIC OUTCOME 1
Prepare for installation of a sliding system.

SPECIFIC OUTCOME 2
Assemble the outer frame of the sliding system.

SPECIFIC OUTCOME 3
Assemble the sashes/openings of the sliding system in a workshop.

SPECIFIC OUTCOME 4
Install the system.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	65769	National Certificate: Glazing	Level 2

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Install a frameless shower door

SAQA US ID	*UNIT STANDARD TITLE*		
262707	Install a frameless shower door		
ORIGINATOR		*PROVIDER*	
SGB Building Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Building Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 2	10

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

SPECIFIC OUTCOME 1
Confirm job/customer requirements for glazing of wood/steel.

SPECIFIC OUTCOME 2
Prepare for installation of a frameless shower door system.

SPECIFIC OUTCOME 3
Install the frameless shower door system.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	65769	National Certificate: Glazing	Level 2

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:
National Certificate: Waterproofing

SAQA QUAL ID	*QUALIFICATION TITLE*		
65929	National Certificate: Waterproofing		
ORIGINATOR		*PROVIDER*	
SGB Building Construction			
QUALIFICATION TYPE	*FIELD*	*SUBFIELD*	
National Certificate	12 - Physical Planning and Construction	Building Construction	
ABET BAND	*MINIMUM CREDITS*	*NQF LEVEL*	*QUAL CLASS*
Undefined	121	Level 2	Regular-Unit Stds Based

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

PURPOSE AND RATIONALE OF THE QUALIFICATION
Purpose:

This Qualification is for any individual who is, or wishes to be, involved as a waterproofer in the waterproofing sector. The Qualification contains all the competencies, skills and values required by a learner who may wish to work towards becoming a fully qualified and recognised waterproofer. In addition, the learner will need to comply with South African National Standards (SANS) and industry regulations.

Waterproofing primarily involves the following: Various substrates (above ground) like balconies, terraces, parking decks; tanking (below ground) like water retaining structures and reservoirs, retaining walls and excluding swimming pools; and damp proofing including under floor and sold cavity walls. Structures of all descriptions that require waterproofing need to be waterproofed by quality individuals. This will prevent future costs and increase the longevity of such structure.

The National Certificate: Waterproofing at NQF Level 2 contains competencies that help the learner install a range of waterproofing systems which could be broadly:

> Heat-fused waterproofing.
> Reinforced and non-reinforced waterproofing.
> Synthetic waterproofing.
> Self-adhesive waterproofing.

The core component consists of competencies in:

> Installing and testing of the waterproofing systems described above.
> Basic first aid.
> Health and Safety.
> HIV/Aids.
> The use of scaffolding and harnesses.
> Ethics.
> Customer service.
> Reading and interpreting installation drawings and specifications.
> Using and maintaining hand and power tools and equipment.

The Elective component allows for the acquisition of entrepreneurial competencies so that the waterproofer could set-up a business of their own or deepen understanding of aspects in the broad construction industry.

Learners working towards this Qualification will find that the acquisition of competence in the Unit Standards, which make up the Qualification, will add value to their conceptual understanding of the field and their work performance. This Qualification is intended to enhance the provision of service within the waterproofing sector.

The Qualification will facilitate access to, and mobility and progression within, education and training for learners who:

> Were previously disadvantaged.
> Have worked in this field for many years, but have no formal Qualification and would like to achieve this Qualification through the process of Recognition of Prior Learning (RPL) and/or formal study.
> Wish to extend their range of skills and knowledge and hence their competencies in waterproofing environment.

The intention of this Qualification is to:

> Promote the development of knowledge, skills and values that are required for service excellence within the waterproofing field.
> Release the potential of people.
> Provide opportunities for people to explore different activities within the waterproofing sector.

Rationale:

There is a significant demand for highly qualified "waterproofers" mainly in the construction field as the state and the private sector embark on or roll out huge projects like the expanded public works programme and the 2010 soccer stadiums, for example. In addition, the country has a robust construction industry, which demands waterproofing expertise.

This Qualification is directed at an individual who will focus solely on the installation of the waterproofing systems, at times under supervision. It will in the interest of the country as a whole to ultimately have quality waterproofers who are trained according to this Qualification in order to improve productivity, efficiency and effectiveness.

Currently there are no national Qualifications for these learners at this level. Learners tend to enter the field by acquiring work experience with a waterproofing company.

The National Certificate: Waterproofing at NQF Level 2 is the first national Qualification in this sector. In terms of a learning pathway the learner will be able to pursue the National Certificate: Construction Masonry (ID 22671) at NQF Level 3.

The National Certificate: Waterproofing at NQF Level 2 supports the objectives of the NQF in that it gives the learner access to a registered Qualification. It will ensure that the quality of education and training in the waterproofing sector is enhanced and of a world-class standard. The Qualification will allow learners not only to develop their knowledge and skills in the waterproofing field but will also enable them to benchmark their competence against international standards.

RECOGNIZE PREVIOUS LEARNING?
Y

LEARNING ASSUMED IN PLACE

Learners wishing to study towards this Qualification are assumed to have:

> Mathematical literacy at NQF Level 1.
> Communication at NQF Level 1.

Recognition of Prior Learning:

The structure of this Unit Standard-based Qualification makes the recognition of prior learning (RPL) possible, if the learner is able to demonstrate competence in the knowledge, skills, values and attitudes implicit in this Qualification.

Learners who already work in the waterproofing sector and who believe that they possess the competencies to enable them to meet all of the outcomes listed in the Unit Standards will be able to present themselves for assessment against the Unit Standards of their choice. A range of assessment tools and techniques should be used which have been jointly decided upon by the learner and the assessor. Such procedures, and the assessment of individual cases, are subject to moderation by independent assessors. The same principles that apply to assessment of this Qualification also apply to recognition of prior learning. Once found competent, these learners will be certified as competent and credited accordingly. Recognition of Prior Learning can also be conducted for these learners at Qualification level, by means of Integrated Assessment.

RPL will allow for accelerated access to further learning and gaining of credits towards the Qualification. All RPL ought to be carried out by the provider in agreement with the relevant ETQA or another ETQA that has a Memorandum of Understanding in place with the relevant ETQA.

RPL is particularly important, as there are people in the profession with a variety of Qualifications of differing quality and scope. It is important that an RPL process be available to assist in making sense of existing Qualifications, and helping to standardise Qualifications towards a common standard.

Access to the qualification:

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

QUALIFICATION RULES

A minimum of 121 credits is required to complete the Qualification which is made up of the following components:

Fundamental Component:

> There are 36 credits allocated to this component at the level of the Qualification. These constitute Communication and Mathematical Literacy skills. All the Unit Standards designated as Fundamental are compulsory.

Core Component:

> 67 credits have been allocated to Unit Standards designated as Core for the purpose of this Qualification. These Unit Standards provide the generic knowledge and skills related to waterproofing in general, issues that have been highlighted in the Purpose Statement.

All the Unit Standards indicated as Core are compulsory.

Elective Component:

> Electives that add up to a minimum of 18 credits must be completed.

These Elective Unit Standards provide opportunities for the holistic development of the learner and allow for maximum flexibility and multi-skilling to enable the learners to achieve a Qualification that is relevant to the context in which they work.

EXIT LEVEL OUTCOMES

1. Explain and apply knowledge of health and safety as it pertains to installation of waterproofing systems.

2. Apply knowledge of scaffolding and fall arrest in the installation of waterproofing systems.

3. Explain the importance of developing an ethical framework and providing good customer service within the waterproofing sector.

4. Install a waterproofing system.

Critical Cross-field Outcomes:

Identify and solve problems in which responses display that responsible decisions using critical and creative thinking have been made when:

> Selecting and using appropriate tools and equipment to install waterproofing systems.
> Identifying potential hazards and dealing with them.
> Erecting and dismantling a system scaffold with ladder access taking into consideration physical conditions.
> Solving problems related to waterproofing and installation.
> Use and performance of basic rescues for fall arrest systems.
> Dealing with ethical dilemmas.
> Resolving customer queries.
> Engaging with waterproofing problems.

Work effectively with others as a member of a team, group, organisation, community to:

> Install the waterproofing system through correct application of waterproofing principles.
> Ensure the safety of all personnel during installation and follow procedures that apply to illness or injury in the work area.
> Communicate and receive advice from client.
> Erect and dismantle a system scaffold with ladder access.
> Repair the waterproofing problem according to standard procedure.

Organise and manage oneself and one's activities responsively and effectively when:

> Reading and interpreting building drawings.
> Identifying, selecting, using appropriate tools and equipment to install the waterproofing system.
> Ensuring the safety of all personnel during waterproofing and installation in accordance with building industry regulations.
> Installing waterproofing system.
> Meeting customer requirements.
> Ensure that all activities take place within an ethical framework.
> Diagnosing a waterproofing problem to perform repairs.

Collect, analyse, organise and critically evaluate information to:

> Prepare for and install waterproofing system.
> Interpret information contained in drawings.
> Resolve problems pertaining to waterproofing and installation.
> Resolve customer queries.
> Selecting and using the appropriate tools and materials for the task.
> Dealing with health and safety issues.
> Diagnose and solve a waterproofing problem.

Communicate effectively using visual, mathematical and/or language skills in the modes of oral and/or written presentation to:

> Issue clear verbal instructions to team members.
> Limit damage to persons or property in the case of an emergency.
> Assemble and check scaffolding and fall arrest equipment and systems.
> Finalise customer preferences and resolve customer queries.
> Complete waterproofing installation.
> Hand over job to supervisor.

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

> Using the appropriate tools, materials and equipment according to manufacturer's instructions.

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

1.1 Basic first aid techniques are applied to according to first-aid procedures.
1.2 Potential hazards in the work area are identified and attended to according to procedure.
1.3 Damage to persons or property in the case of an emergency is limited through identification of the type of emergencies and responding appropriately according to procedure.
1.4 Illness or injury in the work area is attended to and a report is prepared to the relevant authority according to procedure.
1.5 Safety is adhered to according to safety procedures before, during and after job processes.

Associated Assessment Criteria for Exit Level Outcome 2:

2.1 A system scaffold with ladder access is erected and dismantled according to standard procedure.
2.2 A trestle scaffold is erected and dismantled according to procedure and specifications.
2.3 An extension ladder is erected and dismantled and a step ladder is used according to procedure.
2.4 Basic knowledge of the limitations of a limited range of fall arrest equipment and regulations is demonstrated according to procedure.
2.5 Fall arrest equipment is inspected, assembled, used and stored according to procedure.
2.6 Pre-installed vertical and horizontal life-lines are used and explained to reduce risks during rescue according to procedure.

Associated Assessment Criteria for Exit Level Outcome 3:

3.1 Own values and belief systems are reflected in terms of how they influence own behaviour.
3.2 The manner in which an individual can behave ethically in a business context is explained to show how ethical behaviour can impact within and outside of the business.
3.3 Techniques for dealing with situations where own values and ethics conflict with work practice are discussed using case studies.

3.4 The importance of customer service is explained in terms of customer attraction and retention.
3.5 The use of communication skills during interaction with the customer is demonstrated to resolve queries and attend to requests.

Associated Assessment Criteria for Exit Level Outcome 4:

4.1 National Building Regulations and safety legislation are explained and adhered to in order to ensure compliance and safety during the installation.
4.2 The safe handling and use of hand and power tools are applied in accordance with installation requirements.
4.3 Materials and tools transported, handled and used according to procedure.
4.4 Drawings are read accurately and scope of work is described to ensure completion within time frames.
4.5 Different waterproofing systems are described and their application explained according to manufacturers specifications.
4.6 Work is undertaken with safety, using personal protective clothing, scaffolding and/or harnesses if necessary according to procedure.
4.7 Building plans are read and interpreted to calculate measurements for waterproofing according to procedure.

Integrated Assessment:

The importance of integrated assessment is to confirm that the learner is able to demonstrate applied competence (practical, foundational and reflexive) and ensure that the purpose of this Qualification is achieved. Both formative and summative assessment methods and strategies are used to ensure that the Exit Level Outcomes and the purpose of the Qualification are achieved through the achievement of the Unit Standards. Learning, teaching and assessment are inextricably linked.

Learning and assessment should be integrated and assessment practices must be fair, transparent, valid and reliable. A variety of assessment strategies and approaches must be used. This could include tests, assignments, projects, demonstrations and/or any applicable method. The learner must demonstrate evidence of analytical thinking, problem solving, and integration of theory and practice as deemed appropriate at this level.

Formative assessment is an on-going process which is used to assess the efficacy of the teaching and learning process. It is used to plan appropriate learning experiences to meet the learner's needs. Formative assessments can include a mix of simulated and actual (real) clinical practice or authentic settings. Feedback from assessment informs both teaching and learning. If the learner has met the assessment criteria of the Unit Standards then s/he has achieved the Exit Level Outcomes of the Qualification.

Summative assessment is concerned with the judgement of the learning in relation to the Unit Standards and consequently of the Exit Level Outcomes of the Qualification. Such judgement must include integrated assessment(s) which test the learners' ability to integrate the larger body of knowledge, skills and attitudes, which are represented by the Unit Standards and the Exit Level Outcomes. Summative assessment can take the form of oral, written and practical examinations as agreed to by the relevant ETQA.

Integrated assessment must be designed to achieve the following:

An integration of the achievement of the Exit Level Outcomes in a way that reflects a comprehensive approach to learning and shows that the purpose of the Qualification has been achieved.

Judgement of learner performance to provide evidence of applied competence or capability.

INTERNATIONAL COMPARABILITY
The following countries were chosen based on their best practice:

> Australia.
> United States.
> United Kingdom.
> New Zealand.
> Canada.
> Japan.
> India-very little or no information.
> Qatar-very little or no information.
> Egypt-very little or no information.
> Indonesia-very little or no information.
> Zimbabwe-very little or no information.
> Namibia-very little or no information.
> Botswana-very little or no information.

Australia:

Holmsglen institute offers Technical and Further Education (TAFE) courses. TAFE provides students with practical skills that are transferable to the workplace. Most TAFE courses are based on national competency standards that are set around industry training packages. These packages are designed to produce a nationally consistent curriculum and levels of training so that students receive the same standard of training no matter which TAFE they attend. The following courses in waterproofing, closely resemble this Qualification:

> Certificate III in Waterproofing: General Construction.

This qualification is part of the General Construction Training Package and provides the knowledge and skills for the installation of waterproofing in general construction contexts. The course is suitable for new entrants or persons already working in the industry who require formal on-the-job or off-the-job learning and training.

Subjects:

Core:

> Erect and dismantle restricted height scaffolding.
> Handle waterproofing materials.
> Use waterproofing tools and equipment.
> Prepare for construction process.
> Prepare surfaces for waterproofing application.
> Apply waterproofing process to below ground level wet areas; Apply waterproofing process to internal wet areas; Apply waterproofing to external wet areas.

In general terms, Waterproofing to Wet Areas covers the Theory/Content required to achieve these skills/competencies:

> Fixing of linings.
> Construction of floors.
> Installation of flashings.
> Installation of external trays.
> Installation of internal trays.

> Installation of corner angles.
> Installation of waste pipes.
> Installation of membrane systems.
> Screening and tiling.
> Waterproofing wet areas.
> Structural Backgrounds.
> Lining materials for Wet Areas.
> Waterproofing showers, baths and basins.
> Waterproofing materials and definitions.
> Structural movements.

United States:

A workshop run by SAI Global, an applied information services company, offers training in various competencies.

Waterproofing: AS 3740:

Waterproofing internal wet areas is important to prevent any damage to the structure caused by exposure to water. This workshop is aimed at increasing the awareness of attendees to the requirements of AS 3740.

Waterproofing of wet areas within residential buildings and AS/NZS 4858 Wet area membranes.

Course Outline:

For the first time there is a material testing Standard AS/NZS 4858:

> This categorises membranes into three groups based on their elastic properties. These groups are given different bond breaker requirements in AS 3740.
> The testing includes durability against commonly used cleaning chemicals: Examples of poor performance will be shown.
> The testing includes water vapour transmission requirements for use over particleboard substrates: Graphical representation of how water vapour transition increases moisture content in the substrate will be given.
> AS 3740 now can give bond breaker types against the membrane classification based on its elastic properties.
> As leaking from showers is the main cause of damage in wet areas, the Standard is written around confinement of water within the shower area. The shower is designated as the highest risk area.
> New classifications of levels of risk in wet areas.
> Requirement to waterproof the whole floor area in bathrooms where a timber or a timber derived substrate is used.
> Treatment of door threshold revised to prevent water leakage through doorway where water is allowed to penetrate the tile bed outside the shower area.
> The alternative use of installation of the membrane on top of the tile bed or screed is included.

By the end of this workshop participants will:

> Have an increased awareness of the requirements of AS 3740 Waterproofing of wet areas within residential buildings and AS/NZS 4858 Wet area membranes.
> Understand new calculation methods through practical examples.
> Understand world-first methodologies and outcomes put forward by the Standard.

The following people could attend: Waterproofing contractors, waterproofing manufacturers, builders, architects and regulatory bodies.

The Bay Area Roofing and Waterproofing Joint Apprenticeship Training Committees (J.A.T.C.) based in California offers an apprenticeship program.

The stated purpose of the program is 'to help the apprentice by providing training in the various phases of the roofing and waterproofing industry'. It is a much more extended programme than this Qualification.

The program is a 3 1/2 years (42 months) program. Apprentices must work a minimum of 4,000 hours of on-the-job training and 304 hours of related instruction to reach journeyman status. Apprentices are required to attend instructional classes at the J.A.T.C training center for the duration of their apprenticeship, or until released by the J.A.T.C.

The following aspects are covered:

> Intro to Roofing and Waterproofing Apprenticeship.
> Common Materials.
> Standard First Aid.
> Built-Up Roofing.
> Waterproofing and Damp-proofing.
> Cold Applied and Caulking.

The Wisconsin Department of Workplace Development provides training for waterproofers.

Tasks:

> General tasks, including: loading and unloading materials/equipment for roof/ground level; basic safety procedures of "hot" and roof safety; knowledge of tear-off procedures concerning hand tools such as spud bars, forks, pyne bars and other small hand tools; removal of gravel, felts, insulation and clean-up of area for re-roofing; operation of power equipment used for roof removal and transportation of asphalt to work areas; nailing, plastic and fabric application on flashing and materials used for protection of flashing from ultraviolet rays.

> Comprehensive knowledge of all roofing materials, including: knowledge/heating of asphalts relating to skid kettle work, wheel kettles and transports; primer application for deck preparations; B.U.R. which includes the following: preparation of surface, applications of vapor barriers, when required, insulation application, taper systems, crickets, cants, applying/cutting all types of roofing asphalt and/or pitch membrane, asphalt applications, hand mopping and mechanical; proper applications and knowledge of all roof penetrations such as: curbs, stacks, drain systems (including modified mop applied); distribution of roof gravels.

> Knowledge of Elastomers and Plastimer, including: All categories concerning job preparation as well as application of insulation systems; knowledge of all E.P.D.M. or P.V.C. systems; applying the elastomers or plastimer membrane; application of all detail work, flashing and penetrations; anchoring and terminations, modified system application (torch applied); detail work of modified system.

> Shingling and Waterproofing application, including: all systems involving shingling, tile, slate and other roofing membrane. Any/all waterproofing systems involved on commercial or residential buildings. All work processes, both primary and typical, as listed in Prevailing Wage Code 133, Roofer or Waterproofer. Waterproofing of bridges, roadways, sidewalks, tunnels, retention ponds and parking structures.

As can be seen from the information above, this is a very extended programme compared to this Qualification.

How the training is structured:

> Year training program.
> 6,240 hours on-the-job training.
> 400 hours paid related instruction.
> Apprentices shall take and satisfactorily complete an approved standard first aid course and CPR course during the first 2,000 hours of work and have a current card in order to complete the apprenticeship.
> The apprentice in his/her final year must complete the Transition-To-Trainer Course.

United Kingdom:

There is a Level 2 Applied Waterproof Membranes offered by Newcastle College in the United Kingdom. This is very similar to the South African Qualification.

NVQ 2 Applied Waterproof Membranes Ttgane Construction:

Course Overview:

This one year qualification is recognised as the industry standard entry route to a career in Applied Waterproof Membranes; it is part of the Construction Foundation Modern Apprenticeship framework and can also be assessed via the OSAT route for experienced workers. This qualification is a compulsory component along with the Health & Safety test for candidates applying for their CSCS card.

This course is ideal if you are employed and experienced in this particular sector of the building industry and would like to gain a qualification.

Course Content:

This course involves the assessment of craft skills and job knowledge that are required for work in the construction industry. You will, in association with your assessor, produce a portfolio of your work during the course.

A company in the UK, Safeguard, offers waterproof training in West Sussex. The details are as follow:

> Structural Waterproofing (Tanking, Basement Waterproofing).
> An independent course run by Phil Hewitt of the School of Waterproofing. The course is run over three days and is primarily aimed at people whose work involves the waterproofing and refurbishment of cellars and basements:
> Day 1: Basic Principals of Structural Waterproofing.
> Day 2: Surveying, Quoting, Reporting.
> Day 3: Principals/Application of Cementitious and Cavity Drain Systems.

The British Wood Preserving and Damp-proofing Association (BWPDA), considered to be the leading trade body for this industry and offers a range of training options. This includes the Structural Waterproofing Course, a three day foundation course.

New Zealand:

On the NZQA the following two standards are available:

> Apply waterproofing coatings and membranes at Level 4. This standard covers the following competencies:
> Identify waterproofing coatings and membranes.

> Prepare surfaces for waterproofing coatings and membranes.
> Apply waterproofing coatings and membranes.
> Install a manufactured waterproofing system for tiling to interior wet areas on site at Level 4.
This standard covers the following competencies:
> Select manufactured waterproofing system for wet area interior surfaces.
> Prepare wet area interior surfaces for application of waterproofing system on site.
> Install a waterproofing system on site.
> Complete work operations.

Canada:

Humber College, offers the following course:

Advanced Waterproofing: Course Number: ARC. 016:

A two-day course aimed at the practicing waterproofing consultant or designer and for those just getting into this field. Although the term waterproofing can refer to many segments of a building, this course is limited to plaza decks, terraces, below grade walls, and floor slabs. This course provides a good review or learning experience for those aiming toward the RCI Registered Waterproofing Consultant (RWC) credential.

Highlights of the program include: concepts unique to waterproofing; negative and positive systems including lagging; proper drainage; concrete performance, problems and repair; surface and below grade water management; detailed description of materials and systems unique to waterproofing; vegetative roof design principles; waterproofing specifications and details, and waterproofing case studies.

SOPREMA, an industry leader in the Canadian waterproofing sector, offers the following comprehensive training program: PAQ+S:

This course is for experienced installers and other waterproofing experts who wish to receive more in-depth training on the systems developed by SOPREMA in recent years.

The purpose of the course is to familiarize participants with high performance systems and enable them to refresh their knowledge of elastomeric bitumen membrane installation techniques.

During this course, participants will receive classroom instruction on installation safety precautions, SOPREMA waterproofing materials, and installation techniques. In addition, practical, hands-on exercises will be used to expand their expertise with membrane installation procedures.

This course is the mandatory step for those who wish to apply for Programme of Affiliation for Quality + Safety (PAQ+S) accreditation. In this case, there will be a written exam at the end of the course.

T-02 Beginner:

This course is for apprentice-installers as well as for experienced installers not familiar with basic modified bitumen waterproofing products. It will give installers who have some experience but who have never participated in an official training course the opportunity to review their knowledge and validate the notions they have acquired on the job.

T-03 Cold Applied Systems:

This course is for installers and contractors who wish to familiarize themselves with some elastomeric bitumen weatherproofing products that are applied without a propane torch. The purpose of the course is to provide participants with in-depth knowledge of adhesive based, self-adhesive and mechanically fastened waterproofing systems and ALSAN FLASHING waterproofing coating. During this one-day training course, participants with be given the opportunity through hands-on workshops to practice the application techniques for the various systems.

T-04 Air/Vapour Barrier and Below-Grade Waterproofing:

This course is for installers as well as for consultants who wish to familiarize themselves with the installation of air barriers or below-grade membranes as part of the building envelope. It will give installers who have some experience but who have never participated in an official training course the opportunity to review their knowledge and validate the practices they have acquired on the job.

During this course, participants will receive information on membranes, their properties, work site safety precautions, as well as hands-on training to practice the installation techniques. At the end of the course, participants will have the basic knowledge required to install thermofusible, self-adhesive and liquid membranes.

Japan:

Information on the installation of waterproofing systems is scarce. However, there is a study on 'Waterproofing Systems in Japan' by two academics Kyogi Tanaka, chairman of the building materials and construction committee (including waterproofing technology) at the Architectural Institute of Japan and Dr. Hiroyuki Miyauchi, an assistant professor working at the Tokyo Institute of Technology gives guidelines on problems and installation of waterproofing systems.

A search for qualifications/training programmes/courses in India, Qatar, Egypt, Indonesia, Zimbabwe, Namibia and Botswana yielded very little information.

Conclusion:

This Qualification compares very well with the NVQ Applied Waterproof Membranes at Level 2 from the United Kingdom. It also compares favourably with the Australian Certificate at Level 3. As far as specific skills are concerned, this Qualification focusses on the installation of various waterproofing systems while the Level 2 New Zealand Unit Standards do not focus on waterproofing systems per se but on broad competencies to install any waterproofing system. On the whole, this Qualification is more comprehensive than all the qualifications and learning programmes/short courses covered in this comparability exercise.

ARTICULATION OPTIONS

Horizontal Articulation:

> ID: 49022: National Certificate: Floor Covering Installation Level 2.
> ID: 49410: National Certificate: Construction at Level 2.

Vertical Articulation:

> ID: 65409: National Certificate: Building and Civil Construction. Level 3.

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 must be registered as assessors with a relevant accredited ETQA. Providers must also be accredited as providers with a relevant accredited ETQA. Providers will primarily use their own qualified staff as assessors but may, if they wish make use of tutors and/or outside accredited assessors or assessment agencies provided that the provider monitors the process.

Internal and external assessors must have an appropriate Qualification at least one level above the level of the Qualification or appropriate experience in waterproofing.

NOTES

N/A

UNIT STANDARDS

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
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	7480	Demonstrate understanding of rational and irrational numbers and number systems	Level 2	3
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/signed communication	Level 2	5
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
Fundamental	119456	Write/present for a defined context	Level 2	5
Core	13159	Care for, select and use hand and measuring tools	Level 1	4
Core	229998	Explain and perform fall arrest techniques when working at height	Level 1	2
Core	113924	Apply basic business ethics in a work environment	Level 2	2
Core	9964	Apply health and safety to a work area	Level 2	3
Core	114974	Apply the basic skills of customer service	Level 2	2
Core	262665	Install heat-fused waterproofing system	Level 2	10
Core	262668	Install in-situ reinforced and non-reinforced liquid based	Level 2	10
Core	262666	Install self-adhesive waterproofing system	Level 2	10
Core	262667	Install synthetic waterproofing system	Level 2	10

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Core	9965	Render basic first aid	Level 2	3
Core	10255	Select, use and care for power tools	Level 2	5
Core	261664	Erect, use and dismantle access equipment for construction work	Level 3	6
Elective	10007	Identify, analyse and select business opportunities	Level 1	3
Elective	9976	Apply basic business concepts	Level 2	8
Elective	9982	Comply with legal requirements for a construction contract	Level 2	8
Elective	119672	Manage marketing and selling processes of a new venture	Level 2	7
Elective	262670	Perform repairs to existing/obsolete waterproofing system	Level 2	9
Elective	262671	Perform repairs to redundant waterproofing system	Level 2	9
Elective	119670	Produce a business plan for a new venture	Level 2	8
Elective	12463	Understand and deal with HIV/AIDS	Level 2	3

LEARNING PROGRAMMES RECORDED AGAINST THIS QUALIFICATION
None

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Install heat-fused waterproofing system

SAQA US ID	*UNIT STANDARD TITLE*		
262665	Install heat-fused waterproofing system		
ORIGINATOR		*PROVIDER*	
SGB Building Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Building Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 2	10

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

SPECIFIC OUTCOME 1
Demonstrate understanding of heat-fused waterproofing system.

SPECIFIC OUTCOME 2
Prepare to install heat-fused waterproofing system on surfaces above ground.

SPECIFIC OUTCOME 3
Install heat-fused waterproofing system.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	65929	National Certificate: Waterproofing	Level 2

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Install self-adhesive waterproofing system

SAQA US ID	*UNIT STANDARD TITLE*		
262666	Install self-adhesive waterproofing system		
ORIGINATOR		*PROVIDER*	
SGB Building Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Building Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 2	10

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

SPECIFIC OUTCOME 1
Demonstrate understanding of self-adhesive waterproofing system.

SPECIFIC OUTCOME 2
Prepare to install self-adhesive waterproofing system on surfaces above ground.

SPECIFIC OUTCOME 3
Install self-adhesive waterproofing system.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	65929	National Certificate: Waterproofing	Level 2

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Install synthetic waterproofing system

SAQA US ID	*UNIT STANDARD TITLE*		
262667	Install synthetic waterproofing system		
ORIGINATOR		*PROVIDER*	
SGB Building Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Building Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 2	10

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

SPECIFIC OUTCOME 1
Demonstrate understanding of synthetic waterproofing system.

SPECIFIC OUTCOME 2
Prepare to install synthetic waterproofing system on surfaces above ground.

SPECIFIC OUTCOME 3
Install synthetic waterproofing system.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	65929	National Certificate: Waterproofing	Level 2

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Install in-situ reinforced and non-reinforced liquid based

SAQA US ID	*UNIT STANDARD TITLE*		
262668	Install in-situ reinforced and non-reinforced liquid based		
ORIGINATOR		*PROVIDER*	
SGB Building Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Building Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 2	10

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

SPECIFIC OUTCOME 1
Demonstrate understanding of in-situ reinforced and non-reinforced liquid based waterproofing system.

SPECIFIC OUTCOME 2
Prepare to install in-situ reinforced and non-reinforced liquid based waterproofing system on surfaces above ground.

SPECIFIC OUTCOME 3
Install in-situ reinforced and non-reinforced liquid based waterproofing system.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	65929	National Certificate: Waterproofing	Level 2

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Perform repairs to existing/obsolete waterproofing system

SAQA US ID	*UNIT STANDARD TITLE*		
262670	Perform repairs to existing/obsolete waterproofing system		
ORIGINATOR		*PROVIDER*	
SGB Building Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Building Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 2	9

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

SPECIFIC OUTCOME 1
Determine the nature of the problem.

SPECIFIC OUTCOME 2
Prepare for repairs to existing/obsolete waterproofing system.

SPECIFIC OUTCOME 3
Repair existing/obsolete waterproofing system.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	65929	National Certificate: Waterproofing	Level 2

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Perform repairs to redundant waterproofing system

SAQA US ID	*UNIT STANDARD TITLE*		
262671	Perform repairs to redundant waterproofing system		
ORIGINATOR		*PROVIDER*	
SGB Building Construction			
FIELD		*SUBFIELD*	
12 - Physical Planning and Construction		Building Construction	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 2	9

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

SPECIFIC OUTCOME 1
Determine the nature of the problem.

SPECIFIC OUTCOME 2
Prepare for repairs to redundant waterproofing system.

SPECIFIC OUTCOME 3
Repair redundant waterproofing system.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	65929	National Certificate: Waterproofing	Level 2