

HINTS AND TIPS FOR CANDIDATES PREPARING FOR THE C O M STRATA CONTROL CERTIFICATE PRACTICAL EXAMINATION

Prepared by former students, frustrated examiners and other interesting people!

The key to passing the practical examination lies in three main areas:

- Adequate preparation,
- Structured observations and
- Correct interpretation of observations
- Manner in which questions are answered

You should begin your preparation by finding out:

- Which mine the examination is taking place on
- What is the mines' geological and geotechnical environment
- What are the rock engineering issues / problems specific to the mine
- Are there specific geological features / horizons that impact on rock engineering designs
- What are the relative rock properties – rock strengths, Young's modulus, Poisson's ratio, etc.
- What is the support system in use
 - What criteria is used to design it
 - What is the function of the different components of the support system
 - How are the support units integrated to form the support system
 - What are the performance characteristics of the individual support units used
- What survey system is in use and are elevations referenced to mean sea level or the datum plane
- What programmes do they use for modelling and what are the typical outputs?
- Do they monitor seismicity, using what system and what are the typical outputs?
- Are they doing any instrumentation, using what equipment and what are the typical outputs?

You should also do some work on plan reading and working with plans, ideally using something like the Mine Overseer's certificate plan reading lectures from Technical Tutors South Africa.

If possible, arrange a visit to the mine in question, or a similar mine, to get an idea of the conditions.

For the examination, make sure that you have all the materials required:

- Stationery:
 - Scale rule
 - Calculator – ensure you know how to use it, there's nothing worse than watching a candidate struggling to use his own calculator!
 - Pens, pencils, highlighters
 - Protractor and compass
- Equipment:
 - Clinorule
 - Clip board
 - Pen / pencil
 - Note book (wet strength)
 - Tape measure (or laser measuring device - but it may prove unreliable on the day)

On the day of the examination, to make sure that you are mentally calm and prepared:

- Have the correct underground kit – most mines now insist on reflective clothing and hand, ear and eye protection. Get details of these requirements and make sure you have all the necessary items BEFORE you leave for the examination.
- Get good directions or a clear map to the venue, with the examination co-ordinator's telephone number in case you are late or get lost.
- Have a good night's rest before the examination; sleep over nearby the venue if necessary to ensure maximum sleep and minimum travelling time.
- Dress neatly – to an examiner, an untidy person is often the first sign of an untidy mind!
- Arrive at the mine in good time.
- Change as soon as possible after arrival, to get more time to prepare the plans, etc.
- Fold your plans in a concertina fashion, find the plan you are going to start with (normally a 1:1000 or 1:2500 scale), arrange it so that the shaft / access point is on the top and clearly visible. Place the plans on the clipboard, with this plan on top, together with your notebook.
- From the plans, determine the general mining layout in use on the mine

Underground visit and observations:

- When you get out of the cage / onto the level, write it down on the plan and begin to mark your route. Continue marking your route on the plan with arrows as you go along.
- At each observation point, number the point on the plan and then make the notes in your note book, referenced to the plan.
- Given the level of the examination and the focus on interpretation, when making observations you should gain an idea of the conditions in general and only highlight shortcomings, rather than dwell on specific observations e.g. rather note that there is a problem with grouted tendons sticking out of holes, than count that 23 of the 94 installed tendons were sticking out!
- Make brief sketches to explain your point where necessary.
- Note your observations in a logical manner, e.g.

For development:

- What is the purpose of the excavation i.e. why is it there?
- Observe and check plan for the influence of nearby excavations
- Excavation shape and dimensions – roughly, not precisely measured (compare to plan)
- Geology – host rock type and nature, dip, strike, prominent geological features (correlate map and visual information), oddities, etc
- Ground conditions – slabbing, blocky, solid, squeezing, oddities, etc
- Temporary support – type, length, diameter, pattern, installation angle, condition, oddities, etc
- Primary support – type, length, diameter, pattern, installation angle, condition, oddities, etc
- Secondary and / or tertiary support:
 - grouted rods - type, length, pattern, angle, condition, oddities, etc
 - meshing – type, diameter, aperture, overlap, distance from sidewall, condition, oddities, etc
 - lacing – type, diameter, pattern, clamping, overlap, distance from sidewall, condition, oddities, etc
 - shotcrete – type, thickness, quality, probe holes, condition, oddities, etc
 - long anchors – type, capacity, pattern, installation quality, pre-tensioning, grouting, cropping, conditions, oddities, etc

For stoping:

- Excavation shape and dimensions – roughly, not precisely measured (compare to plan)
- Geology – host rock type and nature, dip, strike, prominent geological features (correlate map and visual information), oddities, etc
- Ground conditions – slabbing, blocky, solid, squeezing, oddities, etc
- Face area / temporary support – types, length / size, diameter, pattern, installation angle, condition, oddities, etc
- Back area / permanent support – types, length / size, diameter, pattern, installation angle, condition, oddities, etc
- Gully area support – types, length / size, diameter, pattern, installation angle, condition, oddities, etc
- Barrier or regional support (if applicable) – type, length / size, diameter, pattern, installation angle, condition, oddities, etc
- In all cases check for unusual phenomena – you will usually be taken to an area with some unique problem or situation.
- Use the correct plan for each application – if you have been given a 1:200 scale plan of the stope, then reference your observations to this plan rather than the larger scale plan.
- If you are unsure of something that you observe – ASK! Speak to fellow candidates, guides or nearby production personnel. Usually the best source is a candidate who works on the specific mine, or on a nearby mine, and thus understands the geotechnical environment and conditions.
- When you have finished observing, interpret the cause of the situation. Ask yourself critical questions – e.g:
 - What do the examiners want us to see here?
 - Why is the area meshed and laced, although the conditions look good?
 - Why is there spalling on a haulage at shallow depth?
 - Why is the support failing, although it's been designed correctly?
 - Why is the tunnel size restricted in this area?
 - Could a person model / simulate this situation using a computer package? If so, what evaluation criteria would I use and what results would I expect?
- Write down your elementary interpretations and discuss them with your fellow candidates – do not however simply believe the majority view as it's often wrong.
- Follow the same procedure for each site – mark your route, make structured observations and elementary interpretation.
- Use any spare time (waiting on the station or after changing on surface) to neaten up your notes, clear up anything you are unsure of and discuss what you saw with your fellow candidates.

Surface preparation for the actual examination:

- Using a highlighter, trace the route you followed on the plans and check your referencing between the plans and your notes.
- Orientate yourself on the plans with regard to North, the co-ordinate system and elevation references. Calculate dip at several locations.
- Check the collar elevation of the shaft, the depth below surface of the levels you went to and the correct virgin stress levels, both horizontal and vertical.
- From the plans, check whether the area you went to is any different to the general mining layout in use on the mine. Make use of dates on plans where needed to check mining sequence and face advance rates. Check the stoping width / mining height for any oddities.

- Consider if anything you saw is different to that you would have expected if you had just been given the plan.
- Again make sure that your notes are neat and legible, clear up anything you are unsure of and discuss what you saw with your fellow candidates.

During the examination:

Remember that the examiners' main purpose is to evaluate whether you are fit, qualified and able to stand up and give advice to production management. They are not only evaluating your technical skill, but also your self confidence, assertiveness and conflict-handling ability.

- First impressions count – keep your head up, look neat and organised and have all your notes, plans and equipment ready.
- Conduct yourself in an appropriate manner at all times during the day not just when being examined.
- The first questions inevitably relate to plan reading issues, route followed and simple calculations such as depths, middlings to reef and virgin stress levels – make sure you get them right as this boosts your confidence and starts the examination off well!
- Listen closely to each question and ask the examiner to repeat it if you did not understand.
- Do NOT try to remember all that you saw – refer to your notes at all times – after all, that's why you made them!
- Take time to analyse your answer before speaking – do not be bullied into quick answers that may be wrong.
- Answer each question clearly, distinctly and speak loudly enough to be heard and understood.
- Answer only the question that is put to you – if the examiner asks “what did you see?” then he wants to know what you observed, not how you interpret the situation. If he needs more information he will ask another question.
- Keep your answer simple – by trying to impress the examiner with technical terms and grand theory you are likely to expose yourself to further in-depth questioning as the examiner tries to find out whether you really know what you're talking about.
- Once you have given an answer to a question and are confident of your answer, stick to it. Examiners will occasionally ask “are you sure?” to test the candidate's determination. An unsure candidate makes a poor impression on the examiner, and this will only put you under more stress. Remember there is a difference between being firm and being cheeky. If in doubt, speak to the examiner in the manner in which you would speak to your Manager.
- Do not lie – it immediately upsets the examiner. If you haven't seen something, say so. If you haven't measured precisely, then say “I estimate...”.
- If you make a mistake, admit it immediately and supply the correct answer. Do not try to talk your way out of the situation.
- If you can't answer a question to the examiner's satisfaction, say so, forget it and move on to the next question. Dwelling on mistakes and unanswered questions only puts you under more stress.
- Occasionally, it may be beneficial to ask questions of the examiner, particularly if you have seen something but cannot explain it. Do not however, reverse the examination.

When you walk out of the examination venue, YOU the candidate should know whether or not you passed. If you aren't confident of passing, assess where you went wrong and what remedial action is needed to correct the situation. Make sure that you have got it right before the next examination.