

## Further Education & Training Certificate: Strata Control Operations

### NQF Level 4

**Introduction:** The purpose of this qualification is to equip learners with the theoretical knowledge, technical skills and practical ability to function as a Strata Control Officer within the mining environment. Strata Control Officers assist personnel engaged in mining operations to ensure:

- The safety and efficiency of mining operations.
- Pro-active reduction in Levels of rock related risk in mining operations.
- The development of awareness regarding rock-related risk among mining personnel.
- The qualifying learner should be able to assist the Rock Engineer with the design, implementation and monitoring of strategies to reduce rock-related risk, such as mining layouts and support systems.
- The assessment and interpretation of rock mass behaviour and response
- Learners credited with this qualification will be able to:
- Communicate and solve problems in a variety of ways.
- Demonstrate knowledge, understanding and application of workplace skills.
- Demonstrate knowledge, understanding and application of risk management strategies.
- Demonstrate knowledge and understanding of factors driving rock mass behaviour.
- Demonstrate knowledge and understanding of strata control principles, and apply these when conducting strata control operations and related activities in mining operations.

On a practical Level, learners equipped with this qualification will be able to conduct the essential operations associated with:

- Identification of rock-related hazards, quantification of the associated Level of risk, amelioration of such risk, based on applying risk management strategies.
- Identification and evaluation of deteriorating ground conditions.
- Investigating rock-related incidents and accidents.
- Observation, assessment and reporting of sub-optimal mining practices.
- Extracting, interpreting and transforming information presented on mine plans.
- Assessing the stability of excavations, and where necessary recommending appropriate remedial measures, utilising.
- Knowledge of basic rock mechanics principles.
- Knowledge of rock strength and rock mass behaviour.
- Knowledge of support unit and support system behaviour.
- Knowledge of mining methods and their effects on rock mass behaviour.
- Knowledge of the local geological environment and its effect on rock mass behaviour.
- Assessment and monitoring of the performance of support systems, utilising.
- An understanding of support design methodologies.
- Knowledge of the various support types commonly used.
- The ability to install and operate instrumentation sites, and record and process data.
- Providing data and information used in excavation design and monitoring by executing the following functions:
- Classifying rock masses based on typical rock mass rating systems.
- Installing and operating instrumentation sites, recording and processing data.

**Description:** This Level 4 qualification rounds off the basic foundation of theoretical knowledge, technical skills and practical ability applicable to the discipline of strata control and rock engineering provided by the Level 2 and Level 3 qualifications. The Level 4 qualification completes the learner's education regarding the recognition and investigation of strata control-related issues and moves into the areas of interpreting and assessing rock mass behaviour and response.

**SAQA Qualification ID: 62796**

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|---|---|--|
| <b>Target group:</b><br>New employees and or existing employees.  | <b>Certification:</b><br><br><b>If competent a competence certificate will be issued by MQA</b> | <b>Duration:</b><br><br>170 Days<br><br>Days can be reduced depending on RPL |
| <b>Entry Level Requirements:</b>  |   |  |
| <ul style="list-style-type: none"> <li>▪ Minimum Literacy and Numeracy ABET 4 or NQF 1 or RPL, Grade 9</li> </ul> |   |  |

**Fundamental:** (Could be RPL'd  $\pm 2$  days per unit standard)  
 All 36 credits in the Fundamental Component are compulsory.

**Core:**  
 All 91 credits in the Core Component are compulsory.

**Elective:** (Could be RPL'd  $\pm 2$  days per unit standard)  
 A minimum of 9 credits at Level 3 or above must be selected from the list of elective unit standards that meet site-specific requirements.

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| LEVEL   | TYPE        | CREDITS | U/S                    | Description   |
|---------|-------------|---------|------------------------|---|
| Level 4 | Core        | 3       | <a href="#">256872</a> | Calculate the energy absorption and support resistance for a support system   |
| Level 4 | Core        | 5       | <a href="#">256895</a> | Conduct a fall of ground incident or accident investigation   |
| Level 4 | Core        | 2       | <a href="#">120399</a> | Conduct a risk assessment using geotechnical data and a local geotechnical plan   |
| Level 4 | Core        | 4       | <a href="#">256900</a> | Conduct a rock mass rating utilising rating systems typically used in mining  |
| Level 4 | Core        | 4       | <a href="#">120341</a> | Conduct a Task Analysis and take appropriate action to address identified risks   |
| Level 4 | Core        | 5       | <a href="#">256838</a> | Demonstrate an understanding of common mining methods   |
| Level 4 | Core        | 3       | <a href="#">256847</a> | Demonstrate an understanding of factors that define a ground control district   |
| Level 4 | Core        | 3       | <a href="#">256858</a> | Demonstrate an understanding of hazards associated with various anomalous conditions and the treatment thereof based on risk level    |
| Level 4 | Core        | 4       | <a href="#">256836</a> | Demonstrate an understanding of mining geology related to rock engineering  |
| Level 4 | Core        | 6       | <a href="#">120406</a> | Demonstrate an understanding of mining strategies applicable to the different depth environments                                      |
| Level 4 | Core        | 4       | <a href="#">256849</a> | Demonstrate an understanding of Rock Engineering terminology, theory and mensuration  |
| Level 4 | Core        | 3       | <a href="#">256851</a> | Demonstrate an understanding of the causes of falls of ground   |
| Level 4 | Core        | 4       | <a href="#">256845</a> | Demonstrate an understanding of the characteristics of different depth environments   |
| Level 4 | Core        | 2       | <a href="#">256837</a> | Demonstrate an understanding of the Code of Practice to address rockfall and rockburst accidents                                      |
| Level 4 | Core        | 4       | <a href="#">256873</a> | Demonstrate an understanding of the operation, installation and data recording methods for rock engineering instrumentation           |
| Level 4 | Core        | 3       | <a href="#">256848</a> | Demonstrate an understanding of the relationship between geological structures and mining layouts                                     |
| Level 4 | Core        | 6       | <a href="#">256846</a> | Demonstrate an understanding of theoretical rock mechanics principles   |
| Level 4 | Core        | 4       | <a href="#">256856</a> | Demonstrate knowledge of rock-related hazards and consequences due to the geological environment                                      |
| Level 4 | Core        | 3       | <a href="#">256897</a> | Describe the various rock mass rating systems typically used in mining  |
| Level 4 | Core        | 2       | <a href="#">256861</a> | Draw mining engineering related plans, sections and projections   |
| Level 4 | Core        | 4       | <a href="#">120414</a> | Explain rock behaviour under various loading conditions   |
| Level 4 | Core        | 4       | <a href="#">120415</a> | Explain rock strength deterioration   |
| Level 4 | Core        | 3       | <a href="#">256844</a> | Explain the interaction between rock strength, stress, and fracturing   |
| Level 4 | Core        | 4       | <a href="#">256870</a> | Identify and evaluate signs of deteriorating ground conditions during the mining process  |
| Level 3 | Fundamental | 5       | <a href="#">119472</a> | Accommodate audience and context needs in oral/signed communication   |
| Level 3 | Fundamental | 5       | <a href="#">119457</a> | Interpret and use information from texts  |
| Level 3 | Fundamental | 5       | <a href="#">119467</a> | Use language and communication in occupational learning programmes  |
| Level 3 | Fundamental | 5       | <a href="#">119465</a> | Write/present/sign texts for a range of communicative contexts  |
| Level 4 | Fundamental | 6       | <a href="#">9015</a>   | Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life related problems |
| Level 4 | Fundamental | 5       | <a href="#">119462</a> | Engage in sustained oral/signed communication and evaluate  |

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|         |             |   |                        | spoken/signed texts   |
| Level 4 | Fundamental | 5 | <a href="#">119469</a> | Read/view, analyse and respond to a variety of texts  |
| Level 4 | Fundamental | 4 | <a href="#">9016</a>   | Represent analyse and calculate shape and motion in 2-and 3-dimensional space in different contexts                       |
| Level 4 | Fundamental | 5 | <a href="#">119471</a> | Use language and communication in occupational learning programmes  |
| Level 4 | Fundamental | 6 | <a href="#">7468</a>   | Use mathematics to investigate and monitor the financial aspects of personal, business, national and international issues |
| Level 4 | Fundamental | 5 | <a href="#">119459</a> | Write/present/sign for a wide range of contexts   |
| Level 3 | Elective    | 4 | <a href="#">256867</a> | Implement a rock engineering instrumentation programme for strata control   |
| Level 3 | Elective    | 2 | <a href="#">120329</a> | Respond to, implement and manage emergencies according to an emergency action plan in a workplace                         |
| Level 4 | Elective    | 3 | <a href="#">256850</a> | Apply calculations of support resistance and energy absorption capabilities of support units                              |
| Level 4 | Elective    | 5 | <a href="#">13949</a>  | Apply technical knowledge and skill to align business unit performance to business goals                                  |
| Level 4 | Elective    | 2 | <a href="#">256871</a> | Conduct a fault tree analysis in accident investigations  |
| Level 4 | Elective    | 6 | <a href="#">256915</a> | Conduct quality control tests on support units, process results and evaluate against a set standard                       |
| Level 4 | Elective    | 3 | <a href="#">256841</a> | Demonstrate an understanding of bolting as underground in-stope support   |
| Level 4 | Elective    | 4 | <a href="#">256852</a> | Demonstrate an understanding of pillar failure types, modes and signs of failure  |
| Level 4 | Elective    | 4 | <a href="#">256869</a> | Demonstrate an understanding of practical aspects relating to mass fill placement   |
| Level 4 | Elective    | 4 | <a href="#">256896</a> | Demonstrate an understanding of seismology principles   |
| Level 4 | Elective    | 3 | <a href="#">256863</a> | Demonstrate an understanding of soil mechanics  |
| Level 4 | Elective    | 4 | <a href="#">256859</a> | Demonstrate an understanding of special areas in ensuring excavation stability  |
| Level 4 | Elective    | 3 | <a href="#">256855</a> | Demonstrate an understanding of the effect of spoils on the stability of slopes/highwalls                                 |
| Level 4 | Elective    | 4 | <a href="#">256835</a> | Demonstrate an understanding of the factors that influence the stability of beams   |
| Level 4 | Elective    | 4 | <a href="#">256854</a> | Demonstrate an understanding of the impact of mining spans on excavation stability  |
| Level 4 | Elective    | 3 | <a href="#">256843</a> | Demonstrate an understanding of the process of defining a ground control district   |
| Level 4 | Elective    | 4 | <a href="#">256839</a> | Demonstrate an understanding of the relationship between gully, panel and siding geometry on excavation stability         |
| Level 4 | Elective    | 3 | <a href="#">256842</a> | Demonstrate an understanding of the requirements for designing highwall or slope face shapes                              |
| Level 4 | Elective    | 4 | <a href="#">256853</a> | Demonstrate an understanding of the role of pillars as a support medium, design considerations and principles             |
| Level 4 | Elective    | 4 | <a href="#">256875</a> | Demonstrate an understanding of the various techniques available to assist in achieving high wall/slope stability         |
| Level 4 | Elective    | 5 | <a href="#">256865</a> | Demonstrate an understanding of various slope failure modes   |
| Level 4 | Elective    | 5 | <a href="#">256874</a> | Describe the effects of mining in shallow, intermediate and deep environments on stress distribution                      |
| Level 4 | Elective    | 4 | <a href="#">256857</a> | Evaluate conditions in a rock pass  |
| Level 4 | Elective    | 4 | <a href="#">256899</a> | Evaluate excavation stability when the excavation is re-opened up after a period of time                                  |
| Level 4 | Elective    | 3 | <a href="#">256864</a> | Evaluate the effect of face configuration on stress induced fracture patterns and orientations                            |
| Level 4 | Elective    | 4 | <a href="#">256901</a> | Evaluate the stability of pillars in underground mining   |
| Level 4 | Elective    | 4 | <a href="#">256860</a> | Explain the function of and demonstrate the ability to manage support teams   |

|         |          |   |                        |   |
|---------|----------|---|------------------------|---|
| Level 4 | Elective | 2 | <a href="#">256866</a> | Inspect large excavations during the excavating phase                                   |
| Level 4 | Elective | 4 | <a href="#">256868</a> | Inspect production and service excavations to detect abnormalities in ground conditions |
| Level 4 | Elective | 3 | <a href="#">7873</a>   | Manage one`s own development  |
| Level 4 | Elective | 3 | <a href="#">256840</a> | Perform geotechnical mapping of a highwall/slope and evaluate the results               |
| Level 4 | Elective | 4 | <a href="#">243951</a> | Plan and conduct a meeting  |
| Level 4 | Elective | 4 | <a href="#">256898</a> | Process results of in-situ tests of support installation quality                        |
| Level 4 | Elective | 4 | <a href="#">256862</a> | Re-establish stability after highwall/slope failure                                     |