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President Corner



"Share the knowledge and create a caring culture"

At the AGM held in November 2015, we recognised some of our members for their extraordinary achievements and contributions to our fraternity through the grants of awards in various categories. As Rock Engineers, just doing our jobs, we do not always realise the influence we have on those around us. Through mentoring, we develop the skills of our colleagues and we instil a culture of caring, self-worth, ambition and recognition.

In the workplace as technical specialists, we are responsible for ensuring the safety of thousands of workers through our routine monitoring. Our selfless efforts are not always recognised and typically the areas where we make the largest contributions are celebrated by the industry at events such as MineSafe. However, the efforts of the Rock Engineers and the Rock Engineering Departments are not credited for their interventions which contribute to a safer working environment. As a service department, we do not contribute to the bottom line, but we can contribute strongly through our dedication and involvement. In December, the Principal Inspector of the North-West region issued an instruction for all mines in the Rustenburg area to stop their operations and instructed that all areas be assessed by Rock Engineers to ensure that our workers do not work unsafely or become exposed to an unsafe working environment during the "silly season". The DMR, therefore, recognises the skills we have in the field of strata control.

There are many factors influencing the behaviour of the workers at the face. We can, however, influence their behaviour through on-going coaching, in the workplace, at the face. Our contributions can only add value to processes such as the entry examination and TARP, which is aimed at creating a safe working environment. We should realise that our actions will assist in upskilling our workers at the face. We can, therefore, make a difference by caring and sharing. It goes beyond celebrating fall-of-ground fatality free shifts or setting new records.

Michael du Plessis - SANIRE President

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SANIRE AGM 2015

The SANIRE AGM was held on the 27th November 2015 at the Ruimsig Country Club. The new format of the AGM comprised of the formalities in the morning followed by lunch and ended off with a round of golf. The AGM provided an overview of the SANIRE strategy for the next 2-5 years. Recognition to outstanding commitment, contribution and achievement through the various award categories was also presented. The AGM was well attended and will hopefully continue to do so in the future. A special thanks must be given to Carol Hunter for all her hard work in making the AGM possible.

2016 SANIRE NATIONAL COUNCIL

NAME	PORTFOLIO
Michael du Plessis:	President, Awards; RETC
William Joughin	ISRM, SAIMM, Eng works, AfriRock
Les Gardner	RE Legislation, RETC, SIMRAC
Friedemann Essrich	Treasurer, MQA, QCTO, LI-L4 training
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Jaco le Roux	Website
Robert Armstrong	Organisation Liaison
Dave Arnold	History, RETC
Paul Couto	Newsletter

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Obed Masinge	Northern Cape



Award	Recipient
Best student Award - Best student at Pretoria University	Kara Lombard
Best student Award – Best student at Wits University	Lunghile Ngobeni
Candidate Award - Highest mark > 75% for SCO Theory	85% -Bennett Macuacua
Candidate Award - Highest mark > 75% for Paper 1	82% - Gift Thantsha
Candidate Award - Highest mark > 75% for Paper 2	88% - Jennifer Pilkington
Candidate Award - Highest mark > 75% for Paper 3.1	76% - Moses Modika
Practitioner of the Year Award - Rock Engineer, Strata Control Officer or Observer who contributed significantly outside of what is required by role	Otto van der Merwe



Practitioner of the Year Award
Otto van der Merwe (Left)
Michael du Plessis (Right)

Candidate Award - Highest
mark > 75% for SCO Theory
Bennett Macuacua (Left)
Michael du Plessis (Right)

Candidate Award - Highest
mark > 75% for Paper 3.1
Moses Modika (Left)
Michael du Plessis (Right)

Award	Recipient
Lifetime Achievement Award - Honorary Membership - Person who made significant contribution - Non technical	Apie van Rensburg
Lifetime Achievement Award - Honorary Fellowship - Person who made significant contribution - Technical or other	Michael Roberts
Salamon Award - Person with best (also significant) refereed technical publication	P.J. le Roux and Dick Stacey Measurement and prediction of dilution in a South African gold mine operating with open stoping mining methods
Ortlepp Award - Person with best (also significant) refereed technical publication (less than 35 years old)	A.G Hartzenberg The influence of regional structures associated with the Bushveld Complex on the mechanism driving the behaviour of the UG2 hangingwall beam and in-stope pillars at Lonmin's Marikana Operations.



Michael du Plessis, Prof Dick Stacey, Dr Jaco le Roux



Apie van Rensburg



Alida Hartzenberg and Michael du Plessis



Michael du Plessis and Kim Roberts



Would like to thank the following sponsors for making the AGM possible



Safety is our nature



EST. SINCE 1986



EBENEZER GORDON HOLDER



× 24 May 1956

† 07 December 2015

I have known Gordon for many years, and worked with him between 1996 and 2002, when I was a member of the Rock Engineering Department at Anglo Platinum at that time. He was the Chief Rock Mechanics Officer. Gordon spent most of his career at Anglo Platinum, and because in the early years there were only a few Rock Engineers employed, he had an intimate knowledge about all the producing shafts.

His time keeping was exemplary, if not extreme – he was always the first to arrive in the office in the mornings and the last to leave in the afternoons. When asked why, his answer was perhaps unsurprising: “My job is my life”.

Another part of Gordon’s work which deserves mentioning was his record keeping and I never saw anyone else doing the same. For underground visits, Gordon had small A6 black books where he wrote what he observed and recommended on any particular day. He would then transfer some important notes from the A6 underground books into his A4 black books which he kept for his daily, planning and various meetings notes. Furthermore, he kept both his book formats bound in clearly labelled volumes. So, if you asked him what he did on any specific day, month and year, Gordon would look into his Register and check which volume and book to open, and he would tell you exactly what he did on that day. All these volumes of books took up most of his vast filing cabinet.

Gordon had very good observation and interpretation skills underground, given his knowledge and long experience. He loved to coach young and upcoming Rock Engineers – like me at that time – and his advice was very valuable. Not only was he a good Rock Engineer, Gordon’s strength was also in his very broad general knowledge regarding mining, engineering, stores management and industrial relations, to mention a few.

Another incredible aspect of Gordon’s life was his ability to speak the Setswana language fluently. He often spoke Setswana with black colleagues in the office or underground and one could see how much they appreciated that.

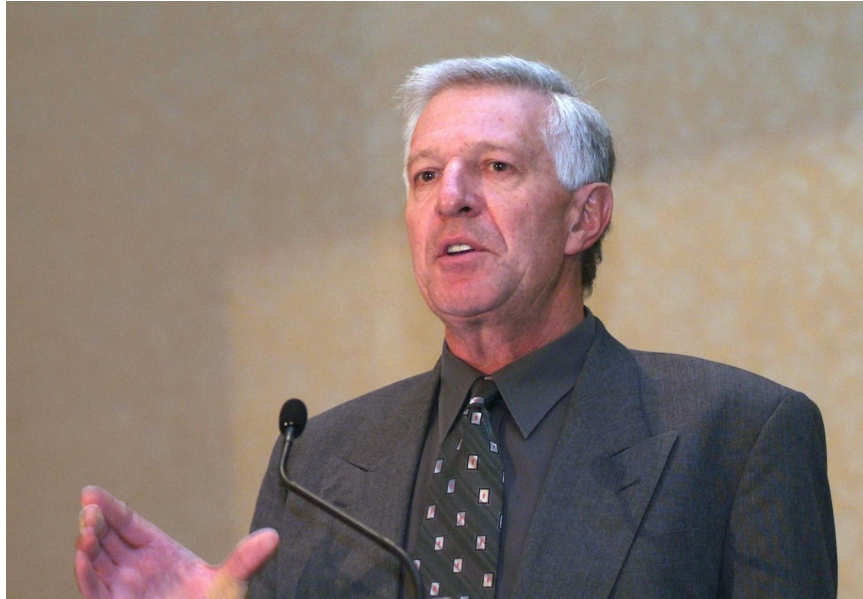
Gordon left Anglo Platinum in 2009 to spend his time elsewhere; Samancor chrome mines being the last place.

After his sudden passing, Gordon left behind his wife Jenny and his sister Fiona. Gordon’s plans were to retire and move with his wife to the Western Cape where his sister lives. Sadly, Gordon could not fulfil his dream.

By Petr Miovsky

Rock Engineering Manager – Impala Platinum

PAUL KRUGER VAN DER HEEVER



× 25 April 1947

† 22 December 2015

It is with great personal sadness that I informed you that our friend, colleague and associate of Groundwork passed away peacefully this morning after a long and stoic battle against cancer.

Paul worked on dozens of projects for us after we were fortunately enough to secure the services of this immensely capable man in September 2006. He conducted many geological mapping and stress measurement site evaluation projects, as well as assisting with other geotechnical investigations. For those of you who didn't know Paul well, he was a geologist and chemist by training who then specialised by obtaining the Chamber of Mines Rock Mechanics Certificate, and also obtained a Master's Degree in Seismology. His desire to acquire knowledge was endless and he was awarded an MBA Cum Laude while working as the manager of Gencor's Technical Services Department in Klerksdorp in the 1980s.

Paul was also an incredibly active man who played golf regularly off a low handicap and ran numerous long distance races, including Comrades many times. He had a remarkable and active mind and had many interests and hobbies. However, his passion always seemed to be geology. I called him our bionic geologist as he had the ability to see well beyond the rock surface when making his geological assessments. Despite his incredible technical skills, he had the relatively unique ability to present findings to senior management in a manner which they always understood and appreciated. An example of this is the model he built by himself to assist the shaft personnel to better understand the complex geology at Kloof Main Shaft. He did this in his spare time, without compensation, out of his own enthusiasm for the project. He was always keen to share his formidable knowledge to help others grow and develop.

Paul touched the lives of many people and he will be sorely missed. At this time, our thoughts are with his wife Bets, his children, Paul Junior, Lisa and Marissa, and his six grandchildren.

By Phil Piper

Director - Groundwork Consulting

Newsletter Advertising



The **SANIRE** Committee has decided to increase the advertising opportunities for suppliers who would like to market their business and products in the Rock Talk.

The table below indicates the prices for different size advertisements as well as bookings for the future.

Please contact Paul Couto for more details

Paul.couto@harmony.co.za / paul.coutopm@gmail.com

Type of advert	Rates (Excl. VAT) Solus, Casual	Availability per newsletter	Select Publication Issue (Mark with x)	
			April 2016	July 2016
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Full page (Middle)	R 8 000	1	Booked	

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E	I	B	S	S	H	R	I	N	K	A	G	E	T	C
N	U	A	X	X	G	P	O	R	Q	Z	T	A	J	K
T	L	S	I	E	E	X	L	P	J	W	I	E	Y	M
C	F	R	S	E	K	L	Q	X	S	L	V	Q	P	R
F	E	E	W	K	J	Y	Q	K	I	S	G	W	F	V
M	N	D	K	B	P	G	F	N	V	Y	Q	I	E	F
Z	Z	N	G	W	P	P	G	D	M	I	C	X	O	A
B	Z	I	S	T	S	S	E	L	C	I	T	R	A	P
S	P	B	W	J	G	T	K	B	N	E	X	M	O	J

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MG-Bolt

RT Cable Anchor



Self Locking Cable Anchor



SLOPE STABILITY CONFERENCE

International Symposium on Slope Stability in Open Pit Mining and Civil Engineering



Dr Loren Lorig presenting his keynote (Photo courtesy of S Coetsee)

The Sixth Slope Stability Symposium was held in Cape Town from the 12th to the 14th of October 2015, hosted by SANIRE in conjunction with SAIMM. The symposium was originally held in Cape Town in 2006 and has subsequently been to Perth (2007), Santiago (2009), Vancouver (2011) and Brisbane (2013). Since it is the only dedicated slope stability conference internationally, it is consistently well attended. While attendance was less than in previous years, as is expected in current times, it still attracted just over 200 delegates, 130 of whom were international. Keynote speakers were Professor Doug Stead from Simon Fraser University, who presented his research on internal failure mechanism during failure, comparing it to current analysis techniques; Dr Loren Lorig CEO of Itasca, presented on designing for extreme events; Geogg Beale (Director at Schlumberger Water Services) presented on the importance of surface water management and its impact on slope stability; and Louis Melis (Melis & Du Plessis Consulting Engineers (Pty) Ltd) presented the recent work he has been doing in designing rock fall protection. Fifty-four papers and ten posters were presented and published in a proceedings volume, a selection of which will be published in an upcoming issue of the SAIMM Journal. A slope stability monitoring workshop was presented on the 15th, organised and facilitated by Huw Thomas from the University of the Witwatersrand. Thanks goes out to the organising committee, SAIMM, presenters and the very generous sponsors!

Robert Armstrong,
Chair, Organising Committee.

ISRM News

Commissions

A recent report on the 2015–2019 commissions was submitted by Prof Doug Stead. While the report was very positive, the lack of participation by the African region was highlighted. South Africa has made significant contributions to the ISRM commissions in the past and SANIRE would like to return to this tradition. Members of the commissions meet at the ISRM International Symposium each year and correspond by email in between. SANIRE will endeavour to raise funding to partially cover the costs of key individuals that would like to attend the 2016 commission meetings in Cappadocia, Turkey (2016-08-29 to 2016-08-31). The 2017 International Symposium (AfriRock 2017) will be hosted in Cape Town, South Africa and SANIRE would like to encourage members to participate then. Please contact William Joughin if you would like to participate in any of the commissions. The following commissions have been approved for 2015–2019:

- Application of geophysics to rock engineering
- Crustal Stress and Earthquakes
- Discontinuous Deformation Analysis (DDA)
- Design Methodology
- Education
- Evolution of Eurocode 7
- Grouting
- Tunnelling in Hard, Faulted, Water Bearing Rock, with Possible Squeezing or Rock Burst – Lessons Learnt and Recommended Best Practice (previously Hard Rock)
- Petroleum Geomechanics
- Preservation of Ancient Sites
- Radioactive Waste Disposal
- Rock Dynamics
- Soft Rocks
- Subsea Tunnels
- Testing Methods
- Underground Nuclear Power Plants
- Underground Research Laboratory (URL) Networking

Suggested methods

A new suggested method has been approved by the ISRM Board:

- ISRM Suggested Method for In Situ Microseismic Monitoring of the Fracturing 2 Process in Rock Masses.
- South African research features in this suggested method.

Online lectures

A new online lecture has been recently presented and is available for viewing or downloading on the ISRM website.

- 12th ISRM Online lecture: Prof Ove Stephansson. “Rock Stress and Stress Fields”

Rocha medal

- Jaco Le Roux’s PhD was submitted for the Rocha medal 2017. Nominations are now closed. The Rocha medal is awarded to the best PhD in Rock Mechanics.

William Joughin - ISRM Africa (Vice President)

PERSONALITY OF THE QUARTER



Philosophy of Life:
*“Too much of anything
is not good. Live a
balanced life.”*

Full Name: Deon Louw

Position: Unit Manager – Rock Engineering Beatrix 3#

Company/Organisations: Sibanye Gold

Date and Place of Birth: Born in Bellville, Cape Town, on 4 March 1960

Education: Matriculated at Bothashof, Salisbury (now Harare)

First Job: Learner Official Mining, Buffelsfontein Gold Mine, Genmin

Personal Best Achievement/s: The design and actual early extraction of the Beatrix 3# Shaft pillar

Philosophy of Life: Too much of anything is not good. Live a balanced life.

Favourite Food/Drink: A good Irish whiskey (Here, I ignore my philosophy). I love chicken – braaied or grilled – with Portuguese spice.

Favourite Sport: I work only because my golf is not good enough.

1. How did your career in the mining industry begin and where are you now?

Following the completion of my military service in 1980, I started off at Buffelsfontein Mine as a Learner Official and later became production Shiftboss, mostly at Orangia Shaft. In 1987, a neck injury in rugby forced me to assist the Rock Engineering Dept for 6 months, while I could not go underground. This was the first time that I was really exposed to Rock Engineering and I immediately became very interested in the subject. Shortly after my return to underground, I applied for the position of Strata Control Officer and joined the RE Dept. I obtained my COM Cert in 1990 and moved to Beatrix mine in the Welkom area in the same year. During the next 10 years, I toured the Welkom Goldfields, working at Oryx Mine, St Helena and back to Beatrix again, working for the same company. (Genmin, Gengold, Gold Fields). In 2002, I joined Brentley, Lucas and Associates, and was based at Bambanani Mine until 2011. It was an interesting 9 years, with Bambanani experiencing serious problems in their orepass systems, and eventually scaling down to a shaft pillar extraction. During this time, I also did a lot of consulting work on smaller diamond mines, as well as at the Afrikander Lease operation in North West. In 2011, I was offered the position of Chief Rock Engineer at Beatrix mine and moved back there, saw the unbundling of Goldfields and the creation of Sibanye Gold, and am still quite happy in my role as Rock Engineer at Beatrix 3#.

**“Confidence.
You need to
show
confidence”**

2. Why did you choose Rock Engineering?

I was very fortunate to be exposed to RE early in my career and to then be able to make the career change to Rock Engineering. It is probably the most interesting, challenging and exciting discipline in the mining industry. No two days are the same, no two problems are the same, and no two people are the same. Every day, there is something new and you keep on learning and gaining experience every day.

3. In your opinion, what are some of the challenges that the fraternity is currently facing?

I think our biggest challenge currently is that our design function is under threat. There is a tendency that we shouldn't design support to suite, but rather to design for the worst case; if one operation utilises a system, it must be implemented throughout, whether it is relevant or not. It is no longer a case of designing out or reducing the risk in the mining of a block ground, but rather that if there is risk, abandon it. We can only overcome this by educating the prescribers and enlightening them in the principles of Rock Engineering.

**“Confidence
sells!”**

4. What are some areas that you believe will become of increasing importance in the near future of the rock engineering discipline?

I believe we will be required and that we need to play a much larger role in the ongoing planning of workings. The expertise is no longer there, as it used to be, and once again, we need to coach and educate.

5. What advice would you offer people aspiring to be in your position?

Confidence. You need to show confidence: when you present a plan, or when you motivate a new support system, mining sequence, whatever. Confidence sells! Even if you yourself are not too confident in what you propose, propose it with confidence.

6. Who is your role model/mentor?

I cannot single out one person. There are too many people that I came into contact with in my career who all contributed in my life, whether big or small. Each person has something to offer which will benefit you in some way.

7. What is the best advice you have ever been given?

It's a golfing tip – Aim high, don't set a low target because then you will hit the ball low. And it is the same in life, set your goals high.

ROCK STAR OF THE QUARTER



Philosophy of Life:
“Everything happens for a reason”

- Full Name:** Darryl James Slawson
- Position:** Senior Rock Engineer
- Company/Organisations:** Northam Platinum: Booysendal Division
- Date and Place of Birth:** 13 October 1987, Morningside, Johannesburg
- Education:** BSc Geology; BSc Hons Environmental Management, COM Rock Engineering Certificate
- First Job:** Pharmacy Assistant
- Personal Best Achievement/s:** Obtaining my Rock Mechanics Ticket
- Philosophy of Life:** Everything happens for a reason
- Favourite Food/Drink:** Pasta/Hansa
- Favourite Sport:** Rugby

“Study ... study ... study. Take the time to learn from experienced professionals. Never be too scared to ask questions.”

1. How did your career in the mining industry begin and where are you now?

I started my mining career at AngloGold Ashanti (Tau Tona Mine) in 2011 as a Rock Engineering MIT.

2. Why did you choose Rock Engineering?

Well, I think Rock Engineering chose me When I went for an interview at AngloGold Ashanti in 2011, I really had no idea what Rock Engineering was all about. After making it through the second round of interviews and a rather intense psychometric test, I was offered employment at Tau Tona mine. After having done some research about the mine, I automatically felt proud of being an employee of one of the world's deepest mines. When I started working it was all rather overwhelming, which literally forced me to learn quickly. Within a few weeks of working at Tau Tona, I quickly gained a keen interest in mining and, of course, Rock Engineering. Since then, I've always tried to learn and gain as much knowledge as possible. I still have a huge amount to learn and am looking forward to the challenges ahead.

3. Please tell us a bit more about your career journey?

My career in Rock Engineering started on the 5th of April 2011 at Tau Tona Mine. Eight months later, I obtained my Strata Control Ticket. In 2013, I then joined Moab Khotsoang Mine where I really learnt a huge amount about Rock Engineering from my peers and supervisors, which stood me in good stead for obtaining my Rock Engineering Ticket in 2014. I have currently worked at Northam Platinum: Booysendal Division for the past year as a Senior Rock Engineer.

4. In your opinion, what are some of the challenges that the fraternity is currently facing?

From an operations point of view I believe that Rock Engineers are so caught up in the day to day functions of the mine, they in turn tend to neglect the R&D and technical side of the science.

5. What are some areas that you believe will become of increasing importance in the near future of the rock engineering discipline?

With the current economic climate, and specifically commodity prices, our (Rock Engineering) role in ensuring safe production at the lowest possible cost will become of increasing importance.

6. What advice would you offer people aspiring to be in your position?

Study ... study ... study. Take the time to learn from experienced professionals. Never be too scared to ask questions.

7. Who is your role model/mentor?

Gary Dukes and Johan Oelofse have had the biggest influence on my career and gave me a huge amount of support and guidance with regard to working towards the Rock Mechanics Ticket.

8. What is the best advice you have ever been given?

Never underestimate yourself

Rock Engineering History

South Africa is without doubt one of the best places in the world to study the entire history of the planet. Because of its particular, and perhaps unique, geological environment, situated as it is on one of the oldest and most stable cratons in the whole world, it has exposures of the earliest rocks on the planet, dating back almost to the very first quarter of the Earth's existence, once the fireball had cooled down. They tell of the break-up of super-continent long before Gondwanaland ever existed – lavas spewed out in the depths of deep, ancient oceans, similar to those currently being extruded along the mid-Atlantic ridge and elsewhere.

South Africa's not very much younger sediments, their deposition dating back to as much as three billion years ago, not only contain some of the world's largest repositories of base and precious metals and minerals, but also trace the conversion of the hostile, oxygen-deficient environment of our planet to the more benign environment that we enjoy and that we are busy destroying today, together with evidence of the very first life-forms to appear; life forms that were in fact instrumental in the process of converting the atmospheric and terrestrial environment, paving the way for our own evolution. The exposure of this evidence close to surface was facilitated in part by one of the largest, and certainly the oldest, known meteorite impacts the world has evidence of. All of this evidence of the pre-history of our planet can readily be seen in numerous exposures situated within short walking distances of the centre of Johannesburg.

Admittedly, there then follows a short billion year gap in the South African record, during which time the trilobites ruled the planet and nothing much else happened, until one is once again able to trace the course of history in the sediments of the Karoo sequence, and follow the evolution of fish, plants, insects and reptiles, starting in a frozen wasteland and progressing through the most luxuriant rain-forests the world has ever seen, to arid desert conditions just before the onset of the

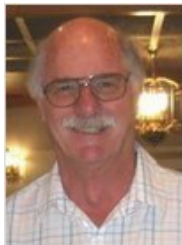
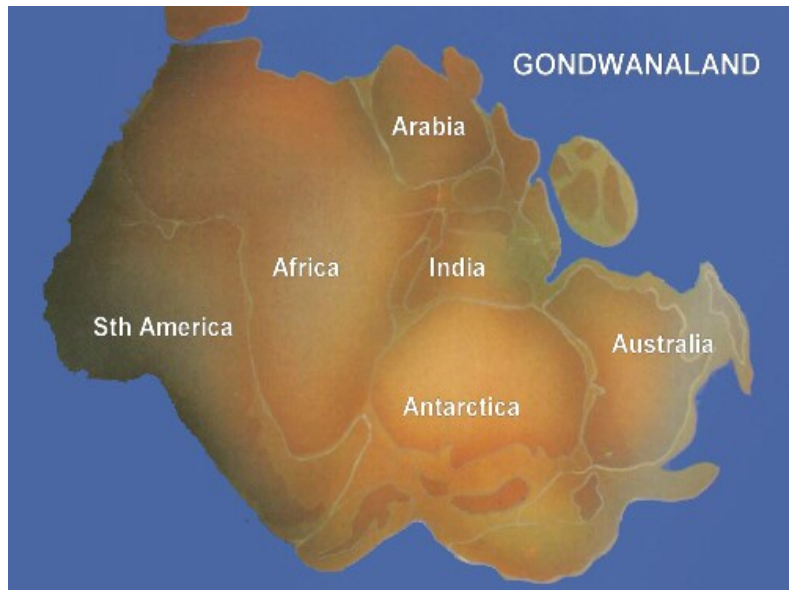
eventual break-up of the Gondwanaland super-continent into the land masses that we are so familiar with in the southern hemisphere today. Even the conversion of some reptiles into our mammalian ancestors can be witnessed during the latter stages of the life of this super-continent. This entire record, including evidence of the break-up, can be readily traced during a short three-hour drive from the seaside of the Natal coast to the mountains of the Drakensberg range. Nearly 200 million years of pivotal history in space of only a few hours, right here, under our noses!

If this were not enough, our own evolution from apes to something perhaps only slightly more intelligent and upright is traced in the detritus of world-renowned archaeological cave sites dotted around the country. Admittedly, one would perhaps need some form of vehicular transport, like a bicycle, to get to some of these exposures in less than a day from central Johannesburg. Even evidence of our progress in learning to at last be able to harvest the bounty of the seas, which began about 150 000 years ago, and which is not recorded anywhere else in the world, and the world's oldest decorated tools for creating works of art more than 75 000 years ago, are to be found locally (albeit you might have to catch the train from Johannesburg – assuming that they still run in the new South Africa) in the caves of our Cape coast. We may even have the direct descendants of these ancient people living amongst us today – although, of course, their hunter/gatherer lifestyle is under enormous threat and is likely to disappear, together with the rhino, elephant and other endangered species, in the not too distant future.

Moving on to relatively more recent times, the remains of settlements and of pre-historic and historic tunnelling and mining operations by our ancestors are to be found all over Southern Africa, including Johannesburg itself where, for example, stone-age hearths and foundries for the production of ironware are battling to be preserved in some of the koppies surrounding the city.

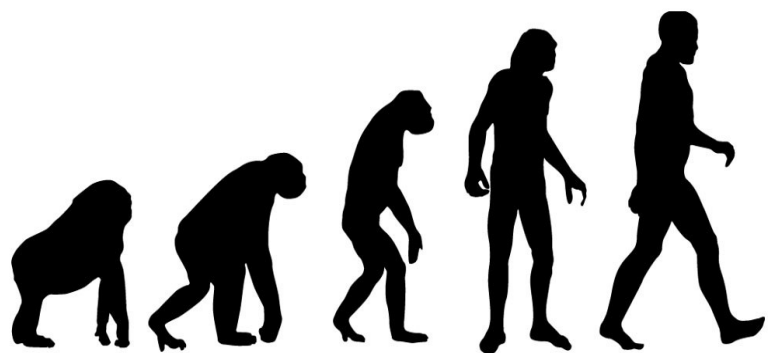
The history of modern mining in South Africa is inextricably tied up with the more recent history of South Africa itself, or, perhaps more correctly put, the history of the country as a whole since the middle of the nineteenth century, which has been dominated and determined by the history of its mining activities. Although early mining ventures in the colonies, such as the exploitation of copper deposits around Springbok, and even the much later gold rushes of the Barberton and Pilgrims Rest areas, did not have a profound effect on the development of the country, it was the discovery in 1869 of the volcanic source of vast diamond reserves, centred initially around what became the Northern Cape town of Kimberley, which paved the way for the conversion of the country from a rural and pastoral backwater into the industrialised powerhouse of sub-Saharan Africa, and which set the stage for the economic, social and political transformation and expansion of the country. The discovery seventeen years later in 1886 of the world's largest repository of gold in the conglomerate rocks of the Witwatersrand ridge adjacent to what was to become Johannesburg, one of the largest, richest, and most influential cities on the African continent, sealed its fate and changed the course of the country's fortunes forever. The exploitation of these deposits, together with the concurrent working of abundant coal seams and the later discovery of other important metal and mineral reserves, has had, and continues to have, an overwhelming effect and fundamental impact on the broad economic environment of the whole of the southern African region, and has profoundly influenced the historical course of events in the sub-continent.

It seems fitting, therefore, that the introduction and development of our rock mechanics discipline in South Africa during the course of the last century should also have played out against this vast and vibrant historical, economic, social, political and mining backdrop.



*This story was written by Dave Arnold.
Please feel free to contact Dave with any
historical stories for the next edition.*

davmae@iafrica.com



Tech News - SIM140201 - MHSC

Risk Based Support Design for Tabular Stopping in Bushveld Underground Mines



 **srk** consulting



Introduction

As most anyone in the Bushveld sphere of Rock Engineering (RE) will know (unless being exposed to the epiphanies of daylight is elusive), a broad-reaching project to equip RE practitioners in risk based support design was initiated through the Mine Health and Safety Council (MHSC), facilitated by SRK Consulting and Open House Management Solutions (OHMS) in 2015. Two phases of the project have been carried out, viz SIM120201 in 2012 and 2013 and SIM140201 in 2014 and 2015. On completion of the programmes, some 100 practitioners in the industry have received training in the technology. These include Rock Engineers, Strata Control Officers, Strata Control Observers and a limited number of geologists.

The purpose of the project is two-fold:

- To promote and revive technical research and scientific solutions to rock engineering challenges within the industry; and
- Encourage practitioners to apply a risk based approach to support design.

The project was completed in November 2015.

Objectives

The first objective is in line with requirements of the Mining Charter which was brought into being in 1996 as a collective assignment between mining stakeholders to promote transformation in the industry. Following on from the 1996 agreement, an addendum in 2002 further required that research outcomes be adopted within the industry to promote skills development and improve performance within the mining industry. In view of flagging attention and committed resources to this kind of output, it is especially encouraging to have had the funding for this initiative.

The second objective is where the programme becomes more meaningful for us as rock engineers. That is: how do we achieve risk based support design in the tabular underground mining environment and what does it actually mean?

Risk based support design

First, we need to understand what the risk based approach actually means and why we should apply it. The risk based approach is essentially a **quantified risk assessment of the consequences associated with falls of ground (FoG)**.

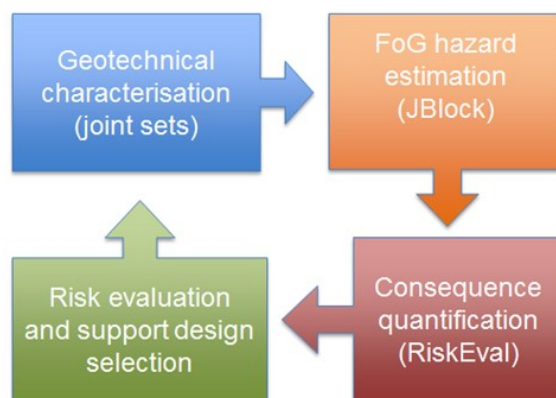
We could ask ourselves, “why not base the support design on the 95% fallout thickness?” Or better yet, using a FoG hazard distribution such as JBlock? These are indeed valid approaches; however, there are distinct limitations. The most obvious limitation is the question, “so what?”, i.e. if a keyblock falls and there is no loss of production and no injury to a person, then does it matter? Or alternatively, what is the potential for a keyblock to result in a significant consequence to the operation? And lastly, what is a significant consequence?

This is where RiskEval is applied, to quantify the consequence of keyblock failure in terms that are meaningful and relevant to the operational decision-making, i.e. personal liability (safety) and cost (finance).

A detailed explanation of the risk evaluation process is not given in this summary; however, for reference, the publications of Joughin et al (SAIMM Vol 112, February 2012) can be sourced online from the SAIMM.

Outcomes

Following the first phase of training in 2012 (SIM120201), the format of the second phase (SIM140201) was revised to accommodate an increased number of RE practitioners and promote the completion of each phase before continuing to the next.



Without labouring the training programme, it is worthwhile to mention that practitioners were exposed from all of the major mining houses, including Anglo, Lonmin, Impala, Northam, XStrata, Herculite and Aquarius in both the western and eastern platinum limbs (inset: training venue, Northam Platinum – Boosendal).

RE practitioners engaged in the principal components of the process as follows:

- Characterisation of the geotechnical setting (joint sets) by structural mapping and processing the results in DIPs and MSeExcel
- Applying the joint set data in JBlock to evaluate a FoG hazard distribution
- Translating the FoG hazard distribution (JBlock outputs) into a quantified safety and economic risk by applying consequence data to the hazard estimates using RiskEval.



Challenges

All of the RE practitioners participated in carrying out the risk evaluation process, and several completed reports have been received in which the process has been applied successfully. However, a number of challenges were encountered, both on a technical level and in terms of resource availability and resource capability (software limitations).

Technical challenges

It's no mystery that the principal focus of operational RE practitioners continues to be diverted to day-to-day troubleshooting of production-related challenges with the result that development of basic skills such as interpretation of joint orientations and manipulation of spreadsheet calculations is frequently compromised.

This became particularly evident during mapping and processing of results obtained using different tools such as clinorule compasses and electronic measuring devices (EMD, i.e. iPhone or Android or similar). Interpretation of joint orientations may be rotated up to 90° if the practitioner did not have a clear sense of the true underground orientation.

Risk based support design is best carried out by an experienced rock engineering practitioner with a CoMCRM. Constituent elements such as joint mapping and geotechnical data processing using DIPs and JBlock are well-suited to the capabilities of strata control officers (holders of a CoMCSC). However, strata control observers should be coached and trained to correctly collect the required geotechnical (joint set) information. Geologists with an engineering geology background were able to collect and interpret joint set data suitably well, while the construction and interpretation of FoG hazard and risk evaluation was left to the RE practitioners.



Continued.....

Resource availability

Sharing of resources presented somewhat of a challenge during the courses in that several practitioners did not have access to hardware (notebook computers) and software (application licenses). Several operations are in possession of limited software licenses due to the sporadic use of these applications which does not justify the purchase of a license per user. Strategic planning of resources helped in some cases to overcome the resource shortage; however, several operations were unable to secure the necessary software with the outcome that they could not satisfactorily complete the project.

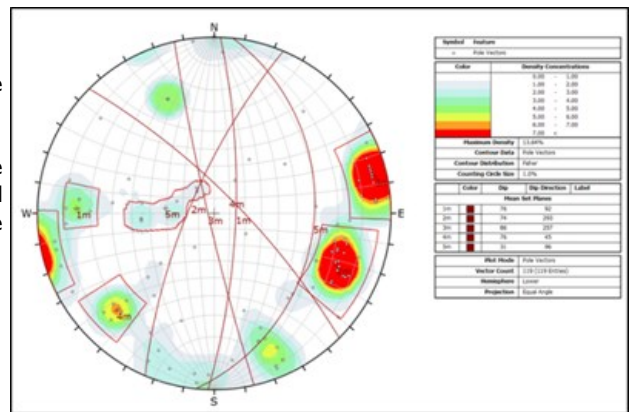
Software limitations

Several limitations within both JBlock and RiskEval were encountered that warrant further development. However, in spite of these limitations, FoG hazard estimations and risk evaluations were successfully carried out using the applications by tailoring the format of input data to suit the structure of the applications. A particular example, is the input of steep-dipping joint sets that “wrap-around” the stereonet plot (inset) with the effect that two distinct joint sets had to be defined in order for JBlock to correctly interpret the variability in dip direction within the joint set.

Going forward

Final results for the project were submitted in November 2015 to the MHSC in a report which is available through the MHSC.

A large body of RE practitioners representing a broad selection of the platinum industry now have the technical tools to provide engineered risk-based solutions for rock engineering challenges on the operations.



Thanks and acknowledgements

In spite of all of the challenges that were encountered, it was truly inspirational to be part of the enthusiasm and willingness with which the RE practitioners engaged in the technology transfer process. Thanks to the facilitators from Impala, Lonmin and Northam for making underground and training sites available, without whom the programme would never have been able to happen. Acknowledgements go the MHSC for funding and the SRK and OHMS teams for presenting and managing the project. Looking forward to continued feedback and suggestions for improvement and applicability of the technology.



Article by Jeanne Walls, SRK Consulting

WELL DONE JACO LE ROUX !!!

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SHORT HISTORY OF PREVIOUS EXPERIENCE:

Jaco started his mining career as a Learner Official in 1995 at Buffelsfontein Gold Mine. He was transferred to St Helena Gold Mine in 1996 where he completed his company mining. In November 1996 he was transferred to Beatrix Mine following his selection as a candidate rock engineer. In May 1997 he attained his Strata Control Certificate and worked on Beatrix and Oryx until February 2002.

In February 2002, Jaco joined Brentley, Lucas and Associates and in March 2002 attained his National Diploma in Metalliferous Mining (studying part time). He attained his Certificate in Rock Engineering in October 2002, followed by his Advanced Certificate in Rock Engineering and Graduate's Diploma in Engineering in June 2005. He obtained his MSc Engineering (Mining) in July 2008 and his Ph.D. in Mining Engineering at the University of the Witwatersrand on 9 December 2015.

Jaco has gained his experience practising at various mining operations where he has made valuable contributions to both mine management and the rock engineering fraternity. These contributions are in the field of remnant pillar extraction, multiple reef extraction, shaft pillar extractions, shrinkage mining, sub-level stoping and massive open stoping.

Jaco is presently the Principal Rock Engineer for Brentley, Lucas and Associates at Target Mine, which is a deep level, massive mining operation. At Target, he has made valuable contributions in the field of open stope stability and secondary support by using mine tailings as aggregate for wetcrete.

SACNASP CPD Points

The South African Council for Natural Scientific Professions (SACNASP) now requires its members to renew their membership every 5 years. Renewal acceptance is based on your continued professional development, measured by the CPD points system. Points are allocated to various professional activities, and the accumulation of the required points will ensure the renewal of your registration. The creation of the CPD culture is to ensure that all registered persons maintain their competence throughout their period of registration.

How it will work?

The allocation of CPD points is based on the system currently in use by ECSA. Once the build-up phase (discussed below) is complete, each member will reapply for registration every five years, when his or her application must be submitted three months prior to membership expiration. During the five-year period, each member must accrue a total of 25 CPD points with no less than three points per year; additional points can be carried over to subsequent years and all accrued points must be submitted on a yearly basis. As per the build-up phase, renewal cycles will depend on your first year of registration.

Credits must come from two of the three categories, with at least five (over the five-year cycle) from category one. Maximum points per year from each category and equivalent hours are listed:

Categories

Category 1: Structured Educational

Developmental Activities	4 credits	40 hours (10 hrs/credit)
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Category 2: Work-based Activities

Natural Scientific Work	2 credits	800 hours (400 hrs/credit)
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Mentoring of Candidate Practitioners	1 credit	50 hours (50 hrs/credit)
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Category 3: Individual Activities

Membership of a recognised Voluntary Association	1 credit	(not linked to hours)
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Other activities	3 credits	30 hours (10 hrs/credit)
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Category 1 activities include structured educational or developmental meetings, with 1 credit obtained for a full-day event and half credits for half-day events. This will include conferences, congresses, large group workshops, lectures, seminars, refresher courses and colloquiums.

Category 2 includes the pursuit of natural scientific activities in the workplace, limited to 2 credits a year. Mentoring or conducting in-house skills training will attract a maximum of 1 credit a year.

Category 3 includes membership to recognised professional bodies (GSSA and SAIEG for example) and other activities which include, but are not limited to, part-time lecturing, oral examinations of students, external examination for university courses, publication of journal articles, technical articles, presentations at technical events, and participation in professional, technical or non-technical committees.

Who will allocate CPD points?

CPD points can be issued by educational institutes, training providers and voluntary natural scientific associations. Educational institutes and training providers are evaluated on a course-by-course basis where each course is approved by SACNASP (approval process is provided on <http://www.sacnaspcpd.org/>). Voluntary associations registered with SACNASP can issue points for events that they organise or recognise. SANIRE cannot register as a voluntary professional association as its membership does not constitute the minimum number of registered professional natural scientists. The Geological Society of South Africa (GSSA) and the South African Institute of Engineering and Environmental Geologists have been approached and are willing to assist SANIRE in recognition of SANIRE events, along with relevant SAIMM and SAICE events. Discussions are on-going in this regard.

What you have to do

The system will be phased in over five years, with your first renewal (and subsequent renewals) based on the year of your first registration with SACNASP. The programme for the build-up phase based on your year of registration is detailed below:

	1982	1983	1984	1985	1986
	1987	1988	1989	1990	1991
	1992	1993	1994	1995	1996
Year of first registration	1997	1998	1999	2000	2001
	2002	2003	2004	2005	2006
	2007	2008	2009	2010	2011
	2012	2013	2014	2015	2016
First renewal of registration	2017	2018	2019	2020	2021
Number of credits required for first renewal of registration	5	10	15	20	25
Second renewal of registration	2022	2023	2024	2025	2026

By way of an example, a registered person who registered for the first time on 15 March 1983 will have to renew his or her registration by 15 March 2018. That person will be required to have 10 credits for the first renewal of registration. That registered person's second renewal will be in 2023, where the normal 25 credits will be required. With the start of the system being 1 January 2015, that person will be required to submit details of his or her CPD activities within 30 days after 14 March 2017 for the first year up to 14 March 2017. The application for renewal will need to be lodged with SACNASP 3 months prior to the expiry date of that person's registration on 15 March 2017, which means lodging the application by 15 December 2016.

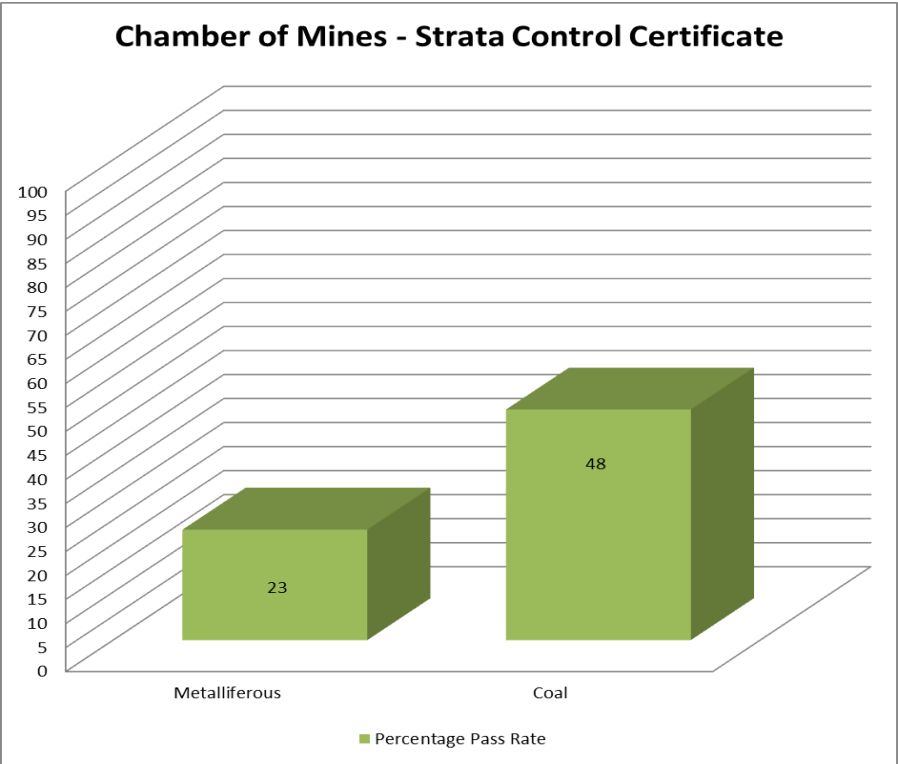
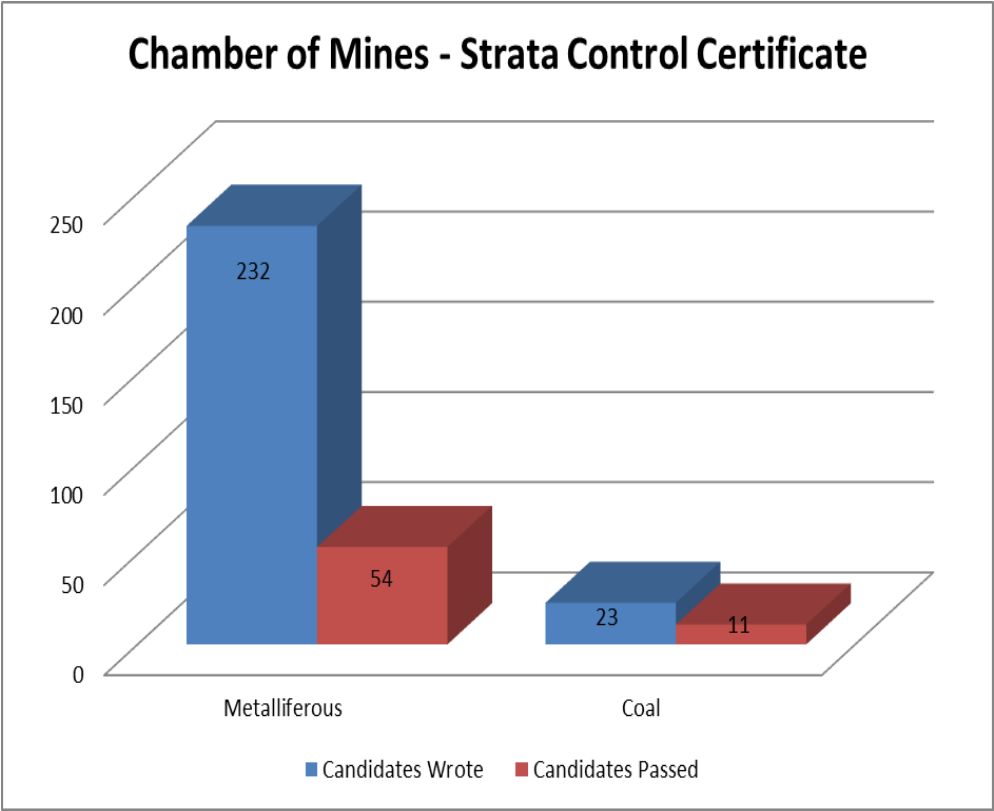
Please note that as a registered professional scientist, you are responsible for your own professional development, and it is therefore up to you to familiarise yourself with the policies related to CPD points. The current policy will be made available on the SANIRE website.

Robert Armstrong

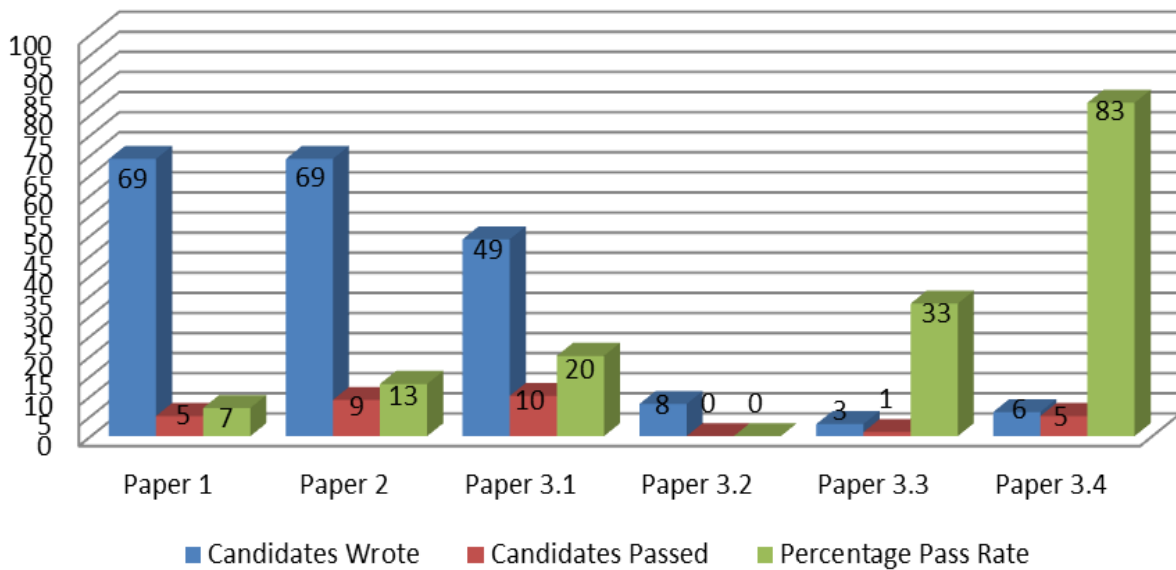
SANIRE Committee: Organisation Liaison Portfolio



ROCK Ed - COM RESULTS



Chamber of Mines - Rock Engineering Results



For any queries and assistance in regard to COM Strata Control and Rock Engineering Exams please follow the website

www.sanire.co.za

or alternatively contact

Yolande Jooste.

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ROCK ENGINEERING PRACTICAL EXAM 2015

In November 2015, the COM metalliferous practical for the platinum industry was hosted by the SANIRE Eastern Bushveld Branch at Ivanplats Mine, Mokopane Office. A total of 22 candidates attempted the practical of which 18 attempted the portfolio section, 17 the conventional section, and 11 the bord and pillar section. Overall, it was a successful day and I (Adam Cooper) would like to thank the Ivanplats staff for assisting with the venue arrangements; the Eastern Bushveld Committee for assistance in setting the exams, and especially Andre Esterhuizen for his contribution with respect to candidate applications, and the examiners for their commitment, time and effort.

I would like to congratulate Tati Bantu on obtaining the COM Rock Mechanics Certificate, as well the following people for outstanding achievement in specific sections of the practical examination:

Craig Slement – Portfolio

Tati Bantu – Portfolio

Obed Masinge – Conventional

Gordon Rabey – Conventional + Bord and Pillar

Omberai Mandingaisa – Bord and Pillar

ADAM COOPER



SANIRE

SOUTH AFRICAN NATIONAL INSTITUTE OF ROCK ENGINEERING

Vision: To promote the interests of a vibrant South African Rock Engineering Fraternity

Mission: SANIRE promotes the advancement of the Rock Engineering discipline through the following objectives:

- ◆ Encouraging interest and the advancement of education in Rock Engineering
- ◆ Maintaining professional practice and high standards of ethics
- ◆ Encouraging networking; Collaboration and information exchange
- ◆ Identifying, promoting and facilitating rock engineering related research

Values:

- ◆ **Honesty**
- ◆ **Integrity**
- ◆ **Professionalism**
- ◆ **Accountability**
- ◆ **Transparency**

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Your feedback will be highly appreciated.

Paul Couto

