

No. 618

23 June 2006

**SOUTH AFRICAN QUALIFICATIONS AUTHORITY (SAQA)**

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

Mining and Minerals

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

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

Comment on the qualification and unit standards should reach **SAQA** at the address *below and no later than 20 July 2006*. All correspondence should be marked **Standards Setting – SGB for Mining and Minerals** and addressed to

The Director: Standards Setting and Development

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DIRECTOR: STANDARDS SETTING AND DEVELOPMENT



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

National Certificate: Rockbreaking: Quarrying

SAQA QUAL ID	QUALIFICATION TITLE		
57121	National Certificate: Rockbreaking: Quarrying		
SGB NAME	ORGANISING FIELD ID	PROVIDER NAME	
SGB Mining and Minerals	6		
QUAL TYPE	ORGANISING FIELD DESCRIPTION	SUBFIELD	
National Certificate	Manufacturing, Engineering and Technology	Fabrication and Extraction	
ABET BAND	MINIMUM CREDITS	NQF LEVEL	QUALIFICATION CLASS
Undefined	160	Level 3	Regular-Unit Stds Based

PURPOSE AND RATIONALE OF THE QUALIFICATION

Purpose:

This qualification will allow a learner in the mining and minerals industry to obtain a nationally recognised qualification in rockbreaking in the areas of quarries and/or dimension stone. It will also contribute to the upliftment of the mining industry and will set a standard for professionalism in the industry. The attainment of this qualification will also attract and retain quality learners and employees. This qualification will also provide for recognition of prior learning to allow for the recognition of existing and common knowledge and skills that will not only allow a learner to gain credits towards this qualification, but also to move across the different occupational areas.

People credited with this qualification are able to:

- > Communicate effectively in the workplace and a variety of other contexts.
- > Apply mathematical principles in practical applications.
- > Handle, transport and store explosives in quarries and dimension stone operations
- > Conduct primary and secondary rockbreaking operations in quarries.

Rationale:

The National Certificate in Rockbreaking (Quarrying) Level 3 is designed to contribute to an effective mining operation, in particular rockbreaking competence in quarries and dimension stone operations.

Persons working in quarry and dimension stone Operations require a sound knowledge of the mining and minerals environment and have the capacity to understand mining operations related to quarrying. While the quarrying industry is increasingly making use of outsourcing (external contractors) to conduct rockbreaking activities, there is nevertheless a requirement for companies to have internal skills as well as ensure that the contractor's employees are competent to carry out primary and secondary rockbreaking. Safe and efficient rockbreaking and associated activities are of paramount importance in the quarrying environment. The skills to be obtained through this qualification would also benefit learners at large as it contributes to workplace readiness.

In the Mining and Minerals sector, employees are appointed on technical knowledge (operations), experience and potential supervisory ability.

The National Certificate in Rockbreaking (Quarrying) Level 3 is designed to meet the needs of learners in the Mining and Minerals sector (or those wish to enter the Mining and minerals sector) who require technical expertise and essential knowledge needed to earn a formal qualification in mining operations. The qualification facilitates access from previously disadvantaged groups and other learners to acquire the technical knowledge and skills that are required.

This qualification will enhance the status, productivity and employability of the learner within the mining and minerals industry as well as contribute to the quality, production rate and growth. This allows for access, progression, portability and mobility within and between the different mining operations areas in the mining and minerals industry.

This qualification provides for both primary and secondary rock breaking in quarries in terms of Chapter 4, Explosives Regulations under the Mines Health and Safety Act

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

It is assumed that learners are already competent in:

- > Communication and Mathematical Literacy at NQF Level 2.
- > The unit standard "Demonstrate knowledge of the most common harmful gases and vapours"; level 1, 1 credit SAQA ID 110118.

Recognition of Prior Learning:

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

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

All such evidence should be judged according to the general principles of assessment described in the note to assessors.

Access to the Qualification:

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

QUALIFICATION RULES

This qualification is made up of a planned combination of learning outcomes that have a defined purpose and will provide the qualifying learners with applied competence and a basis for further learning. The qualification is made up of standards that are classified as Fundamental, Core and Electives for the purpose of this qualification.

Fundamental:

- > All 36 credits are compulsory and must be achieved.

Core:

- > All 74 credits are compulsory and must be achieved.

Electives:

- > 50 credits must be chosen as specified below.

For the specialization stream: Quarries

The following 20 credits must be achieved:

- > Drill small diameter blast holes using a drilling rig and compressor L2, C5; SAQA ID - 230020.
- > Blast materials in quarry operations, L3, C15; SAQA ID - 230012.

An additional 30 credits must be chosen from the rest of the electives to make up a minimum of 160 credits to achieve the qualification.

For the specialization stream: Dimension Stone

The following 40 credits must be achieved.

- > Drill holes for blasting and/or splitting dimension stone blocks L2, C3 - 116632

- > Demonstrate basic understanding of dimension stone geology and mineralogy, L3, C16; SAQA ID - 116627
- > Demonstrate and apply knowledge of dimension stone quality and geology to block extraction L3, C 21; SAQA ID - 230019

An additional 10 credits must be chosen from the rest of the electives to make up a minimum of 160 credits to achieve the qualification.

EXIT LEVEL OUTCOMES

- 1 Communicate effectively in the workplace and a variety of other contexts
- 2 Apply mathematical principles in practical applications.
- 3 Handle, transport and store explosives in quarries and dimension stone operations.
- 4 Conduct rockbreaking operations in quarries.
 - > Range Primary and Secondary rockbreaking

The following Critical Cross Field Outcomes have been addressed in this qualification.

- > Identifying and solving problems in which responses display that responsible decisions using critical thinking have been made
 - > Equivalent Exit Level Outcome 2
- > Working effectively with others as a member of a team, group, organization and community.
 - > Equivalent Exit Level Outcome 1
- > Organising and managing oneself and one's activities responsibly and effectively.
 - > Equivalent Exit Level Outcomes 3, 4.
- > Collecting, analyzing, organizing and critically evaluating information.
 - > Equivalent Exit Level Outcomes 3, 4.
- > Communicating effectively using visual, mathematical and/or language skills.
 - > Equivalent Exit Level Outcomes 1, 2
- > Using science and technology effectively and critically, showing responsibility toward the environment and health of others
 - > Equivalent Exit Level Outcome 2
- > Demonstrating an understanding of the world as a set of related systems by recognizing that problem contexts do not exist in isolation
 - > Equivalent Exit Level Outcome 2

ASSOCIATED ASSESSMENT CRITERIA

- 1
 - > Verbal and written communication is used effectively while performing the tasks related to rockbreaking operations in quarries and dimension stone operations and in other related contexts
 - > Communication skills are used in order to ensure that rockbreaking operations are conducted in accordance with productivity requirements.
2.
 - > Mathematical principles and techniques are applied while performing the tasks related to rockbreaking operations in quarries and dimension stone operations and in other related contexts.
 - > Basic mathematical principles are applied to perform calculations and solve routine problems that occur in the workplace.
3.
 - > Explosives and accessories are handled, transported and stored in accordance with operational requirements.
 - > Safety legislation is understood and complied with during operational activities in accordance with specified requirements.
 - > Occupational Health, Safety and Hygiene requirements are as per workplace requirements.
4.
 - > Marking, drilling and blasting operations are co-ordinated and conducted in quarries in accordance with set standards.
 - > Safety legislation is explained and applied in operational activities in accordance with specified

requirements.

Integrated Assessment:

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

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

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

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

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

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

INTERNATIONAL COMPARABILITY

It was decided to conduct a benchmarking exercise with the following listed countries as their quarrying and mining operational methods are considered world-class. In addition their methods of operation are considered best practice.

- > Australia.
- > The United Kingdom.
- > New Zealand.

It was also considered wise to perform international benchmarking with a country in a similar economic class as South Africa, hence Malaysia was chosen. Furthermore various South African-based organisations conduct quarrying business within Malaysia.

It was prudent to consider educational and training trends within the continent of Africa. Namibia was chosen as a good country to compare this qualification with as many organisations in the sector conduct their business in Namibia.

1. New Zealand - NC in Extractive Industries-(Shotfiring-Surface)

This New Zealand qualification comprises amongst others the following standards:

- > 8890 - Store explosives for use in extractive industries- Level 4, Credits 10.
- > 8907 - Design blasting layouts within quarries and aggregate production areas Level 4, Credits 20.
- > 8918 - Carry out shot-firing operations - Level 3, Credits 12.

Similar outcomes can be found in this qualification.

2. Australia - Certificate III in Extractive Industries Operations

In general this qualification and its component unit standards compare well with this Australian qualification. The only major differences are in formatting and scope of coverage or focus.

3. UK - N/SVQ's Shot firing Operations - Quarries

This qualification contains the following standards:

- > Unit - U1052394 - PR01 - Contribute to an Efficient and Effective Work Environment.
- > Unit - U1052390 - PR02 - Contribute to Health and Safety in the Workplace.
- > Unit - U1053349 - SF3 - Receive, Store and Issue Explosive Materials.
- > Unit - U1053348 - SF4 - Obtain and Transport Explosive Materials.
- > Unit - U1053347 - SF5 - Charge Blast Holes to Specification.
- > Unit - U1053346 - SF6 - Blast to Specification.
- > Unit - U1053345 - SF7 - Deal with Misfires.

Similar outcomes can be found in this qualification.

4

The African benchmark was done with Namibia. Detailed information on the standards for quarrying rockbreaking was not available to be analysed. However Namibia's Vocational Education and Training (VET) system follows the South African system fairly closely. The training that is provided to learners for workplace readiness in the quarrying field compares very well with the South African Quarrying industry. In fact a substantial number of workers in the Namibian quarrying sector have obtained workplace skills from South African where they have received training that is closely linked with the outcomes of this National Certificate being submitted for registration on the NQF.

5.

The institute of Quarrying in Malaysia -(<http://www.iqm.com.my/newpagel.htm>) - is a Branch of the Institute of Quarrying United Kingdom and conducts the following course " training course for shot-firers" that ensures fully qualified, skilful and competent shot-firers officially recognised throughout Malaysia. This course covers the following areas:

- > Receive, Store and Issue Explosive Materials.
- > Obtain and Transport Explosive Materials.
- > Charge Blast Holes to Specification.
- > Blast to Specification.
- > Deal with Misfires.

These unit standards are contained in the National Certificate: Rockbreaking, Level 3.
The above deductions indicate that this qualification compares well with those with what it was compared.

ARTICULATION OPTIONS

This qualification allows for both vertical and horizontal articulation.

Vertical articulation exists with:

- > FETC : Manufacturing and assembly operations supervision; SAQA ID - 48915

Horizontal articulation exists with:

- > National Certificate: Underground Hardrock - Rockbreaking L3; SAQA ID - 49014.

MODERATION OPTIONS

- > Anyone assessing a learner or moderating the assessment of a learner against 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.
- > 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 ETQAs policies and guidelines for assessment and moderation.
- > Moderation must include both internal and external moderation of assessments, unless ETQA policies specify otherwise. Moderation should also encompass achievement of the competence described in the

associated Unit Standards.

> Anyone wishing to be assessed against this qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

Assessors should be in possession of:

> An appropriate qualification at or above the level of this qualification and preferably relevant workplace practical experience.

> Registration as an assessor with the relevant ETQA.

NOTES

N/A

UNIT STANDARDS

(Note: A blank space after this line means that the qualification is not based on Unit Standards.)

	UNIT STANDARD ID AND TITLE	LEVEL	CREDITS	STATUS
core	115101 Address workplace hazards and risks	Level 2	4	Registered
Core	115514 Handle explosives in a surface mining environment	Level 2	5	Registered
Core	116520 Apply safety, health and environmental principles and procedures in a workplace	Level 2	2	Registered
core	116533 Demonstrate basic knowledge and understanding of emergency preparedness and response	Level 2	2	Registered
Core	230015 Mark off drill holes for blasting in quarries	Level 2	3	Draft - Prep for P Comment
Core	115507 Examine and make safe non-blasted quarry excavations	Level 3	4	Registered
Core	115535 Examine and make safe blasted quarry excavations	Level 3	5	Registered
Core	115615 Co-ordinate drilling and blasting operations	Level 3	26	Registered
Core	116534 Carry out basic first aid treatment in the workplace	Level 3	2	Registered
core	116630 Install and maintain support in surface mines and quarries	Level 3	10	Registered
Core	116666 Carry out secondary breaking using explosives	Level 3	11	Registered
Elective	116932 Operate a personal computer system	Level 1	3	Registered
Elective	10490 Carry out secondary breaking by mechanical means	Level 2	8	Reregistered
Elective	10745 Cut mild steel by means of an Oxy-acetylene cutting torch	Level 2	3	Registered
Elective	14911 Participate in formal meetings	Level 2	3	Registered
Elective	115613 Conduct fire fighting in surface mines	Level 2	16	Registered
Elective	116625 Split dimension stone blocks by means of non explosive methods	Level 2	4	Registered
Elective	116632 Drill holes for blasting and/or splitting dimension stone blocks using a mechanised drilling	Level 2	6	Registered
Elective	116658 Drill intersecting holes for diamond wire sawing	Level 2	7	Registered
Elective	116937 Use a Graphical User Interface (GUI)-based spreadsheet application to create and edit spreadsheets	Level 2	4	Registered
Elective	117924 Use a Graphical User Interface (GUI)-based word processor to format documents	Level 2	5	Registered
Elective	230011 Drill medium diameter blast holes using an hydraulic or pneumatic drilling rig and compressor	Level 2	5	Draft - Prep for P Comment
Elective	230018 Operate a mixer-placer explosives truck	Level 2	6	Draft - Prep for P Comment
Elective	230020 Drill small diameter blast holes using a percussion drilling rig and compressor	Level 2	5	Draft - Prep for P Comment
Elective	110218 Collect, store and issue explosives from a surface magazine	Level 3	10	Registered
Elective	116614 Conduct blasting operations in dimension stone quarries	Level 3	15	Registered
Elective	116622 Lift and position loads	Level 3	12	Registered
Elective	116626 Handle dimension stone blocks by means of front end loader	Level 3	13	Registered
Elective	116627 Demonstrate basic understanding of dimension stone geology and mineralogy	Level 3	16	Registered
Elective	116663 Make saw cuts by means of diamond wire saw	Level 3	15	Registered
Elective	117877 Perform one-to-one training on the job	Level 3	4	Registered
Elective	230010 Demonstrate knowledge of the geological nature of surface extraction sites	Level 3	6	Draft - Prep for P Comment

Elective	230012 Blast materials in quarry operations	Level3	15	Draft - Prep for P Comment
Elective	230013 Conduct face profiling and blast hole surveys	Level3	6	Draft - Prep for P Comment
Elective	230014 Carry out basic surveying and calculations in quames	Level3	8	Draft - Prep for P Comment
Elective	230019 Demonstrate and apply knowledge of dimension stone quality and geology to block extraction	Level3	21	Draft - Prep for P Comment
Elective	13941 Apply the budget function in a business unit	Level4	5	Reregistered
Elective	230016 Design blasts for quarry operations	Level4	24	Draft - Prep for P Comment
Elective	230017 Carry out blasting environmental testing	Level4	6	Draft - Prep for P Comment
Fundamental	7456 Use mathematics to investigate and monitor the financial aspects of personal, business and national issues	Level3	5	Reregistered
Fundamental	9010 Demonstrate an understanding of the use of different number bases and measurement units and an awareness of error in the context of relevant calculations	Level3	2	Reregistered
Fundamental	9012 Investigate life and work related problems using data and probabilities	Level3	5	Reregistered
Fundamental	9013 Describe, apply, analyse and calculate shape and motion in 2-and 3-dimensional space in different contexts	Level3	4	Reregistered
Fundamental	119457 Interpret and use information from texts	Level3	5	Registered
Fundamental	119465 Write/present/sign texts for a range of communicative contexts	Level3	5	Registered
Fundamental	119467 Use language and communication in occupational learning programmes	Level3	5	Registered
Fundamental	119472 Accommodate audience and context needs in oral/sign ed communication	Level3	5	Registered



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

1

Demonstrate knowledge of the geological nature of surface extraction sites

SAQA US ID	UNIT STANDARD TITLE		
230010	Demonstrate knowledge of the geological nature of surface extraction sites		
SGB NAME	ORGANISING FIELD ID	PROVIDER NAME	
SGB Mining and Minerals	6		
UNIT STANDARD TYPE	ORGANISING FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Manufacturing, Engineering and Technology	Fabrication and Extraction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	6	Level 3	Regular

SPECIFIC OUTCOME 1

Explain the nature of rocks and minerals.

SPECIFIC OUTCOME 2

Explain the geological unconformities at surface extraction sites.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

2

SAQA US ID	UNIT STANDARD TITLE		
23001 1	Drill medium diameter blast holes using an hydraulic or pneumatic drilling rig and compressor		
SGB NAME	ORGANISING FIELD ID	PROVIDER NAME	
SGB Mining and Minerals	6		
UNIT STANDARD TYPE	ORGANISING FIELD	ION	SUBFIEL DESCRIPTION
Regular	Manufacturing, Engineering and Technology		Fabrication and Extraction
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	5	Level 2	Regular

SPECIFIC OUTCOME 1

Explain the requirements for the blasthole drilling of medium diameter holes.

SPECIFIC OUTCOME 2

Prepare to drill medium diameter blast holes

SPECIFIC OUTCOME 3

Drill medium diameter blastholes.

SPECIFIC OUTCOME 4

Finalise drilling operations



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

3

Blast materials in quarry operations

SAQA US ID	UNIT STANDARD TITLE		
230012	Blast materials in quarry operations		
SGB NAME	ORGANISING FIELD ID	PROVIDER NAME	
SGB Mining and Minerals	6		
UNIT STANDARD TYPE	ORGANISING FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Manufacturing, Engineering and Technology	Fabrication and Extraction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	15	Level 3	Regular

SPECIFIC OUTCOME 1

Explain the blasting operations and requirements in quarries.

SPECIFIC OUTCOME 2

Prepare to conduct blasting operations in quarries.

SPECIFIC OUTCOME 3

Charge up and initiate the blast.

SPECIFIC OUTCOME 4

Treat and blast misfires.

SPECIFIC OUTCOME 5

Destroy old explosives.

SPECIFIC OUTCOME 6

Conduct post-blasting operations



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

4

Conduct face profiling and blast hole surveys

SAQA US ID	UNIT STANDARD TITLE		
230013	Conduct face profiling and blast hole surveys		
SGB NAME	ORGANISING FIELD ID	PROVIDER NAME	
SGB Mining and Minerals	6		
UNIT STANDARD TYPE	ORGANISING FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Manufacturing, Engineering and Technology	Fabrication and Extraction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	6	Level 3	Regular

SPECIFIC OUTCOME 1Plan and prepare for *blast* area survey**SPECIFIC OUTCOME 2**

Operate the survey equipment to conduct face profiling and drill hole surveying.

SPECIFIC OUTCOME 3

Produce survey results and make inputs to the rockbreaking processes.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

5

SAQA US ID	UNIT STANDARD TITLE		
230014	Carry out basic surveying and calculations in quarries		
SGB NAME	ORGANISING FIELD ID	PROVIDER NAME	
SGB Mining and Minerals	6		
UNIT STANDARD TYPE	ORGANISING FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Manufacturing, Engineering and Technology	Fabrication and Extraction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	8	Level 3	Regular

SPECIFIC OUTCOME 1

Explain basic surveying practices in quarries.

SPECIFIC OUTCOME 2

Perform basic surveying tasks.

SPECIFIC OUTCOME 3

Transfer data from quarry plans into the field.

SPECIFIC OUTCOME 4

Conduct basic quarry calculations.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

6

SAQA US ID	UNIT STANDARD TITLE		
230015	Mark off drill holes for blasting in quarries		
SGB NAME	ORGANISING FIELD ID	PROVIDER NAME	
SGB Mining and Minerals	6		
UNIT STANDARD TYPE	ORGANISING FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Manufacturing, Engineering and Technology	Fabrication and Extraction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	3	Level 2	Regular

SPECIFIC OUTCOME 1

Explain the drilling and blasting requirements.

SPECIFIC OUTCOME 2

Prepare to mark off the workplace for drilling.

SPECIFIC OUTCOME 3

Mark off the workplace to be drilled.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

7

Design blasts for quarry operations

SAQA US ID	UNIT STANDARD TITLE		
230016	Design blasts for quarry operations		
SGB Mining and Minerals	6		
UNIT STANDARD TYPE	ORGANISING FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Manufacturing, Engineering and Technology	Fabrication and Extraction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	24	Level 4	Regular

SPECIFIC OUTCOME 1

Explain legal requirements relating to blasting in quarries.

SPECIFIC OUTCOME 2

Explain the types, application and selection of explosives, initiation systems and accessories used and required in quarries.

SPECIFIC OUTCOME 3

Explain the drilling equipment required and their applications in quarries

SPECIFIC OUTCOME 4

Explain the factors influencing blast design and their impacts on quarry Operations.

SPECIFIC OUTCOME 5

Design safe and efficient quarry blasting.

SPECIFIC OUTCOME 6

Estimate the likely environmental effects of the quarry blasts.

SPECIFIC OUTCOME 7

Monitor the blasting performances and take appropriate actions.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

8

Carry out blasting environmental testing

SAQA US ID	UNIT STANDARD TITLE		
230017	Carry out blasting environmental testing		
SGB NAME	ORGANISING FIELD ID	PROVIDER NAME	
SGB Mining and Minerals	6		
UNIT STANDARD TYPE	ORGANISING FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Manufacturing, Engineering and Technology	Fabrication and Extraction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	6	Level 4	Regular

SPECIFIC OUTCOME 1

Plan and prepare for environmental testing of blasts in surface mines and quarries.

SPECIFIC OUTCOME 2

Operate the environmental testing equipment.

SPECIFIC OUTCOME 3

Produce results, interpret the findings and make inputs to the rockbreaking process.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

9

Operate a mixer-placer explosives truck

SAQA US ID	UNIT STANDARD TITLE		
230018	Operate a mixer-placer explosives truck		
SGB NAME	ORGANISING FIELD ID	PROVIDER NAME	
SGB Mining and Minerals	6		
UNIT STANDARD TYPE	ORGANISING FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Manufacturing, Engineering and Technology	Fabrication and Extraction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	6	Level 2	Regular

SPECIFIC OUTCOME 1

Explain the requirements with regards to the operating of a mixer-placer explosives truck.

SPECIFIC OUTCOME 2

Prepare to operate a mixer-placer explosives truck.

SPECIFIC OUTCOME 3

Place explosives into blastholes.

SPECIFIC OUTCOME 4

Finalise operating a mixer-placer explosives truck.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

10

Demonstrate and apply knowledge of dimension stone quality and geology to block extraction

SAQA US ID	UNIT STANDARD TITLE		
230019	Demonstrate and apply knowledge of dimension stone quality and geology to block extraction		
SGB NAME	ORGANISING FIELD ID	PROVIDER NAME	
SGB Mining and Minerals	6		
UNIT STANDARD TYPE	ORGANISING FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Manufacturing, Engineering and Technology	Fabrication and Extraction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	21	Level 3	Regular

SPECIFIC OUTCOME 1

Explain product knowledge, mining and processing technologies and applications of dimension stone.

SPECIFIC OUTCOME 2

Explain dimension stone economics, quality and market requirements.

SPECIFIC OUTCOME 3

Plan and mark cutting lines for block extraction in quarries.

SPECIFIC OUTCOME 4

Plan and mark cutting lines for block dressing.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

11

Drill **small diameter blast holes** using a percussion drilling rig and compressor

SAQA US ID	UNIT STANDARD TITLE		
230020	Drill small diameter blast holes using a percussion drilling rig and compressor		
SGB NAME	ORGANISING FIELD ID	PROVIDER NAME	
SGB Mining and Minerals	6		
UNIT STANDARD TYPE	ORGANISING FIELD DESCRIPTION	SUBFIELD DESCRIPTION	
Regular	Manufacturing, Engineering and Technology	Fabrication and Extraction	
ABET BAND	CREDITS	NQF LEVEL	UNIT STANDARD TYPE
Undefined	5	Level 2	Regular

SPECIFIC OUTCOME 1

Explain the requirements for small diameter blasthole drilling.

SPECIFIC OUTCOME 2

Prepare to drill small diameter blast holes.

SPECIFIC OUTCOME 3

Drill small diameter blastholes.

SPECIFIC OUTCOME 4

Finalise drilling operations.