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Mine Geotechnical Engineer

COMPETENCE PORTFOLIO

INSTRUCTIONS TO CANDIDATES



The document is divided into various sections and the candidate must complete every section.

Knowledge Section

The candidate is expected to develop a portfolio that demonstrates the knowledge that has been gained.

All the information contained within the knowledge section must be their own work.

The candidate may use manufactures and operational material or other open source material, but must provide a reference.

The candidate may use pictures, photographs etc. to illustrate any knowledge elements.

Practical Elements

The candidate uses this section to demonstrate that they can apply the knowledge in a training and operational environment.

The candidate may use photographs, video etc. to form a record for future assessment.

The candidate may also get instructors and workmates to write statements of how the practical elements were demonstrated.

The candidate must provide a reference to any material that they wish to use as evidence, and include within their portfolio.

Number of Occasions

YEAR 1	RESCUE WORKERS APPRENTICESHIP STANDARD															
SECTION 2	RISK ASSESSMENT AND NEAR MISS REPORTING										NAME					
Development Area		Knowl. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References				
					1	2	3	4	5			1	2	3	4	5

The number of knowledge examples is listed here

The number of practical examples is listed here

The number completed is tracked here

References are included and listed here

The sheets contained within this document form a record of progress, and a point for referencing.

The candidate must maintain these sheets to demonstrate progress, and these will be periodically reviewed by the assessor.

		MINE GEOTECHNICAL ENGINEER															
SECTION 1		COMMON INDUCTION MODULES											NAME				
Development Area		Knowl. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References					
					1	2	3	4	5			1	2	3	4	5	
MPVG01 (Safe in the Underground Environment)																	
1.1	Include the certificates from the knowledge section.	1															
1.2	Include the underground assessment.			1													
MPVG02 (Conform to Efficient Work Process)																	
1.3	Include the certificates from the knowledge section.	1															
1.4	Include the underground assessment.			1													
Total Units		2	0	2	0												
Signed - Candidate		Signed - Assessor			Comments												

		MINE GEOTECHNICAL ENGINEER																
SECTION 2		GENERAL LEGISLATION											NAME					
Development Area		Standard	Ref	Know. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References				
							1	2	3	4	5			1	2	3	4	
Health and Safety at Work Act 1974																		
2.1	Outline the requirements of the HASAWA 1974 when it comes to creating a safe place of work.	MPQVG20/ MQPVG21/ PROMS14	K3/ K1/ K1	1										Portfolio 2.1				
2.2	Outline the requirements of the HASAWA 1974 when it comes to ensuring that employees and contractors are provided with adequate instruction, information and training.	MPQVG20/ MQPVG21/ PROMS14	K3/ K1/ K1	1										Portfolio 2.2				
2.3	Define the statutory duties and responsibilities of the employer (mine owner), management, and supervisors under the HASAWA 1974.	MPQVG21	K4	1										Portfolio 2.3				
2.4	Outline the statutory duties of employees under the HASAWA 1974.	MPQVG21/ PROMS14	K4/ K7	1										Portfolio 2.4				
2.5	Outline what the HASAWA 1974 says in relation to personal responsibilities and duty holders.	MPQVG21	K5	1										Portfolio 2.5				
				1														
				1														
The Management of Health and Safety at Work Regulations 1999				1														
2.6	Outline the requirements of the Management Regulations when it comes to assessing risk in the workplace.	MPQVG20/ MQPVG21	K3/ K1	1										Portfolio 2.6				
2.7	Outline the requirement under the Management Regulations to ensure that there are systems in place to ensure that work is done safely.	MPQVG21	K8	1										Portfolio 2.7				
The Mines Regulation 2014																		
2.8	Outline the requirement of MR2014 when considering the requirements to take ground control measures.	MPQVG20/ MQPVG21/ PROMS14	K3/ K1/ K1	1										Portfolio 2.8				
2.9	Outline how your organisation aligns with the key requirements of MR2014 and the accompanying guidance when considering ground control measures.	MPQVG20/ MQPVG21/ PROMS14	K3/ K1/ K1	1										Portfolio 2.9				
2.10	Outline the general duties of the mine operator under the MR2014, and how these duties are discharged within your own organisation.	MPQVG20/ MQPVG21/ PROMS14	K3/ K3/ K4	1										Portfolio 2.10				
2.11	Outline the requirements under the MR2014 to produce a health and safety document. Identify your organisation's approach to producing the document and the type of information that can be found within it.	MPQVG20/ MQPVG21/ PROMS14	K3/ K1/ K15	1										Portfolio 2.11				
2.12	Outline the requirements of MR2014 when it comes to having a management structure, provide an overview of the structure within your own organisation and some of the key roles and responsibilities.	MPQVG20/ MQPVG21/ PROMS14	K3/ K3/ K3	1										Portfolio 2.12				
2.13	Outline the requirements of MR2014 when it comes to competence. Outline how your organisation defines the required competencies and ensure that people have and maintain those competencies.	MPQVG20/ MQPVG21	K3/ K1/ K5	1										Portfolio 2.13				
Total Units				16	0	0	0											
Signed - Candidate				Signed - Assessor				Comments										

		MINE GEOTECHNICAL ENGINEER											M R S TRAINING & RESCUE <i>Safe in our hands</i>				
SECTION 2		GENERAL LEGISLATION (2)											NAME				
Development Area		Standard	Ref	Know. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References			
							1	2	3	4	5			1	2	3	4
Mines Regulation 2014 (Continued)																	
2.14	Outline the requirements of MR2014 when it comes to developing rules and schemes, provide examples of the types of rules or scheme that your organisation develops in compliance with the regulations.	MPQVG20/ MQPVG21/ PROMS14	K3/ K1/ K7	1										Portfolio 2.14			
2.15	Define the definition of a mine under the regulations.	MQPVG21/ PROMS14	K2/ K2	1										Portfolio 2.15			
2.16	Outline the requirements of Regulation 4, and the application of the Mines Regulations 2013.	MQPVG21	K2	1										Portfolio 2.16			
2.17	Define the duties of the mine owners under MR2014.	MQPVG21	K3	1										Portfolio 2.17			
2.18	Summarise the key requirements of the MR2014, when it comes to taking measures to control the ground, and the considerations required around: 1. Understanding the nature of the ground. 2. The design of the support systems. 3. Evaluating the effectiveness of the support systems. 4. Monitoring and reacting to changes in conditions. 5. Providing information to those with responsibilities for installing, or supervising the installation of ground control measures.	MQPVG21/ PROMS14	K7/ K7	1										Portfolio 2.18			
2.19	Define the responsibilities of the Geotechnical Engineer/ Ground Control Coordinator under regulation, and what limits are placed on any authority by your responsibility.	PROMS14	K5	1										Portfolio 2.19			
Reporting of Injuries, Disease and Dangerous Occurrence Regulations 1997																	
2.20	Outline what RIDDOR identifies as a dangerous occurrence related to underground mining operations.	MPQVG20/ MQPVG21	K3/ K1	1										Portfolio 2.20			
Personal Protective Equipment Regulations 1999																	
2.21	Outline your rules relating to PPE to be used when carrying out ground control activities, including any variations dependant on the system.	PROMS14	K13	1										Portfolio 2.21			
2.22	What process is used by your organisation to ensure that the PPE selected is suitable for the task, what do the regulations require you to do.	PROMS14	K13	1										Portfolio 2.22			
2.23	Outline the general PPE that persons in your organisation are expected to have with them, this should consider any equipment that is provided for the purpose of self escape in an emergency.	PROMS14	K13	1										Portfolio 2.23			
				1													
Total Units				11	0	0	0										
Signed - Candidate				Signed - Assessor				Comments									

		MINE GEOTECHNICAL ENGINEER																
SECTION 3		ORGANISATION PROCEDURES AND POLICIES RELATING TO GROUND CONTROL												NAME				
Development Area		Standard	Ref	Know. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References				
							1	2	3	4	5			1	2	3	4	
Operating Structure																		
3.1	Outline the organisational and management structure at your mine.	MPQVG19	K12	1										Portfolio 3.1				
3.2	Outline those within the structure that carry some responsibility for ground control matters. Along with any limitations on their decision making when it comes to ground control issues.	MPQVG19	K12	1										Portfolio 3.2				
3.3	Define the escalation procedure within your organisation.	MPQVG19	K12	1										Portfolio 3.3				
Total Units				3	0	0	0											
Signed - Candidate				Signed - Assessor				Comments										

		MINE GEOTECHNICAL ENGINEER																
SECTION 4		METHODS OF MINING AND MINERAL EXTRACTION												NAME				
Development Area		Standard	Ref	Know. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References				
							1	2	3	4	5			1	2	3	4	
General Risk Definitions																		
4.1	Define what is meant by the term hazard.	MPQVG20	K7	1										Portfolio 4.1				
4.2	Define what is meant by the term risk.	MPQVG20	K7	1										Portfolio 4.2				
4.3	Define what is meant by the term hazard effect.	MPQVG20	K7	1										Portfolio 4.3				
4.4	Define what is meant by the term controls.	MPQVG20	K7	1										Portfolio 4.4				
4.5	Define what is meant by the term residual risk.	MPQVG20	K7	1										Portfolio 4.5				
4.6	Define what is meant by the term risk score/ rating.	MPQVG20	K7	1										Portfolio 4.6				
4.7	Define what is meant by the term hierarchy of controls.	MPQVG20	K7	1										Portfolio 4.7				
4.8	Define what is meant by the term risk assessment.	MPQVG20	K7	1										Portfolio 4.8				
4.9	Define what is meant by the term method statement.	MPQVG20	K7	1										Portfolio 4.9				
Major Mining Hazards																		
4.10	Identify the types of major hazards that may exist within the range of underground mining operations.	MPQVG21/ PROMS14	K14/ K16	1										Portfolio 4.10				
4.11	Identify how the type of mining operations might introduce major mining hazards or exaggerate the hazards that are already present.	MPQVG21/ PROMS14	K14/ K16	1										Portfolio 4.11				
4.12	Identify the types of major mining hazards that are typically present at the mine in which you work.	MPQVG21/ PROMS14	K14/ K16	1										Portfolio 4.12				
4.13	Describe how the mining operation/ mining methods used at the mine at which you work may influence the development of major mining hazards.	MPQVG21/ PROMS14	K14/ K16	1										Portfolio 4.13				
4.14	Define how your organisation measures the effectiveness of major hazard controls including those defined for ground control.	MPQVG19	K11	1										Portfolio 4.14				
Total Units				14	0	0	0											
Signed - Candidate				Signed - Assessor				Comments										

		MINE GEOTECHNICAL ENGINEER																
SECTION 4		METHODS OF MINING AND MINERAL EXTRACTION (2)												NAME				
Development Area		Standard	Ref	Know. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References				
							1	2	3	4	5			1	2	3	4	
Terms and Definitions Associated with Ground Control																		
4.15	What is meant by a defect in relation to ground control or ground control methods?	MPQVG21	K13	1										Portfolio 4.15				
4.16	What is meant by the term trend in relation to ground control or ground control methods.	MPQVG21	K13	1										Portfolio 4.16				
4.17	What is meant by the term fall of ground.	MPQVG21	K13	1										Portfolio 4.17				
4.18	What is meant by the term inter-bolt failure.	MPQVG21	K13	1										Portfolio 4.18				
4.19	What is meant by the term rock bolt failure.	MPQVG21	K13	1										Portfolio 4.19				
Hazards When Installing Ground Control Systems																		
4.20	Outline the hazards that might be present when installing ground control systems.	MPQVG19	K2	1										Portfolio 4.20				
4.21	Define how the design of the support system is used to mitigate some of the hazards that you have identified.	MPQVG19	K2	1										Portfolio 4.21				
Hazards when Excavating																		
4.22	Outline the hazards that are introduced when carrying out excavations at the mine.	MPQVG19	K2	1										Portfolio 4.22				
Total Units				8	0	0	0											
Signed - Candidate				Signed - Assessor				Comments										

		MINE GEOTECHNICAL ENGINEER																	
SECTION 4		METHODS OF MINING AND MINERAL EXTRACTION (3)												NAME					
Development Area		Standard	Ref	Know. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References					
							1	2	3	4	5			1	2	3	4		
Hazards Associated with Ground Control and Mining Operations																			
4.23	Outline how ground control hazards may impact the material transport system at a mine.	MPQVG19	K2	1											Portfolio 4.23				
4.24	Outline how ground control hazards may impact the mineral transport system at a mine.	MPQVG19	K2	1											Portfolio 4.24				
4.25	Outline how ground control hazards may impact the people transport system at a mine.	MPQVG19	K2	1											Portfolio 4.25				
4.26	Outline how ground control hazards may impact the mine ventilation system.	MPQVG19	K2	1											Portfolio 4.26				
4.27	Outline how ground control hazards may impact the safe entry and egress to and from the mine.	MPQVG19	K2	1											Portfolio 4.27				
4.28	Outline how ground control hazards may impact any rescue arrangements that are in place at the mine.	MPQVG19	K2	1											Portfolio 4.28				
4.29	Outline how ground control hazards may impact on the places where machines operate, transition or are stored.	MPQVG19	K2	1											Portfolio 4.29				
4.30	Outline how geological features may affect the safe operation of the mine.	PROMS14	K19	1											Portfolio 4.30				
Mining Sequence																			
4.31	Give an overview of a complete operational cycle, you should ensure that the following are covered: 1. Establishing the mining equipment in advance of the mining cycle. 2. The cutting (or blasting cycle). 3. Mineral clearance process. 4. Insallation of ground support measures. 5. The advancement of other services such as ventilation, power, and utilities.	MPQVG21	K39	1											Portfolio 4.31				
4.32	When conducting excavation operations, outline the geological and physical indications that would indicate deteriorating/ unsafe ground conditions.	MPQVG19/ MPQVG21 PROMS14	K5/ K7/ K18/ K20	1											Portfolio 4.32				
4.33	Outline what are acceptable conditions for a roadway profile (including roof/ sides and where applicable the working face).	MPQVG21/ PROMS14	K19/ K21	1											Portfolio 4.33				
Total Units				11	0	0	0												
Signed - Candidate				Signed - Assessor				Comments											

		MINE GEOTECHNICAL ENGINEER																
SECTION 4		METHODS OF MINING AND MINERAL EXTRACTION (4)													NAME			
Development Area		Standard	Ref	Know. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References				
							1	2	3	4	5			1	2	3	4	
Failure Modes																		
4.34	Outline the various failure modes that may result in ground movement above the accepted limits within your organisation.	MPQVG20	K4/ K9	1										Portfolio 4.34				
4.35	Outline the various failure modes that may result in the failure of the sidewall (rib) of an excavation.	MPQVG20	K4/ K9	1										Portfolio 4.35				
4.36	Outline the various failure modes that may result in the failure of the roof.	MPQVG20	K4/ K9	1										Portfolio 4.36				
4.37	Outline the factors that may result in the total failure of the ground control system.	MPQVG20	K4/ K9	1										Portfolio 4.37				
Ground Support Methods/ Support Systems																		
4.38	Outline what is meant by the term passive support, and how these types of support are used within your organisation.	MPQVG20	K5	1										Portfolio 4.38				
4.39	Outline what is meant by the term active support and how these types of support are used within your organisation.	MPQVG20	K5	1										Portfolio 4.39				
4.40	Outline the advantages and disadvantages of passive and active support systems.	MPQVG20	K5	1										Portfolio 4.40				
4.41	Outline what is meant by the term temporary support, and the limitations on its use within your organisation.	MPQVG20	K5	1										Portfolio 4.41				
4.42	Outline some of the support systems used in your mine, your answer should consider: 1. The types of support systems. 2. The applications in which your organisation would utilise that type of system. 3. Limitations in the use of the support systems. 4. The advantages that the types of support system chosen have for your organisation and mining conditions.	MPQVG20	K5/ K8	1										Portfolio 4.42				
4.43	Outline the hazards that might be present when installing ground control systems.	MPQVG19	K2	1										Portfolio 4.43				
4.44	Define how the design of the support system is used to mitigate some of the hazards that you have identified.	MPQVG19	K2	1										Portfolio 4.44				
4.45	Define how your organisation identifies areas where support is required and areas where support is no longer essential.	MPQVG21/ PROMS14	K16/ K18	1										Portfolio 4.45				
Total Units				12	0	0	0											
Signed - Candidate				Signed - Assessor				Comments										

	MINE GEOTECHNICAL ENGINEER																			
SECTION 5	GROUND CONTROL PLANNING, DESIGN, AND MODELLING												NAME							
Development Area			Standard	Ref	Know. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References					
								1	2	3	4	5			1	2	3	4		
Introduction of and Changes to Support Systems																				
5.1	Define the requirements of any organisational procedures that must be followed prior to installing a new support system in your mine.		MPQVG19/MPQVG21	K1/ K16	1											Portfolio 5.1				
5.2	Define the requirements of any organisational procedure when installing an existing ground support system in to a new part of your mine.		MPQVG19/MPQVG21	K1/ K16	1											Portfolio 5.2				
5.3	Define the organisational procedure that must be followed if you want to make changes to the types of support system used in your mine.		MPQVG19/MPQVG21	K1/ K16	1											Portfolio 5.3				
5.4	Outline the process for the evaluation of support systems that have been installed in your mine.		MPQVG19/MPQVG21	K1/ K16	1											Portfolio 5.4				
Deviation from the Support Standard																				
5.5	Outline the circumstances where it may be necessary to deviate from the defined support rules.		MPQVG19	K1	1											Portfolio 5.5				
5.6	When using the a procedure (for example abnormality procedure) where it allows deviation from the normal standard, define the organisational process that must be followed.		MPQVG19	K1	1											Portfolio 5.6				
5.7	Where the deviation from the standard has required the installation of additional support, outline the organisational procedure that must be followed in order to reduce the support back to the defined standard.		MPQVG19/MPQVG21	K1/ K16	1											Portfolio 5.7				
5.8	Define the process for verifying and signing off changes to the ground control assessments and ground control measures.		MPQVG19	K12	1											Portfolio 5.8				
Factors Affecting the Stability of Ground Support Systems																				
5.9	Outline how horizontal stress may influence the movement and failure of ground in mines.		MPQVG20	K11	1											Portfolio 5.9				
5.10	Outline how vertical stress may influence the movement and failure of ground in mines.		MPQVG20	K11	1											Portfolio 5.10				
5.11	Outline how the process of mining may alter vertical and horizontal stress.		MPQVG20	K11	1											Portfolio 5.11				
5.12	Outline the type of effects that the following may have on the choice and performance of the selected support system (started with water which is very acidic or alkaline in nature, the hardness of the strata, the bedding plains within the strata, the types of transport systems installed, movement of the ground (sides, roof, floor), standup times).		MPQVG21	K52/ K56	1											Portfolio 5.12				
Total Units					12	0	0	0												
Signed - Candidate					Signed - Assessor					Comments										

		MINE GEOTECHNICAL ENGINEER															
SECTION 5		GROUND CONTROL PLANNING, DESIGN, AND MODELLING (2)												NAME			
Development Area		Standard	Ref	Know. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References			
							1	2	3	4	5			1	2	3	4
Factors Affecting the Stability of Ground Support Systems																	
5.13	Outline how highly stressed ground may change the nature of the ground conditions, and the implication for roof, sides, and floor.	MPQVG20	K11	1										Portfolio 5.13			
5.14	Outline how distressed ground may change the nature of the ground conditions, and the implication for roof, sides, and floor.	MPQVG20	K11	1										Portfolio 5.14			
5.15	Outline how the direction of the mining process relative to the horizontal and vertical stresses may influence the ground control techniques.	MPQVG20	K11	1										Portfolio 5.15			
5.16	Outline what is meant by tensile strength and how this influences the ground control techniques.	MPQVG20/MPQVG21	K11/ 42	1										Portfolio 5.16			
5.17	Outline the influence of lateral forces and how this influences the ground control techniques.	MPQVG20/MPQVG21	K11/ 42	1										Portfolio 5.17			
5.18	Outline how the presence of geological faulting might influence the selection and application of ground control techniques.	MPQVG20/MPQVG21	K11/ K16	1										Portfolio 5.18			
5.19	Identify how inclusions may impact the nature of the ground that is being worked and the types of ground control techniques employed.	MPQVG20	K11	1										Portfolio 5.19			
5.20	Outline how the depth of work may influence ground control factors, including the influence on various forces.	MPQVG20	K11	1										Portfolio 5.20			
5.21	Outline the impact that water bearing strata may have on ground control and the support systems used.	MPQVG20	K11	1										Portfolio 5.21			
5.22	Outline how the profile/ dimensions of the extraction influences ground control techniques.	MPQVG20	K11	1										Portfolio 5.22			
5.23	Outline how various types of rock types react under stress.	MPQVG21	K43	1										Portfolio 5.23			
5.24	Outline how pillar sizes are determined for your long-term mine openings (roadways) at you mine.	MPQVG21	K46	1										Portfolio 5.24			
Influence of Historical Working																	
5.25	Outline how workings that are above, below, or adjacent to mining operations may influence ground control factors.	MPQVG20/MPQVG21/PROMS14	K11/ K15/ K17/ K22	1										Portfolio 5.25			
Total Units				13	0	0	0										
Signed - Candidate				Signed - Assessor				Comments									

			MINE GEOTECHNICAL ENGINEER																	
SECTION 5			GROUND CONTROL PLANNING, DESIGN, AND MODELLING (3)											NAME						
Development Area			Standard	Ref	Know. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References					
								1	2	3	4	5			1	2	3	4		
Factors Influencing Roadway Design and Excavated Profile																				
5.26	For your mine outline how the excavated profile and the limits of extraction are determined.		MPQVG21	K19	1										Portfolio 5.26					
5.27	Outline any factors (this may include elements such as mineral recovery) that influence the design and dimensions of the roadway or excavation.		MPQVG21	K19	1										Portfolio 5.27					
The Design and Behaviour of Mine Openings and Rock Pillars																				
5.28	Outline how pillar sizes are determined for long term mine openings (roadways) in your mine.		MPQVG21	K46	1										Portfolio 5.28					
5.29	Outline how the location, types of support system and excavated profile of long term openings (roadways) is varied at your mine. Outline why.		MPQVG21	K46	1										Portfolio 5.29					
5.30	Outline how other mining activates may influence the viability of long term openings (roadways).		MPQVG21	K46	1										Portfolio 5.30					
5.31	Outline how pillar sizes are determined for openings (roadways) that are required for a shorter duration of time at your mine.		MPQVG21	K46	1										Portfolio 5.31					
Modelling Techniques																				
5.32	Outline the type of information that you may need to gather ahead of carrying out any modelling (consider ground conditions, stress, support systems and mining activity).		MPQVG21	K51	1										Portfolio 5.32					
5.33	Outline how the information that is gather in the question above is then used within the modelling process.		MPQVG21	K51	1										Portfolio 5.33					
5.34	For new areas of a mine, outline the various modelling techniques that are used to identify the impact of excavated profile, support design, the impact of time (deterioration), the interaction of activates that have previous taken place, the impact of mining activates which are planned to take place.		MPQVG21	K47	1										Portfolio 5.34					
5.35	For new or alternative support systems that are being considered, outline the various modelling techniques that can be used to evaluate the impact of excavated profile, support design, the impact of time (deterioration), the interaction of activates that have previous taken place, the impact of mining activates which are planned to take place.		MPQVG21	K47	1										Portfolio 5.35					
5.36	Outline the potential impacts of mining on the surface, and how these impacts can be modelled and evaluated.		MPQVG21	K48	1										Portfolio 5.36					
5.37	Outline the procedure within your organisation that is used to evaluate the output from any modelling techniques employed.		MPQVG21	K51	1										Portfolio 5.37					
Total Units					12	0	0	0												
Signed - Candidate					Signed - Assessor					Comments										

		MINE GEOTECHNICAL ENGINEER										 MR TRAINING & RESCUE <i>Safe in our hands</i>					
SECTION 5		GROUND CONTROL PLANNING, DESIGN, AND MODELLING (4)												NAME			
Development Area		Standard	Ref	Know. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References			
							1	2	3	4	5			1	2	3	4
Materials used in ground control and strata support systems																	
5.38	Provide an overview of the types of materials that may form part of a passive support system. For each type of material identified, define the potential advantages and disadvantages associated with its use.	MPQVG21	K54/ K55/ K56											Portfolio 5.38			
5.39	Provide an overview of the types of materials that may form part of an active support system. For each type of material identified define the potential advantages and disadvantages associated with its use.	MPQVG21	K54/ K55/ K56											Portfolio 5.39			
5.40	Outline how sprayed concrete or the use of various resins may be utilised in strata reinforcement. Identify the advantages and disadvantages of the various systems.	MPQVG21	K54/ K55/ K56											Portfolio 5.40			
5.41	Outline how cavity fill systems might be used, what are the limitations, advantages and disadvantages of these types of system.	MPQVG21	K54/ K55/ K56											Portfolio 5.41			
Industrial standards and specifications in relation to ground control and strata support equipment																	
5.42	Identify the standards (UK and International) that relate to the strata support systems.	MPQVG21	K53/ K56											Portfolio 5.42			
5.43	For the standards identified, provide an overview of what the standards recommend when considering: 1. Mine planning. 2. Size of excavations. 3. Avoidance of surface interaction. 4. Design and commissioning of support systems.	MPQVG21	K53/ K56											Portfolio 5.43			
5.44	Outline the considerations that your organisation makes when selecting the equipment to perform the mining operations (excavation).	MPQVG21	K52											Portfolio 5.44			
5.45	Outline the considerations that your organisation makes when selecting the equipment to perform the mining operations (support installation).	MPQVG21	K52											Portfolio 5.45			
Calculating the loading on support systems																	
5.46	When considering passive support systems, outline the factors that may influence the loading and how you calculate the loading and evaluate the suitability of the system selected.	MPQVG21	K57	1										Portfolio 5.46			
5.47	When considering active support systems, outline the factors that may influence the loading and how you calculate density of support required.	MPQVG21	K57	1										Portfolio 5.47			
Total Units				2	0	0	0										
Signed - Candidate				Signed - Assessor				Comments									

		MINE GEOTECHNICAL ENGINEER																
SECTION 5		GROUND CONTROL PLANNING, DESIGN, AND MODELLING (5)											NAME					
Development Area		Standard	Ref	Know. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References				
							1	2	3	4	5			1	2	3	4	
Practical Elements																		
P5.1	Determine the requirements of ground control.	MPQVG20	P1			4												
P5.2	Identify and confirm the objectives for ground control and support.	MPQVG21/ PROMS14	P1/ P1			4												
P5.3	Obtain relevant/ current/ applicable sources of information (including where applicable previous extraction plans).	MPQVG21/ PROMS14	P2/ P3			4												
P5.4	Ascertain the direct and indirect risks associated with the proposed method of working and methods of ground control.	MPQVG21	P3			4												
P5.5	Identify and include the potential effects of the plans on surface features.	MPQVG21	P3			2												
P5.6	Identify and include the potential effects of the plans on underground features and other workings.	MPQVG21	P3			3												
P5.7	Conduct mine geotechnical assessment.	MPQVG21	P5			3												
P5.8	Transfer information from the ground control assessment into ground control plans.	MPQVG21	P6			3												
P5.9	Prepare specifications for proposed ground control systems.	MPQVG21/ PROMS14	P7/ P7			2												
P5.10	Prepare specification for ground control equipment.	MPQVG21	P7			2												
P5.11	Check that the proposed ground control systems comply with the health and safety requirements (including regulation).	MPQVG21	P9			2												
P5.12	Check that the proposed ground control systems comply with organisational procedures.	MPQVG21	P9			2												
P5.13	Prepare rules or procedures for ground control system implementation (including safe systems of work).	MPQVG21/ PROMS14	P10/ P8			4												
P5.14	Adjust or amend the designs to respond to changes in circumstances or audit information.	MPQVG21	P17			2												
P5.15	Review and where necessary revise ground control assessments and design documents.	MPQVG21	P18			2												
Total Units				0	0	43	0											
Signed - Candidate				Signed - Assessor				Comments										

			MINE GEOTECHNICAL ENGINEER																	
SECTION 6			MINE PLANNING PROCESS											NAME						
Development Area			Standard	Ref	Know. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References					
								1	2	3	4	5			1	2	3	4		
Consideration of Geotechnical and Geological Factors on Mine Design																				
6.1	Outline how geological features influence the design and planning process.		MPQVG21	K15	1										Portfolio 6.1					
6.2	Outline how geological features are located and mapped as part of the mine planning process.		MPQVG21	K15	1										Portfolio 6.2					
6.3	Define how geotechnical features such as vertical and horizontal stress influence the layout/ design of the mine.		MPQVG21	K15	1										Portfolio 6.3					
Gathering Information to Support the Mine Design Process																				
6.4	Outline the types of information that need to be collected when making a geotechnical assessment, you should consider and include the purpose of: 1. Geological surveys. 2. Information from drilling and drill logs. 3. The use of seismic data. 4. The use of physical surface and underground surveys. 5. Rock strength analysis. 6. Manufactures technical specifications.		MPQVG21	K32	1										Portfolio 6.4					
6.5	Outline how the information from above is utilised within the mine planning process.		MPQVG21	K32	1										Portfolio 6.5					
6.6	Define how new areas of the mine are identified as having the right characteristics for the extraction.		MPQVG21	K37/ K38	1										Portfolio 6.6					
Developing an Operational Mine/ Design Plan																				
6.7	Outline the process that the your mine goes through to plan access to develop and extract identified mineral deposits.		MPQVG21	K38	1										Portfolio 6.7					
6.8	Define the organisational process for reviewing the operational plan, identify frequency, content, acceptance, sign off.		MPQVG21	K33	1										Portfolio 6.8					
6.9	Outline the role of the geotechnical engineer in contributing to the mine/ design plan.		MPQVG21	K33	1										Portfolio 6.9					
6.10	Once completed how is approval of the mine/ design plan done, who is involved in that process.		MPQVG21	K34	1										Portfolio 6.10					
6.11	How does the mine/ design plan link to the operational plan and the wider planning process.		MPQVG21	K36	1										Portfolio 6.11					
6.12	Outline how the planning process is used by different departments to produce their own plans and budgets.		MPQVG21	K36	1										Portfolio 6.12					
Total Units					12	0	0	0												
Signed - Candidate			Signed - Assessor			Comments														

		MINE GEOTECHNICAL ENGINEER															
SECTION 6		MINE PLANNING PROCESS												NAME			
Development Area		Standard	Ref	Know. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References			
							1	2	3	4	5			1	2	3	4
Cost Benefit Analysis of the Ground Control Systems																	
6.13	As part of the mine planning process outline how the various support options are evaluated.	MPQVG21	K58	1										Portfolio 6.13			
6.14	Outline how as part of the planning process you estimate the costs of support installation, and how the cost benefits may be calculated in terms of cost per linear meter of excavation or cost per tonne of extracted material/ cost by weight of saleable material/ mineral.	MPQVG21	K58	1										Portfolio 6.14			
6.15	Outline any other methods that your organisation may use to evaluate the cost benefits of the chosen support systems.	MPQVG21	K58	1										Portfolio 6.15			
6.16	Outline how your organisation tracks the actual costs, compared to the design costs.	MPQVG21	K58	1										Portfolio 6.16			
6.17	Outline the actions that your organisation would take if there is a difference between the design cost and the actual cost.	MPQVG21	K58	1										Portfolio 6.17			
Practical Elements																	
P6.1	Ascertain the direct and indirect risks associated with the proposed method of working and methods of ground control.	MPQVG21	P3			4											
P6.2	Identify and include the potential effects of the plans on surface features.	MPQVG21	P3			2											
P6.3	Identify and include the potential effects of the plans on underground features and other workings.	MPQVG21	P3			3											
P6.4	Enlist advice and support from other specialists or management as required for the work activity.	MPQVG21	P4			2											
P6.5	Identify the preferred methods of extraction.	PROMS14	P5			3											
P6.6	Identify plant and equipment appropriate to the method of extraction.	PROMS14	P5			2											
P6.7	Identify and specify requirements ventilation/ transportation/ communication/ emergency provision and other services.	PROMS14	P7			2											
Total Units				5	0	18	0										
Signed - Candidate				Signed - Assessor				Comments									

		MINE GEOTECHNICAL ENGINEER															
SECTION 7		MEASUREMENT AND INTERPRETATION OF GROUND CONTROL INFORMATION												NAME			
Development Area		Standard	Ref	Know. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References			
							1	2	3	4	5			1	2	3	4
Collection of Data																	
7.1	Outline how your organisation collects information to the effectiveness of the ground control systems installed at your mine.	MPQVG19/PROMS14	K5/ K7/ K27	1										Portfolio 7.1			
7.2	Outline the advantages and limitations of the various types of ground control monitoring installed at your mine.	MPQVG19/PROMS14	K5/ K22	1										Portfolio 7.2			
7.3	Outline how your organisation uses the data from the measurements taken to evaluate the effectiveness of the ground control measures.	MPQVG19	K3	1										Portfolio 7.3			
7.4	Evaluate various types of measurement devices that are available, whether they are used at your mine or not. Outline the advantages and limitations of the various systems.	MPQVG19/PROMS14	K5/ K22	1										Portfolio 7.4			
7.5	Define how the measuring devices identified above (7.4) can be used to track additional ground movement over time.	MPQVG19/PROMS14	K5/ K7/ K22	1										Portfolio 7.5			
7.6	Identify the actions to be taken in the event that ground conditions are identified which may lead to a hazardous situation or unsafe working.	MPQVG21/PROMS14	K21/ K23	1										Portfolio 7.6			
Action Levels																	
7.7	Define the action levels within your organisation that shows a support is operating within the prescribed levels.	MPQVG19	K1/ K8	1										Portfolio 7.7			
7.8	Define how the action (trigger response) levels set by your organisation that indicate that a support system is operating outside of the design limits.	MPQVG19/PROM14	K1/ K4/ K22	1										Portfolio 7.8			
7.9	Outline the actions that would need to be taken at each action (trigger response) level defined by your organisation.	MPQVG19/MPQVG21	K4/ K21	1										Portfolio 7.9			
7.10	Outline the expected response timeline for each of the action (trigger response) levels defined by your organisation.	MPQVG19/PROM14	K8/ K22	1										Portfolio 7.10			
7.11	Outline how you organisation would use measurement and action levels to determine a rate of deterioration of ground control measures.	PROMS14	K22	1										Portfolio 7.11			
Use of Performance Indicators																	
7.12	Outline the safety performance indicators that are used in your organisation to measure the effectiveness of ground controls, including the effectiveness of ground control measures.	MPQVG19	K11	1										Portfolio 7.12			
7.13	Identify for each of the performance indicators outlined above (7.12), why the measure has been selected, what the measure indicates, the trigger points to move it from acceptable to unacceptable risk levels.	MPQVG19	K11	1										Portfolio 7.13			
7.14	Outline the frequency of review for the safety performance indicators.	MPQVG19	K11	1										Portfolio 7.14			
Total Units				14	0	0	0										
Signed - Candidate				Signed - Assessor				Comments									

		MINE GEOTECHNICAL ENGINEER															
SECTION 7		MEASUREMENT AND INTERPRETATION OF GROUND CONTROL INFORMATION (2)												NAME			
Development Area		Standard	Ref	Know. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References			
							1	2	3	4	5			1	2	3	4
Deterioration/ Creation of Unsafe Conditions																	
7.15	Outline the visible signs of ground deterioration under lateral forces.	MPQVG21	18	1										Portfolio 7.15			
7.16	Outline the visible signs of a tensile failure.	MPQVG21	18	1										Portfolio 7.16			
Dimensional Control																	
7.17	Outline how dimensional excavation limits are established at your mine.	MPQVG21	18	1										Portfolio 7.17			
7.18	Define the process/ procedure for ensuring that minerals are extracted to the defined dimensional limits.	MPQVG21	18	1										Portfolio 7.18			
Mine Condition Surveys																	
7.19	Outline the content of the inspections that are carried out by supervisors or other competent individuals on a shiftly basis to confirm the ground control measures are working.	MPQVG21	21	1										Portfolio 7.19			
7.20	Outline how the information from the shift reports is escalated so issues relating to mine condition are bought to the attention of the relevant people within the management structure.	MPQVG21	21	1										Portfolio 7.20			
7.21	Outline the conditions at your mine, which if unrecognised or untreated, may lead to a hazardous situation or unsafe condition.	MPQVG21	21	1										Portfolio 7.21			
Actions if Problems Identified are not Immediately Rectifiable																	
7.22	Outline the actions that should be taken within your organisation if there is a ground control issue identified and the issue can not be resolved.	MPQVG21	K41	1										Portfolio 7.22			
7.23	How are issues such as these escalated within your organisation.	MPQVG21	K41	1										Portfolio 7.23			
Total Units				9	0	0	0										
Signed - Candidate				Signed - Assessor					Comments								

		MINE GEOTECHNICAL ENGINEER															
SECTION 7		MEASUREMENT AND INTERPRETATION OF GROUND CONTROL INFORMATION (3)												NAME			
Development Area		Standard	Ref	Know. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References			
							1	2	3	4	5			1	2	3	4
Practical Elements																	
P7.1	Identify changes in ground control conditions.	MPQVG19	P3			4											
P7.2	Determine if the changes in ground control conditions are significant.	MPQVG19	P4			4											
P7.3	Identify areas for improvement.	MPQVG19	P5			4											
P7.4	Make recommendations for improvement (priorities).	MPQVG19/ MPQVG20	P5/ P6			4											
P7.5	Report the results and complete records.	MPQVG19/ MPQVG20	P8/ P7			4											
P7.6	Ensure that any measurements and samples are taken according to the planned requirements.	MPQVG20	P3			4											
P7.7	Organise to undertake mine ground control survey.	MPQVG20	P4			2											
P7.8	Analyse the results of the ground control survey.	MPQVG20	P5			2											
P7.9	Specify sensors or monitoring devices or systems.	MPQVG21	P8/ P7			2											
P7.10	Specify monitoring regime for routine working.	MPQVG21	P11			3											
P7.11	Specify monitoring regime for exceptional circumstances.	MPQVG21	P11			3											
P7.12	Specify action levels based on monitoring results.	MPQVG21	P12			2											
P7.13	Monitor the effectiveness of the implemented method/ system.	MPQVG21	P14			2											
P7.14	Monitor the effectiveness of the specified equipment.	MPQVG21	P14			2											
Total Units				0	0	42	0										
Signed - Candidate				Signed - Assessor				Comments									

		MINE GEOTECHNICAL ENGINEER																
SECTION 8		AUDIT AND COMMISSIONING GROUND CONTROL SYSTEMS												NAME				
Development Area		Standard	Ref	Know. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References				
							1	2	3	4	5			1	2	3	4	
Assessment of Support Systems																		
8.1	Outline the types of assessments that are used by your organisation to evaluate the effectiveness of the support systems that have been installed.	MPQVG19	K1	1										Portfolio 8.1				
8.2	Outline why it is important that there is a quality control/ quality assurance system in place at the mine.	MPQVG19	K3	1										Portfolio 8.2				
8.3	When carrying out an audit or assessment of ground control and ground conditions, outline the types of visual indications that may indicate that there is an abnormality present.	MPQVG19	K9	1										Portfolio 8.3				
Support Rules																		
8.4	Outline the process for developing support rules in your organisation.	MPQVG19	K1	1										Portfolio 8.4				
8.5	Define how support rules are issued and commissioned to ensure that they are effective in controlling the ground conditions.	MPQVG19	K1	1										Portfolio 8.5				
Audit Methods																		
8.6	Outline the organisational procedure for auditing the effectiveness of ground control methods.	MPQVG19	K4	1										Portfolio 8.6				
8.7	Outline how the outcomes of any audit is used to evaluate the need for improvement actions.	MPQVG19	K4	1										Portfolio 8.7				
Total Units				7	0	0	0											
Signed - Candidate				Signed - Assessor				Comments										

		MINE GEOTECHNICAL ENGINEER																
SECTION 8		AUDIT AND COMMISSIONING GROUND CONTROL SYSTEMS (2)												NAME				
Development Area		Standard	Ref	Know. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References				
							1	2	3	4	5			1	2	3	4	
Recording of Information																		
8.8	Define how your organisation records the information taken from ground control audits.	MPQVG19/PROMS14	K13/ K28	1										Portfolio 8.8				
8.9	Define how your organisation records the information taken from ground control measurements.	MPQVG19/PROMS14	K13/ K28	1										Portfolio 8.9				
8.10	Outline how long your organisation retains records which relate to the audit and menasurement of ground control measures.	MPQVG19	K13	1										Portfolio 8.10				
Support Rules																		
8.11	Outline the process for developing support rules in your organisation.	MPQVG19	K1	1										Portfolio 8.11				
8.12	Define how support rules are issued and commissioned to ensure that they are effective in controlling the ground conditions.	MPQVG19	K1	1										Portfolio 8.12				
Audit Methods																		
8.13	Outline the organisational procedure for auditing the effectiveness of ground control methods.	MPQVG19	K4	1										Portfolio 8.13				
8.14	Outline how the outcomes of any audit is used to evalaute the need for improvement actions.	MPQVG19	K4	1										Portfolio 8.14				
Total Units				7	0	0	0											
Signed - Candidate				Signed - Assessor				Comments										

		MINE GEOTECHNICAL ENGINEER																
SECTION 8		AUDIT AND COMMISSIONING GROUND CONTROL SYSTEMS (3)												NAME				
Development Area		Standard	Ref	Know. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References				
							1	2	3	4	5			1	2	3	4	
Practical Elements																		
P8.1	Establish a systematic approach to audit of ground control systems.	MPQVG19/ MPQVG20/ MPQVG21	P1/ P1/ P16			1												
P8.2	Establish a systematic approach to the audit of ground control equipment.	MPQVG19	P1			1												
P8.3	Carry out an audit of ground control systems.	MPQVG19	P2			4												
P8.4	Carry out an audit of ground control equipment.	MPQVG19	P2			4												
P8.5	Make recommendations for improvements (priorities).	MPQVG19/ MPQVG20	P6/ P6			2												
P8.6	Audit the improvements to ensure that corrective actions have had the appropriate impact.	MPQVG19	P7			2												
P8.7	Record the results of the audits and complete any records.	MPQVG19/ MPQVG20	P8/ P7			4												
P8.8	Supervise others carrying out a ground control audit.	MPQVG20	P2			2												
P8.9	Analyse and interpret the results of a ground control survey.	MPQVG20	P5			4												
P8.10	Commission the designed support system.	MPQVG21	P13			4												
P8.11	Validate that the installation is working to specification.	MPQVG21	P15			2												
Total Units				0	0	30	0											
Signed - Candidate				Signed - Assessor				Comments										

		MINE GEOTECHNICAL ENGINEER																
SECTION 9		IMPLEMENATION OF REMEDIAL ACTIONS												NAME				
Development Area		Standard	Ref	Know. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References				
							1	2	3	4	5			1	2	3	4	
Taking Remedial Actions																		
9.1	Outline the various types of abnormality that may be present when carrying out a visual inspection of ground conditions.	MPQVG19	K9	1										Portfolio 9.1				
9.2	Define the appropriate remedial actions that would be put in place to deal with the range of abnormalities described above (9.1).	MPQVG19	K9	1										Portfolio 9.2				
9.3	Outline the requirements of the organisational procedure that covers the installation of remedial support.	MPQVG19	K10	1										Portfolio 9.3				
9.4	Outline any work that must be completed ahead of remedial support activates being permitted.	MPQVG19	K10	1										Portfolio 9.4				
Total Units				4	0	0	0											
Signed - Candidate				Signed - Assessor				Comments										

		MINE GEOTECHNICAL ENGINEER																
SECTION 10		EMERGENCY PREPAREDNESS AND PLANNING												NAME				
Development Area		Standard	Ref	Know. Elements	Comp	Practical Elements	Practical Elements Completed					Candidates Signature	Reviewers Signature	Practical and Knowledge Evidence References				
							1	2	3	4	5			1	2	3	4	
How emergency situations can arise in your area of responsibility																		
10.1	Outline the types of emergency that may occur in your area of responsibility.	MPQVG21/PROMS14	K23/ K25	1										Portfolio 10.1				
10.2	Define your roles and responsibilities in the event of an emergency within the underground mine environment.	MPQVG21/PROMS14	K23/ K25	1										Portfolio 10.2				
10.3	Outline any planning that is done by the geotechnical function to ensure any emergency situation that may occur within their areas of responsibility has been considered as part of the mine emergency planning.	MPQVG21/PROMS14	K23/ K25	1										Portfolio 10.3				
How emergencies can arise in your area of responsibility																		
10.4	Outline how the geotechnical engineer/ ground control coordinator may be utilised in the event of an emergency.	MPQVG21	K24	1										Portfolio 10.4				
10.5	Define how your organisation uses various roles with the organisational structure, including your own in the event of an emergency underground.	MPQVG21	K24	1										Portfolio 10.5				
10.6	Summarise the emergency response plan at your place of work, how it is bought in to action and the process to be followed thereafter.	MPQVG21	K24	1										Portfolio 10.6				
Responsibilities of self and others, and procedures to follow in the event of an emergency																		
10.7	Outline the actions that would be taken in the event of an emergency underground.	PROMS14	K26	1										Portfolio 10.7				
10.8	Outline how people within your organisation know how to respond in the event of an emergency underground.	PROMS14	K26	1										Portfolio 10.8				
Total Units				8	0	0	0											
Signed - Candidate				Signed - Assessor				Comments										